Nathaniel Lichfield and Partners

Planning Design Economics

Entec

CO-OPERATIVE GROUP HEAD OFFICE LAND AT MILLER STREET CAR PARK, MANCHESTER

Volume 2

Environmental Statement

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Nathaniel Lichfield & Partners Ltd
3rd Floor
One St James's Square
Manchester M2 6DN

T 0161 837 6130
F 0161 833 3741

manchester@nlpplanning.com
www.nlpplanning.com

Offices also in
Cardiff
London
Newcastle upon Tyne

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1.0 Introduction

1.1 This Environmental Statement [ES] has been prepared on behalf of The Co-operative Group in respect of an application for full planning permission submitted to Manchester City Council.

Development Overview

1.2 The application seeks planning permission for the erection of an office building (Class B1) comprising 45,308m² (GIA) [45,805m² GEA], change of use of car park / Dantzic Street to public realm, closure of Dantzic Street and alterations to the highway.

1.3 The building will achieve an 'Outstanding' BREEAM rating. A significant area of public realm is to be provided to the front of the building and this will be the subject of a separate design competition should planning permission be granted. Access to the site will be via Dantzic Street.

1.4 A more detailed description of the proposed development at both construction and operational phases is set out within Chapter 3.

1.5 The application proposals to which this ES relates will be referred to, hereafter, in this ES as 'the Development'.

1.6 A location plan is attached at Technical Appendix 1.1.

Planning Background

1.7 The Miller Street car park site benefits from an extensive planning history. The relevant planning history covering the application red line boundary relates to use of the site as a car park and is set out in Table 1.

Application Ref. No	Proposal	Address	Applicant	Decision and Decision Date
21453	To continue to use land at the corner of Miller Street and Dantzic Street as a public car park (previously approved 24.12.81 to 31.12.82 under ref. F16975) and to extend the car park to include the site of 79 Dantzic Street following demolition of the building.	Land at the corner of Miller Street and Dantzic Street and the site of 79 Dantzic Street	Euro Car Parks	Approved:– 04/07/1984

Application Ref. No	Proposal	Address	Applicant	Decision and Decision Date
20325	Continuance of use of land for car-parking (previously approved 24/12/81 to 31/12/82 under ref. F16975).	Land at the corner of Miller Street and Dantzic Street,	Euro Car Parks	Withdrawn:– 09/05/1984
F16975	Continuance of use of land for car parking (previously approved 3.12.80 to 31.12.81 under ref:- F13817).	Miller Street/Dantzic Street,	Euro Car Parks Ltd.	Approved:– 28/04/1982
F13817	Use of land as a public car park, after demolition of existing building.	Miller Street/Dantzic Street,	National Car Park	Approved:– 03/12/1980
F06160	Continuance of use of vacant land as private car park (previously approved to 31.12.76 on 17.12.71 per Ref. TP.54397).	Angel Street,	N. Malcolm Esq.	Approved:– 26/04/1978

Table 1 Planning History

The Applicant

1.8 The Co-operative Group is the UK's largest mutual retailer. They are the fifth largest food retailer, the third largest retail pharmacy chain, the number one provider of funeral services and the largest independent travel business. The Group employs approximately 110,000 people, has 3 million members and around 4,900 retail outlets.

1.9 In the financial year ending January 2009 the Group's gross sales exceeded £10bn for the first time, up 15% year-on-year and operating profits increased by 11% to £393m.

1.10 The Co-operative Group has been based in Manchester for nearly 150 years and today continues to be the UK's leading ethical retailer and financial services provider, taking a leadership position on the issues that matter to its members and customers – from fair trade to combating climate change and championing human rights.

1.11 It is the intention of the group to bring the high standards and values that they are famous for to unlock the 20 acres of land on the northern edge of the city that is currently home to the Head Office complex.

1.12 The Co-operative Group is committed to investing in the future of a city that has been so long a part of their history. The proposals will bring new jobs and opportunities to enhance the lives of those who live, work and socialise in the

city.

1.13 The approach has been to work in partnership with the City Council and other key stakeholders to bring new life and investment to Manchester.

Purpose and Approach

1.14 The purpose of this Environmental Statement is to accompany an application for the proposed development as required under Schedule 2 of the Town and Country Planning (Environmental Impact Assessment (England and Wales) Regulations 1999 ('the Regulations') (as amended) in order to allow the consideration of any environmental effects of the Development on the basis of environmental information. The ES has been prepared in accordance with Schedule 4 of the EIA Regulations and assesses the impacts predicted to arise from both the construction and operation of the development. Where necessary mitigation measures are identified to reduce impacts to acceptable levels. Likely residual impacts are also identified.

1.15 The two key stages of the EIA process, as identified in "the Regulations" can be summarised as follows:–

> *"In the first stage the applicant undertakes an assessment so that environmental issues can be taken into account during the design of the project. This involves consultations, data collection and environmental studies to identify the effects and propose mitigation measures to prevent, reduce and offset them. This is reported in an environmental statement (ES) which is submitted in conjunction with the planning application".*
>
> *"The planning authority then undertakes the second main stage by critically evaluating the statement, seeking further information from the applicant if necessary, and taking into account additional consultations and public representations. This is to ensure that the planning authority has sufficient reliable information to understand the likely environmental effects and specify any mitigation measures before the planning application is determined".*

1.16 The Environmental Impact Assessment is based upon the following:–

1 A description of the development comprising information on the scale and nature of uses on the site, floorspace provision, and an indication of construction details, including phasing.

2 A Design and Access Statement providing details of:–

- Application site boundary;
- Physical context;
- The design approach, evolution and concept;

- The height and layout of the building;
- The materials to be used; and,
- Access arrangements.

3 A series of technical studies have been undertaken assessing the likely significant environmental impacts of the proposed development. These form the Environmental Statement.

1.17 For the avoidance of doubt conditions can be attached to the planning permission to tie the permission to the information contained in these documents. It is therefore considered that there is sufficient information to enable the likely significant effects on the environment to be assessed and the proposed mitigation measures to be described.

1.18 This Environmental Statement meets the requirements of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended). It is intended to assist Manchester City Council's determination of the application.

Consultant Team

1.19 The EIA studies have been co-ordinated by Nathaniel Lichfield and Partners [NLP]. The individual technical studies have been undertaken by NLP and other specialists as set out in Table 2.

Chapter Number	Topic	Author
1 - 5	Introduction, The Site and its Surroundings, Development Proposals, Consideration of Alternatives, Land Use and Planning Policy.	NLP/3DReid Architects
6	Water Resources	Entec UK Ltd
7	Air Quality	Entec UK Ltd
8	Noise	Entec UK Ltd
9	Daylight and Sunlight Effects	Entec/Waterslade
10	Wind Assessment	Entec/BRE
11	Land Quality	Entec UK Ltd
12	Transport	Waterman Boreham
13	Archaeology	Entec UK Ltd

Chapter Number	Topic	Author
14	Built Heritage	NLP
15	Townscape and Visual Impact	NLP/3DReid Architects
16	Socio-Economic Effects	NLP
17	Other Environmental Effects	NLP/GTech Surveys Limited

Table 2 Consultant Team

Scoping Process

1.20 Scoping involves identifying the people and environmental resources (collectively known as 'receptors') that could be significantly affected by the proposed development and the work required to take forward the assessment of these likely significant effects.

1.21 The context for scoping is provided in the EIA regulations and in DETR (now DCLG) Circular 02/99 Environmental Impact Assessment. Schedule 4 of the Regulations states that the ES should include:–

> *"a description of the likely significant effects of the development on the environment..."*

1.22 In addition, the Circular states that:–

> *"in many cases, only a few of the effects will be significant and will need to be discussed in the ES in any depth. Other impacts may be of little or no significance for the particular development in question and will need only very brief treatment to indicate that their possible relevance has been considered".*

1.23 A Scoping Report was produced for consultation and discussions were held with regulatory bodies to discuss and ascertain the appropriate scope of the ES. The potential environmental effects were identified for further assessment and were 'scoped in' when:–

1 They were considered to be significant; or

2 They could be significant and further information and / or consultation was required to determine whether they were likely to be significant.

1.24 For each of these potential effects, the Scoping Report identifies the work required to take forward the EIA. The Scoping Report is set out in Technical Appendix 1.2.

1.25 The Scoping Report was submitted to the LPA in May 2009, with the following consultees notified by the LPA:–

1 Greater Manchester Ecology Unit;

2 Natural England;

3 New East Manchester;

4 Greater Manchester Geological Unit;

5 Environmental Health - Pollution Control;

6 Manchester Engineering Design Consultancy;

7 United Utilities;

8 Environment Agency;

9 Lancashire Wildlife Trust;

10 Head of Highways;

11 Environmental Health - Contaminated Land;

12 GM Police;

13 North Manchester Regeneration;

14 Green City Team;

15 Environment and Operations Team;

16 Greater Manchester Archaeology Unit;

17 CABE;

18 Network Rail;

19 GMPTE;

20 4NW (North West Regional Forum); and

21 English Heritage.

1.26 The Scoping Opinion was received on 29th June 2009. Table 3 summarises the comments received as part of the EIA Scoping Process and how they have been addressed within this Environmental Statement.

Consultee / Respondent	Summary of Response	Location within ES
Greater Manchester Geology Unit	No waste sites in the immediate vicinity who could be possible 'bad neighbours'.	N/A
Greater Manchester Ecology Unit	Note the proposal to scope ecology out of the EIA. Records indicate that Black Redstarts nested very close to the site in 2008. It may be necessary to undertake surveys on the site, for example, to determine if the site is being used as a feeding site. Proposals for the site should include measures for biodiversity enhancement, as required by PPS9.	Technical Appendix 3.2 Environmental Standards Statement.
Green Spaces Manager	Tree cover is not considered to be of sufficiently high quality or value to warrant modifications of the layout of the development to accommodate them.	N/A
Network Rail	No objection to the principle of the development. Request the following points are considered: - Where it can be identified that rail patronage will increase as a direct result of new development and impact upon capacity, contributions for transport infrastructure should be sought; - Where vibro-compaction machinery is to be used in development, details of the use of such machinery and a method statement should be submitted for approval of the LPA; - Tower crane usage adjacent to railway infrastructure is subject to stipulations on size, capacity etc; - Information to be provided if abnormal loads will be using routes that include any Network Rail assets e.g. bridges; - Any increase in trips under railway bridges may be of concern; Deep excavations must present no risk to the safety, operation or integrity of the railway.	Technical Appendix 3.3 Construction Method Statement.
Head of Regulatory and Enforcement Services (Contaminated Land section)	Agree with the conclusions of the submitted report and that a desk study has been completed with site investigation underway. Recommend conditions are attached to any approval.	Chapter 11 – Land Quality.
Head of Regulatory and Enforcement Services (Pollution)	No observations	N/A

Consultee / Respondent	Summary of Response	Location within ES
CABE	Wish to be consulted in due course on any significant designs that may come forward for buildings / infrastructure / public space.	N/A
Environment Agency	The FRA should show principles of how SuDS will be incorporated. The FRA to confirm the extent of the existing drainage system on site and its receptor. An ecological element to be incorporated into the overall design process. A detailed desk study report and Site Investigation should be undertaken to ensure that any unacceptable risks to controlled waters are assessed and dealt with.	Technical Appendix 3.2 Environmental Standards Statement; Chapter 6 – Water Resources and Technical Appendix 6.1 – FRA.
GMPTE	A Transport Assessment should make an assessment of the potential impacts of the development. An assessment should also be made aware of the available capacity on the existing public transport infrastructure relevant to the development.	Chapter 12 – Transportation and Technical Appendix 12.1 - Transport Assessment.
4NW	The Regional Spatial Strategy was published in September 2008. A number of other policy documents may be relevant to the proposed development which will be regionally significant.	Chapter 5 – Land Use and Planning Policy.
United Utilities	The site must be drained on a separate system with only foul drainage connected into the foul sewer. Surface water should discharge to the soakaway / watercourse / surface water sewer. Foul drains must have adequate grease traps. Land or subsoil drainage water must not be connected into the public sewer system directly or by way of private drainage pipes. Deep rooted shrubs and trees should not be planted in the vicinity of the public sewer and overflow systems. A water supply can be made available to the proposed development.	Technical Appendix 3.2 – Environmental Standards Statement; Chapter 6 – Water Resources; Chapter 11 – Land Quality.
Design for Security	They are involved with the scheme at the moment and have also asked the Counter Terrorism unit to be involved. Design for Security would like to be involved in the design brief for the future landscape proposals.	Chapter 16 – Socio-Economic effects and Technical Appendix 16.3 – Crime Impact Statement.

Consultee / Respondent	Summary of Response	Location within ES
English Heritage	Primarily concerned with the impact of the development on the City's historic environment. They are pleased to note the methodology set out in the Scoping Report relating to Townscape and Visual Impact, Cultural Heritage and Archaeology. The Townscape and Visual Impact should refer to the approach set out in the Guidance 'Seeing the History in View' (EH 2008). In respect of cultural heritage, the assessment should include consideration of the impact of the site development strategy on the co-op's wider listed complex. Would support the proposed Archaeological analysis.	Chapter 13 - Archaeology and associated Technical Appendices; Chapter 14 - Built Heritage and associated Technical Appendices; Chapter 15 – Townscape and Visual Impact and associated Technical Appendices.
Flood Risk	FRA is required which demonstrates that the development reduces surface water run-off and flood risk elsewhere.	Technical Appendix 6.1 – FRA.
Ecology	Any scheme should incorporate measures to deliver ecological enhancements.	Technical Appendix 3.2 – Environmental Standards Statement.
Geology, Soil and Contaminated Land	Potential contamination issues to be investigated within the ES.	Chapter 6 – Water Resources and Technical Appendices; Chapter 11 – Land Quality and associated Technical Appendices.
Other Issues	Issues relating to the wind environment, sunlight and daylight assessment, TV / Radio reception assessment, and Crime Impact Assessment to be addressed in the ES.	Chapter 9 – Daylight and Sunlight Effects and associated Technical Appendices; Chapter 10 - Wind Environment and associated Technical Appendix; Chapter 16 – Socio-economic Effects and associated Technical Appendix; and Chapter 17 – Other Environmental Effects and associated Technical Appendix.

Table 3 Comments on Scoping Report

Consultation

1.27 The Co-operative Group has been involved in regular meetings with Manchester City Council over a significant period of time as the scheme has evolved.

1.28 The formal consultation process took two different forms, firstly as detailed above an EIA scoping exercise took place involving consultation with a range of organisers that have statutory duties towards the relevant technical areas

covered in this document. Secondly, wider consultation took place in order to receive feedback on the emerging proposals as they evolved towards the planning submission. This latter strand of consultation involved many of the statutory consultees that took part in the EIA scoping exercise but also a detailed consultation exercise held on July 6, 7 and 8 with the Manchester public.

1.29 Details of the consultation exercise are set out within the Statement of Community Involvement included as part of the package of documents submitted with the planning application.

1.30 The Scoping Opinion from Manchester City Council was issued on 29 June 2009 and is attached as Technical Appendix 1.4.

Report Format

1.31 The Environmental Statement is divided into three volumes:–

1 Volume I comprises a Non-Technical Summary of the results of the Environmental Assessment;

2 Volume II comprises the main sections of the Environmental Statement; and,

3 Volume III contains the Appendices.

1.32 The Environmental Statement has been prepared in accordance with Schedule 4 of the EIA Regulations. To ease the interpretation of these requirements, the following table describes the location within the ES of each required component (see Table 4).

Schedule 4 Requirements	Location within ES
Part I	
1. Description of the development, including in particular –	
(a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;	Chapter 3
(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;	Chapter 3
(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation etc.) resulting from the operation of the proposed development.	Chapters 6 – 17 and associated Appendices
2. An outline of the main alternatives studied by the applicant or appellant and an indication of the	

Schedule 4 Requirements	Location within ES
main reasons for his choice, taking into account the environmental effects.	Chapter 4
3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	Chapters 6 – 17 and associated Appendices
4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:- (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.	Within each chapter of the ES
5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Chapters 6 – 17 and associated Appendices
6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Separate Document
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Any difficulties or deficiencies have been identified in the individual technical chapters
PART II	
1. A description of the development comprising information on the site, design and size of the development.	Chapter 3 and Design and Access Statement (Technical Appendix 3.1)
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Chapters 6 – 17 and associated Appendices
3. The data required to identify and assess the main effects which the development is likely to have on the environment.	Chapters 6 – 17 and associated Appendices
4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.	Chapter 4
5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	Separate Document

Table 4 Schedule 4 Requirements

1.33 Where required, the study area relevant to each individual topic of the ES has been agreed with the local authority and other statutory consultees. This includes for example, the transport junction assessment used in the Transport, Air quality and Noise chapters, and the Zone of Visual Influence for the Landscape and Visual Impact chapter.

Cumulative Effects

1.34 There are no cumulative effects to be considered as part of this assessment.

2.0 The Site and its Surroundings

The Site

Location

2.1 The site, owned by the Co-operative Group is situated between Manchester's Victoria Station and the Northern Quarter area of the city centre. It covers approximately 1.6 ha and is bounded by Angel Street and Angel Meadows to the north, Dantzic Street to the west, Miller Street to the south and the remaining car park area to the east.

2.2 The site lies adjacent to the current Co-operative offices site and is dominated by surface car parking, incorporating an extensive area of public car parking on land between Angel Street and Miller Street. Approximately 220 of the spaces available are used by the Co-operative through an agreement with the car park operator.

Accessibility

2.3 The site is conveniently located in terms of accessing Manchester city centre on foot and bus stops are located on Corporation Street and Shudehill Interchange, from where all main bus routes run together with a Metrolink stop. Miller Street (A665) and Shudehill (A664) form key arterial routes from the city centre to the M60 Manchester Ring Road. Victoria train station is located within less than five minutes walking distance from the site.

2.4 The current use of the site as a car park does however form a barrier to accessibility and permeability for pedestrians and cyclists particularly to the Angel Meadows area to the north of the city centre and residential areas close by.

Landscape

2.5 There is some existing low grade vegetation on the site. A copy of the tree survey undertaken by the Lowther Forestry Group is attached as Technical Appendix 2.1.

2.6 The majority of the site is hard-standing, reflecting its current use as a car park. In places the edges of the site have been colonised by ephemeral/short perennial and tall ruderal plant species, including butterfly bush (Buddleja davidii) and common nettle (Urtica dioica).

2.7 The site includes a number of gradually sloping embankments/terraces that have been colonised by semi-natural vegetation, predominantly comprising bramble (Rubus fruticosus agg.) and goat willow (Salix caprea) scrub.

2.8 The terraces have also been colonised by invasive, non-native species including

strands of Japanese knotweed (Fallopia japonica) and a single patch of giant hogweed (Heracleum mantegazzianum).

Site Context

2.9 There are a mix of building sizes, styles and uses' surrounding the site, but the immediate area is dominated by the Grade II Listed CIS Tower.

2.10 The current Co-operative property estate along with Victoria station represents the Northern-most extremity of the city's commercial centre.

2.11 The presence of Victoria Station and the sites proximity to the city centre provide an un-paralleled opportunity to transform this part of Manchester into a truly mixed-use area of exceptional quality and lasting significance. The site will form a pivotal part of this developing City quarter.

2.12 To the north the site is bounded by Angel Meadows, a local public garden which is linked to the Irk Valley, a network of open spaces which are largely based on the valley of the river Irk and its tributaries offering a series of public spaces with high landscape qualities. To the South is a distinctive urban area of public open space located between the Cathedral, Chetham's School of Music, Urbis, the Triangle shopping centre and the approach to Victoria Station.

Topography

2.13 The site lies close to the Eastern Bank of the now culverted River Irk and slopes relatively steeply from East to West. The lowest point of the site is its North West corner at the junction between Dantzic Street and Angel Street (c.37.0m AOD). The highest point is at its North East Corner where Naples Street meets Angel Street (c.44m AOD).

Urban Grain

2.14 The area in the vicinity of the site is includes a mix of low-level residential properties with some larger warehouse type properties to the south and east.

2.15 The grain of the area south of Miller Street consists of large urban blocks that reflect the shift away from housing to today's expansive commerce and retail uses in this area of the city. Although the city has seen significant changes in the scale and use of land in this area, the historical grain of the street pattern remains largely intact. The CIS Tower dominates the immediate vicinity of the site.

2.16 The urban form to the city centre core is reasonably dense with an obvious hierarchy of major and minor streets and squares. The urban grain generally comprising primarily of small scale buildings, particularly to the historical city centre core. Large buildings such as the Arndale Shopping Centre provide internalised routes to provide connectivity throughout the city.

2.17 Moving away from the city centre core however, the density of building form reduces considerably, particularly along the city centre ring road to Trinity Way and Miller Street. The formation of the ring road has segregated the area to the north-east of the centre from the heart of the city.

Surroundings

2.18 The site is situated adjacent to the current Co-operative offices site and is dominated by surrounding surface car parking.

2.19 There are a number of vacant and derelict buildings around the site, including vacant 3-storey buildings fronting onto Miller Street alongside The Ducie Bridge, a Public House located on the corner of Miller Street and Corporation Street. An active Public House, the Crown & Cushion, is also located on the corner of Corporation Street and Aspin Lane.

2.20 The Cooperative Recycling Centre on Corporation Street is located next to the Crown & Cushion and incorporates an extensive surface courtyard area. A disused warehouse on Oswald Street to the west of the site is used by the Princess Royal Trust for Carers. The corner of Hanover Street and Shudehill, behind the CIS car park, also includes a number of active ground floor uses such as a Chinese takeaway and restaurant, a Premier convenience store and a recruitment company.

Listed Buildings and Conservation Areas

2.21 The site lies outside the boundaries of the Shudehill, Cathedral and Smithfield Conservation Areas in this part of the city centre.

2.22 There are a number of listed buildings in this area, including the following:–

1 CIS Tower (Grade II listed);

2 29 Dantzic Street (Grade II listed);

3 Victoria Station (Grade II listed);

4 Chetham's Hospital and attached wall (Grade I listed).

2.23 The listed buildings within the immediate vicinity of the site are listed at Technical Appendix 14.4 which accompanies the chapter on Built Heritage.

3.0 Development Proposals

Introduction

3.1 The vision of the applicant is to develop a unique landmark building to provide a home for its staff that will successfully embody the culture and aspirations of The Co-operative and allow the business to adapt and grow in response to future changes in the workplace and global markets. The new Co-operative head office will provide an environment that will embody and foster the future development of core values and principles that lie at the heart of the Co-operative movement.

The Development

3.2 The proposed development consists of 45,308m² (GIA) [30,352m² NIA] of Class B1 Office floorspace. The GEA of the development is 45,805m². A substantial area of the existing car park will become new public realm which will be the subject of a future design competition. Other works incorporate the closure of Dantzic Street and other alterations to the highway. The total site area incorporating highway works is approximately 1.6ha, with the site area of the building and public realm area being approximately 1.2ha.

3.3 The building will accommodate approximately 3500 staff which will support and encourage a wide range of other uses, spin-off businesses, shops and communal facilities. Due to the proximity of the city centre and the wish to encourage just such development in the future, the Head Office building is not intended to operate as a self-sustaining, 'gated' environment but rather to be an integrated part of the city.

3.4 The following uses are proposed within the building: -

1 Flexible office space;

2 Parking (cars 151, motorcycles 16, bicycle 105);

3 Business use merchandise centres of excellence (Food, Pharmacy);

4 Food test centre;

5 Training and development rooms;

6 Meeting room suite;

7 Brand Experience;

8 Reception;

9 Auditorium;

10 Staff facilities (Gym, Well-being, Catering including Cafeteria);

11 Board meeting and dining; and,

12 Communal space.

3.5 The floor space schedule is set out in Table 5.

Floor	Area (m²) [NIA]
Fourteenth floor	607
Thirteenth floor	856
Twelfth floor	1,104
Eleventh floor	1,280
Tenth floor	1,501
Ninth floor	1,520
Eighth floor	2,181
Seventh floor	2,557
Sixth floor	2,748
Fifth floor	2,557
Fourth floor	2,748
Third floor	2,557
Second floor	2,748
First floor	467
Ground floor	3,433
Lower ground	1,488
Basement level 1 (car park only)	0 (4,911m² GIA)
Total Area	**30.352**

Table 5 Land Uses

Design Principles

3.6 The design principles of the development are set out in the Design & Access Statement which accompanies the planning application. In summary they are: -

1 Everybody Under One Roof – The building will accommodate staff from a number of separate buildings which inherently lead to divisions and do not encourage cross-fertilization of ideas, collaboration and a sense of the collective purpose of The Co-operative Group. The new building should embody the idea of a single organisation made up of individuals brought together and united by the building form and business.

2 Central Communal Space – Until now staff have had no single space open to all and therefore little opportunity for social and casual interaction within

a comfortable interior environment. The new building will provide a generous central space which everyone will occupy at varying points within the working day.

3 Unified Building Form – The form of the building will physically and metaphorically embody the idea of a single and complete entity. Staff should easily identify with the building and feel part of the whole.

4 Continuity of Public Realm – The Building must facilitate ease of movement around its perimeter and ensure pedestrian permeability via an attractive and diverse public realm experience.

5 A New Public Square – The building will be situated at the Northern part of the site to allow for a new public square which gives space and aspect to the existing CIS Tower and provides a foreground to the new building on approach from the city centre. The square also drives activity further north, provides a focus for future development of the area and gives the new building a pivotal location within the developing area.

6 A Positive Response to the Level Change – The level change across the site enables the principle building entrance to be accessed a full storey above the low point of the site ensuring a clear vertical separation between communal spaces and service areas.

7 Dialogue with CIS Tower – The building size and position relates strongly to the CIS Tower. The two buildings have a shared history and will share the new public space. The dialogue is one of contrasts with the new building distinguishing itself, not through its height but through its enveloping, inclusive form. This dialogue of contrasts strengthens the perception of both buildings.

8 Distinct from neighbouring buildings – The building sits at a pivotal point within the urban grid where the two conflicting geometries of the street patterns to the north and south come together. The building form and orientation should reflect this and be a distinct building in space.

9 A landmark on the Manchester skyline – The building is not a tower but nevertheless, should be higher than surrounding buildings and its roofscape designed to provide a dynamic contribution to the skyline.

3.7 The building occupies a footprint of approximately 4,100sq.m within an overall site area of 15,982sq.m. Approximately 28,171sq.m will be devoted to high quality public square.

3.8 The proposed building is to be located on the northern part of the site. It is triangular in plan, arranged in three wings around a central atrium. The building increases in height from 8 storeys at its southern side to 16 storeys at its north-west corner (a height of approximately 80m AOD). The building footprint will be consistent up to level 8. Upper stories reduce in size incrementally up to

level 14. The principal entrance is located in the southern wing opening onto the area of public realm proposed for the southern part of the site.

3.9 The main driver for the plan form and size is the requirement for flexible open plan office space forming approximately 80% of the building. The floor-plate is organised around a large central atrium space in an equilateral triangle with continuous office space forming 3 equal wings and 3 vertical circulation and toilet cores.

3.10 The office wings are 16.5m at their widest point between the external wall and atrium. The relatively narrow floorplates ensure a good level of daylight for all occupants and facilitate the natural ventilation of the building. Voids are introduced on intermittent floors at the 3 corners of the plan to provide increased visual connection between floors and pleasant break-out zones.

3.11 The building is oriented approximately due south to maximise sunlight in the atrium and provide views across the city centre skyline from upper terraced levels. The triangular form of the building ensures that offices face due south, north west and north east therefore largely avoiding the problematic effects of low east and west sun. Solar gain and glare through the south façade can be easily mitigated through the façade design.

3.12 The external appearance of the building seeks to balance the character of the area and ensure that the façade maximises the positive effects on occupier comfort of external factors and minimises their potential negative effects. In addition the façade must contribute to the overarching requirement to achieve a BREEAM “outstanding” rating for the building,

3.13 The façade is composed of two ‘skins’ to provide an environmental ‘buffer zone’ between internal and external space. Performance benefits of the double skin façade are as follows:-

1 The cavity provides an exhaust ‘chimney’ to facilitate the natural ventilation strategy assists with the reduction of direct solar radiation;

2 Provides an effective tool for solar heat gain control;

3 Acts as a thermal buffer between the variable external temperatures and the regulated internal temperature;

4 Reduces noise pollution;

5 Options for incorporating innovative light projection techniques opportunities to reduce daytime perimeter lighting via an increase in the percentage glazing; and,

6 Increase the daylight factor and view of the sky.

3.14 The outer face of the double skin will be almost entirely glazed which would not

be possible if the building were to be single skinned given the high environmental performance targets set for the building. The intention is to provide a building which appears light and open as well as providing visual depth.

3.15 The office floor-plates step back incrementally forming a series of south facing terraces with exceptional views over the city of Manchester. An Inhabited roofscape is formed which will accommodate hard landscaped areas as well as a variety of vegetation.

Landscaping

3.16 The scheme incorporates the creation of a public square on the northern side of Miller Street which will link the CIS Tower and the proposed Head Office Building. The design of the public realm will be through an international design competition.

Access Arrangements

3.17 The vehicular access will be from Dantzic Street.

3.18 The main entrance into the building is in the southern elevation facing the new public square.

Operational Issues

3.19 The proposed building requires 24 hour working requirements, 7 days per week, however, predominant use of the building will be during standard office working hours. Information in respect of deliveries is contained within Chapter 12 (Transportation) of this ES.

3.20 All deliveries and servicing arrangements will be managed in order to avoid any conflicts at the site. Deliveries will be delivered to a third party off-site facility where items can be processed.

3.21 The Co-operative Group has established waste management practices in their other buildings and as a minimum these methods will be transferred to the new building. Current information from their waste management services provider suggests that around 70% of the waste produced by the Co-op's office occupiers is diverted from landfill and put back into the market place. There is a commitment to decrease and in future stop disposing any waste into landfill.

3.22 Waste generation will continue to be minimised as far as possible, however, where the generation of wastes is unavoidable attempts will be made to reduce, reuse, recover or recycle any waste streams where possible.

3.23 All waste produced will be stored in designated areas in a safe and secure manner, to avoid litter, pollution and health and safety risks pending collection by third party contractors for recovery, recycling or disposal. Adequate storage,

in line with BREEAM requirements, will be designed into the building layout as follows:-

1 Storage bins and areas to be clearly labelled;

2 Storage areas to be located so that they are accessible to both building users and waste collectors; and,

3 Storage areas will comply with the minimum size requirements.

3.24 All waste that is produced will be collected in line with current legislation including waste Duty of Care requirements. Further information in respect of these issues is contained within Technical Appendix 3.1.

Sustainability

3.25 An Environmental Standards Statement including BREEAM Pre-Assessment is included as Technical Appendix 3.1 of this ES. The key sustainability features of the proposed development have been summarised below:-

1 The building has been designed having regard to key international, national, regional and local policies and guidance in respect of sustainability;

2 The building shall be carbon neutral through the use of low/zero carbon technologies;

3 The building is to achieve an 'Outstanding' rating on the BREEAM Offices 2008 accreditation scheme;

4 Waste produced during construction will be minimised as far as practicable; and,

5 The proposals will seek to enhance the biodiversity offer of the site.

Timescales and Construction

Timescales

3.26 The construction period is due to start on the 24th May 2010 with a completion date of 20th June 2012. The building is proposed to be occupied by 27th August 2012. Please refer to Technical Appendix 3.2 for further information.

Construction Method Statement

3.27 A Construction Method Statement is included at Technical Appendix 3.2 of this ES. It provides an indication of the likely requirements of the Construction Management Plan prepared by the Principal Contractor upon appointment. The production of this document is likely to be the requirement of a planning condition imposed by Manchester City Council on any grant of planning permission.

Construction Vehicle Movements

3.28 The table and graph included at Technical Appendix 3.2 indicates that the greatest number of daily construction vehicle movements would be during the first 6 months of the build programme (58.5 vehicles). This would predominantly consist of vehicles associated with the earthworks phase of development.

3.29 Between months 7-18 of the programme daily vehicle movements are likely to be about 36 – 40.5 per day. This would be associated with development of the concrete cores, the frame and the façade.

3.30 The final 8 months of the construction programme (months 19-26) see a significant reduction in vehicle movements to 13.5 reducing to 4 per day. This is associated with the façade completion and fit out phase.

Waste Management Strategy

3.31 The Principal Contractor appointed for the works will be responsible for the management of waste on the site. In general, the principles of the waste management hierarchy, which favours waste minimisation, re-use of materials and recycling over disposal to landfill, will be favoured as far as practicable. The disposal of waste, including any surplus spoil, will be managed to maximise the environmental and development benefits from the use of surplus material and to reduce any adverse environmental effects of disposal.

Waste Minimisation and Monitoring

3.32 Waste producers will identify categories and quantities of waste that will be generated. Opportunities for reuse, recycling or use by third parties will be investigated to maximise the environmental and development benefits and to reduce the adverse effects of disposal. Waste will be segregated and clearly labelled where practicable to maximise these opportunities. Handling and Disposal of Waste will be segregated to maximise reuse, recycling and opportunities for use by third parties.

3.33 As a minimum legal obligations to segregate waste into hazardous and non-hazardous waste will be observed at all times. To encourage proper segregation of waste, signage / colour coding will be used. Control measures may be required for the storage of waste, which is contaminated. Liquid wastes will be stored within a bunded area and clearly labelled. Liquids of a hazardous nature will also be controlled in accordance with Control of Substances Hazardous to Health (COSHH) regulations.

3.34 Where hazardous materials such as asbestos and lead are encountered on site and require disposal, works will be undertaken in accordance with Health and Safety legislation and HSE guidance notes.

Worksite Housekeeping

3.35 Control measures will include:-

1 All contractors are to ensure that the site is left in a clean and tidy state at the end of each day. All surplus materials and waste are to be transferred to the appropriate waste management area for processing;

2 The Principal Contractor will ensure that any worksite fencing and hoardings will be maintained to comply with site conditions;

3 All contractors are to ensure that toilets, offices and canteen areas are kept clean and tidy at all times;

4 All vehicles leaving the site will not carry debris on to the public highway;

5 All contractors will ensure that building materials and equipment are stored and used in accordance with health and safety requirements and that chemical drums, fuels, oils and the like are stored upright, and properly sealed when not in use in designated, properly bunded and protected storage areas; and,

6 In the event of any spillage of diesel, fuel, oil or chemicals the sub-contractor will clean up the spillage immediately.

4.0 Consideration of Alternatives

Introduction

4.1 The Co-operative Group's plans for the regeneration of the Northern Gateway of Manchester seek to transform buildings, land and local infrastructure across a 20 acre site. The first phase of this development is the development of a new Head Office of approximately 30,352 sqm [NIA] which will achieve BREEAM outstanding status and set an exceptional standard for green, sustainable design.

4.2 This chapter complies with Paragraph 2, Part I of Schedule 4 of the EIA Regulations which requires applicants to provide an outline of the main alternative approaches to development that have been considered and the reasons for their choice. These are broken down into the following categories:–

1 The 'Do Nothing' Scenario;

2 Alternative sites; and,

3 Alternative designs.

The Do Nothing Scenario

4.3 The Co-operative Group's estate in Manchester city centre comprises 9 statutorily listed buildings and other aged buildings, which are in need of constant maintenance and repair. This incurs and will continue to incur significant operating costs. The existing buildings are not fit for purpose and will not meet the 2010 Building Regulations which in terms of energy efficiency are more onerous.

4.4 In short, the amount of space that the Co-operative Group currently occupies in its estate in Manchester and the age of the buildings themselves are the biggest components of the group's occupancy costs. To move from the existing buildings, the Group would improve its working environment and improve its cost base. The current buildings do not deliver the modern, efficient and flexible workplace that is required in order to improve the working environment for its employees. The Co-operative Group is committed to transforming the Listed estate to bring new uses better suited to ensure that the buildings continue to function economically.

Alternative Sites

Approach

4.5 The Co-operative has a long history with Manchester with commercial floorspace dating back to the late C19th on the northern side of the City Centre. The company identified a need to crate a head office development to

meet the longer-term needs of the business.

4.6 The Co-op considered a number of other sites in Greater Manchester for the location of the proposed Head Office building. The criteria employed for a search of sites within Greater Manchester were as follows: -

1 Land owner;

2 Tenure available;

3 Site value;

4 Planning status;

5 Deliverability;

6 Location of site – match to staff residences and customer locations, access by public transport, pedestrian access, access by car, access to airport, local amenities, environment;

7 Scope of site to provide desired building in an efficient layout;

8 Scope for expansion; and,

9 Availability of labour force and its skills.

Adjacent to Victoria station, Manchester

4.7 The site is highly accessible by public transport and lies fully within the city centre boundary of the UDP. However, part of the site considered is allocated for a high standard of environmental treatment, incorporating an element of open space, in the Manchester UDP. There was therefore a potential departure from the UDP, since offices were potentially proposed on this part of the site. The impact of any development proposal upon the setting of the various listed buildings in this area, and the Cathedral and Shudehill Conservation Areas, was a significant constraint. Additionally most of the site lies within Flood Zone 2 and therefore has a moderate chance of flooding.

1, Hardman Square Spinningfields, Manchester

4.8 The subject site fully lies within the defined boundary of the City Centre area of Manchester. The site is located within Deansgate/Peter Street Conservation Area and in close proximity to listed buildings. Accessibility by modes other than the car is average to the site, with constraints in terms of distance to connect to train stations. An unquantifiable constraint in terms of timetable related to the existing use (offices) of the site. It was not known how long the lease ran for or if it had already been acquired. Also time would have to be factored into the construction programme for demolition of the existing building on the site.

Townside Fields, Bury

4.9 The site, in a prominent location, has been used as a park with an artificial lake and serves a local amenity function with ecological value. The most eastern part of the site (east of Market Street) was more constrained than the rest of the site, as it is surrounded by steep railway embankments, Market Street Bridge and the Townside Row housing development. The site lies within the town centre boundary designated by the adopted Bury UDP and is allocated as a mixed use opportunity site. The site however had no vehicular access. There existed a Metrolink/bus terminal in close proximity to the site, but pedestrian access to the terminal from the site was poor, although this is proposed to be improved in the future.

Land at Exchange Greengate, Salford

4.10 The site is situated in a strategic location at the Salford – Manchester boundary, approximately 200m from Manchester city centre boundary and is a Central Salford URC priority site. Part of the south east corner of the site falls within The Cathedral Conservation Area, and the south west boundary is adjacent to the Flat Iron Conservation Area, with a number of listed buildings in close proximity. The site was highly accessible by public transport, in close proximity to Victoria and Salford Central stations and Shudehill interchange. The site is situated within a major designation for mixed use development. A major outline application for the construction of residential, commercial and office floorspace was pending for the site, but the s.106 still has not been signed enabling permission to be granted. It was likely therefore that a full application would have to be submitted, but there was a risk that this could have been viewed as piecemeal development, ahead of an approved comprehensive permission for the site. On site and local amenities were also found to be lacking.

Kingsway Business Park, Rochdale

4.11 The site benefits from a hybrid extant planning permission for B1/B2/B8-led development and a Development Plan allocation for employment development. A reserved matters application could have therefore been submitted for the head office but it was unlikely that the proposals would accord with the approved masterplan and not breach the parameters specified by the Development Framework which forms part of the outline planning permission concerning height, use, floorspace and building layout. Accordingly, a full planning application would be required. In addition, proposals would be required to meet Rochdale Development Agency's design objectives prior to submission to the Council. Also the Highways Agency would need to be satisfied of the proposed level of car parking and vehicular development flows affecting the M62 and the site was not well served by public transport when assessed.

Hollinwood, Oldham

4.12 The site is allocated by Policy B1.2.6 of Oldham UDP (2006) for business and

office (B1) and general industry uses (B2). The proposed head office would accord with the Council's aspirations as set out by the Adopted UDP, for high quality development of a type, scale and intensity of use which reflect the site's importance. The site is an out of centre site in PPS6 terms but benefits from excellent road links, whilst public transport improvements are proposed. There were a number of detailed aspirations of the approved 2006 masterplan which could have posed constraints to the timescales required by the Co-operative Group or to the development of part of the site, including the realignment of Hollins Road, assembly of land for development, deviation from low density massing envisaged by the masterplan and perceived fragmentation of the site. There also remained an unquantifiable constraint over whether a potential planning application would be found to have an unacceptable impact on traffic. Redevelopment of the site would require the removal of a gas holder and there may be a possibility that the site is constrained by underground pipelines. The site is likely to be contaminated and therefore remediation of the site would be required. The site was also found to be lacking in local amenities.

Ashton, Tameside

4.13 The site falls within town centre boundary of Ashton with good public transport accessibility, although there are currently constraints concerning accessibility by car. The site is previously developed land. Two Options for development were provided by the owners, Tameside MBC. One option required the acquisition of 3rd party land interests and confirmation of a CPO. There was doubt over whether the easier land option, which comprised two parcels of land, provided a site of a sufficient size, or would require undesirable fragmentation of the development.

Miller Street, Manchester (Preferred Location)

4.14 The Co-operative Group selected this site as its preferred site for new Head Office as part of the Masterplan development for Manchester's Northern Gateway. The Miller Street car park site was considered to have the following attributes that led to its selection as the optimum location for the facility: -

1 It benefits from a supportive local planning policy context for B1 office development, with part of the site allocated for business and commercial development. A development specifically tailored to the Co-operative Group's requirements, rather than a speculative proposal, also meets local planning policy for this site.

2 Areas of the site adjacent to listed buildings or adjacent to the Shudehill Conservation Area need to pay particular attention to preserving or enhancing the Conservation Area and preserving the setting of the listed building. The CIS building is also identified as a landmark building in an SPD and development must protect views of it.

3 The new head office on this site will provide an anchor for redevelopment to take place across the rest of the Co-operative Group's estate and

surrounding area in the future. The development would assist by providing a link with the surrounding area and its community (Harpurhey, Lightbowne and Collyhurst) with the city centre. The Co-operative Group's estate is situated in a strategic position within the city and this first stage of development will act as a catalyst to the redevelopment of the north of the city centre.

4 The site, previously developed land, is currently a surface level car park and is well suited to new build and for large floorplates and an efficient layout.

5 The site benefits from outstanding public transport links and adjoins the inner ring road. There are clear pedestrian routes to and from the site.

Alternative Designs

4.15 Having identified the preferred site, several alternative building layout arrangements have been considered. This exercise is considered in detail within the design and access statement which accompanies the planning application. The study looks at how best the facility could be configured on site and the following layouts and design options have been considered.

4.16 The major opportunities were identified as follows:-

1 To create a symbolic and mutually beneficial relationship to the CIS Tower;

2 To provide viable and attractive connections linking otherwise isolated parts of the city centre;

3 To drive value through improved connections and public realm;

4 The site location enables sustainability to be embodied in all aspects of the buildings design, construction and operation;

5 A central position enables a simplicity of form to create a strong identity for the Co-operative Group;

6 Utilise passive design measures to minimise energy demands on the building;

7 Use of the existing topography to minimise works associated with providing basement areas and enable a vertical zoning to ensure clarity of public and private realm; and,

8 Use of existing groundwater reserves for ground energy.

4.17 The major constraints were identified as follows:-

1 Exposure to environmental factors including noise, wind and sun require careful consideration to prevent negative effects on comfort of internal and external spaces;

2 Proximity to Arkwrights Mill will require appropriate Archaeological consideration;

3 Proximity to residential properties to the north east of the site; and,

4 Infrastructure to accommodate any future surrounding development.

4.18 Utilising these features, a series of building designs were considered and discounted for a number of reasons including:-

1 Building considered to be too broad;

2 Building height in relation to surrounding uses;

3 Limitations over the size and flexibility of the floor plate;

4 No articulation of the entrance;

5 Scheme not maximising sunlight to central atrium; and,

6 Scheme not maximising views towards public realm.

4.19 The chosen scheme meets the requirements of the Co-operative Group for a single building form, large internal communal space, large flexible floorplates and a single point of entry. The key design features of the selected scheme which were not offered by the alternative design proposals include:-

1 Everyone under one roof – the building will incorporate staff from a number of separate buildings which inherently leads to divisions and does not encourage cross-fertilisation of ideas and a sense of the collective purpose of the Co-operative group. The new building embodies the idea of a single organisation made up of individuals brought together and united by the building form.

2 Central Communal space – a generous central space is provided by the new building.

3 Unified Building Form – the form of the building physically and metaphorically embodies the idea of a single and complete entry.

4 Continuity of Public Realm – the building facilitates ease of movement around its perimeter to ensure maximum pedestrian permeability via an attractive and diverse public realm experience.

5 A new Public Square – the position of the building allows for a new public square which gives space and aspect to the existing CIS Tower and provides a foreground to the new building on approach from the city centre.

6 A positive response to the level change – the level change across the site enables the principle building entrance to be accessed a full storey above

the low point of the site ensuring a clear vertical separation between communal spaces and service areas.

7 Dialogue with the CIS Tower – the proposed building size and position relates strongly to the CIS Tower. The two buildings have a shared history and will share the new public space. The dialogue is one of contrasts with the new building distinguishing itself, not through its height but through its enveloping inclusive form.

8 Distinct from neighbouring buildings – the building sits at a pivotal point within the urban grid where the two conflicting geometries of the street patterns to the north and south come together. The building form and orientation reflect this.

9 A landmark on the Manchester skyline – the building is not a tower but nevertheless, should be higher than surrounding buildings and its roofscape is designed to provide a dynamic contribution to the skyline.

4.20 Further information in respect of the evolution of the building design is set out within the Design and Access Statement included with the planning application.

5.0 Land Use and Planning Policy

Introduction

5.1 This section assesses the proposed development against the relevant policies from the statutory development plan together with relevant national and supplementary planning guidance.

Land Use Designations

5.2 The following Local Plan designations are relevant to the site and its surroundings:–

1 The site is allocated as a site for Economic Development in the Manchester UDP [HC10(b)];

2 Allocations for Major Road / Rail Environmental Improvement Corridors run adjacent to the site;

3 An allocation for Environmental Improvement / Protection (St Michael's Flags) is directly north-east of the site;

4 Outside of the site, to the south, lies Area 2 of the defined boundary of the City Centre in the UDP; and,

5 Five Conservation Areas lie outside of the application site to the south (Cathedral Conservation Area; Shudehill Conservation Area; Smithfield Conservation Area; Stevenson Square Conservation Area; and, Ancoats Conservation Area).

Development Plan Guidance

5.3 The statutory development plan for the Miller Street site comprises the adopted North West of England Regional Spatial Strategy to 2021 (September 2008) and the adopted Manchester Unitary Development Plan (1995).

5.4 Also of relevance is national guidance and legislation in respect of the EIA process and procedure and also on specific planning matters applicable to the development of the site. The Collyhurst Local Plan provides updated guidance as to the development of the north of Manchester and includes the proposal site within its boundaries. Whilst the plan is not a statutory document, it is afforded weight as a material consideration by Manchester City Council.

North West RSS

5.5 The North West of England Plan is the strategic regional statutory planning document and provides a framework for development and investment in the region over the period to 2021. It was adopted in September 2008.

5.6 The principal policies of relevance to the proposed development are:–

1 Policy DP1 Spatial Principles – sets out the principles underpinning the RSS, including the promotion of sustainable economic development; making the best use of existing resources and infrastructure; and, reduction of emissions and adaption to climate change.

2 Policy DP2 Promote Sustainable Communities – the creation of places where people want to live, including by fostering sustainable relationships between homes, workplaces and other concentrations of regularly used services and facilities; and by taking into account the economic, environmental, social and cultural implications of development and spatial investment decisions on communities.

3 Policy DP3 Promote Sustainable Economic Development – the Strategy seeks to improve productivity, and to close the gap in economic performance between the North West and other parts of the UK.

4 Policy DP4 Make the Best Use of Existing Resources and Infrastructure – priority is to be given to developments which build upon existing concentrations of activities and existing infrastructure and which do not require major investment in new infrastructure. Development is to accord with a sequential approach with using existing buildings and previously developed land within settlements the priority.

5 Policy DP5 Manage Travel Demand; Reduce the Need to Travel, and Increase Accessibility – development to be located to reduce the need to travel, especially by car, and to enable people as far as possible to meet their needs locally. New development is to be genuinely accessible by public transport, walking and cycling, and priority will be given to locations where such access is already available.

6 Policy DP6 Marry Opportunity and Need – priority is to be given to linking areas of economic opportunity with areas in greatest need of economic, social and physical restructuring and regeneration.

7 Policy DP7 Promote Environmental Quality – the protection and enhancement of environmental quality especially by promoting good quality design in new development; maximising opportunities for the regeneration of derelict or dilapidated areas; and assessing the potential impacts of managing traffic growth and mitigating the impacts of road traffic on air quality, noise and health amongst other things.

8 Policy DP9 Reduce Emissions and Adapt to Climate Change – proposals should contribute to reductions in the Region's carbon dioxide emissions from all sources, take into account future changes to national targets for carbon dioxide and other greenhouse gas emissions, Measures suggested include facilitating effective waste management, increasing renewable energy capacity and Sustainable Urban Drainage.

9 Policy RDF1 Spatial Priorities – sets out the priorities for growth and development, with the first priority being the regional centres of Manchester and Liverpool.

10 Policy W1 Strengthening the Regional Economy – seeks to promote opportunities for economic development in the Manchester City Region through the following growth opportunities, advanced manufacturing and engineering, financial and professional services, media, creative and cultural industries, biomedical, ICT / digital, and communications.

11 Policy W2 Locations for Regionally Significant Economic Development – states that regionally significant economic development will be located close to sustainable transport nodes; be capable of development within the plan period; highly accessible; well related to areas with high levels of worklessness and/or areas in need of regeneration and well related to neighbouring uses.

12 Policy W3 Supply of Employment Land – requires provision to be made for a supply of employment land. Office development should, as far as possible, be focused in the regional centres, in or adjacent to town / city centres.

13 Policy RT2 Managing Travel Demand – requires a co-ordinated approach to managing travel demand including, locating major new developments where there is good access to public transport and effective provision for pedestrians and cyclists; reduce private car use through the introduction of 'smarter choices' and other incentives to change travel behaviour; incorporate maximum parking standards that are in line with, or more restrictive than defined standards.

14 Policy RT9 Walking and Cycling – seeks the development of integrated networks of continuous, attractive and safe routes for walking and cycling.

15 Policy EM1 Integrated Enhancement and Protection of the Region's Environmental Assets – requires the Region's environmental assets to be identified, protected, enhanced and managed. EM1 (B) relates to the protection and enhancement of the region's biodiversity, geological and geomorphological resources. EM1 (C) relates to the Historic Environment, including the protection and enhancement of the Victorian and Edwardian commercial developments in Manchester city centre.

16 Policy EM2 Remediating Contaminated Land – encourages the adoption of sustainable remediation technologies.

17 Policy EM3 Green Infrastructure – seeks to achieve environmental and socio-economic benefits by conserving and managing existing green infrastructure, creating new green infrastructure and enhancing its functionality, quality, connectivity and accessibility.

18 Policy EM5 Integrated Water Management – seeks the protection of the

quantity and quality of surface, ground and coastal waters and the management of flood risk.

19 Policy EM10 A Regional Approach to Waste Management – requires schemes to promote and require the provision of sustainable new waste management, facilities and systems and to achieve designated waste targets.

20 Policy EM11 Waste Management Principles – requires every effort to be made to minimise waste, maximise re-use, and maximise opportunities for the use of recycled material.

21 Policy EM15 Framework for Sustainable Energy in the North West – seeks the promotion of sustainable energy production and consumption.

22 Policy EM16 Energy Conservation & Efficiency – the approach to energy is based on minimising consumption and demand, promoting maximum efficiency and minimising waste.

23 Policy EM17 Renewable Energy – in line with the North West Sustainable Energy Strategy, by 2010 at least 10% (rising to 15% in 2015 and 20% in 2020) of the electricity which is supplied within the Region should be provided from renewable energy sources. Opportunities should be sought to identify proposals and schemes for renewable energy.

24 Policy EM18 Decentralised Energy Supply – seeks to encourage the use of decentralised and renewable or low-carbon energy in new developments.

25 Policy MCR1 Manchester City Region Priorities – includes strategies such as encouraging investment and sustainable development in the Regional Centre and other key locations; to secure improvements to internal and external transport links; and to focus environmental improvements where they are most needed and will have the greatest benefit to facilitate sustainable development.

26 Policy MCR2 Regional Centre and Inner Areas of Manchester City Region – plans and strategies are required to ensure the City Region develops as the primary economic driver and should provide for employment within the Inner Areas in accordance with policies W2, W3 and MCR1.

Manchester UDP

5.7 The Unitary Development Plan (UDP) was adopted by the Council on July 1995 and sets out policies for land use and development in Manchester. The subject site lies within the southern part of the Harpurhey, Lightbowne and Collyhurst area of Manchester. The relevant policies of the UDP have been 'saved' following the requirements of the Planning and Compulsory Purchase Act 2004 and continue to represent Development Plan policy. The UDP will be progressively replaced by new development plan documents as set out in the Local Development Scheme programme.

5.8 The principal policies of relevance in respect of the Council's broad approach to development (Part 1 of the Plan) are outlined and summarised below:–

1 Policy I1.1 The Council will ensure the allocation of a range of sites both in terms of size and appropriate location for a variety of different commercial and industrial development purposes in order to maximise new employment opportunities – sets out the need for employment sites and the preferred locations of these sites.

2 Policy I1.4 The Council will continue to encourage further development in the Regional Centre for those activities which will benefit from regional centre location both in terms of the refurbishment of existing buildings, where these need to be retained to safeguard the appearance and character of the area, and the sensitive redevelopment of vacant sites – seeks to build upon and reinforce the economic and cultural role of the Regional Centre.

3 Policy I1.6 The Council will encourage the location of new business development (as defined in Class B1 and A2 of the Town and Country Planning Use Classes Order 1987) on sites where they will contribute to urban regeneration. Particular encouragement will be given to such development on derelict or unused land in areas of high unemployment – this policy also states that key locations for business development will be within the City Centre on allocated sites; within the City's other main shopping and commercial centres and areas which are already primarily industrial or office areas; or elsewhere where they contribute to urban regeneration, do not affect residential amenity nor conflict with other Local Plan policies.

4 Policy I1.12 The Council will support proposals from businesses which seek to expand or adapt their premises to meet changing economic and technological circumstances and to improve energy efficiency – encourages the renewal of old and outmoded premises.

5 Policy I2.1 The Council will seek to ensure that new commercial and industrial development is fully accessible by all forms of transport and, in particular, is adequately served by the public transport network - new commercial development is to be fully accessible especially by the public transport network.

6 Policy I3.1 New commercial and industrial development will be expected to be of a good standard of design and, where appropriate, include suitable landscaping treatment – encourages new development to have a major beneficial effect on the appearance of the City.

7 Policy E1.1 The Council wishes to see substantial reductions in the level of air pollution much of which is caused by vehicles fumes - seeks to promote public transport and cycling, improve conditions for pedestrians, discourage the use of the private car and locate all major new development where it

can be easily served by public transport.

8 Policy E1.3 The Council will promote measures to decrease the level of pollution in the City's watercourses including rivers and canals, and groundwater sources – seeks to ensure the most environmentally effective means of disposal of foul sewage, contaminated surface water and trade effluent together with the prevention of ground water contamination.

9 Policy E1.4 The Council will control noise levels by ensuring that new development involving high noise levels is not permitted where it would be likely to cause a nuisance, minimising the need for heavy goods to pass through the City Centre and the careful design of new roads – seeks to control noise by setting limits, keeping noise and people apart and using adequate controls.

10 Policy E1.5 The Council will contribute towards energy conservation – seeks to ensure new major development is located where it can be easily served by public transport and encouraging high standards of energy efficiency in new development.

11 Policy E1.6 The Council will require the building materials used in new developments and refurbishment schemes to be environmentally friendly wherever this is possible – encourages the use of recycled building materials.

12 Policy E2.4 The Council will ensure that the effects upon wildlife are taken fully into account when considering development proposals. Furthermore, should development be allowed, the Council will seek to protect existing features of ecological value, such as ponds and hedges, by requiring them to be incorporated into the development wherever this is possible. The Council will also encourage developers to create new features which will sustain wildlife – seeks the protection and enhancement of wildlife.

13 Policy E2.6 The Council will prevent wherever possible the loss of existing trees – seeks to retain and increase trees within the City to make it more attractive, healthier and encourage the establishment of wildlife habitats.

14 Policy E2.7 The Council wishes to ensure that buildings and areas of special architectural or historic interest are retained, maintained and, where necessary, restored. It will seek to preserve and enhance the setting of such buildings and areas by appropriate control over the design of new development in their vicinity, control over the use of adjacent land and, where appropriate, by the preservation of trees and landscape features – seeks to protect the City's architectural and historic heritage.

15 Policy E2.8 The Council will ensure that development does not adversely affect scheduled monuments and sites of archaeological interest or their setting. It will encourage the realisation of the educational, recreational and tourist potential of archaeological sites and monuments for the benefit of

the City's residents and visitors – states that these sites are valuable as part of Manchester's heritage and there is a presumption for their retention and against any damage occurring to them. Where damage is inevitable the Council will seek to gain full and proper recording of the site.

16 Policy E3.3 The Council will upgrade the appearance of the City's major radial and orbital roads and rail routes. This will include improvements to the appearance of adjacent premises; encouraging new development of the highest quality; and ensuring that landscape schemes are designed to minimise litter problems – seeks to improve the appearance of the City's major road and rail routes and improve the image of the City in order to attract new investment, jobs, tourists and visitors.

17 Policy E3.5 The Council will promote measures which will lead to a safer environment for all people living in and using the City – this will be achieved by ensuring new development is designed with safety in mind, by designing landscaping schemes so as to minimise the risk of attack, locating community facilities where they are easy to get to, providing safe places for children to play and improving road safety.

18 Policy E3.6 The Council will promote environmental improvements in the City Centre – this will be achieved by improving conditions for pedestrians, upgrading public open spaces / squares, improving waterways and access and bringing disused buildings of architectural / historic importance back into use.

19 Policy E3.7 The Council will promote environmental improvements which are aimed at improving conditions for disabled people and people whose mobility and vision is impaired – the policy seeks to ensure access for all.

20 Policy E3.8 The Council wishes to enhance the appearance of Conservation Areas and will, where appropriate, designate further areas – seeks to protect and enhance existing Areas and consider future designations.

21 Policy T2.1 The Council's general approach to highway investment will be to maintain and improve the existing network rather than to embark on a major new construction programme – seeks to make the maximum use of the existing network to limit the number of trips made by private car and promote public transport and cycling.

22 Policy T2.4 The City Council will expect developments to make adequate provision for their car parking requirements, having regard to the environmental capacity of the site, its effects on neighbouring activities and the ability of the local road network to accommodate generated traffic – seeks to ensure that in providing for car parking from new development environmental considerations are taken fully into account.

23 Policy T2.6 The Council will expect adequate car parking provision to be made for disabled people – to ensure easy access to both existing and new

facilities.

24 Policy T3.1 The Council will ensure that the particular needs of both pedestrians and cyclists are catered for in the design of new developments and new road and public transport schemes – seeks to ensure the recognition of differing needs in designing new facilities.

25 Policy T3.3 The Council will introduce further pedestrian priority schemes into the City Centre. In particular to create new and improve existing squares – seeks to make the City Centre more accessible and a more attractive place to live, work and visit.

26 Policy T3.5 The Council will continue to develop routes and facilities for people whose mobility is impaired – seeks to reduce the number of obstacles the physical environment places in the way of disabled people and others whose mobility or vision is impaired.

27 Policy T3.7 The Council will expect major new developments to make adequate provision for secure cycle parking – seeks to encourage the use of cycles in the City.

28 Policy T3.9 The following broad hierarchy of road users will be used in assessing schemes and policies with significant transport implications:- (i) pedestrians and disabled people; (ii) cyclists; (iii) public transport; (iv) access (commercial); (v) general traffic (off peak); (vi) general traffic (peak) – seeks to ensure that the needs of more vulnerable road users are given careful consideration when planning new developments, schemes or strategies.

5.9 Part 2 of the Plan sets out the Council's approach to development in particular parts of the city. The site lies within Area 3 – Harpurhey, Lightbowne and Collyhurst, the following policies are of relevance:–

1 Policy HC1 Part (e) and (f) of this Policy seek to create employment opportunities and improve accessibility to employment and shopping facilities – the supporting text recognises the importance of the area to the north of Swan Street and Miller Street to secure the economic regeneration of the locality in a way which recognises its particular character.

2 Policy HC10 The following sites are allocated for business or commercial development:- a Dalton Street; b 'CIS' site at Rochdale Road / Miller Street; c Oldham Road Goods Yard – seeks to maximise employment opportunities on suitable sites.

5.10 Part 2 of the Plan also sets out a range of City Wide Development Control Policies. Those that are of relevance to the proposed development are set out below:–

1 Policy DC9.1 The Council will require all new commercial and industrial

buildings and the environments in which they are set, including car parking areas, to meet high standards of accessibility for disabled people – to ensure that disabled people have access to a full range of employment opportunities.

2 Policy DC16.1 In considering development proposals for any site, the retention of existing trees and the planting of new trees within the public highway and along the public frontages of the site will be encouraged by the Council. Except where trees are shown to be in poor health or are individually of little amenity value, or where a satisfactory scheme is more desirable, the Council will not normally permit development proposals which would involve the loss of significant trees and would thereby change the visual character of the street – to protect the role which trees can play in adding to the visual quality of the City.

3 Policy DC18.1 Part (e) of this policy states that Development proposals adjacent to Conservation Areas will be granted only where it can be shown that they will not harm the appearance or character of the area. This will include the protection of views into and out of Conservation Areas – seeks to protect, preserve and enhance Manchester's Conservation Areas.

4 Policy DC19.1 Part (d) of this policy states that the Council will seek to preserve and enhance the settings of listed buildings by appropriate control over the design of new development in their vicinity, control over the use of adjacent land, and where appropriate, by the preservation of trees and landscape features – seeks to ensure the protection of the City's built character and its heritage.

5 Policy DC20.1 The Council will give particular careful consideration to development proposals which affect Scheduled Ancient Monuments and sites of archaeological interests. In particular, by requiring evaluation and assessment of the implications to accompany applications, to have special regard to the desirability of securing the preservation of Ancient Monuments and other sites of archaeological interest, and where preservation is not appropriate to seek to gain full and proper recording of the site through early consultation – reinforces the obligation placed on the Council by statute to give particular attention to development proposals affecting Ancient Monuments and sites of archaeological interest.

6 Policy DC21.1 Development, including the raising of land will not normally be permitted where it would be at risk from flooding or would unacceptably increase the risk of flooding elsewhere – states that detailed technical investigations will be required to evaluate the extent of the risks.

7 Policy DC26.1 The Council intends to use the development control process to reduce the impact of noise on people living and working in, or visiting, the City, through considering the effect of new development proposals which are likely to be generators of noise and the implications of new development being exposed to existing noise sources which are effectively outside

planning control – states that there is a need to consider carefully the relationship between different land-uses from the point of view of noise generation and impact.

Collyhurst Local Plan

5.11 The proposal site is included in the Collyhurst Local Plan, which was approved as a non-statutory plan by the City Council Executive in 2006. The Plan provides updated advice from the UDP with regards to land use development in the Collyhurst area of north Manchester though there are few policies of direct relevance to the redevelopment of the site. Those which are, are summarised below:–

1 In relation to economic development, the key Local Plan objectives are the 'protection and development of employment sites' and the 'development of widespread access to high-quality education, training and employment opportunities'.

2 Section 5 of the Plan relates to Employment and the Economy and states that the Local Plan will seek to 'support local people in accessing job opportunities' and 'protect and expand employment opportunities within the Local Plan area' by amongst other things supporting the retention of existing businesses and jobs.

3 The site falls within the City Fringe Neighbourhood and in relation to its character and townscape sets out the Plan will amongst other things, create a dense city fabric and attract development of the current CIS surface car park to integrate the site back into the fabric of the City Fringe Neighbourhood.

4 In respect of the Neighbourhoods' Open space and public realm, the Plan will seek to, amongst other things, create a high quality public realm and streetscape; identify a palette of high quality, durable materials that give consistency to the street scene; and to create additional high-quality public open spaces as part of new developments.

Local Development Framework

5.12 The Council have just finished consulting on A Refining Options for the Core Strategy document. The Core Strategy itself is due for adoption in 2010. An Employment Land Study which will form part of the LDF evidence base is currently being carried out.

5.13 Given the very early status of the Council's LDF process, it is not at a stage where its policy implications for the proposed development can be assessed.

National Planning Guidance

5.14 The national planning guidance most relevant to the proposed development site is summarised in the following paragraphs.

5.15 PPS1 Delivering Sustainable Development, states that sustainable development is the core principle underpinning planning. It outlines the Government's commitment to promoting sustainable and inclusive patterns of urban and rural development by:- making suitable land available for development; protecting and enhancing the natural and historic environment; and, ensuring high quality development. It states that good design ensures usable, durable and adaptable places and is a key element in achieving sustainable development.

5.16 PPS:- Planning and Climate Change (Supplement to PPS1), sets out how planning should contribute to reducing emissions and stabilising climate change. The PPS states that in determining planning applications, planning authorities should expect new development to:–

1 Comply with local requirements for decentralised energy supply and for sustainable buildings;

2 to minimise energy consumption, including maximising cooling and avoiding solar gain in the summer; and overall, be planned to minimise carbon dioxide emissions;

3 Deliver a high quality local environment;

4 Provide open space as appropriate;

5 Give priority to the use of sustainable drainage systems;

6 Provide for sustainable waste management; and,

7 Create opportunities for sustainable transport.

5.17 The PPS indicates that planning authorities need to consider the likely impact of the proposed development on:–

1 Existing, or other proposed development, and its renewable or low-carbon energy supply;

2 Existing, or proposed, sources of renewable or low-carbon energy supply; and,

3 The vulnerability to climate change of existing or proposed development.

5.18 PPG4:- Industrial and Commercial Development and Small Firms, states that local planning authorities should aim to ensure that there is sufficient land available for industry and commerce which is readily capable of development and well served by infrastructure. One of the Government's key aims is to encourage continued economic development in a way which is compatible with its stated environmental objectives. Local planning authorities should encourage development in locations which minimise the number and length of

trips, and can be served by more energy efficient modes of transport. In allocating land for development, policies should allow for choice, flexibility and competition. Land should be readily capable of development and well served by infrastructure and development must take account of sensitive land uses.

5.19 Draft PPS4:- Planning for Prosperous Economies, will replace PPG4, PPG5, PPS6 and PPS7, it has recently been published for consultation. The Draft PPS states that planning applications for economic growth should be considered favourably unless there is good reason to believe the costs outweigh the benefits. Policy 23 also advises that, *"where office development is ancillary to other forms of economic development not located in the town centre there should be no requirement for such offices to be located in the town centre."*

5.20 PPS6:- Planning for Town Centres, covers town centres and the main town centre uses. Paragraph 1.8 clearly defines the town centre uses to which it applies and includes offices (both commercial and those of public bodies). Other material considerations to be taken into account when determining planning applications are states to include, physical regeneration, employment, economic growth and social inclusion.

5.21 PPS9:- Biodiversity and Geological Conservation, sets out planning policies on protection of biodiversity and geological conservation through the planning system. In respect of species protection, paragraph 16 emphasises the use of planning conditions or obligations to protect species from the adverse effects of development. Permission should be refused where harm to the species or their habitats would result unless the need for, and benefits of, the development clearly outweigh that harm.

5.22 PPG13:- Transport contains the following key objectives designed to integrate planning and transport at the national, regional, strategic and local level:–

1 To promote more sustainable transport choices for both people and for moving freight;

2 To promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling; and,

3 To reduce the need to travel, especially by car.

5.23 The guidance emphasises the need for Transport Assessments and Green Travel Plans to be provided where necessary. It states that policies in development plans should set maximum levels of parking for broad classes of development.

5.24 PPG15:- Planning and the Historic Environment, indicates that it is fundamental to the Government's polices for environmental stewardship that there should be effective protection for all aspects of the historic environment. The objective of the planning process should be to reconcile the need for economic growth

with the need to protect the historic environment. As a consequence, when proposals come forward local planning authorities are urged to assess their impact on the historic environment and give it full weight, alongside other considerations.

5.25 PPG16:- Planning and Archaeology, sets out the Government's policy on archaeology and planning. Where nationally important archaeological remains, whether scheduled or not, and their settings are affected by proposed development there should be a presumption in favour of their physical preservation. Cases involving archaeological remains of lesser importance will not always be so clear cut and planning authorities will need to weigh the relative importance of archaeology against other factors including the need for the proposed development.

5.26 PPS22:- Renewable Energy. sets out the Government's objective of cutting carbon dioxide emissions. Local planning authorities are advised to require a percentage of the energy used in new residential, commercial development to come from on-site renewable energy developments, depending on the viability give the type of development.

5.27 PPS23:- Planning and Pollution Control, states that the consideration of the quality of land, air or water and the potential impacts arising from development, possibly leading to impacts on health, is capable of being a material planning consideration, in so far as it arises or may arise from or may affect any land use. In addition, the planning system plays a key role in determining the location of development which may give rise to pollution, either directly or indirectly and in ensuring that other uses and development are not, as far as possible, affected by major or existing or potential sources of pollution. The controls under planning and pollution control regimes should complement rather than duplicate each other.

5.28 PPG24 Planning and Noise, outlines the considerations that an LPA should take into account in determining planning applications for noise-sensitive developments and for those activities that generate noise. Paragraph 10 acknowledges that much of the development which is necessary for the creation of jobs and the construction and improvement of essential infrastructure will generate noise. The planning system should not place unjustifiable obstacles in the way of such development but local planning authorities must ensure that development does not cause an unacceptable degree of disturbance.

5.29 PPS25 Development and Flood Risk, aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk. It encourages flood risk assessments to be carried out to the appropriate degree at all levels of the planning process to assess the risks of all forms of flooding to and from development taking climate change into account and to inform the application of the sequential approach.

Supplementary Planning Guidance

5.30 Supplementary Planning Guidance does not have the same status as the development plan. However, it is a material consideration that can provide helpful guidance to those preparing planning applications. The weight accorded to it will increase if it has been prepared in consultation with the public and has been subject of a Council resolution.

Guide to Development in Manchester Supplementary Planning Document and Planning Guidance (April 2007)

5.31 This SPD was adopted in April 2007 and aims to support and enhance the ongoing shaping of the City by providing a set of reasoned principles and expanding on UDP policies. The following elements of the SPD are relevant to the proposed development.

Design

5.32 Paragraph 2.3 states that '*a high quality environment is created by buildings which reflect their purpose and respect the place in which they are located'.*

5.33 Paragraph 2.5 confirms that *'Quality is much more than aesthetics. There should be no conflict between good design and buildings that function well and meet the needs of their occupants'.*

5.34 The SPD [¶2.13] requires buildings to relate well to each other especially in respect of the setting and relationship to adjacent buildings and their impact on the street scene, roof line and skyline.

