



Broad Street Mall
Masterplan
Environmental Statement
Non-Technical Summary

Prepared for:
Inception (Reading) Sarl (c/o Moorgarth Group Ltd)

Date:
December 2018

Trium Environmental Consulting LLP
68-85 Tabernacle Street
London
EC2A 4BD
+44 (0) 20 3887 7118
hello@triumenv.co.uk
www.triumenvironmental.co.uk

Project Reference: TEC0046

This report has been prepared for the Client by Trium Environmental Consulting LLP with all reasonable skill, care and diligence and in accordance with the Client's particular and specific instructions. This report is issued subject to the terms of our Appointment, including our scope of Services, with the Client.

This report has been prepared for, and is intended solely for the use of, the Client alone and accordingly is personal to the Client. The Report should not be disclosed, exhibited or communicated to any third party without our express prior written consent. Trium Environmental Consulting LLP accepts no responsibility whatsoever to any third parties to whom this report, or any part thereof, is disclosed, exhibited or communicated to, without our express prior written consent. Any such party relies upon the report at their own risk.

Trium Environmental Consulting LLP disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services.

Trium Environmental Consulting LLP shall be under no obligation to inform any party of any changes or updates in respect of any matter referred to or contained in the Report.

This report is the Copyright of Trium Environmental Consulting LLP. Any unauthorised use or reproduction by anyone other than the Client is strictly prohibited.

CONTENTS

INTRODUCTION.....	1
Purpose of the Environmental Impact Assessment and Non-Technical Summary.....	1
Assessment Methodology	2
Scoping.....	2
Technical ‘Topics’ Included in the Environmental Impact Assessment.....	2
Technical ‘Topics’ Not Included in the Environmental Impact Assessment	2
Impact Assessment	3
The Site and Surrounding Area	4
Surrounding Environmental Context	4
Alternatives and Design Evolution	5
The Proposed Development	6
Access.....	8
external landscaping	8
Servicing.....	9
Supporting Documents.....	9
enabling and Construction	9
Demolition and Construction Works and Programme	9
Description of Works.....	9
Demolition and Construction Works	10
Road Vehicle Movements.....	10
Environmental Impact Assessment.....	10
Assessment of The Future Environment	11
Assessment of The Future Environment	12
Assessment of the Future Environment.....	13
Assessment of the Future Environment.....	14
Assessment of the Future Environment.....	15
The Impact of Climate Change on the Development.....	15
in-combination effects / Effect Interactions	17
Summary of the likely significant effects	17
Demolition and Construction	17
Completed Development	17

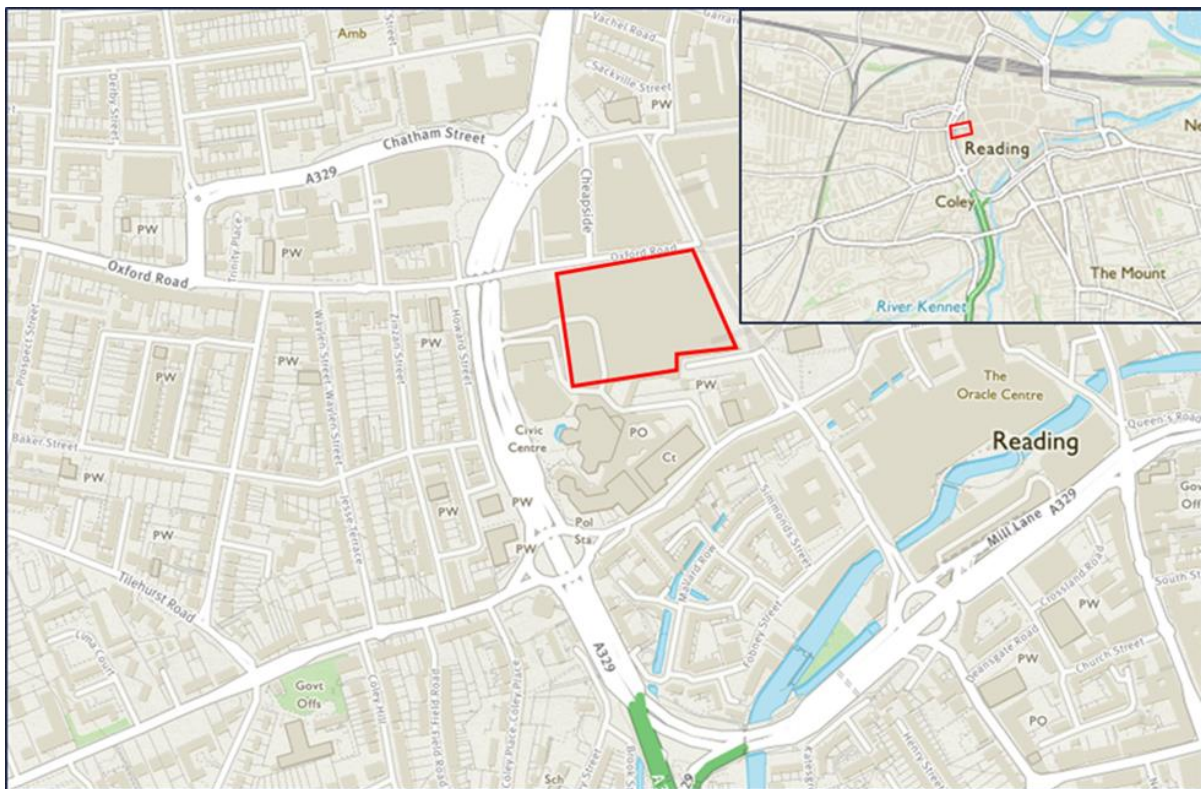
LIST OF TABLES

Table 1 Outline of Site Key Features and Designations	4
Table 2 Surrounding Environmental Context	4
Table 3 Likely Significant Effects	18

INTRODUCTION

- 1 Inception (Reading) Sarl (c/o Moorgarth Group Ltd) is seeking planning permission for the redevelopment and new residential development above and within the existing Broad Street Mall (Figure 1).
- 2 The site includes the existing Broad Street Mall shopping centre. The site is surrounded by roads, pedestrian thoroughfares along Oxford Road, St Mary's Butt's, Hosier Street, Dusseldorf Way and Queen's Walk, and commercial and residential properties. The site location is shown on Figure 1 below.
- 3 This document is a Non-Technical Summary of the findings of the Environmental Impact Assessment which are reported on in the Environmental Statement. This Non-Technical Summary has been prepared to explain the development proposed, the likely significant environmental and socio-economic effects of the development and the measures proposed to protect the environment. The Environmental Impact Assessment has identified the effects that could result during the demolition and construction works and when the development is completed and in use.
- 4 The Environmental Statement has been prepared in accordance with the relevant regulations relating to Environmental Impact Assessment.

