



Environmental Statement Addendum - Volume 4, Technical Appendices

Station Hill, Reading

February 2019

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Technical Appendix 1.1 2015 Environmental Statement



PLOT E AND TELECOM HOUSE

Outline Application
Environmental Statement (ES)

Non-Technical Summary

Waterman
August 2015

Telecom House / Plot E & Station Hill 3, Reading ENVIRONMENTAL STATEMENT: NON-TECHNICAL SUMMARY

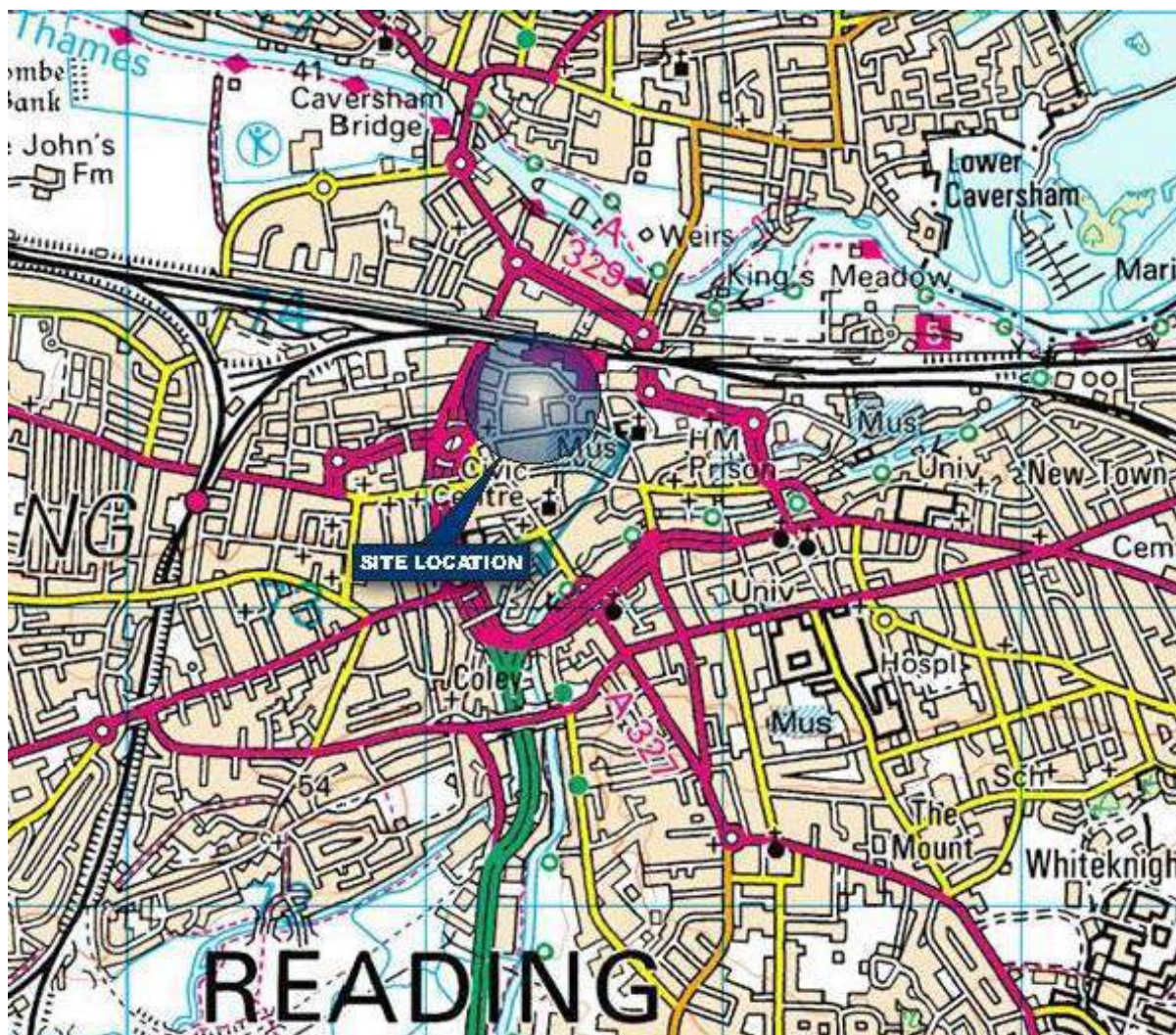
1. INTRODUCTION

In January 2015, Sackville Developments (Reading) Limited (the 'Applicant') was granted outline planning permission for the redevelopment of an under-used and largely vacant plot of land adjacent to Reading Mainline Station in Reading town centre. The development, known as Station Hill 3 (and hereafter referred to as the SH3 Scheme), encompasses land between Station Hill, Greyfriars Road, Friar Street and Station Road (hereafter referred to as the SH3 Site). The SH3 Scheme includes the demolition of all the existing buildings and structures within the SH3 Site, excluding the existing multi-storey NCP car park, and replacement with four new commercial buildings (referred to as Building Plots A - D) and two new primarily residential buildings (referred to as Building Plots E and F). The existing NCP Car-Park would be reconfigured and refurbished.

In addition, the Applicant has been granted full planning permission for the development of 0.35 hectares of land within the north of the SH3 Site for the creation of a temporary landscaped area and multipurpose events platform, which would form an interim condition on the Site as the SH3 Scheme is built out. This is hereafter referred to as the Temporary Events Space.

Since submission of the SH3 Scheme and Temporary Events Space Applications in 2013, the Applicant has acquired a plot of land adjacent to Plot E of the SH3 Scheme, known as Telecom House, and is now seeking outline planning consent for a development which encompasses both the Telecom House Site and Plot E (hereafter referred to as the Telecom House / Plot E Scheme). This is intended to replace Plot E of the consented SH3 scheme.

The location of the SH3 Site and Telecom House / Plot E Site (hereafter collectively known as the Site) is presented below.



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The Telecom House / Plot E Scheme occupies approximately 0.77 ha of land bounded by Garrard Street to the north, 40 Friar Street to the east, Friar Street to the south and 52 Friar Street to the west. The proposals comprise demolition of 41 to 51 Friar Street and the buildings behind and erection of new buildings to provide primarily residential uses together with a range of town centre uses including shops.

As part of the outline planning application for the Telecom House / Plot E Scheme, an Environmental Impact Assessment (EIA) has been undertaken to assess the likely significant environmental effects of the SH3 Scheme (without Plot E) and Telecom House / Plot E Scheme in combination (hereafter collectively referred to as the Development). The EIA has looked at the effects of both developments together because they are interlinked and the Telecom House / Plot E Scheme would only be built out as part of the SH3 Scheme. As the Temporary Events Space also forms part of the wider Development proposals, the EIA has also considered an interim condition with the Temporary Events Space in place.

The findings of the EIA are reported in an Environmental Statement (ES) which has been prepared and submitted to Reading Borough Council (RBC) to accompany the outline planning application. The ES will assist RBC and other statutory consultees in making their planning decision and providing comments on the application respectively. As the ES is an update of the one submitted as part of the SH3 Scheme planning application, it sets out the differences between the findings of the ES of the SH3 Scheme and that of the updated ES which relates to the SH3 Scheme together with the Telecom House / Plot E Scheme. This is to provide clarity to RBC and consultees on the changes brought about as a result of inclusion of the Telecom House / Plot E Scheme. It is for this reason that, whilst demolition works are currently ongoing at the Site, the EIA has considered the Site prior to commencement of demolition to enable a meaningful comparison of effects.

This document provides a summary of the ES in non-technical language.

2. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

EIA is a formal process which aims to ensure that the likely significant environmental effects of a new development (which can be beneficial or adverse) are taken into account by a local planning authority in the deciding whether to grant planning permission for certain redevelopment proposals. The EIA of the Development has been undertaken in accordance with legal requirements, best practice guidelines, and established assessment methodologies. This involved visits to the Site, Site surveys, data reviews, consultation with a number of relevant statutory authorities, computer modelling and specialist assessment undertaken by a team of qualified and experienced consultants.

In consultation with RBC and other statutory consultees it was agreed with RBC that the following environmental topic areas would be addressed as part of the EIA:

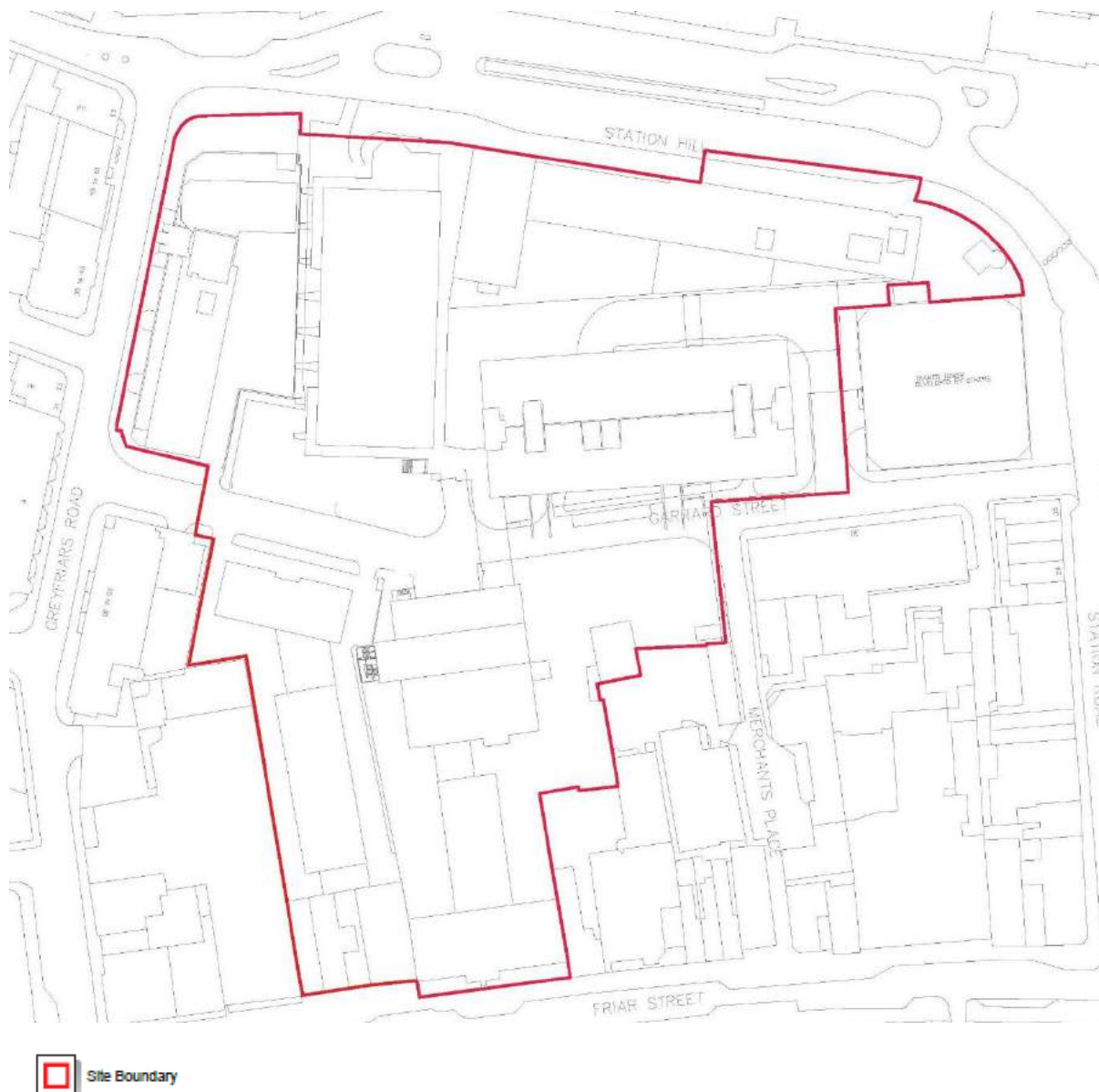
- Demolition and construction;
- Socio-economics;
- Archaeology;
- Transportation and access;
- Air quality;
- Noise and vibration;
- Ground conditions and contamination;
- Surface water drainage and flood risk;
- Ecology;
- Wind;
- Daylight, sunlight and overshadowing;
- Townscape, conservation and visual assessment; and
- Cumulative Effects (the likely significant combined effects of different effects resulting from the Development itself and the likely significant combined effects of the Development with other consented or reasonably foreseeable schemes).

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The assessment of each environmental topic set out above is reported in a separate chapter of the ES. The ES also sets out measures to avoid, reduce, or offset any identified likely significant adverse effects of the Development, known as mitigation measures, and measures to enhance the likely significant beneficial effects. The resulting effects (known as 'residual effects'), following the implementation of the mitigation and enhancement measures are described.

3. LAND USES AND ACTIVITIES

The Site comprises an area of approximately 2.53 ha. The boundary of the Site (comprising the SH3 Site and the Telecom House / Plot E Site) is shown on the Figure below (which also shows the existing layout of the Site).



The majority of the Site is vacant. Only the existing multi-storey car-park, Xfinity House offices in the western part of the Site and a small number of small-scale retail units fronting Friar Street are currently in use. Consequently, much of the Site is underused, derelict, and in a general state of disrepair.

The tallest building on the Site is the Western Tower. This stands at fifteen storeys. Other buildings on the Site are low rise and range between three and eight storeys.

Photographs of the Site are shown below.

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Western Tower and Xafinty House



Garrard Street and Friars Walk Car Park



Entrance to Underground Car Park



Station Hill Retail Units

Land uses surrounding the Site are varied and include:

- Reading Mainline Station and transport interchanges;
- Temporary taxi rank and bus stops;
- Occupied offices;
- Vacant offices;
- Shops, cafes, restaurants and bars;
- Residential properties;
- Hotels; and
- Public open space.

The existing land uses within and around the Site are shown on the figure below.

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Existing Surrounding Land Uses

4. ALTERNATIVES

In line with the EIA regulations, the ES provides a description of the main alternatives considered by the Applicant. It should be noted that since the Development is a response to site-specific guidance and policies, no alternative sites have been considered by the Applicant.

Without redevelopment, the Site would likely remain under-utilised and derelict, thereby attracting vandalism and forfeiting the many potential benefits associated with redevelopment. This would go against planning policy which emphasises the need to encourage extensive sustainable redevelopment through the re-use of previously developed urban sites. Overall, it is considered that the negative effects as a result of leaving the Site undeveloped considerably outweigh any beneficial effects that would arise from the status-quo.

On the basis that the Site is redeveloped, an alternative would be for the renovation and refurbishment of the existing buildings on the Site. However, this option would not include the comprehensive redevelopment of the Site and without new buildings there would be limited opportunities to improve permeability through the Site. The negative issues associated with the Site would also not be resolved with this alternative and the aspirations and vision of RBC for this area would not be realised. Therefore this option was not considered by the Applicant to be a viable redevelopment solution.

The evolution of the Development has responded to a number of design, environmental and economic issues. During the design process the following key considerations have influenced the selection of the final design:

- Pedestrian permeability from Reading Mainline Station, through the Site to Friar Street and surrounding destinations;
- Options for the NCP car-park included the retention and refurbishment or the demolition and re-building;
- The creation and enlargement of a Central Square and enclosure of an Arcade;
- Appropriate building massing and the establishment of long-distance views through the Site;

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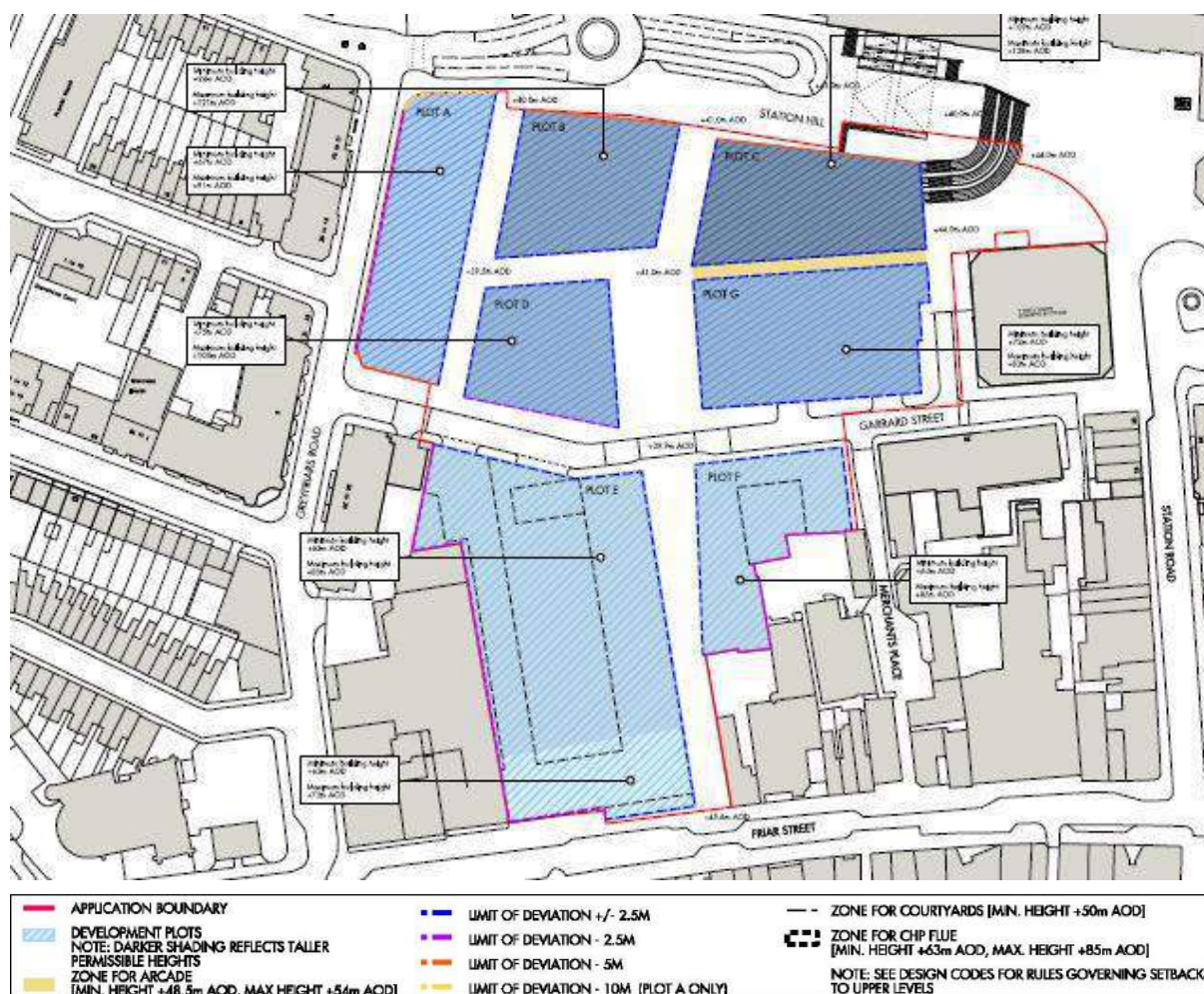
- Building massing and the provision of daylight and sunlight to residential accommodation as well as surrounding residential receptors; and
- Provision of high quality public realm and private amenity space.

The Development has resulted from careful consideration of policy objectives for the wider Reading area and the Site, the Applicant's commercial objectives, and following consultation with RBC, statutory consultees, other interested parties and the public, together with prevailing environmental constraints.

5. THE PROPOSED DEVELOPMENT

As with the SH3 Scheme, outline planning approval is sought for the Telecom House / Plot E Scheme; therefore all details of access, appearance, layout, landscaping and scale are reserved for later approval.

The Development includes the demolition of all the existing buildings and structures on Site, with the exception of the existing multi-storey NCP car-park, and the construction of four new commercial Building Plots (referred to as Building Plots A-D) and two new predominately residential Building Plots (referred to as Building Plots E and F). The existing multi-storey NCP car-park would be reconfigured and refurbished (referred to as Building Plot G).



Building Plots

The Development would provide a total of between 101,000m² Gross External Area (GEA) and 182,400m² GEA of floorspace. This is an increase of between 11,500m² and 13,200m² compared to

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the consented SH3 Scheme. This is largely an increase in residential floorspace. Whilst shops would be provided in the Telecom House / Plot E Scheme, these could be accommodated within the maximum floorspace area consented as part of the SH3 Scheme. The total floorspace areas for the SH3 Scheme and Telecom House / Plot E Scheme combined is broken down as follows:

- Between 69,000m² and 122,000m² GEA of office floorspace;
- Between 6,000m² and 13,500m² GEA of retail floorspace;
- Between 0m² and 2,200m² GEA of leisure uses;
- Between 300 and 475 residential units (an increase of up to 175 units compared to the consented SH3 Scheme);
- Up to 1000 car parking spaces (between 550 - 900 within the reconfigured and refurbished car-park and up to 200 within Telecom House / Plot E); and
- Two new areas of public space referred to as Central Square and Station Square:
 - Central Square: located between Building Plots D and G; and
 - Station Square: located to the east of Building Plot C, north of Thames Tower (adjacent to the east of the Site).

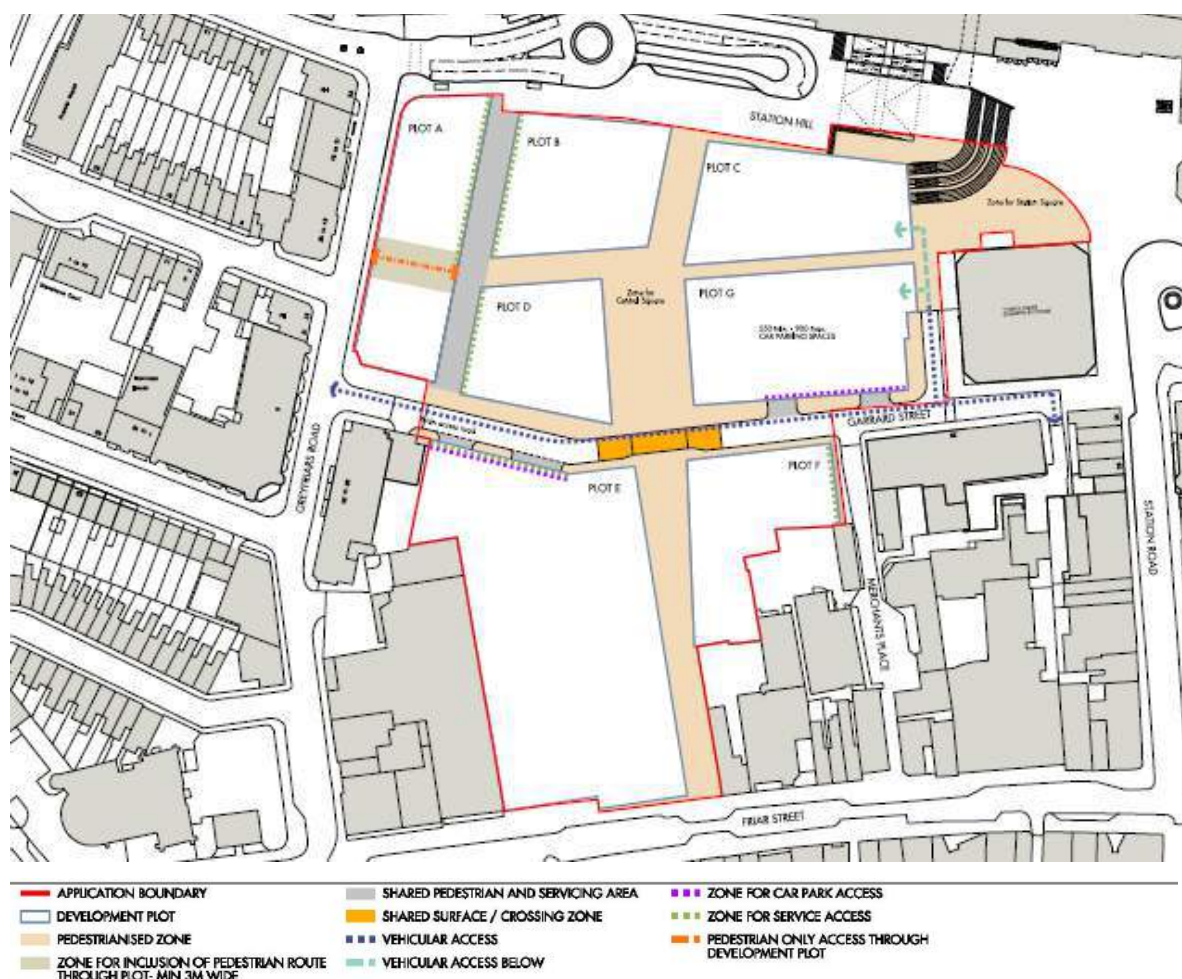
The Development comprises a range of Building Plot heights across the Site, which gives variety in the form of the Development. The tallest Building (within Plot C) would reach a height of between 109m AOD and 128m AOD. The lowest Building (within Telecom House / Plot E, Plot F or Plot G) would reach a height of between 63m AOD and 83m AOD. The taller building elements of the Development would be located towards the north of the Site whilst the lowest building elements would be located to the south. The building heights would also increase from west to east.

The main vehicle access into the Development would be from Greyfriars Road and via Garrard Street. The majority of the vehicular parking would be accommodated in the reconfigured and refurbished car-park. Access and egress to/from the reconfigured and refurbished car-park would also be from Garrard Street.

The Development proposes two key pedestrian routes across the Site. The major pedestrian route would run north-south to connect the new Station Hill Bus Interchange and Reading Mainline Station with the existing retail centre of Reading located south of the Site. A second key pedestrian route would run east-west between Reading Mainline Station and Greyfriars Road to the west of the Site, through Building Plot A and between Building Plots B and D in the west and through a new covered arcade in the east of the Site between building Plots C and G.

Located between Plots D and G, it is envisaged that the Central Square would be the main pedestrian focal point of the Development. In addition, a new Station Square would be created to the east of Building Plot C. This new space would provide a gateway from Reading Mainline Station to Reading town centre.