5.35 In relation to building heights, ¶2.14 states that *'it is important that new developments are of an appropriate height having regard to location, character of the area and specific site circumstances and local effects, such as microclimatic ones'.*

5.36 Developments are also required to enhance existing vistas and create new ones [¶ 2.17].

5.37 In respect of parking, the impact of car parking areas is to be minimised [¶2.21 – ¶2.23] and the submission of Travel Plans required [¶2.30], amongst other things. Further comment on the location and need for parking is set out within section 6.

5.38 Good quality public realm is encouraged together with nature conservation.

5.39 New developments are also required to be inclusive to all, take into account safety and security, provide for refuse and recycling and reduce the impact on the global environment.

Accessibility

5.40 Section 3 of the Guide requires developments to be fully inclusive and accessible. In particular, the Guide focuses on the requirements of pedestrians, cyclists and disabled people.

Environmental Standards

5.41 Requires developments to achieve standards set out relating to energy efficiency, renewable energy, environmental design, water management and weather resilience, waste management, construction management, biodiversity and waterways.

Community Safety and Crime Prevention

5.42 The Guide seeks the creation safe environments through informal surveillance, internal and external design measures and safely designed vehicle parking areas.

Design for Health

5.43 The Guide outlines measures that can be incorporated into developments to achieve this objective. They include, encouraging active lifestyles, to build opportunities for social interaction, to improve access to work, ensure accessibility for all, promote safety and a sense of safety, promote social inclusion, improve the quality of the natural environment and improve the quality and aesthetics of the built environment.

The City's Character Areas – Employment Areas

5.44 Paragraph 11.34 states that *"Variety of built form is welcome as long as there is good design within each discrete parcel, good boundary treatments, and a positive relationship to the overall character of the site."*

5.45 Development is also expected to "*contribute to the provision and improvement of environmental features such as up to date refuse storage facilities, on-site recycling, green travel plans, and cycling and pedestrian provision. Developers will also need to consider the servicing requirements and how these can be accommodated on-site wherever possible."* [¶11.35].

Other Relevant Guidance

English Heritage/CABE - Guidance on Tall Buildings (2007)

5.46 The joint English Heritage/CABE guidance, originally published in 2003, was reviewed and updated in July 2007. The document provides guidance and advice on good practice in the planning system relating to the development of taller buildings.

4NW Best Practice Design Guide

5.47 Provides broad advice on design issues including Biodiversity, Design and Security and Sustainable Drainage.

Regional Waste Strategy (RWS) for the North West

5.48 The Strategy contributes to the sustainable development of the North West by encouraging waste management systems that reduce waste generation, lessen the environmental impacts of waste production and improve resource efficiency, whilst at the same time stimulating investment and maximising associated economic opportunities.

The Sustainable Energy Strategy for the North West

5.49 Seeks to make the North West a leading region for sustainable energy by setting a number of key goals, relating to amongst other things reduced energy waste, renewable energy and greenhouse gas reductions.

Compliance with Policy

5.50 The site is allocated for industrial and commercial uses within the Manchester UDP. As a consequence, the proposed development fully accords with the development plan. The compliance of the proposed development with planning policy is set out in the following paragraphs.

North West RSS Policy

5.51 The proposed development accords with regional planning policy in that:–

1 The proposed development will bring about economic development in a highly sustainable location and introduces a number of sustainability benefits [Policies DP1, DP2, DP3, DP4, DP5, DP9, RDF1, W1, W2, MCR1 & MCR2];

2 The proposed development is well located in relation to the surrounding mix of uses, in particular residential dwellings and city centre workplaces and services [Policies DP2, DP4, DP6, RDF1, W1, W2, MCR1 & MCR2];

3 The proposed development of a large-scale head office building will serve to increase economic productivity and performance [Policies DP1, DP2, DP3, DP6, RDF1, W1, W2, MCR1 & MCR2];

4 The proposed development would build upon existing city centre concentrations of activity and infrastructure provision. A PPS6 Statement is provided with the application justifying the proposed use in this location [Policies DP1, DP2, DP4, DP6 & MCR1];

5 The proposed development is situated in an area which is highly accessible by public transport, walking and cycling [Policies DP4, DP5, DP7, DP9, W2, RT2, RT9 & MCR1];

6 The proposed development will contribute towards urban regeneration [Policies DP2, DP6, W2 & MCR1];

7 The development is of a high quality design which contributes to urban regeneration without detriment to the wider environment [Policies DP2, DP6, DP7, DP9, W2 & MCR1];

8 The proposed development contributes to reductions in carbon dioxide emissions [Policies DP1, DP2, DP4, DP5, DP7, DP9, W2, RT2, EM15, EM16, EM17, EM18 & MCR1];

9 The development would be situated within one of the identified regional priority areas [Policies DP3, RDF1, W1, MCR1 & MCR2];

10 The nature of the proposed development (professional and financial services) is an identified growth opportunity in the Region [Policies W1, MCR1 & MCR2];

11 The site is ideally located to contribute to the supply of employment land required by Manchester City Council [Policy W3];

12 The application is supported by a Travel Plan and incorporates parking standards which are more restrictive than policy requirements [Policies DP5, DP7, DP9, W2, RT2, RT9, EM16 & MCR1];

13 The application site is highly permeable with its surroundings and will link with existing footpaths and cycle links [Policies RT2, RT9 & EM3];

14 The development seeks to protect and enhance interests of ecological, historical and archaeological value [Policies EM1 & MCR1];

15 The application site has been the subject of detailed ground investigations with recommended mitigation measures for its remediation proposed [Policy EM2];

16 The proposed development will create new green infrastructure and will improve principles of connectivity, accessibility and quality through the creation of a new public realm [Policies DP5, RT9 & EM3];

17 The application site is located within Flood Zone 1 and the application is supported by a Flood Risk Assessment demonstrating no risk implications of the development. Sustainable drainage principles will be introduced [Policies DP9 & EM5];

18 The development proposals will introduce sustainable waste management principles in line with current targets and guidance [Policy EM10];

19 The development proposals will seek to minimise waste and maximise re-use during the construction and operational phases [Policy EM11]; and,

20 The development proposals promote sustainable energy production and consumption including an increase in levels of renewable energy [Policies DP1, DP9, EM15, EM16, EM17 & EM18].

Manchester UDP Policy

5.52 The proposed development accords with local planning policy in that:–

1 The site proposes a commercial use in an area allocated for economic development [Policies I1.1, i1.4, I1.6, HC1, HC10 & Collyhurst Local Plan];

2 The current site is underused as a public car park in an area of the city which has suffered from deprivation and high unemployment, the proposed scheme will significantly contribute towards urban regeneration and economic growth [Policies I1.6, HC1, HC10 & Collyhurst Local Plan];

3 The proposed development will allow the expansion and adaption of a long standing major employer in the City, resulting in a development of high quality design and sustainability standards [Policies I1.12, 13.1, E1.1, E1.5, E1.6, E3.3, HC1, HC10 & Collyhurst Local Plan];

4 The site is in a highly sustainable location, being in close proximity to bus stops and a bus interchange, a metrolink stop and Victoria train station. In addition, the site is conveniently located in terms of accessing Manchester city centre on foot and Miller Street (A665) and Shudehill (A664) which form key arterial routes from the city centre to the M60 Manchester Ring Road [Policies i2.1, E1.1, E1.5, T2.1, T3.7 & T3.9];

5 The proposed development is of a high quality design forming a landmark building and will in future incorporate an area of public realm which is of an equally high standard [Policies I3.1, E3.3, E3.5, E3.6, T3.3, DC16.1 & Collyhurst Local Plan];

6 The application is supported by both a Transport Assessment and Green Travel Plan. These documents incorporate measures aimed at reducing the need to travel, especially by car and the promotion of alternative means of travel [Policies 12.1, E1.1, E1.5, T2.1, T2.4, T3.1, T3.7 & T3.9];

7 The application is supported by assessments in relation to ground contamination, flood risk and SUDS [Policies E1.3 & DC21.1];

8 The proposed development is accompanied by an assessment which demonstrate no adverse impact on noise sensitive development [Policies E1.4 & DC26.1];

9 The proposed development meets high standards of sustainability and energy conservation and will achieve an 'Outstanding' BREEAM rating [Policies I1.12, E1.5 & E1.6];

10 The application site is currently of low ecological and amenity value which

will be enhanced by the development proposals [Policies E2.4, E2.6 & DC16.1];

11 The proposed development by reasons of its design will not detract from the setting of nearby listed buildings or Conservation Areas [Policies E2.7, DC18.1 & DC19.1];

12 Archaeological Assessment has been carried out allowing for the full and proper recording of the site [Policies E2.8 & DC20.1];

13 The proposed development has been designed to create a safe internal and external environment [Policies E3.5 & T3.5];

14 The proposed development and associated public realm will create improved external amenity space for all pedestrians [Policy E3.6, E3.7, T3.1, T3.3, T3.5, T3.9 & DC9.1];

15 The proposed development incorporates parking numbers which are below existing standards aimed at encouraging travel by more sustainable modes of transport. Appropriate provision will be available for disabled persons [Policies E1.1, T2.4, T2.6 & DC9.1];

16 The proposed development incorporates appropriate provision for secure cycle parking [Policies E1.1, T3.7 & T3.9]; and,

17 The scheme is highly accessible to all persons [Policies T2.6, T3.5 & DC9.1].

National Planning Policy

5.53 The proposed development accords with national planning policy in that:–

1 The proposed development is located in a highly sustainable location and utilises a high quality design incorporating high standards of resource and energy efficiency and reduction in carbon emissions [PPS1 and Supplement and PPS22];

2 The development brings about economic development whilst respecting environmental objectives. It will enhance the range of job opportunities in the area [PPG4 and Draft PPS4];

3 The proposed development is located in an area designated for employment provision [PPS1 and PPS6];

4 The development will not result in harm to any features of nature conservation or heritage interest [PPS9, PPG15 and PPG16];

5 The site is well located in relation to existing local services and facilities [PPS1 and PPG13];

6 The proposed development is not located in an area that is adversely affected by sources of noise or air pollution and will not adversely impact on these conditions [PPS23 and PPS24]; and,

7 The development will not result in an increased risk of flooding [PPS25].

Supplementary Planning Guidance

5.54 The proposed development accords with the Guide to Development in Manchester, particularly in respect of the following:–

1 The development is of a high quality design which takes into account the character of its surroundings;

2 The scheme creates a safe environment which is inclusive to all;

3 The development positively contributes to environmental sustainability measures; and,

4 The development has a number of spin-off benefits which will improve health and well-being initiatives.

6.0 Water Resources

Introduction

6.1 This chapter considers the potential impacts of the proposed Miller Street development on the water environment, in terms of both water quality and water resource (quantity), compared to the current and future baseline. The potential impacts during both construction and operational phases are considered; the mitigation measures that are planned to manage these impacts are described, and any residual impacts, and their significance, are then assessed.

6.2 The site, occupying approximately 1.6 ha, was a former mill prior to 1945 and has more recently been in use as a car park; it is predominantly covered by hard standing, and there is no formal drainage currently on the site. The nearest watercourse is the partially culverted River Irk, a tributary of the River Irwell, which lies 125m from the site boundary; the site is located within Flood Risk Zone 1 indicating that there is a 0.1% chance of flooding in any given year.

6.3 The site is located over a major aquifer associated with the underlying sandstone deposits, and lies with a groundwater Source protection Zone (SPZ) associated with a public water supply abstract 400m west of the site boundary.

6.4 This chapter is supported by a Flood Risk Assessment in Technical Appendix 6.1 and by Chapter 11 (Land Quality Assessment). This chapter should also be read in conjunction with chapters 2 and 3 which set out the details of the proposed development.

Policy Context

6.5 Key planning policies are considered in Chapter 5 (Land Use Planning Policy). Table 6 lists the local policies relating to the management of the water environment and other key guidance is identified below. This chapter also refers to guidance containing references to, or entirely concerned with, managing the water environment in planning and development. These policies and guidance have been considered in this assessment. This ensured that the scope of the assessment and the proposed mitigation take full account of all relevant legislative requirements.

Policy Reference	Policy Issues
Local planning policies	
Unitary Development Plan (effective until July 2010; Manchester City Council)	UDP Part 1 Policy E1.3 states that the Council will promote measures to decrease the level of pollution in the City's watercourses, and groundwater sources.
Unitary Development Plan (effective until July 2010;	UDP Development Control Policy DC21.1 states that development will not normally being permitted where it would be at risk from flooding or increase the risk of flooding elsewhere.

Policy Reference	Policy Issues
Manchester City Council)	Requires an environmental standards statement to show how water is to be managed in the most environmentally effective way.
Guide to Development in Manchester – Supplementary Planning Document and Guidance (April 2007)	Requires that sustainable drainage systems (SUDS) should be included, and the amount of hard surfacing minimised, for example by providing on site capture and soakaway of all rainwater on site. Examples of SUDS options would include, rainwater harvesting systems, pervious surfaces, green roofs, filter drains, filter strips, swales, infiltration devices, bio-retention areas, basins, ponds and wetland. Developers will be expected to prepare a Flood Risk Assessment for proposals in an area of identified flood risk. New developments should seek to use water efficiently, through specification of water efficient devices and through the use of rainwater harvesting and grey water recycling.
Northern Manchester Catchment Abstraction Management Strategy	Assesses the water resource availability in local catchments and states Environment Agency strategy for making further water resource available in the future.
Draft Northwest River Basin District Plan	Assesses the current ecological status of all waterbodies in the northwest river basin district and identifies measures to meet Water Framework Directive objectives by 2015 or later.

Table 6 Policy and Guidance Relevant to the Water Environment

Other Policy Documents and Guidance

6.6 EA Pollution Prevention Guidance Notes (PPG), namely: -

1 PPG 1: General guide to the prevention of water pollution;

2 PPG2: Above ground oil storage tanks;

3 PPG 3: The use and design of oil separators;

4 PPG5: Works in, near or liable to affect watercourses;

5 PPG6: Working at construction and demolition sites; and,

6 PPG21: Pollution Incidence Response Planning.

6.7 CIRIA guidance notes, namely: -

1 CIRIA R186: Hydraulic Measures for the Control and Treatment of Groundwater Pollution;

2 CIRIA Report C532: Control of Water Pollution from Construction Sites (2001); and,

3 CIRIA Report C502: Environmental Good Practice on Site.

6.8 British Standards and Ministry of Agriculture, Fisheries and Food advice in:-

1 BS6031: 1981 Code of Practice for Earth Works; and,

2 Good Practice Guide for Handling Soils (MAFF 2000).

Potential Impacts

Construction Impacts

Groundwater Quality

6.9 Groundwater may be subject to accidental spillages of chemicals, such as fuels and oils, during the demolition and construction phases. This may lead to impacts on groundwater quality which would be unacceptable within a Source Protection Zone (SPZ) supporting a public water supply.

6.10 Construction of the proposed high rise building will require piled foundations which will penetrate the water table in the underlying sandstone, this could open up a pathway into the major aquifer underlying the site and the associated SPZ.

Surface Water Quality

6.11 There is no apparent direct surface pathway between the site and the River Irwell, however, water from the site could still potentially enter the river through the local drainage network. The demolition and construction phase will involve equipment and vehicles which use oils and other chemical substances; therefore, on-site demolition and construction activities could result in sediment entrained run-off being generated and reaching the river.

Operational Impacts

Flood Risk

6.12 A Flood Risk Assessment (FRA) is required by PPS25 for all new developments greater than 1 ha in area. The site does not fall within any fluvial or tidal flood risk areas, but any new development has the potential to increase surface runoff flood risks by increasing impermeable areas and reducing the infiltration of rainfall.

6.13 An FRA, including drainage assessment, that sets out how surface runoff risks will be managed has been prepared and is presented in Technical Appendix 6.1. The FRA informs the Environmental Impact Assessment in terms of the impact on flood risk from all potential sources on both people and property, within the development area and also at adjacent and downstream areas.

6.14 It should be noted that the potential for impacts to surface water and

groundwater quality from the mobilisation of contaminants already present on the site is considered in Chapter 11 (Land Quality) of this ES.

Assessment Methodology

6.15 The methodology employed in the assessment of impacts on the water environment involved a desk study, which was carried out to collect and review information gathered from a range of sources, and the application of significance evaluation criteria using professional judgement.

6.16 The baseline data collation was supported by undertaking an FRA for the site and by ground investigation work undertaken by Buro Happold in June 2009.

6.17 The selected significance evaluation criteria were based on the Transport Analysis Guidance (WebTAG), the Water Environment Sub-Objective TAG Unit 3.3.11. WebTAG provides a framework that can be used to systematically rank hydrological features and impacts and takes into account the sensitivity (or importance) of potential receptors and the magnitude of predicted impacts on the water receptors. Sensitivity/Importance is based on the value of the water feature or resource (Table 7), while the magnitude of a potential impact is estimated based on the degree of impact and is independent of the sensitivity of the feature (Table 8). The significance of a potential impact (either 'significant' or 'not significant') is derived by considering both the sensitivity of the feature and the magnitude of the impact as summarised in Table 9.

Sensitivity/ Importance	Criteria	Examples
Very High	Attribute with a high quality and rarity, regional or national scale and limited potential for substitution	SSSI, SAC, SPA, Ramsar sites
High	Attribute with a high quality and rarity, local scale and limited potential for substitution attribute with a medium quality and rarity, regional or national scale and limited potential for substitution	Surface watercourses of high ecological value or used for public water abstractions
Medium	Attribute with a medium quality and rarity, local scale and limited potential for substitution attribute with a low quality and rarity, regional or national scale and potential for substitution	Local surface watercourses of low ecological value (and not used for public water supply)
Low	Attribute with a low quality and rarity, local scale and potential for substitution	Water bodies of low sensitivity within/near site (e.g. attenuation ponds/reed beds, local drainage ditches)

Table 7 Overview of Sensitivity/Importance of Water Feature or Receptor

Magnitude	Criteria	Examples
Major	Results in loss of attribute	Loss of (part of) a SSSI / SPA / Ramsar site Change in GQA grade of river reach Loss of flood storage/increased flood risk Pollution of potable source of abstraction
Moderate	Results in impact on integrity of attribute or loss of part of attribute	Compromise integrity of a SSSI / SPA / Ramsar site Loss in productivity of a fishery Reduction in economic or amenity value of a water feature
Minor	Results in minor impact on attribute	Measurable changes in attribute (e.g. a river water quality indicator) but of limited extent and proportion
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use/integrity	No significant loss in water quality, fishery productivity, biodiversity or economic /amenity value No increase in flood risk

Table 8 Overview of Magnitude of Potential Impacts

		Sensitivity/Importance of Attribute			
		Very High	**High**	**Medium**	**Low**
Magnitude of Potential Impact	**Major**	Major Significance	Major Significance	Major Significance	Minor Significance
	Moderate	Major Significance	Major Significance	Moderate significance	Minor Significance
	Minor	Major Significance	Moderate significance	Moderate significance	Minor Significance
	Negligible	Minor Significance	Minor Significance	Minor Significance	Minor Significance
Note:- Shaded cells represent likely Significant Effects					

Table 9 Significance of Impacts - Water Resources

6.18 Only those issues of major significance are considered to be significant for the purposes of EIA.

Baseline Conditions

6.19 The baseline condition was compiled using data from a number of sources which are detailed in Table 10.

Source of information	Data Obtained
Climate	
The National River Flow Archive: www.nwl.ac.uk/ih/nrfa	Rainfall.
Flood estimation handbook	Rainfall.
Topography	
Ordnance Survey (OS) Landranger 1:50,000 map sheet 109	Site location, elevation and topographical relief.
Topographic survey by Land Survey Solutions Ltd	Site level data, April 2009
Surface Waters	
Environment Agency website (http://www.environment-agency.gov.uk/)	Surface water quality, CAMS, source protection zone maps, river flows.
The National River Flow Archive: www.nwl.ac.uk/ih/nrfa/index.htm	River flows.
Groundwater	
Discussion with Darren Billington, Groundwater and Contaminated Land Team, Environment Agency 04/06/09	-
Geology and Soils	
British Geological Survey Map Sheet 085 Manchester BGS Geo Index website http://www.bgs.ac.uk/geoindex/index.htm Soilscapes website http://www.landis.org.uk/soilscapes/ Preliminary site investigation data from Buro Happold, June 2009	Published Geology (drift and solid). Solid and Drift Geology Soil types for the site Regional soils Groundater levels and lithology
Flood Risk and Drainage	
Environment Agency website (http://www.environment-agency.gov.uk/) Email discussion with Sandrine Thomas, Development and Flood Risk Team, Environment Agency Buro Happold Infrastructure Design Note, April 2009 Discussion with Robert Moyser, Engineer, Buro Happold	Flood risk mapping Requirements for Flood Risk Assessment Proposed drainage strategy
Water Resource Use	
Manchester District Council, Environmental Health Department	Private water supply locations
Envirocheck Report	Details of licensed abstractions and discharges
Environment Agency	Licensed abstractions (surface and groundwater) and impoundments.

Table 10 Sources of Information Used in the Water Assessment

Land Use, Topography and Hydrology

6.20 The proposed development site has a developable site area of approximately 1.286 hectares and is located in Manchester city centre at National Grid Reference 384330 398970. The site borders Miller Street, Dantzic Street and Angel Street to the south, west and north respectively and the Manchester regional railway passes 50m to the north of the site. The site is currently in use as a car park, the site surface is currently mostly hard standing (part asphalt, concrete, and crushed stone) with some areas of vegetative planting.

6.21 The site is approximately 600m to the east of the River Irwell, which flows past the site in a southerly direction into the River Medlock, which in turn flows in a westerly direction into the Mersey at Irlam Weir (372800 393600), to the west of the city centre. Approximately 125m to the north, and north of the railway, a tributary of the Irwell (the River Irk) flows southwest, which is culverted before reaching the Irwell. The Rochdale canal is located 850m to the southeast, orientated northeast to southwest.

6.22 Topographic surveying (Land Survey Solutions Ltd) indicate that elevations across the site vary from approximately 47.0 to 39.0 m AOD sloping generally from east to west towards the River Irwell.

6.23 There is no direct surface pathway for flows from the site to the River Irwell or its tributary, as buildings and the railway would prevent this; therefore there is no mechanism for impacts on water quality at the site to reach the river in this way. It is possible however that surface drainage from the site discharges directly into the Irwell, rather than being directed to a treatment works.

Flood Risk

6.24 The site is currently occupied almost entirely by hard standing and buildings, (i.e. impermeable areas). Surface water currently drains to the soft landscape areas of the car park, with no gullies or drainage infrastructure draining these areas to the public sewer.

6.25 The Environment Agency online flood risk mapping shows that the development site falls within Flood Zone 1 as defined by PPS25. Flood Zone 1 covers land with a risk of flooding from fluvial or tidal sources of less than 0.1% in any given year. The site is, therefore, not at risk from fluvial or tidal flooding. In addition to fluvial and tidal risks, the flood risk assessment considers the flood risks posed to the site from all potential sources of flooding.

6.26 New development has the potential to increase surface runoff flooding by changing the surface drainage regime of the site and reducing the storage and infiltration of rainfall during storm events. The FRA is supplemented by a drainage design note by Buro Happold (Appendix C of the FRA).

Geology

6.27 The geology of the site comprises superficial deposits of Devensian Till (Glacial period) underlain by Middle Triassic to Late Permian Sherwood Sandstone. Geological faults are shown approximately 100 m northeast and 150 m southwest of the site. Deposits of Made Ground are not shown on the geological mapping although it is understood the current intrusive investigation has encountered some Made Ground. Some details of ground conditions are known from preliminary information from the site investigation.

6.28 Made Ground ranges in thickness from about 1.5 to 4 metres and comprises a mixture of reworked natural clays, sands and gravels with substantial quantities of fragments of metals, concrete, ceramics, brick ash and clinker. Man-made inclusions are most commonly found within one metre of surface.

6.29 Areas of former pools (reservoir and pond) have been drained and infilled in the past although the infill material is unknown and may have a high organic content. These areas are a potential source of ground gas.

6.30 Devensian Till typically comprises poorly sorted sands and gravels in a glacial clay. The depth of the base of superficial deposits is around 10 metres below ground level (i.e. till thickness is typically 6 – 10 metres).

6.31 The upper parts of the Sherwood Sandstone are substantially weathered to loose or weakly cemented sand. The degree of cementing increases rapidly and the sandstone is extremely weak to very weak red-brown medium-grained sandstone with occasional gravel. Data from site investigations carried out at the site in 2009 by Buro Happold engineers shows lithology data for two boreholes on the site. At both locations there is made ground overlying sand with clay and gravel content. Sandstone was encountered from 11.0 mbgl at BH01 and from 10.2mbgl at BH02. Borehole 1 terminated at 24.8 mbgl and BH02 at 30.5 mbgl.

6.32 The ground conditions encountered as part of the ground investigation works were assessed by both in-situ and geotechnical laboratory testing.

6.33 The Coal Authority report states that the land holding area is within the likely zone of influence from working of a coal seam 810 m below the ground which was last worked in 1965. The report states that any ground movement from these coal workings should have ceased. The Coal Authority is unaware of any future plans to extract coal from the area.

Hydrogeology

6.34 Environment Agency groundwater vulnerability mapping indicates that the site is on a major aquifer associated with the underlying sandstones. The major aquifer designation indicates that this strata is important for providing water supply and baseflow support to rivers.

6.35 The site lies in Zone II of a Source Protection Zone as defined by the Environment Agency, which is associated with abstractions approximately 400m to the west of the site boundary. This Zone is defined by the Environment Agency as follows:

> *"The outer zone (Zone II) covers pollution that takes up to 400 days to travel to the borehole, or 25% of the total catchment area – whichever area is the biggest. This travel time is the minimum amount of time that we think pollutants need to be diluted, reduced in strength or delayed by the time they reach the borehole."*

6.36 Minor instances of perched groundwater occur in overlying glacial deposits and made ground. The site investigation found groundwater strikes in trial pits as a 'slight seepage' at 1.00 m below ground level (mbgl) in the centre of the proposed building footprint (TPBH02) and as 'locally damp' below 2.5 mbgl on the western edge of the building footprint (TPCPT04). The remaining trial pits were dry. It is possible that perched water will be present in both Made Ground and Glacial Till.

6.37 Groundwater levels were encountered in the two boreholes drilled: TPBH01 at the northern edge of the site and TPBH02 at the centre of the site. Preliminary monitoring has found that groundwater levels within the Sherwood Sandstone are between 25.00 and 27.00 mAOD (15 – 16 mbgl).

Water Quality

6.38 The Environment Agency monitors water quality on the Irk downstream of the site between NGRs 384900,399910 and 383800,398900. Results are shown in Table 11 for the most recent period of testing in 2007, and indicate fairly good chemistry, poor biology and elevated nutrients in the Irk.

Parameter	Quality	Year	Environment Agency Definition of Classification
Chemistry	C	2007	Fairly good - Potable supply after advanced treatment, suitable for other abstractions, potentially good cyprinid fisheries and natural ecosystems, or those corresponding to good cyprinid fisheries
Biology	E	2007	Poor - Biology restricted to pollution tolerant species
Nitrates	6	2007	Very high - >40mgNO3/l
Phosphates	6	2007	Excessively high - >1 mgP/l

Table 11 Water Quality data for the River Irk

Licensed Abstractions and Discharges

6.39 The information in this section was taken from an Envirocheck report of May

2009.

6.40 There are 21 groundwater abstraction licences issued by the Environment Agency within 1km of the site, and of these 18 are within 500m. Fourteen are for process water for brewing, located near Strangeways Prison. The annual abstraction volume is stated for only one of these licences, 194755 m3/year (daily rate of 682 m3/day). There are 2 further licences for brewing (stated licensed abstraction of 45,460 m3/year) and 2 for dairy process water (159,110 m3/year); these abstractions are from groundwater. There are 3 licences groundwater abstraction for cooling water, located between 600 and 850m from the site. There are no surface water licences within 1km of the site.

6.41 There are 20 consented discharges located within 500m of the site, and a further 81 within 1.0 km, issued by the Environment Agency. All these consents except one are issued to United Utilities. Of these all but one are for storm sewer overflow to surface water courses, namely the Rivers Irwell, Medlock and Irk, and the Shooters Brook; discharges from storm overflows are generally intermittent and at times of high river flow. The remaining United Utilities consent is for treated water effluent discharge to the Shooters Brook at 385170 398200. One further consent is for trade effluent via a ditch to the River Irwell at 383530 398520. No discharge volumes are stated.

6.42 Abstractions for less than 20m3/day do not require a licence and information on any within the vicinity of the development site was obtained from Manchester City Council. The Council advised that they are aware of two private abstractions at: -

1 Joseph Holts Brewery, Empire Street, Cheetham Hill, Manchester, M3 1JD; and,

2 Hydes Anvil Brewery, Moss Lane West, Moss Side, Manchester.

Water Resources

6.43 The site is included in the Northern Manchester Catchment Abstraction Management Strategy (CAMS) area. The River Irwell Water Resource Management Unit (WRMU) is assessed as currently having “Water Available” for new licensing, although by 2013 it anticipates that there will be no additional resource available. The underlying Groundwater Management Unit (GWMU) is classified as currently “Over Licensed”, indicating that the full abstraction rates could have unsustainable effect on dependant ecology.

6.44 The draft Northwest River Basin District Plan (which implements the Water Framework Directive requirements) predicts that by 2015 overall status or potential status in the Lower Irwell will be less than “Good” while groundwater status (both quantitative and chemical status) will be poor. This result indicates that measures will need to be put in place to restore the status of the Lower Irwell water bodies to “Good”. These measures could involve alterations

to abstraction amounts.

Conservation and Designated Sites – National and International

6.45 There are no sites designated for conservation close to the site. However, the Urban Mersey Basin is a Natural Area and has a considerable variety of habitats and species which Natural England considers it is important to conserve. The Nature Conservation profile for the Urban Mersey Basin (Natural England, March 1997) indicates that:-

> *"The Urban Mersey Basin is one of the most densely populated parts of the country. Central to this area are the Rivers Mersey and Irwell with an associated network of canals, rivers and valleys, around which the major cities and industries have developed. The Urban Mersey Basin supports a varied assemblage of habitats and species, though many of the habitats have been modified and created by human activity. These include ponds, canals and subsidence 'flashes'."*

Factors Affecting the Baseline

6.46 Climate change over the lifetime of the development is likely to influence the hydrological regime at the development site, so that rainfall patterns, river flow and groundwater levels will be impacted. It is likely that more intense rain storms will lead to higher peak river flows, and higher rates of rainfall runoff across the site, than are currently observed. PPS25: Development and Flood Risk recommends allowances for climate change impacts on rainfall, and these have been considered in the Flood Risk Assessment.

6.47 Climate change will also impact on available water resource from groundwater and surface water, both in local catchments and at a regional scale. Revised climate change predictions from the UK Climate Change Impacts Programme were published in June 2009 and show that at the site location winter rainfall may increase by as much as 40% while summer rainfall may fall by as much as 40% by the 2080s, compared to a 1990s baseline. The central values predicted are 10-20% increase in winter rainfall, and 10-20% decrease in summer rainfall.

Impact Assessment

Construction Impacts

Groundwater Quality

6.48 Basement levels are proposed at 8m bgl (below ground level) and piles are proposed at 10m-15m below the basement level. The top of the sandstone has been proved at 10-11m bgl and the water table at 15m-16m bgl during the Buro Happold site investigation work in June 2009. Hence basement excavations will not infringe on the aquifer, however the piles will penetrate the water table. The pilling activities associated with the removal of 8m of

protective overburden in the foundation excavations could open up new pathways to the aquifer.

6.49 There is a risk when constructing foundations and piling that pathways may be established for groundwater pollution from surface contaminants, for example accidental oil and chemical spills. These pathways may also allow existing on site contaminants to reach groundwater as discussed in the Land Quality chapter. Potential impacts could be of a major magnitude due to the location of the site within Zone II of an SPZ. Of the different methods of piling available some are more likely to produce permeable pathways than others. For example driven piling methods tend to cause more disturbance to, and displacement of, the surrounding soils, compared to continuous flight augered (CFA) piles which cause less damage. Penetrative ground improvement methods, which introduce granular material or concrete columns to improve the ground structure, may also introduce conduits for pollution. Impacts have the potential to be **minor to major (adverse)**.

Surface Water Quality

6.50 Although unlikely, accidental pollution from leaks and/or spillages of oil, fuel or chemicals or other site construction activities may result in impacts on river water quality, if polluted water reaches the river indirectly through the local drainage system. Discharge of potentially polluted (e.g. silty) runoff generated from construction activities may also reach local surface waters, although currently no direct pathways between the site and the river have been identified.

6.51 Overall the unmitigated potential impacts on surface water are considered to be **minor to major (adverse).** Such a broad pollution band is given because the exact scale of the potential significance will depend on the pathways between the site and the river and the nature of any pollution event

Flood Risk

6.52 The Flood Risk Assessment for the site is included as Technical Appendix 6.1 to this report. The FRA considered all potential flood risks posed to the site and concluded that the proposed development will not be impacted by flood risk from any source, with the exception of surface runoff flooding.

6.53 The level of impermeable area on the site and the amount of surface runoff generated on-site during storm events will not be increased during construction. Any changes to the topography of the site during construction have the potential to impact on surface runoff flow routes and change the flooding regime on site and in surrounding sites.

6.54 Overall the unmitigated potential impacts on flood risk are considered to be **minor to moderate (adverse).**

Operational Impacts

Groundwater Quality

6.55 The risk of groundwater contamination through pathways established via piling and foundation construction may remain after the construction phase. For example, there is the potential for oil spills in the basement car park levels of the building to reach groundwater through cracks in the floor slab and pathways created by disturbance during driving or drilling of piles. There are two basement levels proposed which means that the distance from the lower level of the car park to groundwater will be reduced (the floor of the lower basement level is 8.0m bgl) and the pollution pathway will therefore be shorter; since the proposed building is high (16 storeys) it is likely that the foundations will be deep.

6.56 The unmitigated potential impacts on groundwater are considered to be **moderate to major (adverse).**

Surface Water Quality

6.57 Although unlikely, accidental pollution from leaks and/or spillages of oil, fuel or chemicals during any maintenance activities in the operational phase may result in impacts on river water quality, if water were to reach the river (e.g. indirectly through the local drainage system.

6.58 The unmitigated potential impacts on surface water are considered to be **minor to moderate (adverse)**.

Flood Risk

6.59 Increase in runoff rates/volumes from the site, or changes in drainage regime, due to introduction of impermeable areas or due to construction activities may result, if unmitigated, in increased flood risk to people and property.

6.60 The unmitigated potential impacts on flood risk are considered to be **moderate (adverse).**

Water Resources

6.61 Water use from the proposed site will be met from the mains and supplied by United Utilities. It will have an impact on the supply demand balance but because the site is allocated in the Local Development Plan, the UU demand forecast in their Water Resource Plan should allow for this demand.

6.62 The unmitigated potential impacts on water resources are considered to be **moderate (adverse)**.

Mitigation Measures

Guidance

6.63 A number of standard mitigation solutions are available and applicable to the study site to negate or minimise the identified potential impacts on the water environment. The following mitigation measures are largely based on the EA's PPG Notes and CIRIA guidance (see section 2) and can effectively mitigate a number of potential impacts during both construction and operation of the site, and have therefore been used in the current mitigation proposals: -

1 Control of Surface Water Runoff. The control of surface water runoff during the construction phase would be based on best practice guidance provided by the EA and CIRIA (Construction Industry Research and Information Association) with systems put in place to ensure suitable treatment and discharge of surface waters. Runoff would be controlled during each of the phases of construction by directing runoff to a settling pond or silt busters, either via gravity or pumping. The design standard for such systems would be in accordance with relevant guidance at the time of construction. Surface run-off from all car park and roadway areas would be diverted to Class 1 oil separators with adequate capacity for the anticipated flows. These Class 1 separators would be designed to the standards outlined within EA PPG 3. Access roads would be regularly cleaned by road-sweepers to reduce the levels of sediment which could become entrained in run-off.

2 Environmental Management Plans. Contractors would be required to provide a detailed specification outlining how they would adhere to the environmental requirements. In particular, they would need to provide detailed information on emergency response to deal with accidental/abnormal occurrences, such as oil spillages. Contaminated materials would be placed within a dedicated skip that would be present on site at all times. Such material would be disposed of at an appropriate waste management facility. A site Pollution Prevention Plan would be formulated, in accordance with the EA PPG 21.

3 Fuel and chemical storage. All chemical/fuel storage areas would be within areas of hardstanding and would be bunded so that 110% of the stored capacity or 25% of the combined volume of the container is provided, which ever is the greatest. They would also be located away from any surface water drains. Measures would be in place to ensure that there are no concrete spillages and that surface water drains are protected should unexpected spillages occur.

4 Preventative practices. Equipment used during the construction phase would be well maintained to minimise the risks of oil leaks or similar. Maintenance and refuelling of machinery would be undertaken within designated areas. In these designated areas contingency plans would be implemented to ensure that the risk of spillages is minimised. Measures

such as placing drip trays beneath machinery during refuelling, parking in designated areas when not in use and regular equipment maintenance would together help to minimise and contain small spillages. Spill kits would be placed at appropriate locations around the site.

5 Groundwater / Water Ingress. Pumping of any groundwater/ water ingress, as necessary, should be carried out to transfer water to a suitable treatment pond (or other facility) prior to discharge.

6 Additional Safeguards. A number of consents may be needed during the construction process, such as a trade effluent consent for any discharges to foul sewers and discharge consents for discharge of runoff or drainage from on-site excavations. These would all be applied for prior to construction.

Mitigation of Construction Impacts

Groundwater Quality

6.64 Protection of the Sherwood Sandstone aquifer is required throughout the construction phase. Detailed designs for building and excavation works would be drawn up in consultation with the EA and other relevant bodies. They would involve the protection of the Sherwood Sandstone from infiltration by contaminants. The nature of the construction of any piled foundations would be confirmed with the EA prior to construction. Water from concrete wash out areas would not be allowed to infiltrate into the Sandstone and would be appropriately treated. Spill kits and other pollution prevention measures would be put in place. Designs would minimise the potential for pollutants from the construction process to enter the Sandstone.

6.65 The Environment Agency will require a Piling Risk Assessment (PRA) to be carried out for this site because it overlies the Sherwood Sandstone which is a major aquifer and piles will penetrate the water table. The PRA will assess the risks of contaminants currently on site or which may be introduced to site, in relation to the proposed location of piling or foundations (for example Impermeable concrete is sometimes used for grout piling and foundations to reduce permeability and limit the risk of groundwater pollution). This will influence the type and position of foundations finally agreed with the EA in the design, and any additional control measures that will be required. Further information can be found in Chapter 11 (Land Quality) of the ES.

6.66 Appropriate design of piling and foundations, control and prevention of site pollution incidents during construction using standard methods as set out in Environment Agency PPG, and to be detailed in construction method statements will ensure that significant pollution of groundwater during construction is prevented.

6.67 The potential impacts on groundwater following mitigation are considered to be **minor (adverse)**.

Surface Water Quality

6.68 The application of the standard mitigation measures (PPG Notes, CIRIA guidance) presented at the beginning of this section will be sufficient in removing potential pollutants from site run-off and reducing all potential impacts to surface waters to within acceptable levels.

6.69 The potential impacts on surface water following mitigation are considered to be **minor (adverse)**.

Flood Risk

6.70 Sustainable drainage solutions have been proposed in the FRA to reduce flood risk from surface water runoff to acceptable levels. SuDS can be applied during construction to intercept and attenuate runoff and ensure that the risk of flooding is minimised.

6.71 The potential impacts on flood risk following mitigation are considered to be **minor (adverse)**.

Mitigation of Operational Impacts

Groundwater Quality

6.72 The mitigation measures presented for the construction phase for the safe design of foundation and the prevention of the opening up of new pollutant pathways will continue to protect groundwater quality in the operation phase. Foundation designs will be agreed with the Environment Agency to ensure the protection of the aquifer during the operation phase, this could include measures such as the lining of basement areas to ensure that oil spillages do not infiltrate into the aquifer

6.73 Mitigation for protecting groundwaters from existing contamination on site during the operation phase is discussed in Chapter 11 (Land Quality) of this ES.

6.74 The potential impacts on groundwater following mitigation are considered to be **minor (adverse)**.

Surface Water Quality

6.75 The application of the standard mitigation measures (PPG Notes, CIRIA guidance) presented at the beginning of this section will be sufficient in removing potential pollutants from site run-off and reducing all potential impacts to surface waters to within acceptable levels.

6.76 The potential impacts on surface water following mitigation are considered to be **minor (adverse)**.

Flood Risk

6.77 As outlined in the Flood Risk Assessment an appropriate drainage strategy is being developed by Buro Happold Engineers and this will include sustainable drainage (SuDs) technology where appropriate. The purpose of SuDs technology is to attenuate rainfall on site, so that flow rates are reduced and water quality is improved before drainage is discharged off site. In this way the design should attempt to mimic natural hydrological flow patterns. SuDs methods keep the water at surface level rather than below ground as in conventional drainage systems; this means that SuDs are easier to maintain. They can be incorporated into the landscape design and should enhance the environment in the public realm area at Miller Street.

6.78 SuDs options include rainwater harvesting, swales, detention basins and attenuation ponds. Infiltration techniques such as permeable paving, and soakaways will be appropriate because the site lies on the permeable Sherwood Sandstone. SuDs components can be incorporated in the large public realm area on site, and drainage from the head office roof can be routed through these drainage components.

6.79 The FRA indicates that surface runoff from the site will be attenuated to greenfield runoff rates, calculated as 4.8 l/s/ha, for all events up to and including the 1 in 100 year storm, with an appropriate allowance for climate change. This is a significant reduction on current runoff rates from the site during storm events. The final drainage design will provide approximately 500m^3 of attenuation storage to reduce surface runoff from the site. 285m^3 of this storage will be provided below ground to attenuate the 1 in 30 year event. The remainder of the attenuation storage will be provided at the surface and will make use of appropriate SuDS techniques.

6.80 Landscaping of the public realm areas may incorporate infiltration SuDS techniques (depending on the outcome of further infiltration tests and EA advice on protection of the SPZ), while swales, detention ponds and infiltration basins may also be suitable. Permeable paving, rainwater harvesting and green roofs are further SuDS to be considered. The application of SuDS will fully alleviate the risk of surface runoff flooding. Buro Happold will consider SuDS further in the detailed drainage design. SuDS can be incorporated into the landscape design and are expected to enhance the environment in the public realm area at Miller Street and provide an improvement compared to current conditions. Drainage from the head office roof can also be routed through these drainage components.

6.81 The potential impacts on flood risk following mitigation are considered to be **minor (positive)**.

Water Resources

6.82 Water resource use on site should be managed by specifying water efficient appliances within the head office building. Appliances would include low flush

toilets, waterless urinals and low flow taps and showerheads, efficient models of which are listed on the government Environmental Technology Acceptance (ETA) list.

6.83 Where possible rainwater harvesting should be installed for non potable use e.g. in toilet flushing, and landscape watering. Rainwater can be collected from roofs and ground surfaces. At Miller Street surface drainage collected in SuDs systems, for example attenuation pond or permeable paving can be re routed to header tanks for use within the building. In commercial buildings there is generally not enough greywater generated to make greywater re-use viable.

6.84 Overall the potential impacts on water resources following mitigation are considered to be **minor (adverse)**.

Summary of Residual Impacts

6.85 Table 12 sets out the residual impacts during the construction and operation phases.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Groundwater Quality	None	Very High – major aquifer and source protection zone II	Negligible – appropriate mitigation put in place to protect groundwater resource. Appropriate pollution prevention guidance followed during construction.	Temporary – during construction phase	Direct or via infiltration	Minor adverse	Not significant	High
Surface Water quality	None	Possibly high if drainage from the site flows directly to river	Negligible – appropriate mitigation put in place for the protection of surface water run-off	Temporary – during construction phase	Via drainage network	Minor adverse	Not significant	High
Flood risk	None	Very High	Negligible – appropriate mitigation put in place to protect groundwater resource. Appropriate pollution prevention guidance followed during construction.	Temporary – during construction phase	Via drainage network and SuDS	Minor adverse	Not significant	High

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Operational Phase								
Groundwater Quality	None	Very High – major aquifer and source protection zone II	Negligible – appropriate mitigation put in place to protect groundwater resource. Appropriate pollution prevention guidence followed during construction.	For the lifetime of the development	Direct or via infiltration	Minor adverse	Not significant	High
Surface Water quality	None	Possibly high if drainage from the site flows directly to river	Negligible – appropriate mitigation put in place for the protection of surface water run-off	For the lifetime of the development	Via drainage network	Minor adverse	Not significant	High
Flood risk and drainage design	None	Development on site and downstream; surface and foul sewerage networks; watercourses and groundwater – all important.	Negligible impact with mitigation measures in place. Runoff rates may be reduced.	Permanent For the lifetime of the development	Via SuDS and local drainage system	Minor positive	Not significant	High
Water Resources	None - There will be some impact on water resources at a water resource zone level but no significant effects.	High - Water resources locally (within the water resource zone) will be impacted; this receptor is important.	The change will be minor in relation to supply / demand volumes within the water resources zone, and allowances have been planned for in the water company plans.	Permanent For the lifetime of the development	Direct	Minor adverse	Not significant	High

Table 12 Summary of Residual Impacts – Water Resources

Cumulative Effects

6.86 There are no cumulative effects to be considered as part of the assessment.

7.0 Air Quality

Introduction

7.1 This chapter summarises the results of the air quality assessment, to outline:–

1 Whether the baseline ambient air quality within the vicinity of the development, plus the increase in road traffic emissions due to the development, are foreseen to result in breaches of any of the road traffic related pollutant Air Quality Objectives [AQOs] for the protection of human health.

2 Whether the proposed biomass boiler will have any air quality impacts upon surrounding potential receptors; and,

3 The dust mitigation techniques to be implemented during the construction phase of the development, and how these techniques will minimise the risk of off-site dust migration.

Policy Context

7.2 There are a number of key policy guidance notes that between them consider the environmental effects of emissions of pollutants to the atmosphere. Planning Policy Statement 23:- Planning Pollution Control also addresses the interface between air quality management and the planning system. The key documents are outlined below.

Planning Policy Statement 23:- Planning Pollution Control

7.3 Planning Policy Statement [PPS] 23 is the primary piece of national policy with regard to the control of pollution and includes guidance in relation to the effects of development upon ambient air quality. Local authorities should have regard to this guidance in preparing policies relevant to potentially polluting developments, or developments near to polluted or potentially polluting sites and in determining applications for planning permission.

7.4 As well as establishing firmly that air quality is capable of being a material planning consideration in land use and development planning PPS 23 reiterates the need for development to contribute to the principles of sustainability. Amongst the matters for inclusion in taking decisions on planning applications, are the potential effects of new developments in or close to Air Quality Management Areas [AQMAs] and areas of poor air quality. The need to consider local air quality reviews and other assessments is also referenced.

7.5 The key elements of PPS 23 are contained in three paragraphs of Appendix 1G as follows:–

1G.1 Any air quality consideration that relates to land use and its

development is capable of being a material planning consideration. Wherever a proposed development is likely to have significant air quality impacts close co-operation between Local Planning Authorities (LPAs) and those with responsibilities for air quality and pollution control will be essential. The impact on ambient air quality is likely to be particularly important:–

- *where the development is proposed inside, or adjacent to, an AQMA designated under Part IV of the Environment Act 1995;*
- *where the development could in itself result in the designation of an AQMA; and*
- *where to grant planning permission would conflict with, or render unworkable, elements of a Local Authority's (LA's) air quality action plan.*

1G.2 *It is not the case that all planning applications for developments inside or adjacent to AQMAs should be refused if the developments would result in a deterioration of local air quality. Such an approach could sterilise development, particularly where authorities have designated their entire areas as AQMAs. LPAs, transport authorities and pollution control authorities should work together to ensure development has a beneficial impact on the environment, for example by exploring the possibility of securing mitigation measures that would allow the proposal to proceed. Road transport is recognised as a significant contributor to poor local air quality, particularly in urban areas. LPAs can play a key role by ensuring that developments reduce the need to travel and encouraging more sustainable travel choices.*

1G.3 *All such applications should be supported by such information as is necessary to allow a full consideration of the impact of the proposal on the air quality of the area. It may be appropriate in some circumstances for the developer to fund mitigation measures elsewhere inside the AQMA to offset any increase in local pollutant emissions as a consequence of the proposed development. These measures could be secured through Section 106 Agreements. Paragraph 1.50 of this Annex gives advice on the use of planning obligations.*

Air Quality Strategy

7.6 The 2007 Air Quality Strategy for England, Scotland, Wales and Northern Ireland [DEFRA, 2007], provides a framework for improving air quality at a national and local level. Central to the Air Quality Strategy are health-based standards for key air pollutants; these standards are based on medical and scientific reports on how and at what concentration each pollutant affects human health. The AQOs based on these standards were made statutory through the Air Quality Regulations 2000, as amended in 2002 and the Air Quality Standards Regulations 2007.

7.7 The Air Quality Standards Regulations 2007 seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive, relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards [AQS] with attainment dates in line with the European Directives.

7.8 The AQOs are based on the Air Quality Limit Values, with interim target dates to help the UK move toward the achievement of the Air Quality Limit Values. The air quality objectives in the Air Quality Strategy are a statement of policy intentions or policy targets. As such, there is no legal requirement to meet these objectives except as far as these mirror any equivalent legally binding limit values in EU legislation.

Air Quality Assessment Criteria

7.9 The Air Quality Strategy includes assessment criteria for a range of air pollutants some of which are relevant to this scheme. These are set out as Air Quality Assessment Criteria.

7.10 The road traffic emissions assessment has focussed on nitrogen dioxide (NO2) and particulate matter (PM10) as these are the two pollutants most associated with road traffic. Emissions of other exhaust gases, essentially carbon monoxide (CO), small quantities of sulphur dioxide (SO_2) and non-methane volatile organic compounds [NMVOC] including 1,3-butadine and benzene, will occur also from vehicles. National level measurement and modelling assessments carried out by DEFRA have shown that policy measures already in place should reduce levels of CO, 1,3-butadine and benzene to ensure compliance with the respective standards and objectives, even at busy roadside locations. The small incremental change due to emission of these pollutants from the proposed development would not change this situation and therefore this assessment focuses only on NO_2 and PM10. The primary oxides of nitrogen (NO_x) emitted from combustion sources undergoes photochemical oxidation in the atmosphere to form secondary NO2, which is the pollutant of concern for local air quality, primary NO2 is also emitted from road traffic sources.

7.11 The assessment of emissions from the biomass boiler has focussed on emissions of NO_x, NO_2, PM_{10} and $PM_{2.5}$, being the main emissions of concern from biomass boilers, with emissions of NO_x assessed at ecological receptors only. Table 13 sets out the air quality objectives that are relevant to this assessment, and the dates by which they are to be achieved.

Pollutant	Objective Value	Concentration Measured As	Date To Be Achieved And Maintained Thereafter	European Obligations	Date To Be Achieved And Maintained Thereafter
Human Health					
Nitrogen Dioxide (NO_2)	40 g m^{-3}	Annual Mean	31 Dec 2005	40 g m^{-3}	01 Jan 2010
	200 g m^{-3}	1 Hour Mean – not to be exceeded more than 18 times a year, equivalent to 99.79 percentile	31 Dec 2005	200 g m^{-3}	01 Jan 2010
Particulates (PM_{10})	40 g m^{-3}	Annual Mean	31 Dec 2004	40 g m^{-3}	01 Jan 2005
	50 g m^{-3}	24 Hour Mean	31 Dec 2004	50 g m^{-3}	01 Jan 2005
Particulates ($PM_{2.5}$)	25 g m^{-3}	Annual Mean	2020	Target value 25 g m^{-3}	2010
	Target of 15 % reduction in concentrations at urban background[1]	Annual Mean	Between 2010 and 2020	Target of 20 % reduction in concentrations at urban background	Between 2010 and 2020
Ecology					
Oxides of Nitrogen (NO_x)	30 g m^{-3}	Annual Mean	31 Dec 2000	30 g m^{-3}	19 Jul 2001
Note:- 25 g m-3 is a cap to be seen in conjunction with 15 % reduction.					

Table 13 National Air Quality Objectives and European Directive Limit and Target Values for the Protection of Human Health and Ecology

7.12 The main issue in terms of the objectives for NO_2 is the more stringent annual mean objective. It is generally considered that the NO_2 1-hour mean will not be exceeded if the relevant annual mean objectives are not exceeded. For PM_{10} the 24-hour mean objective is more stringent than the annual mean objective.

Local Authority Review and Assessment

7.13 Part IV of the Environment Act 1995 requires that Local Authorities periodically review air quality within their individual areas. This process of Local Air Quality Management [LAQM] is an integral part of delivering the Government's AQOs.

7.14 To carry out an air quality Review and Assessment under the LAQM process, the Government recommends a three-stage approach. This phased review process uses initial simple screening methods and progresses through to more detailed assessment methods of modelling and monitoring in areas identified to be at potential risk of exceeding the objectives in the Regulations.

7.15 Review and assessments of local air quality aim to identify areas where national policies to reduce vehicle and industrial emissions are unlikely to result in air quality meeting the Government's air quality objectives by the

required dates.

7.16 For the purposes of determining the focus of Review and Assessment, Local Authorities should have regard to those locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective.

7.17 Where the assessment indicates that some or all of the objectives may be potentially exceeded, the Local Authority has a duty to declare an AQMA. The declaration of an AQMA requires the Local Authority to implement an Air Quality Action Plan [AQAP], to reduce air pollution concentrations so that the required AQOs are met.

Other Guideline Values

7.18 In the absence of statutory standards for the other prescribed substances that may be found in the emissions, there are several sources of applicable air quality guidelines.

Air Quality Guidelines for Europe, the World Health Organisation [WHO]

7.19 The aim of the WHO Air Quality Guidelines for Europe [WHO, 2000] is to provide a basis for protecting public health from adverse effects of air pollutants and to eliminate or reduce exposure to those pollutants that are known or likely to be hazardous to human health or well-being. These guidelines are intended to provide guidance and information to international, national and local authorities making risk management decisions, particularly in setting air quality standards. The 2000 guidance was updated for particulate matter, ozone NO_2 and SO_2 in 2005. For all other substances the 2000 guidance remains applicable.

Environmental Assessment Levels (EALs)

7.20 The Environment Agency's Technical Guidance Note Environmental Permitting Regulations [EPR] H1 [Environment Agency, 2008] provides methods for quantifying the environmental impacts of emissions to all media. EPR H1 contains long and short-term EALs and Environmental Quality Standards [EQS] for releases to air derived from a number of published UK and international sources. For the pollutants considered in this study, these EALs and EQS are equivalent to the AQS and AQOs set in force by the Air Quality Strategy for England, Scotland Wales and Northern Ireland.

EPUK Guidance on Air Quality and Development Control

7.21 A publication for Environmental Protection UK [EPUK] formerly the National Society for Clean Air [NSCA] provides a practitioners' framework for air quality considerations addressed in the local development control process. The guidance stipulates selection criteria for determining whether an air quality assessment is necessary for new developments.

7.22 The key elements which related to the proposed facility are as follows:–

5.4.1:- Proposals that will result in increased congestion, a change in either traffic volumes – typically a change in annual average daily total [AADT] of peak traffic flows of more than ±10 %, or a change in vehicle speed (typically of more than ±10 kph), or both, usually on a road with more than 10,000 AADT;

5.4.ii:- Proposals that would significantly alter the traffic composition (i.e. increase the proportion of Heavy Goods Vehicles [HGVs]) in an area (e.g. bus stations, HGV parks, increased delivery traffic); and

5.4.iv:- Development located in, or which may affect, sensitive areas (e.g. ecological sites) or areas of poor air quality (including AQMAs), where either different emissions to air occur, or where any of the preceding criteria are met.

Greater Manchester Air Quality Action Plan

7.23 The 10 Greater Manchester Authorities have worked together to produce an Air Quality Action Plan, which covers the whole of Greater Manchester and details the measures that will be taken across the area and summarises how the Plan will be evaluated.

7.24 The main aim of the Action Plan is clearly to deliver improved air quality across Greater Manchester, and in particular those locations which have been designated as Air Quality Management Areas. In order to achieve this the Action Plan has the following aims and objectives:–

1 To ensure that air quality is integrated into other local authority plans, strategies and activities;

2 To develop closer relationships with organisations that can help deliver improved air quality;

3 To identify new partners that can work with the Greater Manchester authorities to improve air quality;

4 To raise awareness of air quality issues amongst the population of Greater Manchester; and

5 To encourage individuals to recognise that they can make choices which can lead to improved air quality.

Potential Impacts

Road Traffic Emissions

7.25 Potential exceedences of the air quality objectives for NO_2 and PM_{10} at neighbouring residential properties, within the vicinity of the development may

result in exposure to concentration levels deemed to pose a risk to human health. The potential impacts have therefore been included in the assessment.

7.26 In terms of road traffic emissions, impacts upon local receptors are only likely to be experienced within 200m of the road network in question. A development of this type is unlikely to have a significant impact upon regional air quality; therefore the impacts from the development on a local scale are assessed through the Highways Agency Design Manual for Roads and Bridges [DMRB] tool.

7.27 The changes in traffic flows due to construction traffic, during the construction phase of the development, are likely to be small (less than 5% (EPUK 2006)) and of short duration, thus the construction element of the development is unlikely to result in any significant impacts on local air quality in the long term. Therefore the impacts from construction traffic are not considered further in this assessment.

Biomass Boiler Emissions

7.28 The emissions of primary concern from the biomass boiler are emissions of NO_x (NO_2), PM_{10} and $PM_{2.5}$. Emissions from the boiler have the potential to impact upon the surrounding residential receptors, particularly as the residential properties adjacent to the boiler are multi-storey developments, and therefore there are potential receptors located at height. Potential impacts of NO_x (NO_2), PM_{10} and $PM_{2.5}$ from the biomass boiler have therefore been assessed, based on the screening methodology for biomass boilers requiring assessment, set by Defra for Local Authorities (AEA Energy and Environment, 2008).

7.29 The potential impacts from the boiler are assessed at a number of potential residential receptors and also across a wider area, by the application of a receptor grid within the model. The assessment is carried out through the use of the ADMS 4.1 modelling software.

Dust

7.30 The extent to which dust nuisance might occur is difficult to predict and assess quantitatively because the potential for nuisance depends upon the relative locations of the sensitive receptors and the work being undertaken. In addition, wind direction, wind speed, precipitation, the type and quantity of material being handled, its particle size distribution and moisture content will all influence whether the potential for nuisance exists. Most of these factors are dependent on site operating and weather conditions at any given time.

7.31 As a general rule, even in the absence of mitigation, dust nuisance would not be expected at distances beyond about 100m, depending on size characteristics from the work activity and then only when these receptors are downwind of the dust source and in the absence of appropriate mitigation [ODPM, 2005]. In an urban environment, the area likely to be adversely affected by dust nuisance would be expected to be much smaller than this due

to buildings causing deposition of the dust.

7.32 The site will be employing best practice mitigation measures, appropriate for its location, the nature of the activities on site and following consultation with the local authority to ensure that dust generated onsite is kept to a minimum and does not migrate offsite. Dust effects associated with the development are therefore not considered further in this assessment as the employment of best practise measures will ensure that dust effects are unlikely to be significant. For these reasons, dust has been scoped out of the assessment.

Assessment Methodology

Desk Study

7.33 An initial desk study has been carried out in order to assess the baseline air quality within and surrounding the proposed development site. The desk study involved collating information regarding the baseline air quality in the area of the development; this involved studying the local air quality reports, strategies and guidance coinciding with any monitored concentrations available for the area. Data gathered includes the results of automatic air quality monitoring carried out in the Manchester City Council area and background pollutant concentrations surrounding the development, factored to predict the future background concentrations using National Environmental Technology Centre [NETCEN] adjustment factors. The information gathered has been used to determine the current air quality in the area and any air quality issues which may exist. The data in Table 14 have been sourced for the assessment.

Data	Source/Organisation
NETCEN mapped background concentrations for the nearest kilometre square to the development site.	Air Quality Archive.
Automatic and diffusion tube monitoring data.	Air Quality Archive.
Road traffic data for the surrounding road network.	Waterman Boreham Ltd.
Boiler capacity and stack height details.	Buro Happold Ltd.
Calculated boiler emission rates.	AEA Energy and Environment Technical Guidance.

Table 14 Data and Sources Utilised in the Desk Study

7.34 A dust assessment is not specifically carried out due to the fact that any dust generation during the construction phase of the proposed development would not be permanent. Similarly emissions from construction traffic are not assessed as the construction phase of the proposed development will be short-lived.

Road Traffic Emissions Assessment

7.35 The pollutants of concern which require consideration in an assessment of this

nature are those generated from the exhaust of road vehicles, for which one would anticipate potential breaches of the Air Quality Strategy Objectives. These Objectives are prescribed in the Air Quality (England) Regulations (2000), the Air Quality (England) Amendment Regulations 2002 and the Air Quality Standards Regulations 2007.

7.36 The assessment determines the exposure through quantitative assessment of NO_2, NO_x and PM_{10} concentrations at neighbouring residential receptor locations. For the purpose of this assessment, traffic data have been supplied by Waterman Boreham Ltd. The assessment has been undertaken using the DMRB local impacts model and includes:–

1 Consideration of existing ambient concentrations;

2 Assessment of the emissions of gaseous pollutants and particulates from vehicles; and,

3 Assessment of the potential incremental changes in air quality due to the proposed redevelopment.

7.37 The effects of vehicle emissions on residential receptors in the vicinity of roads likely to experience an increase in traffic flows, due to the development, of greater than 10%, are assessed. The only roads experiencing a greater than 10% change are:–

1 Angel Street, between Dantzic Street and Rochdale Road;

2 Aspin Lane, between Corporation Street and Dantzic Street; and

3 Dantzic Street, between Aspin Lane and Corporation Street.

7.38 The change in traffic flows experienced is primarily due to the proposed closure of the section of Dantzic Street adjacent to the development site, which means that traffic is rerouted. However the traffic data does not show an increase as a result of the development. The details of this are set out in Chapter 12 – Transportation of this ES.

7.39 The forecast number of vehicles accessing the developed site each day has been derived by Waterman Boreham Ltd. This data assumes that 538 vehicles will enter and leave the site each day equating to 1076 daily two-way flows. In the development of the traffic data Waterman Boreham Ltd assumed that around 50% of the existing Miller Street car park will be retained (approximately 250 spaces).

7.40 In terms of the number of biomass delivery vehicles to access the site, it is understood that deliveries will be made to an off-site third party storage facility and subsequent “managed” deliveries will be made to the site from here. Approximately 20 deliveries annually are currently anticipated. Such proposals are not currently finalised, but it is noted that no articulated vehicle deliveries

will be made to the site and many deliveries from the off-site storage site may be shuttled to the development in transit type vans. Therefore it has been assumed that all vehicles accessing the site after development are to be Light Duty Vehicles [LDVs].

7.41 The road traffic data used in the assessment are presented in Technical Appendix 7.2.

Potential Human Receptors

7.42 The impacts of road traffic emissions are only required to be assessed within 200 m of the road link in question. The impacts at residential receptors only are assessed.

7.43 Angel Street, Aspin Lane and Dantzic Street are the only road links predicted to experience a change in traffic flows of more than 10 %, and as such flows along these links are used to determine the effects of the proposed development on neighbouring residents.

7.44 For this assessment a worst case approach has been adopted by predicting ground level pollutant concentrations at the closest receptor point along each link assessed.

7.45 The DMRB model assumes that receptors are at ground-level. Residential properties around the development site are multi-storey and pollutant concentrations would reduce as the vertical distance from the road increases. This assessment will therefore overestimate the concentrations at the first floor residential apartments and above

Potential Ecological Receptors

7.46 The following designated sites should be included within an assessment of road traffic emissions if they fall within 200m of the road network:–

1 Sites of Special Scientific Interest [SSSI];

2 Special Protection Areas [SPAs];

3 Special Areas of Conservation [SAC];

4 Ramsar Sites; and,

5 National Nature Reserves [NNR].

7.47 There are no such Designated Sites within 200 m of the road network assessed and therefore none are included in the assessment. As the NO_x AQO is for assessment at ecological receptors, and there are no such receptors within the vicinity of the development site NO_x is therefore not considered further within the assessment.

Methodology for Prediction of Effects

7.48 The Highways Agency Design Manual for Roads and Bridges (DMRB) screening methodology is utilised in order to quantify the likely ground level concentrations of NO_2 and PM_{10} that the existing and future residential receptors will be exposed to as a result of the existing air quality within the vicinity of the development and the additional road traffic emissions from increased traffic due to the development.

7.49 Assessment of the potential impacts from road traffic emissions has been undertaken by calculating the current baseline air quality as a combination of ambient background concentrations and emissions from the local road network. These concentrations are combined and then compared against the relevant AQO. Future concentrations are predicted on the basis of forecast traffic flows, provided by Waterman Boreham Ltd., and future estimated background concentrations.

7.50 To quantify the forecast concentrations of NO_2 and PM_{10} the following scenarios have been included in the modelling assessment:–

1 The baseline year of 2009;

2 The future development construction completion and occupation year of 2012, without the development; and

3 The future development construction completion and occupation year of 2012, with the development completed and occupied.

7.51 Waterman Boreham Ltd has evidence which suggests no future traffic growth in Manchester city centre. The 2012 baseline flows are therefore based on the 2009 traffic surveys which have been undertaken, but incorporates the likely improvements in vehicle and engine technology, within the DMRB model.

7.52 AADT traffic data and the percentage of Heavy Duty Vehicles (HDVs) for the local road network have been applied. Details of the input traffic data and speeds used in the DMRB assessment are given in Table 15.

Road	Scenario	Road Link[2]	Traffic Volume (AADT)[1]	HDV (%)	Speed (km/h)[1]	Distance to Receptor (m)
Angel Street 1	2009 Baseline	Aspin Lane/Dantzic Street	2255	0.6	47	189
	2009 Baseline	Angel Street	1271	0	47	8
Angel Street 2	2009 Baseline	Aspin Lane/Dantzic Street	2255	0.6	47	118
	2009 Baseline	Angel Street	1271	0	47	8

Road	Scenario	Road Link[2]	Traffic Volume (AADT)[1]	HDV (%)	Speed (km/h)[1]	Distance to Receptor (m)
Angel Street 3	2009 Baseline	Aspin Lane/Dantzic Street	2255	0.6	47	93
	2009 Baseline	Angel Street	1271	0	47	8
Dantzic Street 1	2009 Baseline	Aspin Lane/Dantzic Street	2193	0.4	47	9
	2009 Baseline	Angel Street	1271	0	47	63
Dantzic Street 2	2009 Baseline	Aspin Lane/Dantzic Street	2193	0.4	47	8
	2009 Baseline	Angel Street	1271	0	47	11
Dantzic Street 3	2009 Baseline	Dantzic Street	2828	0.8	47	7
	2009 Baseline	Corporation Street	10255	1.8	47	137
Crown Lane	2009 Baseline	Aspin Lane/Dantzic Street	2255	0.6	32	9
	2009 Baseline	Angel Street	1271	0	47	44
Corporation Street	2009 Baseline	Corporation Street	10255	1.8	47	9
	2009 Baseline	Dantzic Street	2828	0.8	47	137
Angel Street 1	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2255	0.6	47	189
	2012 Baseline Without Development	Angel Street	1271	0	47	8
Angel Street 2	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2255	0.6	47	118
	2012 Baseline Without Development	Angel Street	1271	0	47	8
Angel Street 3	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2255	0.6	47	93
	2012 Baseline Without Development	Angel Street	1271	0	47	8
Dantzic Street 1	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2193	0.4	47	9
	2012 Baseline Without Development	Angel Street	1271	0	47	63
Dantzic Street 2	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2193	0.4	47	8

Road	Scenario	Road Link[2]	Traffic Volume (AADT)[1]	HDV (%)	Speed (km/h)[1]	Distance to Receptor (m)
	2012 Baseline Without Development	Angel Street	1271	0	47	11
Dantzic Street 3	2012 Baseline Without Development	Dantzic Street	2828	0.8	47	7
	2012 Baseline Without Development	Corporation Street	10255	1.8	47	137
Crown Lane	2012 Baseline Without Development	Aspin Lane/Dantzic Street	2255	0.6	32	9
	2012 Baseline Without Development	Angel Street	1271	0	47	44
Corporation Street	2012 Baseline Without Development	Corporation Street	10255	1.8	47	9
	2012 Baseline Without Development	Dantzic Street	2828	0.8	47	137
Angel Street 1	2012 With Development	Aspin Lane	3616	0.5	32	189
	2012 With Development	Dantzic Street/Angel Street	2126	0	47	8
Angel Street 2	2012 With Development	Aspin Lane	3616	0.5	32	118
	2012 With Development	Dantzic Street/Angel Street	2126	0	47	8
Angel Street 3	2012 With Development	Aspin Lane	3616	0.5	32	93
	2012 With Development	Dantzic Street/Angel Street	2126	0	47	8
Dantzic Street 1	2012 With Development	Aspin Lane	3616	0.5	32	63
	2012 With Development	Dantzic Street/Angel Street	2614	0.3	47	9
Dantzic Street 2	2012 With Development	Aspin Lane	2616	0.5	32	8
	2012 With Development	Dantzic Street/Angel Street	2614	0.3	47	8
Dantzic Street 3	2012 With Development	Dantzic Street	1133	0	47	7
	2012 With Development	Corporation Street	12346	0.3	47	137
Crown Lane	2012 With Development	Aspin Lane	2616	0.5	32	9

Road	Scenario	Road Link[2]	Traffic Volume (AADT)[1]	HDV (%)	Speed (km/h)[1]	Distance to Receptor (m)
	2012 With Development	Dantzic Street/Angel Street	2614	0.3	47	44
Corporation Street	2012 With Development	Corporation Street	12346	1.6	47	9
	2012 With Development	Dantzic Street	1133	0	47	135

Note:-

Traffic speeds for Dantzic Street and Angel Street taken from Transport Statistics GB 2008 Edition, Table 7.11. Average speed for all vehicles taken as the road is fairly free-flowing, traffic speeds for Aspin Lane assumed based on the presence of on-street parking which is likely to slow traffic;

Within the baseline scenarios Aspin Lane and Dantzic Street are assumed to be a single road link, due to the similarity of the traffic flows, for the future with development scenario Dantzic Street and Angel Street are assumed to be a single link due to the similarity of the traffic flows;

For each road links, where two traffic counts are available at the end of each road link the worst case i.e. the highest traffic flows have been applied; and,

It is assumed that all vehicles associated with the Co-op development are LDVs.

Table 15 DMRB Assessment Inputs

7.53 The DMRB method assumes constant rates of traffic flow and speeds over a yearly period. AADT data are used to predict pollutant concentrations and the results of the assessment are compared with the AQOs.