Figure 1 Site Location



Purpose of the Environmental Impact Assessment and Non-Technical Summary

- 6 Environmental Impact Assessment is a process that allows the environmental and socio-economic effects of certain projects on the environment to be identified and reported upon. This is required by law and helps the local authority understand the environmental effects of a new development when they make their decision on whether to grant planning permission for it.
- 7 Measures to protect the environment, otherwise known as 'mitigation' have also been identified as part of the Environmental Impact Assessment process.

- 8 Trium Environmental Consulting LLP has undertaken the Environmental Impact Assessment for the development and have prepared the Environmental Statement and this Non-Technical Summary document.
- 9 The Environmental Statement is made up of a number of documents and so this Non-Technical Summary provides an overview of the Environmental Statement in non-technical language.

ASSESSMENT METHODOLOGY

Scoping

- 10 One of the first stages of the Environmental Impact Assessment process is referred to as 'Scoping'. Scoping identifies the possible environmental effects of a development and so the technical topics that need to be investigated further as part of the next stage of the Environmental Impact Assessment process.
- 11 As part of the 'Scoping' process, Trium Environmental Consulting LLP prepared a 'Scoping Report' which explained the proposed approach to the Environmental Impact Assessment. This was issued to Reading Borough Council on 25th September 2018.
- 12 A Scoping Opinion has not been received from the Reading Borough Council at the time of preparing this Environmental Statement, and as such the Environmental Impact Assessment has proceeded as outlined in the Scoping Report.

Technical 'Topics' Included in the Environmental Impact Assessment

- 13 Several environmental studies have been carried out as part of the Environmental Impact Assessment. The technical topic areas that have been covered are:
 - Socio-Economics;
 - Air Quality;
 - Noise and Vibration;
 - Daylight, Sunlight and Overshadowing;
 - Wind Microclimate; and
 - Townscape, Built Heritage and Visual Impacts;
- 14 Each of the above technical topics are addressed in either their own chapter or volume of the Environmental Statement or through a technical report provided within the appendices to the Environmental Statement.

Technical 'Topics' Not Included in the Environmental Impact Assessment

- 15 The Scoping process identified some technical topics where significant environmental effects would be unlikely and, therefore would not need to be assessed further as part of the Environmental Impact Assessment process. These were as follows:
 - Waste;
 - Water Resources, Drainage and Flood Risk; and
 - Telecommunication Interference.
 - Geo-environmental (Land Contamination);
 - Archaeology;
 - Light Pollution;

- Solar Glare;
- Greenhouse Gas Emissions;
- Highways and Transport;
- Ecology; and
- Aviation.

16 However, various documents are provided either as part of the Environmental Statement or separate documents submitted with the planning application to consider these technical topics in detail, for example, a 'Flood Risk Assessment and Drainage Strategy', is provided within the appendices to the Environmental Statement.

Impact Assessment

- 17** The environmental impact assessment process is undertaken in a number of stages, with each technical topic assessment following the same process.
- 18** Firstly, the 'baseline' is identified. The baseline considers the existing conditions of the area where the development will be located and includes both the site itself and the surrounding area. Where an area is subject to widespread, planned change, and is rapidly changing, a 'future baseline' is established. This future baseline makes reasonable predictions (based on published guidance, data, and professional knowledge / experience) of the likely change that may occur, across the area without the development that is proposed taking place.
- 19** Within the baseline conditions, a number of key environmental, social and economic aspects are identified, which are defined as 'receptors'. The sensitivity of the receptors is identified.
- 20** The impact of the Proposed Development is then identified and the size of the impact (impact magnitude) is considered against the receptors. Impacts are identified during the construction works and for when the development is completed and in use.
- 21** The size of the impact and how sensitive a receptor is to the impact defines the scale of an effect.
- 22** Effects can be defined as being either 'negligible', 'minor', 'moderate or 'major' in scale and 'neutral', 'beneficial' or 'adverse' in nature. Once the effect has been identified, the assessment then determines whether the effect is considered 'significant' or 'not significant'.
- 23** If a significant adverse effect is identified, measures are required to reduce or remove these effects; these measures are referred to as 'mitigation measures'. Once the mitigation measures have been identified, the effect is re-assessed to understand whether the scale of the effect has changed because of the mitigation measures.
- 24** Effects resulting from a combination of the Proposed Development and other surrounding development schemes are also assessed; in addition, the combination of lots of different effects from the Proposed Development on a single receptor.
- 25** All of the likely effects of the development are reported within the Environmental Statement, and the likely significant residual (after mitigation measures) effects are specifically highlighted.
- 26** The Non-Technical Summary of the Environmental Statement (i.e. this document) is required to present a summary of the likely significant effects of the Proposed Development. A summary of the likely significant effects relating to the development are outlined in within this Non-Technical Summary and are discussed in detail in each relevant technical topic assessment of the Environmental Statement (**Volume 1-3**).

THE SITE AND SURROUNDING AREA

Site Description and Environmental Context

- 27 The site is roughly rectangular in shape with an area of approximately 1.86 hectares. The site comprises the existing Broad Street Mall shopping centre, multi-storey car park and Fountain House, which is located in the north-east of the site, on top of the existing shopping centre and comprises office provision. The site's main environmental features are listed below in **Table 1**.

Table 1 Outline of Site Key Features and Designations

Environmental Topic	Key features and designations
Traffic and Transport	The car park comprises 700 car parking spaces spread across three floors (first and podium floors, and is present across the whole of the site on the second floor).
Air Quality	The site is located within an AQMA (whole of the Reading town centre has been designated on the basis of exceedances of the annual mean objective for concentrations of nitrogen dioxide (NO ₂));
Water	- The site is located within the Flood Zone 1¹ (regarded as a low probability of flooding, according to the EA Flood Map); - The site is not at risk of surface water flooding; - The underlying Seaford and Newhaven Chalk Formation is designated as a Principal Aquifer, geology comprising high intergranular and/or fracture permeability - meaning they provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale; - The site is not located within a Nitrate Vulnerable Zone (NVZ)²; and - The site lies within a Drinking Water Safeguard Zone (surface water)³.
Ecology	The site is not located within a 'sensitive area' (as defined in Part 1 of the EIA Regulations) and does not fall within the boundaries of any statutory or non-statutory sites, including Special Areas of Conservation (SAC); Special Protection Areas (SPA), Ramsar sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR);
Heritage	There are no statutory designations (listed buildings, conservation areas, scheduled ancient monument or world heritage sites) that fall within the site.