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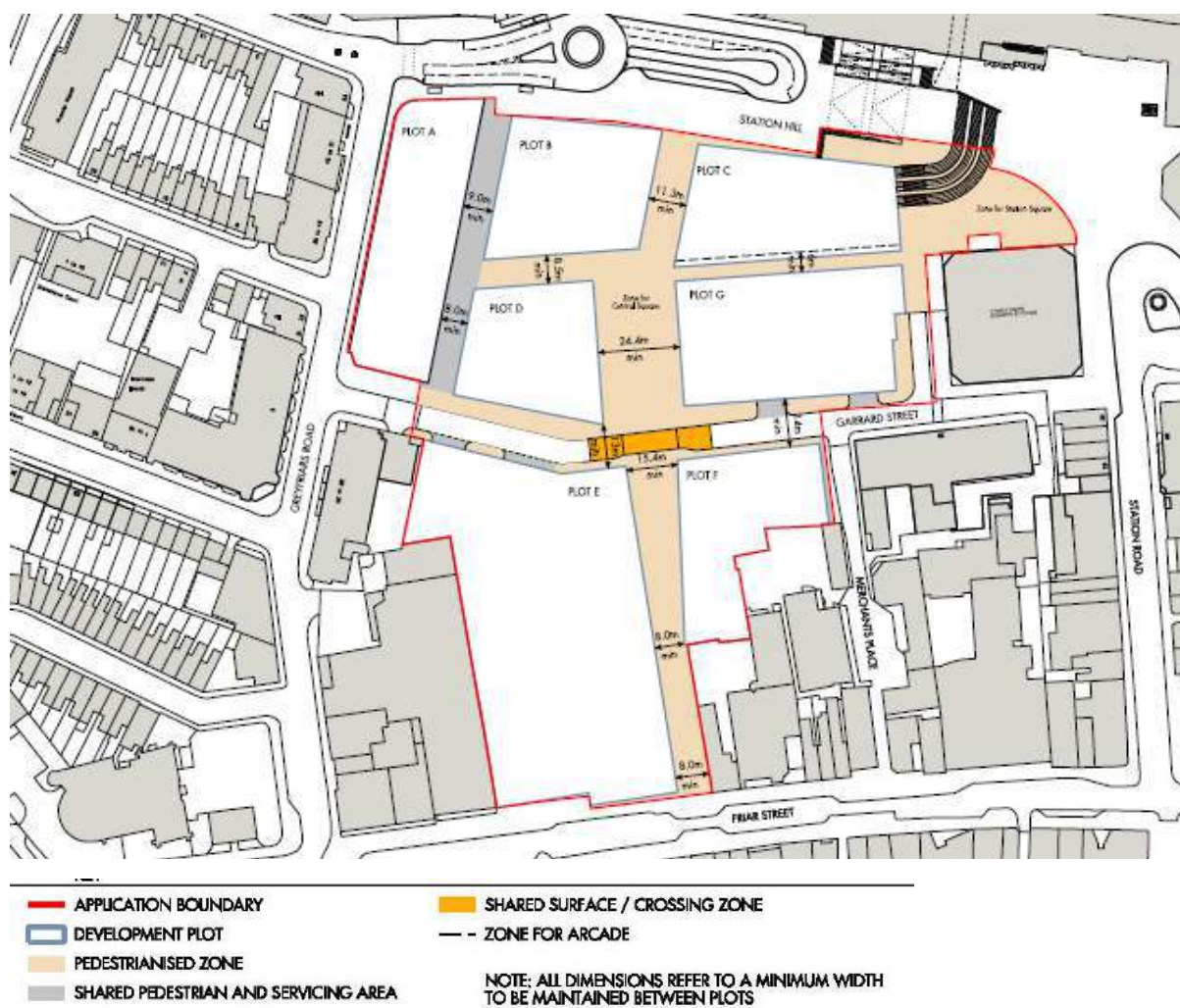
Vehicle and Pedestrian Access Routes

The Development includes the provision of private and shared amenity spaces for residents within balconies, roof terraces and / or a central courtyard area. Roof terraces are also proposed on the commercial Building Plots (Building Plots A-D) for the future occupants of these buildings.

Green and / or brown roofs would be located throughout the Site. The total green / brown roof provision would cover a minimum of 25% of the total roof area of each Plot within the Development. A green wall would also be created on the southern side of the reconfigured and refurbished car-park. All trees removed during demolition works would be replaced and additional trees planted. In addition, seating, litter and re-cycling bins, cycle racks, signage and wayfinding features, information boards and lighting would be provided.

Energy efficiency measures have been incorporated into the design of the Development. These include passive design measures (for example, through insulation to reduce heating requirements and solar shading to reduce cooling requirements); and the provision of energy efficient building services. Combined Heat and Power (CHP) may also be implemented to provide heating and hot water to the residential units.

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Public Realm Plan

6. DEVELOPMENT PROGRAMME, DEMOLITION AND CONSTRUCTION

The current expectation is that the demolition of the existing buildings on the Site and the construction of the Development would take approximately 60 to 70 months. This is an increase of up to 10 months which may be required to accommodate the addition of the Telecom House Site. It is anticipated that the demolition and construction works would comprise the following main stages:

- Enabling works;
- Site preparation and demolition;
- Excavation;
- Foundation works;
- Construction of the sub-structure;
- Construction of the super-structure;
- Cladding;
- Fit-out; and
- Landscaping.

A Construction Environmental Management Plan (CEMP) would be in place during the demolition and construction works. This would include all details of relevant environmental management controls

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necessary for environmental protection during the works. This would follow all relevant legislative requirements and best practice guidelines. The CEMP would be agreed with RBC prior to the commencement of demolition and construction works.

7. TOWNSCAPE, CONSERVATION AND VISUAL ASSESSMENT

An assessment has been undertaken to determine the likely significant effects of the Development upon the existing townscape and 33 key views around the Site. Three additional views were undertaken compared to those for consented the SH3 Scheme to show additional views of the Telecom House / Plot E Scheme.

The view selection was made in consultation with RBC and the assessment has been undertaken in accordance with published best practice. The assessment of views has been informed by accurate computer generated images of the Development inserted into them.

There are no conservation areas or listed buildings within the Site. However, there are a number of listed buildings and conservation areas in the close and wider surrounding area. Including:

- Market Place / London Street Conservation Area, St Mary's Butts / Castle Street Conservation Area and Russell Street / Castle Hill Conservation Area. These are located between 120m east, 250m south-west and 350m south-west of the Site, respectively;
- Grade I listed Greyfriars Church and Grade I listed Church of St Laurence located approximately 120m south-west and 280m east of the Site, respectively; and
- Grade II listed buildings / structures including 39 Friar Street, adjacent to the south-east corner of the Site, Grade II listed Reading Mainline Station (Three Guineas Public House) 30m north of the Site and King Edward Statue located 30m east of the Site, Grade II listed Great Western House 50m south-east and Grade II Listed 13 & 15 Station Road 60m east of the Site.

The demolition and construction works would give rise to inevitable visual intrusion. However, the likely effect would be temporary and of minor to moderate adverse significance. The significance of effects is the same as that of the SH3 Scheme.

The existing poor quality and run-down buildings of the Site do not positively contribute to the setting of the nearby built heritage. Overall, the removal of the existing structures and their replacement with a new landmark Development of sensitive design would enhance the setting of listed buildings and conservation areas in the locality resulting in a substantial beneficial effect. In addition, on completion of Development, the townscape character and quality of the Site would be improved. Furthermore, the Development would significantly improve pedestrian accessibility to, from and through the Site and bring vitality to the streetscape. This would transform the existing neglected and poor quality townscape character resulting in a negligible to moderate beneficial effect.

With regards to views, it is concluded that the Development would result in changes to a number of key views. It is considered that, in general, the Development would create a landmark feature on the skyline that would clearly mark the redeveloped Reading Mainline Station and new bus interchange, assisting local orientation and identifying the Site as a centre of regeneration. The effect is therefore negligible to substantial beneficial depending upon the view in question. All the Townscape, Conservation and Visual Effects remain the same as those of the consented SH3 Scheme. This is because, although the Telecom House / Plot E Scheme occupies a larger area of land, the maximum and minimum heights would remain the same as those of Plot E of the consented SH3 Scheme.

8. SOCIO-ECONOMICS

A socio-economic assessment has been undertaken using a wide range of information sources. These sources include planning policies and guidance, population and Census data, information provided by RBC and professional experience of similar schemes.

The assessment found that the demolition and construction would generate in the region of 370 full time jobs. This is greater than those calculated for the SH3 Scheme (250 jobs) because of the addition of the Telecom House Site. However, the overall effect would remain negligible because of the mobile nature of construction employment. There are approximately 42 existing employees currently working at the Site and these would be lost as a result of demolition of the existing buildings on Site. This is considered to be a minor adverse effect. Once the Development is completed and operational, it is estimated that between 4,900 to 8,845 jobs would be created. This is the same as for the consented SH3 Scheme because the floorspace areas of the main employment generating uses (shops and offices) would not change with the inclusion of the Telecom House / Plot E Scheme. The effect is assessed as substantial beneficial.

The Development is expected to give rise to a new on-Site residential population of between 540 and 855 individuals. This is an increase compared to the SH3 Scheme (255 to 510 residents) because of the increase in residential units within the Telecom House / Plot E Scheme. Of this population, it is estimated that there would be a minimum of 61 and a maximum of 96 primary school aged children, a minimum of 11 and a maximum of 17 secondary school children and a minimum of 4 and a maximum of 7 post -16 aged children living within the new residential units.

In terms of local services, financial contributions would be made towards primary healthcare and primary education, thereby helping to address potential capacity issues and therefore a negligible residual effect.

Together with the new employees and residents it is estimated that the Site would give rise to additional local expenditure totalling approximately £15.6 million to £27.3 million annually. This is assessed as a minor to moderate beneficial effect.

New public spaces, pedestrian routes and ground floor retail frontages would generate a significant amount of pedestrian activity. It is envisaged that the Site would be highly active and vibrant, with a high degree of natural surveillance. This would result in a high quality and safe environment suitable for living, working, shopping and visiting resulting in a minor beneficial effect.

9. ARCHAEOLOGY

A desk-based archaeological assessment of the likely significant effects of the proposed Development, and the temporary events space, on buried heritage assets (archaeology) at the Site has been undertaken. This included a review of various historical information sources and consultation with Berkshire Archaeology (archaeological advisor to RBC).

The results of the desk-based archaeological assessment reveal that the southern part of the Site falls within the RBC designated 'Area of Archaeological Potential'. The desk-based archaeological assessment also established that the Site has yielded direct archaeological evidence in the form of a pit and two layers, all likely to be of medieval/early post-medieval date. Evidence also makes reference to medieval pottery on the OS plan of 1957 and the line of the Civil War ditch which crosses the Site.

A range of archaeological finds are present in the immediate vicinity of the Site, predominantly in the southern area around Friar Street and Merchants Place.

In the northern part of the Site the construction of existing basements appears to have been undertaken in such a way that the historic ground surface is likely to have suffered significant disturbance. In the southern part of the Site, existing basements have been cut into the slope of the hill and would therefore have caused significant disturbance to any archaeological deposits.

Consequently it can be concluded that, overall, the Site has a low to moderate potential for archaeological remains.

The potential impact of the Development is the loss, disturbance and/or truncation of locally, regionally or nationally important archaeological deposits from the Prehistoric, Saxon/Viking, Medieval and Post-Medieval periods. This is likely to result in a permanent, regional, moderate adverse effect with limited potential for substantial adverse effect on national resources. Mitigation is recommended through archaeological evaluation post-demolition with an watching brief during embankment reduction and/or strip, map and sample works during/after site clearance. Localised archaeological excavation and archaeological watching brief, as appropriate, during construction on areas. Preservation in situ is unlikely to be required unless nationally important features are identified. The precise methodologies would be agreed in consultation with the archaeological advisors to Reading Borough Council. The residual effects after mitigation would be permanent, regional effects of minor adverse significance, with a negligible effect on national resources.

10. TRANSPORTATION AND ACCESS

A detailed study of the likely significant effects of the proposed Development upon transportation and access including, local highways, public transport, pedestrians and cyclists has been undertaken.

All demolition and construction related traffic would enter and exit the Site through pre-agreed routes which would avoid the use of Reading's central areas. The main demolition and construction traffic route to the Site would be via the Tudor Road / Inner Distribution Road (IDR) (Caversham Road) from the north and via the grade separated Chatham Street roundabout onto Greyfriars Road from the south.

The average volume of Heavy Goods Vehicles (HGVs) movements associated with the demolition and construction activities of the proposed Development have been assessed to be in the region of 35 vehicles per day. This level of traffic generation is not considered to be significant when compared to the existing traffic flows / volumes of the existing surrounding highway network resulting in a negligible effect. However, there is potential for delays to drivers and pedestrians and a reduction in pedestrian amenity resulting in a minor adverse effect.

The provision of new public spaces and pedestrian routes within the proposed Development would increase the Site's permeability and attractiveness for pedestrian journeys. In addition, the new routes would increase direct accessibility to and from the public transport services located at Reading Mainline Station and central Reading beyond the South of the Site.

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The proposed Development would also provide up to 750 to 800 cycle parking spaces for occupants and users of the whole site. This would further encourage more sustainable modes of travel to and from the Site. A wide raised crossing facility is proposed at Garrard Street to accommodate the increased pedestrian flows between Friar Street and the Railway Station and raise driver awareness of pedestrians in this location. The proposed Development would provide up to 1,000 car parking spaces.

The proposed Development would result in predominantly negligible effects with some minor beneficial effects predicted as a result of improvements in pedestrian permeability and a reduction in driver delay on Greyfriars Road. A Framework Travel Plan has been produced to encourage sustainable travel to and from the proposed Development and further enhance the beneficial effects of the proposed Development.

11. AIR QUALITY

The Site is included within RBC's designated Air Quality Management Area (AQMA). The RBC AQMA has been designated as a result of relatively high levels of pollutants in the air. These pollutants are mainly caused by exhaust emissions from road vehicles.

A detailed air quality assessment has considered the likely significant effects of the Development in relation to demolition and construction activities and the completed and operational Development. Predicted traffic flow data and other information has been analysed using a computer model which has calculated and predicted the likely resultant changes in local air quality.

During demolition and construction works, best practice measures would be implemented to minimise the risk of dust causing a potential nuisance, in particular, to local residents. These measures would form part of the aforementioned CEMP and would include damping down surfaces, the covering of all construction materials and the regular clearing of frequently used areas. Similarly, emissions from construction plant would be minimised through measures in the CEMP, for example, switching off engines at all times when not in use. With these measures in place, at worst, a minor adverse residual effect is anticipated. This is the same as the residual effect for the consented SH3 Scheme.

The additional traffic movements resulting from the demolition and construction works are considered insignificant in relation to the volume of existing traffic flows on the surrounding road networks. However, given the town centre AQMA it is considered that there would be the potential for a minor adverse effect on air quality from construction vehicles, in the peak construction period and negligible outside the peak construction period. This is the same as for the consented SH3 Scheme.

Assessment of the completed Development has shown that there would not be any breaches of the National Air Quality Objectives (which are the maximum values for a number of 'problematic' atmospheric pollutants in the UK, based on EU standards). It can therefore be concluded that traffic generated by the Development and emissions from the Development's heating and cooling plant would have a negligible effect upon local air quality. This is the same as for the consented SH3 Scheme.

12. NOISE AND VIBRATION

The likely significant noise and vibration effects of the Development proposed have been assessed in accordance with published guidelines. The assessment included the monitoring of existing noise levels informed by a Site survey and the identification of local receptors which would be most sensitive to noise and vibration. Such local receptors include future Site occupants and occupants / users of the surrounding residential and commercial properties.

The only potential source of noticeable environmental vibration in the vicinity of the Site is associated with Reading Mainline Station, located approximately 50m to the north of the Site. However, it is very unusual for rail related vibration to be noticeable when it is 50m or more from railway tracks. Furthermore, as the trains are generally moving slowly into or out of the station, they produce relatively

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low levels of vibration and a site visit concluded that vibration levels in the vicinity of the Site would be imperceptible.

During the demolition and construction works, a number of measures would be taken to minimise the amount of noise and vibration arising from the Site. These measures would be included in the CEMP and would include: the careful selection of quiet plant and machinery; the erection of suitable hoardings around the Development to screen noise generated by equipment on-Site; adhering to pre-agreed working hours; and prescribing noise levels limits which would be agreed with RBC. The demolition and construction activities could lead to an increase in vibration at the nearest buildings to the Site such as Thames Tower and the Grade II Listed, 39 Friar Street. However, it has been assumed that construction techniques would be discussed with RBC's Environmental Health Department to ensure that vibration effects would be minimised as much as possible. The overall effect of the demolition and construction works on noise and vibration range from negligible to moderate adverse at the nearest properties. The range of effects is the same as for the consented SH3 Scheme.

A review of the traffic flows associated with the demolition and construction, and an assessment of flows associated with the completed Development, concludes that there would be no perceptible increase in noise levels as a result of traffic related to the Development; a negligible effect.

All proposed buildings would be designed to minimise significant adverse noise effects resulting from the operation of building plant and services and from external influences such as road traffic. In this respect, the Site would provide an environment suitable for residential uses and would not adversely affect nearby existing noise sensitive receptors. The noise levels in Station Square would be noisier than guideline values but this is not unusual for urban environments. The effects range from minor beneficial to moderate adverse and are the same as for the consented SH3 Scheme.

13. GROUND CONDITIONS AND CONTAMINATION

An assessment of the potential for ground contamination to exist at the Site has been undertaken based on information obtained from historical maps, geological maps and previous investigations. An intrusive Site Investigation has also been undertaken on the northern part of the Site, between Garrard Street and Station Hill.

Chemical analysis of environmental samples (soils and groundwater) collected as part of the intrusive Site Investigation of the northern part of the Site did not identify widespread contamination of soils and groundwater. However, further investigation would be undertaken in the southern part of the Site prior to development of this area. If necessary, remediation would be carried out at the Site in order to ensure that contamination is appropriately dealt with in order to not cause harm to humans or the environment.

All demolition and construction works would be undertaken in accordance with legislative requirements and a CEMP. This would minimise the risk of spillages, creation of dust, uncontrolled run off or other activities which could cause or mobilise existing contamination. The resulting effect would be negligible to at worst minor adverse. This is the same as for the consented SH3 Scheme.

On completion of the Development, the risk posed by any remaining residual contamination to future Site occupants, soil, groundwater, and flora and fauna would be very low. This would be due to the remediation employed (as necessary), and the fact that the majority of the completed Development would be covered in hard surfacing, which would serve to act as a physical barrier between the residual contamination source and potential receptors. Landscaped areas would be provided with a clean growth medium to reduce risks of exposure to soil contaminants and fuel storage tanks for backup generators, where required, would be stored on hardstanding. The residual effect of the completed Development is therefore assessed to be **negligible** with minor beneficial effects due to remediation of potentially contaminated soil. This is the same as for the consented SH3 Scheme.

14. SURFACE WATER DRAINAGE AND FLOOD RISK

In accordance with government guidance, a Flood Risk Assessment (FRA) for the Site has been undertaken. This has been informed by a Site survey, topographical data for the Site, a review of geological maps and information provided by the Environment Agency and Thames Water.

There are no surface water features on the Site. The closest watercourses to the Site are the River Thames (located approximately 420m to the north-east of the Site) and the River Kennet (located approximately 600m to the south-east of the Site). The Site is classified by the Environment Agency as being at low risk of flooding from rivers and the sea. However, their Risk of Flooding from Surface Water map shows that there is some potential for surface water flows / ponding within the highways within and surrounding the Site.

During the demolition and construction works, temporary Site drainage associated with construction traffic routes, temporary car parks and dewatering all have the potential to give rise to changes in surface water run-off, including peak flows and low flows. However, assuming the adoption of best practice construction techniques, it is considered that the residual effect would be negligible.

At the detailed design stage, site levels would be reviewed to ensure that no new low points are created where surface water could pond. Finished floor levels would be above the level of the surrounding highway. The risk of surface water flooding is therefore considered low and the effect negligible. The Development would attenuate surface water runoff through the provision of attenuation tanks. This would ensure that the surface water discharge would be no greater than the existing situation and would also cater for the effects of climate change. In addition, areas of hard standing would be reduced from the existing areas of water-resistant land surfaces through the provision of green / brown roofs. The effect of the Development on flood risk would therefore be negligible.

The Development would not cause an obstruction to groundwater flows and hence would not cause any increase in the level of the water table.

Works to the foul water drainage system would be undertaken in consultation and agreement with Thames Water. Such works would be subject to standard best practice and mandatory regulatory controls and would be designed to cope with the future population of the Site.

The effects of the proposed Development on flood risk and drainage remain the same as for the SH3 Scheme.

15. ECOLOGY

To assess the likely significant ecological effects of the proposed Development, an ecological appraisal has been undertaken. This included desk-based ecological research, a range of ecological Site surveys including surveys for bats and black redstart (a protected bird species), and consultation with relevant wildlife organisations.

The habitats present at the Site comprise mostly buildings and hard-standing, with only very small areas of the Site in the north and north-west covered in grassland, ornamental shrubs and scattered trees. All on-Site habitats are considered to be of low quality and value with the exception of habitats for black redstarts, a protected species of bird, which are considered to be of district to county value.

Within the surrounding area there are a number of non-statutory designated sites of wildlife interest and the nearest of these is located 700m from the Site. As such, it is considered that the proposed Development would have no effect on any designated or non-designated sites.

The 2005, 2012, 2014 and 2015 black redstart surveys confirmed that black redstarts are using the Site, having bred on the Site in 2012 and holding territory in 2015. No direct evidence of nesting or breeding black redstarts was recorded during most recent surveys in 2015 however it is considered likely that black redstarts are breeding within the Site due to current activity observed during surveys in

Telecom House / Plot E & Station Hill 3, Reading

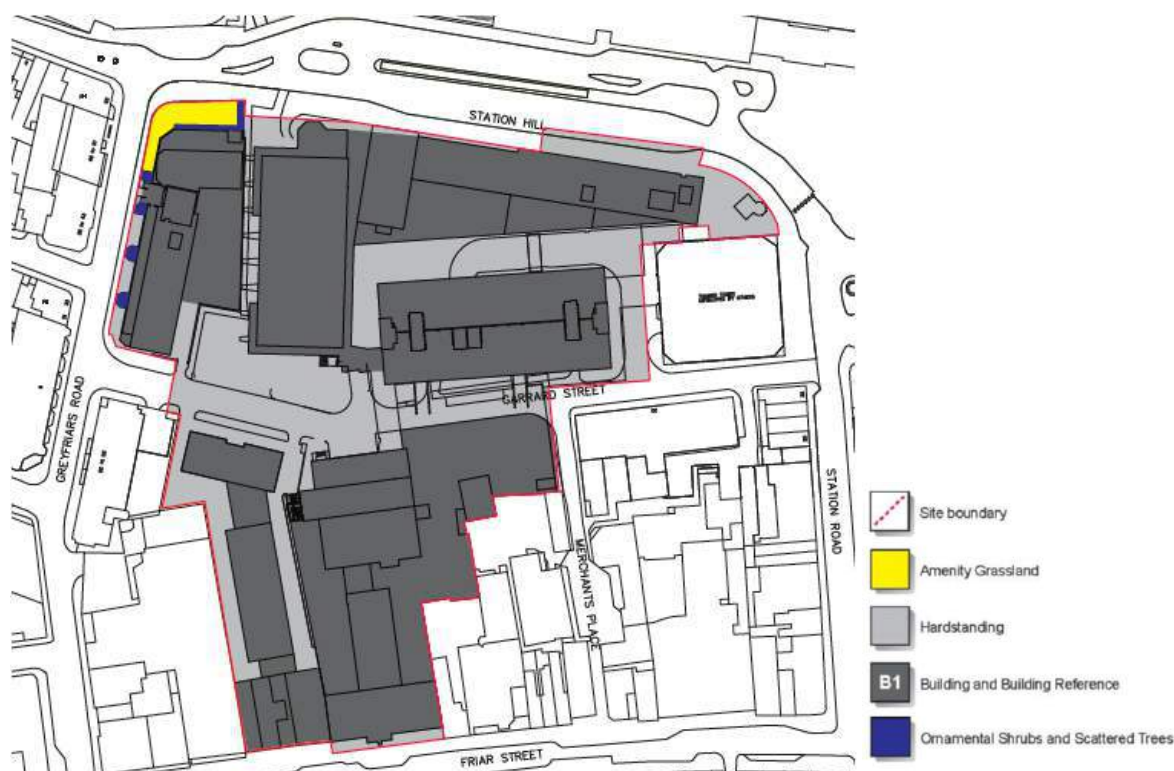
ENVIRONMENTAL STATEMENT: NON-TECHNICAL SUMMARY

2015. Peregrine falcons were recorded potentially perching on the Western Tower within the Site. The Site also has limited potential to be utilised by some ecologically valuable breeding birds including starlings, although the Site in its current form does not provide optimal habitat for this species.

A bat survey of the Site found that the Site does not provide suitable habitat for bats.

In order to protect against disturbance to black redstarts and other breeding birds, demolition and Site clearance works would be undertaken outside the main bird breeding season where practicable (i.e. within the months September to February inclusive). If these works cannot be restricted to within this period, an Ecological Watching Brief would be put in place during the main bird breeding season to ensure that nesting birds are not adversely affected. This would include a pre demolition check to check if any birds including black redstarts and peregrines are breeding on Site. In addition, netting has been placed on Western Tower to discourage peregrine falcons from nesting on this structure prior to its demolition. The effects of demolition and construction would range from minor adverse (due to temporary loss of a peregrine perch on Western Tower) to minor beneficial (due to creation of additional habitats during demolition that are favoured by the black redstart). The majority of effects would however, be negligible. These effects are the same as for the SH3 Scheme.

The creation of new habitats within the completed Development, particularly brown roofs, would provide new habitat for black redstart. Very little suitable foraging habitat is present on the Site currently, and so the provision of this habitat, coupled with the provision of new nest boxes for black redstart, house sparrow, starling and peregrine falcon, would be a minor beneficial effect. This is the same as for the consented SH3 Scheme.



Habitat Plan

16. WIND

The likely significant effects of the proposed Development and the Temporary Events Space on wind conditions have been assessed in relation to the comfort and safety of pedestrians within and around

Telecom House / Plot E & Station Hill 3, Reading

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the Site. The assessment of likely demolition and construction effects was based on professional judgement and experience. However, the assessment of the Temporary Events Space interim condition and completed and operational Development has been informed by the use of a 3-dimensional scale model of the Development which was exposed to the simulated wind and weather conditions of the Site within a wind tunnel.

Once the Site is cleared following demolition, the wind would blow across the open Site. However, demolition would be undertaken in phases and the presence of hoarding and temporary construction buildings would mitigate the effects to some degree. It is therefore considered that the demolition and construction would likely result in negligible effects.

Wind tunnel testing of the completed Development revealed that the wind microclimate at most areas surrounding the Site would remain suitable for the existing (and future) pedestrian uses. The one significant exception is the existing thoroughfare at the northwest corner of the site which was found to be one category too windy for its intended use (a minor adverse effect). However, it is anticipated that the detailed design of Building Plot A would return this area to suitable conditions for thoroughfare use. This would be confirmed through further testing during the detailed design of Plot A and if necessary, additional mitigation such as soft landscaping would be provided to ensure the wind conditions were suitable.

Similarly, testing revealed that the majority of locations within the Site would also experience wind microclimate conditions which would be suitable (or better) for the intended pedestrian uses. Exceptions exist at Station Square and Central Square, certain Building Plot entrances and on roof terraces where the effects range from **minor adverse to moderate adverse**. However, various mitigation options such as the use of landscaping, localised screening and recessing of entrances would be tested at the detailed design stage to ensure that all areas within the Site experience a satisfactory wind microclimate suitable (or better) for the Development's proposed pedestrian uses. Such mitigation would be 'designed into' the Development at subsequent detailed design stages.

The wind conditions are consistent with those for the consented SH3 Scheme.

17. DAYLIGHT, SUNLIGHT AND OVERSHADOWING

An assessment has been undertaken to establish the likely significant effects of the Development proposed upon the amount of daylight and sunlight received by properties adjacent to the Site and the proposed residential properties of the Development itself. An analysis of the amount of overshadowing of new public spaces within the Development has also been undertaken. The assessment has involved the use of a three-dimensional computer model of the Development and its relevant immediate surroundings.