Biomass Boiler Emissions Assessment

The Dispersion Model

7.54 The model used in the assessment of biomass boiler emissions is the ADMS 4.1 advanced atmospheric dispersion model that has been developed and validated by Cambridge Environmental Research Consultants (CERC). The model was used to predict the ground level concentrations of NO_x (and NO_2), PM_{10} and $PM_{2.5}$, being the emissions of primary concern from a biomass boiler, particularly in terms of NO_2, with the site being located within an AQMA for NO_2 and PM_{10}. The model has been used extensively throughout the UK for regulatory compliance purposes and is accepted as an appropriate air quality modelling tool by the Environment Agency and local authorities.

7.55 A range of input parameters is required, including, amongst others, plant emissions data and stack flow rate parameters, meteorological measurements and land surface characteristics. The data used in modelling the plant emissions are detailed in the following sections.

7.56 A representative model input file is provided in Technical Appendix 7.3.

Model Parameters

Plant Emissions

7.57 Emissions data for the proposed biomass boiler have been derived from a technical guidance document produced by AEA Energy and Environment [AEA]. The plant emissions have been derived assuming the maximum of the proposed boiler capacities of 2MW. No information is available regarding the proposed diameter of the stack, and therefore an emission velocity of approximately 15 ms-1 has been assumed and a corresponding stack diameter has been calculated. The stack termination height was determined to be 83 m, emitting 3m above the 80m building. Table 16 details the emission parameters used in the modelling.

Model Parameter	Biomass Boiler Stack Emission Details
Location (X)	384345
Location (Y)	399090
Stack Height (m)	83
Stack Diameter (m)	0.3
Efflux Velocity (ms^{-1})	15.7
Efflux Temperature (°C)	80
Emission Rates (gs^{-1})	
NO_2 (NO_x)	0.300
PM_{10}	0.134
$PM_{2.5}$	0.130

Table 16 Model Input Parameters

7.58 The proposals involve the potential installation of a stand-by boiler. The boiler has not been included in the modelling assessment however as the biomass boiler and the stand-by boiler will not be operational at the same time, and the capacity of the stand-by boiler will be less than the biomass boiler. Therefore the operation of the biomass boiler will be the worst-case emissions scenario.

Meteorology

7.59 The nearest and most suitable meteorological station to the site is located at Manchester International Airport, approximately 9 miles to the south of the site. Data from this station from 2003 to 2007 inclusive have been used in this assessment. The following figures illustrate the frequency of wind directions and wind speeds at sites for the years considered.

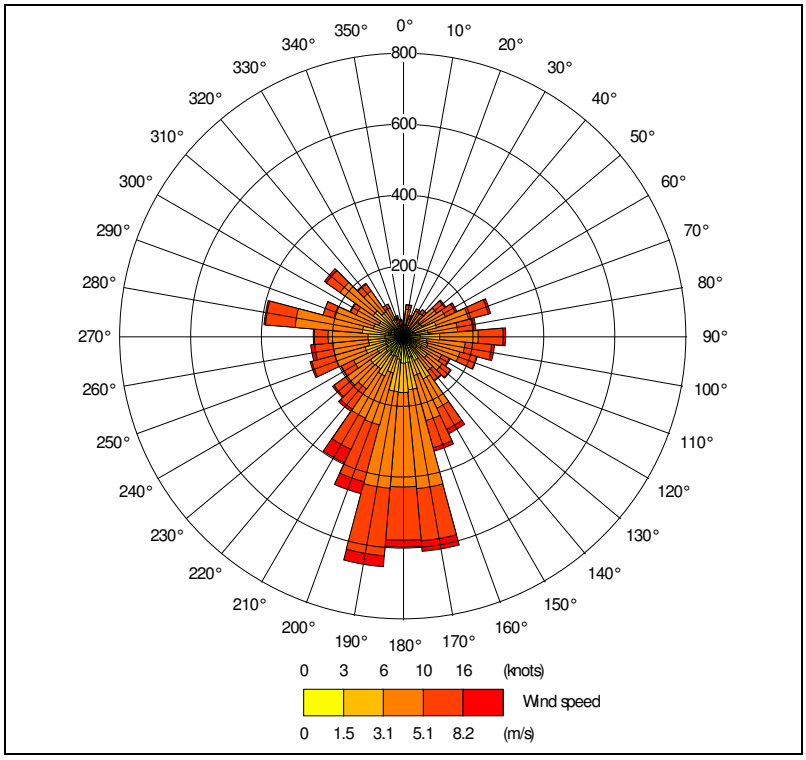


Fig 1 Manchester International Airport Meteorological Data 2003

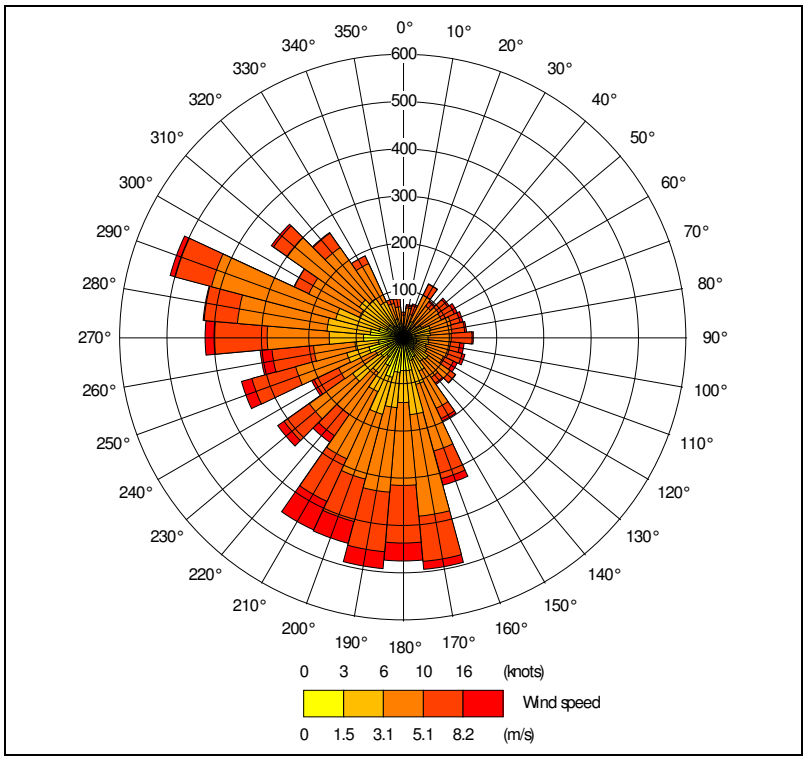


Fig 2 Manchester International Airport Meteorological Data 2004

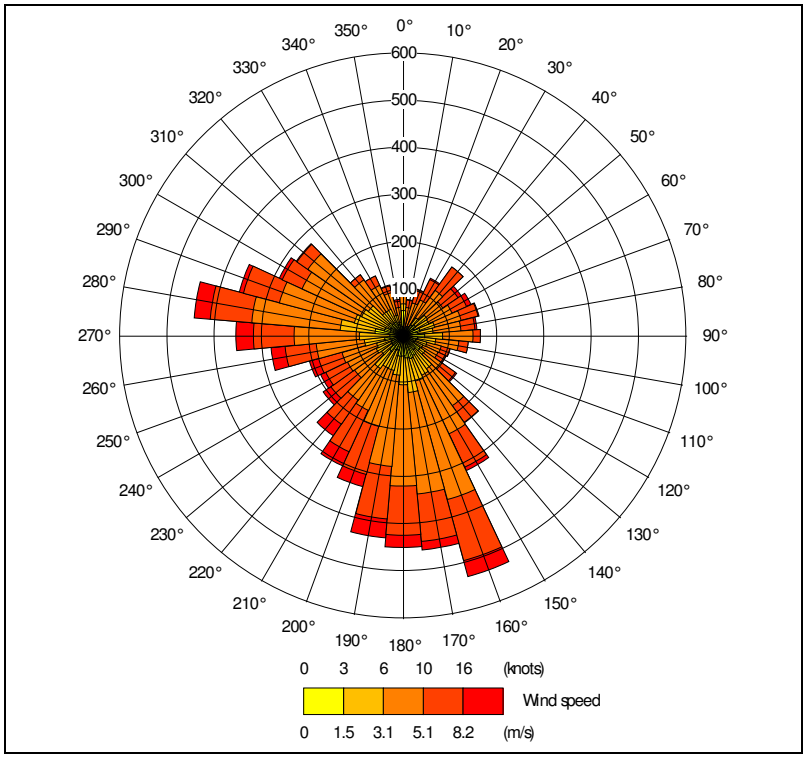


Fig 3 Manchester International Airport Meteorological Data 2005

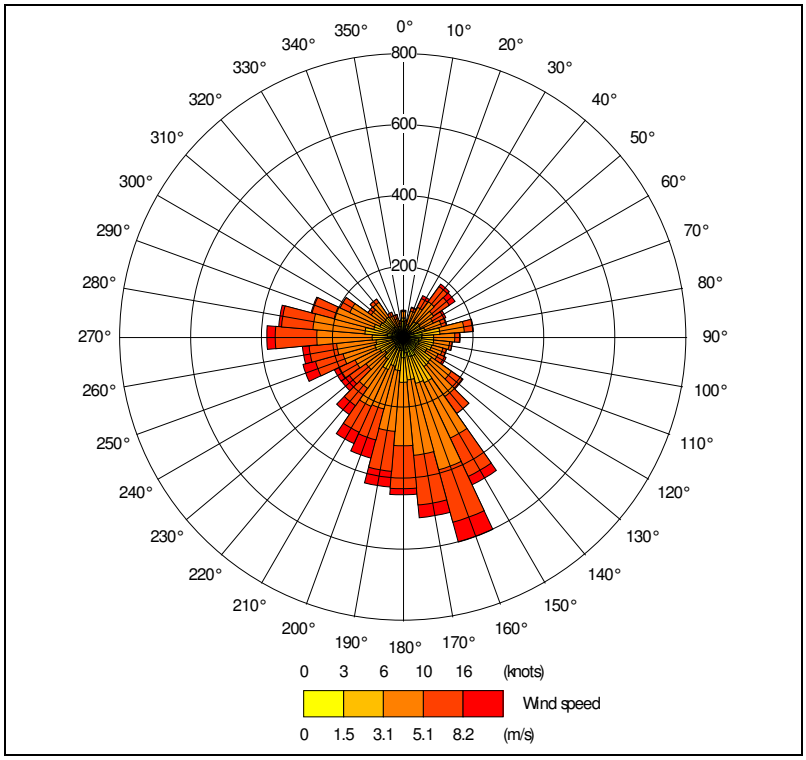


Fig 4 Manchester International Airport Meteorological Data 2006

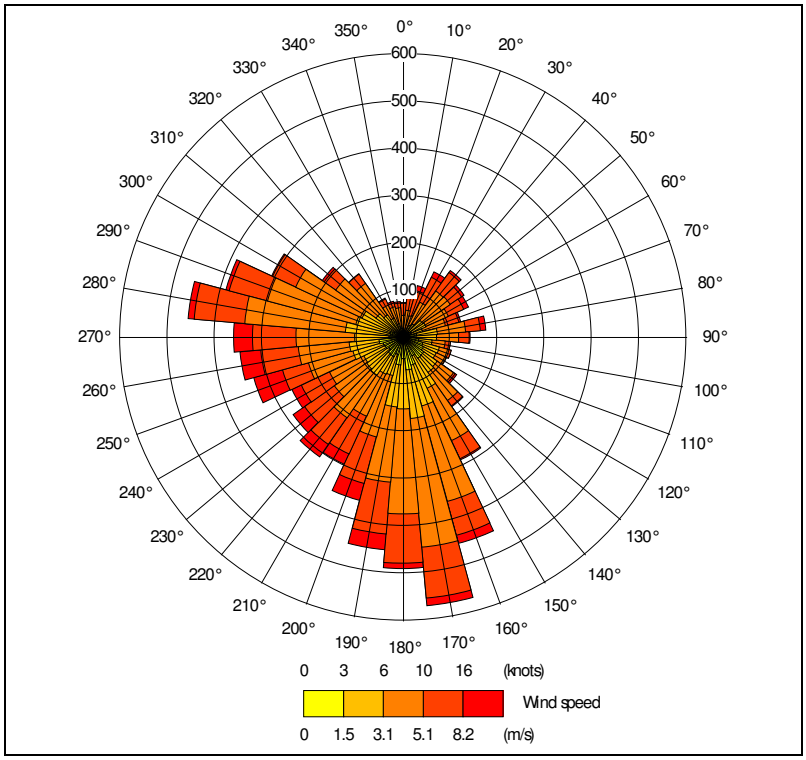


Fig 5 Manchester International Airport Meteorological Data 2007

7.60 The above meteorological data show that the predominant wind direction within the vicinity of the site is from the south, with a lesser westerly component.

Surface Characteristics

Land Characteristics

7.61 The predominant surface characteristics and land use in a model domain have an important influence in determining turbulent fluxes and, hence, the stability of the boundary layer and atmospheric dispersion. Factors pertinent to this determination are detailed below.

Surface Roughness

7.62 Roughness length, z0, represents the aerodynamic effects of surface friction and is physically defined as the height at which the extrapolated surface layer wind profile tends to zero. This value is an important parameter used by meteorological pre-processors to interpret the vertical profile of wind speed and estimate friction velocities which are, in turn, used to define heat and momentum fluxes and turbulence levels.

7.63 The surface roughness length is related to the height of surface elements; typically, the surface roughness length is approximately 10 % of the height of the main surface features. Thus, it follows that surface roughness is higher in urban and congested areas than in rural and open areas. Oke (1987) and CERC

(2003) suggest typical roughness lengths for various land use categories as set out in Table 17.

Type of Surface	z_0 / m
Ice	0.00001
Smooth snow	0.00005
Smooth sea	0.0002
Lawn grass	0.01
Pasture	0.2
Isolated settlement (farms, trees, hedges)	0.4
Parkland, woodlands, villages, open suburbia	0.5-1.0
Forests/cities	1.0-1.5
Heavily industrialised areas	1.5-2.0

Table 17 Typical Surface Roughness Lengths for Various Land Use Categories

7.64 From examination of Ordnance Survey maps it can be seen that within 2km of the proposed plant, land use is mainly city and densely residential, mainly comprising multi-storey properties. Therefore a surface roughness length of 1.3 m has been applied to take account of the predominantly urban land uses.

Surface Energy Budget

7.65 One of the key factors governing the generation of convective turbulence is the magnitude of the surface sensible heat flux. This in turn is a factor of the incoming solar radiation. However not all solar radiation arriving at the Earth's surface is available to be emitted back to atmosphere in the form of sensible heat. By adopting a surface energy budget approach, it can be identified that for fixed values of incoming short and long wave solar radiation, the surface sensible heat flux is inversely proportional to the surface albedo and latent heat flux.

7.66 The surface albedo is a measure of the fraction of incoming short-wave solar radiation reflected by the Earth's surface. This parameter is dependent upon surface characteristics and varies throughout the year. The latent heat flux is dependent upon the amount of moisture present at the surface. The modified Priestly-Taylor parameter can be used to represent the amount of moisture available for evaporation.

7.67 Oke (1987) recommends average surface albedo values of 0.6 for snow covered ground and 0.23 for non-snow covered ground whilst Holstag and van Ulden (1983) suggest Priestly-Taylor parameter values of 0.45 and 1.0 for dry grassland and moist grassland respectively. The Priestly-Taylor parameter is a parameter representing the surface moisture available for evaporation.

7.68 A detailed analysis of the effects of surface characteristics on ground level concentrations by Auld et al. (2002) led them to conclude that:–

> *"… the energy budget calculations had relatively little impact on the overall uncertainty in annual averaged model outputs, whilst the roughness length contributes a relatively large influence on the model uncertainty."*

7.69 Consequently, the model default values of 0.23 for surface albedo and 1.0 for the Priestly-Taylor parameter have been used in this assessment.

Terrain

7.70 The concentrations of an emitted pollutant found in elevated complex terrain differ from those found in simple level terrain. There have been numerous studies on the effects of topography on atmospheric flows which show how dispersion plumes interact with different terrain features. . A summary of the main effects of terrain on atmospheric flow and dispersion of pollutants are summarised below:-

7.71 These effects are most pronounced when terrain gradients vary by more than 1 in 10, i.e., 100 m change in elevation within 1 km distance in the horizontal direction. The gradients within the immediate vicinity of the site do not exceed this criterion and consequently terrain data have not been included in the model.

Treatment of Buildings

7.72 Any large, sharp-edged object has an impact on atmospheric flow and air turbulence within the locality of the object. This can result in maximum ground level concentrations that are significantly different (generally higher) from those encountered in the absence of buildings. The building 'zone of influence' is generally regarded as extending a distance of 5L (where L is the lesser of the building height or width) from the foot of the building in the horizontal plane and three times the height of the building in the vertical plane. Table 18 and Figure 6 detail the buildings that have been included in the model.

Building	X (m)	Y (m)	Height (m)	Length/Diameter (m)	Width (m)	Angle (°)
Co-op Building[1]	384339	399075	80	55	-	-
CIS Tower	384282	398909	100	24	20	24
CIS Front	384292	398926	88	52	15	115
Tower Block	384186	398961	60	15	39	115

Note:-

The Co-op building is represented as circular rather than rectangular as this most closely represents is plan shape.

Table 18 Buildings Modelled

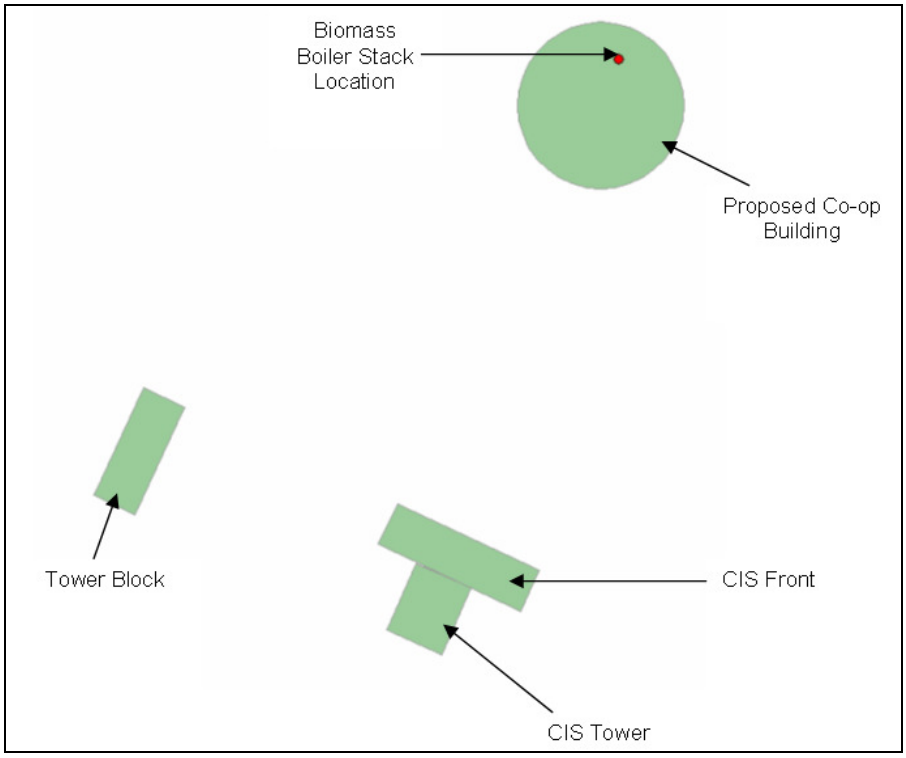


Fig 6 Building Layout as Included in the Model File

Modelled Domain and Receptors

Modelled Domain

7.73 A 5 km by 5 km square grid centred on the site was modelled, with an approximate receptor resolution of 50 m, to assess the impact of atmospheric emissions from the site on local air quality. Within the receptor grid the receptor points have been located at ground level to give the predicted ground level concentrations across the whole modelled domain and to allow a cumulative assessment with the predicted ground level concentrations from the DMRB road traffic emissions assessment.

Human Receptors

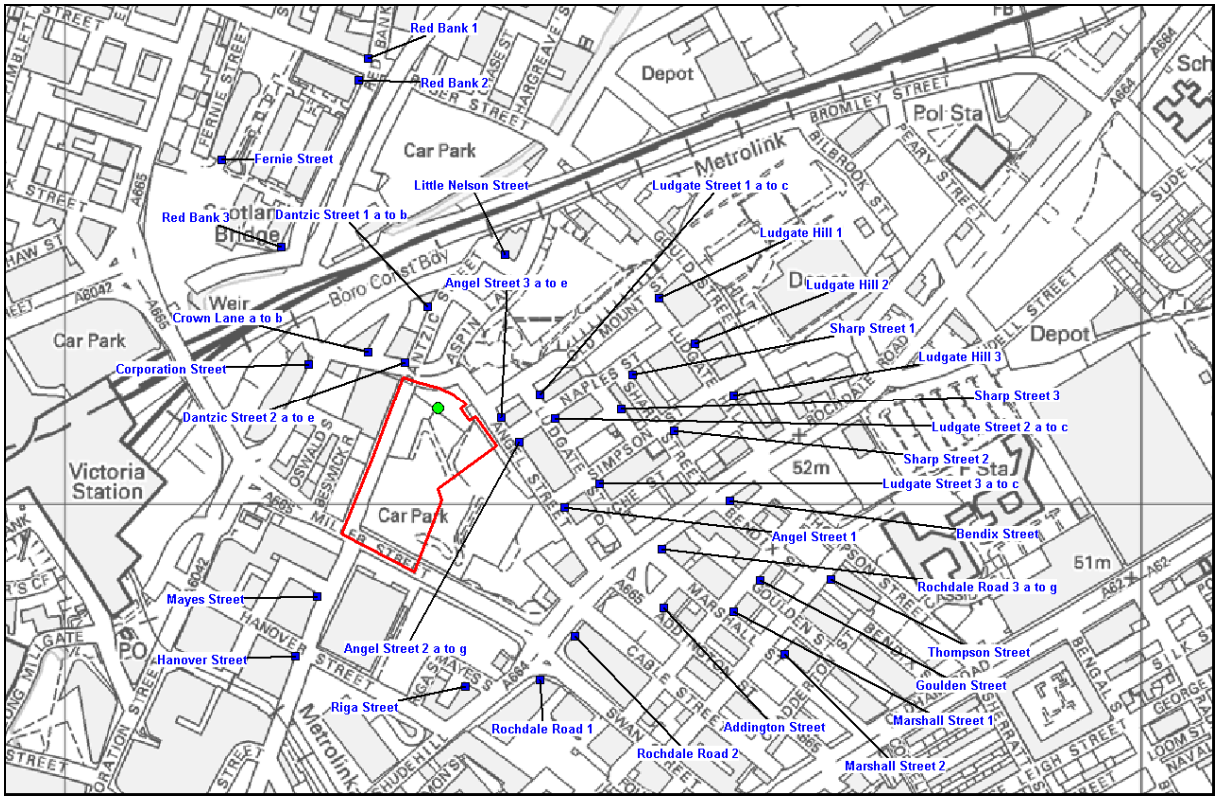
7.74 The receptors considered were chosen based on locations where people may be located and judged in terms of their sensitivity to pollution, the likely duration of their exposure to pollutants and proximity to the site. Receptors at different heights above ground level have been included for the receptors within the immediate vicinity of the biomass stack, with receptors every floor for the closest and receptors every few floors for those further from the stack. Receptors start at head-height (1.5m) and it is then assumed that there is a storey every 3m. For those receptors not in the immediate vicinity of the stack receptors have been located at head-height only. Details of the locations of sensitive receptors are given in Table 19 and Figure 7.

Receptor Name	Easting (m)	Northing (m)	Height (m)
Red Bank 1	384280	399415	1.5
Red Bank 2	384272	399395	1.5
Fernie Street	384144	399321	1.5
Red Bank 3	384200	399240	1.5
Corporation Street	384225	399131	1.5
Hanover Street	384213	398860	1.5
Mayes Street	384233	398915	1.5
Riga Street	384371	398832	1.5
Rochdale Road 1	384440	398838	1.5
Rochdale Road 2	384473	398878	1.5
Addington Street	384555	398905	1.5
Marshall Street 1	384620	398901	1.5
Marshall Street 2	384668	398862	1.5
Goulden Street	384645	398930	1.5
Thompson Street	384711	398931	1.5
Bendix Street	384617	399004	1.5
Ludgate Hill1	384551	399193	1.5
Ludgate Hill 2	384584	399151	1.5
Ludgate Hill 3	384620	399102	1.5
Sharp Street 1	384526	399122	1.5
Sharp Street 2	384565	399069	1.5
Sharp Street 3	384516	399089	1.5
Little Nelson Street	384408	399233	1.5
Angel Street 1	384463	398998	1.5
Rochdale Road 3 a	384554	398959	1.5
Rochdale Road 3 b	384554	398959	10.5
Rochdale Road 3 c	384554	398959	19.5
Rochdale Road 3 d	384554	398959	28.5
Rochdale Road 3 e	384554	398959	37.5
Rochdale Road 3 f	384554	398959	46.5
Rochdale Road 3 g	384554	398959	55.5
Dantzic Street 1 a	384336	399185	1.5
Dantzic Street 1 b	384336	399185	10.5
Dantzic Street 2 a	384315	399133	1.5
Dantzic Street 2 b	384315	399133	4.5

Receptor Name	Easting (m)	Northing (m)	Height (m)
Dantzic Street 2 c	384315	399133	7.5
Dantzic Street 2 d	384315	399133	10.5
Dantzic Street 2 e	384315	399133	13.5
Crown Lane a	384280	399143	1.5
Crown Lane b	384280	399143	10.5
Angel Street 2 a	384421	399058	1.5
Angel Street 2 b	384421	399058	4.5
Angel Street 2 c	384421	399058	7.5
Angel Street 2 d	384421	399058	10.5
Angel Street 2 e	384421	399058	13.5
Angel Street 2 f	384421	399058	16.5
Angel Street 2 g	384421	399058	19.5
Angel Street 3 a	384404	399081	1.5
Angel Street 3 b	384404	399081	4.5
Angel Street 3 c	384404	399081	7.5
Angel Street 3 d	384404	399081	10.5
Angel Street 3 e	384404	399081	13.5
Ludgate Street 1 a	384440	399103	1.5
Ludgate Street 1 b	384440	399103	10.5
Ludgate Street 1 c	384440	399103	13.5
Ludgate Street 2 a	384454	399080	1.5
Ludgate Street 2 b	384454	399080	10.5
Ludgate Street 2 c	384454	399080	13.5
Ludgate Street 3 a	384496	399020	1.5
Ludgate Street 3 b	384496	399020	10.5
Ludgate Street 3 c	384496	399020	16.5

Note:-
Rochdale Road 3 – 19 storeys with receptors every 3 floors;
Dantzic Street 1 – 4 storeys with receptors every 3 floors;
Dantzic Street 2 – 5 storeys with receptors every floor;
Crown Lane – 4 storeys with receptors every 3 floors;
Angel Street 2 – 7 storeys with receptors every floor;
Angel Street 3 – 5 storeys with receptors every floor;
Ludgate Street 1 – 5 storeys with receptors every 3 floors and on the top floor;
Ludgate Street 2 – 5 storeys with receptors every 3 floors and on the top floor; and
Ludgate Street 3 – 6 storeys with receptors every 3 floors and on the top floor.

Table 19 Details of Potential Human Receptors



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Notes:-

The green circle indicates location of the biomass boiler;

The red line indicated the boundary of the development site;

The blue dots indicate the receptor locations; and

Where a number of receptors are located at height only a single receptor point is shown in the figure.

Fig 7 Location of Potential Human Receptors

Sensitive Ecological Receptors

7.75 EPR guidance (Environment Agency, 2008) requires detailed dispersion modelling to be carried out based on local receptors. In ecological terms, European designated sites, including Ramsar sites, SPA, SAC and NNR must be considered if these are within 10km of an installation. This distance should be extended to 15km for large power stations and refineries.

7.76 In addition, the Countryside and Rights of Way (CROW) Act 2000, places obligations on installations to consider the impacts of emissions to air on SSSI within 2km.

7.77 A survey was carried out of the various sites of ecological designations within the specified distances; the following designations were considered:-

1 Sites of Special Scientific Interest (SSSI);

2 Ramsar sites;

3 Special Protection Areas (SPA);

4 National Nature Reserves (NNR); and,

5 Special Area of Conservation (SAC).

7.78 One such site within the relevant distances of the biomass boiler has been identified and has therefore been included within the assessment, with a receptor point located at the closest distance to the site. The site is detailed in Table 20.

Receptor Name	Designation	Easting (m)	Northing (m)	Distance from Site (km)	Direction from Site (°)
Rochdale Canal	SAC/SSSI	389054	400939	5	North East

Table 20 Location of Potential Ecological Receptors

Special Treatments

Deposition

7.79 The predominant route by which emissions will affect the land in the vicinity of the process is by deposition of atmospheric emissions. The model used to predict local air quality has the capability of incorporating both dry and wet deposition based on the gas type or particle size and density. Numerous modelling studies have indicated that deposition (principally dry deposition) is only a significant factor within the immediate vicinity of the site, generally within the first 2 km. Rochdale Canal is at a distance of greater than 2km from the site; therefore the assessment of deposition has not been included.

Other Treatments

7.80 Specialised model treatments, for short-term (puff) releases, coastal models, fluctuations or photochemistry were not used in this assessment. Flagpole receptors are however used in the assessment, to represent receptor locations at different heights on multi-story buildings.

Conversion of NO_x to NO_2

7.81 Emissions of NO_X from combustion processes are predominantly in the form of nitric oxide (NO). Excess oxygen in the combustion gases and further atmospheric reactions cause the oxidation of NO to NO_2. Given the short travel time to the areas of maximum concentration and the rate of reaction to convert NO to NO_2, it is unlikely that more than 30 % of the NO_X is present at ground level as NO_2. This conversion factor is based on comparison of ambient NO and NO_2 continuous measurements evaluated over recent years.

7.82 Ground level NO_X concentrations have been predicted by the atmospheric dispersion modelling. NO_2 concentrations reported in the results section assume 100 % conversion from NO_X to NO_2 for the long-term (annual) averages and a 50 % conversion for short-term (hourly) averages. When assessing the predicted concentrations, it should be noted that these predictions are, therefore, pessimistic and the concentrations are likely to be an overestimation of the actual plant contributions.

Sensitivity Analysis and Uncertainty

Sensitivity Analysis

7.83 Wherever possible, this assessment has used worst-case scenarios, which will exaggerate the impact of the emissions on the surrounding area, including ambient concentrations, meteorology and surface roughness. This assessment has considered the years predicting the highest ground-level concentrations at the nearest sensitive receptor for comparison with the AQOs.

Model Uncertainty

7.84 Dispersion modelling is inherently uncertain, but is nonetheless a useful tool in plume footprint visualisation and prediction of ground level concentrations. The use of dispersion models has been widely used in the UK for both regulatory and compliance purposes for a number of years and is an accepted approach for this type of assessment.

7.85 This assessment has incorporated a number of worst-case assumptions, as described above, which will result in an overestimation of the predicted ground level concentrations from the process. Therefore, the actual predicted ground level concentrations would be expected to be lower than this and, in some cases, significantly lower.

7.86 The model is well validated with observed concentrations for a number of scenarios; however, as the complexity of the modelled domain increases, modelled concentrations deviate from observed concentrations. For this modelling assessment, it was not considered suitable to scope out the inclusion of buildings in the model due to the nature of the possible site. However, the inclusion of buildings in the model introduces a further element of uncertainty but provides a better representation of plume dispersion and downwash.

Significance Evaluation Methodology

7.87 A publication from EPUK (2006) provides an updated practitioners' framework for air quality to be addressed in the local development control process. The guidance aims to provide a methodology for the consideration of air quality in planning decisions.

7.88 The guidance considers that the weight given to air quality in determining an

application should depend on such factors as:–

1 The severity of the impacts on air quality;

2 The existing air quality in the area of the development;

3 The likely use of the development; and,

4 Whether the benefits provided through other considerations, such as social and/or economic advantages, outweigh the air quality effects.

7.89 EPUK has developed a flow chart method for assessing the weight that should be given to the effects on air quality in the determination of planning applications. Following the EPUK flow chart method the importance of quantified air quality impacts are assessed through a series of close-ended questions with 'yes' or 'no' answers. These questions are as follows:–

1 Do the air quality impacts lead to a breach or worsening of a breach of a European Union (EU) Limit Value?

2 Do the air quality impacts lead to a breach of an AQO or cause a new AQMA to be declared?

3 Do the air quality impacts interfere significantly with or prevent the implementation of actions within an AQAP?

4 Do the air quality impacts interfere significantly with the implementation of a local air quality strategy?

5 Do the air quality impacts lead to an increase in emissions, degradation in air quality or increase in exposure, below the level of a breach of an AQO?

7.90 Each question is addressed in descending order through the flow chart, until the answer yes is obtained. This gives the relative priority with which air quality considerations should be dealt with in relation to the development proposal, and the level of re-design or mitigation which may be needed.

7.91 The effects are classified according to their priority under the following classes:-

1 Overriding consideration;

2 High priority consideration;

3 Medium priority consideration; and,

4 Low priority consideration.

7.92 The EPUK methodology is linked to a process to recommend actions which should be undertaken, or measures put in place, in order to reduce or remove the effects as far as is reasonably practicable. It also provides guidance on

describing the significance of the likely effects of a proposed development on air quality taking into account the magnitude of the change, the effects on the achievement of the AQO and the number of people exposed to the changes. These descriptors for the magnitude and significance of the effect on air quality are presented below.

Significance of Impacts

7.93 Although no formal guidance exists for classifying the magnitude and significance of air quality effects, several documents, including technical guidance issued by EPUK (2006), suggest ways to address this issue.

7.94 The magnitude of change is a term used to describe the change in pollutant concentration which is likely to arise with the proposed development, i.e. it is the difference between pollutant concentrations predicted with and without the proposed development. The magnitude of change is often expressed as a percentage and does not take into account any change in the numbers of people exposed or any change in the achievement of the AQO. The EPUK guidance provides examples of terms that can be used to describe the magnitude of change based on the percentage change; these descriptors, presented in Table 21, have been applied.

Magnitude of Change	Annual Mean NO_2 / PM_{10}	Days PM_{10} > 50 µg m^{-3}
Very Large	Increase / Decrease > 25%	Increase / Decrease > 25 days
Large	Increase / Decrease15-25%	Increase / Decrease 15-25 days
Medium	Increase / Decrease 10-15%	Increase / Decrease 10-15 days
Small	Increase / Decrease 5-10%	Increase / Decrease 5-10 days
Very Small	Increase / Decrease 1-5%	Increase / Decrease 1-5 days
Extremely Small	Increase / Decrease < 1%	Increase / Decrease < 1 day

Table 21 Magnitude of Change

7.95 The significance of a change in pollutant concentration is based, not only on the magnitude of the change, but also on the attributed sensitivity, and the number, of people exposed to the changes.

7.96 The sensitivity of a receptor is dependent on how close pollutant concentrations are to the relevant AQO, with the highest sensitivity being attributed to those receptors exposed to existing air quality problems, i.e. where baseline concentrations are above the target levels. A small magnitude of change could, therefore, potentially cause significant effects, either beneficial or adverse, where the sensitivity is deemed to be high. The AQO concentrations have been determined in the context of the exposure of sensitive individuals, e.g. in hospitals and/or schools, to pollutant concentrations. As these AQOs would, in general, protect the most vulnerable members of society, there is no added value in determining significance based

on the type of receptor considered.

7.97 The EPUK significance descriptors take account of the magnitude of the change and the achievement (or otherwise) of the AQOs. This assessment has determined the assessment descriptor of any predicted change in concentrations of NO_2 and PM_{10} based on Table 22. This assessment requires the evaluation of whether a proposed development is likely to have significant effects. In terms of determining whether significant effects are likely, Entec has used professional judgement built over a number of such assessments and considers that effects which are 'substantial' or 'very substantial' are likely to be significant, whereas effects that are 'slight' or 'moderate' are considered not to be significant.

Absolute Concentration in Relation to the AQO	**Extremely Small**	**Very Small**	**Small**	**Medium**	**Large**	**Very Large**
Decrease with scheme						
Above Standard with scheme	Minor Beneficial	Minor Beneficial	Major Beneficial	Major Beneficial	Very Major Beneficial	Very Major Beneficial
Above Standard without scheme, below with scheme	Minor Beneficial	Moderate Beneficial	Major Beneficial	Major Beneficial	Very Major Beneficial	Very Major Beneficial
Below Standard without scheme but not well below	Negligible	Minor Beneficial	Minor Beneficial	Moderate Beneficial	Moderate Beneficial	Major Beneficial
Well below Standard without scheme	Negligible	Negligible	Minor Beneficial	Minor Beneficial	Minor Beneficial	Moderate Beneficial
Increase with scheme						
Above Standard without scheme	Minor Adverse	Minor Adverse	Major Adverse	Major Adverse	Very Major Adverse	Very Major Adverse
Below Standard without scheme, above with scheme	Minor Adverse	Moderate Adverse	Major Adverse	Major Adverse	Very Major Adverse	Very Major Adverse
Below Standard with scheme but not well below	Negligible	Minor Adverse	Minor Adverse	Moderate Adverse	Moderate Adverse	Major Adverse
Well below Standard with scheme	Negligible	Negligible	Minor Adverse	Minor Adverse	Minor Adverse	Moderate Adverse
Notes:- Well below the standard ≤ 75% of the standard level. Standard in the context of this table relates to the specific AQO in question. Shaded cells represent likely Significant Effects						

Table 22 Significance of Impact – Air Quality

Baseline Conditions

Overall Air Quality Baseline

7.98 Information on air quality in the UK is available from a variety of sources, including local authorities and national network monitoring sites. The site is located in the Manchester City Council area.

Local Authority Data

7.99 A review of Manchester City Council's Local Air Quality Management reports, illustrates that Manchester City Council is currently meeting 6 of the 7 health based objectives, however there are areas of the City reporting exceedences for the annual average of nitrogen dioxide levels.

7.100 Subsequent to Manchester City Councils review of air quality an AQMA has been declared, covering the majority of the City area. The AQMA is declared for both NO_2 and PM_{10}. The proposed Co-op development site lies within the AQMA.

Continuous Monitoring

7.101 DEFRA operates a network of nationwide air pollution monitoring sites. Monitoring of NO_2, NO_x, SO2, CO, PM_{10} and $PM_{2.5}$ concentrations takes place at two Automatic Urban and Rural Network (AURN) site in the Manchester City Council area (a third monitoring station closed in 2007). The locations of the sites are described in Table 23.

Monitoring Station	Designation	Approximate Distance from Site (km)	Direction
Manchester Piccadilly	Urban Background	0.7	South East
Manchester Town Hall (closed in 2007)	Urban Background	1	South
Manchester South	Suburban	11.1	South
Note:- Urban Background - Urban locations distanced from sources and broadly representative of city-wide background concentrations e.g. elevated locations, parks and urban residential areas; and Suburban - Sites typical of residential areas on the outskirts of a town or city.			

Table 23 Location Details of Continuous Monitoring Sites

7.102 The Manchester South monitoring station is located at such a distance that the monitoring data are unlikely to be representative of baseline conditions at the site; monitoring data from this station are therefore not considered. The latest monitoring data from Manchester Piccadilly and Manchester Town Hall are shown in Table 24.

Monitoring Location	Designation	Substance	Assessment Period	Assessment Criteria (µg m^{-3})	Year							
					2005		2006		2007		2008	
					(µg m-3)	Data Capture (%)	(µg m-3)	Data Capture (%)	(µg m-3)	Data Capture (%)	(µg m-3)	Data Capture (%)
Manchester Piccadilly	Urban Background	PM_{10} [1]	Annual (µg m^{-3})	40	30.1	79.2	32.0	96.4	31.5	74.8	19.9	99.1
			24-Hourly (µg m^{-3})	50 (no more than 35 exceedences)	46.4		52.0		45.9		34.3	
			Number of Exceedences of 50 (µg m^{-3})	-	21		38		21		10	
		$PM_{2.5}$	Annual (µg m^{-3})	25	18.3	84.7	21.4	93.7	20.8	72.1	-	-
		NO_2	Annual (µg m^{-3})	40	45.1	48.6	43.8	97.4	44.4	96.2	42.5	78.1
			Hourly (µg m^{-3})	200 (no more than 18 exceedences)	191.0		132.2		144.2		188.2	
			Number of Exceedences of 200 (µg m^{-3})	-	6		2		0		12	
		NO_x (Ecological)	Annual (µg m^{-3})	30	102.9	48.6	80.5	97.4	82.6	96.2	86.2	78.1
Manchester Town Hall	Urban Background	NO_2	Annual (µg m^{-3})	40	43.4	94.9	42.4	86.9	36.7	71.6	-	-
			Hourly (µg m^{-3})	200 (no more than 18 exceedences)	141.0		130.0		120.0		-	
			Number of Exceedences of 200 (µg m^{-3})	-	0		3		3		-	
		NO_x (Ecological)	Annual (µg m^{-3})	30	71.2	94.9	66.2	86.9	53.5	71.6	-	-

Note:-

The 2005 to 2007 PM10 data are from 24-hour averages, the 2008 PM10 data are from hourly averages extrapolated to 24-hour averages, therefore the apparent drop of concentrations in 2008 is a false data trend;

Figures in bold show an exceedence of the relevant assessment level.

Data obtained from NETCEN UK Air Quality Archive: http://www.airquality.co.uk; and

All data are ratified.

Table 24 AURN Continuous Monitoring Data (µg m-3)

7.103 The monitoring data show that there are some exceedences of the relevant assessment levels, specifically long-term NO_2 and NO_x and one exceedences of the short-term PM_{10} assessment level at Manchester Piccadilly in 2006.

Passive Monitoring Data

7.104 There are a number of passive monitoring locations within the Manchester City Council area, operated as part of the National Diffusion Tube Network. Recent monitoring data for all monitoring locations are included in Table 25, along with the designation of the monitoring site.

Monitoring Site	Designation	Approximate Distance from Site (km)	Direction	Monitored Concentration (µg m^{-3})							
				2005		2006		2007		2008	
				(µg m^{-3})	Data Capture	(µg m^{-3})	Data Capture	(µg m^{-3})	Data Capture	(µg m^{-3})	Data Capture[6]
Manchester 1N	Roadside	3.2	East	76.0	100 %	91.3	100 %	69.0	8 %	-	-
Manchester 2N	Intermediate	0.7	South	-	-	-	-	-	-	-	-
Manchester 3N	Urban Background	6.8	South East	37.2	100 %	37.2	100 %	45.0	8 %	-	-
Manchester 4N	Urban Background	3.1	East	-	-	-	-	-	-	-	-
Manchester 5N	Urban Background	3.3	East	31.9	100 %	35.7	100 %	42.0	8 %	-	-
Manchester 6N	Roadside	1.0	South	50.0	100 %	52.2	100 %	55.0	8 %	-	-

Note:-
Roadside - 1-5m from a busy road. Formerly named 'Kerbside' (K);
Intermediate - 20-30m from the same or an equivalent road;
Urban Background - >50m from any busy road;
All data are ratified;
No data beyond 2007 available; and
Only 1 monitoring result is available for each monitoring site in 2007 (03/01/2007), therefore 2007 data are not statistically representative

Table 25 National NO_2 Diffusion Tube Monitoring Results - Annual Means (µg m-3)

7.105 Manchester City Council operates a network of monitoring sites at 25 different locations across Manchester, including roadside, city centre, urban and rural sites. Samples are collected both weekly and monthly to determine the pollutant levels throughout the year. The three monitoring points located nearest to the proposed development site are located at Cheethams School of Music, Newton Street and Rochdale Road. At these three locations monitoring of NO_2 is carried out by monthly diffusion tubes. Historic monitoring data from these three locations however are not currently available from the UK Air Quality Archive (NETCEN).

Estimated Ambient Concentrations

7.106 NETCEN has made estimates of background pollutant concentrations on a $1km^2$ grid for the UK for eight of the main pollutants. For NO_2, NO_x, PM_{10} and PM2.5 the data are available with a 2006 base year.

7.107 The background mapped concentrations for the $1km^2$ covering the site are given in Table 26.

	NO_2 Annual Mean $\mu g\ m^{-3}$	NO_x Annual Mean $\mu g\ m^{-3}$	PM_{10} Annual Mean $\mu g\ m^{-3}$	$PM_{2.5}$ Annual Mean $\mu g\ m^{-3}$
2006	32.4	51.0	19.8	12.5
2007	31.3	48.6	19.5	12.2
2008	30.2	46.2	19.2	12.0
2009	29.0	43.8	18.9	11.7
2010	27.9	41.4	18.6	11.5
2012	26.5	38.8	18.2	11.1
Note:- Predicted using guidance in LAQM.TG(03) and updated LAQM.TG(09); and Values for Manchester City Council 384500, 399500.				

Table 26 Estimated Mapped Background Concentrations

Background Concentrations

7.108 For all receptors NETCEN mapped background data forecast for the appropriate year (2009 and 2012), as detailed in Table 26 have been applied within the assessment, as these data are believed to be more representative than the baseline monitoring data, due to the lack of monitoring data within the immediate vicinity of the proposed development site. For the road-traffic emissions assessment long-term emissions only are assessed, for the biomass boiler emissions assessment both long-term and short-term emissions are assessed.

7.109 The annual average process contribution is added to the annual average ambient background concentration, to give a total concentration at each receptor location. This total concentration can then be compared against the relevant AQO/AQS/EAL and the likelihood of exceedences determined. It is not technically rigorous to add predicted short-term or percentile concentrations to ambient background concentrations not measured over the same averaging period, since peak contributions from different sources would not necessarily coincide in time or location. Without representative hourly ambient background monitoring data available it is difficult to make an assessment against the achievement or otherwise of the short-term AQOs.

7.110 For the current assessment, conservative short-term ambient levels have been derived from the annual mean data. The background concentrations included within the modelling assessment are detailed in Table 27. The NO_x background data for the site are also applied at the single ecological receptor.

Pollutant	2009		2012	
	Short-Term Mean[2]	Long-Term (Annual) Mean	Short-Term Mean[2]	Long-Term (Annual) Mean
Road Traffic Emissions Assessment				
NO_2 (µg m^{-3})	-	29.0	-	26.5
PM_{10} (µg m^{-3})	-	18.9	-	18.2
Biomass Boiler Emissions Assessment				
NO_2 (µg m^{-3})	58.0	29.0	53.0	26.5
NO_x (µg m^{-3})[1]	56.6	28.3	50.0	25.0
PM_{10} (µg m^{-3})	37.8	18.9	36.4	18.2
$PM_{2.5}$ (µg m^{-3})	23.4	11.7	22.2	11.1

Note:-

Background NOx concentrations have been derived from Oldham Metropolitan Borough Council for 389500, 400500, being the 1 km grid square representing the Rochdale Canal ecological receptor;

Short-term mean derived from long-term mean by applying a factor of 2; and

For the assessment of the boiler emissions the 2012 background data have been applied, for the year of scheme opening.

Table 27 Short-Term and Long-Term Ambient Background Concentrations

Impact Assessment

Construction Impacts

7.111 A dust assessment has not been carried out as any dust generation during the construction phase of the proposed development will be short-lived. However dust mitigation measures will be incorporated into the scheme during the construction phase of the proposed development, these are detailed in the mitigation measures section of this Chapter.

Operational Impacts

Road Traffic Emissions Assessment

7.112 This section sets out the results of the DMRB modelling assessment, compares the results to ambient air quality standards for the site, and assesses the significance of the increase in road traffic emissions due to the development.

7.113 The locations of the receptor points assessed, between multi-storey buildings means that the receptor points are effectively located within a canyon. Current guidance LAQM TG(09) recommends using local monitoring data against which to verify the model. This would therefore allow the adjustment of the model results to account for the canyon effects on the results. However monitoring data are not available within the study area and therefore the methodology within LAQM TG(03) is adopted whereby to account for canyon effects the road contribution of NO_2 is doubled.

7.114 The results of the DMRB model assessment for the 2009 baseline, the 2012 baseline, and the 2012 baseline plus the effects from the traffic associated with the proposed development are shown in the tables below, along with an assessment of the significance of exposure at each receptor, for NO_2 and PM_{10}.

2009 Baseline

7.115 The assessment of the 2009 baseline concentrations includes the road traffic flows for 2009, plus the 2009 background concentrations, as detailed in Table 28 gives the 2009 baseline concentrations for both NO_2 and PM_{10} at the relevant worst case receptor points. The results show that for NO_2 the baseline concentrations are well below the relevant AQO (i.e. less than 75% of the AQO) at the three receptors on Angel Street and are below the relevant AQO at the two Dantzic Street Receptors and at the Crown Lane receptor. The results show that for PM_{10} the baseline concentrations are well below the relevant AQO (i.e. less than 75 % of the AQO) at all receptors.

Receptor	Annual Mean NO_2 Ground Level Concentration µg m^{-3}	NO_2 Breach of AQO (x/✓)	Annual Mean PM_{10} Ground Level Concentration µg m^{-3}	PM_{10} No. of Days > 50 µg m^{-3}	PM_{10} Breach of AQO (x/✓)
Angel Street 1	29.6	XX	19.0	2.3	XX
Angel Street 2	29.7	XX	19.0	2.3	XX
Angel Street 3	29.8	XX	19.0	2.3	XX
Dantzic Street 1	30.3	X	19.1	2.4	XX
Dantzic Street 2	30.7	X	19.2	2.5	XX

Receptor	Annual Mean NO_2 Ground Level Concentration µg m^{-3}	NO_2 Breach of AQO (x/✓)	Annual Mean PM_{10} Ground Level Concentration µg m^{-3}	PM_{10} No. of Days > 50 µg m^{-3}	PM_{10} Breach of AQO (x/✓)
Dantzic Street 3	30.1	X	19.2	2.5	XX
Crown Lane	30.5	X	19.2	2.5	XX
Corporation Street	32.2	X	19.9	3.3	XX

Note:-

✓ denotes a concentration in excess of the AQO concentration,

X a concentration below the AQO

XX a concentration well below the AQO

All values are rounded to the nearest one decimal place.

Table 28 NO_2 and PM_{10} 2009 Baseline Ground Level Concentrations

Predicted Future Baseline (2012), Without Development

7.116 The assessment of the 2012 baseline concentrations includes the road traffic flows for 2012 without the development, plus the 2012 background concentrations as detailed in Table 29.

7.117 Table 29 gives the 2012 baseline concentrations for NO_2 at the relevant worst case receptor points. The results are assessed relative to the 2009 baseline concentrations. The results show that without the development the ground level NO_2 concentrations can be expected to reduce by 2012 by a maximum of 9.3%, principally due to a reduction in background concentrations, as seen in Table 29, such that the concentrations at all receptors are well below the relevant AQO (i.e. less than 75 % of the AQO).

Receptor	Annual Mean NO_2 Ground Level Concentration µg m^{-3}	Change from 2009 Baseline µg m^{-3}	Change from 2009 Baseline %	Breach of AQO (x/✓)
Angel Street 1	27.1	-2.6	-8.4	XX
Angel Street 2	27.1	-2.6	-8.8	XX
Angel Street 3	27.2	-2.6	-8.7	XX
Dantzic Street 1	27.6	-2.6	-8.9	XX
Dantzic Street 2	28.1	-2.7	-8.5	XX
Dantzic Street 3	27.5	-2.6	-8.6	XX
Crown Lane	27.8	-2.7	-8.9	XX

Receptor	Annual Mean NO_2 Ground Level Concentration µg m^{-3}	Change from 2009 Baseline µg m^{-3}	Change from 2009 Baseline %	Breach of AQO (x/✓)
Corporation Street	29.2	-3.0	-9.3	XX

Note:-
✓ denotes a concentration in excess of the AQO concentration,
X a concentration below the AQO
XX a concentration well below the AQO
All values are rounded to the nearest one decimal place.

Table 29 NO_2 2012 Baseline Ground Level Concentrations

7.118 Table 30 gives the 2012 baseline concentrations for PM_{10} at the relevant worst case receptor points. The results are assessed relative to the 2009 baseline concentrations. The results show that without the development the ground level PM_{10} concentrations can be expected to reduce by 2012 by a maximum of 2.3%, principally due to a reduction in background concentrations, as seen in Table 30, such that the concentrations at all receptors remain well below the relevant AQO (i.e. less than 75 % of the AQO).

Receptor	Annual Mean PM_{10} Ground Level Concentration µg m^{-3}	Change from 2009 Baseline µg m^{-3}	Change from 2009 Baseline %	No. of Days > 50 µg m^{-3}	Change in No. of Days > 50 µg m^{-3} from 2009 Baseline	Breach of AQO (x/✓)
Angel Street 1	18.3	-0.7	-3.7	1.6	-0.7	XX
Angel Street 2	18.3	-0.7	-3.7	1.6	-0.7	XX
Angel Street 3	18.3	-0.7	-3.7	1.7	-0.7	XX
Dantzic Street 1	18.4	-0.7	-3.7	1.7	-0.7	XX
Dantzic Street 2	18.4	-0.7	-4.2	1.8	-0.7	XX
Dantzic Street 3	18.5	-0.7	-3.6	1.8	-0.7	XX
Crown Lane	18.4	-0.8	-4.2	1.8	-0.7	XX
Corporation Street	19.0	-0.9	-4.5	2.3	-1.0	XX

Note:-
✓ denotes a concentration in excess of the AQO concentration,
X a concentration below the AQO
XX a concentration well below the AQO
All values are rounded to the nearest one decimal place.

Table 30 PM_{10} 2012 Baseline Ground Level Concentrations

Predicted Effects and Their Significance, 2012 with Development

7.119 The assessment of the 2012 concentrations includes the road traffic flows for 2012 with the development, plus the 2012 background concentrations as detailed in Table 31.

7.120 The results for the NO_2 assessment are presented in Table 31. The ground level concentrations at the relevant worst case receptors are shown, along with the absolute change, and the percentage change, from the 2012 baseline concentrations. The ground level concentrations are well below the AQO at all receptors. In terms of change from the 2012 baseline assessment the ground level concentrations can be seen to increase due to increased traffic associated with the development. However the percentage increase is less than 3.2%, indicating that the contribution from traffic associated with the proposed development is minimal, when compared to the contribution from the existing background concentrations. Consequently the magnitude of change is 'very small', the assessment descriptor is '**negligible**' and the significance level is 'not significant'.

Receptor	Annual Mean NO_2 Ground Level Concentration µg m^{-3}	Change from 2012 Baseline µg m^{-3}	Change from 2012 Baseline %	Breach of AQO (x/✓)	Magnitude of Change	Assessment Descriptor	Significance
Angel Street 1	27.5	+0.4	1.5	XX	Very Small	Negligible	Not Significant
Angel Street 2	27.6	+0.5	1.8	XX	Very Small	Negligible	Not Significant
Angel Street 3	27.7	+0.5	1.8	XX	Very Small	Negligible	Not Significant
Dantzic Street 1	28.1	+0.5	1.8	XX	Very Small	Negligible	Not Significant
Dantzic Street 2	29.0	+0.9	3.2	XX	Very Small	Negligible	Not Significant
Dantzic Street 3	27.0	-0.5	-1.8	XX	Very Small	Negligible	Not Significant
Crown Lane	28.2	+0.4	1.4	XX	Very Small	Negligible	Not Significant
Corporation Street	29.6	+0.4	1.4	XX	Very Small	Negligible	Not Significant

Note:-

✓ denotes a concentration in excess of the AQO concentration,

X a concentration below the AQO

XX a concentration well below the AQO

All values are rounded to the nearest one decimal place.

Table 31 NO_2 2012 Ground Level Concentrations and the Significance of Effects from the Development

7.121 The results for the PM_{10} assessment are presented in Table 32. The ground level concentrations at the relevant worst case receptors are shown, along with the absolute change in concentrations and the number of days exceeding 50 µg m-3 from the 2012 baseline concentrations. The ground level concentrations are well below the AQO.

7.122 In terms of change from the 2012 baseline assessment the ground level concentrations can be seen to increase due to increased traffic associated with the development. However the percentage increase is less than 0.1% and the number of days exceeding 50 µg m-3 is less than 1 day, indicating that the contribution from traffic associated with the proposed development is minimal, when compared to the contribution from the existing background concentrations. Consequently the magnitude of change is 'extremely small', the assessment descriptor is '**negligible**' and the significance level is 'not significant'.

7.123 As a conservative assumption, for the assessment of $PM_{2.5}$ emissions, if it were assumed that all emissions of PM_{10} are in the $PM_{2.5}$ size range the modelled concentrations in Table 32 would be well below the relevant AQO (i.e. less than 75% of the AQO of 25 µg m-3) and consequently the magnitude of change would be 'extremely small', the assessment descriptor '**negligible**' and the significance level 'not significant'.

Receptor	Annual Mean PM_{10} Ground Level Concentration µg m^{-3}	Change from 2012 Baseline µg m^{-3}	Change from 2012 Baseline %	Breach of AQO (x/✓)	Magnitude of Change	Assessment Descriptor	Significance
Angel Street 1	18.4	+0.1	0.5	XX	Extremely Small	Negligible	Not Significant
Angel Street 2	18.4	+0.1	0.5	XX	Extremely Small	Negligible	Not Significant
Angel Street 3	18.4	+0.1	0.5	XX	Extremely Small	Negligible	Not Significant
Dantzic Street 1	18.5	+0.1	0.5	XX	Extremely Small	Negligible	Not Significant
Dantzic Street 2	18.6	+0.2	1.1	XX	Very Small	Negligible	Not Significant
Dantzic Street 3	18.3	-0.2	-1.1	XX	Very Small	Negligible	Not Significant
Crown Lane	18.5	+0.1	0.5	XX	Extremely Small	Negligible	Not Significant
Corporation Street	19.2	+0.2	1.1	XX	Very Small	Negligible	Not Significant
Note:- ✓ denotes a concentration in excess of the AQO concentration,							

Receptor	Annual Mean PM_{10} Ground Level Concentration µg m^{-3}	Change from 2012 Baseline µg m^{-3}	Change from 2012 Baseline %	Breach of AQO (x/✓)	Magnitude of Change	Assessment Descriptor	Significance
X a concentration below the AQO XX a concentration well below the AQO All values are rounded to the nearest one decimal place.							

Table 32 PM_{10} 2012 Annual Ground Level Concentrations at the Nearest Residential Receptor and the Significance of Effects from the Development

Receptor	No. of Days > 50 µg m^{-3}	Change in No. of Days > 50 µg m^{-3} from 2012 Baseline	Magnitude of Change	Assessment Descriptor	Significance
Angel Street 1	1.7	+0.1	Extremely Small	Negligible	Not Significant
Angel Street 2	1.7	+0.1	Extremely Small	Negligible	Not Significant
Angel Street 3	1.7	+0.1	Extremely Small	Negligible	Not Significant
Dantzic Street 1	1.8	+0.1	Extremely Small	Negligible	Not Significant
Dantzic Street 2	1.9	+0.2	Extremely Small	Negligible	Not Significant
Dantzic Street 3	1.7	-0.1	Extremely Small	Negligible	Not Significant
Crown Lane	1.8	+0.1	Extremely Small	Negligible	Not Significant
Corporation Street	2.5	+0.2	Extremely Small	Negligible	Not Significant
Note:- All values are rounded to the nearest one decimal place					

Table 33 PM_{10} 2012 No. of Days > 50 µg m-3 at the Nearest Residential Receptor and the Significance of Effects from the Development

7.124 It should be noted that the DMRB approach makes predictions of the road traffic contribution to pollutant concentrations at ground-level and the receptors surrounding the development site are all multi-storey residential properties. Therefore, Figure 8 illustrates the reduction in road traffic contribution with height from a recent Entec ADMS-Roads dispersion modelling assessment for a similar roadside residential development.

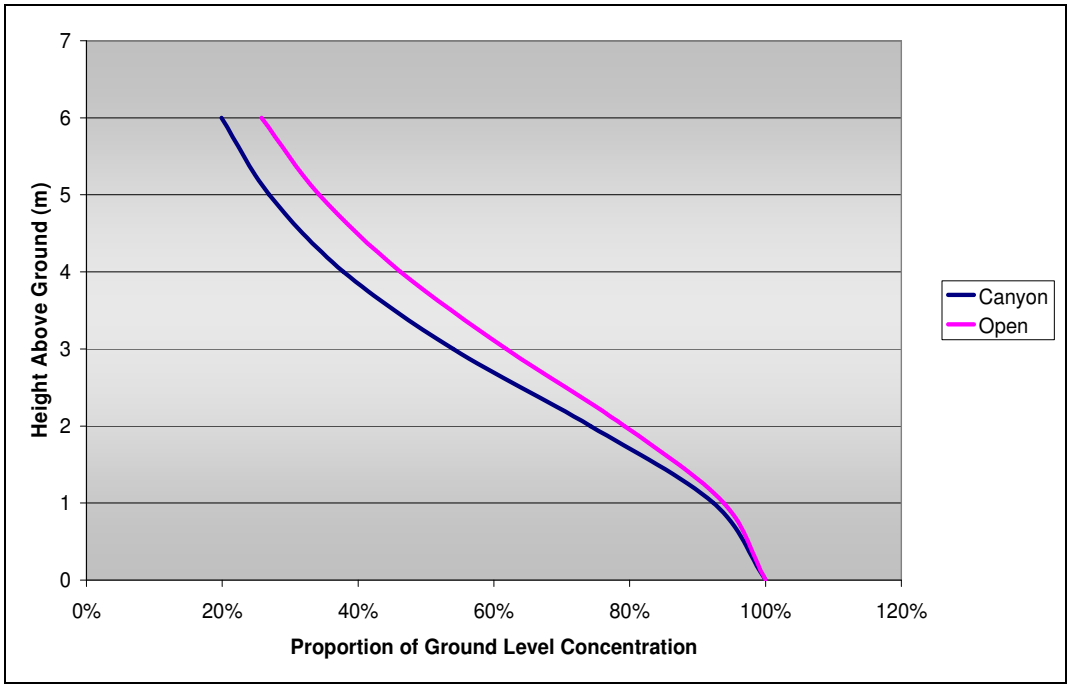

Fig 8 Change in Road Traffic Contribution with Height Predicted by the ADMS-Roads Dispersion Model.

7.125 Road traffic contributions at first-floor level (4.5m) are calculated to be some 45 % of those at ground floor level. Assuming that the background air quality is well-mixed and does not vary significantly with height, and applying the above profile to the road traffic contribution, the estimated NO_2 and PM_{10} concentrations at the first floor level and above will decrease further below the relevant AQOs at the multi-storey residential properties.

7.126 The key conclusion from the assessment is that the contribution from the proposed re-development is minimal when compared with the contribution from the existing baseline concentrations within the vicinity of the proposed development.

Biomass Boiler Emissions Assessment

7.127 This section sets out the results of the detailed dispersion modelling assessment, compares the results to ambient air quality standards for the site, and assesses the significance of the changes in air quality arising from the biomass boiler emissions.

7.128 The predicted concentrations resulting from the process are presented with background concentrations, where applicable, and the percentage contribution that the process concentrations would make towards the relevant AQO. The background concentrations are detailed in Table 34.

7.129 The results are presented for the meteorological year resulting in the highest ground level concentrations as a worst case assumption. The worst-case was determined separately for long-term and short-term contribution, at any grid

location, based on NO_2 process contributions. The results are presented in Table 34.

Year	Predicted Ground Level contribution due to Process Emissions (µg m^{-3})	
	NO_2 Annual Mean	NO_2 99.79 Percentile of 1-Hour Mean
2003	0.5	4.5
2004	0.5	4.4
2005	0.4	4.8
2006	0.4	4.8
2007	0.4	4.0
Note:- The concentrations are based on NO_2 process contributions at any point in the model domain; The concentrations are given to the nearest one decimal place; and The years of meteorological data producing the highest long-term and short-term concentrations are highlighted in bold.		

Table 34 Determination of Worst-Case Meteorological Year

7.130 From the above predicted ground level concentrations 2004 meteorological data results in the highest predicted long-term concentrations (0.5 µg m^{-3}) and 2005 the highest predicted short-term concentrations (4.8 µg m^{-3}). Therefore, as a worst case assumption 2004 and 2005 are taken forward for the assessment of the long-term and short-term modelling results, respectively, in the following sections.

Impacts at Human Receptors

7.131 Predicted ground-level concentrations have been derived from atmospheric dispersion modelling of process emissions from the proposed biomass boiler. Concentrations at the elevated human receptors considered are presented in Tables 35-36 for each of the pollutants modelled. These are presented in terms of the Process Contribution [PC] and the Predicted Environmental Concentration [PEC]. The PC is the contribution from the development only, and the PEC is the concentration including the existing background concentrations.

Receptor	Receptor Height (m)	Annual Mean µg m^{-3}				99.79 Percentile of 1-Hour Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS
Red Bank 1	1.5	40	0.3	26.8	0.6	200	1.6	54.6	0.8
Red Bank 2	1.5	40	0.3	26.8	0.6	200	1.6	54.6	0.8
Fernie Street	1.5	40	0.1	26.6	0.2	200	1.6	54.6	0.8
Red Bank 3	1.5	40	0.1	26.6	0.3	200	1.9	54.9	0.9

Receptor	Receptor Height (m)	Annual Mean µg m^{-3}				99.79 Percentile of 1-Hour Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS
Corporation Street	1.5	40	<0.1	26.5	<0.1	200	0.6	53.6	0.3
Hanover Street	1.5	40	0.1	26.6	0.2	200	1.6	54.6	0.8
Mayes Street	1.5	40	0.1	26.6	0.2	200	1.8	54.8	0.9
Riga Street	1.5	40	0.1	26.6	0.1	200	1.6	54.6	0.8
Rochdale Road 1	1.5	40	0.1	26.6	0.2	200	1.6	54.6	0.8
Rochdale Road 2	1.5	40	0.1	26.6	0.3	200	1.8	54.8	0.9
Addington Street	1.5	40	0.2	26.7	0.5	200	1.7	54.7	0.9
Marshall Street 1	1.5	40	0.2	26.7	0.5	200	1.5	54.5	0.8
Marshall Street 2	1.5	40	0.2	26.7	0.4	200	1.3	54.3	0.7
Goulden Street	1.5	40	0.2	26.7	0.5	200	1.6	54.6	0.8
Thompson Street	1.5	40	0.2	26.7	0.5	200	1.4	54.4	0.7
Bendix Street	1.5	40	0.3	26.8	0.7	200	1.8	54.8	0.9
Ludgate Hill1	1.5	40	0.2	26.7	0.6	200	1.9	54.9	0.9
Ludgate Hill 2	1.5	40	0.3	26.8	0.7	200	1.8	54.8	0.9
Ludgate Hill 3	1.5	40	0.3	26.8	0.7	200	1.8	54.8	0.9
Sharp Street 1	1.5	40	0.3	26.8	0.7	200	2.2	55.2	1.1
Sharp Street 2	1.5	40	0.3	26.8	0.8	200	2.1	55.1	1.0
Sharp Street 3	1.5	40	0.3	26.8	0.7	200	2.4	55.4	1.2
Little Nelson Street	1.5	40	0.3	26.8	0.7	200	2.4	55.4	1.2
Angel Street 1	1.5	40	0.1	26.6	0.3	200	2.6	55.6	1.3
Rochdale Road 3 a	1.5	40	0.3	26.8	0.7	200	2.0	55.0	1.0
Rochdale Road 3 b	10.5	40	0.3	26.8	0.7	200	2.0	55.0	1.0
Rochdale Road 3 c	19.5	40	0.3	26.8	0.7	200	2.0	55.0	1.0
Rochdale Road 3 d	28.5	40	0.3	26.8	0.7	200	2.0	55.0	1.0
Rochdale Road 3 e	37.5	40	0.3	26.8	0.8	200	2.2	55.2	1.1
Rochdale Road 3 f	46.5	40	0.3	26.8	0.9	200	2.5	55.5	1.3
Rochdale Road 3 g	55.5	40	0.4	26.9	0.9	200	3.3	56.3	1.7
Dantzic Street 1 a	1.5	40	<0.1	26.5	<0.1	200	0.3	53.3	0.2
Dantzic Street 1 b	10.5	40	<0.1	26.5	<0.1	200	0.4	53.4	0.2
Dantzic Street 2 a	1.5	40	0.1	26.6	0.2	200	2.1	55.1	1.0
Dantzic Street 2 b	4.5	40	0.1	26.6	0.2	200	2.1	55.1	1.0
Dantzic Street 2 c	7.5	40	0.1	26.6	0.2	200	2.1	55.1	1.0
Dantzic Street 2 d	10.5	40	0.1	26.6	0.2	200	2.1	55.1	1.0
Dantzic Street 2 e	13.5	40	0.1	26.6	0.2	200	2.1	55.1	1.0

Receptor	Receptor Height (m)	Annual Mean µg m^{-3}				99.79 Percentile of 1-Hour Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC of AQS
Crown Lane a	1.5	40	<0.1	26.5	0.1	200	1.6	54.6	0.8
Crown Lane b	10.5	40	<0.1	26.5	0.1	200	1.6	54.6	0.8
Angel Street 2 a	1.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 b	4.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 c	7.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 d	10.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 e	13.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 f	16.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 2 g	19.5	40	0.2	26.7	0.5	200	3.7	56.7	1.9
Angel Street 3 a	1.5	40	0.2	26.7	0.5	200	3.8	56.8	1.9
Angel Street 3 b	4.5	40	0.2	26.7	0.5	200	3.8	56.8	1.9
Angel Street 3 c	7.5	40	0.2	26.7	0.5	200	3.8	56.8	1.9
Angel Street 3 d	10.5	40	0.2	26.7	0.5	200	3.8	56.8	1.9
Angel Street 3 e	13.5	40	0.2	26.7	0.5	200	3.8	56.8	1.9
Ludgate Street 1 a	1.5	40	<0.1	26.5	<0.1	200	0.3	53.3	0.1
Ludgate Street 1 b	10.5	40	<0.1	26.5	<0.1	200	0.3	53.3	0.2
Ludgate Street 1 c	13.5	40	<0.1	26.5	<0.1	200	0.4	53.4	0.2
Ludgate Street 2 a	1.5	40	<0.1	26.5	0.1	200	0.7	53.7	0.4
Ludgate Street 2 b	10.5	40	<0.1	26.5	0.1	200	0.9	53.9	0.4
Ludgate Street 2 c	13.5	40	<0.1	26.5	0.1	200	1.0	54.0	0.5
Ludgate Street 3 a	1.5	40	0.2	26.7	0.6	200	2.5	55.5	1.3
Ludgate Street 3 b	10.5	40	0.2	26.7	0.6	200	2.5	55.5	1.3
Ludgate Street 3 c	16.5	40	0.3	26.8	0.7	200	2.5	55.5	1.3

Note:-
AQO = Air Quality Objective;
PC = Process Contribution;
PEC = Predicted Environmental Concentration (PC + Background).