Surrounding Environmental Context

- 28 The site's surrounding environmental context is described below in **Table 2**.

Table 2 Surrounding Environmental Context

Environmental Topic	Key features and designations
Socio-Economics	A number of educational facilities, including nursery schools, primary schools and secondary schools, medical facilities and open/play spaces are located in the surrounding areas.
Traffic and Transport	- The site is located to the east of (approx. 70m) of the A329, which is mostly a dual carriageway ring road that encircles the town centre of Reading; - The site is located 500m south of Reading Station and 1km west of Reading West Station, which provide links on Great Western Rail, South Western Rail, Cross Country and Great Western Rail Services; - Reading Station is one of the stations set to benefit from the construction of Crossrail. From December 2019, two Elizabeth line trains an hour (four an hour at peak times) will greatly increasing the accessibility to the centre of London from Reading; - There are four bus stops on both Oxford Road and St Mary's Butts, providing easy access to public transport, 59 local bus services are available within 100m of site; and - The site is well served by local and national cycle routes.

¹ Land having a less than 1 in 1,000 annual probability of river or sea flooding.

² Designated areas of land that drain into nitrate polluted waters, or waters which could become polluted by nitrates.

³ Are a catchment area that influence the water quality for their respective Drinking Water Protected Area (Surface Water), which are at risk of failing the drinking water protection objectives. These non-statutory Safeguard Zones are where action to address water contamination will be reviewed

Environmental Topic	Key features and designations
Air Quality	The site is located within an AQMA (whole of the Reading town centre has been designated on the basis of exceedances of the annual mean objective for concentrations of nitrogen dioxide (NO ₂));
Water	The River Kennet lies approximately 315m to the southeast of the site;
Ecology	- There are no Sites of Importance for Nature Conservation (SINC) or sites of local importance for nature conservation (SLINC) within 2km of the site; and - There are three non-statutory designated sites (Local Wildlife Sites) within a 1km radius: - Holy Brook (LWS) (approx. 490m south); - River Kennet / Kennet and Avon Canal (LWS) (approx. 780m south) - Cow Lane Depot (LWS) (approx. 880m northwest);
Heritage	- The site sits adjacent to the northwest of the St Mary's Butts and Castle Street Conservation Area (which is made up of three character areas: St Mary's Church and Graveyard; St Mary's Butts; and Gun Street and Castle Street Frontages); - There are several listed buildings in proximity, including but not limited to: - The Allied Arms (Grade II, adjacent to the site to the east); 55 and 55A St Mary's Butts (Grade II, adjacent to the site to the east); 3 and 5, Cheapside (Grade II, adjacent to the north); - Several buildings to the south of Hosier Street, including the Church of St Mary, Castle Street (Grade II*), the Sun Inn (Grade II), 35 and 37 St Mary's Butts (Grade II), and properties along the south side of Castle Street; and - Church of St Mary, St Mary's Butts (Grade I). - The site is located in close proximity to an Area of Archaeological Potential (AAP) as defined by the RBC. The AAP extends around the northern and eastern boundaries of the site and continues from Hosier Street to the south west, with the closest point located approximately 25m south of site,

ALTERNATIVES AND DESIGN EVOLUTION

- 29** The Environmental Impact Assessment Regulations require an Environmental Statement to summarise the alternatives to the development that is proposed and to also describe the design process (the design evolution of the development). The following sections of this Non-Technical Summary explain the alternative sites considered, the option of not developing the site and the design process.

Alternative Sites

- 30** No alternative sites were considered for the project.
- 31** The Applicant owns the site and additionally the site has been identified in the Draft Hosier Street Area Development Framework as suitable for the development of residential use.

No Development Alternative

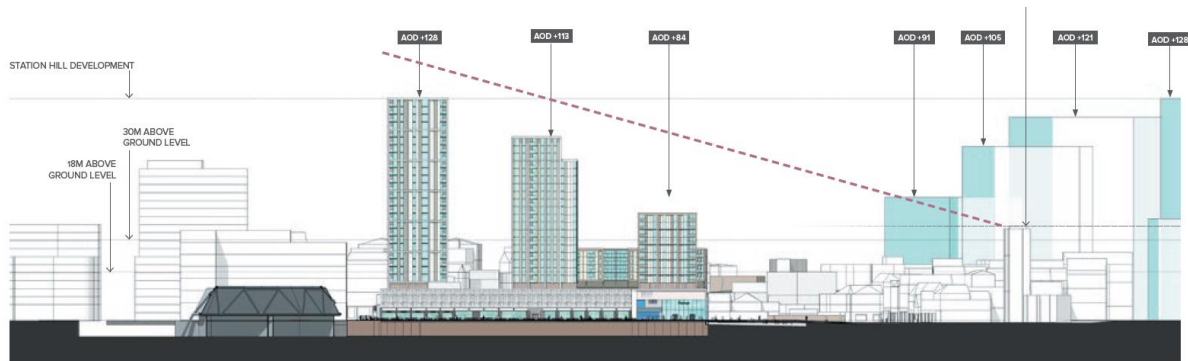
- 32** This refers to leaving the site in its current state and not building the development on this land. This has not been considered as not building the development would result in another missed opportunity to regenerate this site and provide a use on it which works alongside and enhances the surrounding town centre uses and the existing site condition.
- 33** In addition to this, not developing the site for the development will deny the area of the regeneration benefits which would also come about, including various environmental and socio-economic benefits associated with regeneration for example job creation and new open space.

Design Evolution

- 34** The design process has looked at various design options. The variations of the scheme developed in response to the consultation process as well as design development in response to the brief and the technical aspects of the development.

- 35 The site sits within the Hosier Street Area Development Framework and the Reading Tall Building Strategy identifies that site is located within the Western Cluster. These policies provide guidance and parameters for the development of the area and were driving forces in the development of the design of the Proposed Development.
- 36 The height and massing of the Proposed Development has evolved over time to fit within the parameters of the Hosier Street Area Development Framework and the Reading Tall Building Strategy. The massing has been developed to create a slender look. A stepped design was adopted in August 2017 to respect the St Mary's Butts / Castle Street conservation area to the south and east, and the presence of Reading Minster of St Mary (Grade I listed) located to approximately 100 m to the east of site (Figure 2).