Following demolition of the existing buildings, daylight and sunlight levels at the Site and the immediate surrounds are likely to temporarily increase. As the construction works continue the levels of daylight, sunlight and overshadowing received by neighbours for the Site would reduce as the effects progress to those of the proposed Development.

Following completion of the Development, many of the surrounding residential properties would experience no perceptible change to sunlight or daylight availability. However, a number of rooms, mostly in Projection East and West would experience a reduction in daylight and sunlight. Some properties already have low existing levels of daylight and sunlight for which a reduction beyond the levels recommended in relevant guidelines is inevitable. Furthermore, the urban location of these properties would mean that residents are likely to have a lower expectation for high levels of daylight and sunlight.

The residential units proposed within the Development would be designed to maximise daylight whilst acknowledging the urban location.

Telecom House / Plot E & Station Hill 3, Reading

ENVIRONMENTAL STATEMENT: NON-TECHNICAL SUMMARY

The assessment concludes that the majority of overshadowing would be restricted to the north of the Site along Station Hill, and the Reading Mainline Station buildings and track to the north. Additional shadowing beyond that experienced in the Baseline Scenario would not affect surrounding amenity spaces.

The levels of daylight and sunlight in the proposed Development Scenario are largely in line with those in the Consented SH3 scheme. There is an insignificant difference between the scale and magnitude of the impacts for the proposed Development compared with the Consented SH3 Scheme. The degree of alteration is unlikely to be noticeable, so the likely additional effect of extending Plot E to cover the Telecom House Site is considered to be negligible. In addition, the levels of shadow as a result of the proposed Development are similar to those from the Consented SH3 scheme and as there are only slight differences the effect is considered unlikely to be noticeable.

18. CUMULATIVE EFFECTS

Two types of cumulative effects have been assessed in relation to the Development and the temporary events space proposed:

- The interaction of individual effects from the Development upon a set of defined sensitive receptors; and
- The combined effects of the Development / temporary events space and other reasonably foreseeable schemes.

The demolition and construction of the Development in isolation would result in some temporary adverse combined effects. These would be predominantly associated with dust, noise, vibration, traffic and visual effects. The CEMP would ameliorate these construction-related effects as far as possible.

The likely cumulative effects of the Development with other consented and reasonably foreseeable schemes were generally found to be minimal. Exceptions include:

- Additional job creation and local expenditure;
- The provision of new homes;

Air quality and noise and vibration effects during potentially overlapping demolition and construction works. These would generally be restricted to relatively short periods; and

- A further reduction in available daylight to 1-41 Icon House.

If you would like to receive further copies of this Non-Technical Summary, or would like to purchase a copy of the Environmental Statement, accompanying Figures or Technical Appendices, please contact:

Waterman Infrastructure & Environment Ltd
Pickford's Wharf
Clink Street
London
SE19DG

Tel: (020) 7928 7888
Email: ie@watermangroup.com

An aerial, line-art style illustration of a city skyline. The central focus is a large, multi-story building complex with several interconnected volumes. This central complex is surrounded by other city buildings of varying heights and styles. The entire illustration is rendered in a light blue line-art style on a white background. The central building has several flat roofs with rectangular features, possibly skylights or rooftop pools. There are also some smaller, more detailed buildings around the base of the central complex, showing windows and architectural details.

PLOT E AND TELECOM HOUSE

Outline Application
Environmental Statement (ES)

Volume 1: Main Text

Waterman
August 2015

Environmental Statement - Volume 1 - Main Text

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1. Introduction

- 1.1. In January 2015, Sackville Developments (Reading) Ltd (hereafter referred to as the Applicant), received outline planning permission for the mixed use redevelopment of approximately 2.14 hectares (ha) of land to the south of Reading Mainline Station (Planning Application Reference: 130436/OUT). The development, known as Station Hill 3 (and hereafter referred to as the SH3 Scheme), encompasses land between Station Hill, Greyfriars Road, Friar Street and Station Road (hereafter referred to as the SH3 Site). The SH3 Scheme includes the demolition of all the existing buildings and structures within the SH3 Site, excluding the existing multi-storey NCP car park, and replacement with four new commercial buildings (referred to as Building Plots A - D) and two new primarily residential buildings (referred to as Building Plots E and F). The existing NCP Car-Park would be reconfigured and refurbished.
- 1.2. At the same time as submission of the application for the SH3 Scheme in March 2013, the Applicant also submitted a full application for a Temporary Flexible Event Space on 0.35 ha of land within the north east of the SH3 Site (Planning Application Reference: 130440/FUL). The Temporary Flexible Event Space would operate as an interim condition prior to construction of the SH3 Scheme. The Temporary Events Space was granted planning permission by RBC in January 2014.
- 1.3. Since submission of the outline planning application for the SH3 Scheme in March 2013, the Applicant has acquired a plot of land adjacent to Plot E of the SH3 Scheme, known as the Telecom House Site, and wishes to obtain outline planning consent for a development which encompasses both the Telecom House Site and Plot E (hereafter referred to as the Telecom House / Plot E Scheme).
- 1.4. The Telecom House / Plot E Scheme occupies approximately 0.77 ha of land bounded by Garrard Street to the north, 40 Friar Street to the east, Friar Street to the south and 52 Friar Street to the west. The proposals comprise demolition of 41 to 51 Friar Street and the buildings behind (4 to 20 Garrard Street) and erection of new buildings to provide residential uses and, a range of town centre uses including retail and related uses.
- 1.5. A plan showing the location of the SH3 Site and Telecom House / Plot E Site (hereafter collectively known as the Site) is presented as Figure 1.1 and a plan showing the Telecom House / Plot E application boundary, the Temporary Events Space application boundary and the wider SH3 Scheme application boundary is presented as Figure 1.2. A plan of the red line boundary for the Development assessed as part of this ES is presented as Figure 1.3.

Previous Environmental Information Submitted in Relation to the SH3 Scheme and EIA Strategy

- 1.6. An Environmental Impact Assessment (EIA) was undertaken of the SH3 Scheme and an Environmental Statement (ES) prepared to accompany the outline planning application submitted in 2013 (hereafter referred to as the 2013 ES). Following submission of the 2013 ES, an ES Addendum was prepared and submitted in September 2013 (referred to as the 2013 ES Addendum) to address comments raised by consultees and undertake an additional townscape and visual assessment of cumulative schemes. Together, the 2013 ES and 2013 ES Addendum form the ES for the purposes of the SH3 Scheme.

- 1.7. Due to the links between SH3 and the proposed Telecom House / Plot E planning application, it is not considered appropriate to undertake an EIA on the Telecom House / Plot E application in isolation. This is because the Telecom House / Plot E scheme application requires the removal of Plot E from the consented SH3 Scheme (by means of a Section 73 Application) and therefore may alter the environmental effects of the SH3 Scheme as reported in the 2013 ES and 2013 ES Addendum as well as potentially generate environmental effects itself. Furthermore, the Telecom House / Plot E Scheme and the remainder of the SH3 Scheme are closely linked and accordingly are considered to comprise one project for EIA purposes. It has therefore been agreed with RBC that a new updated ES will be prepared to consider the effects of the consented SH3 Scheme, minus Plot E (via the Section 73 Application), plus the new Telecom House / Plot E Scheme (via the Outline Application). These are hereafter collectively referred to as the 'proposed Development'.
- 1.8. The proposals for the Temporary Flexible Events Space would remain the same, irrespective of the Telecom House / Plot E Scheme. However, the phasing of the demolition of the wider SH3 Scheme and construction of the Temporary Events Space has changed. This has meant that, whereas within the 2013 ES, it was assumed that only demolition of the Station Hill Parade (including 26 to 58 Station Hill) would be demolished to facilitate construction of the Temporary Events Space, demolition of the wider SH3 Site has already started meaning that the northern part of the SH3 Site, to the north of Garrard Street (excepting Xafinity House and the NCP car park) would be demolished prior to construction of the Temporary Events Space. This has therefore been addressed within this ES. In most cases, this has been addressed qualitatively in line with the 2013 ES and as agreed with RBC.

Development Context

Planning Context

- 1.9. The Reading Local Development Framework (LDF) Plan Core Strategy was adopted in January 2008¹ and updated in 2015. The Core Strategy identifies the Reading Mainline Station/River Project Area as a Major Development Area (Policy RC1) and promotes the Site for mixed use development including offices, retail, leisure and housing.
- 1.10. The Reading Central Area Action Plan (RCAAP)² was adopted in January 2009, and also as part of the LDF. The RCAAP's vision for the Station/River Major Opportunity Area is as follows:
- "A flagship scheme, extending the centre and providing a mixed use destination..."*
- 1.11. Policy RC1 of this document relates to Development in the Station/River Major Opportunity Area (within which the Site is located) and promotes a high density development suitable for a mix of uses including retail and leisure use. It also seeks greater pedestrian and cycle permeability than at present and requires the safeguarding of space for public transport proposals.
- 1.12. The RCAAP identifies the northern part of the Site (to the north of Garrard Street) as RC1c, Station Hill, specifying that this area will be developed for a mix of uses at a high density, including retail and leisure on the ground and lower floors and residential and offices on higher floors. The RCAAP encourages enhanced links through the various sites identified within the RCAAP, and a network of streets and spaces, with key routes through the Site to provide active uses.

- 1.13. The southern part of the Site (to the south of Garrard Street) is identified within the RCAAP as RC1b, Friars Walk and Greyfriars Road. Within this area, development is sought to be of a mixed-use with a significant leisure element, and active retail and leisure uses on the ground floor, particularly along Friar Street. A mix of uses on higher floors is also encouraged. As for RC1c the RCAAP seeks enhanced linkages in a north-south direction at a single level into the Station Hill area and through to Reading Mainline Station.
- 1.14. The Station Hill South Planning and Urban Design Brief³, adopted in 2007, sets out specific urban design and planning principles for the Site and is adopted as a Supplementary Planning Document (SPD).
- 1.15. In addition to the above planning policy, the Reading City Centre Framework⁴, 2008 and the Station Area Framework⁵, 2010 set out design principles for the area within the context of the RCAAP and Station Hill South Planning and Urban Design Brief, 2007.

Background to the Current Planning Application

- 1.16. In 2004, Land Securities developed plans for the mixed-use redevelopment of the Site. However, a planning application was not made and the Site was subsequently sold to Sackville Developments (Reading) Limited.
- 1.17. An outline planning application was submitted in February 2007 (Planning Application Reference: 07/00188/OUT) for a mixed-use development located in the area that now comprises the northern area of the Site (between Garrard Street and the Reading Mainline Station and Station Hill). This outline planning application is referred to as 'Station Hill 1' (SH1). However, additional land was subsequently acquired around Friar Street and the application was subsequently withdrawn to enable a complete redesign of the scheme.
- 1.18. In 2009 an outline application (Ref 09/01079/OUT) was made for the Site (hereafter referred to as 'Station Hill 2 (SH2)'). RBC subsequently granted planning permission in October 2011 for this mixed used scheme comprising residential development (Use Class C3), offices (Use Class B1a), retail (Use Classes A1-A4), community space (Use Class D1), cultural/leisure space (Use Class D1/D2), bowling alley (D2), and health and fitness (Use D2) and associated car and cycle parking, landscaping, infrastructure and public realm works.
- 1.19. Further details of these former schemes are provided in Chapter 4: Alternatives.
- 1.20. In light of market conditions, the consented SH2 Scheme was not considered deliverable and a new outline planning application for the Site (known as the SH3 Scheme) was prepared by the Applicant and its design team. The revised outline proposals were for a lower rise, lower density development, complementing the redevelopment of Reading Mainline Station and other neighbouring sites. As described above, this scheme was granted planning permission in January 2015.

Nature of the Applications

- 1.21. The following applications are relevant to this ES:
 - The consented SH3 Scheme which was the subject of an outline planning application with matters of appearance, landscaping, layout, scale and access reserved;

- The consented Temporary Events Space which was the subject of a full planning application in 2013;
- A new outline planning application for the Telecom House / Plot E Scheme with matters of appearance, landscaping, layout, scale and access reserved; and
- A new Section 73 Application to amend the consented SH3 Scheme to remove the Plot E from the SH3 Scheme in order to accommodate the Telecom House / Plot E Scheme within an enlarged SH3 proposal.

1.22. The planning application forms define the Telecom House / Plot E Scheme application as follows:

“Outline Application for mixed use redevelopment of Plot E of the Station Hill site and neighbouring Telecom House Site (48 to 51 Friar Street & 4 to 20 Garrard Street) to comprise the demolition of existing buildings and erection of new buildings/structures to provide residential units, a range of town centre uses including retail and related uses (Use Class A1-A5), associated infrastructure, public realm works and ancillary development (all matters are reserved).”

1.23. The consented SH3 Scheme was defined on the planning application forms as:

“Outline Application for mixed use redevelopment of the site through the demolition and alteration of existing buildings and erection of new buildings/structures to provide Offices (Use Class B1), a range of town centre uses including retail and related uses (Use Class A1 - A5), leisure (Use Class D2) and residential units, associated infrastructure, public realm works and ancillary development (all matters reserved).”

1.24. The planning application forms define the Section 73 Application to amend the SH3 Scheme as:

“Section 73 application to vary conditions 2, 5, 6, 54 and 57 of Outline Planning Permission 130436 in order to remove Plot E.”

1.25. The consented Temporary Events Space was defined on the planning application forms as:

“Demolition of Station Hill Retail Parade (including 26 to 58 Station Hill) to create a multipurpose events space for temporary uses (Use Classes A1 to A5, D1, D2 & Sui Generis). Works of hard and soft landscaping and other incidental works.”

Format of the Environmental Statement

1.26. The ES is divided into three volumes, comprising the main text of the ES, figures and a series of appendices. A Non-Technical Summary (NTS) of the ES is also provided as a standalone document. The content of these volumes is described below.

Volume 1: Environmental Statement - Main Document and Volume 2: Environmental Statement – Townscape, Conservation and Visual Assessment

1.27. These documents provide the full text of the ES in accordance with the EIA Regulations.

1.28. Regulation 2 (1) of the EIA Regulations identifies that an ES should amongst other matters, contain information that is:

“...reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile”.

Volume 3: Environmental Statement - Figures

- 1.29. This volume provides a set of figures and illustrations in support of the main text of the ES presented in Volume 1. This volume includes a set of the Parameter Plans.

Volume 4: Environmental Statement - Appendices

- 1.30. A number of appendices are presented and are provided in a separate volume to supplement the main ES text. The appendices are numbered according to the number of the corresponding Chapter in Volume 1.

Environmental Statement - Non-Technical Summary

- 1.31. This comprises a summary of the ES in ‘non-technical language’ as required under the EIA Regulations. Its objective is to provide a concise and balanced summary of the ES without excessive technical detail or scientific language so as to be readily understood by consultees and members of the public not familiar with EIA terminology. The Non-Technical Summary (NTS) is produced as a separate document to facilitate wider public distribution.

Project Team

- 1.32. The EIA has been co-ordinated by Waterman Infrastructure & Environment Ltd (Waterman IE), who has compiled this ES in conjunction with the Applicant and a team of specialist consultants. These consultants are presented in Table 1.1 along with their respective disciplines and contributions to the EIA.

Table 1.1: EIA and Design Team

Organisation	Expertise/EIA Input
Sackville Developments (Reading) Ltd	Applicant
Quod	Planning and socio-economic consultants
Allies and Morrison	Architect
Foundations Archaeology	Archaeological consultants
Faithful & Gould	Cost Consultants
GIA	Daylight, sunlight and overshadowing assessors
Hoare Lea and Partners	Building services engineer, drainage consultant, and energy and sustainability consultants
Peter Brett Associates (PBA)	Highway consultants and sewer diversion advisors
RWDI	Wind microclimate consultants
Tavernor Consultancy	Townscape and Visual Assessors
Cityscape	Visualisations

Organisation	Expertise/EIA Input
Waterman IE	EIA co-ordinators, air quality, noise and vibration, ecology, land quality, and flood risk consultants
Waterman Structures	Structural engineers
Waterman IE	Flood risk consultants

ES Availability and Comments

- 1.33. The ES is available for viewing by the public during normal office hours at the Planning Department of RBC. Comments on the planning application should be forwarded to RBC at the following address:

Development and Control Manager
Reading Borough Council
Civic Centre
Reading
RG1 7AE

Tel: 0118 937 3737

- 1.34. Additional copies of the NTS are available free of charge. Copies of the full ES are available for purchase. For copies of these documents, please contact:

Waterman Infrastructure & Environment Ltd
Pickfords Wharf
Clink Street
London SE1 9DG
Tel: 020 7928 7888

email: ie@watermangroup.com

References

- ¹ Reading Borough Council, 2008, Local Development Framework, Core Strategy, RBC, Reading
- ² Reading Borough Council, 2009, Reading Central Area Action Plan (RCAAP), RBC, Reading
- ³ Reading Borough Council, 2007, Station Hill South Planning and Urban Design Brief, RBC, Reading
- ⁴ Reading Borough Council, 2008, Reading City Centre Framework, RBC, Reading
- ⁵ Reading Borough Council, 2010, Reading Station Area Framework, RBC, Reading

2. EIA Methodology

Introduction

- 2.1. This Chapter sets out the general approach to, and methodology for undertaking the EIA. The Chapter describes the legislative framework within which the EIA has been undertaken and identifies key guidance. The EIA scoping process is also described, together with a description of the general methodology applied to assess the likely significant environmental effects. The Chapter also sets out the structure of the assessment chapters which form this ES. More specific methodologies are described for each of the specific topics that are assessed in Chapters 7 to 16 inclusive.

General Approach

- 2.2. This ES has been prepared to comply with the 2011 EIA Regulations¹ which implement the European Council Directive 2001/1/92/EU². Reference has also been made to currently available EIA good practice guidance, including Good Practice Guidance from the Institute of Environmental Management and Assessment (IEMA)^{3,4} and topic specific guidance, detailed where appropriate in the relevant technical chapters.
- 2.3. The EIA has considered the likely significant environmental effects of the proposed Development, utilising current knowledge of the Site and the surrounding environment.
- 2.4. Based on the findings of the studies undertaken as part of the EIA, methods of avoiding, reducing, or offsetting likely significant adverse effects (collectively known as ‘mitigation measures’) have been identified. Such mitigation measures are set out in each relevant technical chapter of this ES. Measures to enhance the environmental effects of the Development have also been identified, where appropriate.
- 2.5. In line with best practice guidance, a Scoping Study was undertaken at the start of the assessment process to identify the key environmental issues to be addressed in the ES. Further details of this study are provided later in this Chapter.
- 2.6. Detailed technical studies have been on-going throughout the design process, providing information about environmental issues and constraints that may affect the proposed Development. In addition reference has been made to studies undertaken previously to support the outline planning applications for SH1, SH2 and SH3. The Applicant and the design team have therefore taken these environmental issues and constraints into account during the design evolution and sought to ‘design out’ potentially adverse effects wherever possible. Further details are provided in Chapter 4: Alternatives.
- 2.7. The EIA has considered both likely significant beneficial and adverse effects of the proposed Development during the demolition and construction works and once the Development is complete and occupied. In line with legislative and best practice requirements, direct, indirect, cumulative, short, medium, long-term, permanent, beneficial and adverse effects have been addressed where applicable. The approach taken in the assessment of cumulative effects is set out within Chapter 17: Cumulative Effects.

Approach to the Assessment of the Outline Planning Application

- 2.8. As described in Chapter 1: Introduction, the Telecom House / Plot E Scheme is, and the SH3 Scheme was the subject of applications for outline planning permission with matters of appearance, landscaping, layout, scale and access reserved. The Town and Country Planning (Development Management Procedure) (England) Order 2015 (DMPO)⁵ sets out the minimum information that should be provided with an outline planning application.
- 2.9. Regulation 3 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (hereafter referred to as the 'EIA Regulations')⁶ prohibits local planning authorities (LPAs) from granting planning permission without having first taken the environmental information into consideration. In accordance with the minimum requirements required by the DMPO, and to provide sufficient information such that the likely significant effects of the Development can be identified whilst providing the Applicant with sufficient flexibility to enable a high quality and viable redevelopment a series of 'parameters' were defined for the Development. These parameters are set out on Parameter Plans, with additional commitments set out in a written Development Specification and Framework document and Design Codes.
- 2.10. The Development Specification and Framework defines and describes the principal components of the proposed Development, including the form and content of the planning application as well as the parameters for future detailed applications to be submitted under reserved matters. Compliance with the Development Specification would be secured by means of a suitably worded planning condition.
- 2.11. A series of Design Codes have also been submitted in support of the proposed Development, which sets out supplementary information on the design and appearance of the outline proposed Development including materials, and texture. The Design Codes are also anticipated to be secured by planning condition or obligation.
- 2.12. The Parameter Plans together with the Development Specification and Framework and Design Codes have therefore formed the basis of the EIA reported within this ES.
- 2.13. A list of the parameter plans and full description of the Development is provided in Chapter 5: The Proposed Development.
- 2.14. The majority of the technical assessments in this ES identify the likely significant effects of the Development based on the 'maximum' parameters of the built form, as these typically represent the likely 'worst case' scale and magnitude of effects. Where this is not the case, such as for assessment of employment, the assessment of effects also considers 'minimum' parameters in order to represent the 'worst case scenario'.

Future Baseline

- 2.15. As part of the 2013 ES, a future baseline scenario was considered because the Reading Mainline Station located immediately north of the Site was being redeveloped at that time (Planning Application Refs: 10/01270/LBC and 10/01269/FUL). These upgrade works have now been completed and are therefore included in the baseline conditions.
- 2.16. However, a number of other schemes within the vicinity of the Site are currently under construction. Given that these schemes have consent, are funded and are in the process of being implemented,

they have been considered as the 'future baseline'. The future baseline therefore accounts for the full implementation of these schemes and where relevant, the Technical Assessments have taken account of them. The future baseline schemes are shown on Figure 2.1 and comprise:

- **Phase 2, Land at Chatham Place (Application Ref. 12/00798/FUL):** Detailed planning application for Phase 2 of the Chatham Place redevelopment comprising one nine storey and one nineteen storey building to accommodate a total of 184 residential units and ground floor retail uses (Use Classes A1, A2 or A3), together with basement car parking, public and private amenity space, public realm works and landscaping and alterations to existing vehicular access;
- **21 Caversham Road (Application Ref. 110628):** approved 09/02/2012): Demolition of existing building and erection of 11 x 1-bed flats;
- **Energis House, Forbury Road (Application Ref. 12/01856/FUL):** approved 03/06/13 Demolition of existing building and construction of two new office buildings (Use Class B1) with associated access, car parking, servicing, landscaping and engineering works;
- **Thames Tower (Application Ref: 141043):** approved 13/10/2014: refurbishment and recladding of the existing building, construction of four additional storeys of offices (use class B1), change of use of the ground floor to flexible office and retail uses (classes A1, A2, A3 and B1), rooftop plant and associated works;
- **Aldwych House 2 Blagrove Street Reading RG1 1AZ** (Application number 101300 – approved November 2010): Demolition of existing office building and construction of new 6-storey office building (total approximately 13,500 sqm) with associated basement car park and external works.

- 2.17. However, with regard to the Site itself, although demolition is currently on going, in order to provide RBC with a reasonable comparison of effects between those of the currently consented SH3 Scheme and those of the consented SH3 Scheme minus Plot E, plus the Telecom House / Plot E Scheme, and given that the demolition itself forms part of the Development being assessed, the on-site baseline will be that prior to commencement of demolition.

Temporary Flexible Events Space

- 2.18. Planning permission was granted in January 2014 for a Temporary Event Space, which is proposed to be located in the north eastern part of the Site (broadly on Building Plot C). These proposals comprise demolition of the former Station Hill retail parade (including 26 to 58 Station Hill) to create a landscaped area and multipurpose events platform for temporary uses (Use Classes A1 to A5, D1, D2 and *Sui Generis*). In addition, works of hard and soft landscaping and other incidental works are proposed.
- 2.19. The works are likely to be implemented in late 2015, following demolition of some buildings within the northern part of the SH3 Site (to the north of Garrard Street) but in advance of construction of the main SH3 scheme. The Temporary Flexible Events Space is likely to remain in situ until the construction works start on Building Plot C.
- 2.20. Due to the relationship of the Development with the Temporary Events Space, a description of the potential significant effects, mitigation measures, and likely significant residual effects of the Temporary Flexible Events Space are set out within each technical chapter.

Comparison with the Consented SH3 Scheme

- 2.21. In order to provide RBC, other statutory consultees and interested parties with an understanding of the differences between the effects of the consented SH3 Scheme and those of the proposed Development, that is the consented SH3 Scheme, minus Plot E plus the Telecom House / Plot E Scheme, each technical chapter of the ES has included a summary, in the summary and conclusions section and where appropriate, throughout the chapter, of the differences between the effects of the consented SH3 Scheme and those of the proposed Development. In addition, to enable a meaningful comparison between the effects, the conditions on the Site have been assumed to be those pre-demolition. Furthermore, in some cases, guidance regarding assessment methodologies have been updated since undertaking the 2013 ES. However, where appropriate, the updated guidance has not been fully adopted within this ES to enable a comparison of effects. Where this is the case, this is clearly stated within the relevant technical chapter of this ES.

Scoping the EIA

- 2.22. 'Scoping' is an important component of the EIA process, and involves focusing the study (and hence the ES) on those issues of greatest potential significance. It is also important in identifying all of the potentially significant effects of the Development through design, demolition and construction works and once it is complete, to ensure that appropriate mitigation options are considered.
- 2.23. A Scoping Study was undertaken by Waterman EED (now Waterman IE) together with technical specialists on the SH3 Scheme. Based on this study, an EIA Scoping Report was prepared and submitted to RBC in February 2012 together with a request for a formal Scoping Opinion on the issues to be included within the ES.
- 2.24. The Scoping Report set out the overall approach to the EIA and identified the likely environmental effects that may arise from the Development. The proposed scope of the assessments was guided by the outcomes of the EIA process undertaken for SH1 and SH2 together with an understanding of the emerging proposals for SH3.
- 2.25. A Scoping Opinion was received from RBC on 17th April 2012. Following consultation with statutory consultees, the Scoping Report and Scoping Opinion confirmed that the following key environmental issues should be addressed as part of the EIA:
- Townscape, Conservation and Visual Assessment (Volume 3);
 - Socio-Economics (Chapter 7);
 - Archaeology (Chapter 8);
 - Transportation and Access (Chapter 9);
 - Air Quality (Chapter 10);
 - Noise and Vibration (Chapter 11);
 - Ground Conditions and Contamination (Chapter 12);
 - Surface Water Drainage and Flood Risk (Chapter 13);
 - Ecology (Chapter 14);
 - Wind (Chapter 15);

- Daylight, Sunlight and Overshadowing (Chapter 16); and
 - Cumulative Effects (Chapter 17).
- 2.26. The Scoping Report and Scoping Opinion received from RBC are included as Appendix 2.1 and 2.2 respectively. To summarise, in their Scoping Opinion, RBC stated:
- “It is the formal opinion of the Local Planning Authority that the issues and recommendations covered in the document ‘Station Hill 3, Reading: EIA Scoping Report’ are appropriate and necessary and should be included in any subsequent Environmental Statement”*
- 2.27. Key issues that arose as a result of the Scoping Study in relation to the ES and how these issues have been addressed are presented in Table 2.1.