Table 35 NO_2 Impacts at Nearby Human Receptors

7.132 Long-term NO_2 PCs (Process Contributions) and PECs (Predicted Environmental Concentrations) at the nearest human receptors are all below the AQO and, as such, the long-term impact of NO_2 emissions on local human populations is considered to be **negligible** and not of concern. Short-term NO_2 PCs and PECs at the nearest human receptors are all below the AQO and, as such, the short-term impact of NO_2 emissions on local human populations is, also, considered to be **negligible** and not of concern.

Receptor	Receptor Height (m)	PM_{10}								$PM_{2.5}$			
		Annual Mean µg m^{-3}				90.41 Percentile of 24-Hour Mean µg m^{-3}				Annual Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO
Red Bank 1	1.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.4
Red Bank 2	1.5	40	0.1	18.3	0.3	50	0.4	36.8	0.8	25	0.1	11.2	0.4
Fernie Street	1.5	40	<0.1	18.2	0.1	50	0.3	36.7	0.5	25	<0.1	11.1	0.2
Red Bank 3	1.5	40	<0.1	18.2	0.1	50	0.3	36.7	0.5	25	<0.1	11.1	0.2
Corporation Street	1.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Hanover Street	1.5	40	<0.1	18.2	0.1	50	0.2	36.6	0.3	25	<0.1	11.1	0.1
Mayes Street	1.5	40	<0.1	18.2	0.1	50	0.2	36.6	0.4	25	<0.1	11.1	0.1
Riga Street	1.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.2	25	<0.1	11.1	0.1
Rochdale Road 1	1.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.2	25	<0.1	11.1	0.1
Rochdale Road 2	1.5	40	0.1	18.3	0.2	50	0.1	36.5	0.3	25	0.1	11.2	0.2
Addington Street	1.5	40	0.1	18.3	0.2	50	0.2	36.6	0.5	25	0.1	11.2	0.4
Marshall Street 1	1.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3
Marshall Street 2	1.5	40	0.1	18.3	0.2	50	0.2	36.6	0.4	25	0.1	11.2	0.3
Goulden Street	1.5	40	0.1	18.3	0.2	50	0.3	36.7	0.5	25	0.1	11.2	0.4
Thompson Street	1.5	40	0.1	18.3	0.2	50	0.2	36.6	0.4	25	0.1	11.2	0.3
Bendix Street	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.7	25	0.1	11.2	0.5
Ludgate Hill1	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.5	25	0.1	11.2	0.4
Ludgate Hill 2	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.6	25	0.1	11.2	0.5
Ludgate Hill 3	1.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Sharp Street 1	1.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Sharp Street 2	1.5	40	0.2	18.4	0.4	50	0.4	36.8	0.9	25	0.1	11.2	0.6
Sharp Street 3	1.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Little Nelson Street	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.7	25	0.1	11.2	0.5
Angel Street 1	1.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.2
Rochdale Road 3 a	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.7	25	0.1	11.2	0.5
Rochdale Road 3 b	10.5	40	0.1	18.3	0.3	50	0.3	36.7	0.7	25	0.1	11.2	0.5

Receptor	Receptor Height (m)	PM_{10}								$PM_{2.5}$			
		Annual Mean µg m^{-3}				90.41 Percentile of 24-Hour Mean µg m^{-3}				Annual Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO
Rochdale Road 3 c	19.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Rochdale Road 3 d	28.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Rochdale Road 3 e	37.5	40	0.1	18.3	0.3	50	0.4	36.8	0.7	25	0.1	11.2	0.5
Rochdale Road 3 f	46.5	40	0.2	18.4	0.4	50	0.4	36.8	0.9	25	0.1	11.2	0.6
Rochdale Road 3 g	55.5	40	0.2	18.4	0.4	50	0.5	36.9	0.9	25	0.2	11.3	0.6
Dantzic Street 1 a	1.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Dantzic Street 1 b	10.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Dantzic Street 2 a	1.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.1
Dantzic Street 2 b	4.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.1
Dantzic Street 2 c	7.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.1
Dantzic Street 2 d	10.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.1
Dantzic Street 2 e	13.5	40	<0.1	18.2	0.1	50	0.1	36.5	0.3	25	<0.1	11.1	0.1
Crown Lane a	1.5	40	<0.1	18.2	<0.1	50	0.1	36.5	0.2	25	<0.1	11.1	0.1
Crown Lane b	10.5	40	<0.1	18.2	<0.1	50	0.1	36.5	0.2	25	<0.1	11.1	0.1
Angel Street 2 a	1.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 b	4.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 c	7.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 d	10.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 e	13.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 f	16.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 2 g	19.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Angel Street 3 a	1.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3

Receptor	Receptor Height (m)	PM_{10}								$PM_{2.5}$			
		Annual Mean µg m^{-3}				90.41 Percentile of 24-Hour Mean µg m^{-3}				Annual Mean µg m^{-3}			
		AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO
Angel Street 3 b	4.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3
Angel Street 3 c	7.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3
Angel Street 3 d	10.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3
Angel Street 3 e	13.5	40	0.1	18.3	0.2	50	0.3	36.7	0.6	25	0.1	11.2	0.3
Ludgate Street 1 a	1.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Ludgate Street 1 b	10.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Ludgate Street 1 c	13.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	<0.1	25	<0.1	11.1	<0.1
Ludgate Street 2 a	1.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	0.1	25	<0.1	11.1	<0.1
Ludgate Street 2 b	10.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	0.1	25	<0.1	11.1	0.1
Ludgate Street 2 c	13.5	40	<0.1	18.2	<0.1	50	<0.1	36.4	0.1	25	<0.1	11.1	0.1
Ludgate Street 3 a	1.5	40	0.1	18.3	0.3	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Ludgate Street 3 b	10.5	40	0.1	18.3	0.3	50	0.3	36.7	0.6	25	0.1	11.2	0.4
Ludgate Street 3 c	16.5	40	0.1	18.3	0.3	50	0.3	36.7	0.7	25	0.1	11.2	0.5

Note:-

AQO = Air Quality Objective; PC = Process Contribution; PEC = Predicted Environmental Concentration (PC + Background).

Table 36 PM_{10} and $PM_{2.5}$ Impacts at Nearby Human Receptors

7.133 Long-term PM_{10} PCs and PECs at the nearest human receptors are all below the AQO and, as such, the long-term impact of PM_{10} emissions on local human populations is considered to be **negligible** and not significant. Short-term PM_{10} PCs and PECs at the nearest human receptors are all below the AQO and, as such, the short-term impact of PM_{10} emissions on local human populations is, also, considered to be **negligible** and not significant.

7.134 Long-term $PM_{2.5}$ PCs and PECs at the nearest human receptors are all below the AQO and, as such, the long-term impact of $PM_{2.5}$ emissions on local human populations is considered to be **negligible** and not significant.

Impacts at Ecological Receptors

7.135 Predicted ground-level concentrations of NO_x arising from the biomass boiler emissions at Rochdale Canal SAC and SSSI, under both scenarios, are detailed in Table 37.

Receptor	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PC OF AQO
Rochdale Canal	30	<0.1	25.0	<0.1
Note:- AQO = Air Quality Objective; PC = Process Contribution; PEC = Predicted Environmental Concentration (PC + Background); and Short-term NOx emissions are not assessed at ecological receptors.				

Table 37 Annual Mean NO_x Impacts at the Nearby Rochdale Canal Ecological Receptor

7.136 Long-term NO_x PCs and PECs at the nearest ecological receptor of Rochdale Canal are below the AQO and, as such, the long-term impact of NO_x emissions on local ecological receptors is not considered to be **negligible** and not significant.

Maximum Ground Level Impact within the Modelled Domain

7.137 Table 38 details the maximum predicted concentrations at any ground level location within the modelled domain and assesses these with reference to the requirements of the EU Directives.

Pollutant	AQO µg m^{-3}	PC µg m^{-3}	PEC µg m^{-3}	% PEC of AQO
NO_2 Annual Mean	40	0.5	27	67.5
NO_2 1-Hour Mean	200	4.8	57.8	28.9
PM_{10} Annual Mean	40	0.2	18.4	46.0
PM_{10} 24-Hour Mean	50	0.5	36.9	73.8
$PM_{2.5}$ Annual Mean	25	0.2	11.3	45.2

Table 38 Maximum Concentrations within the Modelled Domain

7.138 Maximum ground level long-term and short-term PCs and PECs, of all substances, anywhere within the modelled domain are predicted to be below the relevant AQO. Concentration isopleths for NO_2 only, to show the shape of the long-term and short-term dispersion plume, are presented in Technical Appendix 7.1.

Assessment of Significance

7.139 An assessment of the significance of the modelled biomass boiler emissions has been carried out using the NSCA guidance provided in Section 2 of this

chapter. This has been carried out for the maximum long-term NO_2 and PM_{10} concentrations anywhere within the modelled domain. Table 39 details the results of this assessment.

Pollutant	Baseline µg m^{-3}	Maximum PC µg m^{-3}	% Change from Baseline	Magnitude of Change	Assessment Descriptor	Significance
NO_2 Annual Mean	26.5	0.5	1.9	Very Small	Negligible	Not Significant
PM_{10} Annual Mean	18.2	0.2	1.1	Very Small	Negligible	Not Significant
Note:- PC <75 % of the AQO.						

Table 39 Biomass Boiler Emissions, Assessment of Significance

Mitigation Measures

7.140 Mitigation measures will be used to reduce or eliminate significant dust nuisance, where necessary, during the construction phase. To offset possible dust migration off site, suitable mitigation measures include:–

1 Using water sprays to maintain damp surfaces during dry weather;

2 Place dust raising equipment away from site boundaries and sensitive receptors;

3 Keep stockpiles for the shortest time possible and covered during dry spells where possible;

4 Minimise unnecessary handling of materials;

5 Seeding surfaces of completed mounds where applicable;

6 Sheeting of lorries during transportation of construction materials and spoil export;

7 Enclosing or covering all containers to prevent escape of dust and waste materials during loading and transfer;

8 Providing wheel washing for all vehicles on leaving the site; and,

9 Construction of wind fences and/or hoardings at the site perimeter and around dust sources.

7.141 This is not an exhaustive list of mitigation measures and other mitigation measures which are appropriate for this site may become available which could be used, following consultation with the local authority.

7.142 No mitigation measures are required for the operational phase of the

development as the assessed impacts are all negligible.

Summary of Residual Impacts

7.143 Table 40 provides a summary of the residual impacts from the modelling of road traffic and biomass boiler emissions associated with the proposed development. There are no residual impacts for the construction phase of the development.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
None	None	None	None	None	None	None	None	None
Operational Phase								
Road Traffic NO_2 Emissions	No significant residual effects identified in the modelling	High	Extremely Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Road Traffic PM_{10} and $PM_{2.5}$ Emissions	No significant residual effects identified in the modelling	High	Extremely Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Biomass Boiler NO_x/NO_2 Emissions	No significant residual effects identified in the modelling	Human receptors (High) and one ecological receptor at the Rochdale Canal	Very Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Biomass Boiler PM_{10} and $PM_{2.5}$ Emissions	No significant residual effects identified in the modelling	High	Very Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO

Table 40 Summary of Residual Impacts – Air Quality

Cumulative Effects

7.144 In order to assess the full air quality effects of the proposed development the modelled emissions from both the DMRB road traffic assessment and the biomass boiler assessment have been considered in combination.

7.145 The cumulative assessment has been carried out for those receptors included within the DMRB assessment. In terms of emissions from the biomass boiler

the worst case modelled ground level concentrations anywhere within the modelled domain, have been applied. This approach will ensure a conservative assessment of cumulative effects. This approach will ensure a conservative assessment of cumulative effects. This assessment has been carried out for emissions of NO_2 and PM_{10} only as within the biomass boiler emissions assessment emissions of $PM_{2.5}$ are lower than emissions of PM_{10}. The assessment of cumulative effects is provided in Table 41 and Table 42.

7.146 The assessment shows that, under worst case assumptions, the cumulative emissions of NO_2 and PM_{10}, from road traffic in 2012, including the traffic associated with the development, and the emissions from the biomass boiler, are minimal compared to the existing background values. When combined with the background values the cumulative emission of NO_2 and PM_{10} are well below the relevant AQO (<75%) and as such the cumulative effects are 'not significant'.

7.147 No further changes are anticipated to the highway network and there is no detailed information about other potential developments within close proximity of this scheme which can inform the assessment of cumulative effects.

Receptor	AQO	Road Traffic Contribution	Biomass Boiler Max PC	Background	PEC	% PEC of AQO	% Change from Baseline	Magnitude of Change	Assessment Descriptor	Significance
Angel Street 1	40	1.0	0.5	26.5	28.0	70.0	5.7	Small	Minor Adverse	Not Significant
Angel Street 2	40	1.1	0.5	26.5	28.1	70.3	6.0	Small	Minor Adverse	Not Significant
Angel Street 3	40	1.2	0.5	26.5	28.2	70.5	6.4	Small	Minor Adverse	Not Significant
Dantzic Street 1	40	1.6	0.5	26.5	28.6	71.5	7.9	Small	Minor Adverse	Not Significant
Dantzic Street 2	40	2.5	0.5	26.5	29.5	73.8	11.3	Medium	Minor Adverse	Not Significant
Crown Lane	40	1.7	0.5	26.5	28.7	71.8	8.3	Small	Minor Adverse	Not Significant

Note:-
AQO = Air Quality Objective; PC = Process Contribution; PEC = Predicted Environmental Concentration (PC + Background).

Table 41 Cumulative NO_2 Effects

Receptor	AQO	Road Traffic Contribution	Biomass Boiler Max PC	Background	PEC	% PEC of AQO	% Change from Baseline	Magnitude of Change	Assessment Descriptor	Significance
Angel Street 1	40	0.2	0.2	18.2	18.6	46.5	2.2	Very Small	Negligible	Not Significant
Angel Street 2	40	0.2	0.2	18.2	18.6	46.5	2.2	Very Small	Negligible	Not Significant
Angel Street 3	40	0.2	0.2	18.2	18.6	46.5	2.2	Very Small	Negligible	Not Significant
Dantzic Street 1	40	0.3	0.2	18.2	18.7	46.8	2.7	Very Small	Negligible	Not Significant
Dantzic Street 2	40	0.4	0.2	18.2	18.8	47.0	3.3	Very Small	Negligible	Not Significant
Crown Lane	40	0.3	0.2	18.2	18.7	46.8	2.7	Very Small	Negligible	Not Significant

Note:-

AQO = Air Quality Objective; PC = Process Contribution; PEC = Predicted Environmental Concentration (PC + Background).

Table 42 Cumulative PM_{10} Effects

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8.0 Noise and Vibration

Introduction

8.1 This chapter of the Environmental Statement [ES] presents the results of the noise and vibration assessment. Both noise and vibration can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The effects of noise and vibration can therefore be a material consideration in the determination of planning applications.

8.2 This chapter reviews potential impacts of noise sources associated with the construction and operation of the proposed development at sensitive receptors surrounding the site.

8.3 The methodology set out within this Chapter has allowed, where necessary, recommendations to be made with regard to the design of mitigation measures that should be included in the design at the various stages of the development (i.e. construction and operation).

Policy Context

Relevant Legislation

8.4 Legislation on noise issues is primarily focussed on the control of noise emissions for example through statutory nuisance or the control of occupational exposure to noise.

8.5 Key relevant legislation includes the following:-

1 Environmental Protection Act 1990, Part III;

2 The Pollution Prevention Control Regulations (England and Wales) Regulations 2000; and,

3 Control of Pollution Act 1974.

Development Plan Guidance

8.6 The Unitary Development Plan (UDP) was adopted by Manchester City Council in July 1995 and sets out the policies for land use and development in Manchester. In relation to noise under the heading environmental protection and improvement, Policy E1.4 of the UDP states that:-

"The Council will control noise levels by:-

a) ensuring that new development involving high noise levels is not permitted where it would be likely to cause a nuisance to occupiers of nearby properties;

b) minimising the need for heavy goods vehicles to pass through residential areas and the City Centre;

c) the careful design of new roads so that the lines and levels selected minimise the impact of noise on Local people and, in addition, ensuring that noise barriers are provided to deflect noise away from housing areas."

National Planning Guidance

Planning Policy Guidance 24: Planning and Noise

8.7 The key national planning guidance document which provides guidelines on the assessment of noise issues associated with new developments is PPG24 *Planning and noise* (1994). This document gives general guidance to local authorities on the use of the planning system to:-

"…minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business."

8.8 The guidance outlines the considerations to be taken into account in determining planning applications, both for noise sensitive developments and for activities which will generate noise. PPG24 acknowledges that:-

"Much of the development which is necessary for the creation of jobs…will generate noise. The planning system should not place unjustifiable obstacles in the way of such development. Nevertheless, local planning authorities must ensure that development does not cause an unacceptable degree of disturbance."

8.9 The general principle of the approach is that the planning system should, wherever practicable, ensure separation of noise sensitive development and noisy activities. Where this is not possible, local planning authorities should consider whether it is practicable to sufficiently reduce the effects of noise through the use of conditions or planning obligations.

8.10 PPG24 is only applicable where consideration is being given to introducing residential development into an area with an existing noise source. However, it does make reference to a range of guidance documents on the assessment and control of noise from various sources such as roads, railways and other forms of transportation, construction operations and industrial plant etc. (see British Standards and Other Relevant Guidance).

8.11 Some noise from commercial and industrial activity is expected at the site. Although PPG24 discusses noise from commercial operations and industrial activity, it does not specify noise levels or noise exposure categories. Instead the guidance makes references to alternative guidance and British Standards for its assessment. The same approach is taken for noise from construction

sites. This is discussed further within British Standards and Other Relevant Guidance.

British Standards and Other Relevant Guidance

8.12 PPG24 makes reference to guidance on the assessment of noise from construction activities contained in BS5228:2009 Parts 1 and 2 *'Code of practice for noise and vibration control on construction and open sites'*. Part 1 gives recommendations for basic methods of noise control relating to construction and open sites. It applies to work activities and operations that generate significant noise levels and also includes industry-specific guidance. It provides guidance concerning methods of predicting and measuring noise and assessing its impact on those exposed to it. Part 2 gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels. It includes information concerning methods of measuring vibration and assessing its effects on the environment.

8.13 With respect to changes in road traffic noise levels, PPG24 refers to the documents '*Calculation of Road Traffic Noise'* (1988) and the '*Design Manual for Roads and Bridges: Volume 11 Environmental Assessment'* (1994) (Volume 11, Section 3 replaced by new Advice Note HA 213/08). Both of these documents contain relevant guidance on predicting and assessing changes in road traffic noise, due to, e.g. increasing traffic volumes, changes to the local road network, etc.

8.14 For the assessment of noise from 'industrial' sources, PPG24 prescribes the use of British Standard BS4142:1997 *Method for Rating Industrial Noise in Mixed Residential and Industrial areas*. This British Standard provides a methodology for determining whether a new or existing noise source is likely to cause noise complaints by comparing the operational noise level (noise due to the industrial source) with the background level (noise level without the industrial source).

8.15 Internal noise levels resulting from noise intrusion onto the site due to road traffic and other sources are assessed with respect to the guidance of BS8233:1999 *'Sound Insulation and Noise Reduction for Buildings - Code of* Practice' and the WHO 'Guidelines for Community Noise' (1999).

8.16 BS8233:1999 gives recommended criteria for internal noise levels for different types of rooms. The criteria for bedrooms and living rooms, which have been set to avoid sleep disturbance and ensure suitable living/ resting conditions are:-

1 Bedrooms: Good - $L_{Aeq,T}$ 30dB; Reasonable - $L_{Aeq,T}$ 35dB

2 Living Rooms: Good - $L_{Aeq,T}$ 30dB; Reasonable - $L_{Aeq,T}$ 40dB

8.17 The design criteria in BS8233:1999 are based on guidance contained within the World Health Organisation [WHO] document, Guidelines for Community Noise (1999). In addition to the above, this document recommends that maximum noise levels should not normally exceed 45dB L_{Amax} in bedrooms at night. Although BS8233:1999 does not provide guidance on those this may be interpreted, however based upon WHO guidelines, a criteria of between 10-15 times per night-time period has been adopted.

Potential Impacts

8.18 The assessment methodology and scope of the assessment have been developed through the 29th April 2009 scoping report and from discussions with the relevant Public Pollution Officer [PPO] at Manchester City Council [MCC].

8.19 The scoping report separated out potential noise effects associated with the development into two phases; the construction phase, and the operational phase. The construction phase relates to potential noise generating activities associated with demolition, site remediation and construction of the development. The operational phase relates to the potential significant noise effects from the operation of the development during its use as commercial office space.

Construction Phase

8.20 The following potential impacts during the construction phase of the development were identified during scoping:-

1 Construction and demolition noise (including noise generated by plant on site); and,

2 Potential increases in road traffic noise levels affecting existing residential receptors, due to construction traffic (including HGVs delivering goods and light vehicles transporting personnel).

8.21 The potential effects of construction vibration either causing disturbance or damage to proximal buildings were noted within the scoping report however has been subsequently been scoped out of the assessment because although the excavation of the site will require the use of piling to support the walls of the excavation and to provide a foundation for the proposed structures, it is understood that hydraulic piling plant will be used. Hydraulic piling produces significantly less vibration effects than impact piling and thus the vibration effects associated with the construction of the development have been scoped out of the assessment.

Operational Phase

8.22 The following potential impacts during the operational phase of the development were identified during the scoping stage of the EIA:-

1 Increase in traffic noise at local receptors (due to the proposed development); and,

2 Introduction of new noise sources such as fixed plant items associated with commercial activity from the development on local receptors.

8.23 The potential impact of car parking with the development was identified within the scoping report however has been subsequently been scoped out of the assessment. This is because the size of the proposed car park is smaller than the car park that currently occupies the site. In addition, the car parking for the development will be underground and basement level. As such, it has been determined that the impact of car parking from the proposed development would be less than that already experienced from the existing car park that currently occupies the development site.

Assessment Methodology

Approach

8.24 The potential impacts have been assessed according to the methodology set out in the following sections. The assessment has combined baseline noise measurements alongside noise modelling undertaken using the LimA computational noise modelling suite.

8.25 LimA has been widely used in noise modelling and noise mapping projects throughout the UK and Europe, including Manchester. LimA, developed by Stapelfeldt Ingenieuresellschaft mbH implements a number of methodologies for the calculation of noise levels, including BS5228-1:1997 for the calculation of construction noise (the updated BS5228-1:2009 uses an unaltered calculation methodology), 'The Calculation of Road Traffic Noise" (CRTN) for the calculation of road traffic noise and, as used in the assessment of core site activities, ISO9613-2 "Acoustics - Attenuation of Sound During Propagation Outdoors".

8.26 The LimA noise modelling suite allows a 3-dimensional environmental model to be constructed using digital mapping and topographic data. 3-dimensional models have been constructed for the current, future baseline years and for each phase of the development using obtained from Ordnance Survey. Designs and drawings relating to the proposed development have been obtained from 3DReid.

Methodology for the Prediction of Significant Effects

Construction - Fixed and Mobile Plant

8.27 With respect to the assessment of construction and demolition noise, guidance and assessment criteria for construction noise are now presented in Annex E (informative) of BS5228-1:2009 *"Code of Practice for noise and vibration control on construction and open sites. Part 1 Noise"*. It is recognised within BS5228-1:2009 that a pragmatic approach to assessing the noise impact of construction projects needs to be taken and that the advice that is given in Annex E may only be required for construction projects of significant size. Based on information provided in Chapter 3 and Technical Appendix 3.3 of this ES, the proposed development is considered to be such a project as the construction phase is envisaged to last a total of 26 months and would limited to daytime hours of operation between 0700hrs and 1900hrs.

8.28 The plant list identifies the type and estimates the average number of plant items during each month of construction. Details of construction methodologies have not been provided at this stage however the plant list has been sufficient to undertake indicative noise calculations in accordance with the methodology set out in British Standard BS5228:2009. These indicative calculations have been made at the nearest sensitive receptors.

8.29 The noise calculations have been made using the calculation methodology set out in BS5228:2009. In simple terms, the calculation process involves the following factors:-

1 **Noise Emission Data** - based on either manufacturer's published information or measured data is assigned to each item of plant. The assumed list of plant and associated sound pressure levels is presented in Table 43.

2 **Distance Between Noise Source and Receptor** - based on OS base mapping data;

3 **Ground Attenuation** - related to the ground cover between the source and the receptor;

4 **Barrier Attenuation** - related to any barriers between the source and the receptor; and,

5 **On-Time of Plant** - the amount of time the plant will be active.

8.30 Where uncertainties exist which could affect the outcome of the noise predictions, assumptions have been adopted. Examples of these assumptions include:-

1 **Location** - all plant is assumed to operate at the centre of the site.

2 '**On-time**' **of Plant** - experience has shown that some items of plant are likely

to operate more than others and that for plant items that are highly used, the maximum 'on-time' is typically less than around 83%. On-times for each item of plant is presented in Table 43; and,

3 **Ground Attenuation** - the nature of the ground in inner city locations is typically acoustically reflective. For the purposes of these predictions, it has been assumed that the intervening ground is 100% acoustically reflective.

Plant	Sound Power Level dB(A)	On-time (%)
Excavator 350	110	83
12t tipper wagon	107	50
Excavator 120	108	83
Piling rig BG36	111	83
Agitator	Scoped Out	
Crawler Crane	98	83
Concrete Lorry	107	50
Sheet piling vibrator	98	50
Concrete Vibrator	106	50
Static Concrete Pump	103	50
Diesel Generator - Enclosed	Scoped Out	
Diesel Generator - Small Mobile Unit	87	100
Mobile Crane 25t	98	83
Mobile Concrete Pump	109	50
Tower Crane	104	83
Delivery Artic	109	25
Power Floater for Concrete Finish	100	100
Steel Bolt Tightening Gun	101	10

Table 43 Construction Plant List

8.31 Noise calculations have been made for 10 intervals during the 26 month construction period. These intervals represent groups of months where the construction activity (in terms of average plant numbers) is similar. The construction intervals are summarised in Table 44.

Interval	Month(s)
A	1
B	2

Interval	Month(s)
C	3
D	4
E	5-6
F	7-10
G	11-15
H	16-18
I	19-22
J	23-26

Table 44 Assessed Construction Intervals

8.32 Annex E of BS5228-1:2009 gives an example methodology for determining the significance of construction noise impacts based on an exceedance of the pre-construction ambient noise levels. The total noise (construction noise PLUS pre-construction ambient noise) should not exceed the pre-construction ambient noise levels by more than 5dB(A) subject to a 5dB(A) lower cut-off value of 65 dB(A) daytime, 55 dB(A) evening and 45 dB(A) night-time for construction noise only. In addition, any exceedance of the pre-construction ambient levels must be for a period of one month or more, unless any works of a shorter duration have been identified as being likely to result in noise levels which could be significant.

8.33 The noise levels above which a potential significant impact could occur for construction operations located in an urban environment such as Manchester City Centre are related to the potential periods (or times) of operation. The relevant criteria for the assessment of construction noise effects are summarised in Table 45.

Operations period	Working hours	Construction + pre-construction ambient noise limit
Daytime	(07:00 - 19:00)	65 dB(A) $L_{Aeq\ 12\ hour}$ or 5dB(A) above rounded up pre-construction ambient whichever is the higher)
Evening:	(19:00 - 23:00)	55 dB(A) $L_{Aeq\ 4\ hour}$ or 5dB(A) above rounded up pre-construction ambient whichever is the higher)
Night time	(23:00 - 07:00)	45 dB(A) $L_{Aeq\ 8hour}$ or 5dB(A) above rounded up pre-construction ambient whichever is the higher)

Table 45 - Relationship between the Period of Construction Operation and Noise Threshold

Construction - Traffic

8.34 Construction traffic data has been provided by Waterman Boreham Ltd. The construction traffic shows that over the course of the working day, there may up to approximately 60 vehicular movements associated with the site activity, most of which may be assumed to be heavy good vehicles. The level of construction vehicles varies depending upon the month of construction.

8.35 In addition to construction vehicles, it is understood that the site may be occupied by between 50 to 1,085 staff and subcontractors throughout the construction programme. Waterman Boreham Ltd has advised that it is best to assume that there may be up to 24 vehicular movements per day associated with staff and subcontractors. Waterman Boreham Ltd has also advised that this figure is based on the assumption that most staff and subcontractors would use public transport to get to and from the construction site.

8.36 Based on the calculation methodology set out within the Department of Transport publication 'Calculation of Road Traffic Noise' (CRTN), in general, construction traffic on any given road would need to increase existing traffic volumes by 100% to achieve approximate increase of 3dB in noise levels. However, as most the construction traffic associated with the development will be HGVs, the assessment has found it necessary to calculate Basic Noise Levels (BNLs) using the methodology set out in CRTN for roads surrounding the site in order to evaluate changes in noise level as a result of construction traffic. The assessment has been limited the streets surrounding the site with residential dwellings. These are:-

1 Angel Street;

2 Dantzic Street; and

3 Aspin Lane

8.37 The change in noise level with respect to BNLs before and during construction has been calculated and used as the basis for evaluating significance. It is noted however that due to the low traffic flows on these roads, the methodology as defined within CRTN has been used outside of its validation range. This must therefore be borne in mind when considering the outcome of the assessment.

Operational - Road Traffic Noise

8.38 The methodology typically used for the assessment of road traffic noise effects is that contained within the Highways Agency publication *Design Manual for Roads and Bridges (DMRB) Volume 11 (2008)*. The document includes detailed guidance and procedures for the assessment of road schemes or where changes that could affect noise levels are made to the existing road network.

8.39 There are four key phases of assessment as detailed below: -

1 **Screening:** to determine whether the project has the potential to cause a change to the receiving environment which could result in noise and vibration impacts;

2 **Scoping:** to determine the likely extent of any assessment and to identify sensitive receptors;

3 **Simple assessment** of noise and vibration impact at dwellings and other sensitive receptors; and

4 **Detailed assessment** of noise and vibration impact at dwellings and other sensitive receptors.

8.40 The primary criterion within DMRB throughout the assessment process is whether it is predicted that any link or route will experience changes in 18-hour annual average weekday traffic (AAWT) road traffic flows by at least 25% or decrease by at least 20% within 15 years of the opening of the road scheme. These changes in road traffic flow may result in an increase or decrease of 1 dB(A) in road traffic noise, respectively. Should a simple or detailed assessment be required, road traffic noise levels and changes in road traffic noise may need to be assessed up to 600 metres from the effected link or route.

8.41 Road traffic data is provided in Chapter 12 (Transportation) of this ES and associated Appendices. The traffic data has been provided for the baseline year and for the opening year of the development. Road traffic data for the opening year of the development includes vehicular movements linked to the development (such as employee traffic) and the effect of the closure of the southern section of Dantzic Street. The traffic data therefore includes re-distributed traffic resulting from the road closure.

8.42 The traffic data does not include 15-year forecasts as traffic in Greater Manchester has decreased over the last 15 years and consequently no traffic growth is anticipated. Therefore the assessment has assumed that road traffic volumes for the opening year with the development would be the same as the 15-year forecasts. Based on the supplied road traffic data, the following roads (presented in Table 46) have been predicted to meet the DMRB criterion.

Road	Baseline Traffic Flow	Development Traffic Flow	%age Increase
Aspin Lane East	2197	3537	+61%
Aspin Lane West	2143	3531	+65%
Angel Street West	1238	2074	+68%
Angel Street East	571	1470	+157%

Table 46 Roads Meeting DMRB Road Traffic Flow Threshold Changes (18-hour AAWT)

8.43 Table 46 shows that changes in road traffic noise meeting the criterion set out in DMRB are limited to Aspin Lane and Angel Street. These are relatively low trafficked roads / side streets between main the arterial route of the A664/665 on Rochdale Road and Miller Street. Further examination of the road traffic flows identified that it is likely that road noise levels at locations along Aspin Lane and Angel Street are likely to be dominated by road traffic on Miller Street and Rochdale Road, which are predicted to experience small changes in road traffic volumes as a result of the development. This was supported by observations taken during the noise survey and site visit.

8.44 On this basis, a simple or detailed DMRB assessment would be overly complicated for this situation as it would potentially identify a known group of residential uses with changes in noise level, at what would be a relatively low level of noise. Further consultation with the EHO at MCC was sought to agree an alternative assessment methodology. Following this consultation it was agreed that a road traffic noise model containing roads surrounding the development site should be constructed for scenarios with and without the development and that potential changes in the $L_{A10\ 18\text{-}hour}$ noise level should be used to judge significance at specific locations on Aspin Road and Angel Street.

8.45 The prediction method for road traffic noise levels during the operational phase of the development has been based on the methodology set out in *Calculation of Road Traffic Noise* (CRTN), as prescribed by PPG24 (Annex 1) and DMRB. CRTN contains a methodology for the calculation of road traffic noise levels, in terms of $L_{A10\ 18\text{-}hour}$. It should however be noted that due to low traffic flows on certain roads surrounding the site, the CRTN calculation methodology has in this instance been used outside it's normal range of validation.

8.46 The calculations have used road traffic statistics provided by Waterman Boreham Ltd, OS base mapping and design plans of the proposed development as provided by 3DReid. As part of the calculations, it has been assumed that all roads are of impervious construction and have a texture depth of 1.5mm. Additionally, road traffic speeds have been assumed to be 20mph for side streets and 30mph for other city centre roads.

Operational - Building Services Plant

8.47 Changes in ambient noise levels at sensitive receptors as a result of any building services plant has been assessed using the methodology set out in British Standard BS4142:1997 '*Method for Rating Industrial Noise in Mixed Residential and Industrial areas'*. The assessment uses background levels measured during the baseline noise survey to assess whether industrial sources are likely to result in complaints. This is determined through a comparison of the operational noise level from proposed plant with the measured background noise level.

8.48 In accordance with the methodology set out in BS4142:1997, if the industrial noise contains any annoying characteristics, such as hums, clanks or bangs, or

contains any tonal characteristics in the frequency spectrum, it is also subject to a 5 dB rating penalty. An increase of 10 dB or more means complaints are likely, whereas an increase of 5 dB is considered to have marginal significance. For increases of less than 5 dB the likelihood of complaints is reduced. However, response to noise is subjective and the likelihood of complaints depends on a number of additional factors, as well as the overall noise level, for example, the time of day or night when the noise occurs, a change in the noise environment and also attitude to the noise source.

8.49 From discussions with the Public Pollution Officer at Manchester City Council, it is understood that MCC requires the logic set out within BS4142:1997 to be applied for each octave band. Again, it should be noted that this approach is not strictly compliant with the exact methodology advocated within BS4142:1997.

8.50 A schedule of building services plant and plant has been provided by Buro Happold. The schedule presents the potential location and type of building services plant to be installed at the development. Table 47 presents the indicative location and type of building services plant associated with the development that may emit noise into the environment.

Building Services Plant	Potential Noise Source	Location
Boiler Plant	Air Intake	Basement, intake as louvres in plant room wall
	Air Output	Basement – output as louvres in plant room wall
Chilled Water Plant	Cooling Tower	Chiller Basement, Cooling Tower Roof approximately 4m in height
	AHU (Air Handling Unit)	Chiller Basement, AHU Tower Roof
Electrical Plant	Ground Level Air Inlet	Ground Floor
	Generator	Ground Floor
Substation	Ground Level Vent via Grille in Path	Diverse Locations in the Building
Cooling Towers	Heat Rejection Plant	Roof mounted
Dry Air Coolers	Air Handling Plant	Roof mounted
Ventilation Plant	Air Intake Shaft	Roof mounted
Fresh Air Intake	44.5 m2 air intake 20m from the building	Ground Floor
	Air Intake Shaft	Roof mounted
Other Core Services	WC Ventilation	Roof mounted

Table 47 Building Services Plant

8.51 At the time of the assessment, noise emission data for the above building service plant was not available. It was therefore considered inappropriate to undertake the BS 4142:1997 assessment at each octave band frequency. The assessment has therefore been undertaken using broadband A-weighted levels.

8.52 The BS4142 assessment has taken the approach of setting Environmental Noise Criteria [ENC] which recommends the levels of noise that would be acceptable at each sensitive receptor in order to meet the ENC. The process of setting an ENC requires an understanding of assessment methodology and criteria adopted by the local authority. In this case, MCC has stipulated that any building services plant should be at least 5 dB(A) below the current background noise level. Therefore to set the ENC, a BS 4142:1997 assessment is undertaken in reverse in order to establish the noise level from the building services plant at the receptor that would meet the ENC. For this assessment, the approach has incorporated the inclusion of the BS 4142:1997 rating penalty.

8.53 As it is possible that building services plant may operate during the night, measured night-time background noise levels have been used as a basis for setting the ENC. In addition, some indicative calculations for roof level plant have been made along with professional judgement in order to evaluate suitable emission levels of building services plant. This approach has not been possible for ground level plant due to the distribution of plant around the building and the site.

Significance Evaluation Methodology

8.54 The determination of significance in EIA is based on the sensitivity of a particular receptor (which depends on local circumstances and the type of receptor), as well as the magnitude of change in noise levels (which is related to existing background or ambient noise levels and predicted noise levels due to the development). The actual noise level (i.e. the predicted future noise level) would also influence the determination of significance, since it may either exceed or comply with relevant guideline noise limits, irrespective of the amount of change predicted.

8.55 The determination of significance also takes into account the duration and frequency of occurrence of the noise effect. For example, a particular noise level which is considered to result in significant effects if it is due to a permanent noise source which operates frequently for long durations may be considered to result in no significant effects if it occurs infrequently for short periods.

Noise Sensitivity

8.56 PPG24 focuses on residential properties as being noise sensitive, although it does cite developments such as offices, hospitals and schools as containing buildings and activities that are potentially noise sensitive. PPG24 does not

differentiate between these uses in terms of the degree of sensitivity to noise, however the WHO guidelines does introduce such a concept.

8.57 The significance evaluation methodology developed for this project recognises that receptors have differing sensitivities to noise, and has assigned high, medium and low sensitivities accordingly.

8.58 Patients in hospitals, hospices or other healthcare facilities represent the receptors with the highest sensitivity to noise. The WHO guidelines state that 'patients have less ability to cope with stress' and identifies people with particular diseases, medical problems and people in hospitals as 'vulnerable subgroups'. These receptors have therefore been assigned a sensitivity of 'high'.

8.59 Residential properties are also recognised as being noise sensitive, but since it is assumed that they are occupied by members of the general population, they are considered less sensitive than patients in hospitals etc. Residential properties have therefore been assigned a sensitivity of medium. Whilst the occupants of proposed offices are considered to be less sensitive than typical residential properties, a sensitivity of 'medium-low' has been assigned to recognise the requirement that occupants would require suitable conditions to undertake work requiring concentration. Places of worship have also been assigned a sensitivity of medium to recognise the importance of tranquillity for some activities at these receptors. Schools and other community facilities (including churches) would also be assigned a sensitivity of medium since tranquillity is also an important part of certain activities at these locations.

8.60 PPG24 also notes that special consideration may need to be given to designated areas such as National Parks, Areas of Outstanding Natural Beauty, and Sites of Special Scientific Interest. Recreational users of these areas have been assigned a medium sensitivity to recognise the importance of tranquillity to the enjoyment of such areas.

8.61 Many commercial and industrial premises would normally be considered to be of a low sensitivity. This designation recognises that these premises are often considerable sources of noise in themselves.

Noise Magnitude

8.62 The magnitude of change in noise terms is determined by two key factors, i.e. the amount of increase (or decrease) in noise levels due to the development, and the total amount of noise that will occur (or has been predicted to occur).

8.63 In terms of the amount of change in noise levels, this will only potentially become significant if the change is perceptible. Table 48 presents the categories of noise change in terms of perceptual change.

Change in Noise Level dB(A)	Response
< 3	Difficult to perceive
> 3	Perceptible
10	Up to a doubling of perceived loudness
> 10	Over a doubling of perceived loudness

Table 48 Changes in Noise Level

8.64 With respect to the total amount of noise that would be potentially significant in a given development situation, magnitude takes into account noise levels and limits outlined in the relevant guidance documents.

8.65 Since the noise calculations undertaken for this assessment have been based on worst-case assumptions, it would be inappropriate to conclude that a high magnitude of effect has arisen simply because the relevant guideline limits have been exceeded. The apportionment of magnitude from low to high has therefore taken this situation into account by applying an element of professional judgement and this is guided by the amount that the predictions exceed the limits, together with the duration of the effects. Table 49 therefore provides a summary of how noise magnitude will be determined for this assessment.

Magnitude	Low	Medium	High
Construction Phase			
Existing residential areas affected by construction noise	Construction noise levels below 65 dB $L_{Aeq,12h}$, and total noise levels less than 10dB(A) above pre-construction ambient noise levels.	Construction noise levels below 65 dB $L_{Aeq,12h}$, and total noise levels more than 10dB(A) above pre-construction ambient noise levels OR Construction noise levels greater than 65dB(A) and total noise levels more than 5dB(A) above pre-construction ambient noise levels for a period of less than one month OR Construction noise levels noise levels greater than 65dB(A) and total noise levels less than 5dB(A) above pre-construction ambient noise levels for a period of greater than one month	Construction noise levels greater than 72 dB $L_{Aeq,12h}$, OR Construction noise levels greater than 65dB(A) $L_{Aeq,12h}$ and total noise levels more than 5dB(A) above pre-construction ambient noise levels for a period of greater than one month

Magnitude	Low	Medium	High
Existing residential receptors affected by increase in road traffic noise due to construction traffic	1 dB(A) increase based on road traffic flows	1-3 dB(A) increase based on road traffic flows	3 dB(A) or greater, increase based on road traffic flows
Operational Phase			
Existing residential receptors affected by increased road traffic noise due to operation of the development.	<1 dB(A) increase on existing 18hr ambient traffic noise levels	1-3 dB(A) increase on existing 18hr ambient traffic noise levels	>3 dB(A) increase on existing 18hr ambient traffic noise levels,
Existing residential receptors affected by increased commercial and retail noise due to the operation of the development	Noise rating levels are >5 dB(A) below existing background noise (LA90) levels (BS4142)	Noise rating levels are within 5 dB(A) of existing background noise (LA90) levels (BS4142)	Noise rating levels would result in a >5 dB(A) increase on existing background (LA90) noise levels

Table 49 Summary of Noise Magnitude Criteria

8.66 As stated previously, significance is related to sensitivity and magnitude. Table 50 presents a matrix which shows the interaction between sensitivity and magnitude, and how this has been used to determine the significance of any noise effects. Those criteria shaded indicate significant effects.

Magnitude	Sensitivity		
	High	**Medium**	**Low**
Low	Moderate / Minor	Minor	Negligible
Medium	Major	Moderate / Minor	Minor
High	Major	Major	Moderate / Minor
Note:- Shaded cells represent likely Significant Effects			

Table 50 Significance of Impacts – Noise and Vibration

Baseline Conditions

Site Visit

8.67 The current baseline environment was observed during a site visit on the 6th May 2009. This was followed by two noise surveys undertaken on 8th June and 12th June 2009.

Baseline Noise Surveys

8.68 Noise surveys have been undertaken during daytime and night-time periods within and around the development site at the locations presented in Figure 1

(Technical Appendix 8.5). The location and duration of the noise monitoring and type assessment methodology was discussed and agreed with the Public Pollution Officer for Manchester City Council during the scoping exercise. The surveys were of long enough in duration at points close enough to identified receptors to ensure they were representative of the current noise environment.

8.69 The monitoring consisted of daytime and night-time unmanned monitoring at the junction of Dantzic Street and Angel Street outside the Liberty Court student apartment complex, and at the junction of Naples Street outside residential apartments. The monitoring was undertaken in order to ascertain the existing background noise levels.

8.70 Further manned 15-minute measurements were taken in accordance with the shortened measurement procedures as detailed in CRTN at the junction of Miller Street and Rochdale Road. This was conducted during the day-time.

8.71 A summary of the noise levels measured at the three locations during the survey periods is listed below in Table 51. Full details of the noise surveys can be found in Technical Appendix 8.1.

Location		Day / Night	Date	Time Period (00:00hrs)	$L_{Aeq, T}$ (dB)	L_{Amax} (dB)	$L_{A10, T}$ (dB)	$L_{A90, T}$ (dB)
1	Student Accommodation at Junction of Angel Street and Dantzic Street	Daytime	09/06/2009	11:00-14:00hrs	58.9	61.4	59.1	53.4
		Night-time	12/06/2009	02:00-04:00hrs	51.3	51.5	49.7	45.9
2	Residential Apartments at Junction of Naples Street and Angel Street	Daytime	08/06/2009	11:00-14:00hrs	60.9	59.2	56.8	51.1
		Night-time	12/06/2009	02:00-04:00hrs	48.5	49.0	47.3	44.1
3	Junction of Miller Street and Rochdale Street	Day-time	08/06/2009	11:08-13:41hrs	76.9	98.2	72.0	63.1

Table 51 Summary of Noise Levels at the Development Site and Surrounding

8.72 Noise levels at locations 1 and 2 were taken using two Rion NL-31 Class 1 integrating sound level meter (SLM) with the microphone positioned 1.2-1.5m above ground level in façade conditions (non-free field). The meter was calibrated before and after the measurement using a Rion Sound Calibrator NC-74. No significant drift was observed.

8.73 Noise levels at location 3 were taken using a B&K 2250 integrating sound level meter (SLM), mounted on a tripod, with the microphone positioned at a height of 1.2-1.5m above the ground. The measurements were taken in free-field conditions. Before and after the measurements, the meter was calibrated using a B&K Type 4231 calibrator. No significant drift was observed.

8.74 All measurements were conducted, where possible, in accordance with British Standard BS 7445-1:2003 *"Description and measurement of environmental noise. Guide to quantities and procedures."* Calibration certificates are provided in Technical Appendix 8.2.

8.75 The noise environment during the surveys was judged to be dominated by road traffic noise from the A665 and A664 at all sides of the site. Additional noise sources on the Dantzic Street side of the site included occasional railway noise from the nearby Manchester Victoria Rail-line and road traffic movements along Corporation Street. Noise from aircraft flying over flights was occasionally observed. The noise environment during the daytime was typical of a busy city centre.

8.76 The main noise sources at the junction of Angel Street and Dantzic Street were road traffic and car pass-bys travelling down Corporation Street and Dantzic Street respectively. Noise from parking up and car doors in the adjacent car-park located on the development site were also observed but were not considered to be dominant.

8.77 At the junction of Naples Street and Angel Street the main observed noise sources were from people talking and walking past the meter, sirens from emergency vehicles travelling down Rochdale Road and from cars turning out of Naples Street. Additional noise at the two monitoring points was from railways noise from the Manchester Victoria Line.

8.78 During the night-time period the dominant noise source was road traffic along Miller Street and Rochdale Street, and occasional use of Dantzic Street and Angel Street. The dominant sound level at the junction of Miller Street and Rochdale Road was road traffic with occasional emergency vehicle sirens. Further sources of noise included loud car stereos from cars idling at the junction lights before turning onto Miller Street and people walking past talking.

Impact Assessment

Construction Phase

Fixed and Mobile Plant

8.79 Noise calculations have been made for receptors at the Liberty Court 1 student accommodation at the junction of Aspin Lane and Dantzic Street; and the residential apartments along Angel Street.

8.80 Tables 52 and 53 present the construction noise assessment for both receptors and each of the construction intervals listed previously. The noise levels have been calculated at top floor level in order to represent a worst-case in terms of barrier screening as these apartments are likely to have an unobstructed view into the development site during construction. All pre-construction ambient levels have been reduced by 3 dB(A) in order to reflect

free-field conditions. Predicted construction ambient noise levels are also representative of free-field conditions.

Construction Interval	Month(s)	Pre-Construction Ambient $L_{Aeq\ 12hr}$ (dB)	Predicted Construction Ambient $L_{Aeq\ 12hr}$ (dB)	Total Ambient $L_{Aeq\ 12hr}$ (dB)	Total Ambient minus Pre-construction Ambient $L_{Aeq\ 12hr}$ (dB)
A	1	56	67	67	11
B	2	56	67	67	11
C	3	56	72	72	16
D	4	56	73	73	17
E	5-6	56	73	73	17
F	7-10	56	69	69	13
G	11-15	56	69	69	13
H	16-18	56	69	69	13
I	19-22	56	64	65	9
J	23-26	56	63	64	8

Table 52 Construction Noise Assessment - Location 1: Liberty Court 1 Student Accommodation

Construction Interval	Month(s)	Pre-Construction Ambient $L_{Aeq\ 12hr}$ (dB)	Predicted Construction Ambient $L_{Aeq\ 12hr}$ (dB)	Total Ambient $L_{Aeq\ 12hr}$ (dB)	Total Ambient minus Pre-construction Ambient $L_{Aeq\ 12hr}$ (dB)
A	1	56	67	67	11
B	2	56	67	67	11
C	3	56	72	72	16
D	4	56	73	73	17
E	5-6	56	73	73	17
F	7-10	56	69	69	13
G	11-15	56	69	69	13
H	16-18	56	69	69	13
I	19-22	56	64	65	9
J	23-26	56	63	64	8

Table 53 Construction Noise Assessment - Location 2: Angel Street Apartments

8.81 The results of the assessment show that noise levels at each receptor may be equal to or exceed 72 dB $L_{Aeq\ 12hr}$ during months 3-6 of construction. Based on the construction plant list presented in Technical Appendix 8.3, these levels occur during times at which the site is most active in terms of the average number of plant on site. The tables also show that apart from months 19-26 of

construction, noise levels from construction are greater than 65 dB(A).

8.82 Using the information and analysis presented in Table 52 and 53 above, the significance of noise from fixed and mobile construction plant can be determined using the methodology set out previously. Table 54 and 55 present a conclusion of significance for each month of construction for locations 1 and 2. As locations 1 and 2 are of residential use, these have been determined to be of medium sensitivity. The impact is therefore considered to be **major** (**adverse**) however not lasting as the duration of the effects would be limited to the construction period.

Construction Interval	Month(s)	Magnitude	Rational	Significance
A	1	High	Construction noise levels greater than 72 dB(A) $L_{Aeq,\ 12hr}$ during months 3-6 and construction noise levels greater than 65dB(A) $L_{Aeq,12h}$ and total noise levels more than 5dB(A) above pre-construction ambient noise levels for a period of greater than one month throughout months 1 to 18	Significant
B	2			
C	3			
D	4			
E	5-6			
F	7-10			
G	11-15			
H	16-18			
I	19-22	Low	Construction noise levels below 65 dB $L_{Aeq,12h}$, and total noise levels less than 10dB(A) above pre-construction ambient noise levels.	Not Significant
J	23-26			

Table 54 Construction Noise Assessment - Significance - Location 1: Liberty Court 1 Student Accommodation

Construction Interval	Month(s)	Magnitude	Rational	Significance
A	1	High	Construction noise levels greater than 72 dB(A) $L_{Aeq,\ 12hr}$ during months 3-6 and construction noise levels greater than 65dB(A) $L_{Aeq,12h}$ and total noise levels more than 5dB(A) above pre-construction ambient noise levels for a period of greater than one month throughout months 1 to 18	Significant
B	2			
C	3			
D	4			
E	5-6			
F	7-10			
G	11-15			
H	16-18			

Construction Interval	Month(s)	Magnitude	Rational	Significance
I	19-22	Low	Construction noise levels below 65 dB $L_{Aeq,12h}$, and total noise levels less than 10dB(A) above pre-construction ambient noise levels.	Not Significant
J	23-26			

Table 55 Construction Noise Assessment - Significance - Location 2: Angel Street Apartments

8.83 The conclusions of significance as presented in Table 54 and 55 for locations 1 and 2 respectively show that noise from fixed and mobile construction plant is significant between months 1-18 of construction. The impact is therefore **major** (**adverse**) however not permanent as the duration of the effects would be limited to the construction period.

8.84 Although the outcome of the assessment has determined that during these months, construction noise would be significant, it should be noted that a full construction methodology was unavailable at the time of the assessment. In addition, the assessment presented in this Chapter has been underpinned by assumptions that may or may not accurately reflect the approach that would be set out within the final construction method statement. Furthermore the calculations do not consider potential mitigation measures such as site hoarding or soil bunds, nor do they consider the potential topographic changes to the site during the construction period or the exact location of plant. As such, the results of the assessment should be viewed within that context.

8.85 In addition, because a particular piece of plant or equipment is considered to be located on site for a period of, for example 3 months, it does not necessarily follow that this equipment would be in actual operation for that entire length of time. Therefore some degree of caution should also to be applied to the estimated periods over which any potential significant effects may occur. It should also be noted that it is understood that the majority of construction would occur between 0700-1900hrs during weekdays albeit it is understood there may be a requirement to work outside of these hours or at the weekend.

8.86 In summary, the assessment has identified potential for significant noise effects over an 18 month duration between month 1 and 18 of the construction programme.

Construction Traffic

8.87 Technical Appendix 8.4 presents the percentage of construction traffic on local roads surrounding the site with respect to current baseline traffic flows based on an estimated 84 vehicle movements associated with construction of the proposed development. It shows that for the main local roads surrounding the development, construction traffic would typically make up less than 4% of the total road traffic. For more heavily trafficked roads such as Rochdale Road and

Miller Street, construction traffic would make up less than 1% of the total road traffic flows.

8.88 For roads surrounding the site, construction traffic makes up a greater percentage of the total traffic volume and the increased volume of HGVs on these roads may result in increased noise levels at residential dwellings on Angel Street, Aspin Lane and Dantzic Street. In order to fully assess the impact of these increased HGV movements. Technical Appendix 8.4 also presents the change in BNL for each month of construction with respect to current BNLs.

8.89 The Assessment shows that for East Angel Street, the BNL of the road is between 2-4 dB(A) above current levels as a result of construction traffic however there are no residential dwellings at this end of Angel Street. To the west of Angel Street, the table shows that the BNL of the road will increase by 1-3 dB(A) as a result of construction traffic. This increase may be experienced by residential receptors at location 2.

8.90 For Dantzic Street, the BNL of the road has increases by in excess of 7 dB(A) throughout the construction programme. To the north of Dantzic Street, the increase in BNL with respect to existing BNL is around 9 dB(A). These increases may be experienced by the residents of Liberty Court 1 at the junction of Dantzic Street and Aspin Lane. It is understood that the entrance to the site will be at this junction and therefore directly across from Liberty Court.

8.91 When considering the change in road traffic noise at Liberty Court 1 as a result of construction traffic, a magnitude of high has been assigned. When combined with the medium sensitivity this receptor, it is concluded that the impact of road traffic noise as a result of construction traffic would be significant giving a **major** (**adverse**) impact.

Operational Phase

Road Traffic Noise

8.92 Noise calculations have been made for receptors at the Liberty Court 1 student accommodation at the junction of Aspin Lane and Dantzic Street, and the residential apartments along Angel Street.

8.93 Table 14 presents the $L_{A10\ 18\text{-}hour}$ noise levels at each receptor and the predicted increase as a result of the development. Figures 2 and 3 (Technical Appendix 8.5) present noise maps of the $L_{A10\ 18\text{-}hour}$ road traffic noise in the vicinity of the site. Figure 4 (Technical Appendix 8.5) presents the change in road noise traffic noise as predicted as a result of the development. All calculations have been made at ground floor level.

	Location 1 Liberty Court 1 $L_{A10\ 18\text{-hour}}$ (dB)	Location 2 Apartments on Angel Street $L_{A10\ 18\text{-hour}}$ (dB)
Baseline	55.2	62.8
Development	57.4	63.8
Difference	+2.2	+1.0

Table 56 18-hour Road Traffic Noise Levels at Locations 1 and 2

8.94 The table shows that for the two locations, road traffic noise is likely to increase by 1-3 dB(A) as a result of the development. This change is reflected in noise map resented in Figure 4 (Technical Appendix 8.5) which identifies changes of 0-3 dB(A) along Angel Street and Aspin Lane. Figure 4 also shows that road traffic noise is likely to reduce along towards at the north of Dantzic Street despite there being a decrease in road traffic as a result of the development to the immediate west of the proposed building. Further investigation has identified that this reduction is due to the screening effect of to proposed development from road traffic noise on Rochdale Road and Miller Street.

8.95 When considering the change in road traffic noise at Liberty Court 1 and the apartments on Angel Street, a magnitude of medium has been assigned. When combined with the medium sensitivity of the receptors, it is concluded that the impact of road traffic noise would be **minor - moderate** (**adverse**) and therefore not significant.

Building Services Plant

8.96 Operational noise effects from building services plant are assessed in this section. The assessment begins by calculating the maximum permissible level from all building services plant associated with the development in order to meet the criterion set by MCC. Table 57 presents the calculation of this level with reference to MCC criteria, background noise levels measured at locations 1 and 2 and BS 4142:1997.

	Location 1 Liberty Court 1	Location 2 Apartments on Angel Street
Measured Night-time Background Noise Level (L_{A90})	46 dB	44 dB
MCC Target Level for Building Service Plant (i.e. 5 dB below background)	41 dB	39 dB
Environmental Noise Criteria dB(A) as a Rating Noise Level	**41 dB(A)**	**39 dB(A)**

Table 57 Calculation of ENC for Building Services Plant

8.97 The calculation of the ENC in Table 15 shows that building services plant should be designed to ensure that the rating noise level at locations 1 and 2 should not exceed 41 dB(A) and 39 dB(A) respectively.

8.98 In relation to roof mounted plant, this would mean that all plant working simultaneously should not exceed a noise level of approximately 60 dB(A) at 10 metres. Based on data held on file by Entec for such items of roof top plant, it is understood that many items plant such as Air Handling Units can produce noise levels of less than 40 dB(A) at 10 metres. Additionally, items of plant such as extract fans often typically produce noise levels of less than 50 dB(A) at 10 metres.

Mitigation Measures

8.99 Mitigation measures will be used to reduce or eliminate significant effects, where necessary. The following sections outline suitable mitigation measures that should be considered during both the construction and operational phases of the development.

Construction Phase

8.100 Construction works, such as those which will be involved in the implementation of the proposed development, are often characterised by increases in ambient noise levels which may result in temporary disturbance to nearby sensitive receptors.

8.101 It would be prudent to undertake a further more detailed construction noise assessment for the site once a final method statement for the site has been produced in order to inform the construction methodology. Such an assessment could be formalised through a suitably worded planning condition. This would allow appropriate noise mitigation measures to be specified and formally incorporated into the final scheme through, for example, a construction environmental management plan. Examples of such measures may include:-

1 Use of plant fitted with effective silencers and noise insulation;

2 Use of SMART reversing alarms to reduce the effect of reversing bleepers on site vehicles;

3 All plant to be regularly serviced, maintained and operated in accordance with manufacturer's instructions. Machines that are intermittently used should be shut down in the intervening periods between work or throttled down to a minimum;

4 Erection of site hoardings, to act as noise barriers to ground level sources reducing emissions to nearby noise sensitive receptors;

5 Appointment of a site contact to whom complaints/queries about construction activity can be directed. Any complaints to be investigated and

action taken where appropriate;

6 All construction activity to be undertaken in accordance with good practice as described in BS 5228; and,

7 Routing of HGVs to be agreed with the Local Authority.

8.102 The mitigation scheme used on the development would need to be sufficiently developed to ensure that noise emissions from the site complied with the guidance set out in Annex E of BS 5228-1:2009 at all nearby noise sensitive residential receptors.

8.103 It is also recommended that the site register within a Considerate Constructors scheme, preferably endorsed by the Local Authority. There are several examples of such schemes sites within Manchester City Centre. Such schemes encourage good practice on construction sites. Additionally, the site should where practically possible adhere to guidance offered by Manchester City Council. Briefly, this guidance recommends that contractors (and subcontractors) inform local residents prior to work commencing and provide contact details. The guidance also specifies that the construction work should normally take place between the following hours:-

1 Monday – Friday: 0730 – 1800hrs;

2 Saturday: 0830 – 1400hrs; and,

3 Sunday / Bank Holidays: No construction works.

8.104 The guidance also states that for Monday to Saturday works, contractors may arrive up to 30 minutes earlier however no work should take outside of these hours. If work during any of these periods is required to meet specific demands, consultation with the Local Authority should be undertaken in advance, with the purpose of seeking appropriate agreement and identifying the means of noise control. Local residents will be advised of these normal hours of operation, and of any necessary alterations to them.

8.105 Alternatively, implementation of mitigation for construction noise could be the subject of a 'Prior Consent' Agreement under Section 61 of the Control of Pollution Act 1974 (CoPA). These consents allow the contractor/developer and the Local Authority to agree an appropriate noise management strategy prior to the commencement of works, which may include restrictions on noisy activities, working times, type of construction technique/plant used, etc.

8.106 The Contractor cannot then be subject to enforcement action under S60 of the Act as long as the Agreement is complied with. The Agreement should form part of the legal arrangements between the developer and the contractor, since the ability to comply with the Agreement rests with the Contractor. Adoption of this approach has formed the basis for construction work to proceed on numerous developments close to noise sensitive receptors.

8.107 It should be noted that the construction phase of the development is of a fixed duration only and working hours will be controlled through agreement with the local planning authority. As such, any effects noise and vibration effects would not be permanent.

8.108 The mitigation measures proposed will reduce the degree of impact felt by sensitive receptors, however, until the level of mitigation has been agreed between the contractor and the local authority, its effectiveness cannot be quantified.

Operational Phase

8.109 No mitigation measures are recommended for operational road traffic noise effects associated with the development.

8.110 In terms of operational noise effects from building services plant, the following recommendations are made in order to ensure that the ENC noise rating levels of 41 dB(A) and 39 dB(A) at locations 1 and 2 can be met during the night-time and to make the noise impact minimal:-

1 Use of “low noise” chiller plant with quiet fans and enclosed compressors;

2 Use of air handling units with double skin insulated casings and primary attenuators on inlets, exhausts, supply and return air connections;

3 Consideration of a noise barrier or enclosure for any ground level or roof based building services plant;

4 Use of acoustic louvres on inlet and outlets for plant ventilation systems;

5 Use of appropriately specified silencers on cooling stacks and boiler flumes;

6 Mounting of building service plant on anti-vibration resilient mounts; and,

7 Use of low speed fans.

8.111 The inclusion of these measures would be likely to reduce impacts to **minor** (**adverse**) levels and therefore not of significance.

Summary of Residual Impacts

8.112 Table 58 presents a summary of residual noise impacts associated with the development.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Contraction Noise from Fixed and Mobile Plant	Significant effects identified	'Medium' Residential Receptors on Aspin Lane and Angel Street	'High' between months 1 and 18 of the construction programme	18 months (between month 1 and month 18 of the construction programme)	Direct	Major adverse – detailed mitigation to be agreed between contractor and local authority which will reduce impacts	Significant	Medium, indicative predicted noise levels only since detailed construction methodology unavailable at time of assessment
Construction Traffic Noise	No significant effects identified	'Medium' for Residential Receptors on Angel Street 'Medium' for Residential Receptors at Junction of Dantzic Street and Aspin Lane (Liberty Court 1)	'Medium' 'High'	Throughout construction programme	Direct	Major adverse – detailed mitigation to be agreed between contractor and local authority which will reduce impacts.	Not Significant Significant	Medium, assessment undertaken within limitations of forecasts from traffic model. In addition, CRTN assessment methodology used outside normal range of validation
Operational Phase								
Operational Road Traffic Noise	No significant effects identified	'Medium' Residential Receptors on Aspin Lane and Angel Street	'Low'	Permanent	Direct	Minor – moderate adverse	Not Significant	High, assessment based on assumption that ENC can be achieved
Operational Noise from Building Services Plant	No significant effects identified	'Medium' Residential Receptors on Aspin Lane and Angel Street	'Low'	Permanent	Direct	Minor adverse	Not Significant	High, assessment based on assumption that ENC can be achieved

Table 58 Summary of Residual Impacts – Noise and Vibration

Cumulative Effects

8.113 There are no cumulative effects to be considered as part of the assessment.

References

Department of the Environment, Planning Policy Guidance, PPG 24, Planning and Noise, 1994;

Manchester City Council, (1995) *Unitary Development Plan.* July 1995;

British Standards Institute, British Standard 5228: Code of Practice for noise and vibration control on construction and open sites. Part 1 - Noise (BS5228), 2009;

Department for Transport, Calculation of Road Traffic Noise, HMSO 1988;

Highways Agency, Design Manual for Roads and Bridges Volume 11, 2008;

British Standards Institute, British Standard BS4142: Method for Rating Industrial Noise in Mixed Residential and Industrial areas, 1997;

International Organisation for Standardisation, International Standard ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2 – General method of calculation, 1996;

World Heath Organisation, Guidelines for Community Noise, 2000;

British Standards Institute, British Standard BS7445-1: Method for Rating Industrial Noise in Mixed Residential and Industrial areas, 1997.

9.0 Daylight and Sunlight Effects

Introduction

9.1 This chapter examines the impact of the proposed Co-op Head Office at Miller Street, Manchester on the Daylight and Sunlight enjoyed by neighbouring residential properties. These findings are assessed in terms of the legislative context relating to the proposed scheme. The relevant residential properties are located along Dantzic Street to the north-west and Angel Street to the north east of the site. The properties to the south of the site on Miller Street are commercial and therefore are not of concern.

9.2 This chapter should be read in conjunction with Technical Appendix 9.1 Sunlight and Daylight Impacts.

Policy Context

Development Plan Guidance

9.3 The statutory development plan for the site comprises the adopted North West of England Regional Spatial Strategy to 2021 (September 2008) and the adopted Manchester Unitary Development Plan (1995).

North West of England Regional Spatial Strategy to 2021 (2008)

9.4 The RSS contains no specific policies relating to the daylight and sunlight effects of development. However, Policy DP7 seeks to protect and enhance environmental quality especially by promoting good quality design in new development; maximising opportunities for the regeneration of derelict or dilapidated areas; and assessing the potential impacts of managing traffic growth and mitigating the impacts of road traffic on air quality, noise and health amongst other things.

Manchester UDP (1995)

9.5 The Council seeks to maintain environmental quality by controlling development. There are no specific policies in the UDP relating to the effects of development on daylight and sunlight.

National Planning Guidance

PPS1:- Delivering Sustainable Development (2005)

9.6 PPS1 states that *"The Government is committed to protecting and enhancing the quality of the natural and historic environment, in both rural and urban areas. Planning policies should seek to protect and enhance the quality, character and amenity value of the countryside and urban areas as a whole."* [¶17]

English Heritage/CABE- Guidance on Tall Buildings (2007)

9.7 The joint English Heritage/CABE guidance, originally published in 2003, was reviewed and updated in July 2007. The document provides guidance and advice on good practice in the planning system relating to the development of taller buildings. In particular, it states that development schemes need to address the "*effect on the local environment including microclimate, overshadowing, night-time appearance, vehicle movements and the environment and amenity of those in the vicinity of the building.*" [¶4.1.9]

Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice (1991)

9.8 In the absence of detailed local policy, it is usual to assess Daylight, Sunlight and Overshadowing in relation to the guidelines set out in the Building Research Establishment [BRE] Report. This document was largely based on the guidance contained within 'British Standard 8206 Part 2', although this document itself has recently been superseded by its 2008 counterpart BS 8206-2:2008.

Supplementary Planning Guidance

Guide to Development in Manchester SPD and Planning Guidance (2007)

9.9 The City Council's SPD, 'Guide to Development in Manchester' was adopted in April 2007 and was produced to guide the preparation of design and access statements and expand on UDP policies. It sets out the City Council's stance on a wide range of issues.

9.10 The SPD [¶2.14-2.15] states that building height is to be carefully considered particularly in relation to established residential areas and also in respect of microclimatic issues.

Potential Impacts

Construction Impacts

9.11 There will be no construction impacts from the development on daylight and sunlight.

Operational Impacts

9.12 The proposed development has the potential to reduce the daylight and sunlight in neighbouring buildings and overshadow external areas.

9.13 The sensitive receptors are the nearby residential properties and garden amenity space. To the north east there are residential apartment blocks at 10 Naples Street and 21 Naples Street. Both properties have frontages on Angel Street that face the site. To the north west there is residential student accommodation at 83-85 Dantzic Street and a flat above a shop at 4 Aspin Lane. There is a public garden adjacent to St Michaels Square with a frontage

to Angel Street which is considered in relation to overshadowing.

Assessment Methodology

Approach

9.14 The study covers daylight and sunlight effect on nearby residential properties. Overshadowing is considered in relation to nearby gardens and amenity spaces.

9.15 In order to calculate the various BRE measures of daylight and sunlight – a 3d CAD model was constructed. The model contains the buildings immediately surrounding the site and the existing buildings on the site, and it is created so as to reproduce the massing of the buildings, at a level of detail appropriate to the calculations performed.

9.16 The light levels in the surrounding properties are first calculated in the presence of the existing buildings. A model of the proposed building is then inserted in place of the existing buildings, and the light levels in the surrounding properties are again calculated.

9.17 The BRE criteria for the various measures of daylight and sunlight can then be applied to the existing and proposed light levels so obtained. The calculations are performed using a specialist software package - 'SOL for AutoCAD'. This package was developed by Waterslade Ltd as an implementation of the BRE guidelines, and is used to calculate the various BRE measures of daylight. It has been in use in the field since 1993 and has been used on some of the largest developments in the UK.

Methodology

9.18 The Vertical Sky Component (VSC) is the simplest measure of diffuse daylight. It is a measure of the amount of skylight incident on a vertical plane (i.e. light from the sun that is diffused by the atmosphere). It is most commonly applied to the measurement of light reaching the centre of a window, and in this sense is a measure of the potential for good daylighting.

9.19 The VSC is calculated by taking the ratio of the skylight incident at a point to the unobstructed skylight available on a horizontal plane. For a uniform sky, the maximum value is 50% (since the point is on a vertical plane, clearly only the half of the hemisphere which is in front of the plane can contribute). However, the BRE specify that a Commission International de l'Eclairage (CIE) sky model should be used. This is a non uniform representation of the sky where the brightness at the zenith is twice that at the horizon. For a CIE sky, the maximum value is 39.6%, and this is due to the non-uniform nature of the CIE sky. The maximum figure is less than 50% since, although the CIE sky model is much brighter at the zenith, light from this direction is less able to illuminate a vertical surface due to the shallow angle at which it strikes the window.

9.20 The No-Sky Line [NSL] is a measure of the distribution of diffuse daylight within a room. It simply follows the division between those parts of a room that can receive some direct skylight from those that cannot. If from a point in a room on the working plane (a plane 850mm above the floor) it is possible to see some sky then that point receives light directly from the sky and will lie inside the No-Sky Line contour. Conversely, if no sky is visible from that point then it would lie outside the contour.

9.21 The Average Daylight Factor [ADF] is a measure of daylight within a space. It can be used to establish whether a room will have a predominantly daylit appearance by reference to the BRE and British Standard guidelines figures. ADF values can be calculated for rooms within a proposed development and checked against the recommended value. Existing and Proposed ADF values can also be calculated for properties which overlook a site.

9.22 In the BRE guidelines, a simple formula is given to calculate the ADF. This is an approximation and is appropriate for simple situations where the room is relatively box-like, the windows are small in relation to the room and the external obstructions can be roughly approximated by a single angle of elevation. For instance, windows facing in to a courtyard, or covered by a balcony would not be accurately accounted for by the formula.