Figure 2 Proposed Development Height and Massing



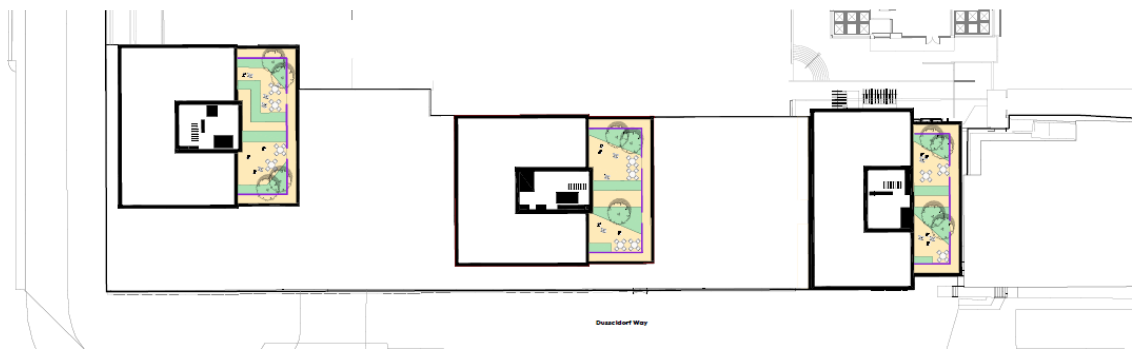
- 37 The layout of the Proposed Development was constrained by and developed to have least impact upon the existing retail provision of Broad Street Mall (BSM).
- 38 Building E, located to the north of the site, the building has evolved from two blocks to the current design of one block. Daylight, Sunlight and Rights of Light analysis was undertaken and identified significant adverse impacts on residential units adjacent to the north of site, as such the building design was altered to one building in order to minimise these adverse impacts.
- 39 Further information regarding the Proposed Developments evolution can be found in the Environmental Statement (*ES Chapter 3 Alternatives and Design Evolution (ES Volume 1)*).

THE PROPOSED DEVELOPMENT

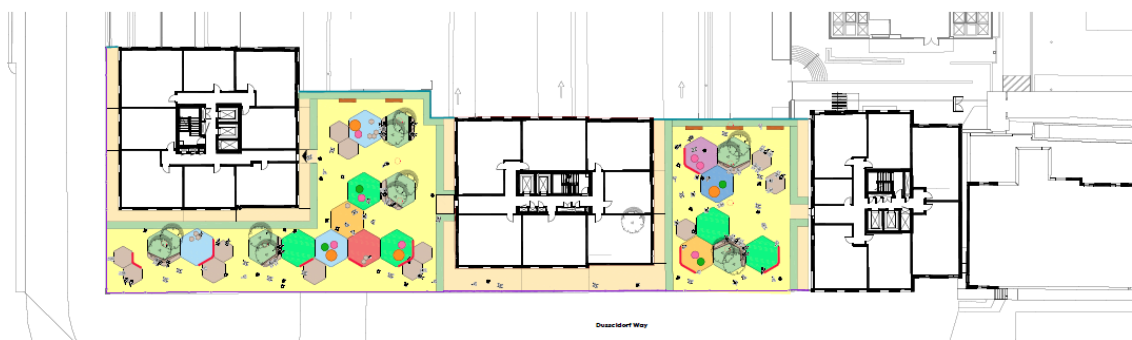
- 40 The redevelopment of the site will comprise a new mixed-use development which will comprise residential and retail space. It will include construction of four new blocks and the extension and refurbishment of the existing structure on site.
- 41 The development consists of approximately 34,738m² of floorspace and 493 residential units. The Proposed Development will be as follows (Figure 3):
- Building A (new build): 25 storeys (22 storeys on top of BSM) providing 172 residential units with amenity space, and parking;
 - Building B (new build): 21 storeys (18 storeys on top of BSM) providing 139 residential units, with amenity space and parking;
 - Building C (new build): 18 storeys (15 storeys on top of BSM) providing 99 residential units, with a new retail unit;
 - Building D (refurbishment and extension of existing Quadrant House): 5 storeys (existing floors to be refurbished with construction of additional 2 floors) providing 31 residential units; and
 - Building E (new build): 9 storeys (6 storeys on top of BSM) provision of 52 residential units.

Figure 3 Site Arrangement**Figure 4 Proposed Amenity Space**

Roof Terraces (Roof Level)



Amenity Area (Podium Level)



42 An amenity space, will be provided at podium level at the base of Buildings A, B and C, will provide

seating and incidental play for the residents of the Proposed Development. Additionally, roof terraces will be provided on the roofs of Buildings A, B and C, at floors 24, 20 and 17 respectively.

- 43** The Proposed Development will have a maximum height of 128.95 m at its tallest point (Building A) which will mirror the height of the nearby Station Hill Development located approximately 350 m north east of the site.
- 44** The development will include new and reconfigured retail space which will provide flexible retail space for shops, professional and financial services and restaurants and cafes.
- 45** The development will also provide 493 residential units which will be a mix of 1, 2 and 3-bedroom units. 5% of the residential units will be wheelchair accessible and the Proposed Development will endeavour to deliver the maximum reasonable amount of affordable housing, subject to viability testing.
- 46** The residential cores of the buildings will be present within the existing basement of BSM, the residential cores will provide cycle storage, service access for servicing vehicles and bin stores for each of the residential blocks waste.
- 47** The Proposed Development is car free but will provide 24 accessible spaces within the existing multi storey car park for the accessible residential units.

ACCESS

- 48** Visitors arriving at the development will be able to access the site via a number of different forms:
 - The development will be accessible by vehicles via Castle Street to the south which will provide access to the basement level for the multi-storey car park.
 - The residents of the Proposed Development will be provided with secure cycle storage within the residential cores of the development. The site will be accessed by cycle along the access road off castle street.
 - The residential buildings and amenity space will be accessible to only the residents through entrances located along Queen's Walk, Hosier Street, St Mary's Butts and Oxford Road.
- 49** Residents in Buildings A, B and C will have access to the amenity area and roof terraces.

EXTERNAL LANDSCAPING

- 50** The existing building contains nearly no landscaping and planting. The Proposed Development aims to increase the planting and landscaping on site.
- 51** The Amenity area within the Proposed Development will use decorative screens, seating pods and integrated planters across the deck area.
- 52** Three roof terraces will be provided to residential Blocks A, B and C, with seating, planting and incidental play opportunities.
- 53** The planting strategy for the Proposed Development has been developed to provide seasonal and robust planting, using grasses and herbaceous flowering species to provide colour.
- 54** A colour combination of purples, oranges and dark green is proposed, making reference to the vibrant colours of a mixed herbaceous and annual border, and Suttons Seed will be utilised for the amenity area. The roof terraces will use a colour combination of soft pastel coloured flowering plants, including pinks and yellows.

SERVICING

- 55 Servicing vehicles will access the Proposed Development via the existing basement level which is accessible off Castle Street, located to the south of the site.
- 56 The existing retail units within Broad Street Mall are serviced via this route, therefore it is deemed appropriate that the Proposed Development is serviced via the same route.