Table 2.1: Key Issues Raised in the Scoping Response of April 2012

Topic	Key issues raised in the Scoping Response	Response
Townscape, Conservation and Visual Assessment	RBC made no comments on the Townscape, Conservation and Visual Assessment in their scoping opinion. They were consulted separately to agree the proposed viewpoints.	Further detail is set out in Volume 3: Townscape, Conservation and Visual Assessment.
Archaeology	Berkshire Archaeology agreed that the Desk-Based Assessment (DBA) undertaken for SH2 should be updated to account for changes in policy and both the findings from a small field investigation that was undertaken since the last DBA was written. Berkshire Archaeology highlighted that archaeological deposits are known to survive on the Site, though likely to be in a truncated state. Berkshire Archaeology stated that if the evaluation should demonstrate that relatively intact Viking fortifications are present within the site that these deposits may be required to be preserved in situ.	The Desk Assessment has been updated to take account of recent investigation. Further detail is set out in Chapter 8: Archaeology.
Transport	RBC Transport Strategy were consulted on the EIA Scoping Report and Transport Assessment Scoping Report. No significant comments were made in relation to the scope of either assessment. However, minor comments were made in relation to the detailed methodology relating to use of 2011 Census data if available, residential trip generation and modal share.	Further detail is set out in Chapter 9: Transportation and Access and Appendix 9.1: Transport Assessment.
Air Quality and Noise	No comments were made in relation to air quality or noise, and the assessment was undertaken in line with the methodology set out in the scoping report.	The results of the assessments are set out in Chapter 10: Air Quality and Chapter 11: Noise and Vibration respectively.
Ground Conditions and Contamination	The EA suggested further environmental investigation would be required of soils and groundwater on the basis of historical potentially contaminative land uses. Sufficient information is available for the purposes of identifying the significant effects in accordance with the EIA Regulations. The Site Investigation would therefore	Further detail is set out in Chapter 12: Ground Conditions and Contamination

Topic	Key issues raised in the Scoping Response	Response
	be carried out following demolition and secured by planning condition	
Flood Risk	The Environment Agency stated they were satisfied with the proposed scope of the Flood Risk Assessment (FRA). The response encouraged the use of innovative SuDS techniques within the drainage network. The response also encouraged the continued use of the proposed exemplar SuDS drainage scheme for a high density urban redevelopment in the previous outline application. The reduction of runoff rates to below that of brownfield conditions were encouraged.	A summary of the outline drainage strategy is provided in Chapter 13: Surface Water Drainage and Flood Risk together with Appendix 13.1: Flood Risk Assessment.
Ecology	RBC set out in the Scoping Report that there is anecdotal evidence that peregrines may nest on the buildings and black redstarts have nested at the Site in the past. Therefore the EIA should consider these species as possible receptors and a nesting bird survey should be undertaken.	A Black Redstart and Nesting Bird Survey was undertaken in the summer of 2012 to determine the presence of these species. Peregrine Falcons were not found to be nesting on the Site. The results of these surveys, the effect on these species and proposed mitigation is set out in Chapter 14: Ecology.
Wind, Daylight, Sunlight and Overshadowing	No objections were made to the proposed methodology. However, RBC requested that consideration was given to the effects of the Development with consented and emerging proposals in the surrounding area.	The assessments set out in Chapter 15: Wind and Chapter 16: Daylight, Sunlight and Overshadowing assess the scheme against the baseline context (existing context with redevelopment of the Station). A cumulative assessment is set out in Chapter 17: Cumulative Effects.
Cumulative Effects	The list of proposed schemes requiring consideration as part of a cumulative assessment as set out in the Scoping Report were agreed. Subsequently, a further review was undertaken to determine additional schemes which have been consented since the drafting of the Scoping Report. As a result of this review, four additional schemes have been included. The revised list was considered acceptable by RBC.	The cumulative assessment is set out in Chapter 17: Cumulative Effects.

- 2.28. Prior to commencement of this updated ES, a Scoping Letter was submitted to RBC in June 2014 setting out the proposed approach to this updated EIA and how each of the Technical Chapters may have been affected by the inclusion of the Telecom House / Plot E Scheme. The Scoping letter is included as Appendix 2.3. A Scoping Opinion was received in October 2014 and is presented in Appendix 2.4. A summary of the responses is provided in Table 2.2.
- 2.29. Due to the subsequent time that elapsed since submission of the Scoping Request in June 2014 and submission of the application, a further letter setting out the proposed approach to the EIA was submitted in June 2015. This letter is included in Appendix 2.5. A formal response was not requested or received from the Council due to the timescales to submission. However, informally,

RBC confirmed that the proposed approach was acceptable and provided updates in relation to the cumulative schemes (29-35 Station Road and Garrard House) which has been incorporated into this EIA.

Table 2.2: Key Issues Raised in the Scoping Response of October 2014

Topic	Comment from RBC	Response
General	A number of changes to sensitive receptors had occurred since the 2013 ES and new change of use to residential developments had been made in the vicinity of the Site. RBC recommended that these were taken into account in the EIA.	An updated list of sensitive receptors and new future sensitive receptors is provided in Chapter 3 of this ES. All technical authors have considered these receptors where appropriate.
Development Programme and Construction	The chapter will need to be updated to reflect the inclusion of the Revised Scheme and to confirm how/if this alters the proposed phasing of the overall scheme.	Chapter 6 has been updated accordingly.
Socio Economics	It should be noted that the socio economics chapter in the 2013 ES did not assess the effect of the additional office floor space on the Borough and wider area in terms of affordable housing. The socio economic effects should be assessed in terms of their impact on the Borough as a whole, not just Abbey Ward.	Chapter 7: Socio Economics
Archaeology	Telecom House falls within an Area of Archaeological Potential. Fieldwork may be required in advance of the application submission.	Noted: Chapter 8 and DBA updated informed by information from the existing buildings and further knowledge of the archaeological potential in the vicinity of the Site.
Transport and Access	Liaison should be undertaken with the Highway Authority in relation to the total number of car parking spaces.	Noted. The transport consultant has liaised with the Highways Authority regarding the scope of the Transport Assessment.
Noise	No comments.	
Air Quality	The use of 2011 baseline data should be fully justified.	Noted. Liaison has been undertaken with the Environmental Protection Officer at RBC and a response has been provided in the letter of June 2015 justifying the use of the data.
Townscape, Visual and Heritage Assessment	The impact, including cumulative impact on heritage assets including Greyfriars Church, St Marys church etc will need to be re-evaluated.	Noted. Further detail is provided in Volume 3: Townscape, Visual and Heritage Assessment.
Ground Conditions and Contamination	A walkover survey is unlikely to be sufficient. A full detail Site Investigation may be required.	Liaison has been undertaken with the Environmental Protection Officer at RBC and it has been agreed that a site investigation is not required at this stage. A site investigation will be undertaken post demolition but a scope will be submitted as part of the EIA. This is presented in Appendix 12.3.

Topic	Comment from RBC	Response
Surface Water Drainage and Flood Risk	No comments	N/A
Ecology	The assessment needs to include potential impact on Black Redstart, Peregrine and bats.	Noted. Further detail is provided in Chapter 14: Ecology
Wind	No comments	
Daylight, Sunlight and Overshadowing	The testing will need to include an assessment of the sites to the west of the Telecom House Site.	Noted. Further detail is provided in Chapter 16: Daylight, Sunlight and Overshadowing.
Cumulative Assessment	A number of changes to the list of cumulative schemes submitted as part of the scoping request were provided.	The cumulative schemes have been updated in line with the comments received. In addition, further changes have been made, as set out in the letter of June 2015 due to changes in the status of certain cumulative schemes such that they are now considered future baseline.

Evaluation of Significance

- 2.30. The EIA process aims to focus attention on the topics which are likely to give rise to significant effects on the environment. The purpose of the EIA is to identify and mitigate the likely significant adverse effects of a project.
- 2.31. Environmental effects have been predicted with reference to definitive standards and legislation, where available. Where it has not been possible to quantify effects, qualitative assessments have been carried out, based on available knowledge and professional judgement. Where uncertainty exists, this has been noted in the relevant assessment Chapter.
- 2.32. The significance of predicted effects has been determined with reference to assessment criteria for each environmental topic considered. These criteria apply a common EIA approach of classifying effects according to whether they are substantial, moderate or minor effects as well as adverse, negligible or beneficial.
- 2.33. Specific criteria for each issue have been developed, giving due regard to the following:
- Extent and magnitude of the effect;
 - Duration of the effect (whether short, medium or long term);
 - Nature of the effect (whether direct or indirect, reversible or irreversible);
 - Whether the effect occurs in isolation, is cumulative or interactive;
 - Performance against environmental quality standards or other relevant pollution control thresholds;
 - Sensitivity of the receptor; and
 - Compatibility with environmental policies.

- 2.34. For issues where definitive quality standards do not exist, significance has been based on the:
- Local, district, regional or national scale of value of the resource and/or receptor affected;
 - Number of receptors affected;
 - Sensitivity of those receptors; and
 - Duration of the effect.
- 2.35. In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental resources or receptors, the following terminology has been used throughout the ES. Effects have been expressed as:
- **Adverse:** Detrimental or negative effect to an environmental resource or receptor;
 - **Negligible:** No significant effect to an environmental resource or receptor; and
 - **Beneficial:** Advantageous or positive effect to an environmental resource or receptor.
- 2.36. Where adverse or beneficial effects have been identified, these have generally been assessed against the following scale:
- **Minor:** Slight, limited duration and frequency or highly localised effect/ limited numbers of receptors affected;
 - **Moderate:** Limited effect (by extent, duration or magnitude) which may be considered significant; and
 - **Substantial:** Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.
- 2.37. Each of the technical chapters provides the specific criteria, including sources and justifications, for quantifying the different levels of effect. Where possible, this has been based upon quantitative and accepted criteria for example, the air quality standards contained in the National Air Quality Strategy (NAQS) or noise assessment guidelines set out by the National Planning Policy Framework (NPPF) and World Health Organisation (WHO) guidelines, together with the use of value judgements and expert interpretations to establish to what extent an effect is environmentally significant.
- 2.38. In the context of the Development, short term effects are considered to be those that last less than 5 years, primarily those associated with demolition and construction and long-term effects are those lasting more than 10 years and are primarily associated with the completed Development. Local effects are those affecting receptors within and in proximity to the Site, whilst effects upon receptors within the wider RBC boundary are considered to be at a district level. Sub-regional effects are those affecting adjacent boroughs, whilst effects upon the south-east of England are considered to be at a regional level. Effects upon different parts of the country, or England as a whole, would be considered to be at a National level. Finally, effects across national boundaries would be considered at an International level. No National or International effects have been identified within this ES.

Other Developments and Cumulative Effects

- 2.39. Effects that result from incremental changes caused by other, present or reasonably foreseeable schemes together with the Development are known as cumulative effects. The EIA therefore takes account of the proposed Development together with other developments in the area.
- 2.40. The assessment of cumulative effects deals with two types of effects:
- **Type 1 Effects:** The combination of individual effects, for example noise and dust from one development on a particular receptor; and
 - **Type 2 Effects:** Effects from several developments, which individually might be insignificant, but when considered together could result in a significant cumulative effect.
- 2.41. Both types of effects are considered within Chapter 17: Cumulative Effects. Type 1 effects have been assessed using the findings of all technical assessment included within this ES and professional judgement. The developments considered as part of the Type 2 effects were agreed with RBC as part of the Scoping process and these developments were included in the technical assessments where appropriate. Further details pertaining to the Cumulative schemes and the results of the cumulative assessment are presented in Chapter 17: Cumulative Effects.

Structure of Technical Chapters

- 2.42. Through the EIA process, the likely significant environmental effects of the Development have been assessed. Each environmental issue has been assigned a separate Chapter in the ES (Chapters 7 - 16), and within each of these Chapters the assessment has been structured in the following way:

Introduction

- 2.43. The Introduction provides a brief summary of what issues are considered in the Chapter, states the author and highlights relevant appendices which accompany the Chapter.

Legislation and Planning Policy Context

- 2.44. This section includes a short summary of national, regional and local policies that are directly relevant to the particular environmental issue and assessment. Legislation is also identified where applicable.

Assessment Methodology and Significance Criteria

- 2.45. The methods used in undertaking the technical study, together with an explanation of the approach to defining the significance of likely environmental effects are outlined in this section with reference to published standard guidelines, best practice and relevant significance criteria. The limitations applicable to the technical assessment are also defined in this section of each chapter. Furthermore, it sets out any limitations to the assessment or any uncertainty.
- 2.46. This section of each Chapter also describes the specific consultation to agree the scope and methodology of the assessment.

- 2.47. In addition, this section of each Chapter describes the basis of the assessment of the outline planning application with reference to the use of minimum and maximum parameters and relevant sections of the Development Specification and Framework document and Design Codes.

Baseline Conditions

- 2.48. In order to assess the effects of the Development, it is necessary to determine the environmental conditions that exist on the Site, in the absence of redevelopment. These are known as baseline conditions. For the purposes of this ES, it has been agreed with RBC that the on Site baseline conditions are those that existed prior to commencement of construction to allow a meaningful comparison of the effects of the Development with those of the consented SH3 Scheme. In addition, the demolition works form part of the Development being assessed.
- 2.49. A summary of the baseline conditions, including future baseline conditions, relevant to each assessment is provided within each technical chapter.

Potential Effects

- 2.50. This section identifies the likely significant effects from the Development as proposed in the outline planning applications and considers the effects during demolition and construction, and once the Development is complete and operational. It also summarises the effects of the Temporary Events Space application, which would be constructed prior to the wider Development. The way in which effects are assessed is described in general terms in the following sections of this Chapter.

Mitigation

- 2.51. One of the main aims of the EIA is to develop mitigation measures to prevent, reduce and where possible, offset any significant adverse effects of a development. An iterative approach has been adopted towards the design of the Development, which has evolved alongside the EIA process. This has enabled many mitigation measures to be effectively designed into the Development, thereby reducing the need for further mitigation. Mitigation measures can relate to design, construction or the activities associated with completed Development. Examples include:
- **Design:** Such as the position or orientation of buildings within the Site. These have predominantly been incorporated into the Development as it has evolved and are therefore described in Chapter 4: Alternatives;
 - **Construction:** Commitment to undertake the construction works in a specific way, for example the use of particular plant, phasing of the works, regular monitoring and implementation of a Construction Environmental Management Plan (CEMP); and
 - **Completed Development:** Inclusion of specific features such as water, waste and energy efficiency design of buildings.
- 2.52. Where significant adverse environmental effects have been identified, the Applicant has committed to implement the mitigation measures as set out in the relevant technical Chapter. Since the proposed Development is submitted in outline form, many of the mitigation measures would need to be incorporated in the detailed design.

Residual Effects

- 2.53. This section identifies the remaining residual effects of the Development and Temporary Events Space and summarises the residual effects assuming implementation of the proposed mitigation measures. It includes an assessment of the significance of those effects in accordance with the criteria set out later in this Chapter.
- 2.54. A summary of the residual effects is included at Chapter 18: Summary of Mitigation and Residual Effects.

Summary and Conclusions

- 2.55. This section provides a brief summary of the chapter findings.

Assumptions and Limitations

- 2.56. The principal assumptions that have been made, and any limitations that have been identified in undertaking the EIA, are set out below. Assumptions specifically relevant to each topic have been set out in each chapter:
- The assessments contained within each of the technical chapters are based upon the Parameter Plans, Development Specification and Framework, Design Code documents and land use schedules submitted as part of the outline planning application for both SH3 and the Telecom House / Plot E Scheme;
 - The assessments are based on the SH3 Scheme and Telecom House / Plot E Scheme being linked such that one would not be built out without the other;
 - The assessment of demolition and construction effects are based upon the indicative demolition and construction timetable, phasing and methodologies as provided by the project team and agreed by the Applicant (refer to Chapter 6: Development Programme Demolition and Construction);
 - Baseline conditions have been established from a variety of sources, including Site surveys and historical data, but due to the dynamic nature of certain aspects of the environment, conditions may change during the construction and operation of the Development;
 - The on Site baseline conditions are those that existed prior to commencement of demolition to allow a meaningful comparison of the effects of the Development with those of the consented SH3 Scheme. In addition, the demolition works form part of the Development being assessed;
 - Future baseline conditions surrounding the Site assume that the consented schemes currently under construction would be constructed in accordance with the relevant planning consents, and completed and operational prior to or at the same time as that of the proposed Development;
 - Future interim conditions assume the implementation of the Temporary Flexible Event Space proposals within the Site;
 - All of the principal existing land uses adjoining the Site remain substantially unaltered, with the exception of the future baseline and cumulative schemes as described above and in the Cumulative Effects Chapter;
 - Information received from third parties is accurate, complete and up to date;

- The design, construction and operation of the completed Development will satisfy environmental standards consistent with contemporary legislation, practice and knowledge as a minimum;
- A Construction Environmental Management Plan (CEMP) will be discussed and agreed with RBC after the planning application is determined, to control subsequent construction activities. This CEMP will be enforced and monitored during all key stages of the works. The key elements of the CEMP are set out in Chapter 6: Development Programme Demolition and Construction; and
- For the purposes of the ES, a year of completion of 2018 has been used throughout the ES to be consistent with the ES of the SH3 Scheme although it is likely that the year of completion including Telecom House would likely be 2019 or 2020. However, the assessments are considered to remain valid for this later year of completion on the basis that the forecast traffic data is valid up to 2026 (refer to Chapter 9: Transportation and Access).

References

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- ¹ HMSO, 2011 'Town and Country Planning (Environmental Impact Assessment) Regulations 2011, SI 2011/1824'. London.
 - ² Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment.
 - ³ Institute of Environmental Management and Assessment (IEMA). (2004) Guidelines for Environmental Impact Assessment
 - ⁴ Timothy Smith (2006) Guidelines for Environmental Impact Assessment 2006 Updates
 - ⁵ OPSI ,2015, Town and Country Planning (Development Management Procedure) (England) Order 2015. Statutory Instrument 2015 No.595.
 - ⁶ HMSO, 2011, 'Town and Country Planning (Environmental Impact Assessment) Regulations 2011 SI 2011/1824'. London.

3. Land Uses and Activities

Introduction

- 3.1. This Chapter provides a summary of the historical, existing and future land uses and activities on the Site and within its surrounds. This includes a summary of designations and environmental conditions, thereby enabling potentially sensitive receptors that could be affected by the Development to be identified. Future potentially sensitive receptors within the Development and surrounding area are also identified and set out in this Chapter.
- 3.2. A full description of the baseline conditions relevant to each technical assessment undertaken as part of the EIA is provided in the respective technical Chapters of this ES (Chapters 7 to 16 inclusive).
- 3.3. This Chapter should be read in conjunction with Figures 3.1 to 3.5.

Site Location and Setting

- 3.4. The Site is centred on National Grid Reference 47137, 17369 and is located within the administrative boundary of Reading Borough Council (RBC). As illustrated in Figure 1.1, the Site is located in the northern part of Reading town centre, immediately to the south of Station Hill and Reading Mainline Station, forming an important gateway to Reading town centre. The planning application boundary of the SH3 Site and Telecom House Site are shown on Figure 1.2.
- 3.5. The Site occupies an area of approximately 2.53ha (2.14ha for the SH3 Site and 0.39ha for Telecom House Site) and is bound by Station Hill to the north. Thames Tower and Station Road demarcate the northern part of the eastern boundary of the Site whilst Greyfriars Road bounds the northern part of the western boundary. South of Garrard Street, the Site is bound to the east and west by retail units and offices, of which some were vacant at the time of undertaking the EIA. Merchants Place runs parallel to the eastern boundary of the Site to the south of Garrard Street, and connects Friar Street with Garrard Street. A number of retail units, offices and a block of residential apartments are located on Merchants Place. Friar Street, which is lined by a combination of leisure, office and retail units, forms the southern boundary of the Site.
- 3.6. Levels across the Site vary from approximately 38m Above Ordnance Datum (AOD) to 46m AOD, and typically the Site rises in a south-easterly direction. Site levels in the west of the Site lie at a minimum of 38.35m AOD on Greyfriars Road and along the west of Garrard Street. Along the northern boundary of the Site, the gradient rises west to east to a height of 43.5m AOD in the north-east corner of the Site. In the southern area of the Site, the ground level rises north to south from approximately 38.35m AOD on Garrard Street to a maximum of 45.75m AOD along Friar Street, at the southern boundary of the Site.

Historical Land Uses at the Site

- 3.7. In the early 19th century, the Site was undeveloped comprising gardens and / or fields. At this time, Friar Street, which comprises a thoroughfare dating back to medieval times, comprised a number of residential properties. However, following the construction of the Great Western Railway and station to the north of the Site in the mid to late 19th century, the Site and surrounding area was intensively developed. By the late 19th century, the south-western corner of the Site was occupied by terrace housing, whilst further housing and a timber yard were constructed on the western boundary of the Site. A large malt-house and coal yard were constructed towards the centre of the

Site, whilst livery stables occupied the north-eastern area of the Site. The Telecom House Site was occupied by a Veterinary Infirmary.

- 3.8. During the early to mid-20th century, the Site had been partially redeveloped to accommodate a large garage and also industrial type buildings. The Site was comprehensively redeveloped between the 1950s and 1980s, which included the construction of a bus station, commercial premises, including Western Tower, a bingo hall and later a multi-storey car park and Friars Walk Shopping Centre. The Telecom House Site was constructed in its current form by the 1960s. More recently, the bus station, Western Tower, Friars Walk Shopping Centre and the office element of Telecom House have been vacated, and the buildings have fallen into a state of disrepair.
- 3.9. A detailed description of the historical development of the Site and surrounding area is included in Chapter 8: Archaeology; and Chapter 12: Ground Conditions.

Existing Land Uses at the Site

- 3.10. The Site is dominated by vacant retail, office and leisure buildings and the disused Friars Walk Shopping Centre, together with Friars Walk multi-storey car park, road infrastructure and hard-standing as illustrated in Figure 3.1. Friars Walk Shopping Centre and the bingo hall have been closed and unoccupied for a number of years. Office space provided in Western Tower, above Friars Walk Shopping Centre and above the retail units on Station Hill as well as the office uses in Telecom House above the retail uses facing onto Friars Walk are also vacant. Consequently, much of the Site is underused, derelict, and in a general state of disrepair.
- 3.11. The operational uses on the Site are limited to the NCP Friars Walk multi-storey car park which is accessed by vehicles from Garrard Street, Xafinity House offices in the western part of the Site and a small number of small-scale retail units fronting Friar Street.
- 3.12. As shown on Figure 3.2, a small area of vegetation exists in the north-western corner of the Site between Xafinity House and Station Hill, comprising a few ornamental shrubs and trees.
- 3.13. The main vehicular access to the Site is from Garrard Street, a one-way street, which is accessed from Greyfriars Road to the west of the Site. Access to Friars Walk NCP car park, the former bus station and Merchants Place can be gained from Garrard Street. No vehicle access to the Site is available from Station Hill and Friar Street to the north and south of the Site. Greyfriars Road is accessed from the Inner Distribution Road (IDR) (A329) which circumnavigates Reading town centre.
- 3.14. There are currently no on-street parking spaces within the Site. However, car parking spaces are also provided as follows:
 - Garrard Street Multi Storey Car Park (MSCP) – 950 spaces;
 - Friars Walk – 94 spaces located on the roof that can be accessed from the Garrard Street MSCP. However, these have been inaccessible for some time;
 - Western Tower – 280 spaces;
 - Xafinity House – 81 spaces; and
 - Telecom House – 58 spaces.
- 3.15. Pedestrians can access the Site from footpaths on all roads adjacent to, and within the Site. From Reading Mainline Station, pedestrians can access the Site via Station Road, Greyfriars Road and (prior to the current demolition works) the elevated pedestrian walkway between Western Tower and the former bingo hall connecting Station Hill to Garrard Street. Access through the southern part of the Site to Garrard Street would have been through Friar's Walk Shopping Centre; however

this access is now locked up and disused. There is however, access from Garrard Street to Friar Street via Merchants Place to the east of the Site.

- 3.16. Pedestrian permeability through the Site is currently poor owing to the built form and vacant nature of the Site. Following the closure of Friars Walk Shopping Centre and the associated Friars Walk elevated walkway no public access is provided in a north-south direction between Reading town centre and Reading Mainline Railway within the Site.
- 3.17. Pedestrian permeability through the Site in an east – west direction between Station Hill and Greyfriars Road is limited to Garrard Street.
- 3.18. Further details on transport and access issues are provided in Chapter 9: Transport and Access and the appended Transport Assessment.
- 3.19. A summary of existing buildings on the Site and their associated use is provided below in Table 3.1, with Site photographs provided in Figure 3.1.

Table 3.1: Summary of Existing Site Buildings and Uses

Building	Location within the Site	Description and Land Use
Xafinity House	Xafinity House is located in the north-western part of the Site, along Greyfriars Road.	Xafinity House is a six-storey 'L-shaped' red-brick structure with ground floor parking. This building is currently occupied by a variety of commercial office uses and is a fairly well maintained building.
Former Bus Station and Mecca Bingo Hall.	The former bingo hall and bus station are located towards the north-western area of the Site. The former bus station is located at grade with Garrard Street beneath the former bingo hall, which is raised on columns above ground.	The former bus station and Mecca Bingo Hall comprise a pitched corrugated roof concrete structure. The Mecca Bingo Hall is disused and is in a state of disrepair. At the time of undertaking the EIA, the bus station was being used by taxi's queuing to reach the temporary taxi rank.
Western Tower, connecting to a low rise block on Station Hill.	Western Tower is located in the north of the Site, adjacent to Station Hill. The adjacent connected low rise block (units 20-58 Station Hill) extends eastwards along Station Hill situated adjacent to the northern boundary of the Site.	Western Tower is a fifteen-storey (above ground level) rectangular tower block which is connected to a three-storey low rise block. The building elements represent an architectural style of the early 1970s. Western Tower has been unoccupied for a number of years and is in a state of disrepair. Similarly, the office space on the upper floors on the low rise block connecting to Western Tower is unoccupied. However, the ground level of the three-storey low rise block is partially occupied by small scale retail outlets.
NCP car park.	The NCP car park is located in the central area of the Site, largely to the north of Garrard Street, from which access to the car park is gained. The NCP car park extends over Garrard Street and occupies the roof level of Friars Walk Shopping Centre to the south of Garrard Street.	The NCP car park is an eight-storey rectangular concrete structure. It provides 950 public parking spaces over ten floors of split-level car parking space.