9.23 The factors in the simple formula on which the ADF depends are: the Total Window Area, Total Wall Area, Wall Reflectance and Window Transmittance. The ADF also depends on a simple angle factor, which for a uniform obstruction is the angle of visible sky. For non-uniform skylines, this must be derived from the VSC at the window. The BRE and BS 8206 Part 2 state that the VSC in this case must be calculated on the inner plane of the wall containing the window. This VSC is then translated to an effective angle of visible sky, as described in the BRE guide. In the analysis, we have used a Wall Reflectance of 0.5, and a Window Transmittance of 0.65 (appropriate to typical double glazing) and have allowed for an 8% maintenance factor (resulting in a multiplying factor of 0.92) – typical of an urban location, and this gives an overall effective glazing transmittance of 0.6.

9.24 Annual probable sunlight hours [APSH] is a measure of sunlight received at a window. It is a measure of the average number of hours of sunlight one would expect to receive at a given position, as a fraction of the unobstructed total number of hours at the same location. The BRE has compiled data sets consisting of a statistical sample of solar positions convolved with local meteorological data. Using these to calculate APSH, the number of solar positions visible from a point is simply calculated, compared to the total number, and expressed as a percentage.

9.25 In relation to overshadowing, the BRE guidelines recommend the 'Permanent Shadow' test. This test involves testing for areas within an amenity space which receive no direct sun light on March 21st. In order to do this, the area of interest is subdivided into a grid. At each grid point, the sun is tracked across

the sky in 1 minute intervals on March 21st, and a test is performed each minute to see if the sun reaches that point. If it does at any time, then the point is not in permanent shade. The points which don't see the sun on March 21 are then highlighted, and the area of permanent shade is calculated.

Significance Evaluation Methodology

9.26 In terms of the effect upon neighbouring properties, the BRE guidelines state that 'If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25 degrees to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if either: the VSC at the centre of a window is less than 27%, and less than 0.8 times its former value, or the area of the existing room which can receive direct skylight is reduced to less than 0.8 times its former value'.

9.27 There are no specific BRE criteria for reduction in ADF within neighbouring properties if a proposed development were to be implemented, but in Appendix C it states that *"if the VSC is reduced from 30% to 24% (0.8 times its former value)…the ADF is reduced to 0.86 times its former value."* This implies that if up to a 20% reduction in VSC is acceptable, then up to a 14% reduction in ADF would also be acceptable. In practice, the relationship between VSC and ADF is more complicated but the above holds to be approximately true over a range of values.

9.28 In relation to sunlight, the BRE report states that for windows within a new development, if a point at the centre of a window on the plane of the inside surface of the wall *"…can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable hours during the winter months between 21st September and 21st March, then the room should still receive enough sunlight."* For windows in surrounding properties which experience a change in APSH, it goes on to say that, *"Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount given and less than 0.8 times their former value, either over the whole year or just during the winter months, then the occupants will notice the loss of sunlight."*

9.29 In relation to Permanent Shadow, the test is described in the BRE guidelines as follows:-

> *"it is suggested that no more than two-fifths, and preferably no more than a quarter, of any of the listed amenity areas should be prevented by buildings from receiving any sunlight at all on 21 March. If as a result of new development, an existing garden or amenity area does not meet these guidelines, and the area which can receive some sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable."*

9.30 In relation to daylight and sunlight within the proposed development, the recommended measures of daylight and sunlight are ADF and APSH respectively.

9.31 The BRE guidelines state that:-

> *"if a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2.0% for kitchens, 1.5% for living rooms and 1% for bedrooms."*

9.32 We also note that the BRE guidelines state that:-

> *"…all main living rooms of dwellings … should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block out too much sun."*

9.33 In any scheme, given the usual site constraints and proximity of neighbouring buildings, it is inevitable that some particular windows or rooms will fall short of the guideline figures – particularly in urban locations. However, daylight and sunlight is one of a number of factors to be considered in designing a building. Often it needs to be balanced with energy efficiency considerations, or the provision of external balcony space.

9.34 In the introduction, the BRE guide itself urges that the guidelines be interpreted flexibly:-

> *"The advice given here is not mandatory……Although it gives numerical guidelines these should be interpreted flexibly…..For example in an historic city centre a higher degree of obstruction may be unavoidable…."*

Significance of Impacts

9.35 In the context of the above guidelines table 59 below provide a summary of the classification of the significance of the impacts. The BRE assessment criteria consider the retained level of light as well as the proportional reduction and therefore the evaluation of the significance of the effects reflects this. For example, if the retained daylight (as measured by VSC) is above a certain level then the percentage loss caused by the scheme is not relevant. Conversely if there is no loss of light then the retained level is not relevant. All effects relating to daylight and sunlight are localised.

Significance	Effect
Negligible	No measurable effect is expected to occur as a result of the development
Minor	Effects are small scale (localised) and/or are a low environmental hazard. The reduction of daylight is either small or the retained levels of daylight or sunlight are reasonable for the location.

Significance	Effect
Moderate	Effect represents a medium level of environmental impact. The reduction in daylight or sunlight is significant but the retained values are reasonable for the location.
Major	Effects represent a major environmental impact. The reduction in daylight or sunlight is large and the retained levels are low for the location.

Table 59 Significance of Impacts – Daylight and Sunlight Effects

Baseline Conditions

On-site

9.36 The baseline condition on-site was as detailed in the topographical measured survey completed in April 2009. This was augmented by a site inspection on 16th June 2009. Drawings 551/01-03 in Technical Appendix 9.1 show the vacant site baseline situation. This was used to calculate the existing values of the various measures of daylight and sunlight received by nearby surrounding buildings. The results table in Technical Appendix 9.1 shows the existing levels of daylight and sunlight for each property.

Off-Site

9.37 The baseline condition off-site is the nearby surrounding properties as of 16th June 2009, and shown in drawings 551/01-03 in Technical Appendix 9.1. Although not assessed for Daylight and Sunlight, non-residential buildings must be included as they can influence the daylight and sunlight received by the residential properties.

Impact Assessment

Construction Impacts

9.38 There are no construction impacts associated with the proposed development.

Operational Impacts

9.39 The operational impacts are assessed in relation to the nearest sensitive receptors (see the drawings and results tables in Technical Appendix 9.1).

10 Naples Street

9.40 Drawing 557/08 of Technical Appendix 9.1 shows the window labelling used for this property. We were not able to obtain the internal arrangements of this property and the assumed room sizes are shown in drawings 557/12-14 of Technical Appendix 9.1 along with the No-Sky Line contours. This shows that the impact as measured by No-Sky Line is small and complies with the BRE guidelines.

9.41 The VSC reductions factors for many windows are appreciably less than the BRE guideline figure of 0.8. However, this is to be expected for a development on a vacant site since those windows which face the site currently have unusually high levels of daylight and sunlight for a city centre location. The question is therefore whether or not the retained values are reasonable and appropriate for the particular location. It can be seen from the ADF values in the proposed situation that most rooms exceed the British Standard recommended figure for a living room of 1.5%. The are a few rooms with lower figures but these are served by much smaller windows and are therefore likely to be bedrooms or bathrooms and in either case would have a lower requirement for daylight. This shows that the resulting daylight levels will be reasonable and in many cases very good.

9.42 The sunlight values to all but one are very good and comfortably will comply with the BRE guidelines. The APSH values typically between 30% and 40% are significantly in excess of the BRE suggested target figure of 25%. The one exception is on the top floor and its comparatively low value is due to it being located beneath a large eaves overhang.

9.43 The proposed development would therefore lead to a **minor** (**adverse**) impact in terms of daylight and sunlight effects.

9.44 However, if we look at the existing levels of daylight to a number of windows in Naples Street we see that these are similar to the proposed daylight levels for the windows facing the site. Given that the BRE advice that a flexible interpretation of the guidelines should be adopted, and that in a city centre higher levels of obstruction may be unavoidable, it is reasonable to use existing daylight levels in the immediate vicinity as a guide to acceptable levels of retained daylight.

21 Naples Street

9.45 Drawing 557/07 of Technical Appendix 9.1 shows the window labelling used for this property. We were not able to obtain the internal arrangements of this property and the assumed room sizes are shown in drawings 557/09-11 of Technical Appendix 9.1 along with the No-Sky Line contours. The impact of the proposed development on the principal north and south elevations of this property which face the garden and Naples Street respectively is small with VSC reduction factors of greater than 0.8 that comply with the BRE guidelines.

9.46 The windows in the flank wall elevation on Angel Street that face the site appear to serve bedrooms. The VSC reductions factors for these windows are appreciably less than the BRE guideline figure of 0.8. However, as explained above, this is to be expected for a development on a vacant site where unusually high levels of daylight and sunlight are currently available. The retained VSC values are not unusual for a city centre location.

9.47 The outer columns of windows in this elevation located adjacent to the corners

of the building serve dual aspect rooms and will therefore have access to light from windows that are not materially impacted by the development. The inner two columns appear to serve single aspect bedrooms. With the exception of these two columns of bedrooms all rooms achieve the British Standard ADF figure of 1.5% for a living room.

9.48 The proposed development would therefore lead to a **moderate** (**adverse**) impact in terms of daylight and sunlight effects.

9.49 Whilst there will therefore be significant reductions to the sunlight levels the proposed values are not unusual in a city centre location. In addition, if we look at the existing levels of daylight to many of windows in Naples Street we see that these are similar to, and in several cases lower than, the proposed daylight levels for the windows facing the site. It is therefore considered that the impact to this property is acceptable.

83-85 Dantzic Street

9.50 Drawing 557/08 of Technical Appendix 9.1 shows the window labelling used for this property. The internal arrangements of this property were obtained from planning records and are shown in drawings 557/15-17 of Technical Appendix 9.1 along with the No-Sky Line contours. This shows that the impact as measured by No-Sky Line is small and complies with the BRE guidelines.

9.51 As expected, the VSC reduction factors are less than 0.8 but since the baseline level is exceptionally high the retained levels remain very good, particularly for a city centre location.

9.52 The ADF values to seven rooms do not achieve the suggested levels in the existing situation which given that the high level of daylight availability at each windows shows that the windows are too small compared to the size of the room. Clearly this relates to the design of this property rather than the proposed development.

9.53 Whilst there will be a reduction, the retained values will be good and most windows will receive APSH totals in excess of the BRE target of 25%. Some windows will receive low winter sunlight values but this is not unsual in urban areas. For example, at midwinter the maximum elevation of the sun is only around 16 degrees which is below a typical urban skyline. Furthermore, the rooms in question are kitchens and bedrooms, which, according to the BRE, are less important than living rooms.

9.54 The proposed development would therefore lead to a **minor** (**adverse**) impact in terms of daylight and sunlight effects.

4 Aspin Lane

9.55 Drawing 557/07 of Technical Appendix 9.1 shows the window labelling used for this property. The internal arrangements of this property were obtained from

planning records and are shown in drawing 557/14 of Technical Appendix 9.1 along with the No-Sky Line contours. This shows that the impact as measured by No-Sky Line is small and complies with the BRE guidelines.

9.56 The VSC reduction factors are only slightly less than 0.8 and the retained levels of daylight are good for the location. There is no material impact to sunlight.

9.57 The proposed development would therefore lead to a **minor** (**adverse**) impact in terms of daylight and sunlight effects.

Overshadowing to St Michaels Square Gardens

9.58 Drawing 557/18 of Technical Appendix 9.1 shows the shows that there is no region of permanent shadow on 21st March. A region of shadow will track across the southern portion of the garden during the afternoon and its size and duration will vary throughout the year. The garden will retain very good access to sunlight and the pattern of transient shadow will be typical of an urban location. The impact to overshadowing is therefore small and accords with the BRE guidelines.

9.59 The proposed development would therefore lead to a **minor** (**adverse**) impact in terms of daylight and sunlight effects.

Mitigation Measures

9.60 For a given proposed scheme massing, access to daylight is principally dependent on the window size, the location and sky visibility of the neighbouring properties. Since these cannot be altered by the developer mitigation measures are not usually possible.

9.61 The existing site is a prime development site in a brownfield location close to Manchester city centre. The proposed development will bring significant regeneration benefits to the immediate and wider area.

Summary of Residual Impacts

9.62 The assessment has identified moderate to minor adverse impacts on the neighbouring properties in relation to daylight and sunlight. However, this is to be expected for a development on a vacant site since those windows which face the site currently have unusually high levels of daylight and sunlight for a city centre location. The proposed levels of daylight to many of windows in Naples Street are similar to, and in several cases lower than, the proposed daylight levels for the windows facing the site. It is therefore considered that the impacts are acceptable.

9.63 Table 60 provides a summary of the predicted effects of the proposed development on daylight and sunlight. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
None	None	None	None	None	None	None	None	None
Operational Phase								
10 Naples Street	None. There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor	Not Significant	High
21 Naples Street	There will be reasonable residual levels of daylight & sunlight	High	Large	Permanent	Direct	Moderate	Not Significant	High
83-85 Dantzic Street	There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor	Not Significant	High
4 Aspin Lane	There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor	Not Significant	High
St Michaels Square gardens	None	Medium	Small	Permanent	Direct	Minor	Not Significant	High

Table 60 Summary of Residual Impacts - Daylight and Sunlight Effects

Cumulative Effects

9.64 The assessment has used the completed scheme which, in relation to the effects, represents the worst case. The daylight and sunlight levels would decrease during construction of the new development culminating in the effects detailed in this report. There are no nearby proposed developments that would affect the assessment.

References

Building Research Establishment (BRE) Report 'Site layout planning for daylight and sunlight - A guide to good practice' by P. J. Littlefair.

British Standard BS8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting.

10.0 Wind Effects

Introduction

10.1 This Chapter assesses the effect of the wind upon the Co-op Head Office Miller Street site in Manchester. This assessment has been undertaken by considering the likely wind conditions at the site. These findings are assessed in terms of the legislative context relating to the proposed scheme. The impact after the incorporation of mitigation measures is considered, as well as the cumulative effect of nearby proposed developments.

Policy Context

Development Plan Guidance

10.2 The statutory development plan for the site comprises the adopted North West of England Regional Spatial Strategy to 2021 (September 2008) and the adopted Manchester Unitary Development Plan (1995).

North West of England Regional Spatial Strategy to 2021 (2008)

10.3 The RSS contains no specific policies relating to the wind effects of development. However, Policy DP7 seeks to protect and enhance environmental quality especially by promoting good quality design in new development; maximising opportunities for the regeneration of derelict or dilapidated areas; and assessing the potential impacts of managing traffic growth and mitigating the impacts of road traffic on air quality, noise and health amongst other things.

Manchester UDP (1995)

10.4 The Council seeks to maintain environmental quality by controlling development. There are no specific policies in the UDP relating to the wind effects of development.

National Policy Guidance

10.5 PPS1 Delivering Sustainable Development seeks to protect and enhance the quality of the quality, character and amenity value of urban areas. Impacts on the environment should be taken into consideration during the design of development.

Supplementary Planning Guidance

The Guide to Development in Manchester Supplementary Planning Document and Planning (2007)

10.6 The City Council's SPD, 'Guide to Development in Manchester' was adopted in April 2007 and was produced to guide the preparation of design and access

statements and expand on UDP policies. It sets out the City Council's stance on a wide range of issues.

10.7 Paragraph 2.14 states that building heights should be carefully considered having regard to local microclimatic effects amongst other things.

10.8 The SPD specifies that where the public realm includes hard landscaped areas, its design should reflect the level and nature of their use, and should consider issues such as prevailing winds [¶2.40].

Potential Impacts

Construction Impacts

10.9 There will be no construction impacts from the development on the wind microclimate.

Operational Impacts

10.10 The proposed development has the potential to create wind effects that could have impacts upon the public and workers around the base of the proposed building.

10.11 The impacts depend upon both the activity and expectation of the person experiencing the wind conditions. For example, a person whose job entails walking-with-purpose will perceive the wind conditions at a given location to be less windy than a member of the public sitting for a long period.

Assessment Methodology

Approach

10.12 The assessment of the wind conditions around the Co-op Head Office Miller Street site is the professional opinion of Gordon Breeze who is employed by the Building Research Establishment [BRE]. Gordon Breeze is a Chartered Civil Engineer who has over 20 years of experience working in the field of wind engineering. The assessment is guided by the findings of BRE wind tunnel investigations undertaken upon other sites in Manchester.

10.13 There are no published standards or guidelines relating to a professional opinion concerning the wind environment.

Methodology

10.14 When considering potential impacts of the wind micro-climate, the effects of both high and low wind speed conditions need to be considered. High wind speeds can be dangerous and/or unpleasant. In this situation, the public are likely to avoid using certain areas, and this can have an adverse effect upon commercial activity. Furthermore, once a location has a reputation for being

windy, it can be difficult to subsequently restore public confidence. Low wind speeds can cause the build up of pollutants (e.g. traffic fumes, smells from rubbish bins).

10.15 Proposed developments can cause adverse microclimate conditions, and therefore attention is usually focussed upon preventing or minimising areas of unpleasant winds. However, developments can also enhance the wind conditions by providing local shelter, and/or sheltering a downstream area of the surrounding context. A consideration of low wind speed conditions can also enhance the environment. For example, the smell of bread baking or coffee brewing can be very welcoming.

10.16 In light of the comments above, with regards to the potential wind impact of a proposed development, the most important factor to consider is whether or not the scheme and its surroundings has suitable wind conditions for its intended pedestrian activity.

Significance of Impacts

10.17 The intermittent nature of the wind means that the significance of wind impact depends upon the time period (or likelihood) that suitable or unsuitable wind conditions are likely to occur. The levels of significance assigned in this Chapter are described below. These significance levels depend upon a knowledge and an understanding of the concept of the 'prevailing wind direction', which is described later in this Chapter.

Negligible When, for all approaching wind directions, the wind conditions at a location are assessed as being suitable for a given pedestrian activity, then this situation is judged to have a 'negligible' wind impact.

Minor When wind conditions at a location are assessed as being occasionally likely to be unsuitable for a given activity, then this situation is judged to have a 'minor' wind impact. This scenario would occur if unsuitable wind conditions are likely when the wind blows moderately strongly from non-prevailing wind directions.

Moderate When wind conditions at a location are assessed as being likely to be unsuitable for a given activity for significant periods of time, then this situation is judged to have a 'moderate' wind impact. This scenario would occur if unsuitable wind conditions are likely when the wind blows moderately strongly from the prevailing wind direction.

Major When wind conditions at a location are assessed as being likely to be unsuitable for a given activity for most of the time, then this situation is judged to have a 'major' wind impact. This

scenario would occur if unsuitable wind conditions are likely when the wind blows moderately strongly from both prevailing and other wind directions.

Baseline Conditions

The Site

10.18 The Miller Street site is a large open area presently being used as a car park. The South-West of the site is dominated by the 31-storey CIS building. The North of the site is bounded by Angel Meadows, a local public garden linked to the Irk Valley which contains a network of open spaces. The area in the vicinity of the site is predominantly low-level residential properties with some larger warehouse type properties to the South and East.

10.19 The Miller Street site lies on the Eastern Bank of the now culverted River Irk and slopes relatively steeply from East to West. The lowest point of the site is its North West corner at the junction between Dantzic Street and Angel Street (c.37.0m AOD). The highest point is at its North East Corner where Naples Street meets Angel Street (c.44m AOD). For the purpose of assessing the baseline wind conditions, this means that the Miller Street site rises by about 2-storeys in height from West to East.

General Wind Conditions in Manchester

10.20 For most of the UK, the prevailing wind direction is South-West. At a given site, a 'Wind Rose' gives a visual impression of the long-term wind strength and directional behaviour. For the year as a whole, the Wind Rose for Manchester International Airport is presented in Figure 9. It can be seen that the wind conditions in Manchester are unusual in that the prevailing wind direction is from the South. This means that not only are South winds the most common winds, but also on average they tend to blow more strongly than any other particular wind direction.

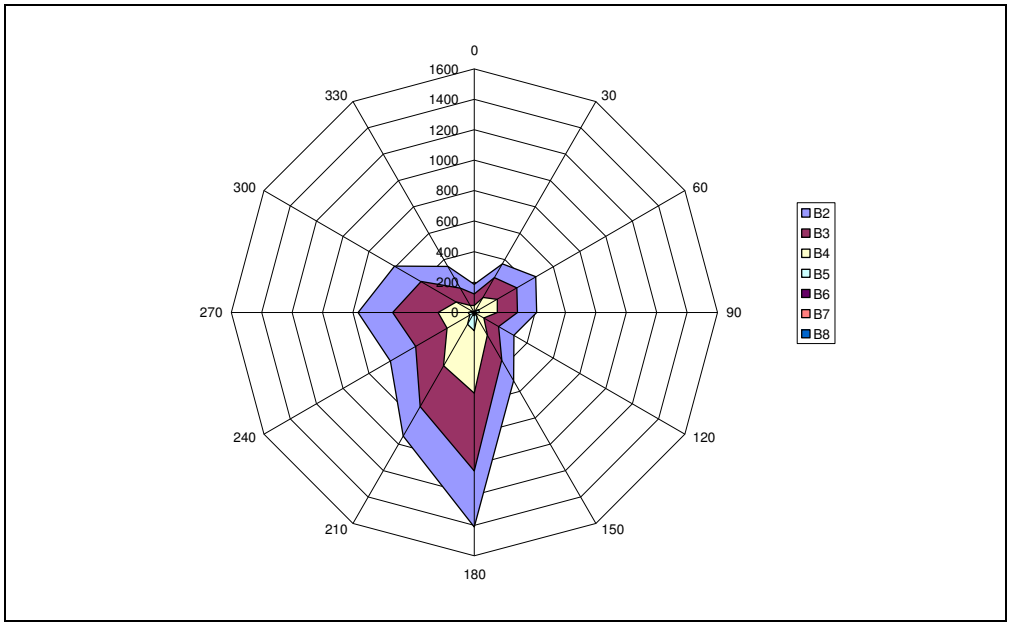

Fig 9 Wind Rose for Manchester International Airport (Year as a Whole)

Wind Conditions around Existing Miller Street Site

10.21 The Miller Street site rises about 7m from West to East. The distance of this rise is about 50m, giving a ground slope across the site of 8°. Winds tend to be accelerated as they pass up slopes. However, the relatively small site size and slope means that for practical purposes any wind effects caused by the topography are likely to be insignificant.

10.22 The 31-storey CIS Tower is located to the South-South-West of the site. The distance between the Tower and the site is such that any localised wind effects at the base of the Tower are likely to have dissipated before they reach the site. Hence in the lee of the Tower, winds from the Tower direction are likely to be reduced due to the upstream presence of the Tower. This means that for South and South-West winds, the Co-op Head Office building is likely to experience some shelter from the wind.

10.23 The buildings around the rest of the site are low-rise, and there is an open parkland area to the North of the site. This means that apart for the South-West wind direction (which is considered above), there is relatively little protection from the wind.

10.24 Wind tunnel tests have been undertaken at BRE upon schemes in Manchester which have similar open site characteristics as those described above. The findings from these tests indicate that the wind conditions everywhere around the Miller Street site are likely to be suitable for the less wind-sensitive pedestrian activities of walking-with-purpose and strolling. However, with regards to the most wind-sensitive pedestrian activities (i.e. long-term sitting and entrance doors), the test results suggest that about a half of the existing site (where nearby building provide local shelter) is likely to be suitable for

these activities.

Impact Assessment

Proposed Scheme

10.25 The proposed Co-op Head Office building is located at the North-East corner of the Miller Street site. A ground level plan of the building showing the building location is presented in Figure 10. As can be seen, the building is triangular in plan form with slightly concave facades and rounded vertices. The direction of North is indicated on Figure 10, and the main entrance to the building is shown located near to the centre of the South façade.

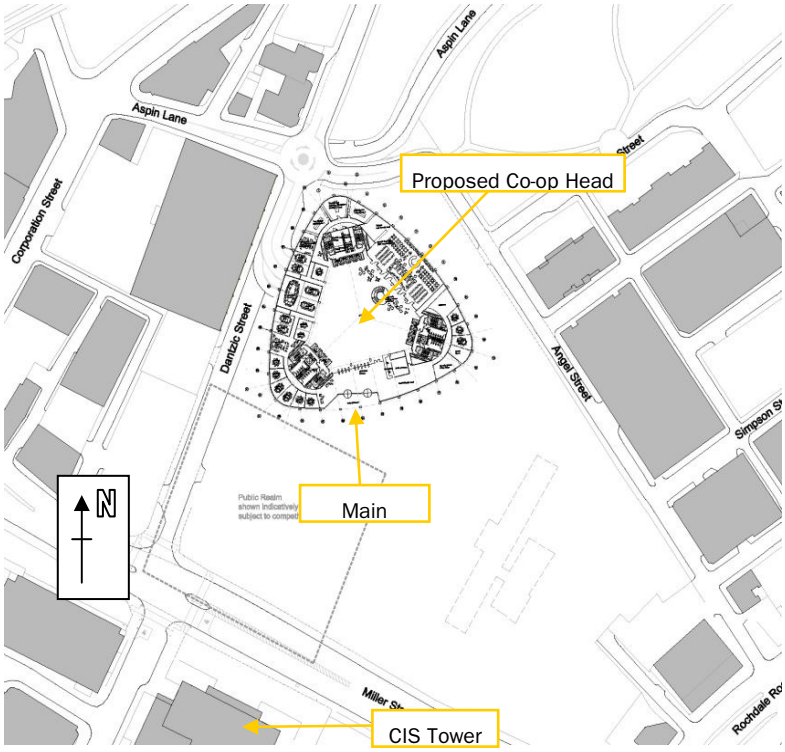

Fig 10 Ground Floor Plan of Proposed Development

10.26 The Northern tip of the proposed Co-op Head Office building is 16-storeys in height above the ground, and the building reduces to 8-storeys in height at the South facade. Two isometric views of the building in context with its surroundings are shown in Figures 11 and 12. The CIS Tower has been identified on these figures. Apart from this tower, is can be seen that the surrounding buildings are significantly lower in height than the proposed Head Office building, and that there are large open areas to North and South of the building.

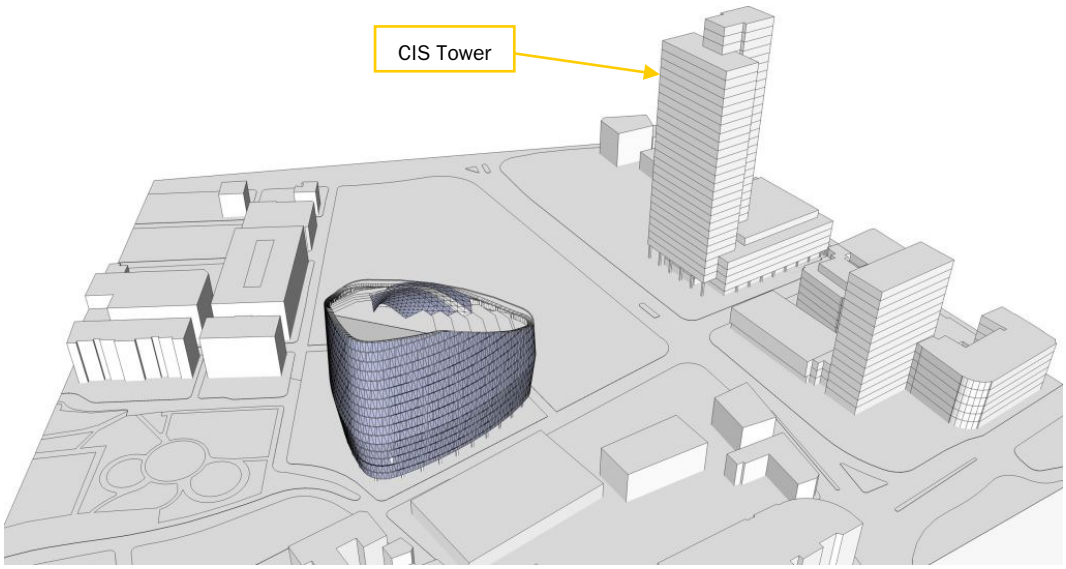

Fig 11 Isometric View of Proposed Development, Looking Towards South-East

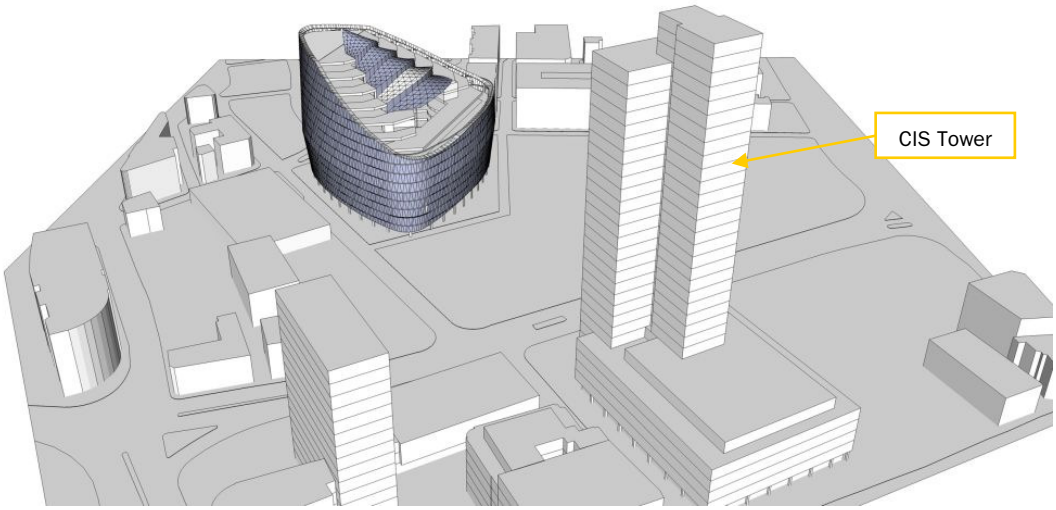

Fig 12 Isometric View of Proposed Development, Looking Towards North-East

Assessment of Wind Conditions

10.27 Windward vortices occur when buildings have large facades which face in a perpendicular direction towards the approaching wind. In this situation, if the building is unsheltered, the approaching wind tends to be blown downwards towards the ground producing downdraughts in front of the building. These downdraughts can then be accelerated around the windward corners of the building. The strength of the downdraughts is related directly to the building height – the taller the building, the greater is the potential for the generation of unpleasant ground level winds.

10.28 As can be seen on Figure 9 the proposed Co-op Head Office building has South, North-East and North-West facing facades. Since the building is not sheltered from these directions, windward vortices are therefore likely to occur for these approaching winds. The resulting localised areas of increased winds around the base of the Co-op Head Office building are shown in Figure 13.

10.29 Note that the presence of the building will cause the approaching wind to accelerate as it passes around the windward corners. The areas of these accelerated winds are contained within the corner locations shown on Figure 13. It should be noted that the wind does not necessarily have to blow perpendicularly to a building face to produce accelerated corner winds.

10.30 As shown by the Wind Rose presented in Figure 9, the prevailing wind direction in Manchester is South. For South and Southerly winds, the three areas of concern associated with these wind directions (indicated on Figure 13) require individual consideration, which is given below. For other wind directions, the North corner of the Co-op Head Office building, and the centres of the North-East and North-West facades are likely to have wind conditions that are slightly windier than the baseline conditions. Therefore these locations are still likely to be suitable for walking-with-purpose, and may also be suitable for strolling, window shopping, etc. However, these locations are not likely to be suitable for the most wind-sensitive activities of long-term sitting and entrance doors.

10.31 Taking into account the sheltering effects of the CIS Tower, for South and Southerly winds, the three areas of concern shown on Figure 13 are likely to have stronger winds than the baseline. Therefore these locations are likely to be suitable only for the least wind sensitive pedestrian activity of walking-with-purpose, but they may also be suitable for the less sensitive pedestrian activity of strolling. In light of the preceding discussion, it follows that without mitigation these locations are not likely to be suitable for long-term sitting or entrance doors.



a) South winds b) North-East winds c) North-West winds

Although the coloured areas highlighted above are likely to be more windy than the baseline wind conditions, these areas do not necessarily have adverse wind impacts. This is because wind impact (which is assessed later in this Chapter) takes the effects of intended pedestrian usage into consideration.

Fig 13 Likely Areas of Increased Pedestrian Level Wind Speeds

Suitability of Wind Conditions

10.32 The wind assessment described above identified a number of localised areas of concern, and these areas are shown on Figure 13. However, with the exception of the main entrance doors in the centre of the South façade, it is understood that these areas are intended only for walking-with-purpose. In this circumstance, these other locations are suitable for their intended pedestrian purpose, even though the wind conditions are likely to be windier than the existing baseline scenario.

10.33 For the reasons described above, without mitigation, the wind conditions at the South façade entrance doors are not likely to be suitable for their intended purpose. There will therefore be a **minor** (**adverse**) impact.

Mitigation Measures

10.34 There are a number of mitigation measures incorporated into the design of the proposed Co-op Head Office building, and the likely efficacy of these measures is considered in this section.

10.35 It should be noted that that planting is a recognised method of ameliorating unpleasant wind conditions. The design of the public realm is to be subject to a later design competition, and therefore the scheme has been assessed upon the basis that planting has not been incorporated as part of the design. Notwithstanding this, landscaping proposals e.g. the inclusion of small trees will be required as part of the wider public realm to mitigate against the effects of the wind environment.

10.36 The ground plan of the proposed Co-op Head Office building is shown on Figure 10. As can be seen, the facades of this building are convex, and the corners of the building are rounded. These features tend to reduce slightly the windward vortex effects described above. However, since there is a significant façade area that remains perpendicular to winds approaching from the South, North-East and North-West directions, it is still likely that a windward vortex will be formed when the wind blows from these directions.

10.37 Close examination of Figure 10 shows that the South façade main doors are set back beneath the overhanging South façade. Setting back doors in this way produces an ‘entrance lobby’, which is a recognised wind amelioration technique. Entrance lobbies work by producing a transition zone between indoor quiescent conditions, and the outdoor wind conditions. By providing a transition area in which a person becomes acclimatised to the outdoor wind conditions, the doorway is then perceived to be less windy.

10.38 It is judged that the size of the set back is sufficiently large that it is likely to provide significant wind amelioration. Experience suggests that this feature, coupled with the mitigating factors noted above and the shelter provided by the CIS Tower, means that the wind conditions at the main entrance doorway are likely to be suitable for its intended pedestrian usage.

Summary of Residual Impacts

10.39 Although a small number of locations around the base of the proposed building are likely to be made slightly windier than the baseline, these locations are judged to be suitable for their intended pedestrian usage. Therefore, using the criteria of wind impact described earlier, the residual wind impacts of the Miller Street Co-op Head Office building are assessed as being **negligible.**

10.40 Table 61 provides a summary of the predicted wind effects of the proposed development. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
None	None	None	None	None	None	None	None	None
Operational Phase								
South winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
North east winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
North west winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
Front doors	No significant effects anticipated (after mitigation)	High	Low (after mitigation)	Intermittent	Direct	Negligible	Not significant	High

Table 61 Summary of Residual Impacts – Wind Effects

Cumulative Effects

10.41 No information about the location of, and/or massing of any future proposed developments around the Miller Street site are available. Therefore the Cumulative Effects of this proposed scheme are the same as the Residual Impacts identified above.

11.0 Land Quality

Introduction

11.1 The presence of contamination in land can present risks to human health and the environment which adversely affect or restrict the beneficial use of land but development presents an opportunity to deal with these risks. Contamination is not restricted to land with previous industrial uses; it can occur on greenfield as well as previously developed land and can arise from natural sources as well as from human activities.

11.2 This section of the Environmental Statement [ES] reports on the baseline land quality status of the site and potential effects on the proposed development. It considers the location and history of the site in defining any risks to future users of the site during construction or occupation of the development, and assesses the significant environmental effects to, and as a result of, land quality which might occur as a result of the development. It also includes measures to mitigate any such impacts.

Policy Context

Legislation

11.3 The regulatory framework for contaminated land primarily comprises Part 2A of the Environmental Protection Act 1990 [EPA 1990] which was brought into force by Section 57 of the Environment Act 1995. The main objective of the Part 2A contaminated land regime is to provide a system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment assessed in the context of the current use and circumstances of the land.

11.4 For the purposes of Part 2A, contaminated land is defined as:–

> *"any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:–*
>
> *(a) significant harm is being caused or there is a significant possibility of such harm being caused; or,*
>
> *(b) pollution of controlled waters is being or is likely to be caused.*

11.5 Central to the Part 2A regulatory approach is a rigorous procedure of risk assessment which is used to determine whether land meets the definition of 'contaminated land' in accordance with the new Statutory Guidance. Under the risk assessment procedure, harm to humans, the environment or the pollution of controlled waters may occur if there is a 'Pollutant Linkage', as follows:–

1 A source of pollution (the contaminant);

2 A receptor which is affected by the pollutant. This includes human beings, other living organisms, controlled waters, physical systems and built structures which could be affected by the contaminant; and,

3 A pathway capable of exposing the receptor to the contaminant.

11.6 For each receptor, a description of the harm that is to be regarded as significant harm for the purposes of the regime is contained in the statutory guidance. Receptors include human beings, ecological systems in certain protected locations (e.g. sites of special scientific interest), property such as crops, livestock, domesticated animals, animals maintained for sporting purposes, buildings and their services. Significant harm includes in appropriate cases death, disease, serious injury, specified ecological system effects, substantial diminution of crop yield and structural building failure. Pollution of controlled waters arising from the contaminated condition of land is also included in the regime.

11.7 The regulator for the contaminated land regime is the Local Authority (Manchester City Council). The Environment Agency may, in appropriate cases, assist local authorities in identifying contaminated land, particularly in cases where water pollution is involved, and provide site-specific guidance to those authorities. It will also act as the enforcing authority for special sites, as defined in the Regulations and publish periodic reports on contaminated land.

11.8 The Local Authority as regulator must determine whether land is Contaminated Land. Before the authority can make this judgement, it must satisfy itself that a Pollutant Linkage exists in relation to the land. The next step is for the Local Authority to satisfy itself that the Pollutant Linkage is a Significant Pollutant Linkage (i.e. meeting the definition of contaminated land).

11.9 The potential for new contamination to arise is generally controlled through other environmental protection legislation, including Parts 1 and 2 of the EPA 1990 and the Environmental Permitting (England and Wales) Regulations 2007 [EPR]. Part 2 of the EPA 1990 covers the handling, transport, storage, recovery and disposal of wastes. The EPR regime controls emissions to air, water and land and site restoration to the baseline condition on cessation of an authorised activity.

National Planning Guidance

11.10 Planning Policy Statement 23 [PPS23] Planning and Pollution Control provides guidance to planning authorities in relation to development on land affected by contamination. This assessment takes account of the policies in PPS23 and specifically the advice provided in the accompanying Annexes (Annex 1:- Pollution Control, Air and Water Quality and Annex 2:- Development on Land Affected by Contamination). In so far as it affects land use and development the quality of land is a material planning consideration in preparing development plans as well as in the determination of planning applications.

11.11 Annex 2 to PPS23 expands on the policy considerations in relation to development on land affected by contamination. It gives necessary legislative and technical background and some examples of good practice to assist authorities in implementing the policies contained in PPS23.

11.12 When considering development on land affected by contamination, the principal planning objective is to ensure that any unacceptable risks to human health, buildings and other property and the natural and historical environment from the contaminated condition of the land are identified so that appropriate action can be considered and then taken to address those risks.

11.13 Where new development is taking place, it is the developer's responsibility to carry out the necessary remediation and, in most cases, the enforcement of remediation requirements will be through planning conditions and building control.

11.14 In managing issues of potential contamination, the developer is responsible for the following:–

1 Ensuring the development is safe and suitable for the purpose for which it is intended;

2 Determining whether the land in question is already affected by contamination through contaminant-pathway-receptor linkages and how those linkages are represented in a conceptual model;

3 Determining whether the development proposed will create new linkages; and,

4 Determining what action is needed to break those linkages and avoid new ones, dealing with any unacceptable risks and to enable safe development and future occupancy of the site and neighbouring land.

11.15 It remains the responsibility of the landowner/developer to identify land within proposed developments affected by contamination and to ensure that remediation is undertaken to ensure a safe development. Where new development is taking place, it is the developer's responsibility to carry out the necessary remediation and that, in most cases, the enforcement of remediation requirements will be through planning conditions and building control rather than through a remediation notice under Part 2A.

11.16 After development, the land should not be capable of being determined as "contaminated land" under Part 2A of the EPA 1990 and all unacceptable risks must have been addressed.

Potential Impacts

Development as Proposed

11.17 As a former industrial site located over a major aquifer (Sherwood Sandstone), there is significant potential for contamination to be present in made ground, natural ground and controlled waters (groundwater) from historical use of this site. There is also potential impact from ground gases owing to infilling of an historical reservoir on the site and an historical pool on land adjacent to the site. It is possible that significant pollution linkages may be present on the site.

11.18 Potential receptors considered to be of sufficient importance that they could be significantly affected by the proposed development are shown in Table 62. These receptors are in accordance with the regulatory regime for land with potential contamination and the scoping letter for this work. There is also potential for groundwater and surface water to be affected by the development; these issues are addressed in Chapter 6 (Water Resources) of this ES.

Receptors	Potential Effect
Construction Phase	
Construction workers	Dermatological, respiratory or other health problems
Adjacent site users	Dermatological, respiratory or other health problems
Groundwater (major aquifer in Sherwood Sandstone)	Pollution of groundwater (controlled water)
Surface water (River Irk)	Pollution of surface water
Operational Phase	
Future site users after development (commercial use and visitors)	Dermatological, respiratory or other health problems
Adjacent site users	Dermatological, respiratory or other health problems
Groundwater (Major aquifer in Sherwood Sandstone)	Pollution of groundwater (controlled water)
Surface water (River Irk)	Pollution of surface water
Buildings and Buried Services	Degradation of building materials
Vegetation	Reduced plant growth ranging from no growth to reduced growth.

Table 62 Potential Receptors and Effects from Land Quality

11.19 It is possible that new pollutant linkages will arise as a result of developing the site. These could have an impact on the development and may require site investigation and mitigation measures to control impacts during the construction process and the operational phase of the development.

No Development

11.20 In the event that the site is not developed, any contamination of land and controlled waters will remain unassessed and untreated. In its current condition, there are no buildings on the site, although foundations of former buildings may be present. The site is predominately a hard standing car park; consequently the potential for significant pollutant linkages to exist is limited.

Assessment Methodology

Sources of Information

11.21 To assess the likelihood of significant environmental effects the following data sources were reviewed:–

1 Envirocheck® Report, Order number 27833921_1_1 dated 5 May 2009 (included as Technical Appendix 11.1) which provided current environmental data for the site including the environmental context, historical mapping, record of pollution incidents, environmental licensing (discharges and abstractions); and

2 Coal Authority Report, Reference 00019201-09 dated 7 May 2009 which identifies the potential for coal mining under the site including the potential occurrence of related voids and ground instability.

11.22 Information on the proposed development layout has been obtained from the following:–

1 Briefing Note, Nathaniel Lichfield and Partners [NLP], MA40465/09/JG/JD/ML, February 2009;

2 Briefing Note, NLP, MA40465/09/JD/ml, 18 March 2009;

3 Site boundary (development and public realm areas) annotated on plan Drawing 090109 (D) 001 by 3DReid. This site boundary supersedes that in Appendix 1.1 of the briefing note dated February 2008;

4 Draft Report on Ground Investigation at Co-Operative Group Head Office Manchester, Report No. 761072, June 2009, Structural Soils for Buro Happold;

5 Draft Preliminary Site Assessment Report Revision 2, July 2009, Buro Happold;

6 Draft PSA site constraints figure, July 2009, Buro Happold;

7 Draft Ground Investigation figure, July 2009, Buro Happold;

8 Draft Human Health Assessment for soil, leachate and water analyses, Buro Happold, July 2009; and,

9 Draft Ground Conditions Summary, Technical Note, 7 July 2009, Buro Happold.

11.23 The draft report on the ground investigation prepared by Structural Soils contains all intrusive survey logs, the explosive ordnance magnetometer/cone penetrometer ('Magcone') survey by Zetica and analytical data from Envirolab. The brief draft technical notes prepared by Buro Happold are preliminary interpretations of desk study data for the site and data from the Structural Soils site investigation. Full and finalised interpretation of the site investigation is not available at the time of writing. Comments on ground conditions and potential contamination are drawn from the Buro Happold draft ground condition summary with reference to the human health risk assessment and the Structural Soils report.

11.24 The site investigation comprised an array of boreholes, trial pits, window samples and magnetometer/cone penetrometer holes across the site. Samples of soil were selected for chemical analysis from two boreholes and five trial pits.

11.25 The following assessments have been prepared by other parties but have not been available for review by Entec at the time of writing (July 2009):-

1 Draft Preliminary Site Assessment Report Revision 1, January 2009, Buro Happold) (Revision 2 July 2009 has also been used); and,

2 Unexploded Ordnance desk study (Zetica) (the subsequent site survey has been available).

Methodology

11.26 The prediction of effects of the proposed scheme on the receptors identified in Table 62 is based on:–

1 Existing baseline information on land contamination conditions;

2 An understanding of the site preparation, construction and operational activities associated with the scheme (including likely remediation works); and,

3 The status and sensitivity of the receptors.

11.27 In addition, the prediction is informed by widely accepted regulations and guidance, and the application of professional experience and judgement in assessing and mitigating contaminated land risks.

Significance Evaluation Methodology

11.28 The potential significance of an effect resulting from the presence or remediation of contamination is determined by the sensitivity (or value) of a given receptor and the magnitude of the likely effect. In respect of human

receptors their health is always treated as having a high sensitivity.

11.29 The magnitude of change for human receptors directly relates to the scale of the likely effects on health. Significant effects to human health potentially range from irreversible damage to slight short term problems.

11.30 The assessment of effects is therefore based on how the presence of any historic contamination on the site and the remediation proposals and incorporated mitigation would affect the receptors. This would be both during the construction phase, when construction workers, site users and adjacent site users would be the key receptors to be considered; and following completion of the development, when future site users would be the key receptors.

Significance Evaluation for Management of Contaminated Land (Part 2A)

11.31 The Part 2A regime, the approach to evaluating significance for the assessment and management of contaminated land is outlined below.

11.32 A risk based approach is adopted which considers the degree of harm which a receptor may experience from being exposed to contamination, and the likelihood of such an exposure occurring.

11.33 In general terms the potential consequence for a receptor is rated from severe to minor and a summary of what each level of consequence means in respect of the various receptor types is given in Tables 63 to Table 64, which is taken from CIRIA guidance on risk assessment [2].

Classification of Consequence	
Severe	Short term risk to human health likely to result in "significant harm" as defined by the EPA 1990, Part 2A. Short-term risk of pollution (note that the Water Resources Act (WRA) contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem as defined in Statutory Guidance (DEFRA Circular 01/2006 dated September 2006).
Medium	Chronic damage to Human Health ("significant harm" as defined in Statutory Guidance – DEFRA Circular 01/2006). Pollution of sensitive water resources (see WRA note above) of sensitive water resource. A significant change in a particular ecosystem, or organism forming part of such ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm"). Damage to sensitive buildings, structures, services or the environment.

[2] Contaminated Land Risk Assessment, A Guide to Good Practice, CIRIA C552, 2001

Classification of Consequence	
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.). Easily repairable effects of damage to buildings, structures and services.

Table 63 Classification of Consequence

11.34 It should be noted that these levels of consequence as defined in Table 63 are based on full exposure to contamination, whereas in reality the likelihood of exposure may be somewhat less. It is therefore important to consider the probability of exposure, as indicated in Table 64.

Classification of Probability	
High Likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the longer term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Table 64 Classification of Probability

11.35 The application of probability in respect of the potential consequence provides a Risk Classification as summarised in Table 65.

Consequence	Probability			
	High Likelihood	Likely	Low Likelihood	Unlikely
Severe	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
Medium	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
Mild	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
Minor	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table 65 Risk Classification of Consequence against Probability

11.36 Shading in Table 65 indicates risk levels which may be significant and at which further assessment or mitigation measures may be required. Table 66 provides an overall definition of each risk classification.

Comparison of Consequence against Probability	
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. The risk if realized is likely to result in significant liability. Urgent investigation and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be required in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However if it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realized it is not likely to be severe.

Table 66 Definition of Risk Classifications

11.37 In contaminated land assessments, the risk classification is carried out prior to the incorporation of mitigation measures. Where a risk classification of moderate or greater is determined (i.e. shaded in Table 65) the risk of a particular contaminant–pathway–receptor pollutant linkage is considered to require some form of risk management or intervention. In the first instance this would normally take the form of either further investigation or more detailed risk assessment. With the additional knowledge gained, the risk classification can then be adjusted and confirmed.

11.38 If the risk classification remains at moderate or above then remediation, would be required to reduce or remove the source of contamination or disrupt the pathway to the receptor. Where possible, the preferred strategy for remediation is by on-site treatment.

Significance of Impacts

11.39 For EIA purposes significant contamination effects would occur if a risk classification of medium or greater were still predicted following the incorporation of mitigation measures.

11.40 In terms of human receptors, who are always considered to be of high sensitivity, significant effects would range from slight short term health effects that were almost certain to happen and non permanent effects that could occur at greater than a moderate probability.

11.41 The significance of effects is considered according to the matrix set out in Table 67. The shaded classifications represent significant impacts.

		Sensitivity of Receptor		
		Low	**Medium**	**High**
Magnitude of Effect	**High**	Moderate	Major	Major
	Medium	Minor	Moderate	Major
	Low	Negligible	Minor	Moderate
	Negligible	Negligible	Negligible	Minor
	Unknown	Unknown	Unknown	Unknown
Note:- Shaded cells represent likely Significant Effects				

Table 67 Significance of Impacts – Land Quality

Baseline Conditions

11.42 Discussion of baseline conditions covers geology, coal mining, hydrogeology, surface water drainage and tipping of wastes as appropriate to description of the site conceptual model for land quality. The site conceptual model is presented in Figure 7.1 (Technical Appendix 11.1) as a schematic cross-section to illustrate the potential sources, pathways, and receptors on the site and surrounding land.

Geology

11.43 The geology of the site comprises superficial deposits of Devensian Till (Glacial period) underlain by Middle Triassic to Late Permian Sherwood Sandstone. Geological faults are shown approximately 100 m northeast and 150 m southwest of the site. Deposits of Made Ground are not shown on the geological mapping although it is understood the current intrusive investigation has encountered some Made Ground. Some details of ground conditions are known from preliminary information from the site investigation.

11.44 Made Ground ranges in thickness from about 1.5m to 4m and comprises a mixture of reworked natural clays, sands and gravels with substantial quantities of fragments of metals, concrete, ceramics, brick ash and clinker. Man-made inclusions are most commonly found within one metre of surface.

11.45 Areas of former pools (reservoir and pond) have been drained and infilled in the past although the infill material is unknown and may have a high organic content. These areas are a potential source of ground gas.

11.46 Devensian Till typically comprises poorly sorted sands and gravels in a glacial clay. The depth of the base of superficial deposits is around 10 metres below ground level (i.e. till thickness is typically 6m – 10m).

11.47 The upper parts of the Sherwood Sandstone are substantially weathered to loose or weakly-cemented sand. The sandstone is poorly cemented and

therefore is described as extremely weak to very weak red-brown medium-grained sandstone with occasional gravel.

11.48 The ground conditions encountered as part of the ground investigation works were assessed by both in-situ and geotechnical laboratory testing.

11.49 The Coal Authority report states that the land holding area is within the likely zone of influence from working of a coal seam 810m below the ground which was last worked in 1965. The report states that any ground movement from these coal workings should have ceased. The Coal Authority is unaware of any future plans to extract coal from the area.

Groundwater (Hydrogeology)

11.50 The Sherwood Sandstone is classified as a major aquifer, which may be highly productive and is regionally extensive. The overlying soil classification is urban (U) which assumes a worst case scenario of high leaching potential. The site lies within Source Protection Zone II (outer protection zone) of the Strangeways groundwater abstraction. The abstraction point is located 480 m west of the site. The depth to groundwater in the sandstone aquifer is not known. Minor instances of perched groundwater occur in overlying glacial deposits and made ground.

11.51 The site investigation found groundwater strikes in trial pits as a 'slight seepage' at 1.00 m below ground level (mbgl) in the centre of the proposed building footprint (TPBH02) and as 'locally damp' below 2.5 mbgl on the western edge of the building footprint (TPCPT04). The remaining trial pits were dry. It is possible that perched water will be present in both Made Ground and Glacial Till.

11.52 Groundwater levels were encountered in the two boreholes drilled: TPBH01 at the northern edge of the site and TPBH02 at the centre of the site. Preliminary monitoring has found that groundwater levels within the Sherwood Sandstone are between 25.00 and 27.00 mAOD (15 – 16 mbgl).

Surface Water

11.53 The nearest surface water feature is the River Irk, which located, at its nearest point, 125m west of the site. The river is largely culverted near to the site and flows southwards past the site to a confluence with the River Irwell. The site does not lie within an area of potential risk from river flooding. The site is currently unsurfaced and does not appear to have any formalised arrangements for drainage of surface water.

11.54 The site investigation has not assessed surface water quality.

Buried Structures

11.55 Foundations of former buildings and minor roads are expected to be present across the site from developments formerly on the site. From enquiries made by Buro Happold it is understood that there is also an abandoned sewer which crosses the site in a northwest to southeast direction under the proposed building.

Land Quality

Soil

11.56 Concentrations of potential contaminants were determined by analysis of soil, leachate and water samples for a typical suite of determinants selected on the basis of the recorded development history of the site, observations made during the ground investigation works and other geo-environmental development considerations. Chemical concentrations have been determined for soil samples collected from two boreholes and five trial pits.

11.57 Samples were also assessed with reference to criteria for disposal of soils as wastes. All samples tested were found to be in the inert or non-hazardous classifications.

Groundwater and Surface Water

11.58 Buro Happold has made no comment regarding groundwater quality. The site investigation did not assess surface water.

Ground Gas and Radon

11.59 Assessments of ground gas and radon are currently being undertaken but the preliminary findings can be summarised as follows:-

1 Gas monitoring within boreholes located in the proposed are of the building have, to date, recorded gas concentrations and flows which fall into Characteristic Situation 1 in accordance with in CIRIA guidelines. Further gas monitoring is being undertaken.

2 The site is in an area where less than 1% of homes are above the Radon Action Level and, therefore no radon protection measures are considered necessary for the proposed development.

Effects on water pipes

11.60 Buro Happold advised that protection of water supply pipes may also be required where these are to be laid in or near to contaminated soils or groundwater.

Impact Assessment

11.61 A site investigation has been undertaken and although some preliminary

information has been made available, the fully interpreted findings were not available at the time of writing. As a consequence of this, the assessment is only indicative at this stage.

Construction Impacts

Construction Workers

11.62 Construction workers are likely to come in to direct contact with any potentially contaminated material present within the ground. The sensitivity of the receptor is high. Primary exposure routes will be through direct dermal contact, ingestion and inhalation. The risk of a pathway link to construction workers without mitigation measures is high and the potential magnitude of effects is also high.

11.63 Based on the chemical testing undertaken, Buro Happold have reported that, the risk to construction workers due to direct contact with soils is considered to be low and it is envisaged that nominal safety precautions will be acceptable (i.e. the adoption of good hygiene and the use of overalls, gloves and dust masks).

11.64 Information provided by Buro Happold has identified potential remnants of foundations and roadways under the site. There is also known to be an abandoned sewer beneath the building footprint.

Adjacent Site Users

11.65 Dust will be released during earthmoving operations and the risk of a pathway link to adjacent site users from any contaminated element of the soil is considered to be high. The sensitivity of these receptors is high. Impacts will arise mostly from dust migration and if any contaminated soil is tracked onto adjacent land. The magnitude of effects is medium and the impacts may be **major** (**adverse**). Potential impacts could be similar to those for construction workers although the severity will be reduced by the greater distance from the site and reduced exposure.

Groundwater

11.66 Construction works including excavations may expose and mobilise contamination in soils and thereby may increase the infiltration of contaminated materials to groundwater. Piled foundations and other infrastructure works may also create preferential pathways for mobile contaminants to infiltrate to groundwater. The risk of a pathway link to groundwater during construction works is considered to be high, which could lead to pollution of groundwater in the underlying major aquifer. The sensitivity of groundwater is high and the magnitude of effect is medium. The effects on groundwater are therefore of **major** (**adverse**) significance. Groundwater may in turn discharge to surface water. The effects on groundwater are considered more fully in the Water Environment section of the ES.

11.67 The Buro Happold report advised that some groundwater may be encountered during earthworks/excavations. Where relatively minor seepages occur it is likely that these could be controlled by sump pumping methods. It should be noted, however, that where more significant water ingress is encountered, then more substantial water control measures may be required.

Surface Water

11.68 Construction works will alter the profile and surfacing of the site leading to increased surface water run off, with entrained contaminants. The nearest surface water feature, the River Irk, is 125 m west of the site, and it is likely that local storm drains discharge to the river. This could lead to pollution of the river. The sensitivity of the receptor is medium and the magnitude of effects is medium, leading to an impact of **moderate** (**adverse**) significance.

11.69 The site investigation did not assess surface water.

Operational Impacts

Future Site Users

11.70 Future site users include both commercial workers, visitors and grounds maintenance workers once construction has been completed. The sensitivity of future users is therefore high. Without mitigation there is the potential for future users to come in to direct contact with any potentially contaminated material present within the ground. Primary exposure routes will be through direct dermal contact, ingestion and inhalation. Potential impacts on users could include health effects, dermatological or respiratory problems i.e. impacts of medium to high magnitude. These effects are potentially of **major** (**adverse**) impact.

11.71 Based on the chemical testing undertaken and the proposed end use of the site (predominantly commercial use), Buro Happold reported that chemical concentrations in soils are not likely to pose a significant risk to end users of the proposed development provided that any ‘hot spots’ or other areas of contamination which may be identified during the earthworks are removed during the construction period.

Adjacent Site Users

11.72 Users of adjacent land could be similarly exposed to potentially contaminated material present on the site, if it is not dealt with appropriately. The sensitivity of adjacent land users is considered to be high, and potential impacts could be of medium magnitude. The effects are therefore potentially of **major** (**adverse**) impacts.

11.73 Based on the chemical testing undertaken, Buro Happold reported that chemical concentrations in soils are not likely to pose a significant risk to end users of the proposed development provided that any ‘hot spots’ or other areas

of contamination which may be identified during the earthworks are removed during the construction period.

11.74 This comment applies also to potential migration of dusts to adjacent property where it may affect commercial and residential users.

Groundwater

11.75 If contamination is not appropriately dealt with as part of the site development works, there is potential for the creation of permanent preferential pathways for mobile contaminants to infiltrate to groundwater e.g. piled foundations; site infrastructure (drains; services etc). This could lead to pollution of groundwater in the underlying major aquifer. The sensitivity of groundwater is high and the magnitude of effect is medium. The potential effects on groundwater are therefore of **major** (**adverse**) impacts. Groundwater may in turn discharge to surface water.

Surface Water

11.76 If contamination is not appropriately dealt with as part of the site development works, there is potential for the creation of permanent preferential pathways for mobile contaminants to enter the surface water drainage system and be rapidly transported to the River Irk. This could lead to pollution of the river. The sensitivity of the receptor is medium and the potential magnitude of effects is medium, leading to an impact of **moderate** (**adverse**).

Buildings and Buried Services

11.77 There is currently no information available as to whether aggressive ground conditions are present at the site, or whether ground gases are an issue. Although at the time of writing an intrusive investigation was underway. As such the risk for a pathway link to building (foundations/structure) and underground services is currently unresolved.

11.78 Buro Happold has reported that gas monitoring within boreholes located in the proposed area of the building have, to date, recorded gas concentrations and flows which fall which Characteristic Situation 1 in accordance with CIRIA guidelines. Further gas monitoring is to be undertaken.

11.79 The site is in an area where less than 1% of homes are above the Radon Action Level and, therefore, no radon protection measures are considered necessary for the proposed development.

11.80 If contamination is not appropriately dealt with as part of the site development works, there is the potential for ground contaminants to degrade concrete foundations, or degrade/permeate service pipes, and for ground gases to permeate into buildings (confined spaces). There is the potential for ground gases to be present from infilled ponds and made ground. The potential impact of ground gas is greatest where it may enter confined spaces as in buildings.

Potential consequences might be conditions under which explosion or asphyxiation might occur. The sensitivity of the receptor is medium but the potential magnitude of effects is probably only low to medium, leading to a potential impact of **minor to moderate (adverse).** Further monitoring is required.

Vegetation

11.81 Currently the site soil conditions with regard to phytotoxic materials are unknown. If contamination is not appropriately dealt with as part of the site development works, there is the potential for ground contaminants to affect the growth of plants. Vegetation is of medium sensitivity and the potential magnitude of effects is low to medium. The impact on vegetation is potentially of **minor to moderate (adverse).**

Mitigation Measures

11.82 The level of mitigation required will depend on the levels of contamination, if any, identified during the ground investigation.

11.83 Preliminary interpretation of data from the site investigation by Buro Happold is that concentrations of potential contaminants in site soils are not likely to pose a significant risk to end users of the proposed development provided that any 'hot spots' of contamination found during earthworks are removed. The mitigation measures required are therefore expected to be primarily within the construction phase.

11.84 Preliminary results from gas monitoring within boreholes in the proposed area of the building have recorded gas concentrations and flows which fall within Characteristic Situation 1 (CIRIA 665), which represents a very low risk and for which no special precautions are required.

11.85 There has been no commentary from Buro Happold on risks to groundwater or surface water.

Construction Phase

Construction Workers

11.86 Risks to construction workers can be mitigated by the adoption of safe working methods; awareness briefings to site staff; plus use of appropriate Personal Protective Equipment (PPE: comprising overalls, boots, gloves, eye-glasses etc.) and monitoring protocols. Removal or isolation of any potentially contaminated source materials ('hot spots') identified during the ground investigation will reduce the risk to construction workers to **minor (adverse)** due to the potential for accidental spills.

Adjacent Site Users

11.87 Risks to adjacent site users can be effectively managed through control of dust from earthworks and preventing off-site dust dispersion. The impact will be

reduced to **minor (adverse).** This is addressed in more detail in Chapter 7 (Air Quality) of this ES.

Groundwater

11.88 Mitigation measures in the form of removal or isolation of potential sources of contamination during the construction phase will reduce the risk of mobilising contaminants and/or creating potential pathway linkages to groundwater to **minor (adverse).** A foundation risk assessment can also be undertaken in accordance with Environment Agency guidance.

Surface Water

11.89 Mitigation measures in the form of removal or isolation of potential sources of contamination during the construction phase will reduce the risk of mobilising contaminants and/or creating potential pathway linkages to surface water to **negligible (adverse).** Standard construction practices can be adopted such as covering/blocking drains, perimeter surface barriers and dewatering of excavations. Collected water should be disposed in accordance with duty of care requirements and consent conditions.

Operational Phase

Future Site Users

11.90 The design of the proposed development will incorporate mitigation measures including the removal or isolation of any potential contamination; and gas protection measures as necessary. Mitigation measures should remove or minimise the pathway linkage to the receptors.

11.91 The site is to be developed predominately as a building with surrounding hard and soft landscaping. As such the site surface will be covered or capped which will effectively block pathways from any contamination in soils to site users within buildings and outside. If needed, ground gas exclusion measures should be designed into the development (e.g. floor slab membranes and ventilation). The removal of potential contamination will result in a **minor (positive)** impact.

Adjacent Site Users

11.92 As noted above, the design of the proposed development will incorporate mitigation measures which include the removal or isolation of any potential contamination; and gas protection measures as necessary. Mitigation measures will remove or minimise the pathway linkage to the adjacent site receptors. The removal of potential contamination will result in a **minor (positive)** impact.

Groundwater

11.93 The incorporation of mitigation measures in the construction of the development will involve the removal or isolation of contaminated soils;

appropriate foundation and infrastructure design and construction; control of surface water infiltration and use of landscaping to reduce the risk of leaching and mobilizing contaminants into the underlying groundwater. This will result in a **minor positive** impact.

Surface Water

11.94 The incorporation of mitigation measures in the construction of the development will involve the removal or isolation of contaminated soils; and appropriate infrastructure design and construction, including an engineered surface water drainage network. This will result in a **minor** (**positive**) impact.

Buildings and Buried Services

11.95 The incorporation of mitigation measures in the construction of the development will involve the removal or isolation of contaminated soils; and appropriate design/specification of construction materials. Buro Happold reported that protection of water supply pipes may also be required where these are to be laid in or near to contaminated soils or groundwater. The specifications will include corrosion resistant construction materials or coatings and gas protection measures to buildings. Mitigation measures for ground gas required for buildings will be based on the concentration and flow rates of ground gas as advised in CIRIA Report C665. This will result in a **negligible** (**positive**) impact.

Vegetation

11.96 Mitigation measures for soft landscaping at the site will include removal or isolation of contaminated soils; covering the proposed landscaped areas with imported clean topsoil and subsoil prior to planting; and selection of tolerant species. Similarly the use of 'tree pits' may be required for larger deep rooted plants. This will result in a **negligible** (**positive**) impact.

Summary of Residual Impacts

11.97 It is considered that all the potential impacts to or from land quality can be effectively reduced or removed by using appropriate mitigation measures as identified above. There are unlikely to be any significant remaining residual impacts from the development either during the construction of operational/occupation phase (subject to full interpretation of the site investigation findings).

11.98 A summary of residual impacts is presented in Table 68.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Construction Workers: human health effects from soil and water contamination	None	High	Negligible	Temporary	Direct	Minor, (adverse)	Not significant	High
Adjacent Site Users: human health effects from soil and water contamination	None	High	Negligible	Temporary	Indirect	Minor, (adverse)	Not significant	High
Groundwater: pollution of controlled waters from on-site contamination	None	High	Negligible	Temporary	Direct	Minor, (adverse)	Not significant	High
Surface Water: pollution of controlled waters from on-site contamination	None	Medium	Negligible	Temporary	Indirect	Negligible, (adverse)	Not significant	High
Operational Phase								
Future site users: human health effects from soil and water contamination	None	High	Negligible	Permanent	Direct	Minor positive	Not significant	High
Adjacent Site Users: human health effects from soil and water contamination	None	High	Negligible	Permanent	Indirect	Minor positive	Not significant	High
Groundwater: pollution of controlled waters from on-site contamination	None	High	Negligible	Permanent	Direct	Minor positive	Not significant	High
Surface Water: pollution of controlled waters from on-site contamination	None	Medium	Negligible	Permanent	Indirect	Negligible positive	Not significant	High
Buildings and Buried Services (degradation/permeation)	None	Medium	Negligible	Permanent	Direct	Negligible positive	Not significant	High
Vegetation: phytotoxic effects	None	Medium	Negligible	Permanent	Direct	Negligible positive	Not significant	High

Table 68 Summary of Residual Impacts – Land Quality

Cumulative Effects

11.99 No cumulative effects are identified with respect to land quality either during the construction or operational phase.

References

Envirocheck® Report, Order number 27833921_1_1 dated 5 May 2009.

Coal Authority Report, Reference 00019201-09 dated 7 May 2009.

12.0 Transportation

Introduction

12.1 This chapter predicts and evaluates the impact of the proposed development on junction/network capacity, means of access and car parking provision.

12.2 The Chapter begins by setting out the methodology used in undertaking the assessment and classifying the types of impact that may arise. It then describes the existing baseline conditions in respect of highway conditions and site accessibility by none-car modes. Following which an assessment of the impact of all phases of the development on local highway network conditions is provided along with setting out the mitigation measures proposed and the predicted residual impacts.

12.3 A Transport Assessment [TA] has also been prepared in support of the planning application and should be read in conjunction with this chapter. A copy of the TA is attached as Technical Appendix 12.1 with Traffic Flow data attached as Technical Appendix 12.2.

Policy Context

Development Plan Guidance

Regional Spatial Strategy for the North West to 2021 (2008)

12.4 The North West of England Plan was published in September 2008. It provides a framework for development and investment in the region over the period to 2021. Policies relevant to this Chapter are set out below.

1 Policy DP1 Spatial Principles – sets out the principles underpinning the RSS, including the promotion of sustainable economic development; making the best use of existing resources and infrastructure; and, reduction of emissions and adaption to climate change.

2 Policy DP5 Manage Travel Demand; Reduce the Need to Travel, and Increase Accessibility – development to be located to reduce the need to travel, especially by car, and to enable people as far as possible to meet their needs locally. New development is to be genuinely accessible by public transport, walking and cycling, and priority will be given to locations where such access is already available.

3 Policy RT2 Managing Travel Demand – requires a co-ordinated approach to managing travel demand including, locating major new developments where there is good access to public transport and effective provision for pedestrians and cyclists; reduce private car use through the introduction of 'smarter choices' and other incentives to change travel behaviour;

incorporate maximum parking standards that are in line with, or more restrictive than defined standards.

4 Policy RT9 Walking and Cycling – seeks the development of integrated networks of continuous, attractive and safe routes for walking and cycling.

Manchester Unitary Development Plan (1995)

12.5 The Unitary Development Plan [UDP] was adopted by the Council in July 1995 and sets out the policies for land use and development in Manchester. Relevant policies of the UDP have been 'saved' following the requirements of the 2004 Act and continue to represent Development Plan policy. The UDP will be progressively replaced by new Local Development Framework [LDF] documents. Policies relevant to this Chapter are set out below.

1 Policy I2.1 The Council will seek to ensure that new commercial and industrial development is fully accessible by all forms of transport and, in particular, is adequately served by the public transport network - new commercial development is to be fully accessible especially by the public transport network.

2 Policy E1.1 The Council wishes to see substantial reductions in the level of air pollution much of which is caused by vehicles fumes - seeks to promote public transport and cycling, improve conditions for pedestrians, discourage the use of the private car and locate all major new development where it can be easily served by public transport.

3 Policy T2.1 The Council's general approach to highway investment will be to maintain and improve the existing network rather than to embark on a major new construction programme – seeks to make the maximum use of the existing network to limit the number of trips made by private car and promote public transport and cycling.

4 Policy T3.1 The Council will ensure that the particular needs of both pedestrians and cyclists are catered for in the design of new developments and new road and public transport schemes – seeks to ensure the recognition of differing needs in designing new facilities.

National Planning Guidance

Planning Policy Statement 1 (PPS1): Delivering Sustainable Development

12.6 PPS1 identifies sustainable development as the core principle underlying planning. It states that planning authorities should seek to enhance the environment as part of development proposals.

12.7 In order to deliver sustainable development, PPS1 advises that local authorities should provide improved access to jobs, education, leisure and community facilities, open space and sport and recreation by ensuring that development is

located where everyone can access services or facilities on foot, bicycle or public transport.

Planning Policy Guidance 13 (PPG13): Transport

12.8 PPG13 outlines the key objectives and principles regarding transport and sustainable development. It emphasises the need to secure greater integration between land use planning and transportation. It particularly encourages the location of development where it is accessible by a range of modes of transport including walking, cycling and public transport.