Waste Management

- 57 Bin stores for each of the residential developments are located within residential cores at the basement level. Buildings D and E will have servicing corridors, as the bin stores are not directly accessible from the existing service road.
- 58 The amount of bin storage for each of the developments has been established from the “*Waste Management Guidelines for Property Developers, Architects, Planners and Contractors*”⁴ and assumes a weekly collection of bins to include general waste and recycling. It is anticipated that a waste management company will be responsible for the collection of residential waste.

SUPPORTING DOCUMENTS

- 59 The following reports have been prepared to support the design, management and operation of the development.
- GHG Emissions Assessment, which has assessed the development’s design and generation of GHG emissions.
 - Energy and Sustainability Strategy, with the development targeting a ‘Very Good’ Building Research Establishment Environmental Assessment Method (BREEAM) rating.
 - Flood Risk Assessment, to identify flood risks to the site.
 - Transport Assessment to assess the site and wider transport implications of the development.
 - Outline Construction and Environmental Management Plan that set out the framework for environmental management during the enabling and construction stage.
 - Preliminary Ecological Appraisal, to identify the existing environmental condition of the site and the surrounding area.

ENABLING AND CONSTRUCTION

Demolition and Construction Works and Programme

DESCRIPTION OF WORKS

- 60 The site is currently comprised of the Broad Street Mall Shopping Centre, the Proposed Development will be constructed on top of the current shopping centre, with the cores running through the existing BSM to the exiting basement.
- 61 The development will take approximately 30-months to build and will be open towards the end summer of 2022.
- 62 The works required to build the development include:

⁴ Reading Borough Council: “*Waste Management Guidelines for Property Developers, Architects, Planners and Contractors*”. Available at: http://www.reading.gov.uk/media/5931/Waste-management-guidelines-for-property-developers/pdf/Waste_Management_Guidelines_for_Reading_V1_2.pdf

- Site establishment – setting up of the site ready for the construction works including site hoardings and construction site offices;
- Internal Demolition – demolishing some of the floors and ceiling within the existing shopping centre;
- Piling and substructure work for the building’s foundations and basement;
- Construction of the buildings;
- Outside works to the buildings and podium;
- Internal works to the buildings and testing of the technology and systems; and
- Landscaping and other external works to the site.

DEMOLITION AND CONSTRUCTION WORKS

- 63** Prior to the start of the demolition and construction works, discussions with Reading Borough Council and other relevant consultees (such as Thames Water) will be undertaken in relation to enabling and construction logistics, as well as site and environmental management.
- 64** Due to the location of the Proposed Development within the site of the existing Broad Street Mall, the communication with the existing retail tenants is very important. Prior to the start of any construction works, all existing retail tenants will be consulted, to ensure that there is no disruption to their stores and no interruption to the public access of their retail units
- 65** Also, a number of management plans will be prepared and agreed with Reading Borough Council, including a Construction Management Strategy, a Construction Environmental Management Plan, and a Site Waste Management Plan. Specifically, these documents will explain how the works and the site will be managed including environmental management.
- 66** The likely construction working hours are:
- 08:00 – 18:00 hours between Monday and Friday;
 - 08:00 – 13:00 hours on Saturdays; and
 - No working on Sundays, Bank or Public Holidays (unless otherwise agreed with Reading Borough Council).

ROAD VEHICLE MOVEMENTS

- 67** It is likely that the average daily construction vehicles will peak at 20 heavy goods vehicles (HGVs) per day. A construction vehicle peak period is expected during the construction programme, between months 16 – 18.

ENVIRONMENTAL IMPACT ASSESSMENT

- 68** The following sections of this Non-Technical Summary present a summary of the environmental technical topic assessments that have been undertaken as part of the Environmental Impact Assessment. Further details can be found within the Environmental Statement (Volumes 1-3).

Socio Economics

- 69** The assessment undertaken has focussed on key social and economic considerations, specifically the potential loss of existing employment due to the demolition and reconstruction of the existing site, job creation due to demolition and construction works associated with the Proposed Development and also new retail spaces within the completed development, local spending with the provision of new retail space including but not limited to shops and cafes, social impacts such as population increase and

labour market, and the effect of the new residential population on the local social infrastructure including medical and educational facilities. The chapter also assessed the provision of new open space within the Proposed Development.

- 70** The development will have a significant beneficial effect locally through the provision of housing supply which will provide residential 493 units that will make a significant contribution to the scale and choice of housing.
- 71** The development will also have a significant beneficial effect locally on the population and labour market as it is expected that the Proposed Development will increase the local impact areas population by 7% having a beneficial impact on the labour supply of the local area.
- 72** The Proposed Development is not expected to have any other significant effects during construction and demolition or once the development is complete.

ASSESSMENT OF THE FUTURE ENVIRONMENT

- 73** Taking into account the introduction of a range of residential, commercial, community and leisure developments, namely those set out in the cumulative schemes, it is anticipated that the future baseline of the surrounding area would experience increased job creation, housing provision and population growth. These changes in the baseline position may bring about increased demand for social infrastructure such as education, healthcare and open space.
- 74** The Proposed Development in combination with other Committed Developments has the potential to realise an increase in local housing supply and the local population and working population with a likely increase in employment opportunities, as well as a corresponding increase in expenditure in the local area from new workers and residents. Whilst an increase in workers and new residents will place an additional demand in local social infrastructure (i.e. health services and education), only a negligible effect is anticipated.
- 75** The Hosier Street Area Development Framework (HSADF) provides a comprehensive masterplan for the future development and regeneration of the Hosier Street Area. If developments in the area come forward it is likely to result in a range of beneficial socio-economic impacts such as additional employment opportunities, increased local expenditure and improvements to local open space. Any additional population generated as part of the HSADF will likely increase demand for social infrastructure including education and health services. It is assumed any mitigation required to meet the needs of this additional demand will be subject to negotiations with Reading Borough Council to provide adequate on or off-site provision social infrastructure or financial contributions towards the development of new social infrastructure within the local area.

Air Quality

- 76** The assessment undertaken has considered the potential for both the construction works, and the operation of the development, to result in air quality impacts. The key considerations of this assessment have been dust emissions and emissions from HGVs during construction, road traffic emissions once the development is in use, emissions from onsite emergency (life-safety) power generators, and emissions from existing emissions sources, specifically the surrounding road network, the neighbouring Engie Energy Centre and other surrounding development's plant.
- 77** The assessment has identified that the development will not cause significant air quality impacts during either the construction works, or once completed and in use.
- 78** To minimise impacts to air quality, the design has incorporated the provision of pedestrian and cycle access into the development (including cycle parking), as well as providing only accessible car parking spaces. These measures will encourage residents to use public transport options to get to and from the development.