Building	Location within the Site	Description and Land Use
Friars Walk Shopping Centre.	Friars Walk Shopping Centre is located between Garrard Street and Friar Street.	Friars Walk Shopping Centre is a 1970s five-storey construction. All units in the shopping centre and the offices located over the units are now disused.
Friars Walk	Friars Walk is located above Garrard Street.	Friars Walk is an elevated walkway connecting the multi-storey car park with Friars Walk Shopping Centre and Friars Street beyond. The walkway is no longer accessible to the public.
Telecom House	Located between Garrard Street and Friar Street immediately west of Friars Walk Shopping Centre	Telecom House is a largely vacant 1960s/1970s building with retail uses at ground floor level fronting onto Friar Street and 5 levels of office uses above.

3.20. The quantum of existing land uses on the Site is shown in Table 3.2.

Table 3.2: Quantum of Land Uses on the Site (Pre-Demolition)

Use Class	Gross External Area (m ² GEA)		
	SH3 Site	Telecom House Site	Total
Office	15,576	5,697	21,273
Retail & Related Uses (Use Class A1 – A5) m ²	14,020	613	14,633
Leisure m ²	3,568	0	3,568
Residential m ²	0	0	0
Total Floor Space Area	33,164	6310	39,474
Car Parking spaces	1311*	58	1369

* This figure excludes the 94 spaces provided in Friars Walk as these have been inaccessible to the public for some time

Existing Land Uses Surrounding the Site

- 3.21. The Site is located in the northern part of Reading town centre. The surrounding area currently comprises predominantly a mix of commercial, retail and leisure uses. However, residential uses and hotels are located within the vicinity. Residential properties include Projection East and Icon House on Merchants Place approximately 15m east of the Site, terraced housing is on Stanshawe Road and Vachel Road, approximately 45m and 55m west of the Site, and Malcolm Place a modern residential apartment block, approximately 130m west of the Site on Caversham Road. In addition, a number of prior notification applications have been submitted to RBC for change of use from predominantly offices to residential uses. There will therefore be future sensitive receptors present if these change of use consents are implemented. Hotels include the Novotel and Ibis on Friar Street and Malmaison on Station Road.
- 3.22. Reading Mainline Station is located approximately 50m north-east of the Site, and includes an elevated walkway over the railway tracks to Vastern Road. RBC's two new transport interchanges are located to the north and south-west of Reading Station. These along with the south-eastern interchange all include access to taxis and buses within close vicinity of the Site.

Sensitive Receptors

- 3.23. An appraisal has been undertaken to identify the properties, buildings and people that should be considered as being sensitive to the construction and operation of the Development. Potential effects on these 'receptors' have been considered as part of the EIA. Potentially sensitive receptors are listed in Table 3.3 with future sensitive receptors listed in Table 3.4. Both existing and future sensitive receptors are identified on Figures 3.2 - 3.5. Further details on sensitive receptors are provided in the baseline conditions section of Chapters 7 to 16, inclusive.

Table 3.3: Potentially Sensitive Receptors

Category	Existing Sensitive Receptor/Land Use	Nearest Approximate Distance from the Site Boundary
Residential Properties	The Gateway Public House, 31 Greyfriars Road, with residential use at first floor level	15m west
	Malthouse Public House, 53 Greyfriars Road/Tudor Road junction, residential uses above the pub.	15m west
	Projection West, Merchant's Place (flats and serviced apartments)	20m south east
	Projection East, Merchant's Place (flats and serviced apartments)	30m south east
	Icon House, Merchant's Place	50m east
	25a-25b Friar Street	100m south east
	32-34 Friar Street	35m east
	1 st Floor Flat, 125 Friar Street	20m south
	136-137 Friar Street (Building to the rear of)	50m south east
	144 Friar Street	80m south east
	Bridewell House/Samuel House (student accommodation), junction of Friar Street/Greyfriars Road	60m west
	Terrace Housing Stanshawe Road	35m west
	Terrace Housing, Vachel Road	65m south east
	54 Russell Street	750m south west
	107 Castle Hill	650m south west
	Alms House Castle Street	475m south west
	41 Bath Road	1500m south west
	96 Berkeley Avenue	1500m south west
	88 Queens Road	900m south east
	Grantley Heights	890m south east
	90 Kings Road	800m south east
	119 Caversham Road	400m north
	20-30 New Bright Street	650m south
	10-20 Hieatt Close	1100m south east
	44 Crown Street	825m south east
	6 Tilehurst Road	850m south west

Category	Existing Sensitive Receptor/Land Use	Nearest Approximate Distance from the Site Boundary
	Blenheim Terrace, Castle Street	675m south west
	162 Castle Hill	815m south west
	31a Vastern Road	370m north
	68 George Street	890m north east
	10 Trinity Place	600m south west
	33 Caversham Road	120m west
	Kennet House, 80-82 Kings Road	680m south east
	5 to 21 Tudor Road	60m west
Hotels	Malmaison, Station Road	70m east
	Novotel, Friar Street	85m east
	Ibis, Friar Street	85m east
Commercial properties	Occupants of existing office and retail premises adjacent to the Site, including on Station Road, Friar Street and Greyfriars Road.	Adjacent east, south and west.
Educational	Forbury Gardens Day Nursery	600m east
Local Views	Views to and from the Site, (including those associated with listed buildings, conservation areas, Scheduled Monuments and historic parks and gardens).	Not applicable.
Places of Worship	Greyfriars Church (Church of England).	120m south-west.
	St Laurence's Church.	280m east.
Built Heritage	Reading Abbey Scheduled Monument and associated Forbury Gardens Historic Park and Garden.	300m east.
	High Bridge Scheduled Monument	480m south-east
	Forbury Gardens Historic Park and Garden	300m east
	Market Place/London Street Conservation Area.	120m east.
	St. Mary's Butts/Castle Street Conservation Area.	250m south-west.
	Russell Street/Castle Hill Conservation Area.	350m south-west.
	St Peter's Conservation Area	850m north
	Grade I listed Reading Abbey and Associated Forbury Gardens	400m east
	Grade I listed Greyfriars Church.	120m south-west.
	Grade I Church of St Laurence	280m east
	Grade II listed Abbey Mill ruins in Abbey Square.	495m south-east.
	Grade I listed St. Mary's Church in St. Mary Butts.	245m south-west
	Grade II* listed Town Council Chamber and Offices with Clock Tower	280m east
	Grade II* listed Church of St Peter	950m north
	Grade II listed St Giles' Church	700m south

Category	Existing Sensitive Receptor/Land Use	Nearest Approximate Distance from the Site Boundary
	Grade II listed 39 Friar Street	Adjoins south-east corner of the Site
	Grade II listed (Three Guineas Public House) Reading General Station, Station Hill.	30m north
	Grade II Listed High Bridge, London Road	450m south east
	Grade II listed statue of King Edward VII.	30m east
	Grade II listed Great Western House	50m south-east.
	Grade II Listed 13 & 15 Station Road	60m east
	Grade II Listed Quadrant Walls and Railings to Former No.64 (Greyfriars Vicarage)	100m south-west
	Grade II listed The Mitre Inn	125m south-west
	Grade II listed Regent Place	130m west
	Grade II listed WI Palmer Memorial Hall	130m south-west
	Grade II Listed 11, 12, 13, 14 & 15 Friar Street	230m east
	Grade II listed 147 Friar Street.	150m south-east
	Grade II listed 154 Friar Street	230m east
	Grade II listed 155 Friar Street	230m east
	Grade II listed 1-31 & 2-32 Queen Victoria Street, 148, 149 & 150 Friar Street and 24-28 & 35-38 Broad Street	220m east
	Grade II listed Reading Prison	690m east
	Grade II listed Church of St James	690m east
	Grade II listed 29 & 31 Caversham Road	160m west
	Grade II listed 35 and 37 St Mary's Butts	240m south-west
	Grade II listed 55 and 55a St Mary's Butts	240m south-west
Archaeology	Potential archaeological remains beneath the Site; the southern part of the Site between Garrard Street and Friar Street is located within an Archaeology Priority Area.	On-Site.
Transportation	Users of Reading Mainline Railway Station and taxi rank on Station Road.	Adjacent north and north-east.
	Pedestrian, cyclists and other road users in the local area.	Adjacent in all directions.
	Users of buses including the bus interchanges located on Station Hill, Station Road and to the north of Reading Station.	Adjacent to the north and east.
Controlled Waters	Principal Aquifer (Seafood Chalk Formation)	Beneath the Site.
	Secondary A Aquifer (Alluvium and the Taplow Gravel Formation)	Beneath the Site
	River Thames.	400m north-east.
	River Kennet / Kennet and Avon Canal.	500m south-east.
Habitats and Species	Black Redstart observation in 2012.	On-Site.
	Peregrine Falcon observation in 2012.	On-Site.

Table 3.4: Future Potentially Sensitive Receptors

Category	Future Sensitive Receptor/Land Use	Nearest Approximate Distance from the Site Boundary
Residential Properties	Proposed: Residential Buildings Plot E and F	On Site
	7-11 Station Road (Application Number: 141529)	80m east
	Summit House, 49-51 Greyfriars Road (Application Number: 141751);	20m west
	136-137 Friar Street Reading RG1 1EX (Application Ref: 150068);	50m east
	30-31 Friar Street, Reading (Application Ref: 150829, pending).	35m east
	29-35 Station Road (Application Ref 141275).	80m east
	Garrard House, 30 Garrard Street, (Application ref 141277).	Immediately adjacent to the Site

4. Alternatives

Introduction

- 4.1. This Chapter, prepared by Waterman Infrastructure & Environment Ltd (Waterman IE), describes the considerations and constraints influencing the layout, massing and outline design of the Development. The Chapter also describes the main alternatives to the Development which have been considered by the Applicant.

Site Considerations and Constraints

- 4.2. A range of considerations and constraints have been identified which influenced the final design and layout of the Development and the Temporary Event Space proposal. A summary of the main considerations and constraints is provided in Table 4.1.

Table 4.1: Site Considerations and Constraints

Issue	Specific Consideration and Constraints
Surrounding built environment	The Development has given due consideration to the existing urban grain defined by Station Hill, Station Road, Friar Street and Greyfriars Road. As identified within the Reading Central Area Action Plan¹ (RCAAP) Reading Borough Council (RBC) has an aspiration for a cluster of tall buildings at the Site. The relationship of such tall buildings with the surrounding range of urban forms has been a key consideration in influencing the siting, scale and massing of the Development.
Surrounding land uses	The commercial land uses surrounding the Site have been considered in the provision of a suitable and complementary mix of land uses which would not lead to adverse commercial competition.
Surrounding redevelopment	Redevelopment works have recently been completed at Reading Mainline Station. In conjunction with these works, RBC undertook public realm upgrades along the length of Station Hill. A major component of the works was to lower the present ground level of Station Hill by demolishing the raised podium. The Development has been designed to complement these proposals. In addition, the refurbishment and addition of 4 stories onto Thames Tower, immediately to the east of the Site is currently ongoing. The Applicant and SH3 design team have undertaken consultation with the Thames Tower team to ensure that the proposed redevelopment of the Thames Tower site and the Development would provide a consistent approach to the scale and design of the two proposals and to ensure that public realm proposals are coordinated and complementary. Other ongoing redevelopment proposals in the surrounding area include Chatham Place, 21 Caversham Road, Energis House/ Forbury Place and Aldwych House. These developments have been considered in the assessments undertaken as part of the Environmental Impact Assessment.
Site levels	The Site presents a steep gradient, sloping upwards from west to east. Levels have been considered to ensure inclusive access to all parts of the Site by all users. Addressing the level changes has also been a key driver in the appropriate design of the public realm.
Townscape and views	The Site is not affected by any statutory or non-statutory designated views, however, the design has given due consideration to maintaining and where possible improving the character, quality and context of local, middle and long distance views.
Built heritage	The design of the Development has carefully considered maintaining and where possible improving the setting, character, quality and context of the Site's surrounding three conservation areas and numerous listed buildings including the former station

Issue	Specific Consideration and Constraints
	ticket office on Station Road (now the Three Guineas Public House), 39 Friar Street, the statue of King Edward VII and Greyfriars Church.
Archaeology	Archaeological evidence has previously been recorded within the Site in the form of a pit and two layers, and the line of the Civil War ditch crosses the Site. The southern part of the Site lies within the RBC designated Area of Archaeological Potential. Whilst the Development proposes excavation for the construction of the lower ground level, appropriate archaeological safeguarding and mitigation would form an integral part of the ground work phase, prior to the construction of the Development.
Transportation and access	The Site has excellent links to public transport facilities. Maintenance and enhancement of these public transport links have been a key consideration of the Development design, particularly in allowing for the accommodation of RBC's public transport improvements. Pedestrian permeability through the Site is considered essential to the Development's success. This has been considered in the layout of the proposed buildings and the design of the public realm.
Noise and vibration	In accordance with the National Planning Policy Framework (NPPF)², the presence of a nearby existing highway network, the railway and other busy town centre activities has required the consideration of the appropriateness of the Site for residential dwellings. The construction and future operational use of the Development has also been considered in terms of potential noise generation and nuisance both within and outside the Site.
Ground conditions	The presence of potential contamination from previous Site uses has required consideration with respect to ground works and the potential need for remediation.
Surface water, drainage and flood risk	There are no watercourses or water bodies on the Site and the nearest watercourse (the River Thames) is located approximately 420m north of the Site. Accordingly, the Site has a low flood risk potential. Nonetheless, the Development has considered the need to minimise increases in surface water run-off through the use of Sustainable Urban Drainage Systems (SuDS). Groundwater is likely to be encountered at approximately 4-6m below ground level (bgl) on the Site. The depth and design of underground infrastructure (including piling foundations) has considered groundwater levels and flows.
Ecology	The Site is currently of predominantly low ecological value. However, the protected black redstart (<i>Phoenicurus ochruros</i>) and peregrine falcon (<i>Falco peregrinus</i>) have been recorded on the Site during surveys conducted in 2012. The landscape proposals for the Development have considered opportunities for biodiversity enhancements including providing habitat for black redstarts. As such, several living roofs (brown roof and green roofs) have been included within the final Development design.
Wind	The suitability of the local wind environment has been considered in terms of the comfort levels required for particular pedestrian activities in and around the Site. This is of particular relevance to the Development's provision of public realm and pedestrian routes.
Daylight, sunlight and overshadowing	The dense urban massing of the Development presents a potential constraint in terms of the daylight, sunlight and overshadowing to neighbouring residential properties and within the Site itself. The massing of the Development has been carefully considered to minimise such effects.
Utilities	There are a number of existing services across the Site which pose physical constraints to the Development. In particular, a mains trunk sewer beneath the Site.

Issue	Specific Consideration and Constraints
	Utility constraints have been considered in the construction phasing to minimise disruption to existing services.

Alternatives

- 4.3. Under the EIA Regulations³, an Environmental Statement (ES) is required to provide:
"an outline of the main alternatives studied by the applicant ... and an indication of the main reasons for his choice, taking into account the environmental effects".
- 4.4. The development of the design commenced with a detailed review of the constraints summarised in Table 4.1. Since the EIA progressed in parallel with the design process, iterations to the design were also made to minimise potential environmental effects which were identified from the baseline surveys and analysis.
- 4.5. The main alternatives to the Development that were considered by the Applicant include:
- The 'Do-Nothing' alternative;
 - The 'Do Minimum' Alternative;
 - Implementation of Consented Station Hill 2 (SH2) Scheme alternative;
 - Temporary Event Space;
 - Implementation of the Consented Station Hill 3 (SH3) Scheme Alternative; and
 - Alternative Designs.
- 4.6. In addition, for completeness a summary is included of the SH1 proposals.
- 4.7. It should be noted that from the outset, the Development has been designed to respond to the relevant planning policy objectives as set out in Chapter 1: Introduction for the mixed use redevelopment of the Site. Accordingly no alternative sites or alternative land uses have been considered by the Applicant. In addition, whilst the 'do-nothing' alternative has never been truly considered by the Applicant, guidance on the preparation of EIAs suggest that it is good practice to consider the evolution of a site in the absence of specific proposals i.e. the 'Do-Nothing' alternative. This is discussed below prior to the consideration of the main alternatives listed above.

The 'Do-Nothing' Alternative

- 4.8. The 'Do-Nothing' alternative refers to the option of leaving the Site in its current state. This option would result in a number of negative outcomes. These can be summarised as follows:
- Continued deterioration of the existing Site buildings and general Site environment with time;
 - Continued under-utilisation of the existing Site buildings. For example, the Western Tower is vacant and has been for some time, reflecting its inability to deliver commercial floorspace of a size and quality to suit the current market;
 - Continued increasing maintenance costs of the small proportion of occupied and operational on-Site buildings;
 - The existing buildings would be difficult to let over time;

- National and local planning objectives would not be met in terms of facilitating sustainable development through the intensive regeneration of town and city centre sites;
 - The local and regional socio-economic benefits of regeneration in terms of housing provision, employment and other commercial opportunities would not be achieved;
 - Significant opportunities to improve the quantum and quality of public open spaces, pedestrian permeability, together with the creation of Site vitality, a sense of place and community would be lost; and
 - The perception of crime at the Site would continue to blight this strategic location.
- 4.9. In addition to the above, if redevelopment is not taken forward, the existing Site presents little opportunity for natural ecological succession. The Site would simply deteriorate. As a result, the beneficial outcomes of leaving the Site in its current state are limited to:
- Zero costs associated with redevelopment;
 - The absence of disruption to Site neighbours during the demolition and construction works; and
 - No potential disruption to finite archaeological resources.
- 4.10. Overall, it is considered that the negative effects as a result of leaving the Site undeveloped considerably outweigh the beneficial effects that would arise from the status-quo. The expectation is that given RBC's and the Government's priorities for brownfield redevelopment and the local policy support provided by the Reading Central Area Action Plan, the Station Hill South SPD⁴ and Station Area Framework⁵ for the redevelopment of the Site, that the Site would be redeveloped in the medium to longer term, even in the absence of the current Development proposals.

The 'Do Minimum' Alternative

- 4.11. The 'Do Minimum' alternative would include the renovation and refurbishment of the existing buildings on the Site. However, this option would not include the comprehensive redevelopment of the Site and with limited new buildings there would be few opportunities to improve permeability through the Site. The negative issues associated with the Site (as set out above) would not be resolved and the aspirations and vision of RBC for this area (as defined in the adopted planning policy for the area as set out in Chapter 1: Introduction) would not be realised. Therefore this option was not considered by the Applicant to be a viable redevelopment solution.

Station Hill 1

- 4.12. An outline planning application was submitted in February 2007 (Planning Application Reference: 07/00188/OUT) for a mixed-use development located in the area that now comprises the northern area of the Site (between Garrard Street and Station Hill).
- 4.13. This development known as Station Hill 1 (SH1), proposed 6 buildings to provide up to 75,504m² of new office space, between 577-624 residential units, retail, community, leisure and cultural land uses, together with associated public open space, car parking and public transport improvements.
- 4.14. The Applicant subsequently acquired additional land around Friar Street and the application was withdrawn to enable a complete redesign of the scheme encompassing these additional areas of land.

Station Hill 2

- 4.15. As noted within Chapter 1: Introduction, in 2009 the Applicant submitted an outline application (Ref 09/01079/OUT) for the Site known as Station Hill 2 (SH2). RBC subsequently granted planning permission in October 2011 for this mixed used scheme comprising residential development (Use Class C3), offices (Use Class B1a), retail (Use Classes A1-A4), community space (Use Class D1), cultural/leisure space (Use Class D1/D2), bowling alley (D2), and health and fitness (Use D2) and associated car and cycle parking, landscaping, infrastructure and public realm works.
- 4.16. The SH2 scheme proposed 8 buildings rising up to 26 commercial storeys (168m AOD).
- 4.17. A summary of the approved land uses is set out in Table 4.2.

Table 4.2: Summary of Land Uses Consented

Use (Use Class)	Min (m ²)	Max (m ²)
Offices (B1)	76,550	80,579
Residential (C3)	44,175	56,585
Retail (A1-A4)	17,962	18,907
Community Space including art centre (D2)	1,426	1,500
Leisure uses (gym) (D2)	475	500
Bowling Facility	1,929	2,030
Car Parking		324 spaces
Cycle Parking		800 spaces

- 4.18. Due to a change in market conditions, SH2 is no longer considered to be a viable and deliverable means of regenerating the Site. Consequently, the Applicant instructed its design team to prepare an alternative proposal for the Site, which would still comply with the relevant policy requirements, but be viable and deliverable in the prevailing economic conditions.

Station Hill 3

- 4.19. Following on from the Applicant's instructions to prepare an alternative proposal to SH2 which was viable and deliverable within the prevailing economic conditions, an outline planning application was submitted for Station Hill 3 (SH3) in March 2013 (Ref: 130436/OUT). Planning consent for SH3 was granted in January 2015.
- 4.20. The SH3 Scheme was described on the planning application forms as an *"Outline Application for mixed use redevelopment of the site through the demolition and alteration of existing buildings and erection of new buildings/structures to provide Offices (Use Class B1), a range of town centre uses including retail and related uses (Use Class A1 - A5), leisure (Use Class D2) and residential units, associated infrastructure, public realm works and ancillary development (all matters reserved)."*
- 4.21. SH3 comprised seven Building Plots (A to G) as well as a covered arcade between Plot C and Plot G and pedestrian public realm. The existing NCP car park would be retained. The quantum of land use proposed by SH3 is set out in Table 4.3.

Table 4.3 Consented Quantum of Land Use for SH3

Land Use/Use Class	Minimum Gross External Area (m ² GEA)	Maximum Gross External Area (m ² GEA)
Offices (Class B1)	69,000	122,000
Retail (Class A1-A5)	6,000	13,500
Leisure (Class D2)	0	2,200
Back of House Facilities	-	2,000
Residential	14,500 (150 units)	29,500 (300 units)
Total Floorspace	90,500	169,200

Telecom House / Plot E

- 4.22. Following submission of the SH3 Application, as described in Chapter 1, the Applicant has acquired the Telecom House Site located immediately to the west of Plot E of the SH3 Scheme. It was considered that in order to provide a comprehensive form of development, building on the design and land use principles which were established by the grant of permission for SH3, that the Telecom House Site and Plot E of the consented SH3 scheme should be combined to form a new Plot E. The parameters and principles established as part of the consented SH3 scheme are considered to remain sound and have been extended across the Telecom House Site.

Temporary Event Space

- 4.23. An application is submitted for a temporary event space in the north of the Site, which would be utilised prior to the construction of Plot C of the wider Station Hill Development.
- 4.24. The temporary event space would allow for a range of alternative uses including:
- Market Stalls / Retail Uses;
 - Concerts / Open Air Theatre / Cinema;
 - Leisure / Sports Events;
 - Fairground;
 - Marketing Events (e.g. product launches, cars etc.); and
 - Ice Rink.
- 4.25. The temporary use would bring part of the Site into early use, improving the public realm and setting of the Station. However, these effects would be temporary and it is anticipated that a planning condition/obligation would be imposed so that the temporary uses do not impinge on permanent development proposals.
- 4.26. The option of a Temporary Event Space or no Temporary Event Space is therefore considered acceptable.

Alternative Designs

- 4.27. The design of the Development has evolved in consultation with RBC and other consultees including the Commission for Architecture and the Built Environment, English Heritage, and the

public. The key evolutionary stages of the Development can be considered as 'The Competition Scheme', 'The Illustrative Scheme' and 'The Final Illustrative Scheme for SH3'. The Final Illustrative Schemes were used to prepare a series of Parameter Plans for which the SH3 outline planning application sought consent. Further detail on the Parameter Plans are provided within Chapter 5: Description of the Development. Whilst there has been a subsequent evolution of the design since the Final Illustrative Scheme (and therefore the SH3 planning application) to accommodate the Telecom House Site, the design principles of the Telecom House / Plot E scheme mirror those of the consented Plot E (as part of the SH3 Scheme) and therefore the design evolution discussed below is also applicable to the Telecom House / Plot E Scheme.

- 4.28. A summary of the key options considered during the evolution of the Development design are set out below.

Layout

- 4.29. The preferred Scheme proposed that commercial development plots would be located to the north of Garrard Street and residential building plots would be located to the south. No alternative options to this were considered. However, retail uses are proposed at ground floor level to the south of Garrard Street (within Plots E and F).
- 4.30. The layout of the building plots was established from the need to improve permeability through the Site both east-west between Greyfriars Road and Station Road and also north-south between Reading Mainline Railway Station and Reading Town Centre. There was also a desire to create regular commercial floorplates. This led to the creation of 5 building plots (Building Plots A, B, C, D and G) to the north of Garrard Street and Building Plots E and F to the south of Garrard Street.

Treatment of NCP Car-Park

- 4.31. Two options were considered for the NCP car-park:
- Retention and refurbishment of the NCP car-park; or
 - Demolition and re-building of the NCP car-park.
- 4.32. The option of re-use was favoured due its location within the centre of the Site which lends itself to a retention option and the minimal disruption this would have on traffic flow disturbances within the surrounding highway network. In addition, pre-application discussions with RBC concluded that the preferred option would be to retain and re-clad the existing NCP car-park.
- 4.33. The initial options for the retained car-park included car-park use for the entire ground floor level. However, due to concerns raised by RBC in relation to the proposed Arcade (refer to later in this Chapter), retail land uses were introduced along the northern edge of the NCP car-park to animate the public realm to the north. Activity in this part of the Site is also encouraged by the option to provide a roof-top leisure use on the NCP car-park. The final design allows for a sports pitch on the roof of the NCP car-park (refer to Chapter 5: Description of the Development).

Public Realm

Central Square

- 4.34. Early versions of the design included for a relatively small area of public realm in the centre of the Site. This option was presented to RBC in February 2012. In their feedback, RBC raised concern

regarding the nature of this space and, specifically, the amount of light that would be available during the key lunchtime periods of the day when this area of the Site would be most heavily utilised. Accordingly, the Central Square was enlarged to a minimum width of 24.4m. This is shown on Parameter Plan 4 (refer to Chapter 5: Description of Development).

Arcade

- 4.35. Early versions of the design proposed this east-west route as an uncovered pedestrian street. However, due to the width of this street, its orientation and location to the north of the NCP car-park, it was decided to enclose part of the route and a colonnade was introduced along the southern edge of Building Plot C. In addition, a roof was added over the route. Finally, as described earlier in this Chapter, retail uses were introduced along the northern elevation of the retained NCP car-park. It was considered that the inclusion of these design elements would create a welcoming sense of enclosure, along with activity.

Height and Massing

- 4.36. The early versions of the design established the basic design principle of an increase in height of buildings from east to west along Station Hill, rising up from the low rise development on Greyfriars Road and Stanshawe Street to the taller commercial building to the east, with the tallest building on Site to be Building Plot C. A step up from south to north was also proposed for the residential building plots (south of Garrard Street) to reflect the massing on Friar Street.
- 4.37. A number of massing models were made to establish appropriate minimum and maximum parameters. This also allowed consideration to be given to the cluster of buildings with and without the redevelopment of Thames Tower. The Parameter Plans and Design Code allow flexibility and the final design would be determined at detailed design.

Foul Water Sewer

- 4.38. Two alternatives were considered in relation to the existing foul water sewer, either building over it or diverting it. The preferred option is to build over it and seek a build over agreement from Thames Water. A 3m easement zone either side of the sewer is proposed, where no below ground structure would be built.