12.9 PPG13 encourages the incorporation of access by public transport, walking and cycling and the discouragement of the car for access.

Potential Impacts

12.10 A full description of the proposed development is contained in Chapter 3 of the ES. In summary the following is proposed:–

1 A single building, triangular in plan, arranged in three wings around a central atrium to be located in the northern part of the site.

2 Access from Dantzic Street for deliveries and staff.

3 Access from Angel Street for visitors.

4 A basement car park for 151 vehicles.

Construction & Operational Impacts

12.11 The construction phase is likely to generate a total maximum of 84 vehicle movements per day.

12.12 The staff are being transferred from the existing Co-operative buildings to the south. As a consequence, the operational phase will generate no additional trips. The proposed development will occupy an area currently utilised for car parking. It represents the loss of up to 100 car parking spaces and as a result will actually reduce the number of traffic movements on the local highway network.

12.13 The main transport effects of construction and development arise from increased travel demand on routes within the vicinity of the site. The IEA guidelines suggest that the following effects need to be considered:-

1 Severance;

2 Driver delay;

3 Pedestrian delay and amenity;

4 Fear and intimidation; and,

5 Accidents and road safety.

Assessment Methodology

Approach

12.14 The Transport Assessment predicts the net effect of the proposed office development on travel to the existing site and assesses the potential traffic impacts. The following was used to inform the assessment: -

1 Traffic counts were undertaken to establish the existing traffic flow characteristics of the local highway network;

2 A robust approach using "first principles" and TRICS data has been used to predict development car trips;

3 Whilst traffic flows are anticipated to decrease, new trips have been assigned to the network based on existing traffic turning movements;

4 Traffic flows have been re-distributed on the local highway network as a result of proposed road closures based on existing traffic turning movements and ease of alternative routes;

5 Public transport information was used to determine the accessibility of the site by bus, light rail (Metrolink) and heavy rail;

6 Walk and cycle catchment plan were prepared to assess accessibility by these modes; and,

7 Government planning guidance was examined to determine whether the proposals accord with national transportation planning policy guidance.

Assessment Criteria

12.15 The assessment of individual environmental elements has been carried out in accordance with the "Guidelines for the Environmental Assessment of Road Traffic" published by the Institute of Environmental Assessments [IEA].

12.16 The IEA document suggests that the following criteria should be adopted to assess the need for environmental assessment:-

1 Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles (HGV) will increase by more than 30%).

2 Include any other specifically sensitive areas where traffic flows have increased by 10%, or more.

12.17 Increases in traffic flows of less than 10% are generally accepted as having

negligible impact as daily variance in traffic flows can be of equal magnitude.

12.18 The 30% threshold relates to the level at which humans may perceive change and there may therefore be an effect. Impacts above this level therefore do not suggest that there is a significant impact, only that further consideration is required.

12.19 The Transport Assessment has been prepared having regard to "Guidance on Transport Assessments", March 2007, which was jointly published by the Department for Communities and Local Government and Department for Transport [DfT].

Significance of Impacts

12.20 If any of the potential impacts are identified as a result of the proposed development a standard approach expressing the duration, magnitude, direction and location of each effect is required. The magnitude of the impacts associated with the development has been categorised as follows:-

Major Where the impact leads to serious and lasting disruption and substantial mitigation is required.

Moderate Where the impact leads to moderate disruption and mitigation measures are required.

Minor Where the impact leads to no material disruption and mitigation measures are not required.

Negligible Where the impact will be imperceptible to existing users.

12.21 The direction of the effect is categorised as follows:

Positive Where the proposals result in an improvement to the current situation.

Adverse Where the proposals result in a worsening of current conditions.

Neutral No perceivable impact.

Unknown Impact can not be quantified.

Baseline Conditions

Walking and Cycling

12.22 PPG13 recognises that walking is the *"most important mode of travel at the local level and offers the greatest potential to replace short car journeys, particularly under two kilometres."* The Transport Assessment [TA] highlights the fact that the site is located in a highly accessible location and is within

easy walking distance of the majority of Manchester city centre which includes numerous residential, retail, leisure and further employment facilities.

12.23 In addition, the site is located within easy walking distance of a number of public transport hubs [approximately 400 metres] including Victoria rail station, Shudehill interchange, Piccadilly Gardens and Piccadilly rail station. These facilities provide frequent, easy access to a number of destinations across the region by a range of bus, light rail and heavy rail services.

12.24 There are a number of key facilities located within an easy walking distance of the site including many residential, retail, leisure and further business /employment uses within the city centre.

12.25 There are several existing pedestrian crossing points on the immediate local highway network surrounding the proposed site. The Cheetham Hill Road/Corporation Street/Miller Street signal controlled junction provides dedicated crossing facilities across all approach arms as does the Miller Street/Dantzic Street junction and the Miller Street/Rochdale Road/Swan Street junction. These facilities ensure safe and convenient access to the many facilities on offer to the east, west and south of the site including the major public transport hubs.

12.26 The proposed development site can therefore be considered as being accessible on foot.

12.27 PPG13 also states that cycling has the potential to replace short car journeys, particularly those under 5km. The 5km cycle catchment extends to cover the whole of Manchester city centre as well into built up areas of Salford to the west, Prestwich to the north, Newton Heath and Clayton to the east and Trafford to the south.

12.28 The cycle catchment includes significant residential areas making cycling to work at the proposed site a realistic mode of travel. The proposed development site can therefore be considered as being accessible by cycle.

Public Transport - Bus

12.29 Bus travel represents a realistic mode of travel for all staff and visitors accessing the proposed development site. There are existing bus stops located Corporation Street, Cheetham Hill Road and Rochdale Road as well Victoria rail station and Shudehill interchange. All these existing public transport facilities are within a 400m walk of the proposed development site.

12.30 The Shudehill Interchange is located approximately 250m to the south of the proposed site and provides access to a large number of bus services operating throughout the day. These services provide sustainable access to a number of destinations including Bolton, Rochdale, Farnworth, Heywood, Cadishead, Moston, Blackley, Bury, Warrington, Langley and Altrincham. In addition, the

free city centre Metroshuttle service operates from Shudehill which provides frequent, easy access around Manchester city centre on a daily basis.

12.31 Table 69 provides a summary of the bus services operating from Shudehill Interchange.

Service No.	Destination	Frequency (minutes)		
		Mon – Fri	Sat	Sun
8	Bolton	10	10	20
10	Brookhouse	8	8	30
17	Rochdale	10	10	15
31	Farnworth	60	60	60
64	Oldham	30	30	60
67	Cadishead	10	10	30
68	Bolton	20	20	60
70	Clifton Junction	60	60	60
71	Clifton Junction	4/day	N/A	N/A
73	Clifton Junction	60	60	60
77	Moston	20	20	60
88	Cheetham Hill Circular	10	10	60
89	Higher Blackley Circular	10	10	30
93	Bury	20	20	30
96	Simister	60	60	60
98	Bury	10	10	30
100	Warrington	20	20	30
123	Langley	10	10	30
135	Bury	10	10	20
137	Bury	20	20	N/A
138	Bury	Evening only		30

Table 69 Bus Service Summary

12.32 There are up 76 bus services in total operating from Shudehill Interchange. These services provide the opportunity for those working or visiting the proposed development to travel via public transport. The proposed development is therefore considered to be highly accessible by bus.

Public Transport - Light Rail (Metrolink)

12.33 The closest Metrolink station to the proposed development site is located at Shudehill Interchange approximately 250m to the south of the site.

12.34 Metrolink services operate between the hours 06:00 and 23:00 and provide access to Bury, Eccles and Altrincham every 12 minutes.

12.35 The proposals to extend the Metrolink network ensures that after 2012 frequent access will be available to further destinations including Rochdale, Oldham, Droylsden, Chorlton and Mediacity:uk.

12.36 The proposed site is considered to be highly accessible by light rail services and will be enhanced further by the Metrolink network expansion.

Public Transport – Heavy Rail

12.37 Victoria rail is located approximately 430m to the southwest of the proposed development site.

12.38 There are frequent services operating from this rail station providing direct access to a number of destinations across the region including Leeds, Huddersfield, Halifax, Oldham, Rochdale, Wigan, Blackpool and Liverpool.

12.39 The proposed development site is therefore considered to be highly accessible by heavy rail services.

Local Highway Network

12.40 The A665 Miller Street is a two-way road with two lanes in each direction. The road is subject to a 30mph speed limit and has a typical carriageway width of approximately 17m. The road forms part of the Manchester inner ring road and runs in an east/west direction.

12.41 Pedestrian footways and street lighting are provided along both sides of the carriageway ensuring a good quality pedestrian environment. Pedestrian crossing points are situated at the signal controlled junctions at the eastern and western extent of Miller Street as well on all approach arms of the Miller Street/Dantzic Street signal controlled junction.

12.42 Miller Street forms a signal controlled junction with the A664 Rochdale Road and A665 Swan Street to the east of the proposed site. Pedestrian crossing facilities are provided on all approach arms at this junction.

12.43 Miller Street also forms a signal controlled junction with the A665 Cheetham Hill Road and Corporation Street to the west of the proposed development site. Pedestrian crossing facilities are also provided on all approach arms at this junction.

12.44 Dantzic Street is accessed off Miller Street via a signal controlled junction although movements are restricted to access only from Miller Street. The majority of Dantzic Street is a single lane two-way with parking permitted along the eastern side of the carriageway. The road is subject to a 30mph speed limit, with pedestrian footways and street lighting provided along both sides.

Dantzic Street currently provides access to the car park on which the development is proposed.

12.45 Dantzic Street forms a five arm priority junction with Aspin Lane and Angel Street to the northwest of the proposed site. Dantzic Street currently has priority over all other movements at this junction.

12.46 Aspin Lane forms a priority junction with Corporation Street to the west of the junction and continues north before rejoining Dantzic Street approximately 230m to the north of the junction. Parking is permitted along the southern side of Aspin Lane although it is restricted to two hours.

12.47 Angel Street is a single lane two-way road with a typical carriageway width of approximately 5m. Footways and street lighting are provided along both sides of the carriageway with the road subject to a 30mph speed limit. Angel Street terminates to the west of the site at a signal control junction with Rochdale Road and the A665 Addington Street. Traffic movements are restricted to access only into Angel Street from Rochdale Road.

12.48 Rochdale Road has a speed limit of 30mph and is the main route between Manchester city centre and Middleton/Rochdale to the north.

12.49 Addington Street is a one-way road in the eastbound direction and forms part of the Manchester inner ring road.

Highway Safety

12.50 Personal Injury Accident data has been obtained from the Greater Manchester Transportation Unit [GMTU] for the period of 1st March 2004 to 28th February 2009 covering Miller Street, Rochdale Road, Angel Street, Aspin Lane and Corporation Street.

12.51 The data indicates that 69 accidents have occurred within the agreed study area over the last five years. A total of 61 accidents were classified as slight in severity, eight were classified as serious and zero fatal accidents have occurred in the study area over the last five years.

12.52 A review of the accident data indicates that the vast majority of the accidents which have occurred within the study area can be attributed to driver error, alcohol/drug impairment, excessive speed or weather conditions. There is nothing to suggest that the highway layout or the maintenance of the highway contribute towards the accidents.

Traffic Flows

12.53 In order to understand the impact of the development proposals on the local highway network traffic counts were undertaken on Thursday 21st May 2009 during the AM and PM peak hour periods at the following locations:-

1 Great Ducie Street/Trinity Way/Victoria Street/New Bridge Street;

2 New Bridge Street/Cheetham Hill Road;

3 Corporation Street/Aspin Lane/Red Bank;

4 Dantzic Street/Aspin Lane/Angel Street;

5 Cheetham Hill Road/Miller Street/Corporation Street;

6 Dantzic Street/Miller Street;

7 Shudehill/Swan Street/Miller Street/Rochdale Road; and,

8 Angel Street/Addington Street/Rochdale Road.

12.54 The surveys were undertaken between 07:30 and 09:30 hours and between 16:30 and 18:30 hours. The vehicle movements were recorded in fifteen minute time periods and classified as light vehicles, heavy vehicles and buses.

12.55 The results of the survey were used to determine the network peak operating hours for use in the traffic impact assessment. The peak hours were found to be:-

1 AM peak hour – 07:45 to 08:45; and;

2 PM peak hour – 16:30 to 17:30.

12.56 The AM and PM peak hour existing traffic flows are presented as Figures 1 and 4 of Technical Appendix 12.2.

Impact Assessment

12.57 The impact of the proposed development during the construction and operational phases of the proposed development have been assessed separately.

Construction Impacts

12.58 The main transport impacts during construction are additional traffic in the form of HGVs and cars of construction workers on access roads surrounding the proposed development site. It is anticipated that the site clearance, earthworks, construction and fit out of the proposed office development would be undertaken over a period of 26 months.

12.59 In assessing the likely impact of the construction traffic anticipated vehicle numbers have been provided based on the individual elements of the construction phase which include: -

1 Stripping the existing site;

2 Piling;

3 Earthworks;

4 Erection of concrete core;

5 Construction of building frame;

6 Construction of building façade; and,

7 General fitting out of completed structure.

12.60 The busiest period during the construction phase is understood to be during month's three to six where piling, earthworks and erection of the concrete core overlap. During this period the maximum number of HGVs travelling to/from the site per day equates to approximately 60. Based on a typical nine hour day this equates to an average of seven construction vehicle movements per hour. It is also anticipated that up to 24 two-way vehicles movements will by generated each day by on-site construction staff.

12.61 The total maximum vehicle numbers associated with the construction phase of the proposed development are therefore likely to be 84 movements per day. It is considered that this represents the worst case scenario of the construction phase as traffic flows are likely to be lower during the remainder of the construction period. The volume of traffic associated with the construction of the proposed development would lead to a **moderate** (**adverse**) impact on highway capacity and pedestrian amenity. This impact would be short-term and temporary in nature.

Operational Impacts

12.62 The main transport impact associated with the proposed development would normally arise from the increase in traffic on the immediate highway network surrounding the proposed development site.

12.63 However, the proposed development scheme will effectively relocate staff that are already travelling to existing office facilities located to the south of Miller Street. The proposals will therefore generate no additional trips as the staff is currently on the highway network and consequently included within the existing traffic flows which have been surveyed.

12.64 Furthermore, the proposed development will occupy an area currently utilised for car parking. Whilst the proposed development will provide 151 car parking

spaces at basement level, the proposed building will result in the loss of up to 250 existing spaces. It can therefore be stated that the proposals represent the loss of up to 100 car parking spaces and as a result will actually reduce the number of traffic movements on the local highway network.

12.65 For robustness however, it has been assumed that all traffic to the proposed development will be new to the network and no discount to existing traffic flows has been made to reflect the loss of existing car parking spaces and existing staff trips on the local highway network.

12.66 In order to provide a robust assessment of the "operational impact" or increased traffic associated with the proposed development on the local highway network a combination of "first principles" and the TRICS database have been used.

12.67 It has been assumed that 75% of the total car parking provision will arrive to the site during the AM peak hour period, this equates to 113 vehicles. The TRICS database has then been used to derive an arrival and departure profile of office developments located in similar locations to that of the proposed site. Based on this arrival and departure profile the AM and PM peak hour trips have been calculated and summarised in Table 70.

Time Period	Trip Generation	
	Arrivals	Departures
AM Peak Hour	113	12
PM Peak Hour	30	104

Table 70 AM and PM Peak Hour Trip Generations

12.68 In order to derive the percentage impact of the proposed development on the local highway network the traffic generated by the proposals must be added to the observed traffic counts for the anticipated opening year.

12.69 However, it is also proposed as part of the development scheme to close Dantzic Street to all traffic movements to/from Miller Street. The closure of this road will result in the redistribution of traffic movements across the network. Furthermore, it is proposed that the remainder of the existing car park not occupied by the development will remain with alternative access taken off Kenwright Street via Rochdale Road.

12.70 Figures 3 and 4 of Technical Appendix 12.2 illustrate the redistributed observed traffic movements across the local highway network as a result of the closure to Dantzic Street and the alternative access into the remainder of the car park. It should be noted that whilst the remaining car park will effectively be half the original size no reduction in existing traffic flows has been made to reflect this. The redistributed traffic flows therefore represent a worst case scenario.

12.71 The GMTU Report 1390 dated August 2008 presents the transport statistics for Manchester during 2007. This report states that:-

> *"Since 1993, traffic flows on A and B roads in Manchester have decreased by 11% compared to a 2% increase in Greater Manchester and a 4% increase nationally."*

12.72 Based on this evidence it is suggested that zero growth is applied to the 2009 observed traffic flows to derive the opening year assessment flows. The surveyed traffic flows are therefore assumed to accurately represent the opening year situation.

12.73 The anticipated traffic generated by the proposed development has therefore been added to the redistributed traffic flows to provide the assessment traffic flows. Figures 5 and 6 of Technical Appendix 12.2 provide the assessment traffic flows for the AM and PM peak hours respectively.

12.74 The difference between the assessment traffic flows and the 2009 observed traffic flows calculated for each movement on the local highway network. The results of this are presented in Figures 5 and 6 of Technical Appendix 12.2. The difference in traffic was then used to determine the percentage increase in traffic following the development.

Screening Test

12.75 The calculations in Figures 7 and 8 of Technical Appendix 12.2 have been used to assess junction impact and therefore all calculations refer to peak hour periods. For the purpose if the environmental assessment the flows have been factored to 24 hour daily flows. The results of the screening test using these flows, is presented in Table 71 to identify links where effects may arise.

Road/Link	2009 Observed Traffic	Assessment Traffic	Percentage Difference
Corporation Street (N)	8921	8930	0.10%
Aspin Lane	2255	3616	37.64%
Corporation Street (S)	10255	12346	16.94%
Red Bank	4785	4843	1.20%
Dantzic Street (N)	2193	2614	16.11%
Aspin Lane (E)	841	857	1.87%
Angel Street	1271	2126	40.22%
Dantzic Street (S)	2828	1133	-149.60%
Aspin Lane (W)	2199	3610	39.09%
Rochdale Road (N)	15500	15684	1.17%

Road/Link	2009 Observed Traffic	Assessment Traffic	Percentage Difference
Addington Street	11445	11557	0.97%
Rochdale Road (S)	23543	24543	4.07%
Angel Street	586	1508	61.14%
Rochdale Road	23791	25141	5.37%
Swan Street	15668	15996	2.05%
Shudehill	11550	11550	0%
Miller Street	29449	30316	2.86%
Dantzic Street (N)	1981	0	-
Miller Street (E)	29580	30446	2.84%
Dantzic Street (S)	2791	2791	0%
Miller Street (W)	30016	31206	3.81%
Corporation Street (N)	11052	13329	17.08%
Miller Street	32801	33997	3.52%
Corporation Street (S)	10547	10634	0.82%
Cheetham Hill Road	35910	36267	0.98%
Cheetham Hill Road (N)	21064	21125	0.29%
Cheetham Hill Road (S)	35910	36087	0.49%
New Bridge Street	34122	34238	0.34%
Great Ducie Street	20029	20041	0.06%
New Bridge Street	36358	36474	0.32%
Victoria Street	13862	13879	0.12%
Trinity Way	36159	36246	0.24%

Table 71 Screening Test

12.76 The screening test demonstrates that the additional traffic associated with the proposed development is expected to have a greater impact than 30% on a number of links. IEA guidance therefore states that the environmental effects should be assessed further. However, it should be recognised that a proportion of this traffic is redistributed traffic and hence already on the local highway network and the additional development traffic represents a robust scenario. The actual percentage impact is anticipated to be much lower than identified in Table 71.

12.77 Notwithstanding the above, in order to provide a complete assessment the magnitude and significance of each of the five environmental effects which could arise have been considered.

Assessment of Severance Impacts

12.78 Severance is described as the perceived division of community that may arise when a road traffic link runs through an existing settlement. This can occur when a road becomes too heavily trafficked, making crossing the road a problem.

12.79 Whilst the majority of links show only a minor increase in traffic, there are number in close proximity to the proposed development site which identifies an impact of greater than 30%. On closer inspection it would appear that this increase is more of a consequence of redistributed traffic as a result of the Dantzic Street road closure rather than any increase in traffic from the proposed development. The effected links are summarised below:-

1 Aspin Lane on approach to Corporation Street – 37.64%,

2 Angel Street on approach to Dantzic Street – 40.22%,

3 Aspin Lane (W) on approach to Dantzic Street – 39.09%, and

4 Angel Street on approach to Rochdale Road – 61.14%.

12.80 The above links are currently only lightly trafficked and therefore any increase in traffic flows as a result of the development proposals or the redistribution of traffic is likely to have a larger percentage increase.

12.81 It is considered that the resultant traffic flows on the links identified above will remain relatively low and will not create any severance issues to the surrounding areas. The proposed office development would therefore lead to a **minor** (**adverse**) impact in terms of severance.

Assessment of Driver Delay Effects

12.82 It has been agreed with Manchester City Council highways officers as part of the TA scoping study exercise that given the nature of the scheme the proposed development will have no material impact upon the operation of the local highway network.

12.83 However, as part of the proposals it is intended to provide a mini-roundabout junction at the Dantzic Street/Aspin Lane/Angel Street junction and reduce the junction to four arms through the closure of the Aspin Lane eastern arm.

12.84 To ensure that the proposed mini-roundabout has sufficient capacity to accommodate the development traffic an ARCADY assessment has been undertaken and completed for both the AM and PM peak assessment

scenarios. The full assessment is contained within the TA at Technical Appendix 12.1. To summarise it has been demonstrated that proposed junction has significant spare capacity to accommodate the proposed development traffic in both the AM and PM peak hour periods with little or no queuing being experienced on any of the four approach arms.

12.85 The delays on the local highway network are therefore not envisaged to be significant and it is expected that the proposed development would lead to a permanent **minor** (**adverse**) impact in terms of driver delay.

Assessment of Pedestrian Delay and Amenity Effects

12.86 Due to the number of factors that can influence pedestrian delay, the IEA guidance does not provide specific guidance for determining how delay may change as a consequence of development. The guidance does advise that a lower threshold equates to a two-way flow of approximately 1,400 vehicles per hour.

12.87 The traffic flows on the Aspin Lane and Angel Street approach arms do not exceed 1,400 two-way vehicles per hour and as a result the pedestrian delay will be kept well within acceptable limits.

12.88 It is therefore considered that the proposed development would lead to a permanent **negligible** local impact.

Assessment of Fear and Intimidation Effects

12.89 A number of factors are considered in determining changes in the level of fear and intimidation experienced by pedestrians and cyclists. Including changes in the speed, proximity and HGV content of traffic.

12.90 Speed limits on the surrounding highway network will be unaffected by the proposed development and significant numbers of HGVs are not expected. In addition, the crossing point at the Miller Street/Rochdale Road/Swan Street junction, Miller Street/Dantzic Road junction and Miller Street/Corporation Street/Cheetham Hill Road junction provide clear routes to major surrounding facilities and help to ensure that fear and intimidation will have a permanent **negligible** impact.

Assessment of Accidents and Road Safety Effects

12.91 Accident records for the area surrounding the proposed development site have been assessed in detail within the Transport Assessment. No patterns indicating highway layout, traffic flows or poor maintenance were identified and as traffic levels are not expected to increase significantly it is considered that the risk of accident will not significantly increase.

12.92 The proposed development is considered to have a permanent **minor** (**adverse**) effect in relation to accidents and road safety.

Mitigation Measures

Construction Phase

12.93 Construction traffic is of a temporary nature and as a result it would be inappropriate to provide permanent infrastructure to fully mitigate the environmental impacts. However, detailed on site practices would be implemented to control and mitigate the additional traffic. These could be agreed with the Manchester City Council prior to construction.

12.94 Measures would include the introduction of route management strategies to ensure that HGVs travel outside of peak periods where possible and avoid sensitive residential areas.

12.95 In relation to construction workers sustainable transport choices will be encouraged so that the number of cars is kept to a minimum. Where workers do travel by car, dedicated car parking facilities will be provided so that vehicles do not park on the public highway.

12.96 The nuisance arising from construction traffic would be mitigated via considerate construction practices and road and vehicle cleaning facilities.

12.97 It is expected that the mitigation measures outlined above would mitigate some of the major impacts associated with construction traffic. Nonetheless, the impacts cannot be completely mitigated and it is anticipated that there would still be a temporary **minor** (**adverse**) impact.

Operational Phase

12.98 In accordance with current Planning Policy the proposed development has been designed to encourage sustainable forms of transport and integration with the existing community. To achieve this physical measures have been incorporated into the development design and a Travel Plan will be implemented to influence travel choices.

12.99 The Travel Plan is effectively a management tool which ensures that all of the travel opportunities, location advantages and sustainable initiatives are disseminated amongst employees and visitors of the proposed development. The Travel Plan will include targets that are monitored on an annual basis with a report being provided to the Local Authority.

12.100 The development proposals will create a significant area of public realm which would create a pedestrian friendly environment for staff and visitors.

12.101 The assessment demonstrates that the highway network can operate within capacity following development with a **negligible** impact. In addition, measures to encourage sustainable forms of travel will contribute to increased accessibility to the site which would further mitigate the impacts of any additional traffic associated with the development.

Summary of Residual Impacts

12.102 The assessment has identified no adverse impacts on transportation as a consequence of the proposed development. Table 72 provides a summary of the predicted effects of the proposed development on transportation. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Building and Construction Traffic Movements	Nuisance arising from traffic (including HGV movements)	Local	Minor (adverse)	Temporary	Direct	Minor (adverse)	Not significant	High
Building and Construction Traffic Movements	Increased traffic volumes	Local	Minor (adverse)	Temporary	Direct	Minor (adverse)	Not significant	High
Operational Phase								
Use of Building	Severance	Local	Minor (adverse)	Permanent	Direct	Negligible (positive)	Not significant	High
Use of Building	Driver delay	Local	Minor	Permanent	Direct	Minor (adverse)	Not significant	High
Use of Building	Pedestrian delay and amenity	Local	Minor	Permanent	Direct	Negligible	Not significant	High
Use of Building	Fear and Intimidation	Local	Minor (adverse)	Permanent	Direct	Negligible	Not significant	High
Use of Building	Accidents and road safety	Local	Minor (adverse)	Permanent	Direct	Minor (adverse)	Not significant	High

Table 72 Summary of Residual Impacts - Transportation

Cumulative Effects

12.103 There are no additional cumulative effects to be considered as part of the assessment.

13.0 Archaeology

Introduction

13.1 This chapter assesses these potential effects on archaeological and other features of the historic environment and should be read in the light of the overall project description. Following a summary of relevant policy and legislation this chapter outlines the data-gathering methodology that was adopted as part of the historic environment assessment. This leads on to a description of the overall baseline conditions, the environmental measures that have been incorporated into the scheme, the scope of the assessment, the assessment methodology and, for each identified receptor, an assessment of likely significant effects.

Policy Context

Legislation

13.2 The importance of archaeological remains is recognised in legislation as well as national and local policy. Certain features that are deemed to be of particular importance are given legal protection through legislation. The Ancient Monuments and Archaeological Areas Act 1979 provides for a schedule of monuments which are protected (Scheduled Monuments). Similarly, the Planning (Listed Buildings and Conservation Areas) Act 1990 provides for the definition and protection of Listed Buildings.

Development Plan Guidance

Regional Spatial Strategy for the North West to 2021 (2008)

13.3 The North West of England Plan Regional Spatial Strategy to 2021 [RSS] was prepared by the North West Assembly in liaison with local authorities and other regional stakeholders and sets out a long term development strategy for the North-West region. RSS Policy DP2 'Promote Sustainable Communities' identifies the importance of sustainable development, specifically highlighting the need to improve the built and natural environment and conserving the region's heritage.

Manchester Unitary Development Plan (1995)

13.4 The Unitary Development Plan for the City of Manchester [UDP] was adopted in 1995 and in accordance with section 1(3) of Schedule 8 of the Planning and Compulsory Purchase Act 2004 certain policies have been saved at the direction of the Secretary of State. UDP Policy E2.8 Environmental Improvement & Protection states that 'the Council will ensure that development does not adversely affect scheduled monuments and sites of archaeological interest or their setting. It will encourage the realisation of the educational, recreational and tourist potential of archaeological sites and monuments for

the benefit of the City's residents and visitors.'

National Policy Guidance

13.5 The following national policies include guidance relevant to the treatment of cultural heritage in this proposed development:-

1 Planning Policy Guidance Note [PPG] 15:- Planning and the Historic Environment; and

2 PPG 16:- Archaeology and Planning.

13.6 PPG 15 deals with the historic environment, including Listed Buildings and Conservation Areas whilst PPG 16 deals with archaeology. PPG 16 describes archaeological remains as a finite and non-renewable resource that should not be thoughtlessly or needlessly destroyed.

13.7 In addition to the statutory designations of Scheduled Monuments and Listed Buildings, there are a number of non-statutory designations, comprising Registered Historic Parks, World Heritage Sites and Registered Battlefields. The treatment of these features is subject to guidance within PPGs 15 and 16 and modifications contained in subsequent Planning Circulars.

Potential Impacts

Construction Impacts

13.8 Archaeological remains which may be present on the site are likely to be affected during the construction phase of any new development. These effects are likely to be adverse effects arising from physical damage and disturbance to in-situ archaeological remains arising from construction activities such as excavation, plant movements or remediation of contaminated land. In addition, damage to archaeological remains could arise indirectly through effects such as vibration damage or dewatering of preserved waterlogged deposits.

13.9 Adverse effects could also arise from public realm improvements, including landscaping and tree planting as well as activities such as the insertion of services and other groundwork. Given the reduced level of disturbance, these impacts are less likely to be significant than those associated with the main construction phase

Operational Impacts

13.10 It is unlikely that any significant adverse or beneficial impacts will arise from the operation of the proposed development.

Assessment Methodology

Sources of Information

13.11 In order to place the development in context and to attempt to identify the potential for previously unrecorded archaeological remains, data was collected for a Study Area of land within 0.5km of the site boundary.

13.12 The assessment of the site has involved an initial desk study, and site walkover. For the purpose of this assessment the following sources were consulted:–

1 National and County based registers of known archaeological and historical sites;

2 Cartographic and historic documents;

3 Aerial photographs;

4 Place and field name evidence; and

5 Published sources.

13.13 These were obtained from the following organisations:-

1 English Heritage - the National Monuments Record [NMR];

2 Greater Manchester Archaeology Unit [GMAU] Historic Environment Record (HER);

3 Envirocheck ® ; and,

4 Entec Library and internet sources.

13.14 The whole of the present Miller Street car park was the subject of a desk-based assessment in 2007 (Gifford 2007), which is included as Technical Appendix 13.1. This identified the potential survival of industrial and domestic features dating from the late 18th century onwards.

13.15 Arkwright's Mill has also been the subject of a detailed documentary history search (Champness 2004), which focused on the steam power plant and the remains of the Mill visible in 2003, along with the results of a ground penetrating radar survey [GPR] aimed at locating the engine room.

13.16 The present site is currently the subject of more detailed archaeological assessment and evaluation undertaken by Oxford Archaeology. This comprises a detailed mapping and documentary study, along with a programme of trial trenching. This process is being carried out to a Project Design produced by Oxford Archaeology (Oxford Archaeology 2009), which is included as Technical

Appendix 13.2, in response to a Project Brief issued by Greater Manchester Archaeology Unit (GMAU 2009) and intended to provide a more detailed view of the likely survival of archaeological features and their interpretation.

13.17 A site visit (walkover survey) was undertaken on 16th June 2009 by John Mabbitt MA MIFA Consultant (Historic Environment) with Entec UK Ltd. This aimed to confirm the presence, condition and extent of previously recorded features of cultural heritage interest, in addition to noting the general ground conditions.

13.18 The National Monuments Record holds the national datasets (lists) of designated archaeological and cultural heritage features. There are no World Heritage Sites, Registered Historic Parks or Registered Battlefields within the Study Area. There is one Scheduled Monument within the Study Area, the Hanging Bridge south of Manchester Cathedral (MAN-001), which is located 500m south-west of the site.

Ref.	SM ID	Description	Location
MAN-001	33889	Hanging Bridge immediately South of Manchester Cathedral	SJ 83855 98696

Table 73 Scheduled Monuments

13.19 Whilst there are no World Heritage Sites within the Study Area, the Manchester and Salford (Ancoats, Castlefield and Worsley) area was inscribed on the UK Tentative List of World Heritage (McNeil and George 2002). The site is not within the defined area, which has also not been adopted as a candidate World Heritage Site.

13.20 There are no Listed Buildings within the site, but there are over 50 Listed Buildings within the Study Area. A full list of these buildings is included in Technical Appendix 13.3. These are mostly listed at Grade II and date from the 19th and 20th century expansion of Manchester, and include a number of buildings associated with the Co-operative movement such as the CIS Tower, Miler St (Grade II:- MAN-046), The Co-operative Society Building, Redfern St (Grade II:- MAN-041), the Co-operative Wholesale Society buildings, Corporation Road (Grade II:- MAN-033, MAN-026), The Co-operative Press, New Mount Street (Grade II:- MAN-024) and the Co-operative Building Society, Dantzic St (Grade II, MAN-020). The two Grade I Listed Buildings within the Study Area, Chethams Hospital (MAN-047) and the Cathedral Church of St Mary (MAN-050) are located over 300m to the south-west of the site.

13.21 The Greater Manchester HER records over 150 sites, features or objects within the Study Area, but none within the site. The vast majority of these records relate to the industrial development of Manchester from the late 18th century onwards, although prehistoric, Roman, early medieval and medieval features are represented as well. The most significant record for the purpose of this

assessment is the site of Arkwright's Mill (MAN-062) which was the first cotton-spinning mill to be built in Manchester (1781-2:- McNeil and Newman 2006) and is thought to have been one of the earliest steam-powered cotton mills in the world (Wessex Archaeology 2006). The formal record for Arkwright's Mill places it on the edge of the site and it is possible that elements associated with this structure extend within the site.

13.22 Other records within close proximity to the site include an 18th-century cellar dwelling at 35 Angel St (MAN-150), the former Church of St Michael (MAN-065) and finds of a Roman coin and quernstone (MAN-174). The significance of these features is discussed below. The HER records for the study area are set out in Technical Appendix 13.4.

13.23 The earliest detailed mapping available (Casson and Berry 1741, which includes a reproduction of a map dated 1650) shows the site as enclosed fields on the north side of 'Mill Lane'. Laurent's map of 1793 shows the site bounded to the west by Blackley Street with development within the site boundary. The western part of the site is shown occupied by a number of minor streets and with buildings facing onto Blackley Street. The eastern half of the site is shown as open ground, with the reservoir to 'Simpson's Factory' (Arkwright's Mill) immediately to the east.

13.24 Greens' map of 1794 shows the site in more detail, but suggests no further change. The map produced by Bancks and Co (1831) shows considerable change within the site. The late 18th century development of the eastern part of the site had continued, and now included a ropery, as well as several further smaller, unlabelled buildings, some of which appear to form part of a complex centered on Arkwright's Mill. In the western part of the site, the reservoir to 'Norris and Hodgson's Cotton Mill' had been extended into the site.

13.25 The Ordnance Survey 60″-1 mile plan (1848) shows little further change, but provides much more detail. The ropery appears to consist of a single long building and a similar sized open area, labelled 'ropewalk'. A Timber Yard and a brewery are shown, along with two public houses. Adshead's map of 1851 records little further change in the western part of the site, other than the renaming of Blakely St as Charter St, and labelling ' Charles Johnson's Rope Works. In the eastern part of the site, the reservoir to Arkwright's Mill appears to have been largely backfilled.

13.26 The Ordnance Survey 10′- 1 mile plan (1891) shows substantial further change to the western part of the site, with large new buildings occupying the formerly open factory yard. These buildings are also shown on Goad's insurance plan of 1888, which lists the principal occupier of the former Mill complex as Baxendale, Andrews and Co. In addition, the Mill reservoir appears to have been moved to the north and west from the site recorded in 1851.

13.27 The Ordnance Survey 25′-1 mile plans (1908, 1933) show little further change beyond the apparent backfilling of the reservoir. The Ordnance Survey 1:-1250

plans for 1949-1951 show the eastern part of the site as largely derelict, and the western part of the site taken over largely as warehousing. Subsequent editions of the Ordnance survey show some industrial use of the site through the 1950s and 1960s, before it was cleared and used as a car park from the 1970s. During this time, both Miller Street and Dantzic Street were realigned, with Miller Street being widened over the former street frontage.

Methodology

13.28 To assess direct effects on archaeological remains information is required on any features that are known to be or could potentially be within areas where ground may be directly disturbed as a result of the proposed development. This includes the footprint of the proposed development as well as all land to be landscaped and managed as part of the overall scheme.

13.29 The proposed development has the potential to significantly affect the historic environment in a number of different ways and an understanding of these has helped to inform the identification of potential receptors for this assessment. Consideration has been given to the nature of the current environment, the known history of land use within the site and the nature and layout of the proposed development.

Significance of Impacts

13.30 Not all historic environment features are considered to be of equal importance, and in this assessment a distinction is made between features of national, regional, local or lesser importance. These are defined below:–

1 National Importance:- by legal definition, Scheduled Monuments are considered to be of national importance. As the process of scheduling is ongoing, there are further features which are not scheduled but which may also meet the established criteria (PPG 16 Annex 4) and may also be of national importance. All Listed Buildings are given equal protection by law and are of special architectural or historic interest, although the buildings are graded in importance with Grades I (most important), II* and II. Buildings listed at Grade I are described by English Heritage (Circular 01/07) as being 'of exceptional interest' and those listed at Grade II* are 'particularly important buildings of more than special interest' and therefore these are considered as being of potential national importance for the purposes of this assessment.

2 Regional Importance:- Archaeological sites which do not merit scheduling but which are nevertheless significant examples of their type in the regional context. For the purposes of this assessment, Grade II Listed Buildings described as being of 'special interest' (Circular 01/07) are also considered to be of local or regional importance.

3 Local Importance:- Archaeological sites or historic buildings which are of some interest in the local context.

4 Lesser Importance:- This includes sites where their presence is of some historical note although the feature itself is of no intrinsic interest, such as recorded isolated artefact finds locations. Sites of lesser importance may also include those which have been extensively damaged or isolated artefact finds.

5 Features where insufficient information is available to make an assessment of importance may be classified as of unknown importance.

13.31 The assessment of significance of any effect is largely a product of the importance/sensitivity of a feature, as informed by legislation, policy and the magnitude of the effect on it, qualified by professional judgement.

13.32 Effects on receptors are assigned to one of five classes of magnitude:–

1 High:- total or substantial loss of a feature;

2 Medium:- partial loss or alteration of a feature, or a more total loss which is temporary and/or reversible;

3 Low:- minor loss to or alteration of a feature;

4 Slight:- minor alteration of a feature; and,

5 Unknown:- extent of potential loss is unknown

13.33 As noted above, the assessment of magnitude of an effect essentially relies on professional judgement rather than any scoring of the criteria.

13.34 The significance of effects is considered according to the matrix set in Table 74. Effects which are 'major' are likely to be significant, whereas effects that are 'moderate', 'minor' or negligible' are considered not to be significant.

		Policy Importance		
		Local	**Regional**	**National**
Magnitude	**High**	Moderate	Major	Major
	Medium	Minor	Moderate	Major
	Low	Negligible	Minor	Moderate
	Slight	Negligible	Negligible	Minor
	Unknown	Unknown	Unknown	Unknown
Note:- Shaded cells represent likely Significant Effects				

Table 74 Significance of Impact – Archaeology

Baseline Conditions

Site History

13.35 There are some indications of Prehistoric activity within the Study Area, including reports of the sites of caves at Red Bank (MAN-082) and Old Millgate (MAN-076), as well as chance finds of stone artefacts, including a polished axe (MAN-136), a hammerhead (MAN-187) and other flint objects (MAN-189, 190). The significance of this type of evidence is very difficult to assess, but is suggestive of use of the wider area within this period.

13.36 The site of the Roman fort at Manchester is located approximately 2km south by south west of the site. As such, it appears likely that the site is outwith the main focus of Roman occupation of the area although there are indications of activity dating to this period within the Study Area:- the site is within 400m of the Manchester-Ribchester Road (MAN-206) and the HER also records Roman coins recovered from the River Irk (MAN-178) and a Roman coin and quern found immediately north of the site (MAN-174). A cobbled surface of this date was observed at Fennel St (MAN-056, 057)

13.37 Knowledge of the early-Medieval period in Manchester is extremely limited, although it is thought that the focus of the settlement moved slightly towards the confluence of the rivers Irk and Irwell within the area defined by the hanging ditch (Kidd 1996, MAN-192). There is no known evidence for early medieval occupation of the Study Area.

13.38 The site lies outside the medieval centre of Manchester, which was focused on the area around the present Cathedral. The earliest mapping shows the site as fields in the post-medieval period, and it appears likely that this reflects the earlier land use of the site in the medieval period.

13.39 The earliest records of the site are the copy of the map of 1650 and the 1741 map, which show the site as enclosed fields. At this time, the production of cotton in Manchester was becoming significant, the cloth being produced by individual weavers, often in distinctive ‘colonies’ of weavers (McNeil and Newman 2006). This system appears to have remained the norm in Manchester until the later 18th century. The construction of the Irwell and Mersey navigations (1736) and the Bridgewater Canal (1761) allowed for the supply of raw cotton and coal in bulk and with the development of mechanized spinning and weaving technologies in the 1770s (Kidd 1996) this favoured factory production. The larger houses shown on the Ordnance Survey mapping at the north-west corner of the site appear likely to be survivals of the larger houses with well-lit weaving lofts built in the 18th century (Hartwell 2008).

13.40 The eastern part of the site appears to have been in use until 1780 as a brickyard (Wessex Archaeology 2006). At this point, the land was leased by Richard Arkwright and his partners John Whittenbury, John Simpson and Samuel Simpson. The cotton mill that they built on the site between 1780 and

1782 was the first such building in Manchester (Champness 2004). Early attempts to power the machinery by steam were apparently unsuccessful, but the installation of a successful steam power plant in 1791 made this one of the first steam-powered cotton mills in Manchester, the earliest being the nearby Piccadilly Mill, built in 1789 (Nevell et al. 2003). The mill remained in operation until 1854, when it was damaged by fire but it was rebuilt and converted to an engineering workshop in 1892 (Wessex Archaeology 2006).

13.41 The site appears to have been occupied by the western half of the Mill complex, comprising elements of the reservoirs, ancillary buildings and the Mill yard. The Mill and the majority of the associated water-lifting and steam plant are thought from cartographic and archaeological evidence to have been located to the east of the site (Wessex Archaeology 2006).

13.42 The site remained in industrial use into the 20th century. The Mill was destroyed during Luftwaffe bombing of the area in 1940, leaving the eastern part of the site derelict until it became a car park. The smaller buildings and industrial concerns on the western part of the site were replaced by warehousing, which appears to have survived into the later 20th century.

Overall Archaeological Baseline

13.43 The most important archaeological features that may be present on the site are likely to be features and remnant structures associated with the construction and use of Arkwright's Mill. In addition, there is the potential for archaeological evidence of other industrial structures such as the ropery and domestic buildings to be present on the site. While the cotton industry has dominated perceptions of Manchester's industrial past and is recognised in the Manchester Research Framework as a significant theme in this history, the significance of other, often smaller industries also forms an important theme in this framework (Nevell et al. 2003).

13.44 There is no definite evidence for pre-industrial activity on the site other than agriculture and it is likely that the use of much of the site for clay pitting, the terracing of the site (which appears to date from the construction of the Mill) and associated reservoirs with its subsequent demolition and clearance after bomb-damage and redevelopment in the mid 20th century will have significantly disturbed any evidence of activity pre-dating the industrial use of the site.

13.45 The preservation of elements of features relating to the 18th-century and later development of the site is inherently unpredictable. While many of these features such as cellars and foundations are likely to be substantial and could have survived clearance of the site, other parts of the site may have been subject to more intrusive works. Archaeological evaluation of the adjacent Arkwright's Mill demonstrated a high level of survival of evidence of the building and of associated floors and surfaces, both of the substantial industrial buildings and of slighter domestic structures (Wessex Archaeology 2006). Conditions there are likely to be analogous to those on the eastern part of the

site, where a brick revetment wall and patches of cobbled surfaces of uncertain date survive in the car park. However, the western part of the site, which was partially redeveloped after World War II, is likely to have been more heavily disturbed, though the potential for surviving archaeological features to be present remains.

13.46 The site of Arkwright's Mill, as the first industrialized cotton mill in Manchester and one of the earliest steam-powered mills in the country, is clearly of a very high level of importance within the development of Manchester and the cotton industry, and by extension of the history of the 18th-century industrialization of England. Cultural and economic links deriving from the production import of raw cotton and export of finished cloth place these developments into a much wider context with international significance, similar to those of other British industrial products (Belford 2002). The early date of the mill and its importance in this context suggests that despite the lack of either formal designation or the presence of extensive above-ground remains, the Mill and its associated infrastructure is potentially of national importance.

13.47 In this case, this importance is primarily in the potential informative value of the archaeological remains, and therefore the level of importance depends largely on the preservation of these features. The historical and communal values of the Mill site should be acknowledged, but in the absence of substantial visible remains, these are comparatively minor factors (see English Heritage 2008). It should also be noted that the earliest and most important elements of the Mill complex, including the Mill itself and the vast majority of its water management infrastructure are located outside the site to the east, and the associated features within the site appear to form later ancillary elements of the wider Mill complex.

13.48 Archaeological evidence for other industrial features and the remains of domestic structures on the site dating from the 18th to 20th centuries is likely to be present on the site. This type of feature is identified in the Archaeological Research Framework for North-West England (McNeil and Newman 2007), and is important not only for its own sake but also for providing a social and cultural context for the larger industrial buildings (Nevell 2005). These are likely to be of local importance due to their evidential value, again depending on their nature and preservation.

13.49 Assuming no significant changes to the site over the short-medium term future, the archaeological baseline is likely to remain stable, with few, if any changes caused by the continued operation of the existing car park.

Data Gaps

13.50 Intrusive archaeological evaluation of the site is currently underway and the preservation and character of archaeological features on the site cannot be definitively described. Further archaeological works are currently planned to resolve this situation.

Impact Assessment

Construction Impacts

13.51 There is potential for the presence of below-ground archaeological features or deposits which cannot be confirmed or discounted on the basis of desk-based sources or a site inspection. More detailed study of the documentary and drawn sources for Arkwright's Mill and an extensive field evaluation are being carried out by Oxford Archaeology. The timescale for submission of the Environmental Statement does not allow for the formal results of these investigations to be incorporated here, and they will be submitted in due course.

13.52 Based on these factors and on the consultation response received from the planning authority, the following receptors have been selected as being potentially subject to significant impacts, and are therefore assessed in this section:–

1 Features associated with Arkwright's Mill; and,

2 Other 18th century and later industrial and domestic features.

13.53 Impacts on these potential archaeological features are likely to include effects such as physical removal through bulk excavation such as for foundations, compression and churning by plant movement and soil compaction. It is also possible that some deeper features, such as the backfilled reservoirs may contain waterlogged deposits that could be affected by construction of foundations, or that vibration from construction could indirectly affect archaeological features and deposits.

13.54 The level of effect is likely to vary across the site. Archaeological features within the footprint of the proposed building are likely to be removed in their entirety, whereas features in the area proposed for public realm improvements are likely to be less severely affected considering the generally shallower level of disturbance associated with this use.

13.55 Features associated with Arkwright's Mill have the potential to be of national importance, but those within the site are likely to form minor elements of the wider Mill complex are likely to be less important. In the absence of further information, effects have been assessed against features of national importance as a worst case, but this interpretation should be revised as further information from detailed fieldwork becomes available. Construction of the office building is likely to involve the effective removal of a small proportion of the Arkwright's Mill complex resulting in a permanent adverse impact of low magnitude. The public realm work will be likely to involve less damage, resulting in a permanent adverse impact of slight magnitude. The overall impact on the Arkwright's Mill complex can therefore be characterised as being of **moderate (adverse)** significance.

13.56 Other industrial and domestic features are likely to be of local importance, providing information about less important industries, as well as living conditions and culture within the area. Construction is likely to involve the total removal of features from part of the site, with lesser damage in areas where development will be restricted to public realm improvements. This will result in a permanent adverse impact of medium magnitude and the overall impact can be characterised as being of **minor** (**adverse**) significance.

Operational Impacts

13.57 It is not considered likely that the operational phase of the proposed development will result in any adverse impacts additional to those incurred during the construction phase.

Mitigation Measures

13.58 The constricted nature of the site means that avoidance of archaeological remains within the footprint of the proposed building is not a practicable option at this stage of development, though it may be possible to configure the public realm development in such a way as to minimise adverse effects. Therefore, some form of further evaluation will be required to determine whether mitigation is required and what form that mitigation will take. A programme of archaeological evaluation is underway and the results will be available in due course.

13.59 Implementation of measures to ensure the subsequent archaeological investigation and recording of below-ground archaeology within the site can be secured through an appropriately worded condition on any planning permission. It is anticipated that this would require a Written Scheme of Investigation (WSI) to be submitted to and agreed by the Planning Authority before the start of the development. The planning condition would be discharged by the acceptance and implementation of this WSI.

13.60 Further mitigation of the effects of development on archaeological features could be provided through developing a community engagement programme within any agreed archaeological works in order that the informative potential of any archaeological remains is effectively disseminated and that the communal and historic importance of those remains can be more widely appreciated. The form of this programme would be dependent on the nature of any archaeological works and would be most appropriately developed in parallel with those works.

13.61 This recording of at risk archaeological features and deposits and the engagement of the community with any archaeological works will not serve to reduce the level of impact, but will provide a measure of compensation for their loss.

Summary of Residual Impacts

13.62 The assessment has identified no adverse impacts on archaeology as a consequence of the operation of the proposed development. The development would result in adverse impacts on archaeology during construction but they are not considered to be significant.

13.63 Table 75 provides a summary of the predicted effects of the proposed development on archaeology. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Building and Construction Processes	Damage to archaeological features associated with Arkwright's Mill	Potentially National	Low	Permanent	Direct	Moderate (adverse)	Not significant	Likely
Building and Construction Processes	Damage to other industrial and domestic archaeological features	Local	Medium	Permanent	Direct	Minor (adverse)	Not significant	Likely
Operational Phase								
None	Increased knowledge through archaeological investigations and potential for community involvement	Local/regional	low/medium	Permanent	Direct	Minor positive	Not significant	Likely

Table 75 Summary of Residual Impacts - Archaeology

Cumulative Effects

13.64 It is important to recognise the potential for cumulative adverse impacts, particularly on the site of Arkwright's Mill, where it is possible that a series of developments, each of a relatively low level of effect could significantly adversely affect the important archaeological remains. It is important that this potential is recognised and addressed in impact assessments. In addition, any archaeological works carried out in mitigation of the effects of this scheme should be used to better assess the significance of development on adjacent sites and inform design and planning decisions.

13.65 At the current time, it is understood that that there are no other developments

planned which would, alongside this proposed development, result in a significant adverse effect on Arkwright's Mill.

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14.0 Built Heritage

Introduction

14.1 This chapter assesses the potential effects of the proposed development on built heritage (i.e. the historic landscape and any historic buildings). The term built heritage is used to describe valued components of the physical environment which reflect the human activities, ideas and attitudes which have contributed to the character of an area over time.

14.2 This assessment considers the impact of the development proposals on elements of Manchester's built heritage that may be sensitive to change as a result of their proximity and/or visual relationship to the development site. Such valued elements include Conservation Areas, Listed Buildings and the wider townscape within which the new development will be located.

14.3 The main considerations are the effect of the proposals on the setting of the adjacent Conservation Areas and the Listed Buildings within the vicinity of the site. As a consequence, the Chapter should be read in conjunction with Chapter 15 (Townscape and Visual Impact) which considers the key views of the development and the impact on the townscape. In addition, it should be noted that there are significant industrial and social archaeological remains located within the site boundaries. As a consequence, the impacts upon archaeology are considered separately under Chapter 13.

Policy Context

14.4 This section expands on the policy information set out in Chapter 5 of this ES.

Legislative Background

14.5 The sets out the legislative framework for the protection of Listed Buildings and Conservation Areas.

14.6 The Act [s66] requires LPAs in considering whether to grant planning permission for development which affects a Listed Building or its setting, to have special regard to the desirability of preserving the building or its setting or any features of architectural or historic interest which it possess.

14.7 Section 71 of the Act requires that special attention shall be paid in the exercise of planning functions to the desirability of preserving or enhancing the character or appearance of conservation areas. This requirement extends to all the powers under the Planning Acts.

Development Plan Guidance

Regional Spatial Strategy for the North West to 2021 (2008)

14.8 The North West of England Plan was published in September 2008. It provides a framework for development and investment in the region over the period to 2021. Policies relevant to this Chapter are set out below.

14.9 Policy DP1 (Spatial Principles) sets out the eight principles which underpin the RSS, which includes the promotion of environmental quality.

14.10 Policy DP7 (Promote Environmental Quality) states that:–

> *"Environmental quality should be protected and enhanced, especially by:-*
>
> *(i) Understanding and respecting the character and distinctiveness of places and landscapes;*
>
> *(ii) The protection and enhancement of the historic environment;*
>
> *(iii) Promoting good quality design in new development and ensuring that development respects its setting taking into account relevant design requirements, the NW Design Guide and other best practice…"*

Manchester Unitary Development Plan (1995)

14.11 The Unitary Development Plan [UDP] was adopted by the Council in July 1995 and sets out the policies for land use and development in Manchester. Relevant policies of the UDP have been 'saved' following the requirements of the 2004 Act and continue to represent Development Plan policy. The UDP will be progressively replaced by new Local Development Framework [LDF] documents.

14.12 Part 1 policies of the UDP are topic based and include policies for environmental improvement and protection. Policy E2.7 (Safeguard the City's Environment) provides protection for buildings of special interest. It states that:–

> *"The Council wishes to ensure that buildings and areas of special architectural or historic interest are retained, maintained and, where necessary, restored. It will seek to preserve and enhance the setting of such buildings and areas by appropriate control over the design of new development in their vicinity, control over the use of adjacent land and, where appropriate, by the preservation of trees and landscape features."*

14.13 Policy E3.8 (Enhance the City's Environment) provides protection for conservation areas. It states that:–

> *"The Council wishes to enhance the appearance of Conservation Areas and will, where appropriate, designate further areas."*

14.14 Part 2 of the Plan sets out the Council's approach to development in particular parts of the city and to development control policies. The site lies within Area 3 – Harpurhey, Lightbowne and Collyhurst.

14.15 Policy DC18.1 (Conservation Areas) advises that the Council will seek to preserve and enhance the character of its designated conservation areas by carefully considering issues which include:- the relationship of new structures to neighbouring buildings and spaces and the effect of signs and advertisements.

14.16 The policy also states that the Council will not normally grant outline planning permission for development within Conservation Areas and that development proposals adjacent to Conservation Areas will be granted only where it can be shown that they will not harm the appearance or character of the area. This includes the protection of views into and out of Conservation Areas.

14.17 Policy DC19.1 (Listed Buildings) states that:-

> *"In determining applications for listed building consent or planning applications for development involving or having an impact on buildings of Special Architectural or Historic Interest, the Council will have regard to the desirability of securing the retention, restoration, maintenance and continued use of such buildings and to protecting their general setting. In giving effect to this policy, the Council will,* [inter alia], *seek to preserve and enhance the settings of listed buildings by appropriate control over the design of new development in their vicinity, control over the use of adjacent land, and where appropriate, by the preservation of trees and landscape features."*

Collyhurst Local Plan (2006)

14.18 The area to the north of Miller Street is included in the Collyhurst Local Plan, which was approved by the City Council Executive in 2006. The Plan provides updated advice from the UDP with regard to land use development in the Collyhurst area of north Manchester. Whilst it is not statutory document, it is afforded weight as a material consideration by Manchester City Council.

14.19 The Plan seeks to address the physical, social and economic needs of the area. In terms of the character and townscape of the city fringe area it seeks to:–

1 Create a dense city fabric;

2 Ensure development extends to the back of the pavement to contribute to a clearly defined street frontage;

3 Retain the traditional grid street pattern (development should not subsume existing streets and alter the grain of the area);

4 Ensure buildings are of a scale, height and massing complementary to the

neighbourhood;

5 Promote building design using active frontages on the main arterial roads (particularly Rochdale Road and key junctions) and southern gateways into North Manchester;

6 Attract development of the current CIS surface car park to integrate the site back into the fabric of the City Fringe Neighbourhood.

National Planning Guidance

PPS1:- Delivering Sustainable Development (2005)

14.20 This document emphasises the importance of the design of new buildings. The document notes that planning should facilitate and promote sustainable and inclusive patterns of urban and rural development by:–

- *"protecting and enhancing the natural and historic environment, the quality and character of the countryside, and existing communities;*
- *ensuring high quality development through good and inclusive design, and the efficient use of resources..."* [¶5]

PPG15:- Planning and the Historic Environment (1994)

14.21 PPG15 emphasises the need for careful consideration of the design of new buildings adjacent to historic buildings. The PPG [¶2.14] notes that in general, it is better that old buildings are not set apart, but are woven into the fabric of the living and working community. This can be done, provided that the new buildings are carefully designed to respect their setting, following fundamental architectural principles of scale, height, massing and alignment, and use appropriate materials.

14.22 In considering the impact of development on the setting of listed buildings, the PPG advises this should not be too narrowly interpreted, noting that where a listed building forms an important visual element in a street it would probably be right to regard any development in the street as being within the setting of the listed building. A proposed high or bulky building might also affect the setting of a listed building some distance away or alter the views of a historic skyline [¶2.17].

14.23 The PPG [¶4.2] notes that it is the quality of areas, rather than that of individual buildings which should be the prime consideration in conservation areas. In particular, the following factors are identified as being important:–

1 The historic layout of property boundaries and thoroughfares;

2 The mix of land uses;

3 The characteristic materials;

4 The scale and detailing of contemporary buildings;

5 The quality of advertisements, shop fronts, street furniture and hard and soft surfaces;

6 The vistas along streets and between buildings; and,

7 The extent to which traffic intrudes and limits pedestrian use of spaces between buildings.

14.24 PPG15 [¶4.16] notes that many conservation areas include the commercial centres of the towns. While conservation (whether by preservation or enhancement) of their character or appearance must be a major consideration, this cannot realistically take the form of preventing all new development:- the emphasis will generally need to be on controlled and positive management of change. In addition, the PPG [¶4.17] states that many conservation areas include gap sites, or buildings that make no positive contribution to, or indeed detract from, the character or appearance of the area; their replacement should be a stimulus to imaginative, high quality design, and seen as an opportunity to enhance the area.

English Heritage/CABE - Guidance on Tall Buildings (2007)

14.25 The joint English Heritage/CABE guidance, originally published in 2003, was reviewed and updated in July 2007. The document provides guidance and advice on good practice in the planning system relating to the development of taller buildings. The document acknowledges the potential benefits of well designed taller buildings in suitable locations:–

> *"Cities and their skylines evolve. In the right place, tall buildings can make positive contributions to City life. They can be first rate works of architecture in their own right; some of the best post war examples are now listed buildings. Individually or in groups, they affect the image and identity of a city as a whole. In the right place they can serve as beacons of regeneration and stimulate further investment…"*[¶1.1]

14.26 The guidance indicates that proposals for taller buildings should be of the highest standards of design and should be assessed both a pieces of architecture and as pieces of urban design sitting within a wider context. The document sets out a series of eleven criteria [¶4] upon which proposals for taller buildings should be evaluated and urges LPAs to ensure:–

> *"…any new tall building should be in an appropriate location, should be of excellent design quality in its own right and should enhance the qualities of its immediate location and wider setting."*[¶4.4]

Supplementary Planning Guidance

Guide to Development in Manchester SPD and Planning Guidance (2007)

14.27 The City Council's SPD, 'Guide to Development in Manchester' was adopted in April 2007 and was produced to guide the preparation of design and access statements and expand on UDP policies. It sets out the City Council's stance on a wide range of issues.

14.28 The SPD [¶2.6] states that "*the rich urban heritage of Manchester and the distinctive qualities of its different neighbourhoods and buildings help to create a strong sense of place and should be respected in new development, to promote high quality environments that combine good design with the best architectural traditions of the City*." It also advises that new developments will only be acceptable if they preserve or enhance the special nature of these varied parts of the City.

14.29 The SPD [¶2.24] states *"the historic street pattern of Manchester's streets and spaces is still evident in most parts of the City. It is a significant element which helps to define the character of different neighbourhoods and should be respected….Development proposals should respect and help to reinforce* [the hierarchy and network of routes], *by providing an appropriate, well-designed street network which joins new development with existing, and reinforces links to and through the area."*

14.30 The SPD provides further general guidance in relation to the design and function of new buildings and places. This is applicable to all new buildings and not just those in or adjacent to conservation areas or listed buildings.

Potential Impacts

14.31 A full description of the proposed development is contained in Chapter 3 of the ES. In summary the following is proposed:–

1 A single building, triangular in plan, arranged in three wings around a central atrium to be located in the northern part of the site.

2 The building increases in height from 10 storeys at its southern side to 16 storeys at its north-west corner (a height of c.80m AOD).

3 It has a south-facing roof terrace.

4 The principal entrance is located in the southern wing opening onto the area of public realm proposed for the southern part of the site.

5 A basement car park for 151 vehicles is provided.

14.32 The detailed landscape design proposals will be development following a design competition. The landscaping proposals which form part of this

application are illustrative only and it is envisaged full landscaping details will be agreed through the discharge of a planning condition. As such the Built Heritage Impact Assessment does not take into consideration the future landscape proposals.

14.33 The proposed development has the potential to:–

1 Change the setting of the nearby Conservation Areas; and,

2 Change the setting of Listed Buildings.

Assessment Methodology

14.34 This assessment has been carried out using desk-based data gathering and fieldwork, and is intended to supplement, and be read in conjunction with Chapter 9 (Townscape and Visual Impact) and Chapter 14 (Archaeology).

Sources of Information

14.35 The following sources of information were utilised in undertaking the assessment:–

1 A Plan of Manchester and Salford, taken 1650. Drawn from a Plan in possession of William Yates Esq. By John Palmer Arch. 1822. In Shercliff, W.H, Manchester. A Short History of its Development, 1969

2 A Plan of the town of Manchester and Salford, by Casson and Berry, 1771

3 A Plan of Manchester and Salford, 1787-94, reprint by Neil Richards, 1982

4 Map of Manchester, Lewis's Manchester Directory for 1788

5 Manchester & Salford with their environs, from an actual survey by William Green, begun in the year 1787 and completed in 1974

6 Ordnance Survey Map, 1819

7 Ordnance Survey Map, 1824

8 Ordnance Survey Map, 1832

9 Ordnance Survey Map, 1850

10 Ordnance Survey Maps, 1891-1893

11 Ordnance Survey Map, 1908

12 Ordnance Survey Maps, 1922-1933

13 Ordnance Survey Maps, 1948-1949

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14.36 Fieldwork studies were undertaken, walking the area and the immediate and local environs, viewpoints and vistas.

Methodology

14.37 In assessing built heritage impacts there is a need to consider:–

1 Direct impacts on sensitive built heritage elements (e.g. through alteration

or demolition); and,

2 Indirect impacts on elements of built heritage (e.g. the setting of listed buildings and other areas of recognised historic or architectural significance).

In this case there are no direct changes to listed buildings/structures resulting from the proposal.

14.38 The significance of the impact of the proposed development on the historic character of the area has been examined in terms of [cf. ¶2.14 of PPG15]:–

1 scale,

2 height,

3 massing,

4 alignment, and,

5 materials.

14.39 The role of the proposed development in the setting of the elements of built heritage importance is described as positive, neutral or adverse. A judgement as to whether the development will on balance preserve, enhance or harm the setting of the element of built heritage importance in comparison to the existing situation is then made, taking all of these factors into account.

Significance of Impacts

14.40 Not all built heritage features are considered to be of equal importance, and in this assessment a distinction is made between features of national, regional or local importance. These are defined below:–

1 National Importance: Grade I and Grade II* Listed Buildings and Scheduled Monuments.

2 Regional Importance: Grade II Listed Buildings and archaeological sites which do not merit scheduling but which are nevertheless significant examples of their type.

3 Local Importance: Historic buildings and features which are of some interest in the local context.

14.41 The assessment of significance of any effect is largely a product of the sensitivity of the feature and the magnitude of the effect on it. Effects on receptors are assigned to one of four classes of magnitude:–

1 High: total or substantial loss of a feature;

2 Medium: partial loss or alteration of a feature, or a more total loss which is temporary and/or reversible;

3 Low: minor loss to or alteration of a feature; and,

4 Negligible: minor alteration of a feature.

14.42 The assessment of magnitude of an effect essentially relies on professional judgement rather than any scoring of the criteria. The significance of effects is considered according to the matrix set out in Table 76.

		Magnitude of Change			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of Receptor	**Local**	Negligible	Negligible	Minor	Moderate
	Regional	Negligible	Minor	Moderate	Major
	National	Minor	Moderate	Major	Major
Note:- Shaded cells represent likely Significant Effects					

Table 76 Significance of Impact – Built Heritage

Baseline Conditions

The Site

14.43 The site is located between Manchester's Victoria Station and the Northern Quarter area of the City Centre. It covers approximately 1.2ha and does not contain any buildings. There is some existing vegetation on the site.

14.44 The site lies adjacent to the current Co-operative offices complex and is used for surface car parking; incorporating the surface car park for the CIS Tower on Miller Street and an extensive area of public car parking on land between Angel Street and Miller Street. There is little above ground evidence of any buildings or structures on the application site, and the C19th street pattern on the site has disappeared.

14.45 The application site is situated adjacent to five Conservation Areas. In addition, there is a significant group of listed buildings to the south of the site (on the opposite side of Miller Street) including the CIS Tower and New Century House. The site does not, in its current state, contribute to the setting of the nearby Conservation Areas or Listed Buildings.

Historic Development of the Site

14.46 The urban use of the site developed in the C18th with the construction of

Arkwright's Mill (one of the world's first steam powered cotton mills) between 1780 and 1782 on the eastern edge the site, together with workers housing on Angel Street, along the northern boundary of the site. In 1784 Arkwright sold the mill to his son Richard. In 1854, the mill was badly damaged by fire but it was rebuilt and converted to an engineering workshop in 1892.

14.47 Baxendale and Co., a firm of engineers and plumbers' merchants took over and redeveloped the site in 1892. It is understood that the Mill stood until 1940 and was completely destroyed by the Blitz in October 1940. The site then remained derelict until it became a car park in the 1980s.

14.48 By 1850 the application site was occupied by terraced houses fronting onto Blankley Street (later Charter Street and now Dantzic Street) and a dense grid of streets on the main body of the site. The eastern part of the site was partly occupied by commercial buildings together with a reservoir associated with the mills. Small scale clothing, warehouse and workshops were scattered throughout Shudehill. It is understood that some of the late C18th three storey town houses were converted to business premises

14.49 This pattern of development continued during the late C19th and early C20th, although the commercial development on the eastern part of the application site was intensified, with the mill reservoir being reduced in size and additional buildings being erected. The Co-operative Wholesale Society (CWS) moved to 53 Dantzic Street, which is now occupied by the Dantzic Building in 1865.

14.50 The historic urban form and grain of the application site was therefore high density terraced housing fronting narrow streets, in small blocks, with commercial buildings on the eastern side of the site and frontage to Miller Street. However, this pattern of development was swept away during World War II and by 1948 all the buildings on the site were demolished apart from a warehouse adjacent to Angel Street and a small building fronting Dantzic Street.

14.51 In the post war period a meat cold store was erected at the junction of Dantzic Street and Miller Street (1952-53) and extended in 1955-56. The meat cold store building was demolished in c1970 and the site became a surface car park. The present configuration of the site has therefore existed for over 30 years and there is little evidence, above ground, of the historic pattern of development on the land.

14.52 Additional information on the historic development of the site is provided in Chapter 14 (Archaeology).

Historic Development of the Surrounding Area

14.53 In Medieval times, Manchester's growth was centred on the confluence of the rivers Irwell and Irk, around the Parish Church, which is now Manchester Cathedral and the Manor House, which is now Chetham's School of Music.

14.54 Medieval Manchester was a relatively insignificant town, but by the C16th a prosperous class of clothiers and merchants had developed. By the C18th Manchester became the regional centre for textile manufacture. Trade was stimulated by improvements in river transport with the connection of the River Irwell to the Mersey and the Port of Liverpool. By 1830 the town was served by one of the first passenger railways.

14.55 The town expanded rapidly in the late C18th and early C19th as a consequence of the forces of the Industrial Revolution. New dwellings were hastily erected to accommodate the rapid rise in population to an estimated 455,000 people in 1851. The area encompassed by the Shudehill and Smithfield Conservation Areas was fully urbanised by 1793. Buildings of modest proportions were initially concentrated in the Smithfield and Shudehill district's in the north eastern part of the centre on roads including Dantzic Street, Well Street, Shudehill, Withy Grove, Turner Street, Thomas Street and High Street.

14.56 By 1850 the application site was within an area dominated by mills, factories and terraced housing. The housing was dense, dominated by back to back terraced houses fronting onto narrow streets; typical of the period. To the north of the site was St Michael's church and burial ground (on the site of the current St Michael's Flags recreation ground). This was the only undeveloped area within the immediate vicinity of the application site by the late C19th.

14.57 The continued prosperity of the town in the second half of the C19th and the growth of the local railway network (including the construction of Victoria Station) led to major reconstruction of the area. Corporation and Dantzic Streets were driven through the maze of narrow streets to improve access within the town and facilitate the development of larger commercial buildings in the place of the poorer housing and shops.

14.58 By the C20th large scale property was being developed along Corporation Street; first the head office of the Co-operative Wholesale Society, then the buildings on the corner of Withy Grove and Corporation Street to accommodate national newspaper publishers. This period led to the progressive re-planning of the area, the narrow streets being replaced by a more regular grid of wider streets.

14.59 The application site and the land to the south and east were cleared as a result of the bombing during World War II. There was limited building activity in the middle of the C20th. However, the later years saw greater diversity with the building of New Century House and the Co-operative Insurance Society building.

14.60 The City of Manchester Plan was published in 1945. This document proposed radical redevelopment of the City Centre. The Plan identified buildings for retention and included the Cathedral and Chetham's College. The City of Manchester Plan was only implemented in a limited way, through slum clearance and some of the new road systems were put into place.

14.61 The closure of Smithfield Market in 1973 and the demolition of most of its

market buildings lead to a significant loss of retailers in this area. Areas of substandard housing were cleared, and some commercial buildings were demolished.

Character of the Site and Surrounding Area

14.62 The site is used for surface car parking and contains no buildings. It comprises a gap site in the townscape and makes no contribution to the character of the area. The undeveloped form of the site extends into the adjoining land owned by the applicant up to Rochdale Road, where there are further surface car parks (both on the frontage to the main road and on Addlington Street to the east).