- 79 To manage impacts to air quality during the construction works, dust risk assessment has been used along with the professional judgement of the consultant, to determine the appropriate level of mitigation at the site. The IAQM guidance is clear that, with appropriate mitigation in place, effects will not be significant.
- 80 No significant air quality effects have been identified.

ASSESSMENT OF THE FUTURE ENVIRONMENT

- 81 If the Proposed Development was not to be built it is expected that the site would remain in its current state. Air quality within the local environment will mainly be affected by background pollution levels and would vary due to changes in the type and volume of local traffic resulting from the completion of other schemes located in proximity to the site. It is generally expected that air quality in the local area would improve with time, due to for example, more stringent emission standards for motor vehicles.
- 82 The demolition and construction works of the Proposed Development may overlap with the demolition and construction works of other developments in proximity to the site. In this case it is anticipated each development would implement their own controls to prevent the transfer of pollutants beyond their site, and it is recommended that construction sites within 500 m of each other would regularly meet to co-ordinate controls and minimise dust and particulate matter emissions.
- 83 The air quality modelled and assessed within this assessment used future traffic numbers based on the developments likely to come forward in close proximity of the site, therefore no significant effects are likely to occur.
- 84 The Hosier Street Area Development Framework (HSADF) provides a comprehensive masterplan for the future development and regeneration of the Hosier Street Area. If developments in the area come forward it may lead to an increase in dust and particulate matter due to demolition and construction works, however with best practice measures and appropriate mitigation in place the effect would be negligible. Additionally, the developments may lead to an increase in traffic in the local area, therefore increase pollutant emissions from traffic. However, the effect is anticipated to be insignificant due to the anticipated improvements in fuel and the anticipated decrease in future emissions.

Noise and Vibration

- 85 The assessment undertaken has focused on potential noise and vibration affects during demolition and construction, in particular construction road traffic (HGVs) and onsite works noise. The assessment has considered surrounding noise sensitive properties as the key receptors, principally surrounding residential properties and has also considered new residents living on site within the proposed development while construction works are ongoing across the remainder of the site. In addition, the assessment has considered noise from road traffic from the completed development and building services / plant noise.
- 86 The assessment has identified that a number of mitigation measures will be required to manage the noise associated with the demolition and construction works. This will include the use of “best practicable means”.
- 87 A Construction Environmental Management Plan which will include the appropriate noise and vibration management measures and a detailed Construction Method Statement shall be prepared and agreed with Reading Borough Council.
- 88 With noise and vibration control measures in place during the construction works, significant adverse effects during demolition and construction are not expected. The non-significant adverse noise and vibration effects associated with HGV movements and onsite construction works noise and vibration will be localised and temporary.

- 89 Once the development is built and in use, no significant adverse noise or vibration effects are expected as a result of road traffic generated by the development and from building services / plant.

ASSESSMENT OF THE FUTURE ENVIRONMENT

- 90 Whilst it is recognised that there are other developments coming forward across the surrounding area, the use of “best practicable means” across each construction site to minimise construction related noise and vibration effects will mean that significant adverse cumulative noise and vibration effects are unlikely. The surrounding development site are not expected to generate a significant amount of construction related traffic such that significant adverse HGV noise effects are not expected.
- 91 In relation to the wider development of the Hosier Street Area Development Framework, it is expected that the proposed development will be constructed before any development across this Area and therefore the new residential properties proposed as part of the proposed development will become noise sensitive receptors that any future development across the Hosier Street Area will need to take account of.

Daylight, Sunlight, and Overshadowing

- 92 Potential daylight, sunlight and overshadowing effects associated with the proposed development are considered to involve temporary changes to the duration and quality of daylight and sunlight as well as the occurrence and duration of overshadowing experienced by surrounding sensitive receptors during the demolition and construction works and once the development has been completed.
- 93 During the construction works, a number of tall cranes are likely to be on-site. The presence of such machinery is temporary, and due their proportions, any impact upon daylight, sunlight or overshadowing is likely to be very minor, and imperceptible in nature. The potential effects of the proposed development will gradually increase however to the maximum effects identified for the completed development.
- 94 Daylight is the general amount of light (direct and indirect) which enters a room during the daytime. To identify potential effects to sensitive receptors, 547 windows, serving 273 rooms in 12 properties surrounding the site, have been assessed.
- 95 In relation to one of the daylight tests (Vertical Sky Component), when the proposed development has been built, 416 (76%) of the 547 windows assessed would meet the relevant guidelines. 489 windows (89%) will either meet the relevant guidelines or experience a Minor Adverse effect. The Minor Adverse effects are significant effects as they amount of daylight is less than the level defined within the relevant guidelines. 44 windows (8%) will experience a Moderate Adverse effect and 14 windows (3%) will experience a Major Adverse effect. The Moderate and Major Adverse effects are also significant effects.
- 96 In relation to a further daylight test (No Sky Line), 254 (93%) of the 273 rooms assessed, will meet the relevant guidelines and 13 will experience a Minor Adverse effect. 2 rooms (<1%) will experience a Moderate Adverse effect. The 4 remaining rooms which experience a Major Adverse effect in NSL represent only 1.5% of the overall 273 rooms assessed. The Minor, Moderate and Major effects are significant effects on the basis that the amount of daylight is below the level in the relevant guidelines.
- 97 The six properties that experience significant daylight effects are: Mcilroys Building, 61-62 St Mary's Butts, 59-60 St Mary's Butts, 58 St Mary's Butts, 55-56 St Mary's Butts; and 15 Queen's Walk (Queen's Court).
- 98 In relation to sunlight, a total of 424 windows have been assessed within 9 properties. Of the 424 windows assessed, 345 (81%) would meet the relevant guidelines for both winter and annual (yearly) sunlight.
- 99 In relation to winter sunlight, 382 (90%) meet the relevant guidelines.
- 100 Of the 42 windows that do not meet the relevant guidelines for Winter Sunlight, 2 experience a Minor

Adverse effect, 3 experience a Moderate Adverse effect and 37 experience a Major Adverse effect.