Summary and Conclusion

- 4.39. The proposed Development has resulted from careful consideration of policy objectives for the wider Reading area and the Site, the Applicant's commercial objectives, and following consultation with RBC, CABE and the public, together with prevailing environmental constraints. The evolution of the Development has responded to a number of design, environmental and economic issues as described above.

References

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- ¹ Reading Borough Council, 2009. Reading Borough Local Development Framework Reading Central Area Action Plan, Adopted January 2009
 - ² Department of Communities and Local Government, 2012, National Planning Policy Framework, 2012
 - ³ Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, SI 1999/293 (as amended).
 - ⁴ Reading Borough Council, 2007. Station Hill South Planning and Urban Design Brief, March 2007
 - ⁵ Reading Borough Council, 2010. Reading Station Area Framework, Adopted December 2010

5. Description of Development

Introduction

- 5.1 This Chapter provides a description of the Development (that is the SH3 Scheme as amended by the Telecom House / Plot E Scheme) as defined by the outline planning applications for both the SH3 Scheme and Telecom House / Plot E Scheme. As described in Chapter 1, the SH3 Scheme has already received planning permission however, as the proposed development on the Telecom House / Plot E Site will form an integral part of an enlarged SH3 Scheme, it forms the proposed Development for the purposes of this ES.
- 5.2 The outline planning applications comprise a series of Parameter Plans, Development Specification and Framework and Design Code documents, all of which have been, or would be, secured by planning condition, and which form the basis of the Environmental Impact Assessment (EIA).
- 5.3 The parameter plans for both the SH3 Scheme and the Telecom House / Plot E Scheme define the planning application boundary, the existing buildings and structures to be demolished and retained, the broad layout of the buildings, the location of land uses, the upper and lower limits of the heights, widths and length of each building plot, ground levels, key access locations, the main vehicular and pedestrian routes within the Site, and open spaces. A set of parameter plans, defining the parameters as assessed within this ES are presented as Figure 5 within Volume 3: Figures of this ES.
- 5.4 The Development Specification and Framework documents set out the principles of the Development including the amount of floorspace and associated land uses, housing numbers and mix, the amount of car-parking and key landscaping principles including the amount of amenity space and green roofs that would be provided.
- 5.5 The Design Codes set out illustrated design rules and requirements that instruct the physical development of the Site. The Design Codes set out the requirements for the reserved matters applications. Each provide guidance on design quality and further information and detail on appearance and landscaping.
- 5.6 It is proposed that the principles of the Development as defined by the Parameter Plans, Development Specification and Framework and Design Code would be secured through planning conditions.
- 5.7 This Chapter also provides a summary of the Temporary Flexible Event Space, which was the subject of a separate full planning application submitted at the same time as the outline planning application for the SH3 Scheme. The Temporary Flexible Event Space received planning permission in January 2014 and if constructed, would form an interim condition in the north eastern part of the Site prior to construction of Building Plot C. As the Temporary Flexible Event Space influences, and is influenced by, the phasing of the proposed Development, a description of it has been included in this Chapter for completeness.
- 5.8 A description of the anticipated demolition and construction works sequence of activities, together with the likely programme of works are outlined separately within Chapter 6: Development Programme Demolition and Construction.

Temporary Flexible Event Space

- 5.9 A Temporary Event Space is proposed on 0.35ha of land in the north of the Site prior to the construction of Building Plot C. The full application for the Temporary Events Space has been approved and proposes the demolition of Station Hill Retail Parade (including 26 to 58 Station Hill)

and the construction of a Temporary Event Space of approximately 1,096m². The ground level of the site would be raised to integrate with the public realm to the north of the site and provide step-free access throughout.

5.10 It is anticipated that the uses of the Temporary Events Space would include land use classes A1 to A5, D1 and D2 and could include, for example, the following types of uses:

- Market Stalls / Retail Uses;
- Concerts / Open Air Theatre / Cinema;
- Leisure / Sports Events;
- Fairground;
- Marketing Events (e.g. product launches, cars etc.); and
- Ice Rink.

Overview of the Development

5.11 The Development (comprising the SH3 Scheme as amended and extended by the Telecom House / Plot E Scheme) would provide between 101,000 square metres (m²) Gross External Area (GEA) and 181,200m² GEA of floorspace (excluding car parking). This represents an increase in residential floor space of 11,500m² GEA in the minimum parameters or 12,000 m² GEA (or an additional 175 units) in the maximum parameters compared to the consented SH3 Scheme. Car parking spaces would range from 550 spaces to 1000 spaces, which is consistent with the consented SH3 Scheme. In all cases, the increases in floor space area provided within the Telecom House / Plot E Scheme, would be partly off set by reductions in other parts of the SH3 Scheme resulting in the minimal increases in floor space area.

5.12 The minimum and maximum floorspace for each land use as part of the Consented SH3 scheme, for the Telecom House / Plot E Scheme and the proposed overall total is set out within Table 5.1. Whilst the floorspace mix was not fixed as part of the SH3 Scheme application and will not be fixed as part of the Telecom House / Plot E Scheme application, the floor space would not fall below the specified minimum or above the maximum floorspaces for each land use as defined by the outline planning applications and set out within Table 5.1.

Table 5.1: Proposed Total Minimum and Maximum Floorspace by Land Use

Land Use/Use Class	Minimum Gross External Area (m ² GEA)		Maximum Gross External Area (m ² GEA)		Overall Minimum Gross External Area (m ² GEA)	Overall Maximum Gross External Area (m ² GEA)	Change from Consented Scheme
	Consented SH3	Telecom House/Plot E	Consented SH3	Telecom House / Plot E			
Retail (Class A1-A5)	6,000	1000	13,500	7,000	6000	13,500	0
Leisure (Class D2)	0	0	2,200	0	0	2,200	0
Residential	14,500 (150 units)	20,000 (225 units)	29,500 (300 units)	34,000 (285 units)	26,000 (300 units)	41,500 (475 units)	Increase in 11,500 m ² minimum and 12,000m ² maximum

Land Use/Use Class	Minimum Gross External Area (m ² GEA)		Maximum Gross External Area (m ² GEA)		Overall Minimum Gross External Area (m ² GEA)	Overall Maximum Gross External Area (m ² GEA)	Change from Consented Scheme
Offices (Class B1)	69,000	0	122,000	0	69,000	122,000	0
Back of House Facilities	0	0	2,000	1,200	0	3,200	Increase of 1,200m ² maximum
Total Floorspace	89,500	21,000	169,200	41,000	101,000	182,400	Increase of 11,500 m² minimum and 13,200m² maximum
Car Parking	550	0	1,000	200	550	1000	0

1. Floorspace figures exclude roof top and basement plant (incl. energy centre)
2. The public realm may additionally include small retail kiosks (Use Class A1 –A5), which in total will not exceed 10% of the approved retail floorspace.
3. The leisure floorspace excludes the roof top pitches on the roof of Plot G.

- 5.13 The Development includes seven Building Plots (A to G) as well as a covered arcade between Plot C and Plot G and pedestrian public realm.
- 5.14 Retail space would be accommodated at the ground floor levels of Building Plots B – G. Plot A will be predominantly office use at the ground floor level. Office land uses are provided on first floor and above of Plots A – D. Residential land uses are accommodated on first floor and above of Plots E and F.
- 5.15 The existing NCP car park would be retained, refurbished and reconfigured, with a leisure use at roof-level.
- 5.16 The Development would provide pedestrian routes into, out of and through the Site, together with a Central Square, and Station Square and other areas of public realm and private or semi-private open space.
- 5.17 The Development would provide a choice of routes to the main retail core, south from Friar Street and north from Reading Mainline Station.
- 5.18 The Development would incorporate green or brown roofs, to provide additional amenity space to residents and to enhance the biodiversity within the Site.
- 5.19 The Development provides the opportunity to encourage the utilisation of future public transport improvement aspirations of Reading Borough Council (RBC). Further details are provided in Chapter 9: Transportation and Access.
- 5.20 The Development would also include associated infrastructure works including service and utilities modifications and diversion, drainage works and provision of sustainable energy infrastructure. The key elements are described later within this Chapter.

Parameter Plans

- 5.21 The outline planning applications for both the SH3 Scheme and the Telecom House / Plot E Scheme include seven Parameter Plans, which provide the parameters for redevelopment of the Site as set out in Table 5.2. A consolidated set of parameter plans showing the parameters of the SH3 Scheme

as amended and extended by the Telecom House / Plot E Scheme are presented in Volume 3 of this ES.

Table 5.2: Parameter Plans presented with the outline planning application

Parameter Plan Drawing number (SH3 Scheme and Telecom House / Plot E Scheme)	Title	Description
698_04_210	Planning Application Boundary	The existing Site in the context of the surrounding area. Defines the planning application boundary.
698_04_211	Demolition and Retained Buildings	Buildings to be demolished and the retention of the existing NCP car park building.
698_04_212	Building Plot Parameters (including heights)	Proposed building plots, each building plot's maximum and minimum heights and each building plot's maximum footprint (subject to limits of deviation).
698_04_213	Public Realm	Proposed location of public realm.
698_04_214	Vehicle and Pedestrian Access Routes (including car parking)	Proposed access points and routes for pedestrians and vehicles.
698_04_215	Ground Floor Uses	Proposed land uses at ground level.
698_04_216	Upper Floor Uses	Proposed land uses at upper levels.

- 5.22 The following sections of this Chapter describe the Development in accordance with the Parameter Plans, floorspace area schedule as set out within Table 5.1 and the commitments made within the Design Codes.

Layout of Built Development

- 5.23 Parameter Plan 698_04_212 illustrates the layout of the proposed buildings and each building plot's maximum footprint (subject to limits of deviation). The Parameter Plan illustrates that the Development would comprise seven building plots and a covered arcade between Plot C and Plot G.
- 5.24 The Building Plots are defined by Garrard Street together with the following pedestrian desire lines:
- Friars Walk, running north-south to connect the new Station Hill bus interchange and Reading Mainline Station with Friar Street to the south;
 - A pedestrian route running east-west between Reading Mainline Station and Greyfriars Road to the west of the Site, running parallel with Station Hill; and
 - A pedestrian route connecting Station Hill with Garrard Street running parallel with Greyfriars Road.
- 5.25 Parameter Plan 698_04_213 shows zones for the public realm area between the buildings. It defines the minimum width between the building plots at ground level and therefore the extent of the public realm areas between buildings excluding any colonnaded areas on the lower floors.
- 5.26 The commercial building plots (Plots A-D) and multi-storey car park (Plot G) are located to the north of Garrard Street and are located surrounding a new public square (Central Square). In a clockwise

direction, starting from the north-west part of the Site, the layout of these five building plots are as follows:

- Plot A would be located in the north-west of the Site;
- Plot B would be located in the north of the Site, to the east of Plot A, a minimum distance of 9m from Plot A, allowing the creation of a shared pedestrian and service route between;
- Plot C would be located in the north-eastern corner of the Site, a minimum distance of 11.3m east of Plot B, which would provide the north-south pedestrian route 'Friars Walk';
- Plot G (the existing multi-storey car park) is located in the east of the Site. It would be separated from Plot C by a covered 6m arcade;
- Plot D would be located 8m to the east of Plot A, and west of the proposed Central Square, a minimum of 24.4m west of Plot D.

5.27 The residential building Plots (Plots E and F) would be located in the south of the Site, immediately south of Garrard Street, either side of Friars Walk. At the southern extent of Plot E and Plot F, a minimum of 8m would separate the buildings at ground level. At the northern extent of Plot E and Plot F, a minimum of 15.4m would separate the buildings.

Building Heights and Massing

5.28 Minimum and maximum building heights are annotated on Parameter Plan 698_04_212. This illustrates that the Site comprises a range of building heights, which gives variety in the form of the Development. The taller building elements of the Development are located towards the north of the Site whilst the lowest building elements are located to the south. Table 5.3 outlines the proposed range of minimum and maximum building heights.

Table 5.3: Minimum and Maximum Building Heights.

Building Plot	Minimum Building Heights (metres Above Ordnance Datum (AOD))	Maximum Building Heights (m AOD)
Plot A	67m	91m
Plot B	94m	121m
Plot C	109m	128m
Plot D	75m	105m
Telecom House / Plot E	63m	85m
Plot F	63m	85m
Plot G	72m	83m

5.29 The Design Code stipulates that building heights would increase from west to east and from south to north. For example, the building in Plot B must be taller than the building in Plot A; the building in Plot C must be taller than the building in Plot B. Similarly, the building in Plot B must be taller than the building in Plot D which should itself be taller than the buildings in Plots E and F.

5.30 As set out in the Design Codes, the height of the residential buildings (Plots E and F) would be required to step up from Friar Street to the Central Square.

5.31 The buildings in Plots A, B, C and D would have set backs on the upper floors to help articulate the massing of each building and differentiate each individual building when viewed together as a cluster. This would create a roof top pavilion. The pavilions would be between 1 and 3 storeys in

height. The maximum footprint area of the roof top pavilion would be 75% of the lower level footprint.

- 5.32 Double height colonnades are proposed around the Central Square and along the northern part of Friars Walk on the east elevations of Plots D and B, and west elevation of Plots C and G. These are shown on Parameter Plan 698_04_215.

Elevational Treatment

- 5.33 The elevational treatment of each building would be determined at detailed design. However, the Design Codes set out the following key principles in respect of elevational treatment.

Commercial Plots

- 5.34 It is proposed that the elevations of buildings on Plots A, B, C and D would have a regular structural pattern and complement one another, either through similar materials or structural rhythm.
- 5.35 The base of the buildings would be defined by full height glazing, with a double height colonnade on façades surrounding the key public spaces of Central Square and the northern part of Friars Walk. The top of the buildings would be defined by the setback pavilions.
- 5.36 The proposed materials for principal façades and pavilions could include:
- Brickwork;
 - Terracotta;
 - Reconstituted or natural stone;
 - Anodised aluminium;
 - Glass; and
 - Architectural metalwork.

Residential Building Plots

- 5.37 The elevations of buildings on Plot's E and F must share a common architectural language so that they complement one another through similar materials.
- 5.38 Windows would be set back by a minimum of one brick from the façades of the external walls in order to introduce depth to the façades.
- 5.39 Each elevation would be finished in a principal material, with other materials used to enhance the design.
- 5.40 The proposed materials for principal façades and pavilions could include:
- Facing brickwork;
 - Reconstituted or natural stone;
 - Anodised aluminium;
 - Glass;
 - Architectural metalwork;
 - Self finish render; and
 - Louvre panels.

Multi-Storey Car-Park

- 5.41 The existing multi-storey car park would be retained and refurbished, and re-clad to cover the existing concrete structural frame and pre-cast panels. The external cladding would allow natural ventilation, and be semi-reflective.
- 5.42 Three façade types would be used. The south facing façade would comprise a 'green wall' (refer to later in this Chapter). The second type of façade would be on the east and north elevations, which would use the same cladding system to provide consistency. A third façade treatment would be used on the west façade fronting the Central Square with a colonnade along the west elevation.
- 5.43 Active frontages would be incorporated along the north and west facades to animate the arcade and Central Square respectively, with full height glazing.
- 5.44 The proposed materials for the multi-storey car park could include:
- Anodised aluminium panels;
 - Painted aluminium panels;
 - Plant trays;
 - Glass;
 - Architectural metalwork;
 - Galvanised metal mesh;
 - Self finish render;
 - Metal louvre panels;
 - Treated softwood battens; and
 - Metal mesh sheets.

Site Levels

- 5.45 The Development has been designed to incorporate direct level pedestrian access to the Station Hill area and the Reading Mainline Station as well as connections through to Garrard Street and Friar Street. The existing 5m level change across the Site would be addressed through the design of Station Square which would include a ramped and stepped access to overcome the level change and ensure suitable access to, and through, this public space.
- 5.46 Proposed ground levels within the Site boundary once the Development is completed would be confirmed at the Reserved Matters for each building but levels within the following areas have been set as part of Parameter Plan 698_04_212, as follows:
- 45.6m AOD to the south adjacent to Friar Street;
 - 39.9m AOD at Garrard Street (central); and
 - 44.0m AOD in the east adjacent to Thames Tower.

Land Uses

- 5.47 Parameter Plans 698_04_215 and 698_04_216 illustrates the location and distribution of the proposed land uses within the Development. Retail uses would be provided at ground floor throughout the Development except within Plot A. Commercial land uses would be concentrated north of Garrard Street with residential uses south of Garrard Street. Plot G would provide the majority of parking for the Development although up to 200 spaces could be accommodated in Telecom House / Plot E. Leisure uses would be provided in Plot F and/or in Plot G.

Office Use (Class B1)

- 5.48 The building plots fronting Station Hill in the north of the Site are proposed for office use to reflect the high visibility from the Reading Mainline Station and the busy Station Hill street frontage as well as the excellent public transport accessibility. The office content of the Development would range between 69,000m² and 122,000m² and would be located in the ground and upper floors of building Plot A and upper floors of building Plots B – D.

Retail Uses (Class A1-A5)

- 5.49 Retail uses would provide between 6,000m² and 16,000m² GEA and comprise a mix of shops, financial and professional services, restaurants and cafés and drinking establishments. These would be provided at ground floor level of building Plots B – G so as to complement the uses on the upper floors and provide frontages which activate the public realm at the ground floor. A mix of unit sizes is proposed to cater for a range of tenants.
- 5.50 The precise mix of retail land uses would be subject to market demand at the time of detailed design. This would ensure that the Development is viable and that an appropriate mix of activities is provided to support the population, whilst having due regard to the facilities provided elsewhere within Reading.

Leisure

- 5.51 The Development would provide up to 2,200m² GEA of leisure uses. The leisure floorspace would be provided on the upper floor of buildings within building Plot F (maximum floorspace 1,100m² GEA) and / or on the roof area of Plot G (maximum area 2,200m² GEA). Plot F could include a ten-pin bowling alley should the viability be demonstrated and a suitable operator found.

Residential Land Uses

- 5.52 Residential land uses would be located in the south of the Site at first floor level and above within Telecom House / Plot E and Plot F.
- 5.53 As noted within Table 5.1, the Development would provide a minimum of 300 residential units and a maximum of 475 residential units, with a minimum and maximum aggregate floorspace of 26,000m² and 41,500m² GEA respectively. The size of these units has not been determined. However for the purpose of the EIA it is assumed that 70% would comprise 2 bedroom units and 30% would comprise one-bedroom units. A percentage of the total residential floorspace would be allocated to affordable housing and would be subject to discussions with RBC.

Vehicular Access, Circulation, Parking and Servicing

- 5.54 Parameter Plan 698_04_214 illustrates the proposed means of vehicular access, servicing and pedestrian circulation within the Development. The primary vehicle access into the Development would be from Greyfriars Road and via Garrard Street. Access and egress from the reconfigured multi-storey car park would be from Garrard Street which will connect to the wider road network via Greyfriars Road.

Car Parking

- 5.55 A maximum of 1,000 car parking spaces would be provided within the Development. As previously noted, the existing multi-storey car park building would be retained, reconfigured and refurbished and would provide between 550 and 900 car parking spaces. There is also potential for a separate

car park of up to 200 spaces to be introduced within Telecom House / Plot E. Access to the residential uses within Telecom House / Plot E would be available from the car park, via lifts and staircases.

Cycle Parking

- 5.56 It is proposed that between 750 - 800 cycle spaces would be provided for within the Development.

Servicing

- 5.57 As shown on Parameter Plan 698_04_214, building Plots A, B and D would be serviced from a shared service and pedestrian route between Garrard Street and Station Hill. Building Plot C would be serviced via Garrard Street through the provision of a dedicated service entry point at lower ground on the north side of Garrard Street. Building Plots E and F would be serviced from Garrard Street and Merchants Place respectively.

Pedestrian Access and Circulation

- 5.58 Parameter Plan 698_04_214 defines the pedestrian routes within the Development. This shows that there would be two key pedestrian routes across the Site. The major pedestrian route would run north-south to connect the new Station Hill bus interchange and Reading Mainline Station with Friar Street to the south. This route is referred to as Friar's Walk and would be pedestrianised with a shared surface crossing at Garrard Street. To account for a 5m level difference across the Site from Station Hill to Friar Street ramps and steps are proposed. This route would be animated by retail land uses which form active edges at the ground level. This pedestrian route would be a minimum of 8.0m in width in the south and 11.3m in the north and pass through the proposed 'Central Square' between building Plots D and G.
- 5.59 The second key pedestrian route would run east-west between Reading Mainline Station and Greyfriars Road, through building Plot A and between building Plots B and D in the west and through a new covered arcade in the east of the Site between building Plots C and G. The route would be a minimum of 3m wide through building Plot A, increasing to a minimum of 8.5m between building Plots B and D and 6m along the covered arcade. Active frontages are proposed along the Arcade.
- 5.60 The Development also seeks to re-model Garrard Street as a 'shared' surface / crossing zone where traffic is accommodated within an essentially pedestrian-orientated environment.
- 5.61 The key building entrance points would be located on the street frontages on the periphery of the Site as well as facing the Central Square and the pedestrian routes, thereby providing active frontages throughout the Site.

Open Spaces and Landscape

Public Space

- 5.62 The principal areas of public realm are shown on Parameter Plan 698_04_213 and 698_E_PP_07_004.
- 5.63 With the exception of Garrard Street, the service access between building Plots A, B and D and the vehicular access to the east of building Plots C and G, the spaces between the buildings would be publically accessible public spaces. In addition to new areas of public realm (Friars Walk and the arcade, as described above) the Development would include two new public squares as follows:

Central Square

- 5.64 As shown on Parameter Plan 698_04_213, a new square 'Central Square' is proposed between Plots D and G and would be a minimum of 24.4m wide. The key north-south and the east-west pedestrian routes converge at Central Square. It is therefore envisaged that this space would function as the main pedestrian focal point of the Development. The space would be animated by retail land uses which would provide active edges.

Station Square

- 5.65 A new Station Square would be created to the east of building Plot C, north of Thames Tower. This new space would provide a gateway from Reading Mainline Station to Reading town centre and would accommodate major pedestrian flows and movements as well as providing areas of seating and waiting.
- 5.66 The design of this area would link with existing proposals for the wider area including the RBC bus interchange works. Station Square would include new steps and ramps to negotiate a level difference of approximately 4m that is being created by the new RBC bus interchange works.
- 5.67 The area would be landscaped to include benches and trees. The proposed paving would follow that proposed on the adjacent RBC land.

Private Space

- 5.68 Each apartment would have access to a shared amenity space and / or private balcony. A minimum of 10m² of private or shared amenity space would be provided per residential unit. Shared amenity spaces for residents would be provided at ground floor level and/or roof level.
- 5.69 Roof terraces are also proposed on the office buildings (Building Plots A-D) at the level where the buildings are set back to provide amenity space for the office workers.

Green and Brown Roofs

- 5.70 Green and / or brown roofs would be located throughout the Site. The total green / brown roof provision would cover a minimum of 25% of the total roof area of the Development.
- 5.71 The brown roofs would provide ecological enhancement to the Development through the provision of suitable habitat for the protected bird species, black redstart (*Phoenicurus ochruros*). This is discussed within Chapter 14: Ecology.
- 5.72 The brown roofs would be constructed using shallow layers of recycled aggregate or similar material sourced from the Site where practicable, in order to create an environment suitable for ruderal plant species, bryophytes and invertebrates. These would, in turn, provide a food source for a variety of bird species including black redstarts. The roofs would be bespoke designed to ensure that the most appropriate habitat for attracting black redstarts is created. Access to these roofs would be restricted for maintenance and survey purposes only.

Green Wall

- 5.73 A green wall would be created on the southern elevation of the refurbished multi-storey car-park, using suitable plants arranged in planting tray.

Tree Planting

- 5.74 All trees removed would be replaced, alongside additional tree planting. The species would be determined at detailed design.

Landscaping

- 5.75 Soft landscaping at ground level would include trees, shrubs and hedges, and green walls. Tree planting would establish a strong identity for the Development and define the proposed public spaces and circulation routes. The proposed species would be determined at detailed design and would be selected for tolerance, and biodiversity value.
- 5.76 High quality street furniture including seating, litter and re-cycling bins, cycle racks, signage and wayfinding features, information boards and lighting would be provided in varying materials and colour materials. This may include natural stone, cast stone, hardwood, painted mild steel, stainless steel, glass and enamelled surfaces. All street furniture would be located so as not to impede pedestrian flows.

Utilities and Services

- 5.77 The existing records for utility routes and service provision were obtained from the statutory utility providers by Hoare Lea. A summary is set out below in Table 5.5.

Table 5.5: Existing Utility Providers on Site

Company	Utility
Scottish & Southern Electricity PLC	High Voltage (HV) and Low Voltage (LV) electricity supply
Thames Water Services	Potable water
Thames Water Utilities	Foul and surface water drainage
Transco	Gas
British Telecom	Telecoms
Cable & Wireless	Telecoms
Energis Communications	Telecoms
Fibrenet	Telecoms
Kingston Communications	Telecoms
NTL	Telecoms
Vodafone Ltd	Telecoms

- 5.78 The Development would require the modification and/or relocation of selected existing utilities. Accordingly, where appropriate, the existing infrastructure networks would be diverted, remodelled and reinforced to suit the demands of the Development. Further details are summarised in Table 5.6.

Table 5.6: Proposed Utilities Required on the Site

Utility	Requirements
Electricity	Installation of an HV and LV distribution infrastructure.
	Provision of new underground HV and LV cables.
Gas	Extension of the existing low pressure underground gas pipework infrastructure.
Mains water and sewerage	Re-enforcement of water mains serving the Site.
	Provision of water storage tanks and pumping facilities across the Site.
Telecommunications	Installation of new telecoms infrastructure.
	Extension and upgrading of existing telecoms utilities.

- 5.79 It is proposed the existing primary foul sewer running beneath the Site would be retained and the structural designs would allow for a 3m easement zone either side of the sewer, where no below ground development would take place.

Surface Water Drainage Strategy

- 5.80 A Flood Risk Assessment has been undertaken for the Development and is included within Appendix 13.1. This concludes that in order to limit increases in surface water run-off generation from the Site (accounting for the effects of climate change), in addition to the green and brown roofs, a maximum of approximately 900m³ of surface water drainage attenuation tanks together with hydrobrakes would be required to attenuate runoff from a 100 year storm event.
- 5.81 The locations of the attenuation tanks would be determined at detailed design. However, the outline design allows space for tanks beneath the public realm.
- 5.82 Further details regarding the surface water drainage strategy are provided in Chapter 13: Surface Water Drainage and Flood Risk and Appendix 13.1.

Energy

- 5.83 An Energy Strategy has been prepared by Hoare Lea for the Development. The energy strategy estimates that the carbon emissions for the whole Site would be 5-15% better than a Part L 2013 baseline. This target is currently proposed to be achieved entirely through passive design and energy efficiency. A Combined Heat and Power (CHP) plant may also be implemented (subject to technical and financial viability to be reviewed at the detailed design stage). Opportunities for renewables would also be reviewed further at the detailed design stage.
- 5.84 The Development would be future-proofed to allow the expansion of potential low carbon district energy sources, should these exist in the future.