14.63 The area to the north-east of the site is predominantly residential comprising some original C19th buildings and modern apartment developments of 5-storeys to 7-storeys high. These new buildings have been built within the C19th street pattern and provide a strong edge on the eastern side of the site, together with the trees within the St Michael's Flags recreation ground.

14.64 To the west of the site, the pattern of land uses is mixed with residential and commercial uses. The C19th street pattern remains together with the pre-war buildings (such as Ashton House and New Century House), although there has been some modern development including a warehouse fronting Dantzic Street and apartment blocks on Dantzic Street and Corporation Street.

14.65 The area to the south of Miller Street consists of large urban blocks that reflect the shift away from housing to today's expansive commerce and retail uses in this area of the city. Although the city has seen significant changes in the scale and use of land in this area, the historical grain of the street pattern remains largely intact.

14.66 The CIS Tower and New Century House dominate the immediate vicinity of the site, although there large surface car park on the south side of Miller Street creates an open frontage.

14.67 The urban form to the city centre core is reasonably dense with an obvious hierarchy of major and minor streets and squares. The urban grain generally comprising primarily of small scale buildings, particularly to the historical city centre core. Large buildings such as the Arndale Shopping Centre provide internalised routes to provide connectivity throughout the city.

14.68 To the south-east of the site, the density of building form reduces considerably, with significant areas of undeveloped land used for surface car parking:- some of these vacant blocks remain from the bombing during World War II and the post-war slum clearance. The exception is a modern apartment development fronting Rochdale Road which provides a strong focal point in the townscape.

Sensitive Heritage Receptors

Conservation Areas

14.69 The application site is not located within a Conservation Area.

14.70 The desk study has identified five Conservation Areas within 1km of the application site, namely: Cathedral, Shudehill, Smithfield, Ancoats and Stephenson Square. The location of the conservation areas is shown on the plan attached as Technical Appendix 14.1.

14.71 The Ancoats and Stephenson Square Conservation Areas are located a substantial distance from the application site and there is no direct inter-visibility between them. It is therefore considered that the application site does not form part of the wider urban setting of these conservation areas.

14.72 The application site adjoins three conservation areas immediately to the south (i.e. Cathedral, Shudehill and Smithfield). The proposed development has the potential to affect the character or appearance of these areas. The appraisals for these conservation areas are included in Technical Appendix 14.2. Photographs together with the photographic viewpoints are contained in Technical Appendix 14.3. The appraisal of the effects of the development on the setting of conservation areas is therefore contained within the assessment of these three conservation areas.

Role of the Application Site in the Setting of the Adjacent Conservation Areas

14.73 The application site sits at a pivotal point within the townscape. To the north and east, the C19th street pattern remains and whilst modern buildings have been erected the essential small grid pattern has not changed. To the south and west, there are large urban blocks that reflect the commercial and retail use of the area, again based on the street pattern established in the late C19th and early C20th.

14.74 The application site is located on the northern side of Miller Street, which forms part of the City's inner ring road and is an important thoroughfare. The road is dual carriageway and acts as a physical barrier to pedestrian movement and a visual break in the townscape.

14.75 **The Cathedral Conservation Area** is focussed around the Cathedral and Chetham's Hospital School. These buildings cluster around the medieval street pattern and front onto Cathedral Gardens which was laid out as part of the Urbis development. Around this historic core is a range of Victorian buildings, including the listed Corn & Produce Exchange and the Victoria Station (which forms the northern boundary of the conservation area).

14.76 The conservation area was principally designated to preserve and enhance the quality of the setting of the Cathedral and Chetham's Hospital School. However, these buildings are divorced from the application site by Victoria

Station and the associated complex of railway lines and structures on the eastern side of the station concourse. As a consequence, there is an open aspect to the west of the junction of Corporation Street and Miller Street. This contrasts with the complex of Co-operative buildings fronting onto Corporation Street, Hanover Street and Dantzic Street, which create a dense group of buildings that provide a barrier between the conservation area and the application site.

14.77 There are clear views of Miller Street, and particularly the listed Parkers Hotel, from Corporation Street which forms the eastern boundary of the conservation area. However, there are no direct views of the application site from Exchange Square and consequently the undeveloped nature of the site has a negligible impact on the conservation area.

14.78 **The Shudehill Conservation Area** is mainly composed of a large buildings constructed during the C20th. These buildings line Corporation Street and Dantzic Street together with more modern buildings located in the southern part of the area. The older, smaller scale, buildings are situated on the eastern side of the conservation area.

14.79 The character of the area is largely created by the unified way in which buildings are designed and grouped together, giving each street coherence and identify. This is particularly the case with the Co-operative complex (many of which are listed) fronting onto Corporation Street, Hanover Street and Dantzic Street. This group buildings show the development of commercial architecture through the C20th ranging from the Neo- Baroque (Holyoake House), through the Art Deco (Redfern Building) to the modernist tower blocks of New Century House and the CIS Tower.

14.80 The conservation area is separated from Miller Street, and the application site, by New Century House and the CIS Tower which lie outwith the conservation area. These buildings provide a strong edge to the south side of Miller Street with the CIS Tower a dominant feature in the townscape.

14.81 However, the car park to the east of the CIS Tower provides an open area at the junction of Shudehill and Miller Street and allows views of the site from Hanover Street. In addition, there are clear views of the application site from the heart of the conservation area along Dantzic Street. In these views, the application site appears as an undeveloped gap site which detracts from the appearance of the townscape and the character of the conservation area. It is therefore considered that the application site has a moderate (adverse) impact on the setting of the conservation area.

14.82 **The Smithfield Conservation Area** contains a wide range of buildings. In the south-western part of the conservation area the buildings are large and mainly date from the C20th reflecting the commercial and retail use of the area. The remainder of the conservation area is composed of relatively smaller buildings of one to four storeys in a mixture of residential and commercial uses. These

smaller buildings date from the late C18th and C19th when this part of the city was first developed.

14.83 Until relatively recently there were significant areas of vacant land within the conservation area used for surface car parking. However, many of these gap sites have been developed over the last 10 years repairing the urban form and enhancing the variety and interest in the townscape. In particular, the southern side of Shudehill (close to the junction with Swan Street) has been developed with an apartment block and the Crowne Plaza Hotel. This modern development provides an edge to the conservation area as it faces the application site and the associated surface car parking.

14.84 There are restricted views of the application site from Swan Street (which forms the northern boundary of the conservation area). The views are contained by the buildings along the back edge of the footpaths but the application site appears as an undeveloped gap site which detracts from the appearance of the townscape and the character of the conservation area. It is therefore considered that the application site has a minor (adverse) impact on the setting of the conservation area.

Listed Buildings

14.85 There are no listed buildings within the application site.

14.86 The desk study has identified 50 listed buildings within 1km of the application site. A list of these buildings is provided in Technical Appendix 14.4 and shown in orange and yellow on the plan attached at Technical Appendix 14.1. The listing descriptions are included in Technical Appendix 14.5 together with photographs.

14.87 PPG15 [¶2.17] indicates that the setting of a listed building should not be interpreted too narrowly and may include land some distance from it. In addition, the setting of may encompass a number of other properties, including a grouping of buildings, especially where the building is located with a dense urban street. The PPG also notes that a high or bulky building may also affect the setting of a listed building some distance away, or alter the views of a historic skyline.

14.88 Many of the listed buildings identified through the desk study are situated a substantial distance from the application site and there is no direct inter-visibility between them. It is therefore considered that the application site does not form part of the setting of these Listed Buildings. However, the application site (and the proposed development) forms part of the setting of 12 of the identified listed buildings. These buildings are listed in Table 77.

Map Ref	Sensitive Built Heritage Receptor	Location	Listing Grade
1	Co-operative Wholesale Society – Main Block (Old Bank)	Corporation Street	Grade II
2	Co-operative Wholesale Society – Hanover Street Junction (Hanover Building)	Corporation Street	Grade II
3	Ashton House	Corporation Street	Grade II
4	New Century House	Corporation Street	Grade II
5	Parkers Hotel	Corporation Street	Grade II
7	No.29. Co-operative Society Building	Dantzic Street	Grade II
8	Holyoake House	Hanover Street	Grade II
9	Co-operative Insurance Society (CIS Tower)	Miller Street	Grade II
10	Co-operative Society Building	Redfern Street	Grade II
11	Victoria Station	Victoria Station Approach	Grade II
22	Smithfield Market Hall 39,43 and 45 Swan Street	Swan Street, Ancoats	Grade II
30	Co-operative Press	23 New Mount Street	Grade II

Table 77 Listed Buildings with the Potential to be affected by the Proposed Development

14.89 The majority of the listed buildings within the vicinity of the application site date from the late C19th or early C20th. They were mainly constructed as commercial warehouses or offices and are intimately connected with Manchester's past position as a centre for the manufacture and trade of cotton goods and its important role in the development of the Co-operative Society movement.

14.90 The buildings are important individually but they also play an important role in the townscape by providing focal points and clearly links to the history of the city. In particular, the Co-operative complex of buildings is especially important as they demonstrate the social and historic development of the city, as well as illustrating the development of commercial architecture over the C20th.

14.91 The buildings exhibit a variety of architectural styles, from the Edwardian Baroque, through the Art Deco to the modernist tower blocks of New Century House and the CIS Tower. Generally the buildings have the air of solidity and whilst the buildings were erected for a particular purpose, they have proved reasonably adaptable to the needs of the late C20th and early C21st.

14.92 The buildings are generally 3-storeys to 5-storeys high (the multi-storey tower blocks are an exception) with basements and attics. They have a strong vertical emphasis and feature corners which are a common characteristic of the buildings within the city centre. The buildings are set on the back edge of the footpaths and create a dominant urban townscape. Most are constructed from red brick with stone dressings, although the Victoria Station and the Smithfield Market are constructed of stone. The modernist New Century House and CIS Towner are curtain wall structures typical of the late C20th.

Role of the Application Site in the Setting of Listed Buildings

14.93 **New Century House and the CIS Tower** are located on the southern side of Miller Street opposite the application site. The application site, together with the land to the east, represents an inappropriate gap in the townscape. The northern side of Miller Street has no clear frontage definition, a problem reinforced by the car park to the east of the CIS Tower. In its current state the lack of enclosure and current car park use is considered to have a moderate (adverse) impact on the setting of these buildings.

14.94 **Hanover Building, Old Co-operative Bank and Victoria Station** define the frontage of Corporation Street. The application site forms part of the wider setting of these buildings but they are separated from the site by the existing buildings fronting Miller Street and Dantzic Street. However, the absence of development and the advertisement hoardings on the site create an impression of dereliction which has a detrimental impact on the wider character of the area and is considered to have a minor (adverse) impact on the setting of these buildings.

14.95 **Holyoake House, #29 Dantzic and the Redfern Building** front onto the western side Dantzic Street. There are views along Dantzic Street of the application site which are framed by these buildings together with New Century House and the CIS Tower. In these views the lack of enclosure and advertisement hoardings are detrimental to the appearance of the area. The application site in its current use is considered to have a moderate (adverse) impact on the setting of these buildings.

14.96 **Parkers Hotel** is located at the northern corner of Miller Street and Corporation Street. The building is prominent in the townscape but there are no direct views between it and the application site due to the frontage development on Miller Street and Dantzic Street. However, the appearance of the application site creates an impression of dereliction which has a detrimental impact on the wider character of the area and is considered to have a minor (adverse) impact on the setting of this building.

14.97 **Ashton House** is located to the west of the application site fronting onto Corporation Street. There are views between the site and the building along Aspin Lane. In these views the construction hoardings and car parking use are apparent and are detrimental to the appearance of the area. The application site is considered to have a minor (adverse) impact on the setting of this

building.

14.98 **The Co-operative Press** building is located to the east of the application site and front onto New Mount Street. There are views along New Mount Street of the application site but the majority of the land is screened by the planting within the site. As a consequence, the open nature of the application site is not a prominent feature of the townscape and it is considered to have a negligible impact on the setting of this building.

14.99 **Smithfield Market** is located to the south-east of the application site fronting onto Swan Street. There are restricted views between the application site and this building. In these views, the application site appears as an undeveloped gap site which detracts from the character of the area and it is considered to have a minor (adverse) impact on the setting of this building.

Impact Assessment

Construction Impacts

14.100 There are no existing buildings within the application site; therefore there will be no demolition during the construction process.

14.101 The impacts of the construction process on the identified townscape and built heritage assets of the area will primarily include the use of tower cranes and other machinery on site, scaffolding and sheeting, and hoarding around the site boundaries.

14.102 There will be **minor (adverse)** impacts on the setting of the Conservation Areas and Listed Buildings as a result of these works. These effects will, however, be temporary and of limited duration. The impacts are not therefore considered to be significant.

Operational Impacts

Historic Townscape Impacts

14.103 Any impacts on the architectural or historic features which contribute to the special interest of the Conservation Areas and Listed Buildings have been assessed as part of the formulation of the design. This is discussed in more detail in the Design and Access Statement which accompanies the planning application. The impact of the Development on the wider historic townscape is considered firstly in relation to scale, height, massing, alignment, design details and materials (cf. ¶2.14 of PPG15).

Scale

14.104 The proposed development acknowledges the scale of the buildings on the opposite side of Miller Street which includes tall buildings including New Century House (14-storeys) and the CIS Tower (25-storeys). The Development

seeks to reflect the scale of the existing buildings to the south, providing a focal point in the townscape to reflect and balance the scale of New Century House and the CIS Tower.

14.105 The proposed building varies in height from 10-storeys at its southern side to 16-storeys at its north-west corner. As a consequence, the proposed building will create an enclosing frontage to Miller Street, whilst ensuring that the apartment developments fronting Angel Street, which vary in height from 5-storeys to 7-storeys, will not be overwhelmed or unduly dominated.

Height

14.106 The complex of Co-operative buildings on Corporation Street, Dantzic Street and Miller Street illustrate the development of commercial architecture over the last century. The proposed building continues this tradition of the Co-operative Society commissioning high quality buildings that illustrate the architecture of the period in which they were built.

14.107 These Co-operative buildings also reflect the technology of their era (cf. the difference between the Hanover Building, Redfern Building and New Century House) and illustrate the general increase in the height of buildings, as technology facilitated the intensification of land uses. The heights of the nearby Listed Buildings and other buildings in the Conservation Areas also reflect these changes in technology as well as the social and economic drivers of the period.

14.108 The proposed building reflects the currently available technologies and the desire to secure a sustainable built form which meets the wider corporate responsibility of the applicant. The height of the Development responds well to the general heights of the buildings on the opposite side of Miller Street. It will create an enclosing frontage of 10-storeys to the proposed open space along the Miller Street frontage. In addition, the building incorporates additional height (16-storyes) at the north-western corner where taller structures can be accommodated and act as a balancing focal point in the townscape.

Massing

14.109 The proposed building reflects the large urban blocks to the south of Miller Street. The bulk and mass of the building reflects the commercial use of the Development and extends the architectural language of commercial development into an area of the City that was originally developed during the Industrial Revolution for industrial and warehousing uses.

14.110 The use of a broadly triangular shape for the floor plate of the building minimises its apparent massing; as the bulk of the building is less visible in any view. The curved face of the elevations together with the variation of the building height, with the tallest section at the northern ‘apex’, also reduces the apparent massing of the structure when viewed from Miller Street.

14.111 The elevations of the building include horizontal banding which contrasts with their curved face and the articulation of the roof including the variation in the parapet and an increase in height towards the northern 'apex'. The Development thereby reflects the scale and mass of the buildings to the south and introduces both horizontal and vertical elements into the design.

Alignment

14.112 The proposed building is set back approximately 70m from Miller Street, which provides an opportunity to lay out an area of public realm in a part of the City which is short of public space. The design of this area of open space will be the subject of a design competition in order to create a high quality area of public realm facing Miller Street.

14.113 The location of the building to the rear of the site enables Miller Street to be enclosed but avoids the building from competing with New Century House and the CIS Tower. In addition, the alignment of the building with an 'apex' facing Miller Street, ensures that whilst the building encloses the northern side of the proposed public space, it will not unduly dominate it.

14.114 The Development seeks to introduce street level activity which is absent due to the barrier effect of Miller Street. The architect has sought to establish linkages and permeability across the site. The public space will create new opportunities for public access and space that will create an appropriate setting to the Listed Buildings to the south and the proposed building.

Detailed Design & Materials

14.115 The proposed design reflects the Listed Buildings to the south of Miller Street which are the most dominant in the townscape. It is considered that it would be inappropriate to adopt the traditional design forms (i.e. materials, proportions and window openings) that are prevalent to the north-east and west of the application site.

14.116 The storey heights and curtain glazed treatment to the elevations reflects modern use requirements. The sculptural form of the building is a creative response to the immediate environment and seeks to produce a form and design which will create a strong sense of place. The roof forms part of the sculptural qualities of the building and conceals the lift overruns and other plant to create clean lines uninterrupted by the normal roof clutter of commercial buildings.

Conclusion

14.117 The proposed development will enhance the setting of the architectural and historic assets through a positive, and highly original, design response to the character of the area. The Development is therefore considered to have a **minor / moderate (positive)** overall impact on the historic townscape of the area.

Setting of Conservation Areas

14.118 The impact of the Development on the Character of the Conservation Areas should be read in conjunction with Chapter 9 (Townscape and Visual Impact) in which specific views (including those from the Conservation Areas) are considered. This assessment considers the broader impact on character, appearance and historic value of the Conservation Areas.

14.119 **The Cathedral Conservation Area** is focussed around the Cathedral and Chetham's Hospital School. These buildings are divorced from the application site by Victoria Station and the buildings fronting Corporation Street and Dantzic Street. However, due to the height of the proposed building it will form part of the north-western skyline when viewed from Cathedral Gardens in front of Chetham's Hospital School.

14.120 The Development will be seen in the context of Urbis, New Century House and the CIS Tower. The proposed building will be in keeping with the urban context of the Conservation Area and the apparent scale and massing of the Development will be comparable with other developments in the area. It will not therefore be a dominant or intrusive feature on the skyline and the scale of the building is considered to be consistent with other developments that form part of the setting of the Conservation Area.

14.121 The Development is therefore considered to have a **negligible** impact on the Conservation Area.

14.122 **The Shudehill Conservation Area** is mainly composed of a large buildings constructed during the C20th. The application site forms part of the northern edge of the Conservation Area and the proposed building will be visible from Dantzic Street, Shudehill and other viewpoints.

14.123 The relationships between the existing buildings in the Conservation Area, the proposed public square and the proposed Co-operative Head Office building have been carefully considered in order to integrate the Development into the area. The form and alignment of the proposed building reflects the historic street pattern and urban grain of the Conservation Area. In addition, the scale and massing of the building is comparable with New Century House and the CIS Tower which form part of the setting of the Conservation Area. The proposed building will therefore continue the historic and architectural pattern of development of the area.

14.124 The Development site will remove a prominent gap site on the edge of the City Centre that detracts from the setting of the Conservation Area. Whilst the building is set back from Miller Street, due to its scale and massing, the building will enclose the frontage to Miller Street. The proposed public square will create a setting for both the proposed building and the CIS Tower which is a prominent feature in the townscape of the area. In addition, the scheme will facilitate improved pedestrian crossing of Miller Street thereby enhancing the

permeability of the area.

14.125 The application proposals will play a key role in underpinning the future economic vitality of the wider area and, through the substantial investment in the site, will encourage the development of other infill sites in the immediate vicinity. The development will, over the longer-term, therefore lead to a significant regeneration and enhancement in the setting of the Conservation Area.

14.126 The Development is therefore considered to have a **moderate** (**positive**) impact on the Conservation Area.

14.127 **The Smithfield Conservation Area** contains a wide range of buildings, although the Crowne Plaza Hotel creates an edge to the Conservation Area, as it faces the application site. The proposed building will be visible from Swan Street and across the Rochdale/Miller Street junction.

14.128 The Development will be seen in the context of the CIS Tower and the multi-storey buildings further towards the north at The Green Quarter development. As a consequence, the scale and massing of the proposed building is consistent with the existing development that forms part of the setting of the Conservation Area. It will not dominate the buildings that front onto Shudehill and Swan Street which form the edge of the Conservation Area. The removal of this prominent gap site and its replacement with a high quality building and public square will enhance the appearance of the area and thereby the setting of the Conservation Area.

14.129 The Development is therefore considered to have a **minor** (**positive**) impact on the Conservation Area.

Setting of Listed Buildings

14.130 The Development offers the opportunity to repair the townscape (which has been in this form for over 30 years). The negative townscape value of the site will be removed through the erection of a building of quality and significance. It will create an attractive frontage to Miller Street and an appropriate setting for the nearby Listed Buildings.

14.131 **New Century House and the CIS Tower** are located on the southern side of Miller Street opposite the application site. The layout of the proposed development, including the creation of a new public square on the frontage to Miller Street, will be important to the setting of these Listed Buildings.

14.132 The proposed footprint of the building is of a comparable size to the CIS Tower and the height of the building reflects both of the Listed Buildings. In addition, the sculptural form of the Development (with the tallest section at the northern 'apex') and the separation of the proposed building from the Listed Buildings will enable their landmark qualities to be retained. The scale, mass and height

of the proposed development is therefore considered to be consistent with the character of the surrounding area and will not detract from the setting of the Listed Buildings.

14.133 The Development will be seen in the context of the proposed public square which will also provide an enhanced setting for the CIS Tower. The square will be the subject of a design competition to ensure that it provides the highest quality of public realm. The introduction of a new pedestrian crossing over Miller Street will increase the permeability of the area and link the existing Listed Buildings to the new square thereby enhancing the legibility and a sense of place.

14.134 The Development will result in the formation of a new built edge to Miller Street which will create a sense of enclosure that has been missing since the original C19th buildings on the application site were destroyed during World War II. The removal of the under-used site and the associated advertisement hoardings will have a positive impact on the setting of these Listed Buildings.

14.135 The application proposals will also play a key role in underpinning the future economic vitality of the wider area. The development will facilitate the restoration and enhancement of the buildings within the Co-operative complex in accordance with the applicant's wider strategic regeneration initiative. It will also facilitate improvements to the setting of the buildings through further infill development and public realm enhancement. The development will, over the longer-term, therefore lead to a significant regeneration and enhancement in the setting of the Listed Buildings.

14.136 The Development is therefore considered to have a **moderate** (**positive**) impact on the Listed Buildings.

14.137 **Hanover Building, Old Co-operative Bank and Victoria Station** define the frontage of Corporation Street. In the views from Corporation Street the building will be a prominent feature in the townscape rising above the frontage properties that front the northern side of Miller Street. The Development will have a different scale, height, mass, materials and pattern of fenestration to these buildings. However, this juxtaposition of architectural forms is a characteristic of the area.

14.138 The Development will reflect the scale, height, massing and materials of the New Century House and the CIS Tower which are on the southern side of Miller Street and also form part of the setting of these buildings. As a consequence, the proposed building would be read as forming part of the general larger scale development in this part of the City and would not be a dominant of intrusive feature in the townscape.

14.139 The application proposals will facilitate the restoration and enhancement of the buildings within the Co-operative complex and enable improvements to the setting of the buildings through further infill development and public realm enhancement.

14.140 The development of this under-used site will contribute to the regeneration of the area and therefore the Development is considered to have a **negligible /minor (positive)** impact on the Listed Buildings.

14.141 **Holyoake House, #29 Dantzic and the Redfern Building** front onto the western side Dantzic Street. In the views along Dantzic Street, the western half of the proposed building will be clearly visible, including the full height of the structure. The Development will remove an undeveloped site that detracts from the townscape and provide a focal point in the view along Dantzic Street. It will enclose the western side of Miller Street thereby creating an end-stop to longer distance views reflecting the historic pattern of development in the area.

14.142 The proposed building will be seen in the context of New Century House and the CIS Tower which frame the views towards the application site from Dantzic Street. These buildings are 14-storeys to 25-storeys high and are steel frame structures with glass curtain walling to the elevations. The scale, height, mass, materials and pattern of fenestration of the Development will complement these Listed Buildings. The proposed development will introduce a new building that is consistent with the character of the area in terms of scale, massing and materials.

14.143 The application proposals will also play a key role in underpinning the future economic vitality of the wider area. The development will facilitate the restoration and enhancement of the buildings within the Co-operative complex in accordance with the applicant's wider strategic regeneration initiative. It will also facilitate improvements to the setting of the buildings through further infill development and public realm enhancement. The development will, over the longer-term, therefore lead to a significant regeneration and enhancement in the setting of the Listed Buildings.

14.144 The Development is therefore considered to have a **moderate (positive)** impact on the Listed Building.

14.145 **Parkers Hotel** is located at the northern corner of Miller Street and Corporation Street. In the views from Miller Street and Corporation Street the building will be a prominent feature in the townscape rising above the frontage properties. The Development will have a different scale, height, mass, materials and pattern of fenestration to the buildings that front Miller Street and Dantzic Street. However, this contrast of buildings with different heights, scales and architectural forms is a common theme within this part of the City (cf. the juxtaposition of the Old Co-operative Bank and New Century House).

14.146 The Development will be seen in the context of the other significant structures on the southern side of Miller Street, notably New Century House and the CIS Tower. As a consequence, the proposed building would be read as forming part of the general larger scale development in this part of the City that already forms the setting to Parkers Hotel.

14.147 The spacing between the buildings will minimise impact and avoid the Development being unduly dominant. The development of this under-used site will contribute to the regeneration of the area and therefore the Development is therefore considered to have a **minor** (**positive**) impact on the Listed Building.

14.148 **Ashton House** is located to the west of the application site fronting onto Corporation Street. In the views from Corporation Street and along Aspin Lane the building will be a prominent feature in the townscape. The Development will be seen in the context of the modern apartment development that fronts onto Angel Street and the other large scale development in this part of the City, particularly the CIS Tower.

14.149 The proposed building will be 16-storeys fronting the junction of Asplin Street / Dantzic Street which is significantly taller that any other building in the immediate vicinity of the Listed Building. However, the Development is considered to be an appropriate city scale and the juxtaposing of buildings with significantly different heights and scales is common theme within this part of the City. In addition, the distance between the buildings together with the use of curtain wall glazing will ensure that the Development will not dominate the setting of the Listed Building. The Development is therefore considered to have a **minor** (**positive**) impact on the Listed Building.

14.150 **The Co-operative Press** building is located to the east of the application site and front onto New Mount Street. The Development will involve the remove of the planting that forms part of the application site. The eastern corner of the building will be visible and it will close off the end of New Mount Street, thereby preventing views to the west of Angel Street.

14.151 The proposed building will reinstate the Angel Street frontage using high quality, contemporary materials that are appropriate to the location and will preserve and enhance the appearance of the street. It will also reinforce the urban grain and street pattern that exists to the east of the application site. The proposed development will be prominent in the townscape but it will be seen in the context of the modern apartment blocks that front Angel Street and Style Street.

14.152 The scale of the building will be broadly consistent with the character of the area and will not dominate the setting of the Listed Building. The Development is therefore considered to have a **minor** (**positive**) impact on the Listed Building.

14.153 **Smithfield Market** is located to the south-east of the application site fronting onto Swan Street. In the views along Swan Street, the proposed development will be seen in the context of the Crowne Plaza and other modern buildings. The proposals will be read as part of the larger scale developments in this part of the City, particularly the CIS Tower.

14.154 The Development will introduce a new building into the townscape that forms part of the setting of the Listed Building that is consistent with the character of

the area in terms of scale, height, massing and materials. The Development is therefore considered to have a **minor** (**positive**) impact on the Listed Building.

Summary

14.155 Table 78 summarises the historic townscape impacts of the proposed development. This assessment should be read in association with the detailed townscape analysis contained in Chapter 15.

Component	Existing Situation	Change resulting from the proposal	Historic Townscape Impact	Comment
Scale	Negative	Beneficial	Minor (positive)	Reflects the scale of New Century House and CIS Tower. Enclosure to Miller Street.
Height	Negative	Beneficial	Minor (positive)	Continues tradition of high quality commercial buildings. Height of the Development responds well to the general heights of the buildings on the opposite side of Miller Street.
Massing	Negative	Beneficial	Minor (positive)	Mass of the building reflects the commercial use of the Development. Broadly triangular shape for the floor plate of the building minimises its apparent massing. Massing appropriate to location.
Alignment	Negative	Beneficial	Moderate (positive)	Reinstatement of enclosure to Miller Street. Creation of public square to enhance the setting of CIS Tower and other Listed Buildings. Introduce street level activity and enhance permeability.
Detailed Design & Materials	Negative	Beneficial	Moderate (positive)	Contemporary design. High quality and original design response. Materials appropriate.

Table 78 Summary of Historic Townscape Impacts

14.156 It is concluded that the proposed development will have an overall positive impact on the character of the historic townscape.

14.157 Table 79 provides a summary of the Conservation Area impacts.

Conservation Area	Existing Role of Site in Setting	Role of Development in Setting	Impact on setting of Conservation Area (Preserved, Enhanced or Harmed)
Cathedral CA	Negligible	Negligible Building part of northern skyline. In keeping with the urban context of the Conservation Area and the scale is comparable with other developments in the area.	Preserved
Shudehill CA	Moderate (adverse)	Moderate (positive) The Development site will remove a prominent gap site on the edge of the City Centre that detracts from the setting of the Conservation Area. Development of site contributes to the regeneration of the area.	Enhanced
Smithfield CA	Minor (adverse)	Minor (positive) Development of gap site will enhance the townscape and contribute to the regeneration of the area. The scale, massing and design of the development is consistent with the character of the area.	Enhanced

Table 79 Summary of Conservation Area Impacts

14.158 It is concluded that the proposed development will preserve or enhance the setting of the Conservation Areas surrounding the site.

14.159 Table 80 provides a summary of the Listed Building impacts.

Listed Building	Existing Role of Site in Setting	Role of Development in Setting	Impact on setting of Listed Building (Preserved, Enhanced or Harmed)
Co-operative Wholesale Society – Main Block (Old Co-operative Bank)	Negligible / Minor (adverse)	Negligible / Minor (positive) Development of site contributes to the regeneration of the area. Scale, height, massing, materials and fenestration are characteristic of the modern development on the southern side of Miller Street.	Preserved / Marginally Enhanced
Co-operative Wholesale Society – Hanover Street Junction (Hanover Building)	Negligible / Minor (adverse)	Negligible / Minor (positive) Development of site contributes to the regeneration of the area. Scale, height, massing, materials and fenestration are characteristic of the modern development on south side of Miller Street.	Preserved / Marginally Enhanced

Listed Building	Existing Role of Site in Setting	Role of Development in Setting	Impact on setting of Listed Building (Preserved, Enhanced or Harmed)
Ashton House	Minor (adverse)	Minor (positive) Development of site contributes to the regeneration of the area. The building is of an appropriate scale in the context of the modern development on the southern side of Miller Street. The spacing will ensure that the building does not dominate the setting.	Enhanced
New Century House	Moderate (adverse)	Moderate (positive) Development of gap site and reinstatement of frontage to Miller Street and creation of public square. Character of development consistent with existing street.	Enhanced
Parkers Hotel	Minor (adverse)	Minor (positive) Development of site contributes to the regeneration of the area. The juxtaposition of buildings with different scale, height, massing, materials and fenestration is a common feature of the area.	Enhanced
#29 Dantzic Street	Moderate (adverse)	Moderate (positive) Development of gap site and creation of public square will enhance the townscape and enclose the northern side of Miller Street. Character of development consistent with existing street.	Enhanced
Holyoake House	Moderate (adverse)	Moderate (positive) Development of gap site and creation of public square will enhance the townscape and enclose the northern side of Miller Street. Character of development consistent with existing street.	Enhanced
Co-operative Insurance Society (CIS Tower)	Moderate (adverse)	Moderate (positive) Development of gap site and reinstatement of frontage to Miller Street and creation of public square. Character of development consistent with existing street.	Enhanced
Co-operative Society Building (Redfern Building)	Moderate (adverse)	Moderate (positive) Development of gap site and creation of public square will enhance the townscape and enclose the northern side of Miller Street.	Enhanced

Listed Building	Existing Role of Site in Setting	Role of Development in Setting	Impact on setting of Listed Building (Preserved, Enhanced or Harmed)
		Character of development consistent with existing street.	
Victoria Station	Negligible / Minor (adverse)	Negligible / Minor (positive) Development of site contributes to the regeneration of the area. Scale, height, massing, materials and fenestration are characteristic of the modern development on the southern side of Miller Street.	Preserved / Marginally Enhanced
Smithfield Market Hall 39,43 and 45 Swan Street	Minor (adverse)	Minor (positive) Development of gap site will enhance the townscape and contribute to the regeneration of the area. Character of development consistent with existing street.	Enhanced
Co-operative Press	Negligible	Minor (positive) Development of gap site will enhance the townscape by creating a frontage to Angel Street. Character of development consistent with existing street.	Enhanced

Table 80 Summary of Listed Building Impacts

14.160 It is concluded that the proposed development will preserve or enhance the setting of the Listed Buildings surrounding the site.

Mitigation Measures

Construction Impacts

14.161 A series of mitigation measures will be put in place during the construction process to minimise impacts on the build heritage elements. For example, visually appropriate hoardings will be constructed at the site boundary and issues such as siting of equipment and lighting can be addressed in the Construction Management Document. Construction effects can be addressed with detailed mitigation proposals by way of a planning condition, typically in the form of a requirement to submit a Construction Management Plan.

14.162 The implementation of a Construction Management Plan will reduce the **minor (adverse) impacts to negligible**.

Operational Impacts

14.163 The design of the development does not give rise to significant negative

impacts that require mitigation.

Summary of Residual Impacts

14.164 The assessment has identified no adverse impacts on the built heritage as a consequence of the proposed development. The development would result in significant beneficial impacts to the setting of the Conservation Areas and Listed Buildings.

14.165 Table 81 provides a summary of the predicted effects of the proposed development on the relevant receptors in relation to built heritage. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Building & Construction Processes	Impact on setting of Conservation Areas	Medium	Medium	Temporary (24 months)	Indirect	Negligible	Not significant	High
Building & Construction Processes	Impact on setting of Listed Buildings	Medium	Medium	Temporary (24 months)	Indirect	Negligible	Not significant	High
Operational Phase								
Erection of Building and Construction of Public Square	Impact on Historic Townscape	Medium	Medium - High	Permanent	Indirect	Minor - Moderate (positive)	Not significant	High
Erection of Building and Construction of Public Square	Impact on setting of Conservation Areas	Medium	Medium - High	Permanent	Indirect	Negligible - Moderate (positive)	Not significant	High
Erection of Building and Construction of Public Square	Impact on setting of Listed Buildings	Medium	Medium - High	Permanent	Indirect	Negligible - Moderate (positive)	Not significant	High

Table 81 Summary of Residual Impacts – Built Heritage

Cumulative Effects

14.166 There are no cumulative effects to be considered as part of the assessment.

References

Planning (Listed Buildings and Conservation Areas) Act 1990

Regional Spatial Strategy for the North West to 2021 (2008)

Manchester Unitary Development Plan (1995)

Collyhurst Local Plan (2006)

PPS1:- Delivering Sustainable Development (2005)

PPG15:- Planning and the Historic Environment (1994)

English Heritage/CABE:- Guidance on Tall Buildings (2007)

Guide to Development in Manchester SPD and Planning Guidance (2007)

15.0 Townscape and Visual Impact

Introduction

15.1 This chapter examines the townscape (urban landscape) and visual impact of the development proposals. The consideration of the townscape and visual impacts of the proposals involves two separate but inter-related assessments:-

1 Consideration of the impact on the character and quality of the townscape of Manchester; and,

2 An evaluation of the visual impact of the development on views, viewers and visual amenity.

15.2 This assessment should be read in conjunction with Chapter 14: Built Heritage which considers the potential impacts of the development on listed buildings and conservation areas.

15.3 This chapter: -

1 Briefly sets out the planning policy context relevant to townscape and visual effects;

2 Explains the methodology used for the assessment;

3 Establishes the extent of the study area;

4 Describes the existing townscape character and quality in the vicinity of the site and the sensitivity of views towards the site;

5 Provides a brief overview of the potential effects arising from the development;

6 Examines and evaluates the changes to the townscape and views as a result of the proposed development whether adverse, neutral or beneficial; and,

7 Discusses the potential for the mitigation of any adverse effects arising from the development.

15.4 Appendices 15.1 to 15.5 are to be read with this Chapter.

Policy Context

Development Plan Guidance

15.5 The statutory development plan for the site comprises the adopted North West of England Regional Spatial Strategy to 2021 (September 2008) and the

adopted Manchester Unitary Development Plan (1995).

North West of England Regional Spatial Strategy to 2021 (RSS)

15.6 The RSS promotes sustainable development particularly by improving the built environment and conserving the region's heritage (Policies DP2 and EM1 (c)). There are no specific policies relating to views and visual amenity.

Manchester UDP (1995)

15.7 The Council will seek to preserve and enhance the setting of buildings and areas of special architectural or historic interest (Local Plan Policy E2.7) and enhance the appearance of Conservation Areas (Local Plan Policy E3.8). There are no specific policies relating to views and visual amenity.

Collyhurst Local Plan (2006)

15.8 The area to the north of Miller Street is included in the Collyhurst Local Plan, which was approved by the City Council Executive in 2006. Whilst it is not a statutory document, it is afforded weight as a material consideration.

15.9 The Plan seeks to address the physical, social and economic needs of the area. In terms of the character and townscape of the city fringe area it seeks to:-

1 Create a dense city fabric;

2 Ensure development extends to the back of the pavement to contribute to a clearly defined street frontage;

3 Retain the traditional grid street pattern (development should not subsume existing streets and alter the grain of the area);

4 Ensure buildings are of a scale, height and massing complementary to the neighbourhood;

5 Promote building design using active frontages on the main arterial roads (particularly Rochdale Road and key junctions) and southern gateways into North Manchester; and,

6 Attract development of the current CIS surface car park to integrate the site back into the fabric of the City Fringe Neighbourhood.

National Planning Guidance

15.10 The government requires the protection and enhancement of the character and amenity value of urban areas through Planning Policy Statement 1: Delivering Sustainable Development. It emphasises the importance of design and notes that regard should be had to the CABE guidance, 'By Design: Urban Design in the Planning System'.

15.11 Planning Policy Guidance 15: Planning for the Historic Environment, requires local planning authorities to have special regard, when considering planning permissions for development which may affect listed buildings, to *"the desirability of preserving the building or its setting..."*. Special regard should also be given to the desirability of preserving or enhancing the character or appearance of a conservation area.

English Heritage/CABE:- Guidance on Tall Buildings (2007)

15.12 The guide, jointly produced by CABE and English Heritage, states that proposals for tall buildings should be accompanied by realistic representations of the building. It states local planning authorities should advise applicants during the pre-application stage the visual material required to determine any application.

15.13 The guidance states that generally buildings which are substantially taller than their neighbours and/or which significantly change the skyline [¶4.1] can be defined as tall buildings. The criteria for assessing tall buildings, relevant to this application, are:-

1 Relationship to context;

2 Effect on the historic context;

3 Relationship to transport infrastructure;

4 Architectural quality of the building;

5 Sustainable design and construction;

6 Credibility of the design (technically and financially);

7 Contribution to public space and facilities;

8 Effect on the local environment;

9 Contribution made to permeability; and,

10 Provision of a well-designed environment.

15.14 Whilst the supporting documentation to the application provides information on much of this criteria. This chapter will consider those elements relevant to the effects on the townscape in conjunction with the guidance set out in By Design.

By Design: Urban Design in the Planning System: Towards Better Practice (2000)

15.15 By Design: Urban Design in the Planning System: Towards Better Practice (2000) promotes higher standards in urban design. It identifies the following urban design objectives:-

1 Character: To reinforce locally distinctive patterns of development.

2 Continuity and Enclosure: To promote continuous street frontages to help to define the public and private realm.

3 Quality of Public Realm: To promote safe and attractive routes for all members of society.

4 Ease of Movement: To promote accessibility and permeability.

5 Legibility: To provide easily recognisable routes, intersections and landmarks.

6 Adaptability: A place that can change easily.

7 Diversity: Promote choice through a mix of compatible developments.

15.16 These translate into the following aspects of urban form. They are used in conjunction with the above as the basis of the assessment of townscape character:-

1 Layout - urban structure and grain

2 Landscape

3 Density and mix

4 Scale - height and mass

5 Appearance - materials and details

Supplementary Planning Guidance

Guide to Development in Manchester SPD and Planning Guidance (2007)

15.17 The City Council's SPD, 'Guide to Development in Manchester' was adopted in April 2007 and was produced to guide the preparation of design and access statements and expand on UDP policies. It sets out the City Council's stance on a wide range of issues.

15.18 In relation to views, the SPD [¶2.17] notes that developments should enhance existing vistas and create new ones. The guidance on tall buildings states consideration will be given to the *"quality and interest of the roofline; the design of the lower floors; the relationship to the surrounding streets; the impact of*

servicing and parking requirements; the microclimate, including overshadowing and air turbulence effects, created by the relationship of the building to those adjacent; and the quality of spaces surrounding the building." [¶12.28]

15.19 Part two notes, views to landmark buildings within the city centre should be *"enhanced by new developments"* [¶12.19]. The SPD goes on to state that views of landmark buildings will need to be protected, such buildings include those which are tall, substantial or obviously different from their neighbours (eg CIS) ¶12.25]. The Council require tall building proposals to be assessed by CABE and English Heritage guidance [¶12.26].

15.20 The SPD [¶2.53] acknowledges that that the majority of new development within the City will continue to be on infill sites within an established neighbourhood or street. It therefore requires new developments to, "*respect the existing scale, appearance, grain and mix of uses and make a positive contribution to the quality and character of the area."*

Potential Impacts

15.21 A full description of the proposed development is contained in Chapter 3 of the ES. In summary the following is proposed:-

1 A single building, triangular in plan to be located in the northern part of the site.

2 The building increases in height from 10 storeys at its southern side to 16 storeys at its north-west corner (a height of c.80m AOD).

3 The principal entrance is located in the southern wing opening onto the area of public realm proposed for the southern part of the site.

4 A basement car park for 151 vehicles is provided with the entrance from Dantzic Street.

5 The massing of the building reduces towards the south to respect the scale of surrounding buildings.

6 It has a curved form and terraced roofscape responding to the buildings orientation and views across the city.

7 The façade is composed of two 'skins' to provide an environmental 'buffer zone' between internal and external space. The outer face of the double skin will be almost entirely glazed emphasising its sculptural quality.

15.22 The detailed landscape design proposals will be developed following a design competition. The landscaping proposals which form part of this application are illustrative only. As such this Townscape and Visual Impact Assessment does not take into consideration the future landscape proposals.

Construction & Operational Impacts

15.23 The proposed development has the potential to:–

1 Alter the character, appearance and aesthetic value of an area through the proportion, scale, enclosure, texture and materials of the proposed building.

2 Create visual intrusion in the townscape or repair the urban form and grain of an area;

3 Have an impact on key views and vistas; and,

4 Remove landscape features which contribute to the townscape and/or create a landscape character which enhances the character of the area.

Assessment Methodology

Approach

15.24 This study has been undertaken using a methodology for townscape and visual impact assessment based on wide experience of analysing the effects of developments in urban and other locations and devising measures to mitigate potential effects. The methodology is in general conformity with the approach set out in the guidelines prepared by the Countryside Commission and the Landscape Institute and the Institute of Environmental Assessment (2nd edition 2002). The methodology set out in the English Heritage's draft guidance (for consultation) '*Seeing the History in the view: A method for assessing heritage significance within views*' (April 2008) has also been referred to. It should be noted, however, that the impact of the development on heritage assets has been dealt specifically within the Chapter 14 (Built Heritage) of this ES.

15.25 There are two interrelated assessments: an assessment of the impact, or change, on the character and quality of the townscape together with an assessment of the visual impact of development on views, viewers and visual amenity. Townscape and visual impacts generally, but do not necessarily, coincide.

15.26 The assessment comprised a three-stage process:-

1 A desk based study and field survey of the site and surroundings (the information gathering stage - the baseline);

2 Analysis of the information gained to establish the character and quality of the site and the surrounding townscape, the existing role of the site in views and the views and viewers likely to be affected by the development and their sensitivity to change; and,

3 An assessment of the effects of the development on the character and quality of the surrounding townscape and on views, viewers and visual

amenity.

15.27 The significance of the effects on the landscape and/or visual resources is a function of the sensitivity of the affected landscape and visual receptors and the magnitude of change that they will experience. The resultant effects on the landscape and visual resources can be positive, neutral or adverse.

Extent of Study Area

15.28 The extent of the assessment area has been established through a combination of desk-based study and fieldwork. A review of OS mapping established the views likely to be available towards the site. Fieldwork was undertaken in June 2009 to confirm the views of site that are available. Views from publically accessible areas only have been considered. Consideration has also been given to sensitive receptors in the landscape such as public open spaces, conservation areas and listed buildings.

15.29 The extent of survey and analysis for the assessment of townscape value and character was confined to the broad visual envelope of the site.

Townscape Assessment Methodology

15.30 The townscape is a product of the interaction between a range of physical characteristics (e.g. topography, vegetation and buildings) and human activity (e.g. land use, human culture and history).

15.31 The assessment of townscape effects requires the existing characteristics, quality and sensitivity of the application site and the surrounding area to be defined to enable an evaluation of the effect of the proposed development on the townscape to be made. Sensitive townscape components include conservation areas and listed buildings.

15.32 Townscape impact assessments require a balance of objective and subjective techniques. Objective techniques usually involve measurement and quantification of the various components which make up the environment. These techniques establish the "character" of the area. Subjective approaches, on the other hand, rely on the judgement and responses of the surveyor. They are generally more descriptive and seek to evoke the aesthetic characteristics of the townscape and the reactions of people to it. They establish the "quality" of the area.

15.33 For each character type/area identified, the key characteristics that give the area its distinct sense of place are set out. These are usually positive features but can also be negative and are important indicators of the current character of the townscape. Key positive characteristics are sensitive receptors that could be directly or indirectly affected by the development.

15.34 Establishing the existing townscape quality of the study area in terms of character areas is advocated in the CABE Publication Protecting Design Quality

in Planning, 2003. The existing townscape quality of these areas has been categorised based on the criteria in Table 82.

High	Visually coherent groups of well-designed/well-proportioned buildings, well related to streets, spaces and landscape elements, highly distinctive sense of place, may be protected by heritage designation. Few detracting elements.
Medium	Relatively coherent grouping of buildings reasonably well-related to the public realm to create a good although not exceptional sense of place - occasional buildings and spaces may lack quality and cohesion.
Low	Largely undistinguished area lacking sense of place and identity, poor spatial definition and generally limited visual interest.
Very Low	Poor quality environment, lacks cohesive form and structure significant potential for enhancement and very little or no visual interest.

Table 82 Quality of Townscape

15.35 The magnitude of change to the townscape that arises from the introduction of the development is defined by the criteria in Table 83.

Classification	**Magnitude**
High	Major uncharacteristic change to townscape character
Medium	Moderate changes to townscape character, major change consistent with character
Low	Minor changes generally in keeping with character
Negligible	Nil/negligible change to townscape

Table 83 Definition of Magnitude of Townscape Change

Visual Assessment Methodology

15.36 The assessment of the visual impact relates to the changes that will occur in views as a result of the development, viewers' responses to those changes and the effect the changes have on visual amenity. The existing situation - the baseline - has been recorded, establishing the components, character and amenity of the existing scene within each view. Analysis of the effects of the proposed development on those views has then been undertaken with reference to the application plans, photographs of the existing situation and the visualisations produced by 3DReid Architects.

15.37 The extent of the study area, and the visual envelope of the site has been established through a combination of desk-top study and fieldwork. Over 40 photographs were taken towards the site from short, medium and long range locations within an approximate 2.5km radius. These were taken as a record of

where views of the proposed building may be obtained.

15.38 From this initial visual analysis together with an understanding of sensitive receptors within the townscape (listed buildings, conservation areas, recreation spaces), 15 key representative views were identified (see Technical Appendix 15.2). The photographs for these views were taken using a 28mm lens. An analysis of the effect of the development on these selected views is considered to form a robust assessment of the likely effect of the development on views and visual amenity in the surrounding area.

15.39 Non-verified visualisations of these 15 views have been undertaken to assist the assessment. The methodology for creating the visualisations is attached at Technical Appendix 15.3 and has been agreed in pre-application discussions with the Council. Wire-frame images have been created for the 10 views further from the site which show the height and massing of the development and its relationship to surrounding development. The closest five visualisations are rendered montages which illustrate the height and massing of the proposals and additionally show the materials and detailing to be used and the relationship of the building to the surrounding streetscape at ground level.

15.40 Visual effects relate to changes in available views of the townscape and the effects of those changes on people. Visual impact assessment concerns:-

1 Direct effects (adverse or beneficial) due to proposed development upon representative views through intrusion or obstruction;

2 The reactions and numbers of viewers who may be affected; and,

3 The overall effects on visual amenity.

15.41 The effects on views are a factor of the sensitivity of the view and the magnitude of the change to it. The sensitivity of visual receptors to change is categorised according to a number of factors: the quality and sensitivity of the townscape, the activity and expectations of the receptors and the importance of the view. Sensitivity to change is rated as set out in Table 84.

Classification	Sensitivity (Capacity of people, at particular locations - the visual receptors - to accept change).
High	Public open spaces where focus is on views/ public rights of way through highly valued landscapes, national/regional routes, immediate setting of elements of national cultural heritage value that are not compromised, residential properties with good visual amenity
Medium	Public rights of way through landscapes of moderate scenic value, setting for elements of local cultural heritage value or national value whose settings are already compromised, residents with compromised visual amenity
Low	Observer within area of low landscape quality, or medium landscape quality where significant elements detract, people at work or transient views receptors such as motorists.

Negligible	Observer within area of very low landscape quality (e.g. industrial areas/busy main roads) that has very few positive characteristics

Table 84 Sensitivity of Receptors of Views

15.42 The magnitude of the change to representative views which is introduced as a result of the development has been predicted using the visualisations together with the application plans. The magnitude of change is categorised as negligible, low, medium or high and are set out in Table 85.

Classification	Magnitude
High	Very large change to the view. Development comprises major new component in the view. No/limited screening.
Medium	The proposals are a visible and recognisable new element within the scene and would be readily noticed. May replace existing development. Screening of some but not all elements.
Low	The proposals can be seen but would comprise a minor component in the view. Awareness of the proposals would not have a major effect on the scene. Significant screening
Negligible	Very slight to nil change to views.

Table 85 Definition of Magnitude of Visual Effect

Significance of Impacts

15.43 The significance of the effect on the townscape or view is categorised as being high, medium, low or negligible and is dependent on the magnitude of change which the development introduces to the townscape/view and the sensitivity of the townscape/view. The matrix for identifying these effects is shown in Table 86.

		Sensitivity of Receptor/Receiving Environment to Change/Effect			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change /Effect	**High**	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
Note:- Shaded cells represent likely Significant Effects					

Table 86 Significance of Impact - Townscape and Visual Impacts

15.44 The overall effect on the townscape/view is established by the significance of the effect and its nature. The nature of the change to the townscape or view is categorised as being positive, neutral or adverse. This is, necessarily, a subjective judgement made by experienced planning and urban design professionals in light of the relevant policy context. The assessment is made based on an overview of all townscape components and a comparison with the existing situation.

Baseline Conditions

15.45 Chapter 2 of the ES provides a comprehensive description of the site and surrounds. The follow provides a brief summary of the key elements of the existing site.

The Site

15.46 The site, a vacant plot approximately 1.2ha in size, is located between Manchester's Victoria Station and the Northern Quarter, to the north-east of Manchester City Centre (see Technical Appendix 1,1 for a site location plan). It is currently used for surface car parking. There is some existing vegetation on the site.

15.47 The topography of the site varies, with areas of grass and trees in narrow strips on the banks between the different levels. These banks have not been landscaped and are rough areas still containing building debris and poor soil.

15.48 A mixture of small (less than 5cm trunk radius at 1.5m high) and more mature trees including Ash, Elder, Poplar, Sycamore are located around the boundary of the site and within the banks between levels. A copy of the tree survey undertaken by the Lowther Forestry Group is attached as Technical Appendix 2.1. The development will involve the loss of these trees. However, as the tree survey indicates that there are no trees of amenity value located on the site the proposed loss is not considered to be significant and no further assessment is necessary.

15.49 Due to bombing during World War II, development on the site has been lost. A commercial building erected after the war was demolished in the 1970s when the site became a surface car park. The present configuration of the site has therefore existed for over 30 years and there is no evidence, above ground, of the historic pattern of development on the land.

The Surrounding Area and Context

15.50 The site forms a gap site in the townscape. It is located adjacent to other undeveloped land, also owned by the applicants, which extends to Rochdale Road. This undeveloped land is also used as surface car parking.

15.51 The area to the immediate north-east of the site is predominantly residential comprising modern apartment developments of 4-6 storeys high. These buildings have been built within the C19th street pattern and provide a strong edge on the eastern side of the site, together with the trees within the St Michael's Flags and Angel Meadow - a small park which was originally the burial ground to St. Michael's Church, demolished in 1935.

15.52 To the immediate west of the site, the pattern of land uses is mixed with residential and commercial uses dominating. The C19th street pattern remains together with some pre-war buildings. More recent development includes a warehouse fronting Dantzic Street and apartment blocks fronting Dantzic Street and Corporation Street.

15.53 The area to the south of Miller Street consists of large urban blocks that reflect the shift from traditional housing to larger scale commerce and retail uses in this area of the city. Although the city has seen significant changes in the scale and use of land in this area, the historical grain of the street pattern remains largely intact. Buildings vary, including medium scale (c.5-8storey) warehouse buildings constructed during the early C20th, smaller scale C18th and C19th buildings and more recent mixed use/flat developments. The CIS Tower and New Century House dominate the immediate vicinity of the site. The large surface car park on the south side of Miller Street creates an open frontage.

15.54 To the south-east of the site, the pattern of development has become more fragmented, with significant areas of undeveloped land used for surface car parking: some of these vacant blocks remain from the bombing during World War II. The exception is a modern apartment development fronting Rochdale Road which provides a strong focal point in the townscape.

15.55 In the wider locality, the city centre has a dense urban form with an obvious hierarchy of major and minor streets and squares. There is a mix of large scale buildings, such as the Arndale Shopping Centre, which include internal routes to provide connectivity through the City Centre and buildings of smaller footprint which create a finer urban gain. The prevailing building height is generally 6-7 storeys.

15.56 To the north of the railway line which serves Victoria Station, land uses vary significantly. To the immediate north there is a large expanse of commercial development (and Strangeways Prison) generally located between Bury New Road and North Street. To the east of this commercial area lies railway land which comprises undeveloped land, a dismantled railway, a caravan park and some commercial buildings. To the west and north of these areas residential development predominates in the form of Lower Broughton, Cheetham Hill and Collyhurst.

15.57 There are no designations relating to land to the north of the application site. To the south there are five Conservation Areas (Ancoats, Smithfield, Shudehill,

Cathedral and Stephenson Square). In addition, there are a number of listed buildings situated within the townscape including a significant group of listed buildings to the south of the site (on the opposite side of Miller Street) which includes the CIS Tower and New Century House.

Identification of Receptors

15.58 The assessment of visibility is constrained by the level of public accessibility to surrounding land. The Guidelines for Landscape and Visual Assessment note that:-

> *"…although residents may be particularly sensitive to changes in their visual amenity, most planning regimes consider that public views are of greater value than views from private property. However, the cumulative effects on a number of residents may be considered to give rise to an effect on the community."*

15.59 Consideration has therefore been given to public views and the effects on visual amenity of residents in terms of the cumulative effects on communities.

15.60 The following are considered to be the most sensitive receptors to changes to the townscape (see Technical Appendix 15.4):

1 Views from the Cathedral Conservation Area;

2 Views from the Shudehill Conservation Area;

3 Views from Smithfield Conservation Area;

4 50 Listed buildings;

5 St. Michael's Flags and Angel Meadow;

6 Residential properties, whose main living windows face the site (tower blocks); and,

7 Pedestrians within the public realm surrounding the site.

15.61 Other receptors that are less sensitive but numerous include motorists travelling along busy main roads in the area which from approaches to the City Centre (e.g. Cheetham Hill Road and Rochdale Road).

15.62 The Ancoats and Stephenson Square Conservation Areas are located a substantial distance from the application site and there is no direct inter-visibility between them. It is considered that the application site will not impact on the townscape of these conservation areas these have therefore not been considered as part of this assessment.

Townscape Character and Quality

15.63 To assess the impacts of the development on the townscape of Manchester, seven character areas have been established (see Technical Appendix 15.1), these are:-

1 Rochdale Road

2 Smithfield

3 Shudehill

4 Cathedral

5 Industrial/railway land

6 Bury New Road and environs

7 Residential

15.64 The site is located in Character Area 1: Rochdale Road, development within the site will have a direct effect on the townscape character of this area. The remaining six character areas have a visual relationship only with the site, therefore, the effects of the development will be indirect.

15.65 A summary of the character, condition and the value of the townscape character areas is provided in Table 87.

Character Area	Relevant Designations	Condition/Character	Value
1. Rochdale Road	None	Historic grid pattern retained to west of area, coarse grain to the east Buildings of relatively large footprint and massing, generally comprise whole/half of street block 30 storey CIS tower and 14 storey New Century House dominate to the south-west Mixture of high density, 4-6 storey flats, smaller scale historical commercial buildings (some converted to flats) and vacant plots to east and south-east Poor enclosure to streets where vacant plots exist Apart from land within Co-ops ownership where street pattern has been lost (including site), legibility and permeability of the area is good St. Michael's Flags & Angel Meadow provides only landscaped space in area. Generally poor quality public realm Lack of overall cohesion to area	Low
2. Smithfield	Conservation Area	South-western part of the conservation area comprises predominantly large commercial buildings dating from the 20th Century Remainder of area comprises smaller 18th/19th Century buildings, one to four storeys in a mixture of residential and commercial uses	High

Character Area	Relevant Designations	Condition/Character	Value
		Previous gap sites within the area have been developed more recently (apartment block and Crowne Plaza Hotel on south side of Shudehill) enhancing the variety and interest in the townscape	
3. Shudehill	Conservation Area	Dominated by large warehouse buildings constructed during the 20th Century lining Corporation Street and Dantzic Street More recent buildings located to the south of the area Historic, smaller scale buildings located to the east Good enclosure, legibility and permeability throughtout area Variety of materials and details which creates high levels of visual interest	High
4. Cathedral	Conservation Area (Victoria Station falls outside of the Conservation Area but is listed)	Cathedral and Chetham's Hospital School form focal point of conservation area Medieval street pattern still exists Recent Urbis development introduces high quality new building and area of public realm to the conservation area Generally buildings enclose the spaces well For the purposes of this assessment Victoria Station has been incorporated into the character area as its principal elevation relates directly to the open space in front of it Generally good legibility and permeability throughout the area Area to west of Victoria Street which includes car park and bus exchange is of lower value	High
5. Industrial/ railway land	None	Area lacks identifiable urban structure Dominated by undeveloped railway land/disused railway Large scale industrial buildings to north-east Generally very poor quality public realm - lack of enclosure, legibility and permeability	Low
6. Bury New Road and environs	None	Strangeways prison dominates centre of character area Historic grid pattern retained to the west. Some historic warehousing remains. Urban blocks developed with large scale industrial buildings Predominantly 1-2 commercial storey buildings Limited quality public realm	Low
7. Residential	None	Predominately 20th Century housing Mix of Victorian and modern terraces. Predominantly 2 residential storey heights Cul-de-sacs creating poor permeability a feature Some parks/open space throughout area	Medium

Table 87 Character and Condition of Landscape Character Areas

Key Representative Views

15.66 As set out in the methodology, extensive fieldwork has been undertaken to establish the current visual role of the site. As the site is undeveloped it is currently only seen from the streets immediately surrounding it. The fieldwork,

therefore, considered locations of where the views of the proposed development may be available after its construction. Views from a variety of representative locations were considered. These reflect views from all directions within an approximate 0.5km radius of the site.

15.67 From a greater distance (between an 0.5km and a 2.5km radius), a combination of the topography of Manchester and dense development to the east, south and west means that very limited views of the development would be available. The land to the north, however, rises and from a number of locations (Views 13-15) views towards the site are obtained.

15.68 The key short and long range views considered in this assessment are the views looking: -

1 North, north-east from junction of Market Street and Fountain Street;

2 North-east from the front of the Cathedral;

3 East from the junction of Miller Street and Cheetham Hill Road;

4 South-east along Cheetham Hill Road;

5 South from the south-eastern end of St. Chad's Street;

6 South-west along Aspin Lane;

7 South-west along Old Mount Street;

8 West from Rochdale Road;

9 North-west along Marshall Street;

10 North-west from the junction of Shudehill and Swan Street;

11 North from Shudehill (middle);

12 North, north-east along Dantzic Street;

13 South-west from Queens Road; and,

14 South from Cheetham Hill Road.

15 South-east across Albert Park from Great Cheetham Street West

15.69 A description of the existing situation for each of the identified views establishing the components, character and amenity of the existing scene is provided in the Visual Impact Assessment contained in Technical Appendix 15.5. The sensitivity of the view using the criteria set out in Table 84 is also provided.

Impact Assessment

15.70 This section assesses the likely environmental effects of the proposed development on the townscape and visual resources during the construction of the development and when the development is completed and in operation.

Construction Impacts

15.71 There are no existing buildings within the application site; therefore there will be no demolition during the construction process.

15.72 During the construction process the use of tower cranes and other machinery on site, scaffolding and sheeting, and hoarding around the site boundaries will be introduced.

15.73 In terms of the effects on the townscape, this will have a direct effect on the Rochdale Road character area, within which the site is located. This effect is considered to be minor adverse given that the introductions would be temporary in nature, of limited duration and not unexpected in an evolving urban setting. The construction effects on the remaining character areas are all indirect visual effects.

15.74 The visual impacts arising from the construction process would be seen from a range of locations in the surrounding area, these would give rise to temporary minor adverse visual effects. These effects will be of limited duration and are considered not unexpected in an urban setting.

15.75 The effects of the construction process on the townscape and surrounding views are considered to be **minor** (**adverse**) impacts.

Operational Impacts

Townscape Assessment

15.76 The significance of the impacts is dependent on the value attributed to the townscape character area and the magnitude of change to it. Table 88 summarises the impacts of the application proposals on the townscape character of the site and surrounding area.

Character Area	Value	Magnitude of Change	Effect Significance	Nature of Change	Comment
1. Rochdale Road	Low	Medium	Minor	Positive/ Direct	Introduction of high quality building on previously vacant plot. Introduces improved enclosure to surrounding streets. Assists in legibility of townscape in vicinity of site.
2. Smithfield Conservation Area	High	Low	Minor to Moderate	Positive /Indirect	Limited visual relationship. Replacement of vacant

Character Area	Value	Magnitude of Change	Effect Significance	Nature of Change	Comment
					plot with high quality building improving view out of the conservation area.
3. Shudehill Conservation Area	High	Low	Minor to Moderate	Positive /Indirect	Limited visual relationship. Where glimpses of new building seen these are characteristic.
4. Cathedral Conservation Area	High	Negligible	Negligible	Neutral /Indirect	Very limited visual relationship only - glimpses of roofline only within context of existing skyline.
5. Industrial/ railway land	Low	Medium	Minor	Positive /Indirect	Visual relationship only. Introduction of high quality new landmark element in views out of area.
6. Bury New Road and environs	Low	Low	Negligible to Minor	Positive /Indirect	Very limited visual relationship only. Introduction of high quality new landmark element in views out of area.
7. Residential	Medium	Low	Minor	Positive /Indirect	Very limited visual relationship only. Introduction of high quality new landmark element in views out of area.

Table 88 Townscape Impact Assessment

15.77 The magnitude of change to the townscape ranges from **negligible to minor** / **moderate** depending on the relationship of the townscape character area with the site and its established sensitivity. The only direct change to the landscape is to the Rochdale Road character area. All other changes are indirect. The effects are all considered to be positive except for the Cathedral Conservation Area, where the effect is considered to be neutral given the very limited change in context with the existing skyline.

15.78 Chapter 10 assesses the effects of the proposals on the historic townscape of the area as part of the assessment of impacts on built heritage. It should be read in conjunction with this assessment.

Visual Assessment

15.79 The role of the proposed development has been considered in relation to a series of views from the surrounding area. Technical Appendix 15.5 provides the assessment of the visual impacts of the proposed in these identified views.

15.80 The assessment demonstrates that the impact of the proposals on all the views is considered to be either **positive** or **neutral** (ranging in magnitude **from**

nil / negligible to moderate / major). Where views of the majority of, or a substantial part of, the proposed building are gained (Views 4, 5, 6, 7, 9, 10, 12, 13 and 14) the effects on the views are positive due to the introduction of a high quality new building that complements the existing surrounding buildings in terms of materials, scale and massing. Where the building is either screened from view by existing development, or where only very minor glimpses of the building are gained beyond existing development, the effect on the views is considered to be neutral (Views 1, 2, 8, 11 and 15). View 3 is an exception, however, where the proposed building is considered to have a neutral effect on the view, even though a substantial part of the building is seen. This is because, in this confined view, the proposed building contrasts with the historic buildings in the foreground and is uncharacteristic in shape. When considered in the wider context, however, with the CIS tower to the right and surrounding new build of larger scale to the north, east and west (outside the frame) the building is considered to be appropriate.

Mitigation Measures

Construction Impacts

15.81 A series of mitigation measures will be put in place during the construction process to minimise impacts on the townscape and views, viewers and visual amenity. For example, visually appropriate hoardings will be constructed at the site boundary. Issues such as siting of equipment and lighting can be addressed in the Construction Management Document. Construction effects can be addressed with detailed mitigation proposals by way of a planning condition, typically in the form of a requirement to submit a Construction Management Plan.

15.82 The implementation of a Construction Management Plan will reduce the **minor** (**adverse**) impacts to **negligible**.

Operational Impacts

15.83 The design of the development does not give rise to significant negative impacts that require mitigation. However, the landscaping that will be introduced as part of the high quality public realm to the south of the building will introduce further beneficial elements to the townscape and visual amenity of the site where seen.

Summary of Residual Impacts

15.84 The assessment has identified no adverse impacts on the townscape as a consequence of the proposed development. The development would result in significant beneficial impacts to the area.

15.85 Table 89 provides a summary of the predicted effects of the proposed development on the townscape surrounding the site and on views, viewers and visual amenity. This summary is based on the incorporation of the

recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Building & Construction Processes	On townscape	Low to high	Low	Temporary (24 months)	Direct (Rochdale Road Character area) Indirect (all other character areas)	Negligible	Not significant	High
Building & Construction Processes	On views, viewers and visual amenity	Low to High	Low	Temporary (24 months)	Direct / Indirect	Negligible	Not significant	High
Operational Phase								
Erection of Building and Construction of Public Square	On townscape	Low to high	Negligible - Medium	Permanent	Direct (Rochdale Road) Indirect (all other character areas except Cathedral Conservation Area which is neutral/indirect)	Nil / Negligible / Minor / Moderate Positive	Not significant	High
Erection of Building and Construction of Public Square	On views, viewers and visual amenity	Low to High	Nil/Negligible - Medium	Permanent	Direct / Indirect	Nil / Negligible / Moderate / Major Positive views 3, 4, 5, 6, 7, 9, 10, 12, 13 and 14) Neutral (views 1,2, 8, 11 and 15)	Not significant	High

Table 89 Summary of Residual Impacts – Townscape and Visual Impacts

Cumulative Effects

15.86 There are no cumulative effects to be considered as part of the assessment.

References

PPS1:- Delivering Sustainable Development (2005)

PPG15:- Planning and the Historic Environment (1994)

Regional Spatial Strategy for the North West to 2021 (2008)

Manchester Unitary Development Plan (1995)

Collyhurst Local Plan (2006)

English Heritage/CABE:- Guidance on Tall Buildings (2007)

By Design: Urban Design in the Planning System: Towards Better Practice (2000)

Guide to Development in Manchester SPD and Planning Guidance (2007)

Guidelines for Landscape and Visual Impact Assessment (2002)

16.0 Socio-Economic Effects

Introduction

16.1 This chapter assesses the socio-economic impacts of the proposed development of The Co-operative Group Head Quarters building in Manchester City Centre, in particular:-

1 How the proposed development is likely to directly affect the local and regional economies during its construction and operation in terms of capital investment, employment generation and the local labour market; and,

2 The indirect effects of the development within its primary labour catchment area, as well as its contribution to the wider economic regeneration of the area.

16.2 The main issues considered in this chapter are: -

1 The extent of the labour catchment area of the proposed development;

2 Current socio-economic and labour market conditions within the defined labour catchment area;

3 Direct employment associated with the proposed development;

4 Temporary construction employment generated by the proposed development;

5 Indirect/induced employment associated with the initial spending of occupying firms within the proposed development and their employees;

6 Impacts on population and the local labour market arising from the proposed development;

7 Levels of in-commuting and additional housing demand associated with the proposed development; and,

8 Wider regeneration effects in the surrounding area as a result of the proposed development.

Policy Context

Development Plan Guidance

Regional Spatial Strategy for the North West to 2021 (2008)

16.3 The North West of England Plan was published in September 2008. It provides a framework for development and investment in the region over the period to 2021. Policies relevant to this Chapter are set out below.

16.4 Policy DP3 Promote Sustainable Economic Development – the Strategy seeks to improve productivity, and to close the gap in economic performance between the North West and other parts of the UK.

16.5 Policy W1 Strengthening the Regional Economy – seeks to promote opportunities for economic development in the Manchester City Region through the following growth opportunities, advanced manufacturing and engineering, financial and professional services, media, creative and cultural industries, biomedical, ICT / digital, and communications.

16.6 Policy W2 Locations for Regionally Significant Economic Development – states that regionally significant economic development will be located close to sustainable transport nodes; be capable of development within the plan period; highly accessible; well related to areas with high levels of worklessness and/or areas in need of regeneration and well related to neighbouring uses.

Manchester Unitary Development Plan (1995)

16.7 The Unitary Development Plan [UDP] was adopted by the Council in July 1995 and sets out the policies for land use and development in Manchester. Relevant policies of the UDP have been 'saved' following the requirements of the 2004 Act and continue to represent Development Plan policy. Policies relevant to this Chapter are set out below.

16.8 Policy I1.4 The Council will continue to encourage further development in the Regional Centre for those activities which will benefit from regional centre location both in terms of the refurbishment of existing buildings, where these need to be retained to safeguard the appearance and character of the area, and the sensitive redevelopment of vacant sites – seeks to build upon and reinforce the economic and cultural role of the Regional Centre.

16.9 Policy HC1 Part (e) and (f) of this Policy seek to create employment opportunities and improve accessibility to employment and shopping facilities – the supporting text recognises the importance of the area to the north of Swan Street and Miller Street to secure the economic regeneration of the locality in a way which recognises its particular character.