- 101** In relation to annual sunlight 372 (90%) meet the relevant guidelines.
- 102** Of the 52 (12%) that do not meet the relevant guidelines, 24 experience a Minor Adverse effect.
- 103** Of the remaining 28 windows (7%), 9 (2%) experience a Moderate Adverse effect. 24 (6%) experience a Major Adverse effect.
- 104** Overall, 5 out of 9 properties will meet relevant guidelines for winter and annual sunlight.
- 105** The 4 properties which experience significant adverse sunlight effects are 38 Oxford Road, McIlroys Building, 61-62 St Mary's Butts; and 15 Queens Walk (Queens Court).
- 106** In relation to overshadowing, 6 amenity areas surrounding the proposed development have been assessed. 5 of the amenity areas assessed receive the recommended 2 hours of sunlight to over 50% of the amenity area and there do not experience a significant overshadowing effect. Only St Mary's Butts (a pedestrianised shopping street) falls short of the relevant guidelines for sunlight however, it is important to note that in the existing condition only 30% of the area achieves 2 hours of sunlight. As such the part affected by the proposed development is relatively small in relation to the overall size of the amenity area.
- 107** Overall, at worst, the overshadowing effect of the proposed development is assessed as being minor adverse.
- 108** Transient overshadowing has also been considered. Whilst the proposed development will cast some shadows over the surrounding area, the transient overshadowing effect of the proposed development is assessed as being minor adverse at worst.

ASSESSMENT OF THE FUTURE ENVIRONMENT

- 109** The daylight, sunlight and overshadowing assessments have also considered a new Hotel Development, located adjacent to the site along Hosier Street. In terms of combined or 'cumulative' effects on surrounding properties because of the proposed development and the Hotel Development, further impact assessments have been undertaken. The assessments show that the effects are limited to other surrounding properties located to the south west of the new Hotel Development and the proposed development.
- 110** 1 additional window experiences a Minor Adverse effect this is located at McIlroys Building. In addition, 1 room within 58 St Marys Butts changes from experiencing a minor adverse effects to a moderate adverse effect.
- 111** No further permanent or transient overshadowing has been identified as a result of the proposed development and the new hotel Development.
- 112** The Hosier Street Area Development Framework (HSADF) provides a masterplan for the future regeneration of the Hosier Street Area. Consideration has been given to this coming forward along side the proposed development. Significant cumulative effects are not expected, primarily due to the location of the Hosier Street area being to the south of the proposed development site and away from the majority of the sensitive properties considered within the daylight and sunlight assessments. In addition, the tallest elements of the Hosier Street Area Development Framework are located to the west of the Area, away from the existing residential buildings.

Wind Microclimate

- 113** The wind microclimate assessment has focused on understanding whether any undesirable wind speeds would be created on site and in the and surrounding area as a result of the development. Undesirable wind speeds may result in effects to pedestrian comfort and safety. Areas within and

around the site have been considered and these include thoroughfare locations (associated with the car park), building entrances and amenity areas such as the podium and terraces on the residential towers (located on the upper levels of the buildings).

- 114** In addition, areas around other buildings surrounding the site, along roadways (St Mary's Butts, Oxford Road) and thoroughfares (Queen's Walk, Hosier Street, Dusseldorf Way) have been tested.
- 115** A wind tunnel test has been undertaken and wind speeds have been considered against the Lawson Comfort Criteria.
- 116** The wind tunnel test has identified a number of significant adverse effects as a result of the proposed development and as such the need for wind mitigation. The effects are minor and moderate adverse. A mitigation strategy has been developed by the project's wind engineers. The wind mitigation strategy includes the incorporation of a combination of trees, planters, screens, signage, canopies, pergolas, trellises and raised balustrades to reduce wind conditions across the site and achieve conditions that are suitable for the intended outdoor use and which are safe. The Applicant is committed to doing further rounds of wind tunnel testing to ensure that appropriate measures are incorporated into the proposed development so that following the incorporation of the wind mitigation measures there are no likely significant adverse wind microclimate effects.

ASSESSMENT OF THE FUTURE ENVIRONMENT

- 117** The wind tunnel test has also been run including several other surrounding development schemes that are known about, these are as follows:
- Land between Weldale Street and Chatham Street;
 - Hotel Development on Hosier Street;
 - 52 – 55 Friar Street and 12 Greyfriars Road; and
 - Plot E & Telecom House Land Friar Street/ Garrard Street Station Hill.
- 118** Generally, the wind conditions across the proposed development site and the surrounding area remain the same as the test of the proposed development on its own. At some locations, the other surrounding development schemes have a beneficial effect and make the wind conditions calmer, this is the case at the entrance to St Mary's Church and on the corner of Oxford Road and St Mary's Butts.
- 119** The Hosier Street Area Development Framework (HSADF) provides a masterplan for the future regeneration of the Hosier Street Area. Consideration has been given to this coming forward along side the proposed development. The framework identifies that the development coming forward could range in height from approximately 6 to 20 storeys, the prevailing wind direction in the area is from the south west, therefore as the development is located to the south of the site, there is potential that the development could provide some blockage and shelter to winds accessing the Broad Street Mall site and the public realm (especially along Queen's Walk and Hosier Street) and therefore could lead to a reduction in wind speeds experienced on site. If the development were to come forward there is potential for beneficial significant cumulative effects.

Townscape, BUILT Heritage AND VISUAL

- 120** TO BE UPDATED

Climate Change

THE IMPACT OF CLIMATE CHANGE ON THE DEVELOPMENT

- 121** Climate change has the potential to alter existing the current environment. To consider how the environmental and socio-economic effects of the development might change under a different climate in the future, a future climate scenario has been developed using projections published by the Met

Office. The projections consider the local climate effects arising from a series of different greenhouse gas emission scenarios (and the associated impacts to the climate).

- 122** As a result of climate change, several different environmental factors are likely to vary in the future. These include the increase in average air temperatures, increase in yearly rainfall and sea level rise. Additionally, cloud cover could slightly decrease.
- 123** Each technical topic assessment has reviewed the possible implications of a different climate in the future against the results and conclusions of impact assessment of the development. With the exception of socio-economics, noise and vibration, the likely effects identified for the technical topics are not expected to change as a result of climate change.
- 124** Under a moderate climate change scenario, it is expected that the health of the population may be adversely affected by increased risk of overheating and other heat-related illnesses, drought, and decreased water and food security. This is partially offset against a reduced risk of cold-weather related illness in the winter, particularly in vulnerable groups such as the elderly. Increased rainfall over short periods also leads to increased numbers of bacteria in surface water with detrimental effects on drinking water. It is likely that, without any behavioural change towards reducing GHG emissions, the health of the population is likely to be affected in the period to 2080, increasing the burden on GPs. The changing climate will magnify the negative impacts of the Proposed Development on GP provision in the Local Area is thus assessed to have a minor adverse impact at a local level.
- 125** Although the impact of climate change would not significantly impact most of the noise and vibration assessment effects identified. Climate change has the potential to intensify heat in the summer and cold in the winter, therefore as a result there is the potential for an increase in the use of heating and cooling functions of air handling type plant and a potential for receptors to open windows for longer durations.