Waste Generation and Management

- 5.85 Commercial and retail waste would be collected and taken to the servicing areas from where collection would take place. Convenient purpose designed storage space for recycling in commercial areas will be incorporated into all Station Hill commercial buildings in accordance with the BREEAM requirements for offices.

- 5.86 In the residential blocks residents would be responsible taking their rubbish to the base of each building core and placing it in the appropriate euro bin for collection. Each residential unit would be provided with an internal recycling storage area to encourage residents to segregate their recyclable waste and store it prior to collection.

Environmental Performance and Sustainability

- 5.87 The Development incorporates a number of features to ensure high environmental performance. These features constitute the following:
- The Development would be built on previously developed land;
 - The Development is within 5 to 10 minute walk of public transport links, community facilities and amenities of Reading town centre;
 - The Development would provide pedestrian linkages throughout the Site, connecting Friar Street and central Reading with the new station interchange (bus station and Reading Mainline Station);
 - The Development would allow internal and external waste recycling facilities, making it possible to achieve a high recycling levels;
 - The Development would be designed to achieve a 'Very Good' rating under BREEAM Retail 2011 and BREEAM Offices 2011, with potential to achieve excellent, subject to tenant fit-out;
 - The Development would incorporate a range of energy efficiency measures (as discussed above);
 - The Development would achieve an average per capita water consumption rate of 105 litres per head per day through the use of water efficient fittings;
 - The Development would provide between 750 - 800 cycle spaces;
 - The Development would include of green roofs and brown roofs on 25% of the roof space to provide habitat for the black redstart;
 - The Development would provide a green wall; and
 - Tree-planting would exceed the number and quality of existing trees removed during demolition.

6 Development Programme Demolition and Construction

Introduction

- 6.1 This Chapter describes the anticipated programme and sequence of demolition and construction works and the key activities that would be undertaken on the Site during the construction of the Development. It identifies, in general terms, potential effects associated with demolition and construction activities and outlines proposals for their mitigation. Detailed consideration of demolition and construction related environmental effects relevant to the various technical assessments are provided in each relevant Chapter of this ES (refer to Chapters 7-16 inclusive).
- 6.2 This Chapter has been prepared by Waterman Infrastructure & Environment Ltd (Waterman IE) with input from the Applicant's Team.
- 6.3 It is proposed that a Construction Environmental Management Plan (CEMP) be implemented during demolition and construction works. This would be discussed and agreed with the relevant planning officers at Reading Borough Council (RBC) following approval of the outline planning application. An outline of the content of the CEMP is provided in this Chapter.
- 6.4 Planning for demolition and construction is necessarily broad at this stage and may be subject to modification. In the first instance, an outline application can only consider an overview of the proposed demolition and construction activities. Secondly, specific demolition and construction activities would vary in frequency depending upon the particular stage of works. However, it is considered that sufficient information is available to enable the assessment of all likely and significant environmental effects related to the demolition and construction works.

Programme of Works

- 6.5 Site Preparation and Demolition works to the northern plots commenced in May 2015; given the scale of the Development, the current expectation is that the demolition of the existing buildings on the Site and the construction of the Development would take approximately 60 to 70 months. This is up to 10 months longer due to the inclusion of Telecom House although it may be that the original 60 month programme would still be met, depending upon the level of overlap in the demolition and construction works. Whilst full details regarding the demolition and construction works are not finalised, it is possible to provide general information about the timing of activities and this is provided below.
- 6.6 An indicative phasing strategy has been developed for the construction implementation. This strategy is subject to external influences but has been used as the basis of the master programme and project timeline.
- 6.7 Indicative Phasing Plan 698_04_202 (included as Figure 6.1) shows the location and sequence of proposed construction. It is intended that Site clearance would be undertaken in two, or potentially three, phases.
- 6.8 Table 6.1 summarises the main activities to be undertaken during the demolition and construction works and the approximate duration of the works. It is important to note that Table 6.1 indicates the approximate duration of each main stage of the works, some of which would be occurring concurrently. The overall development programme is likely to remain the same, irrespective of the inclusion of the Telecom House Site. This is due to the overlaps in the construction programme.

Table 6.1 Indicative Demolition and Construction Activities and Duration

Activity	Approximate Duration of Works (Months)
Enabling Works	12
First phase of site preparation and demolition	22
Construction of Phase 1	24
Second phase of site preparation and demolition	10-14
Construction of Phase 2	27-35

Sequence of Works

6.9 The proposed sequence includes two phases of demolition and associated construction in the sequence described below:

- Site enabling works;
- Phase 1 Site Preparation and Demolition - to enable the construction of Building Plots B, A, D and preparation for Building Plots C and G. This would include:
 - demolition of the low rise retail parade (including 26 to 58 Station Hill), Western Tower, walkways around the NCP car park, the former Bus Station and Mecca Bingo Building – this will also allow construction of the temporary event space;
 - demolition of the western side of the NCP car park;
 - demolition of Xafinity House;
 - Archaeological Investigations and Site Investigations.
- Construction of Phase 1 including:
 - Creation of the Temporary Events Space;
 - Construction, cladding and fit-out of buildings within Plots A, B, D and car park (G). It is envisaged that phasing would commence with building Plot B, followed by Building Plots A, D and G;
 - Construction of the central plant serving Phase 1 buildings;
 - Creation of the public realm adjacent to Plot C;
 - Landscaping works.
- Demolition Phase 2 - to enable the construction of Building Plots E and F. this would include:
 - demolition of Friars Walk Shopping Centre;
 - Archaeological investigations and Site Investigations.
- Construction of Phase 2 including:
 - Construction, cladding and fit-out of Buildings E, F and C. It is envisaged that phasing would commence with Building Plot E and Friars Walk, followed by building Plot F, and finally Building Plot C. This sequence is intended to maximise the use of the temporary event space;
 - Completion of the pedestrian route from Friar Street through the Site to Reading Mainline Station; and
 - Landscaping works.

Description of the Works

Site Preparation and Demolition

- 6.10 During Site preparation, hoardings would be erected around the Site boundary. The hoarding would accord with the Health and Safety Executive (HSE) and RBC requirements and be a 2.4m high timber secure solid fencing, be well lit and maintained throughout the works to ensure the safety of the public.
- 6.11 Scaffolding would be erected around the perimeter of the existing buildings and protective gantries over pavements would be incorporated where necessary. Existing services on the Site would be identified, surveyed, tested and diverted or cut off as appropriate. Key services and re-instated services would be temporarily protected and weather proofed to ensure a safe clearance process.
- 6.12 Prior to demolition, internal soft furnishings would be stripped and removed. An intrusive inspection would also be undertaken to identify the presence of any potentially hazardous materials e.g. asbestos-containing materials. If present, these would be removed from the Site and disposed by appropriately licensed contractors following prescribed health and safety procedures.
- 6.13 During demolition, all building elevations which front public boundaries or which are immediately adjacent to adjoining properties would be fully scaffolded and completely enclosed by monarflex sheeting to provide a dust and safety shield. De-construction methods would be employed where possible. Should it be deemed necessary, short-term pavement closures would be implemented to ensure the safety of the public.
- 6.14 Following the demolition works, the intrusive Site investigation, as described in Chapter 12: Ground Conditions and Contamination, would be undertaken to establish the extent and nature of potential ground contamination on the Site. In addition, archaeological evaluation would be undertaken, as described in Chapter 8: Archaeology, to inform the archaeological mitigation strategy. Archaeological evaluation works would commence prior to demolition and continue throughout the demolition and construction phase (as necessary). The piling technique to be employed during the construction works would be informed by the findings of the archaeological evaluation. The indicative programme of works allows for these two activities.

Excavation

- 6.15 Excavation works include:
- Nominal excavation (approximately 1m) and then grading of the Site to allow the construction of the service trenches and lower ground level;
 - The installation of new services such as electricity, gas, drainage and water mains; and
 - Establishment of foundations, such as the installation of piles, pile caps and ground beams.
- 6.16 Excavations would generally be undertaken using normal earth moving equipment, such as dozers, graders and excavators. High pressure wheel washing facilities will be used at egress points.

Foundations

- 6.17 The structural loads generated by the proposed buildings would necessitate the use of piled foundations. Adequate pile capacities would be achieved using either single piles or small groups of piles founded in the Valley Gravels over the Chalk.
- 6.18 It is envisaged that rotary bored piles would be suitable for the foundations. These would be installed to depths of between 30 - 50m below ground level (bgl) dependent upon the applied load.

It is anticipated that the upper and lower public spaces, together with the lower rise structures, would be supported on a one-pile-per-column basis. Mid and high-rise structures together with all core building areas would be supported on pile groups combined by pile caps. Piles would be spaced based on a minimum of three times the pile diameter.

- 6.19 As noted above, there is the potential for archaeological remains to be present beneath the Site, and therefore, if required, a multi-pile solution would be utilised to avoid damage to such remains.

Construction of the Sub-Structure

- 6.20 The Development has been designed to minimise the amount of sub-structure works. Minimal areas of new sub-structures are needed and these would consist of reinforced concrete retaining walls and reinforced concrete slabs. A limited length of contiguous piled wall with a reinforced concrete lining wall would be required in order to retain boundary soil adjacent to the foundations of the neighbouring Thames Tower.
- 6.21 A proportion of the Development would be covered by suspended reinforced concrete slabs from which the building elements would rise. All columns located in car park areas below ground level would also be concrete.
- 6.22 To suit the frame construction for the commercial buildings, a shallow steel solution would replicate the concrete flat slabs. Similarly, the commercial columns would be concrete cased and designed as composite elements.

Construction of the Super-Structure

- 6.23 Residential buildings within the Building Plots would likely be constructed using a reinforced concrete frame.
- 6.24 The commercial buildings would likely comprise a steel composite construction. This would be formed using a slab of lightweight concrete on a permanent metal deck shutter.

Cladding

- 6.25 Although building appearance is a reserved matter at the outline planning application stage, at the time of writing, it is envisaged that cladding materials would include glass, anodised aluminium, brick, Terracotta, stone and reconstituted stone, render, louvre panels and architectural metalwork.

Fit-out

- 6.26 Within Building Plots E and F, fit-out would be included for all residential units provided. Within Building Plots A, B, C, and D, the office floorspace would be provided as flexible shells to be completed by each occupier. Similarly, retail space would be provided as flexible shells to be completed by each occupier.

Landscaping

- 6.27 Landscaping works for the public realm areas would involve paving, tree planting, and provision of street furniture including seating and signage.
- 6.28 At roof level landscape works would involve construction of the brown and green (sedum) roofs and landscaping of private amenity spaces.
- 6.29 Streetscape works including provision of signage would also be undertaken along Garrard Street.

Materials and Resource Use

Excavation

- 6.30 Disposal of waste material would be carried out by appropriately licensed contractors to disposal sites licensed to accept material of the quality excavated. Where appropriate, inert or structurally suitable materials would be reused and/or recycled for both on and off-site uses.

Demolition

- 6.31 At this point in the design process, it is not possible to accurately quantify the amount of materials arising from the demolition works. However, Table 6.2 provides an indication of the major types of materials likely to arise from demolition.

Table 6.2: Indicative Materials Arising from Demolition

Material	Material Sources
Concrete	Superstructures, floor slabs, walls, columns
Brick	External and internal walls
Glass and cladding	Windows and cladding
Metal components	Windows, plant, superstructures, sub-assemblies
Timber and plasterboard	Partitions and ceilings
Plastics/fibrous materials	Internal furnishings
Hard-standing/tarmac	Internal pathways, car parks
Earth spoil	Excavations

Construction

- 6.32 The generation of waste material would occur at all stages of the construction process, from structural and foundation works to fit-out of the new buildings. Following a number of audits, the Building Research Establishment (BRE) has determined that, as a broad guide¹, approximately 18.1m³ of waste is generated in the construction of 100m² of residential developments, approximately 19.8m³ of waste is generated in the construction of 100m² of commercial offices, 20.98m³ of waste is generated in the construction of 100m² of retail developments, and 14.4m³ of waste is generated in the construction of 100m² of leisure developments. The waste generated by the construction of the Development has been estimated based on these figures, as shown in Table 6.3.

Table 6.3: Waste Arisings

Land Use/Use Class	Minimum Gross External Area (m ² GEA)	Waste Arisings (m ³)	Maximum Gross External Area (m ² GEA)	Waste Arisings (m ³)
Offices (Class B1)	69,000	13,662	122,000	24,156
Retail (Class A1-A5)	6,000	1,259	13,500	2,833
Leisure (Class D2)	0	0	2,200	317
Back of House Facilities	0	0	3,200	671
Residential	26,000	4,706	41,500	7,511
Total Floorspace	101,000	19,627	181,200	35,488

- 6.33 Using the BREs broad indicators, the Development could produce up to 35,488m³ of waste over approximately five years, equivalent to approximately 7,021m³ per year from the new construction. Additional waste would be generated from the refurbishment of the car-park. It is therefore estimated that approximately 40,000m³ of waste would be generated, equivalent to approximately 8,000m³ per year. This compares with approximately 35,000m³ over 5 years for the consented SH3 Scheme or 7,000m³ per year. No significant waste arisings would be expected from the construction of the Temporary Flexible Event Space.

Construction Traffic and Access

- 6.34 Construction routes to the Site would be selected to allow for the safest and most efficient movement into and around the Site during works. The routes of construction traffic to and from the Site would be agreed with RBC in accordance with the requirements of Planning Conditions 32 (Demolition Management Statement) and 33 (Construction Management Statement) on the SH3 planning consent, and would be confined to the local major roads where possible. The conditioned Demolition and Construction Management Statements would be established with RBC to agree the details of the construction routes, operating hours and other operational issues. This information would form part of the CEMP (further detail is provided later in this chapter).
- 6.35 As shown in Figure 6.2, incoming construction traffic would travel along the A33 and northbound (clockwise) on the Inner Distribution Road (IDR). Such traffic would then egress the IDR to reach the Site via the Chatham Street/IDR roundabout and Greyfriars Road.
- 6.36 Outgoing construction traffic would share the managed access point located south of the Site to Garrard Street. Such traffic would reach the IDR via Tudor Road to return to the A33.
- 6.37 Figure 6.2 shows that the construction traffic routes avoid Reading's central area, thereby reducing potential disruption to the commercial core.

Plant and Equipment

- 6.38 Consideration has been given to the types of plant and equipment that are likely to be used during the demolition and construction works. An indication of typical types of plant and equipment associated with each key element of the construction process is set out within Table 6.4.

Table 6.4: Indicative Plant Used During Demolition and Construction

Plant and Equipment	Site Preparation and Demolition	Substructure	Superstructure	Cladding	Fit out	Landscaping and construction of public realm
Bulldozers	✓					✓
Concrete crusher	✓					
Concrete silo and ready-mix lorries		✓	✓			
Concrete splitters and concrete saws	✓					
Cranes and hoists	✓	✓	✓	✓	✓	
Cutters, drills and small tools	✓	✓	✓	✓	✓	
Excavators and breakers	✓	✓				✓
Floodlights	✓	✓	✓	✓	✓	✓
Fork lift trucks	✓	✓	✓	✓	✓	✓
Hydraulic benders and cutters	✓	✓	✓	✓	✓	
Lorries/vans	✓	✓	✓	✓	✓	✓
Tarmac and paving laying equipment						✓
Scaffolding and hydraulic access platforms	✓	✓	✓	✓	✓	
Temporary supports	✓	✓	✓	✓		
Tipper lorries	✓	✓	✓			✓

Potential Environmental Effects

- 6.39 Demolition and construction works can cause significant environmental impacts and disruption to neighbours if they are not properly managed. The Applicant is committed to minimising the impacts of the works and, in accordance with the requirements of Planning Condition 35 on the SH3 Scheme Planning Consent, would require the appointed contractor(s) to implement a Construction Environmental Management Plan (CEMP) for the demolition and construction works. The CEMP would set out procedures that the contractors would be required to adopt to manage the environmental impacts of the works. Elements of Planning Conditions 32 (Demolition Method Statement) and 33 (Construction Management Statement) on the SH3 Scheme Planning Consent would also be incorporated into the CEMP. The requirement to comply with the CEMP would be included as part of the contract conditions for each element of the work. All contractors tendering for work would be required to demonstrate that their proposals would comply with the contents of the CEMP. Trade Contractors would also be vetted to establish their history of compliance with the required environmental standards for their relevant disciplines. It is intended that planning conditions would be imposed on the Telecom House / Plot E planning permission which would also require compliance with the proposed CEMP, Demolition Method Statement and Construction Management Statement.
- 6.40 A summary of the key issues considered by the CEMP, and details of where further information in relation to mitigation can be found within the ES, is identified in Table 6.5 below.

Table 6.5: Key Issues Considered by the CEMP

Topic	Issues Covered	Location of further Information
Site Management	Working hours. Pedestrian safety and Site security Management of sub-contractors	Chapter 6: Development Programme, Demolition and Construction
Noise	Methods of minimising noise from demolition works, piling, concrete crushing, construction etc e.g. selection of quieter plant, plant maintenance and screening. Management of construction vehicle routing to minimise disruption due to vehicle noise.	Chapter 11: Noise and Vibration Chapter 9: Transportation and Access
Vibration	Methods of minimising vibration from demolition works, piling, and general construction works e.g. selection of piling methods, cutting rather than breaking.	Chapter 11: Noise and Vibration
Dust / Air Quality	Methods of minimising windblown dust from ground surfaces, stockpiles, earth moving vehicles, work faces etc, e.g. damping down during dry weather, wheel washing, street sweeping. Methods of minimising the impact of exhaust emissions from construction vehicles e.g. switching off engines when not in use.	Chapter 10: Air Quality
Waste / Materials	Methods to minimise waste e.g. minimising packaging waste, protecting materials from damage by weather or vandalism, and the correct disposal of waste.	Chapter 6: Development Programme, Demolition and Construction
Traffic Management	Construction traffic routing to minimise congestion, conflicts between HGV traffic and pedestrians and disturbance to local residents. Wheel washing and street sweeping requirements to minimise the transfer of mud and material from vehicles onto the public highway. Requirements relating to planned closures and diversions of roads. Management of pedestrian access routes within the locality of the Site, particularly around Reading Mainline Station.	Chapter 9: Transportation and Access Chapter 6: Development Programme, Demolition and Construction
Site drainage and spill control	Methods of handling accidental spills and leaks. Fuel storage Correct disposal of Site drainage. Pollution Prevention Guidelines.	Chapter 12: Ground Conditions and Contamination Chapter 13: Flood Risk and Drainage
Ecology	Protection of important species including black redstart, peregrine falcons and other breeding birds from harm and/or disturbance.	Chapter 14: Ecology
Archaeology	Inclusion of archaeological evaluation and recording in the Construction Programme Preventing disturbances or losses of archaeological resources	Chapter 8: Archaeology
Townscape and Visual Quality	Temporary visual intrusion of construction to nearby residents, occupiers of other properties and road and rail users.	Volume 3; Townscape, Conservation and Visual Assessment

Topic	Issues Covered	Location of further Information
Built Heritage	Temporary adverse effects upon the setting of the nearby Grade II listed buildings including: the Three Guineas public house to the north, 13-15 Station Road, Great Western House on Station Road; the statue of King Edward VII adjacent to the east of the Site. Potential for damage due to vibration effects. Temporary adverse effects upon Market Place/London Street, St. Mary's Butts/Castle Street and Russell Street/Castle Hill Conservation Areas.	Volume 3; Townscape, Conservation and Visual Assessment Chapter 11: Noise and Vibration
Liaison with neighbours and Reading Borough Council	Procedures for liaising with neighbours, including production of a regular newsletter. Procedures for liaison with RBC e.g. for planned departures from the CEMP. Procedures for handling complaints.	Chapter 6: Development Programme, Demolition and Construction

- 6.41 The CEMP would follow best practice guidelines and have due regard to RBC's Sustainable Design and Construction Supplementary planning Document². The document would be agreed with RBC's Environmental Health Department prior to the commencement of demolition and construction works.
- 6.42 The CEMP would also detail responsibilities for the Applicant, the Construction Manager, the Contractors and Sub-Contractors; housekeeping procedures; requirements for monitoring and record keeping; and prohibited or restricted operations.
- 6.43 The following sections provide further details on working hours, public safety and site security, waste management, materials storage, management of sub-contractors and liaison with RBC and Neighbours. For further details regarding the additional issues outlined in Table 6.5 above, please refer to the relevant technical chapter of the ES.

Hours of Work

- 6.44 Prescribed hours of work would be agreed with RBC. However, due to the proximity of residential dwellings and commercial activities to the Site, and on the basis of initial consultation with RBC, it is likely that the standard hours of work would be as follows:
- 08:00 to 18:00 hours Monday to Friday;
 - 08:00 to 13:00 hours Saturday; and
 - No working on Sundays or Bank Holidays.
- 6.45 Where the works are undertaken in close proximity to sensitive receptors (such as residential uses), timing of some demolition and construction activities may be considered in further detail.
- 6.46 In certain cases, there may be a reason that specific activities cannot be completed within the standard hours of work. In these cases, prior notification would be provided to RBC and neighbouring occupiers.

Public Safety, Site Security, Emergencies and Accidents

- 6.47 A clear and secure demarcation between operational activities and other areas would be maintained to ensure public safety. Particular attention would be paid to any crossing points on surrounding roads, demolition and construction routes, access gates and security arrangements. Hoarding will

be maintained around the site at all times and will be positioned to maintain existing pedestrian and cycle routes wherever possible. The positioning of this hoarding must be agreed in writing with RBC and all relevant licenses acquired prior to its installation. The hoarding will be provided in accordance with Health and Safety Executive (HSE) standards and will be well lit during hours of darkness and maintained during the works. Information regarding the project and its progress would be provided at the Site boundaries.

- 6.48 An Emergency Incident Plan would be in place to deal with potential spillages and/or pollution incidents. Any pollution incidents would be reported immediately to the relevant regulatory bodies.

Waste Management

- 6.49 The generation of waste material would occur at all stages of the demolition and construction process, from foundations and structural works through to fitting-out of the new buildings. Major sources include:
- Demolition spoil, for example, concrete, brick rubble, steel, aluminium, plastics, wood, that cannot be re-used or recycled;
 - Geotechnically and/ or chemically unsuitable soils (Refer to Chapter 12: Ground Conditions and Contamination);
 - Soils/ rock from basement excavation that is not required for use on-site;
 - Packaging, for example, plastics, pallets, expanded foams; and
 - Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage.
- 6.50 All relevant contractors would be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of demolition and construction materials. Wherever feasible, such arisings would be dealt with in a manner that reduces environmental impact and maximises potential re-use of materials. Records would be maintained regarding the types and quantities of waste produced during the demolition and construction works and the quantities sent for recycling, recovery or disposal.
- 6.51 All waste will be stored securely in clearly labelled stockpiles, skips or drums in designated areas. Where possible, materials to be reused or recycled will be sorted on-site and stockpiled ready for collection. However, it may be necessary for some wastes to be taken off-site for segregation by a specialist contractor. The amount of construction waste reused, recycled or sent to landfill will be recorded by the Contractor.
- 6.52 All waste removed from site (including recyclable waste) will be taken to a licensed or exempt waste disposal facility by a registered waste carrier. The Principal Contractor will ensure that all waste carriers and waste disposal facilities are appropriately licensed.
- 6.53 All potentially hazardous materials, such as waste oil and batteries require additional handling, storage and disposal precautions. They will be clearly labelled and removed by a specialist, licensed Waste Contractor and appropriate measures made for their disposal in accordance with all applicable environmental and health and safety legislation.
- 6.54 Where suspected contaminated or hazardous material or ground is encountered, that has not previously been identified by site investigations, the Contractor is responsible for commissioning testing of samples to classify the extent and nature of these substances. This shall be undertaken by a UKAS accredited testing facility. If contamination is confirmed present, a suitably qualified specialist would be consulted to determine an appropriate remediation strategy for the Site.

- 6.55 Stockpiling of potentially contaminated material shall be avoided. Where stockpiling is unavoidable, the material must be located on hardstanding and covered with sheeting. Samples of excavated material will also be tested by the Contractor, or appointed agent, to enable classification of the waste for disposal purposes.
- 6.56 When leaving the site, appropriate measures will be taken to prevent waste escaping onto the public highways, for example containers must be secured and open skips must be covered by sheeting.
- 6.57 All roads, pavements, construction equipment, temporary structures, materials and machines will be kept clean and tidy at all times with litter and rubbish removed promptly. Food waste will be collected regularly to avoid attracting vermin to the site.
- 6.58 On completion of the works, each contractor will clear away, and remove from the site, all plant, surplus materials, rubbish and temporary works.
- 6.59 Provided that waste is managed in accordance with legislation, the likely effects from waste are not considered to be significant. No further consideration has therefore been given to the effects of waste in this ES.

Materials Storage and Handling

- 6.60 Environmental issues would be considered in the procurement of raw materials and manufactured building components and all such materials would be appropriately stored on-site to minimise damage by vehicles, vandals, weather or theft. Tanks and drums of liquid chemicals and fuels would be stored in bunded compounds. Packaging materials would be returned, where possible.

Management of Sub-Contractors

- 6.61 All sub-contractors on the Site (for example for demolition or waste disposal) would be required to follow a good working practice as outlined in the CEMP and comply with Statutory Requirements.
- 6.62 Through the tender process the sub-contractors would be required to demonstrate how they would achieve the provisions of the CEMP, how targets would be met, and how potential environmental and public nuisance effects would be minimised.
- 6.63 Contractors at the Site would be required to:
- Run induction courses for all personnel on-site to ensure that the Site rules are obeyed and to achieve the least amount of disruption to neighbouring properties; and
 - Inform the Principal Contractor or Construction Manager of any complaints or abnormal works.

Liaison with Neighbours and Reading Borough Council

- 6.64 The Principal Contractor or the Construction Manager would be required to undertake the following:
- Establish a dedicated point of contact and responsibility to deal with issues as they arise. This would be a named representative;
 - Undertake regular dialogue with the Council and the local community;
 - Log complaints and respond to them in a timely manner. The required actions would be different in each specific case, depending on the operation, equipment and location, and may involve applying additional controls; and
 - Notify the Council and neighbours, where appropriate, in advance of unusual activities or events that can be anticipated. The relevant activities would be determined by agreement wherever

possible with the Council, once the detailed programme of construction is defined and would include:

- Commencement of demolition/construction in certain areas;
- Necessary night time, weekend or evening working (outside core areas) of a type which may affect properties;
- Road or footpath closures/diversions and movements of wide loads;
- Actions requiring monitoring by the Council; and
- Work on roads affecting land used by others.

References

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- ¹ Building Research Establishment, June 2012, BRE Waste Benchmark Data, Watford
 - ² Reading Borough Council, 2011, Revised Sustainable Design and Construction Supplementary Planning Document

7. Socio-Economics

Introduction

- 7.1. This Chapter has been prepared by Quod and assesses the likely socio-economic effects of the proposed Development. In particular it considers the prevailing social and economic conditions existing at the Site, within Reading and its wider catchment area. The Chapter then concentrates on potential likely significant direct, indirect and wider socio-economic effects of the proposed Development on the surrounding environment and community, together with any mitigation measures required to prevent, reduce or offset any adverse effects. The resulting residual effects are also discussed.