National Planning Guidance

Draft Planning Policy Statement 4 – Planning for Prosperous Economies

16.10 Published for consultation in May 2009, the Government's underlying aims are to streamline planning policies on economic development by consolidating policies currently contained in PPG4, PPG5 and PPS7, and incorporating the town centre and retail policy statements currently contained in PPS6. Draft PPS4 seeks to *"provide a clear and positive framework within which sustainable economic development can be delivered."*

16.11 The Statement defines 'economic development' as development which:-

1 Provides employment opportunities;

2 Generates wealth; or

3 Produces or generates an economic output or product.

16.12 Draft Policy EC12 (Planning applications for economic development) requires that *"local authorities should adopt a positive and constructive approach towards planning applications for economic development as defined for the purposes of this statement in both urban and rural areas."*

Economic Guidance and Strategies

North West Regional Economic Strategy

16.13 The current Regional Economic Strategy [RES] was launched in March 2006. It sets out a clear vision for the region's economy and identifies specific priority actions to meet the economic challenges and opportunities of the next ten years and close the economic gap with the rest of England.

16.14 The RES identifies three major drivers to achieving the strategy's vision; to improve productivity and grow the market; to grow the size and capability of the workforce; and to create and maintain the conditions for sustainable growth.

16.15 The Strategy focuses on a number of key themes – business, skills and education, people and jobs, infrastructure and quality of life. To address these themes, the Strategy recommends a number of key factors including:-

1 Developing new enterprise and growing existing companies;

2 Tackle the lack of basic skills and qualifications;

3 Growing local employment and developing job linkages;

4 Developing transport infrastructure;

5 Ensuring appropriate land use both in terms of brownfield land and new employment sites; and,

6 Improving the environment.

Greater Manchester Economic Development Plan 2004/5 – 2006/7

16.16 The Plan provides a framework to connect and deliver national, regional and local priorities within Greater Manchester. The overarching vision is that by 2015 Greater Manchester will be: -

1 One of Europe's premier city-regions, at the forefront of the knowledge

economy, and with outstanding commercial, manufacturing, cultural and creative activities;

2 World class, successfully competing internationally for investment, jobs and visitors;

3 Where people have the opportunity to participate in, and benefit from, the investment and development of their city-region; and,

4 Distinguished by the quality of life enjoyed by its residents.

North Manchester Strategic Regeneration Framework

16.17 This Framework has been developed in response to the challenging economic, social and physical issues facing this part of the city. The objectives of the strategy are to: -

1 Identify and target job opportunities;

2 Target training linked to opportunities;

3 Remove barriers to ensure equal access to jobs; and,

4 Support and encourage entrepreneurial activity and existing businesses.

Manchester Independent Economic Review, 2009

16.18 This review consisted of a Commission of prominent economists and business leaders with responsibility for commissioning evidence-based research to inform decision-makers in Manchester. The key findings of the Review included:-

1 Outside London, Manchester is the city-region best placed to take advantage of the benefits of agglomeration and increase its growth;

2 The Manchester city-region is underperforming in terms of productivity;

3 The productivity of its skilled workers is lower than that of the South East;

4 Large businesses within the region are Manchester's main source of investment and productivity; and,

5 More of the Manchester city-region's population are employed in the knowledge based industries of financial and business services, such as legal services, than ever before.

The Manchester Strategic Enterprise Framework 2009-2011

16.19 The Framework supports many of the objectives in other strategies and plans, particularly in attracting and retaining successful businesses in key growth sectors.

Draft Strategic Plan for Manchester City Centre 2008-2012

16.20 This document recognises the challenges faced in the Victoria area of the city, particularly the need to create amongst other things, a new gateway destination. It considers the need to strengthen the functionality and positioning of the wider area in relation to The Co-operative Group's future operational requirements.

The Manchester Way – Manchester's Community Strategy 2006-2015

16.21 In respect of the economy, the Strategy's vision for Manchester is of it being a 'knowledge capital' driving education and employment; a city that stands out as uniquely enterprising, creative and industrious and one that is inspirational, welcoming and inclusive; a city of opportunities, inviting and inspiring people to succeed; and, a city with people that are highly skilled, motivated and wealth creating.

The Manchester City Region Development Programme 2006

16.22 This document produced by The Northern Way emphasises that the Manchester City Region has the range and assets necessary to accelerate economic growth over the coming years and to realise its full potential as the country's second growth node. It also recognises serious challenges to be overcome including, rising levels of transport congestion; persistently high levels of worklessness; poor resident skills levels and stark economic performance disparities within the City Region.

Manchester: Knowledge Capital

16.23 Established in 2002, Manchester: Knowledge Capital is a unique partnership of Greater Manchester's universities, local authorities, public agencies and leading businesses. It seeks to support Manchester to become a modern and original city in which everyone benefits; to create the right conditions for sustainable growth; and to create and be the catalyst for new opportunities and new relationships.

Policy Summary

16.24 In policy and strategy terms, Manchester is acknowledged as a focus for economic assets in the North West region. The Manchester City-Region has performed well in economic terms to establish a platform for future growth, but some challenges remain if higher levels of productivity and output are to be achieved in the future. The need to encourage the regeneration of the Victoria area is highlighted as a potential new 'gateway' for the City Centre.

Potential Impacts

16.25 A full description of the proposed development is contained in Chapter 3 of the ES. In summary the following is proposed:-

1 The erection of a 16 storey office building (Use Class B1), comprising

approximately 30,352sq.m NIA floorspace.

2 The building will accommodate approximately 3,500 staff, of which approximately 5% will be new employees and the remainder transferred from existing Co-operative Group premises nearby.

Construction & Operational Impacts

16.26 The proposed development has the potential to:–

1 Increase direct and indirect levels of employment, and impact the local labour market.

2 Impact on existing commuting patterns.

3 Create additional needs for housing.

4 Contribute to wider economic regeneration aims in the local area.

Assessment Methodology

Approach

16.27 This assessment first establishes the baseline position in terms of local economic conditions, current employment on the site, and the existing provision of housing and retail facilities in the area, before examining potential impacts of the proposed development, and their significance. Opportunities for the mitigation of any adverse effects and the enhancement of positive effects are then examined.

16.28 The assessment draws upon published national statistics, including the latest available data from the 2001 Census, the 2007 Annual Business Inquiry, and planning and economic strategy documents relating to the area.

Significance of Impacts

16.29 In the absence of any generally accepted criteria for assessing the significance of socio-economic impacts, the scale of any impacts is assessed in relation to the magnitude of the change against the baseline position, as well as the nature and context of the impact.

16.30 Impacts are identified as either positive (beneficial) or negative (adverse), while their magnitude can be classified as either ‘minor’, ‘moderate’, ‘major’ or ‘negligible’.

		Sensitivity of Receptor/Receiving Environment to Change/Effect			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change / Effect	**High**	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
Note:- Shaded cells represent likely Significant Effects					

Table 90 Significance of Impact – Socio Economic Effects

Baseline Conditions

16.31 This section establishes the baseline for assessing socio-economic impacts by identifying the area likely to be most strongly affected by these, against which any future impacts can be measured.

Area of Impact

16.32 The application site is located on the northern edge of Manchester city centre. Given the location and scale of the proposed development, the most significant impacts will be concentrated within Manchester itself.

16.33 However, given the potential economic linkages and travel-to-work patterns, some effects of the development will be spread over a wider area. The main economic impacts will be concentrated in the labour catchment area of the proposed development – the area from which it would draw the majority of its workforce. Given that the proposals involve the relocation of existing workforce, information on the distribution of existing employees has been examined. Based on this, the labour catchment is defined as consisting of the Greater Manchester area, including the local authority areas of Bolton, Bury, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan (Figure 14).

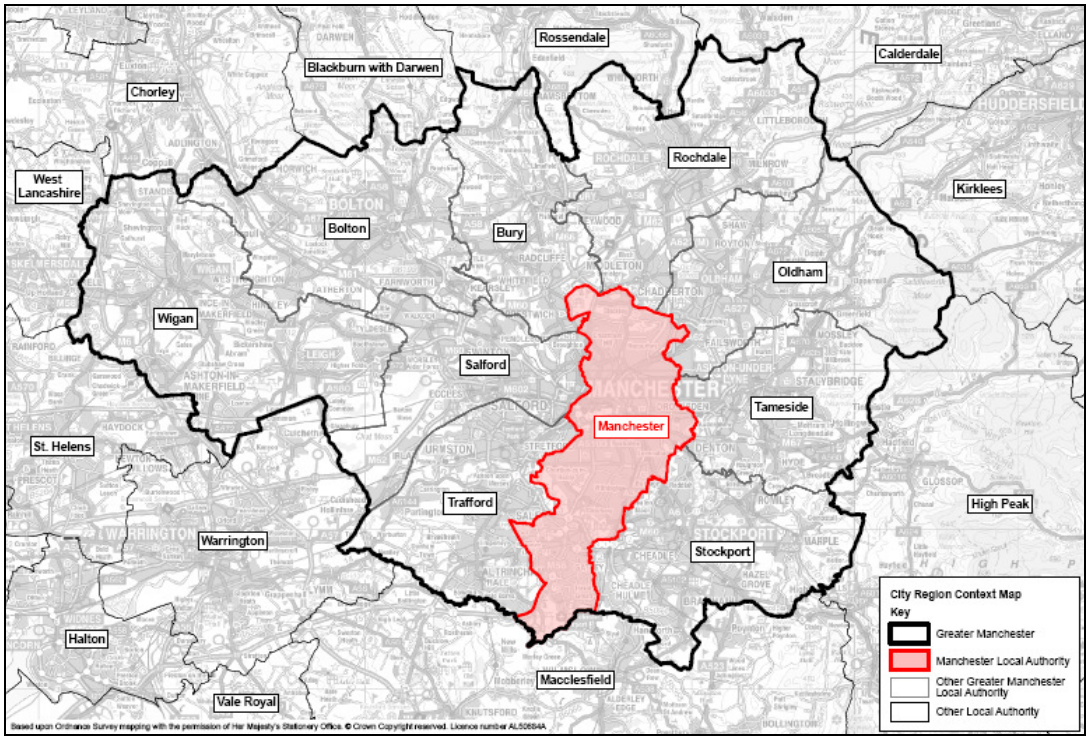


Fig 14 Labour Catchment Area

Economic Developments

16.1 Manchester is an internationally significant business location; it is the UK's largest commercial centre excluding London and the only UK City outside of London to be ranked in the top 20 European business destinations.[2] This position is underpinned by existing strengths in growth industries such as financial and professional services, media production and digital communications, as well as the City's extensive retail, cultural and sporting offer.

16.2 Economic activity within Manchester is largely focused upon the City Centre and in the south around Manchester Airport. The area's key office locations are concentrated within the City Centre, whilst the area around the Airport and the M56 represents the City's main industrial location.

Socio-Economic Conditions

Greater Manchester

16.3 A brief overview of key economic characteristics and trends across the wider labour catchment area of Greater Manchester are summarised below.

16.4 In 2007, the resident population of the Greater Manchester area was

[2] Source: Manchester City Council Core Strategy Economy Issues Paper

2,562,200, with a working age population of 1,613,900 (63%).[3]

16.5 The employment structure of the labour catchment area reflects a high proportion of management, professional, administrative and elementary occupations. The local economy is increasingly dominated by the service sector, with 83.3% of overall jobs, which is above the regional and national average. About 26.6% of employment is in public administration, education and health, although this is below both regional and national figures. Employee jobs in construction, transport and communications, and finance, IT and other business activities are above both the regional and national average. Manufacturing jobs at 10.9% have fallen significantly since 1995 (20.1%).

16.6 Between 1998-2008, the financial and professional sector has seen the greatest rise in employment numbers – 60,800 (3.7% increase per annum); the manufacturing sector has seen the greatest fall in employment numbers – 73,800 (4.3% decrease per annum). This pattern is predicted to continue over the next 10 years.

16.7 In April 2009, the proportion of working-age residents claiming job seekers allowance (JSA) in Greater Manchester (4.8%) were above the regional (4.6%) and national (4.1%) average. These figures are the highest since April 1997, and reflect the national picture of economic recession.

16.8 The Greater Manchester Forecasting Model is an integrated economic, population and household forecasting model focused on the Manchester City Region and adopted by the Association of Greater Manchester Authorities. Reflecting the national recession, the model forecasts the loss of around 37,000 jobs between 2008 and 2010. These losses are expected to be led by service based industries, with financial and business services forecast to experience the largest falls in employment within Greater Manchester. However, the recession is also likely to result in significant job losses in the distribution and retail, manufacturing and construction sectors.

Manchester City

16.9 More detailed information on economic trends in Manchester is summarised below. Where possible, the City's performance has been benchmarked against national, regional and City-Region data.

16.10 Over the period 1997 to 2007, the resident population of Manchester increased by 9.6% to 458,000. This rate of growth is considerably higher than observed nationally (4.5%) and across the North West (1.0%)[4].

16.11 In 2007, Manchester accounted for 309,400 employee jobs, the highest of all

[3] 2007 mid-year population estimates, ONS

[4] Source: ONS Midyear Population Estimates

the Greater Manchester authorities[5]. Over the period 1998 to 2007, employee jobs in the City increased by 15.5%, significantly exceeding the national average (9.2%) and making Manchester the fastest growing authority in the City Region.

16.12 As Figure 15 illustrates, the main employment sectors in Manchester are banking, finance and insurance (30.0% of all jobs) and public administration, education and health (29.4%). Whilst the latter accounts for a proportion of employment that is similar to national and regional levels, Manchester clearly has an over-representation of jobs in financial and business services compared with national and regional averages of 21.6% and 19.4% respectively.

16.13 The transport and communications sector accounts for significantly more jobs in Manchester (9.6%) than it does nationally (5.9%). In contrast, the manufacturing, construction and distribution, hotels and catering sectors are all under-represented within the City compared to national averages.

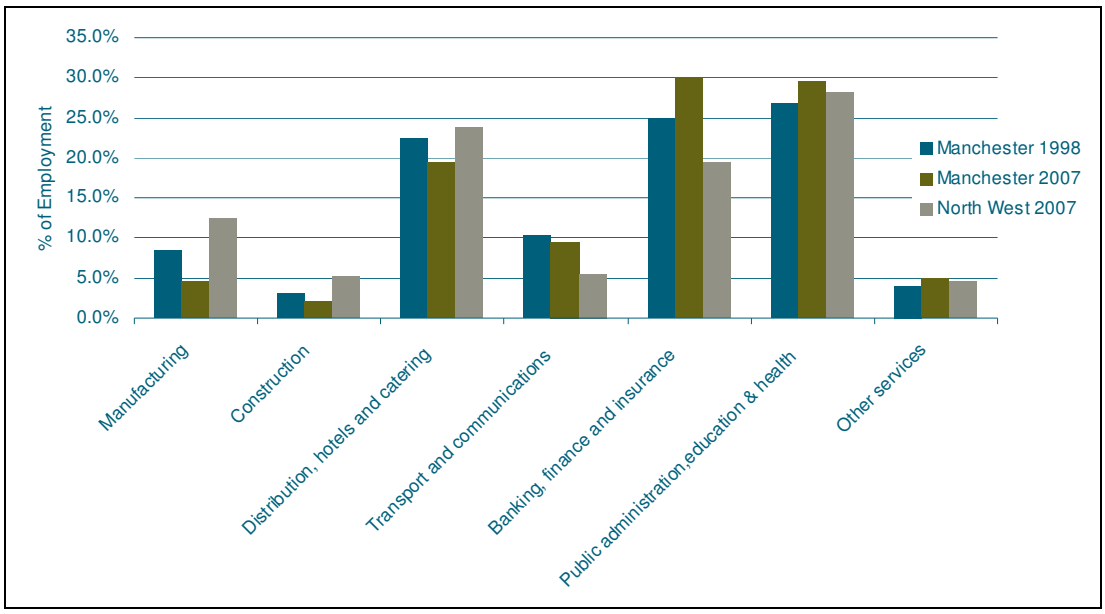


Fig 15 Principal Sectors of Employment

Source: Annual Business Inquiry 1998-2007 / NLP analysis

16.14 Analysis of absolute employment levels over the same period demonstrates the extent to which the level of employment in manufacturing has fallen in Manchester in recent years. Over the period 1998 to 2007 the number of jobs in the sector has fallen from 22,500 to 14,000; a decrease of 38%. Whilst the move away from manufacturing is a national trend, employment in the sector across Great Britain did not decline to the same extent, falling by 30%.

16.15 'Other services' was the fastest growing sector in the City, with the number of

[5] Source: Annual Business Inquiry

jobs increasing by 46%, whilst banking, finance and insurance rose by 39%. For both sectors, growth rates in Manchester significantly outstripped those observed nationally. Public administration, education and health (27%) and transport and communications (8%) also increased, although at rates similar to the national averages.

16.16 Between 1998 and 2008, the number of VAT registered businesses in Manchester increased by 6.6%. This is significantly lower than the growth in the business base of Greater Manchester (17.7%), the North West region (19.7%) and the UK (21.2%). In spite of this, the City appears to have a reasonably good entrepreneurial culture, with 43 VAT registrations per 10,000 population recorded in 2007 compared to 42 nationally and 37 regionally. The growth of Manchester's business base in recent years does not, therefore, appear to have been constrained by a low level of start-ups but rather a comparatively high proportion of business failures. Indeed, in 2005 just 64% of those businesses registered 3 years earlier were still trading compared to national and regional averages of 70% and 71% respectively.

16.17 Unemployment in Manchester is relatively high. The current claimant unemployment rate (4.3%) is significantly higher than the regional (3.5%) and national (3.0%) averages (Table 8a). However, it should also be noted that levels of unemployment in the City have fallen significantly over the past decade, thereby narrowing the gap, as highlighted by Figure 16.

16.18 The graph also shows a significant increase in claimant unemployment over the period 2007 to 2008 at the three spatial levels, reflecting the current economic difficulties. Long-term unemployment[6] within Manchester (8.7%) is slightly lower than the regional (9.2%) and national (8.9%) rates. However, there are a number of wards within the City where particularly high levels of long-term unemployment are observed, most notably Ardwick (13.4%), Bradford (13.4%), Whalley Range (12.2%) and Gorton North and South (11.6% and 11.3% respectively).

[6] The proportion of claimant unemployed that have been out of work for more than 12 months

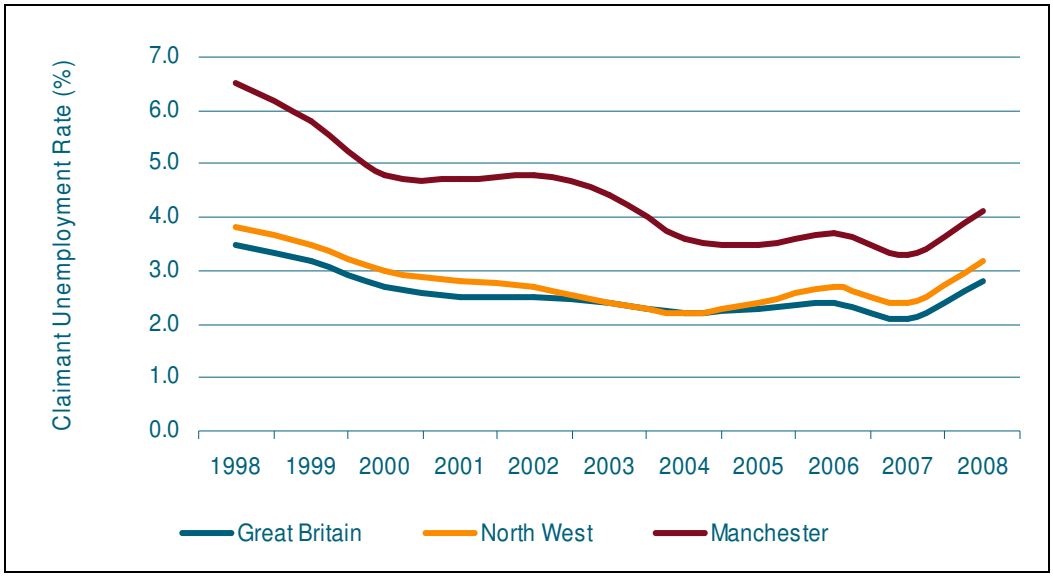


Fig 16 Claimant Unemployment Rate 1998-2008

Source: Nomis / NLP analysis

16.19 In November 2008 there were 3.5 claimant unemployed workers for every notified job centre vacancy in the City. Whilst this figure is above the national average (3.0) it is lower than the figures for Greater Manchester (4.0) and the North West (3.7). This illustrates that there is currently some slack in the labour market as a result of the current economic downturn, although less so than elsewhere in the City Region.

16.20 An analysis of economic activity rates also suggests that there is scope to expand the indigenous local labour supply to help meet any further increases in employment demand. The economic activity rate for Manchester stands at 67.4%, which is significantly lower than the levels observed nationally (78.8%) and regionally (76.7%).

16.21 The occupational structure of Manchester's labour force is shown in Figure 17 below, which illustrates that the City's profile is broadly similar to that of the North West and Great Britain. There are, however, some subtle differences, with the labour force of Manchester containing a higher proportion of professional occupations (14.4%) and associate professional and technical occupations (17.7%). At the other end of the spectrum, the City's labour force also includes a higher proportion of lower skilled, elementary occupations (13.4% compared to a national average of 11.5%) emphasising the polarisation of the local economy.

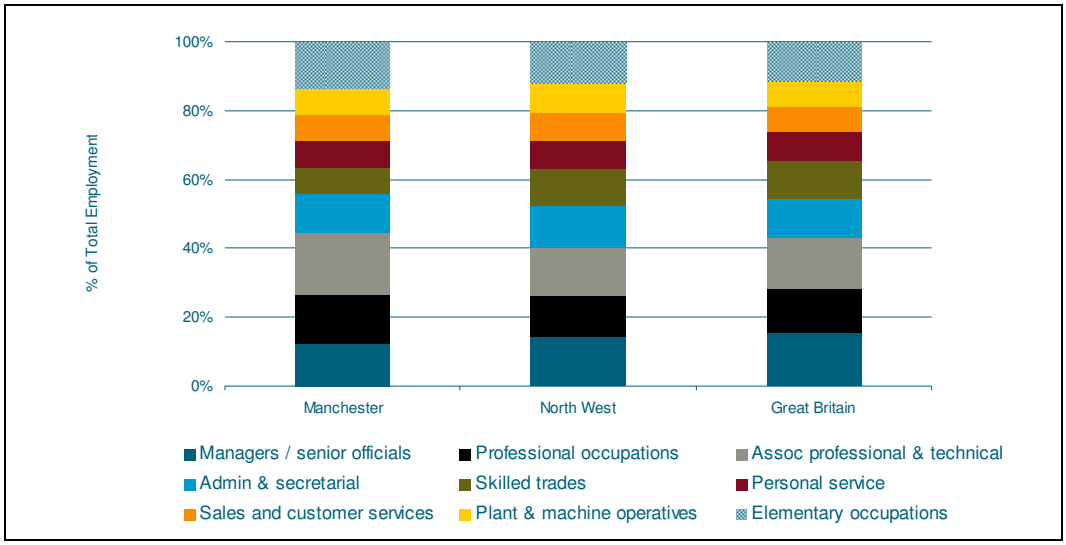


Fig 17 Occupational Breakdown of Labour Force

Source: Annual Population Survey / NLP analysis

16.22 An analysis of the skills levels also indicates a polarisation within the City's resident workforce. The working age population includes an above average proportion of highly skilled residents, with almost one in three (30.3%) educated to degree level or above compared with 25.4% regionally and 28.6% nationally. However, the City also has a large share of residents with no qualifications (18.7%) relative to the North West (15.0%) and Great Britain (13.1%) averages. An assessment of this data at a more localised level illustrates the existing of significant disparities within Manchester City. For instance, the proportion of residents educated to degree level or above varies from just 7.00% in the wards of Benchill and Newton Heath to 52.40% in Chorlton.

16.23 Average wage levels also indicate that not all Manchester residents are currently capitalising upon the economic opportunities within the Local Authority area. Workplace earnings in the City are 4% above the national average and 11.8% above the regional average. However, an examination of earnings by residence shows that those workers living in Manchester earn 17.9% less than the Great Britain average and 10.4% less than the figure for the North West. This indicates that many of the highly paid jobs in the City are currently filled by people living beyond the authority's borders and highlights the need to enable the resident population to tap into these opportunities to a greater extent.

16.24 Manchester suffers from high levels of deprivation. The English Index of Multiple Deprivation (2007) ranks it as the fourth most deprived authority out of 354, making it the most deprived authority within Greater Manchester.

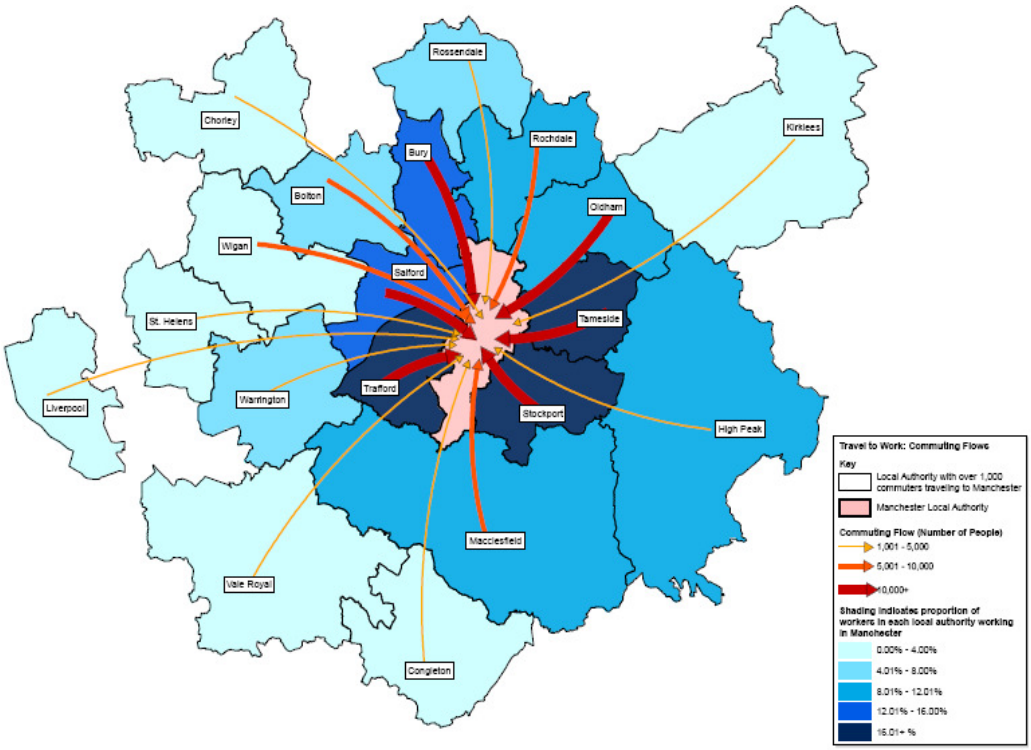
Commuting

16.25 Based on 2001 Census data (the latest available), more than 47,000 residents

travelled out of Manchester to work, commuting primarily to the adjacent Greater Manchester authorities of Trafford, Stockport and Salford (Figure 18). This outflow of workers was equivalent to 33% of all employed residents.

16.26 At the same time, over 172,000 residents of other local authorities travelled in to the City to work. The majority of in-commuters were resident in the neighbouring authorities of Stockport, Trafford, Tameside and Salford. This inflow of workers accounted for 64% of all workplace jobs in the City, illustrating the important sub-regional role that Manchester plays in the provision of employment opportunities. These flows result in a net inflow of 125,000 workers to the City, approximately 47% of all workplace jobs based in the City.

16.27 Travel to work data can also be used to calculate an area's self-containment rate. This reflects the proportion of employed residents that are employed locally, rather than commuting to jobs beyond the Local Authority boundary. 2001 data indicates that Manchester has a containment rate of 67%, the second highest in the City Region. This illustrates that the City provides jobs for a comparatively high proportion of its residents, which is to be expected given the scale of employment opportunities available. However, the local economy is clearly not self-contained, as demonstrated by the scale of the net inflow of commuters discussed above.



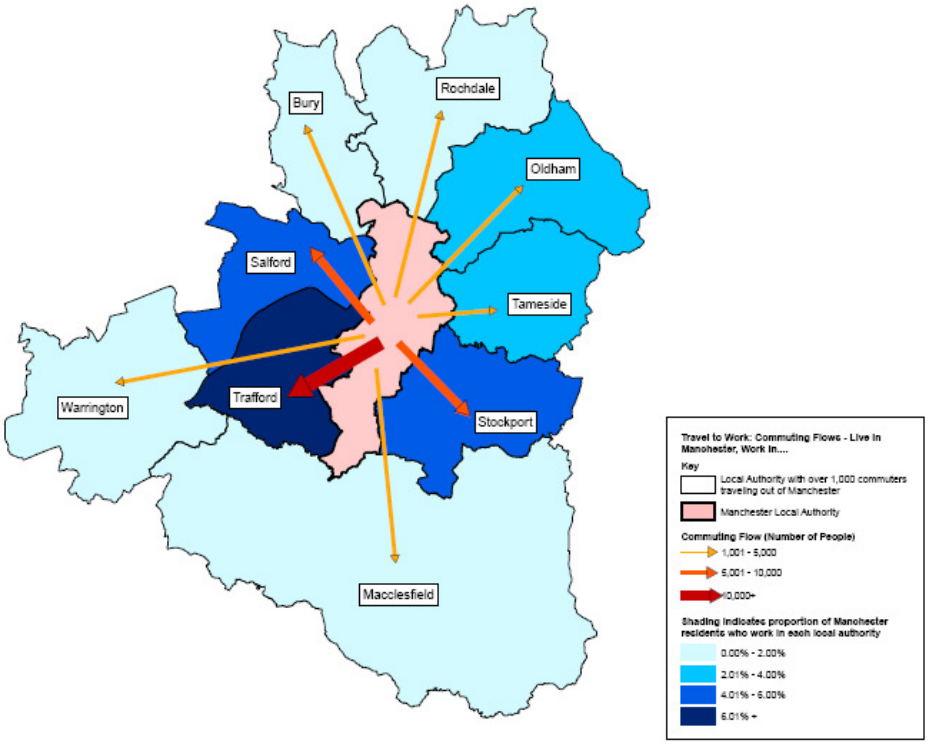


Fig 18 Manchester Commuting Flows

Source: Census 2001 / NLP analysis

Existing Employment on the Application Site

16.28 The application is currently use as an open car park for the existing Co-operative Group Head Office, and therefore no employment is currently based on the site.

Assessment of Crime

16.29 A Crime Impact Assessment has been prepared with Greater Manchester Police Design for Security consultancy. This Assessment is attached at Technical Appendix 16.3.

16.30 The report concludes that the development is consistent with the principles of Crime Prevention Through Environmental Design (CPTED), thus reducing the opportunities for crime and fear of crime. It recommends the incorporation of detailed design principles including, CCTV cover, robust door entry system, enclosed lockable and secure bin stores, clear signage, laminated glazing, access control doors, good lighting and construction site security.

Impact Assessment

16.31 This section identifies the socio-economic impacts that are likely to be generated by the proposed development. The main employment-generating element is new B1 office accommodation totalling 45,308m² (30,352m² net).

16.32 The significance of the impacts identified have been evaluated, with impacts assessed as either beneficial (positive) or negative (adverse), while their magnitude can be classified as either 'minor', 'moderate', 'major' or 'negligible'.

Construction Impacts

16.33 The principal socio-economic impact during the construction phase of the proposed development will be temporary construction-related employment. This has been estimated based on a construction cost for the proposed development and localised infrastructure of £136 million. An average of 30% of the total cost of construction is typically accounted for by labour costs, which equates to nearly £41 million. Dividing this figure by the gross average cost of construction labour in the North West in 2008, produces approximately 1,330 person-years of employment[7].

16.34 An alternative approach is to divide the total construction cost by the average turnover per construction sector employee in the UK, which was £110,969 in 2007[8]. With an additional allowance made for overheads, this produces approximately 1,110 person-years of construction employment.

16.35 This indicates that between 1,110 – 1,330 person-years of construction work would result directly from the proposed development. Since the construction of this development would be spread broadly over a two-year period, an overall average of approximately 555 – 665 job opportunities per year could be directly created. In economic terms, there is a convention that 10 temporary construction jobs are equivalent to 1 FTE job, so that up to about 135 FTE construction jobs will result in total.

16.36 Given that national construction firms now frequently employ contractors with only a proportion of construction workers drawn from the local area, it is difficult to identify the likely source of workers to fill these construction jobs before contracts have been let. However, based on experience elsewhere it would be reasonable to expect a proportion of the construction jobs created by the proposed development could be taken up by the local workforce, particularly if measures are in place to encourage local recruitment and to raise local skills levels.

16.37 In addition, it is also likely that some businesses in the local area, as well as in the regional economy, would benefit from the trade linkages that would be established to construct the development. This means that further indirect jobs would be supported locally in suppliers of construction materials and equipment. Local businesses would generally also benefit to some extent from temporary increases in expenditure as a result of the direct and indirect

[7] £30,575 based on Annual Survey of Hours & Earnings, ONS, 2008

[8] BERR/Small Business Service

employment effects of the construction phase, for example, as construction workers spend wages in local shops and other facilities.

16.38 Applying an employment multiplier of 1.2 to the FTE construction employment indicates that a further 30 FTE indirect/induced jobs could be temporarily supported in the local area as a result of construction-related expenditure.

16.39 Drawing together these various effects, the construction of the proposed development could generate up to 1,330 person-years of temporary construction work (165 FTE jobs) spread over a two year period, a proportion of which would be based in the local area.

16.40 On balance therefore, the construction employment generated by the proposed development is assessed as a **minor (positive)** impact.

Operational Impacts

Employment Impacts

16.41 The additional employment which would be generated or supported by the proposed development after completion will fall into the following categories:

1 Direct employment within the new employment element; and,

2 Indirect and induced employment supported in businesses in the surrounding area.

Direct Employment

16.42 The level of direct employment associated with the proposed development has been estimated from information provided by The Co-operative Group. On this basis, the expected number of jobs that will be generated by the proposed development is approximately 3,500 jobs.

16.43 The vast majority of these will represent transfers of Co-operative Group employees from the existing head office and other buildings within Manchester City Centre. A proportion of the jobs will be relocated from outside of Manchester, although it is not possible to quantify these accurately at this time, but as a working assumption it is assumed that up to 5% of jobs may be additional to Manchester which would equate to 175 jobs.

16.44 The jobs transferred comprise a range of office-based activities relating to the Co-operative Group's headquarter operations, including specialist functions such as Co-operative Financial Services. Based on national patterns of employment in the finance and business services sector, approximately 2,625 jobs (75%) would be full time, and 875 (25%) part time, although actual figures may vary subject to the Co-operative Group's operational requirements. The total employment therefore equates to 3,060 Full Time Equivalent [FTE] jobs (Table 91).

Proposed Use	Potential job generation *	Full Time	Part Time	FTE Jobs *
Headquarter offices (B1)	3,500	2,625	875	3,060
Note: totals rounded.				

Table 91 Estimated Employment Generation by Full Time Equivalents (FTE

Source: FT/PT split based on 2007 Annual Business Inquiry data for financial and business services

Net Additional Employment

16.45 Net employment impacts have been estimated from the gross employment generation estimated above. This reflects that a significant proportion of jobs will represent transfers of Co-operative Group employees from existing buildings within Manchester City Centre. As noted above, it has been assumed that only 5% of the total jobs transferred will be new to Manchester City Centre, amounting to 175 jobs. Therefore, the net additional employment generated by the proposed development amounts to 175 jobs (Table 92).

Gross employment generated by proposed development	3,500
Less transfers of existing Co-operative Group jobs from within Manchester	3,325
Net Additional Employment	**175**
Note: based on 5% assumption of new jobs relocating from outside Manchester	

Table 92 Net Employment Change in Local Area

Source: NLP Analysis

Indirect/Induced Employment

16.46 As indicated earlier, indirect jobs are supported by the spending on goods, supplies and services, of companies based on the application site with firms in the surrounding area. The spending of wages by both Co-operative Group employees and of local suppliers will also support induced employment in local shops, services and other firms, for example lunchtime expenditure. As before, these types of employment can be estimated using employment multipliers derived from research on similar operations elsewhere, with adjustments to reflect the specific characteristics of the development, the amount of spending retained in the local area, and local economic and labour market conditions.

16.47 Based on the characteristics of the proposed development, its local economic context and labour market, the same combined employment multiplier of 1.2 used at the baseline stage is considered appropriate to estimate both indirect and induced employment within the labour catchment area, while a multiplier of

1.4 is assumed to reflect job impacts in the wider region. Applying the local area multiplier to the estimated net gain of 175 jobs generated by the development (converted to FTE jobs) would result in 30 "spin-off" jobs being supported in local services and other firms across the labour catchment area (Table 1, Technical Appendix 16.2).

16.48 On this basis, it is estimated that the operation of the proposed development would support, directly and indirectly, 205 net additional permanent jobs in total within the labour catchment area. Across the North West region, a similar calculation indicates that about 60 net additional jobs would be generated, or about 235 jobs in total (Table 2, Technical Appendix 16.2).

16.49 Based on the preceding sections, the operational employment impacts of the proposed development on the local economy would be:-

1 An estimated 3,500 direct permanent job opportunities based on the site, a net increase of 175 direct jobs;

2 A total of 205 net additional direct and indirect jobs spread across the local area; and,

3 A total of 235 net additional direct and indirect jobs spread across the North West region (including those in the local area).

Impacts on the Local Labour Market

16.50 It is estimated that the proposed development will result in a net gain of up to 175 permanent jobs once fully operational, as a result of some Co-operative Group employees being transferred from outside of Manchester. It is likely that these jobs will be filled through existing employees choosing to relocate to, rather than generating additional demands for local labour.

16.51 In the event that these jobs were not filled by existing employees opting to relocate to Manchester, then it is possible that these jobs could be filled by local workers subject to the skills levels required by these jobs and the skills available in the local workforce.

16.52 As indicated above, claimant unemployment is relatively high within Manchester at 5.5%, with a total of about 17,300 claimants. Unemployment has been rising rapidly in recent months reflecting the picture of national recession, and as a lagging indicator may continue to rise for at least a further 12 months. Many of the jobs created by the proposed development are expected to fall within the professional, technical and administrative occupations. There are currently 3,700 claimants (21%) seeking work in these occupations within Manchester. In the unlikely event of all of the additional jobs created by the proposed development were drawn from the study area and employed in these occupations, this number of unemployed local residents could be reduced by around 5%.

16.53 The majority of jobs generated by the proposed development will be transfers of existing employees within Manchester, with only a modest level of net additional employment.

16.54 On balance therefore, impacts on the local labour market are assessed as a **minor** (**positive**) impact.

Impact on Commuting

16.55 Consideration has been given to potential impacts on commuting patterns arising from the net change in jobs which would result from the proposed development.

16.56 It is considered that as the majority of jobs created will be transfers of existing employees, existing commuting patterns will be unaffected. Some impacts derived from the net additional jobs relocating from outside of Manchester, however the scale is modest.

16.57 On this basis, the impact on current commuting levels is assessed as **negligible** (**positive**) impact.

Housing Impacts

16.58 The worst case impact of the proposed development on the local housing market would be if each new job filled from within the local area gave rise to need for an additional dwelling there.

16.59 However, the majority of jobs within the proposed development will be filled by transfers of existing employees already resident within the labour catchment area, and therefore will not generate additional housing needs.

16.60 Some additional demand may arise from those jobs being relocated from outside of Manchester. However, it is not anticipated that significant additional housing demand will result as the net increase in jobs will be relatively small.

16.61 On this basis, the overall impact on housing is assessed as **negligible** (**negative**) impact.

Wider Regeneration Benefits

16.62 The regeneration impacts of the proposed development are considered fully in the Regeneration Statement that accompanies the Application submission. Drawing on this, and the impacts considered above, the proposed development will represent a major investment in the Victoria area of Manchester City Centre, where particular regeneration needs have been identified. Key regeneration benefits of the proposed development will include:-

1 A significant contribution to the wider regeneration of the Victoria area, by enhancing the image of the area and investor confidence in it, thereby

potentially helping to attract further investment;

2 Providing modern, state-of-the-art office accommodation to reaffirm the Co-operative Group's commitment and status as a major employer within Manchester, contributing to the City's growth agenda; and

3 The long term impact of expenditure by employees and other visitors to the development in the local economy, in turn supporting the vitality and viability of the City Centre and the Manchester economy more widely.

16.63 Taken overall, in terms of significance, the impact on wider regeneration is assessed as **moderate (positive)** impact.

Mitigation Measures

16.64 The social and economic impacts of the proposed development are principally on employment and the local labour market.

16.65 Since a number of the economic impacts of the proposals are assessed as positive, there is no requirement for mitigation in these cases. Other socio-economic effects (housing and population) are estimated to be negligible, and consequently no mitigation is required.

Summary of Residual Impacts

16.66 The assessment has identified no significant adverse socio-economic impacts as a consequence of the proposed development. After implementation of any local job recruitment and training measures, the residual impact on the local labour market would be moderate positive.

16.67 Table 93 provides a summary of the predicted socio-economic effects of the proposed development. This summary is based on the incorporation of the recommended mitigation measures.

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Construction Phase								
Temporary Employment	Creation of Employment	High	Low	Temporary (24 months)	Direct / indirect	Negligible (positive)	Not significant	Medium
Operational Phase								
Labour Market	Creation of Employment	High	Low	Permanent	Direct / indirect	Negligible (positive)	Not significant	High
Commuting	Impact on commuting flows	Medium	Low	Permanent	Direct / indirect	Negligible (positive)	Not significant	High

Topic	Significant residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of Impact	Significance	Level of certainty or confidence
Housing	Impact on housing demand	Medium	Low	Permanent	Direct	Negligible (adverse)	Not significant	High
Regeneration	Contribution to regeneration needs	High	Medium	Permanent	Direct / indirect	Moderate (positive)	Significant	High

Table 93 Summary of Residual Impacts – Socio Economic Effects

Cumulative Impacts

16.68 There are no other developments which are required to be assessed for the purposes of considering cumulative impacts.

References

Regional Spatial Strategy for the North West to 2021 (2008);

Manchester Unitary Development Plan (1995);

Manchester City Council Core Strategy Economy Issues Paper (2009);

Draft PPS4: Planning for Prosperous Economies (2009);

North West Regional Economic Strategy (2006);

Greater Manchester Economic Development Plan 2004/5 – 2006/7;

North Manchester Strategic Regeneration Framework;

Manchester Independent Economic Review (2009);

Manchester Strategic Enterprise Framework, 2009-2011;

Draft Strategic Plan for Manchester City Centre, 2008-2012;

The Manchester Way – Manchester's Community Strategy 2006-2015;

The Manchester City Region Development Programme (2006);

Manchester: Knowledge Capital (2002).

17.0 Other Environmental Effects

Introduction

17.1 This chapter considers the other environmental effects that may be caused by the proposed development. Two environmental issues, not covered elsewhere in the Environmental Statement, have been identified: -

1 The possible impact of the development on air traffic navigation and communication systems at Manchester Airport; and,

2 The effect of the development on television reception.

17.2 This chapter assesses the potential effects of the proposed development on the air traffic navigation and television reception and should be read in conjunction with Appendices 17.1 and 17.2.

Policy Context

Development Plan Guidance

17.3 There are no policies which explicitly relate to the effects of tall buildings in the Manchester Unitary Development Plan or within the North West of England RSS with regard to the possible impact on air traffic navigation and the effect of the development on television reception.

National Planning Guidance

17.4 There is no national planning guidance which specifically affects tall buildings although they are subject to the full range of relevant national, regional and local policies to which other buildings are subject.

17.5 Non-statutory guidance on tall buildings was produced by CABE and English Heritage in 2003. This deals predominantly with design but does also refer to wider effects on the local environment including microclimate, overshadowing, night-time appearance, vehicle movements and the environment and amenity of those in the vicinity of the building.

17.6 The Impact of Large Buildings and Structures (including Wind Farms) on Terrestrial Television Reception, produced by the BBC and OFCOM, seeks to bring the effects of tall buildings to architects, developers and planning authorities. The document sets out general guidance in respect of shadowing effects, reflection effects and how to assess and reduce impact.

Supplementary Planning Guidance

Guide to Development in Manchester SPD and Planning Guidance (2007)

17.7 This document provides development principles and has Supplementary Planning Document [SPD] status. In relation to tall buildings, the guidance states (¶2.14 – 2.15) that building height should be carefully considered and also that *"Tall buildings provide very positive messages about Manchester, and can significantly improve its image and peoples' perceptions of it. Conversely, badly located tall buildings could have an adverse effect and as such any proposals will always have to be fully justified and carefully considered."* [¶12.26].

Potential Impacts

Air Traffic and Navigation Systems

17.8 The applicant has discussed the proposed development with Manchester Airport to ascertain if there could be any possible impacts on air traffic and navigations systems of the erection of a 16-storey building on the applications site. The Airport has confirmed there are not likely to be any aerodrome safeguarding or operational implications from the development (see Technical Appendix 17.1). As a consequence, these effects are unlikely to be significant and they have been scoped out of further assessment.

TV Reception

17.9 The introduction of new buildings/structures into an area can cause impairments to terrestrial TV reception. These impairments can be caused by shadowing: where the new development shadows existing properties from the TV transmitter (subsequently reducing signal strength and quality); or by reflections, where the new development reflects signals from the TV transmitter. These unwanted reflected signals are received by the TV aerials on existing properties, along with the direct signal from the TV transmitter, resulting in effects called 'ghosting'.

17.10 The digital television broadcast platform offers many advantages over older analogue broadcast technologies, however, disruption to Digital Terrestrial Television (DTT) services is normally caused by an obstruction on the line of sight from the transmitter to the receiver antenna.

17.11 To ensure good reception of satellite services, satellite receiver antennae (satellite dishes) are normally positioned away from trees and other clutter. Disruption to these services is normally caused by an obstruction on the line of site from the satellite to the receiver antenna.

Assessment Methodology

Data Gathering

17.12 Due to the complex nature of television interference in cluttered environments, field investigations must be undertaken in the general area around a development site to fully evaluate any potential effects. Additionally, investigations were carried out in all areas where predicted (modelled) interference may occur. In this study, field measurements were undertaken up to 1000 metres away from the development site. These are identified Technical Appendix 17.2.

17.13 The following data was assessed:-

1 Field strength and picture quality measurements of analogue television transmissions from the Winter Hill transmitter;

2 Field strengths of DTT transmissions from the Winter Hill transmitter; and,

3 Viewing preference (choice of television transmitter) of residents in all areas visited.

17.14 All television measurements were carried out using a log-periodic receive antenna, mounted on GTech Surveys' broadcast survey vehicle, at a receive height of 10 metres AGL (above ground level), industry standard height for such work.

17.15 During the survey, no assessment was made of reception conditions within viewers' homes.

17.16 Further information in respect of survey procedures and equipment details is set out in Technical Appendix 17.2.

Potential Receptors

17.17 The potential receptors for the TV assessment are those people with televisions which receive a signal from a transmitter which would be shadowed by the new development. The development would affect digital users (Granada region is due to go digital in 2009) in the same way as it will analogue users since the same transmitters will be used. Users of satellite and cable channels would not be affected.

17.18 Figure 19 identifies the surveyed locations, with the development site identified in blue.

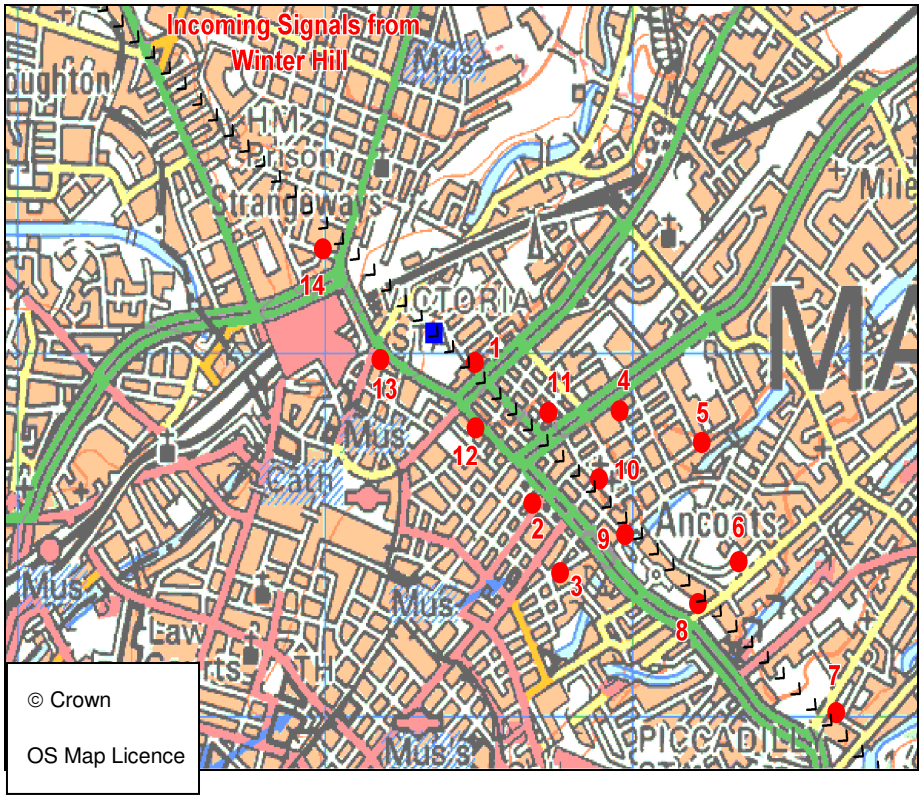


Fig 19 Survey Locations

Significance of Impact

17.19 For television reception, the potential significance of effects resulting from the development is determined by the sensitivity (or value) of a given receptor and the magnitude of the effect. Effects received might be failure to receive analogue TV channel at all, or receiving pictures with double images known as ghosting. The actual effects caused by this building will not be identified until the development is complete and the reception locally can be re-surveyed.

17.20 To measure the clarity of reception, the industry uses a 5 point impairment scale as set out in Table 94.

Quality	Impairment	Grade	Significance
Excellent	Imperceptible	5	Negligible / Nil
Good	Perceptible	4	Minor
Fair	Slightly Annoying	3	Moderate
Poor	Annoying	2	Major
Bad	Very Annoying	1	Very Major
Note:- Shaded cells represent likely Significant Effects			

Table 94 Significance of Impact – Other Environmental Effects

Baseline Conditions

Analogue transmissions

17.21 At all locations visited, analogue terrestrial television services were available and were deemed to be generally good with respect to picture quality and received field strength.

17.22 Multipath interference was noted at locations 1, 9, 12 and 14, likely to be through the influence of nearby, tall existing developments.

17.23 All viewers in all areas surveyed receive transmissions from the Winter Hill transmitter.

Digital Terrestrial Television

17.24 DTT services were available at all locations from the Winter Hill transmitter. At all locations, received signal levels were well in excess of recommended minimum amounts[9]. DTT services currently provide good coverage and service throughout the study area.

Digital Satellite Television

17.25 During the survey it was noted that approximately 35-40% of households in the survey area had satellite-receiving equipment in place.

Impact Assessment

Construction Phase

17.26 During Q4 OF 2009, this region of the country undergoes Digital Television Switchover and analogue services will cease transmission. The construction phase of the development will commence after this time as detailed in Chapter 3 of this ES. There will therefore be **nil** impact on analogue television during the construction phase.

17.27 The construction process will have **negligible** impact on Digital Terrestrial Television or Digital Satellite Television.

Operational Phase

17.28 After switchover to digital services at the end of 2009 the building will not have the opportunity to cause interference to analogue services. The impact on reception will therefore be **nil**.

17.29 Modelling has demonstrated that Digital Terrestrial Television services are not

[9] Signal levels as specified by the Digital TV Group in their report – UK Digital TV Receiver Recommendations, Versions 1.4, dated 18 June 2008.

at risk from signal interference generated from the building. This is due to the location of the development in relation to the highest levels of received field strengths. The impact on reception will be **negligible**.

17.30 The proximity of the proposed development in relation to existing satellite receiver dishes will mean no degradation of satellite reception. The impact will be **negligible**.

Mitigation Measures

17.31 Given that only negligible or nil impacts are expected, mitigation measures are not required.

Cumulative Effects

17.32 There are no cumulative effects to be considered as part of the assessment.

18.0 Summary of Residual Impacts

18.1 Residual impacts are defined as those impacts, which may be either positive or negative, that remain after the implementation of mitigation measures.

18.2 The proposed development may result in the creation of some negative effects. However, where relevant, appropriate mitigation measures have been proposed. It is considered that none of the impacts are of such significance that they should prevent the development of this site. Furthermore, the development results in the creation of many positive environmental effects and economic and sustainability benefits.

18.3 The residual impacts identified during the construction and operational phases of the development are identified within Table 95.

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
Water Resources								
Construction impacts								
Groundwater Quality	None	Very High – major aquifer and source protection zone II	Negligible – appropriate mitigation put in place to protect groundwater resource. Appropriate pollution prevention guidance followed during construction.	Temporary – during construction phase	Direct or via infiltration	Minor adverse	Not significant	High
Surface Water quality	None	Possibly high if drainage from the site flows directly to river	Negligible – appropriate mitigation put in place for the protection of surface water run-off	Temporary – during construction phase	Via drainage network	Minor adverse	Not significant	High
Flood risk	None	Very high – people and property	Negligible – appropriate mitigation put in place to protect groundwater resource in consultation with the Environment Agency. Appropriate pollution prevention guidance followed during construction.	Temporary – during construction phase	Via drainage network and SuDS	Minor adverse	Not significant	High
Operational Impacts								
Groundwater Quality	None	Very High – major aquifer and source protection zone II	Negligible – appropriate mitigation put in place to protect groundwater resource. Appropriate pollution prevention guidance followed during construction.	For the lifetime of the development	Direct or via infiltration	Minor adverse	Not significant	High
Surface Water quality	None	Possibly high if drainage from the site flows directly to river	Negligible – appropriate mitigation put in place for the protection of surface	For the lifetime of the development	Via drainage network	Minor adverse	Not significant	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
			water run-off					
Flood risk and drainage design	None	Development on site and downstream; surface and foul sewerage networks; watercourses and groundwater – all important.	Negligible impact with mitigation measures in place. Runoff rates may be reduced.	For the lifetime of the development	Via SuDS and local drainage system	Minor positive	Not significant	High
Water Resources	None - There will be some impact on water resources at a water resource zone level but no significant effects.	High - Water resources locally (within the water resource zone) will be impacted; this receptor is important.	The change will be minor in relation to demand / supply volumes within the water resources zone, and allowances have been planned for in the water company plans.	Permanent	Direct	Moderate adverse	Not significant	High
Air Quality								
Construction Impacts								
None	None	None	None	None	None	None	None	None
Operational Impacts								
Road Traffic NO_2 Emissions	No significant residual effects identified in the modelling	Human receptors only	Extremely Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Road Traffic PM_{10} and $PM_{2.5}$ Emissions	No significant residual effects identified in the modelling	Human receptors only	Extremely Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Biomass Boiler NO_x/NO_2 Emissions	No significant residual effects identified in the modelling	Human receptors and one ecological receptor at the	Very Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
		Rochdale Canal						%) the AQO
Biomass Boiler PM_{10} and $PM_{2.5}$ Emissions	No significant residual effects identified in the modelling	Human receptors only	Very Small	Permanent	Direct	Negligible	Not Significant	High, modelled PEC well below (< 75 %) the AQO
Noise and Vibration								
Construction Impacts								
Contraction Noise from Fixed and Mobile Plant	Significant effects identified	'Medium' Residential Receptors on Aspin Lane and Angel Street	'High' between months 1 and 18 of the construction programme	18 months (between month 1 and month 18 of the construction programme)	Direct	Major adverse – detailed mitigation to be agreed between contractor and local authority which will reduce impacts.	Significant	Medium, indicative predicted noise levels only since detailed construction methodology unavailable at time of assessment
Construction Traffic Noise	No significant effects identified	'Medium' for Residential Receptors on Angel Street	'Medium'	Throughout construction programme	Direct	Major adverse - detailed mitigation to be agreed between contractor and local authority which will reduce impacts.	Not Significant	Medium, assessment undertaken within limitations of forecasts from traffic model. In addition. CRTN assessment methodology used outside normal range of validation
		'Medium' for Residential Receptors at Junction of Dantzic Street and Aspin Lane (Liberty Court 1)	'High'	Throughout construction programme	Direct		Significant	
Operational Impacts								
Operational Road Traffic Noise	No significant effects identified	'Medium' Residential Receptors on Aspin Lane and	'Low'	Permanent	Direct	Minor-moderate adverse	Not Significant	High, assessment based on assumption

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
		Angel Street						that ENC can be achieved
Operational Noise from Building Services Plant	No significant effects identified	'Medium' Residential Receptors on Aspin Lane and Angel Street	'Low'	Permanent	Direct	Minor adverse	Not Significant	High, assessment based on assumption that ENC can be achieved
Daylight and Sunlight Effects								
Construction Impacts								
None	None	None	None	None	None	None	None	None
Operational Impacts								
10 Naples Street	None. There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor adverse	Not significant	High
21 Naples Street	There will be reasonable residual levels of daylight & sunlight	High	Large	Permanent	Direct	Moderate adverse	Not significant	High
83-85 Dantzic Street	There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor adverse	Not significant	High
4 Aspin Lane	There will be reasonable residual levels of daylight & sunlight	High	Moderate	Permanent	Direct	Minor adverse	Not significant	High
St Michaels Square gardens	None	Medium	Small	Permanent	Direct	Minor adverse	Not significant	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
Wind Effects								
Construction Impacts								
None	None	None	None	None	None	None	None	None
Operational Impacts								
South winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
North east winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
North west winds	Increased winds at small number of site locations.	Medium	Noticeable (before mitigation)	Intermittent	Direct	Negligible	Not significant	High
Front doors	No significant effects anticipated (after mitigation)	High	Low (after mitigation)	Intermittent	Direct	Negligible	Not significant	High
Land Quality								
Construction Impacts								
Construction Workers: human health effects from soil and water contamination	None	High	Negligible	Temporary	Direct	Minor adverse	Not significant	High
Adjacent Site Users: human health effects from soil and water contamination	None	High	Negligible	Temporary	Indirect	Minor adverse	Not significant	High
Groundwater: pollution of controlled waters from on-site contamination	None	High	Negligible	Temporary	Direct	Minor adverse	Not significant	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
Surface Water: pollution of controlled waters from on-site contamination	None	Medium	Negligible	Temporary	Indirect	Negligible (adverse)	Not significant	High
Operational Impacts								
Surface Water: pollution of controlled waters from on-site contamination	None	Medium	Negligible	Temporary	Indirect	Negligible (adverse)	Not significant	High
Adjacent Site Users: human health effects from soil and water contamination	None	High	Negligible	Permanent	Indirect	Minor adverse	Not significant	High
Groundwater: pollution of controlled waters from on-site contamination	None	High	Negligible	Permanent	Direct	Minor adverse	Not significant	High
Surface Water: pollution of controlled waters from on-site contamination	None	Medium	Negligible	Permanent	Indirect	Negligible (adverse)	Not significant	High
Buildings and Buried Services (degradation/permeation)	None	Medium	Negligible	Permanent	Direct	Negligible (adverse)	Not significant	High
Vegetation: phytotoxic effects	None	Medium	Negligible	Permanent	Direct	Negligible (adverse)	Not significant	High
Transportation								
Construction Impacts								
Building and Construction Traffic	Nuisance arising from traffic	Local	Minor (adverse)	Temporary	Direct	Minor adverse	Not	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
Movements	(including HGV movements)						significant	
Building and Construction Traffic Movements	Increased traffic volumes	Local	Minor (adverse)	Temporary	Direct	Minor adverse	Not significant	High
Operational Impacts								
Use of Building	Severance	Local	Minor (adverse)	Permanent	Direct	Negligible (positive)	Not significant	High
Use of Building	Driver delay	Local	Minor	Permanent	Direct	Minor adverse	Not significant	High
Use of Building	Pedestrian delay and amenity	Local	Minor	Permanent	Direct	Negligible	Not significant	High
Use of Building	Fear and Intimidation	Local	Minor (adverse)	Permanent	Direct	Negligible	Not significant	High
Use of Building	Accidents and road safety	Local	Minor (adverse)	Permanent	Direct	Minor adverse	Not significant	High
Archaeology								
Construction Impacts								
Building and Construction Processes	Damage to archaeological features associated with Arkwright's Mill	Potentially National	Low	Permanent	Direct	Moderate adverse	Not significant	Likely
Building and Construction Processes	Damage to other industrial and domestic archaeological features	Local	Medium	Permanent	Direct	Minor adverse	Not significant	Likely
Operational Impacts								
None	Increased knowledge through archaeological investigations	Local/regional	low/medium	Permanent	Direct	Minor positive	Not significant	Likely

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
	and potential for community involvement							
Built Heritage								
Construction Impacts								
Building & Construction Processes	Impact on setting of Conservation Areas	Medium	Medium	Temporary (24 months)	Indirect	Negligible	Not significant	High
Building & Construction Processes	Impact on setting of Listed Buildings	Medium	Medium	Temporary (24 months)	Indirect	Negligible	Not significant	High
Operational Impacts								
Erection of Building and Construction of Public Square	Impact on Historic Townscape	Medium	Medium - High	Permanent	Indirect	Minor - Moderate positive	Not significant	High
Erection of Building and Construction of Public Square	Impact on setting of Conservation Areas	Medium	Medium - High	Permanent	Indirect	Negligible - Moderate positive	Not significant	High
Erection of Building and Construction of Public Square	Impact on setting of Listed Buildings	Medium	Medium - High	Permanent	Indirect	Negligible - Moderate positive	Not significant	High
Townscape and Visual Impact								
Construction Impacts								
Building & Construction Processes	On townscape	Low to high	Low	Temporary (24 months)	Direct (Rochdale Road Character area) Indirect (all other character areas)	Negligible	Not significant	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
Building & Construction Processes	On views, viewers and visual amenity	Low to High	Low	Temporary (24 months)	Direct / Indirect	Negligible	Not significant	High
Operational Impacts								
Erection of Building and Construction of Public Square	On townscape	Low to high	Negligible - Medium	Permanent	Direct (Rochdale Road) Indirect (all other character areas except Cathedral Conservation Area which is neutral/indirect)	Nil / Negligible / Minor / Moderate Positive	Not significant	High
Erection of Building and Construction of Public Square	On views, viewers and visual amenity	Low to High	Negligible - Medium	Permanent	Direct / Indirect	Nil / Negligible / moderate / major Positive (views 3, 4, 5, 6, 7, 9, 10, 12, 13 and 14) Neutral (views 1,2, 8, 11 and 15)	Not significant	High
Socio-Economic Effects								
Construction Impacts								
Temporary Employment	Creation of Employment	High	Low	Temporary (24 months)	Direct / indirect	Negligible (positive)	Not significant	Medium
Operational Impacts								
Labour Market	Creation of Employment	High	Low	Permanent	Direct / indirect	Negligible (positive)	Not significant	High
Commuting	Impact on commuting flows	Medium	Low	Permanent	Direct / indirect	Negligible (positive)	Not significant	High
Housing	Impact on	Medium	Low	Permanent	Direct	Negligible	Not	High

Topic	Significant Residual effects	Importance of receptor	Magnitude of change	Duration	Nature	Level of impact	Significance	Level of certainty or confidence
	housing demand					(adverse)	significant	
Regeneration	Contribution to regeneration needs	High	Medium	Permanent	Direct / indirect	Moderate positive	Significant	High
Other Environmental Effects								
No Residual Impacts								

Table 95 Summary of All Residual Impacts

19.0 Glossary

Aquifer	Layers of underground porous rock, which can both contain water and allow water to flow through in significant quantities.
Background (BG)	Background air quality is used in this report to mean the concentration of atmospheric pollutants that would prevail if no local sources of air pollution, such as local road traffic and industrial sources were present.
Baseline Projection	An assessment of how current conditions are predicted to change if development does not take place.
Baseline Study	A study of conditions existing at a particular time against which changes can be detected or assessed
Circular	An explanatory note of Government Regulations.
Concentration	The amount of a polluting substance in a volume of air, typically expressed as a mass of pollutant per unit volume of air or a volume of gaseous pollutant per unit volume of air.
Early Medieval Period	from the end of the Roman occupation to the Norman Conquest (c. 400- 1066)
Environmental Impact Assessment	An assessment of the likely significant effects of a development upon the environment.
Environmental Statement	A report of the findings of an environmental impact assessment
Exceedence	A concentration of a pollutant greater than the appropriate Air Quality Objective.
Listed Building	A building of special architectural or historic interest, which is statutorily protected from demolition or alteration which would affect its special character.
Medieval Period	from the Norman Conquest to the English Reformation (1066-1540)
Microgram (µg)	One millionth of a gram.
Micrometre (µm)	One millionth of a metre.
Mitigation	Actions taken to reduce the impacts of development upon a particular environmental resource.
Non-technical Summary	A précis of an environmental statement written in a non-technical language which outlines the findings and results of the environmental assessment.

Phase 1 Habitat Survey	A survey undertaken, using a methodology devised by English Nature, which identifies the key habitat types within a site.
Planning Policy Guidance Note	Policy guidance on land use matters issued by the Department of Communities and Local Government.
Planning Policy Statement	Policy guidance on land use matters issued by the Department of Communities and Local Government.
Previously Developed Land	Land which is or was occupied by a permanent (non-agricultural) structure and associated fixed surface infrastructure. The definition includes defence buildings, and land used for mineral extraction and waste disposal, where provision for restoration has not been made through development control procedures.
Post-Medieval Period	From the English Reformation to the end of the 19th century (1540-1900):- the later part of this period is commonly referred to as Industrial
Prehistoric Period	Before the Roman conquest of Britain (c. AD 70 in the North of England)
Quernstone	Stone used for grinding grain by hand
Roman Period	The period of the Roman occupation of Britain (c. AD 70 - c. 400):- the term Roman is used in this context merely to denote a period of time rather than any specific cultural connotations
Ropery	Site or building used for the manufacture of rope
Scoping	The establishment of the terms of reference for an environmental assessment.

20.0 Acronyms

AADT	Annual Average Daily Traffic
ADF	Average Daylight Factor
ADMS	Atmospheric Dispersion Modelling Software.
AQAP	Air Quality Action Plan.
AOD	Above Ordnance Datum
APSH	Annual Probable Sunlight Hours
AQO	Air quality objective.
AQS	Air quality standards.
ACEC	Aggressive Chemical Environment for Concrete
ACMs	Asbestos Containing Materials
AQMA	Area Quality Management Area
AURN	Automatic Urban and Rural Network.
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BHS	Biological Heritage Site
BRE	British Research Establishment
BS	British Standard
CEMP	Construction Environmental Management Plan
CLEA	Contaminated Land Exposure Assessment
CERC	Cambridge Environmental Research Consultants.
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CRTN	Calculation of Road Traffic Noise
CROW	Countryside Rights of Way Act.
dB (A)	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear.
dB LA90	A weighted noise level exceeded for 90% of the specified measurement period.
dB LAeqs	The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified

	measured period.
DCLG	Department of Communities & Local Government
DEFRA	Department of Environment, Farming & Rural Affairs
DTLR	Department of Transport, Local Government and the Regions
DETR	Department of the Environment, Transport and the Regions
DfT	Department for Transport
DIV	Dutch Intervention Values
DMRB	Design Manual for Roads and Bridges Screening Model (v1.03).
DOE	Department of the Environment
DWS	Drinking Water Standard
EA	Environment Agency
EAL	Environmental Assessment Level.
EEC	European Economic Community
EIA	Environmental Impact Assessment
EIA Regulations	Town & country Planning (Environmental Impact Assessment) (England & Wales) Regulations 1999
EiP	Examination in Public
EMP	Environmental Management Plan
ENC	Environmental Noise Criteria
EPAQS	DOE Expert Panel on Air Quality Standards
EPA	Environmental Protection Act.
EPR	Environmental Permitting Regulations.
EPUK	Environmental Protection UK.
EQS	Environmental Quality Standards
ES	Environmental Statement
EU	European Union
GONW	Government Office for the North West
GP	General Practitioner
GQA	General Quality Assessment
gs-1	Grams per second.
ha	Hectares

HDV	Heavy duty vehicle.
HGV	Heavy Goods Vehicle
HSE	Health and Safety Executive
IEA	Institute of Environmental Assessment
IFA	Institute of Field Archaeologists
IHT	Institute of Highways and Transportation
LPA	Local Planning Authority
LAQM	Local Air Quality Management.
LDD	Local Development Documents.
LDF	Local Development Framework.
LDV	Light duty vehicle.
mbgl	metres below ground level
MAFF	Ministry of Agriculture, Fisheries and Food
MCC	Manchester City Council
m3 h-1	Metres cubed per hour.
ms-1	Metres per second.
µg m-3 or ug m-3	Micrograms per cubic metre.
mg m-3 or mg m-3	Milligrams per cubic metre.
NEC	Noise Exposure Category
NETCEN	National Environmental Technology Centre.
NMVOC	Non-methane volatile organic compounds.
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NRTF	National Road Traffic Forecast
NSCA	National Society for Clean Air.
NSL	No Sky Line
NSR	Noise Sensitive Receptors
ODPM	Office of Deputy Prime Minister
OS	Ordnance Survey
PAH	Poly Aromatic Hydrocarbons
PC	Process Contribution.
PEC	Predicted Environmental Concentration.

PIA	Personal Injury Accidents
ppb	Parts per billion
PMF	Probable Maximum Flood
PM_{10}	Particulate matter less than 10 µm in diameter.
$PM_{2.5}$	Particulate matter less than 2.5 µm in diameter.
PPG	Planning Policy Guidance Note
Ppm	Parts per million
PPO	Public Pollution Officer
PPS	Planning Policy Statement
PTE	Potentially Toxic Elements
QHRA	Quantitative hydrogeological risk assessment
RPB	Regional Planning Authority.
RSS	Regional Spatial Strategy
SGV	Soil Guideline Values
SI	Statutory Instrument
SMR	Sites and Monuments Record
SOA	Super Output Area
SO_2	Sulphur Dioxide.
SOM	Soil Organic Matter
SPG	Supplementary Planning Guidance
SPD	Supplementary Planning Document
SSSI	Site of Special Scientific Interest
SSV	Soil Screening Values
SUDS	Sustainable Urban Drainage System
SVOC	Semi Volatile Organic Compounds
TA	Transportation Assessment
THC	Total Hydrocarbons
TRICS	Trip Rate Information Computer System
TSO	The Stationary Office
TPH	Total Petroleum Hydrocarbons
UDP	Unitary Development Plan.
UK	United Kingdom
UU	United Utilities

VOC	Volatile Organic Compounds
vph	Vehicles per hour
VSC	Vertical Sky Component
WFD	Water Framework Directive
WHO	World Health Organisation
WS	Window Sample
z0	Surface roughness length.
ZVI	Zone of Visual Influence

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Volume 2

Environmental Statement

July 2009

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