Greenhouse Gas Emissions

- 126** Greenhouse gasses are gases in the atmosphere which have the potential to increase air temperatures. All greenhouse gas emissions are described as significant in accordance with the relevant guidance for the assessment of greenhouses gases as part of the environmental Impact Assessment process.
- 127** A greenhouse gas emissions assessment was undertaken and identified that the net GHG emissions from the Proposed Development have been quantified and compared against an existing carbon budget (defined at national level) in order to contextualise the project's carbon contribution by developing a sense of the scale of the emissions anticipated.
- 128** The UK national Carbon Budget for the period 2018 to 2032 has been adopted, which is 6,219 metric tonnes of CO₂ (MtCO₂). The total estimate of GHG emissions for the Proposed Development over the assumed building life is 80,763 tCO₂ (or 0.808 MtCO₂).
- 129** It is considered that additional measures could yield further reduction in site wide GHG emissions over the 60-year lifetime of the project. Further GHG analysis can be undertaken as part of the detailed design (during the construction stage) in order to refine the analysis based when further scheme details (i.e. tender drawings, specification documentation) are prepared.

IN-COMBINATION EFFECTS / EFFECT INTERACTIONS

In-Combination Effects / Effect Interactions

- 130** In-combination effects / effect interactions are the result of interactions of effects on an individual receptor (e.g. when both noise and dust affect a particular residential property).
- 131** The assessment identified the following:
- That there is the no potential for **significant adverse** in-combination effects or effect interactions during the **demolition and construction works**.
 - That there is the potential for **significant adverse** in-combination effects or effect interactions between noise and vibration, and daylight and sunlight when the **development is complete** on the existing residential occupants (along Queen's Walk, St Mary's Butts and Oxford Road) and the residential amenity space within the Proposed Development.
 - That there is no potential for **significant adverse** in-combination effects or effect interactions on residential amenity when the **development is completed and in operation**. The assessment has identified no significant adverse effect interactions to the residential amenity space within the Proposed Development relating to socio-economics, overshadowing and wind microclimate. This is because, there is benefit with regards to the Proposed Development providing new amenity spaces, however this is tempered by the temporary effects of overshadowing resulting from the Proposed Development. Additionally, although there is a significant adverse effect associated with wind microclimate within the amenity space, the Applicant is committed to further detailed design to mitigate these effects.
- 132** The EIA has demonstrated that there are no anticipated significant in-combination effects or effect interactions during the demolition and construction period of the Proposed Development.
- 133** However, the EIA has identified the potential for significant adverse effect interactions to Residential Occupiers / Residential Amenity following the completion of the Proposed Development, specifically along Queen's Walk, St Marys Butts and Oxford Road, as a result of in-combination effects associated with noise from surrounding road traffic and building services plant and changes in daylight and sunlight amenity. This is, however, an inevitable consequence of living within a dense urban environment.

SUMMARY OF THE LIKELY SIGNIFICANT EFFECTS

- 134** The significant effects associated with the development have been included in the following table. Note that this table only includes the effects which have been identified as significant within each of the technical assessments and does not include the effects considered to be not significant.

Demolition and Construction

- 135** The EIA identified that no likely significant effects are anticipated as a result of the demolition and construction works associated with the Proposed Development.

Completed Development

- 136** The socio-economics are all considered to be significant moderate beneficial effects, which are positive, direct effects, permanent in nature, and long-term effects.
- 137** The daylight, sunlight and overshadowing effects considered to be significant are identified as negligible to minor to moderate adverse, which is negative, permanent in nature, and long-term effects.
- 138** The wind microclimate effects are all considered to be significant minor to moderate adverse effects, which are negative, permanent in nature, and long-term effects.
- 139** Climate change is considered to be a significant adverse effect, which is negative, the effect is likely to

be felt on a global scale and is permanent in nature, and long-term in effect.

Table 3 – Likely Significant Effects

ES Chapter	Receptor	Description of Residual Effect	Nature and Scale of Residual Effect
Completed Development			
Socio-Economics	Local Housing Supply	Provision of new houses for the local housing supply	Moderate Beneficial (Local)
	Population and Labour Market	Increase in the local population and working population within Reading	Moderate Beneficial (Local)
Light pollution Solar Glare	Neighbouring Residential Receptors	Daylight: Locations- 21-23, 58, 61 – 62 St Mary's Butts and 15 Queens Walk (Queens Court)	Minor Adverse (Local)
		Daylight: Locations -19, 20 St Mary Butts and Mclroys Building	Minor to Moderate Adverse (Local)
		Daylight: Locations - 59, 60 St Mary Butts	Moderate Adverse (Local)
		Sunlight: Locations - 61 and 62 St Marys Butts	Negligible to Minor Adverse (Local)
		Sunlight: Locations – 21, 22, 23, 32, 35, 36, 37 St Mary's Butts, 15 Queens Walk (Queens Court) and Mclroys Building)	Minor Adverse
		Sunlight: Locations - 38 Oxford Road, 19 – 20 St Marys Butts	Moderate Adverse (Local)
		Sun Hours on Ground: Amenity Areas	Negligible to Minor Adverse (Local)
		Transient Overshadowing: Amenity Areas	Minor Adverse (Local)
Wind Microclimate	Pedestrians and Cyclists (Ground Floor)	Off site Thoroughfares: Queen's Walk	Minor Adverse (Local)
		Entrances: Queen's Walk (on site) St Mary's Church (off site)	Minor Adverse (Local)
		Off site Amenity Areas (summer season): Off St Mary's Butts	Minor Adverse (Local)

ES Chapter	Receptor	Description of Residual Effect	Nature and Scale of Residual Effect
		Off site Roadways (Pedestrian and Cyclist): St Mary's Butts	Moderate Beneficial (Local)
		Off site Roadways (Pedestrian and Cyclist): Oxford Road	Major Beneficial (Local)
	New Introduced Residents (Podium and Terrace Level)	On site Amenity Areas (summer season): Between Buildings A and B and Buildings B and C	Moderate Adverse (Local)
		On site Terraces (summer season): Buildings A, B and C	Minor Adverse (Local)
Townscape, Built Heritage, and Visual Impact Assessment	Townscape, Built Heritage and Visual Impact Assessment to be completed		
Climate Change	Global Climate	Contribution of GHG to the environment	Significant Adverse (Global)

Trium Environmental Consulting LLP
68-85 Tabernacle Street
London
EC2A 4BD
+44 (0) 20 3887 7118
hello@triumenv.co.uk
www.triumenvironmental.co.uk

Project Reference: TEC0046