Planning Policy Context

National Planning Policy and Guidance

National Planning Policy Framework, 2012

- 7.2. The National Planning Policy Framework (NPPF)¹, replaces all previous planning policy statements and advice. At the heart of the NPPF is a presumption in favour of sustainable development, which should be interpreted and applied locally to meet local aspirations. This presumption in favour of sustainable development is grounded in the planning system's need to fulfil a social, economic and environmental role.
- 7.3. The NPPF established core planning policies that should underpin local plan making, and decisions made through the planning process. These include:
- Proactively drive and support sustainable economic development to deliver the homes, businesses and industrial units, infrastructure and thriving local places that the country needs;
 - Always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings; and
 - Promote mixed use developments and encourage multiple benefits from the use of land in urban and rural areas.
- 7.4. The NPPF outlines a number of objectives to deliver sustainable development. These include building a strong, competitive economy, ensuring the vitality of town centres, delivering a wide range of quality homes, and promoting sustainable transport.
- 7.5. In terms of building a strong, competitive economy, the NPPF emphasises the Government's commitment to ensuring the planning system does everything it can to ensure economic growth in order to create jobs and prosperity, building on the country's inherent strengths. This includes:
- Supporting existing business sectors, taking account of whether they are expanding or contracting and, where possible, by identifying and planning for new or emerging sectors likely to locate in an area;
 - Planning positively for the location, promotion and expansion of clusters or networks of knowledge driven, creative or high technology industries; and
 - Facilitating flexible working practices such as the integration of residential and commercial uses within the same units.

- 7.6. The NPPF sets the aim to significantly boost housing supply by:
- Delivering a wide choice of high quality homes; and
 - Creating sustainable inclusive and mixed use communities.
- 7.7. In order to promote sustainable transport, planning decisions should:
- Ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised; and
 - Aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities.

Local Planning Policy

Reading Borough Local Development Framework, Adopted Core Strategy, 2008 (updated 2015)

- 7.8. The Reading Borough Council (RBC) Core Strategy² sets out the key elements of the planning framework for Reading. It establishes a spatial vision for the Borough which is supported by a set of policies which steer future development. A major emphasis of the Core Strategy is the development of Reading as a regional centre, characterised by high density, mixed use development focussed in central Reading.
- 7.9. The spatial vision for Reading includes the following aspirations:
- To maintain and improve the quality of life in Reading;
 - To provide good access to a range of local facilities, services, housing and employment;
 - Continue to develop as a regional centre serving the wider Thames Valley;
 - To be a location of choice for a number of major national and international companies; and
 - To focus development in locations with good public transport accessibility.
- 7.10. The Core Strategy identifies a set of Key Principles which further guide the spatial strategy:
- Major development should be located in areas of high accessibility;
 - Development should be directed to those areas in most need of physical, economic or social regeneration; and
 - Development must have excellent access to effective and efficient public transport.
- 7.11. The Site is located within the Reading Central Area. This is identified as a sustainable location for future development, based on its excellent transport connections and major development opportunities.
- 7.12. Within the Reading Central Area, three Major Opportunity Areas are identified. The Site is located within the Station / River Project Area, for which further detail is provided in the Reading Central Area Action Plan.
- 7.13. There are a number of policies set out in the Core Strategy which are of particular relevance to this assessment.
- 7.14. Policy CS 10 'Location of Employment Development' supports major office development within the centre of Reading.

- 7.15. Policy CS13 'Impact of Employment Development' states that employment development should provide mitigation measures in line with its impacts on demand for housing (including affordable housing), labour and skills and on the transport network.
- 7.16. Policy CS14 'Provision of Housing' sets out the housing targets for the Borough. A target of 572 homes per annum has been set from 2006 to 2016, and 521 dwellings per annum from 2016 to 2026.
- 7.17. Policy CS 16 'Affordable Housing' states that all developments with 15 or more units will provide 30% affordable housing subject to viability assessment.
- 7.18. Policy CS29 'Provision of Open Space' states that new development should provide open space on or off-site, or through contributions towards the improvement of existing facilities as appropriate.
- 7.19. Policy CS32 'Impact on Community Facilities' states that development which have an adverse effect on demand for community facilities mitigation measures will be required to provide additional facilities or the expansion or improvement of existing facilities.

[Reading Borough Local Development Framework, Sites and Detailed Policies Document, Adopted 2012 \(Updated 2015\)](#)

- 7.20. The Sites and Detailed Policies Document (SDPD)³ compliments the Core Strategy and the Reading Central Area Action Plan (RCAAP), and completes the Borough's Local Development Framework (LDF).
- 7.21. The SDPD embeds the presumption in favour of sustainable development into the LDF, and provides detailed policies relating to a variety of development issues. Many of the 'cross-cutting policies' relating to adaptation to climate change and infrastructure planning are relevant to the Site.

[Reading Borough Local Development Framework, Reading Central Area Action Plan, 2009](#)

- 7.22. The RCAAP⁴ provides the policies required to achieve the spatial vision for Reading Central.
- 7.23. Policy RC1 relates to the development of the Station / River Major Opportunity Area. It states that the area will:
- Provide a high-density mix of uses;
 - Include retail and leisure on the ground and lower floors and residential and offices on higher floors;
 - Facilitate greater pedestrian and cycle permeability through the site, including a network of streets and spaces; and
 - Provide active frontages along routes through the site.

[Station Hill South Planning and Urban Design Brief, 2007](#)

- 7.24. This planning and design brief is the Borough's supplementary planning document (SPD)⁵ for the Site. It provides detailed guidance for the development of the Site, and establishes the planning and design principles against which planning decisions are to be considered.
- 7.25. The SPD specifies that:
- Building heights are to generally increase from the south and western Site borders, up to a cluster of tall buildings in the north east corner of the Site;

- Development must provide for a balance of residential and office uses that are flexible in floorspace; and
- Community uses should be provided within the study area and allow for a crèche and/or childcare facilities, public conveniences, shopmobility, taxi parking, leisure uses and licensed premises.

Station Area Framework, 2010

- 7.26. This Station Area Framework⁶ provides guidelines for the development of land around Reading Mainline Station. It builds on the RCAAP, and highlights the preferred development approach for the Site. This includes an indicative site layout, preferred density, built form and land use mix, a response to sensitive local vistas, sustainability aspirations and connectivity with adjoining sites.
- 7.27. The Framework clearly prioritises a high-density, mixed use development approach for the Site, however it is intentionally non-prescriptive regarding the quantity and location of specific land uses. Major components of the Framework include:
- A defined cluster of tall buildings located to the centre and station side of the Site, and stepping down in scale towards the southern and western site edges; and
 - Significant enhancements to the public realm and the delivery of new public spaces within the Site, such as 'Station Hill central piazza' and 'Station square south'.

Affordable Housing Supplementary Planning Document, 2013

- 7.28. This SPD⁷ sets out guidance on delivering affordable housing in accordance with Core Strategy Policy CS16 and the Sites and Detailed Policies Document Policy DM6. The SPD includes the policy background, housing needs assessment and guidance on delivery including design, mix, viability and off-site provision.

Employment, Skills and Training Supplementary Planning Document, 2013

- 7.29. This SPD⁸ sets out the planning obligations that the Council will seek in relation to construction and end user employment arising from new developments. The contributions sought aim to support local people in accessing job opportunities arising from development. Planning obligations secured through the Section 106 will assist local residents to receive training during construction and in the end uses of developments that include commercial floorspace. The council will request that developers and occupiers will develop a site specific Employment and Skills Plan which will cover the following:
- Number of apprenticeships;
 - Employment and training initiatives;
 - Training and work experience for younger people, including those not in employment, training or education (NEET);
 - Best endeavours to maximise local labour; and
 - Local procurement agreement – potential for local businesses to be included in tender lists.

Assessment Methodology and Significance Criteria

Assessment Methodology

- 7.30. In the absence of any Government guidance setting out a preferred methodology for assessing the likely socio-economic effects of a major development, the following section outlines the methodologies undertaken to identify the range of likely significant socio-economic effects of the Development in accordance with general guidelines where these exist (and referred to throughout this Chapter) and wider professional experience.
- 7.31. The assessment considers the likely significant effects of the Development upon:
- Construction related employment;
 - The provision of new homes and the corresponding new residential population;
 - The demand for community facilities (healthcare and education) arising from the new residential population;
 - Permanent employment associated with the Development once completed and operational;
 - Potential spending by the new residential population and employees of the Development in the local economy;
 - Local amenity space, including playspace; and
 - Public safety and crime.
- 7.32. The baseline socio-economic conditions have been established through the interpretation of nationally recognised research and survey information, including:
- 2011 Census data⁹;
 - Business Register and Employment Survey data (2013)¹⁰;
 - Indices of Multiple Deprivation (2010)¹¹;
 - Claimant Count (JSA) data (2015)¹²;
 - NHS Business Services (2015)¹³;
 - Annual Schools Census (2014)¹⁴; and
 - Reading Primary & Secondary School Admissions (2014/15)¹⁵.
- 7.33. The baseline assessment has considered the future baseline schemes (Chatham Place, 21 Caversham Road, Energis House, Thames Tower and Aldwych House) where relevant, in determining trends or socio economic baseline conditions. This is set out in the Future Baseline Section below.
- 7.34. Where relevant, the assessment of effects has been undertaken using the following methods, estimates and assumptions:
- Construction related employment effects have been assessed using standard ratios of construction employment to output, assuming an average output per employee of £97,100 per year from ONS Construction Statistics 2013 (Table No. 14)¹⁶ and data from Business Register and Employment Survey¹⁷ (i.e. one construction worker equates to £97,100 of construction industry output). This allows for a calculation of person years of employment which is converted into one permanent full-time equivalent (FTE) by equating 10 person years of employment to one permanent full-time job;

- Completed Development commercial floorspace employment was calculated by applying standard job density ratios¹⁸ and based on the quantum of Development sought for approval;
- Completed Development population projections have been forecast using a model based on data from the 2011 Census (Average Household Size for flats in Reading is 1.8 persons per household);
- An estimate of the demand for education provision was calculated based on the child yield methodology set out in Reading Borough Council's SPD on Planning Obligations¹⁹. The child yield method outlined in the SPD takes no account of tenure mix. See Section 5 Table 2 in the SPD for further details;
- An estimate of the spending generated as a result of the completed and operational Development is calculated using an average regional household expenditure figure of £270 per week on goods and services (ONS, 2013)²⁰ and £10.59 per day (Visa Europe, 2014)²¹ on food and drink by employees; and
- A comparison of the existing average ratio of patients to General Practitioners (GPs) with the most frequently used planning assumptions of an acceptable average ratio of 1,800 patients per GP.

Approach to Outline Assessment

- 7.35. The assessment of the Development has been based on the minimum and maximum area schedules set out in Chapter 5: Description of Development, to identify the likely significant effects.
- 7.36. The ranges proposed would vary the level of employment generated in the commercial floorspace, and the number of residential units and associated population effects. Therefore, for the purpose of this assessment and the associated effects arising from the Development, two development scenarios are assessed. The minimum development scenario is based on the minimum area schedule and includes 76,000m² GEA of commercial floorspace (B1 and A1-5), 300 residential units and 550 parking spaces. The maximum development scenario is based on the maximum area schedule and includes 139,700m² GEA commercial floorspace (B1, A1-5 and D2), 475 residential units and 1,000 car parking spaces.

Limitations and Assumptions

- 7.37. The assessment of effects was carried out against socio-economic baseline conditions as defined by the data sources referenced throughout this Chapter. As with any data set, these may be subject to change.
- 7.38. The assessment of effects assumes that the Development would be constructed in accordance with the maximum and minimum parameters and area schedules being applied for.

Consultation

- 7.39. An EIA Scoping Report was prepared by Waterman EED and submitted to RBC, together with a request for a formal Scoping Opinion, in February 2012. The Scoping Opinion received from RBC on 17th April 2012 made no comments on the scope of the socio-economic assessment. A subsequent EIA Scoping letter was submitted to RBC in May 2014 setting out the scope of the revised assessment encompassing Telecom House. The Scoping Opinion from RBC requested that the effect of additional floorspace on the Borough and wider area in terms of affordable housing should be considered. Although the gain in floorspace does not include B1 offices, the socio

economic effects should be considered in terms of their impact on the Borough as a whole not just Abbey Ward.

Comparison with existing Consent

- 7.40. Part of the site is covered by an existing planning consent which is referred to as the SH3 Scheme. The Development considered within this chapter is the SH3 Scheme, minus Plot E plus the Telecom House Plot/ E Scheme. The key differences between these two applications in relation to socio-economics impacts are set out under each area of assessment in order to provide a clear comparison.

Significance Criteria

- 7.41. The scale of significance described below, together with expert judgement, was used to assess the likely significant potential and residual effects of the Development against the relevant baseline conditions. The assessment process aims to be objective and quantifies the effects as far as possible. However, some effects can only be evaluated on a qualitative basis:
- Beneficial classifications of significance indicate an advantageous or beneficial effect to a socio-economic resource or receptor, which may be minor, moderate, or substantial in effect;
 - Insignificant classifications of significance indicate imperceptible effects to a socio-economic resource or receptor; and
 - Adverse classifications of significance indicate disadvantageous or adverse effects to a socio-economic resource or receptor, which may be minor, moderate, or substantial in effect.
- 7.42. Effects are assessed in terms of the magnitude of change ranging from negligible to minor, moderate and substantial, these can be classified as follows:
- Substantial: Substantial change to employment prospects, the local economy, increase in population and demand for social infrastructure;
 - Moderate: Noticeable change to employment prospects, the local economy, increase in population and demand for social infrastructure;
 - Minor: Hardly perceptible change to employment prospects, the local economy, increase in population and demand for social infrastructure; and
 - Negligible: Imperceptible effect to employment prospects, the local economy, increase in population and demand for social infrastructure.
- 7.43. Temporary, short to medium-term effects are considered to be those associated with the construction works.
- 7.44. Long-term effects are those associated with the completed and operational Development. Long-term effects were considered with regard to the following spatial scales:
- Local: Effects to the Site and Abbey ward;
 - District: Effects upon receptors in the wider administrative boundary of RBC; and
 - Regional: Effects across the South East.

Baseline Conditions

Existing Site and Spatial Context

- 7.45. The existing Site comprises primarily of vacant office buildings and retail units together with an operational NCP car park. However, part of Xafinity House and the retail units in Telecom House along Friar Street are currently occupied. The Berkshire Women's Association are located within Xafinity House and employ 12 people. The number of people working within the retail units in Telecom House along Friar Street is unknown, however based on the size of the units, applying a standard employment density it can be assumed these units could support 30 jobs.
- 7.46. The Site is located in Reading Town Centre, within Abbey Ward in the administrative boundary of RBC (as shown in Figure 7.1).

Demographics

Population

- 7.47. According to the 2011 Census, there are 12,630 residents within Abbey ward. This represents 8% of Reading's population of 155,670. Abbey ward's population has grown from 8,200 in the ten years since the 2001 Census, this represents a growth of 54%. Reading's overall population has grown from 143,090 in the same period (9%).

Age Profile

- 7.48. Abbey ward has a higher proportion of working age residents (81% are aged between 16 – 64 years) than the wider Reading area (69%) and South East average (64%). The working age population is young, with 67% under 45 years, compared to 49% in Reading and 38% across the South East. There is a lower proportion of children (13% under 16 years) living within Abbey ward compared to Reading and the South East (both 19%) as a whole.

Ethnicity

- 7.49. The ethnic profile of Abbey ward is diverse, with 39% of residents coming from Black and Asian Minority Ethnic (BAME) communities. This compares to 25% across Reading and 9% in the South East as a whole. There is a large Asian community within Abbey ward.

Qualifications

- 7.50. Abbey ward has a high proportion of well-educated residents, 50% of the ward's residents hold qualifications of degree level or higher. This compares to 35% in Reading and 30% across the South East as a whole.

Economic Profile

Unemployment

- 7.51. Economic activity relates the percentage of the working age population who are either within employment or actively seeking employment. Abbey ward has a high level of economic activity, 80% of working age residents are economically active. This compares to 74% in Reading and 72%

across the South East. Of these economically active residents, 5.1% are unemployed in Abbey ward, compared to 4.6 % in Reading and 3.4% across the South East.

- 7.52. Claimant Count rate relates to the number of economically active people who are claiming work related benefits and are actively seeking employment. The claimant count rate in Abbey ward is 1.7% compared to 1.4% in Reading and 1.2% across the South East.

Occupation & Industry

- 7.53. According to the 2011 Census the majority (60%) of residents in Abbey ward hold high skilled occupations, these include managers and senior officials, professional occupations and associate professional and technical occupations. This compares to 47% in Reading and 45% across the South East. A high proportion of residents work within the Information & Communications sector (20%) and the Professional, Scientific and Technical Activities sector (12%). As a comparison to the other spatial scales, 11% of residents in Reading and 6% of the South East are employed in the Information and Communications sector. 9% of Reading's residents and 8% of the South East residents are employed within the Professional, Scientific and Technical Activities sector. The Wholesale, Retail and Motor Trade sector makes up the largest proportion of the employment of residents in Reading and the South East (both 16%), a lower proportion (13%) of Abbey ward's residents are employed within this sector.

Business Base

- 7.54. The Business Register and Employment Survey²² sets out data on the level of employment by industry across various spatial scales. There are 38,280 jobs within Abbey ward, this represents 40% of Reading's employment (96,130 jobs). These jobs are main city centre office and retail employment.
- 7.55. Abbey ward has a high level of employment in the retail sector, 18% of employment in the ward is within retail, compared to 13% in Reading as a whole, and 11% across the South East. There is also a high concentration in the professional, scientific and technology sector, 19%, compared to 12% in Reading and 8% across the South East. Health accounts for 3% of the employment base of Abbey ward compared to 13% in Reading and 12% across the South East.

Housing Profile

- 7.56. Abbey ward has a population density of 39.8 persons per hectare (ha), which is roughly in line with the average for Reading as a whole, which is 38.5 persons per ha. However, this is due to the mix of uses in the town centre with a large amount of commercial space. Residential uses in Abbey Ward are generally high density developments. The housing stock in Abbey ward mainly consists of flats and apartments at 72%. Reading has a higher proportion of houses, 68% of the housing stock across the Borough is houses compared to 32% flats and apartments. Across the South East, 78% of the housing stock is houses, compared to 21% flats and apartments.
- 7.57. There is a high proportion of private rented households; 51%, in Abbey ward. This compares to 26% in Reading and 16% across the South East. Owner occupier households represent the highest proportion of the tenure split in Reading (55%) and the South East (68%), but makes up a lower proportion of the tenure split in Abbey ward; 28%. The proportion of affordable housing in the Abbey ward and Reading is higher than the average for the South East as a whole. In both Abbey ward and Reading 16% of housing is social rented, compared to 14% across the South East. Shared

Ownership housing makes up 3% of housing in Abbey ward, compared to 2% in Reading and 1% in the South East.

Deprivation

- 7.58. The Government's Index of Multiple Deprivation (2010) measures deprivation by combining a number of indicators which include a range of social, economic and housing indicators to give a single deprivation score for each small area across England. These are then ranked relative to one another according to their level of deprivation. Figure 7.2 shows the level of deprivation within Reading. This shows that there are a few areas within the 20% most deprived in England.

Crime

- 7.59. Given the Site's location within Reading town centre and its proximity to a major transport interchange it would be expected to have higher crime rates, particularly for opportunistic crimes. Town centres tend to have higher crime levels due to concentration of people passing through and the mix of uses such as retail, entertainment and transport interchanges.
- 7.60. The crime domain of the Indices of Multiple Deprivation (IMD) measures the incidence of recorded crime including burglary, theft, criminal damage and violence. Figure 7.3 illustrates the crime IMD figures, showing that Reading town centre is within the most deprived in terms of crime, amongst the highest 10% in England.
- 7.61. Thames Valley Police data show that overall crime figures have fallen in Reading from 2013/14 to 2014/15. Table 7.1 below sets out the summary of Notifiable offences in Reading as the number of crimes per 1,000 population.

Table 7.1 Crime Data

Offences	2013/14	2014/15
Violence Against the Person	13.47	15.77
Sexual Offences	1.68	2.22
Robbery	1.00	0.80
Burglary	16.86	5.25
Vehicle Crime	7.84	5.22
Arson & Criminal Damage	9.86	9.51
Total Victim Based Crime	74.52	68.28
Crimes Against Society (Drugs, public disorder, possession of weapons etc.)	8.76	8.11
All Crime	83.28	76.39

Source: Thames Valley Police

Social Infrastructure

Education

- 7.62. As illustrated by Figure 7.4 there are five primary schools within 1km of the Site, Coley Primary School, EP Collier Primary School, Oxford Road Community School, Thameside Primary School

and Katesgrove Primary School. Amongst these five schools there are 235 surplus places. However, at reception level, space is limited with only 5 surplus places. The Primary School capacity is presented in Table 7.2.

Table 7.2 Primary School Capacity

Name	Published Admission Number (PAN)	Number on Roll (NOR)	Surplus Capacity	Reception Surplus
Coley Primary School	30	184	56	0
EP Collier Primary School	30	208	62	2
Oxford Road Community School	30	238	2	0
Katesgrove Primary School	90	349	71	1
Thameside Primary School	60	493	44	2
			235	5

- 7.63. Secondary Schools are considered at a wider spatial level, across Reading Borough as a whole. This is because secondary school age children tend to travel further to school. As shown in Table 7.3 there are seven secondary schools across Reading Borough. Across these schools there are a total of 559 surplus places.

Table 7.3 Secondary School Capacity

Name	PAN	NOR	Surplus Capacity
Highdown School	220	1,073	27
Kendrick School	96	480	0
Reading School	124	598	0
Prospect School	240	1,116	84
John Madejski Academy	180	779	124
Reading Girl's School	170	580	270
Blessed Hugh Faringdon Catholic School	180	726	54
			559

Healthcare

- 7.64. There are a range of healthcare facilities located in the local area around the Site as illustrated on Figure 7.5.
- 7.65. There are five GP surgeries within 1km of the Site. All of these surgeries are currently accepting new patients. Within these surgeries there are 13 GPs operating (based on information available from the NHS, which assumes each GP is a whole time equivalent). The average list size of these surgeries is approximately 2,133 patients per GP. The Health Urban Development Unit (HUDU) recommended average list size is 1,800 patients per GP. This indicates there may be limited surplus capacity within the existing surgeries.

- 7.66. The Royal Berkshire Hospital on London Road is the nearest general hospital to the Site offering acute healthcare services.

Open Space

- 7.67. There is currently no open space on the Site. Forbury Gardens is the nearest open space to the Site, located 300m west of the Site. This public park includes formal landscaped gardens which underwent significant restoration in 2005. This park has received a Green Flag Award.
- 7.68. Christchurch Meadow and the Thames riverbank 680m to the north of the Site provide open space for public use.
- 7.69. To the west of the Site (550m) there is an area of open space and playspace, used by the surrounding residential areas. This open space has some recreational facilities and children's playspace.

Future Baseline

- 7.70. A number of developments are currently under construction in the area surrounding the Site. These include Chatham Place, 21 Caversham Road, Energis House, Thames Tower and Aldwych House. As these will be completed and occupied by the time the Proposed Development will commence, these development are considered to be the Future Baseline.
- 7.71. Energis House, Thames Tower and Aldwych House are all commercial developments. These three developments are replacement office developments which will increase the level of office space on each site. Chatham Place and 21 Caversham Road are both residential developments (with some ground floor retail floorspace at Chatham Place).
- 7.72. Together these developments will accommodate a net increase of approximately 2,160 jobs. The new homes will accommodate approximately 350 new residents.
- 7.73. It is assumed that the additional residents would result in additional demand for social infrastructure including schools and healthcare facilities. Therefore it is likely that some of the surplus capacity identified in the baseline may be taken up by these new residents. It is assumed the Council would have secure appropriate mitigation through the planning consent for these schemes which would address the impact on social infrastructure.

Potential Effects

Demolition and Construction

- 7.74. The existing uses on the Site include vacant office buildings and retail units and Garrard Street NCP car park. The majority of retail units were vacated in March 2013. The remaining occupied employment uses set out in the baseline section accommodate a total of 42 jobs.
- 7.75. The Development would require the retention and refurbishment of the car park and the demolition of the existing buildings on Site.

Loss of Existing Employment

- 7.76. The construction works associated with the Development would require vacant possession of all of the existing buildings. Therefore the remaining 42 jobs located on the Site would be displaced and

would need to relocate. It is assumed that these jobs would relocate within the district and would not be lost to the economy as a whole. Therefore the potential effect of the Development on existing employment would be **temporary, short term, adverse** and of **minor** significance at the **local** level, and in the **long-term, negligible**.

Construction Employment

- 7.77. The construction works associated with the Development would generate employment within the construction industry. Construction employment on-site would fluctuate during the demolition and construction period which would be phased over a number of years.
- 7.78. The level of employment created during the demolition and construction period is estimated using standard ratios for gross output per employee in the construction sector. Applying these ratios to the estimated construction cost provided by the Applicant, the construction of the Development would generate approximately 3,700 person years of employment.
- 7.79. Equating 10 years of employment to one full-time job created (or Full-Time Equivalent (FTE)), it is estimated that approximately 370 permanent FTE construction jobs would be created during construction of the Development.
- 7.80. Construction employment is relatively mobile and therefore it is not considered appropriate to assess the potential employment effects of the construction at the local level. When assessing this effect at the regional level, the likely direct effects of the construction employment would be **negligible** because of the relatively low magnitude of the effect in comparison with the scale of the broader regional construction workforce.
- 7.81. The assessment of the SH3 Scheme found that the proposed Development would generate approximately 2,500 person years of employment, which equates to 250 permanent FTE construction jobs. It was considered that the effect on construction employment arising from the SH3 Scheme would be negligible. Therefore the scale and significance of the assessment of effects remains unchanged from the previous assessment related to the consented SH3 Scheme.

Construction Workforce Spending

- 7.82. Construction workers based onsite would contribute to the local economy through additional spending on food and drink. The level of construction workforce onsite would fluctuate over the course of the construction programme therefore it is not possible to estimate the level of spending that could be generated and spent within the local area. However it is broadly considered that the likely effect of the construction phased on spending would be **temporary, short-term, beneficial** and of **minor** significance at the **local** level.

Interim Condition: Temporary Flexible Event Space

- 7.83. The consented Temporary Flexible Event Space would be undertaken as a first phase of development on the Site following demolition of buildings in the northern part of the Site (excepting Xafinity House and the Garrard Street NCP Car Park). Given the short-term lead in times associated with temporary uses and events it is not possible to be specific about the nature of the temporary uses. Temporary uses would be agreed with RBC in advance. However, it is anticipated that the uses may include:
- Market Stalls/ retail uses;

- Concerts/ Open Air Theatre/ Cinema;
- Leisure/ Sports Events;
- Fairground; and
- Ice rink.

7.84. The implementation of interim uses would bring the Site into use which would have a range of temporary benefits for the town centre. Benefits would include the generation of temporary employment and community and cultural uses. It is assessed that this would be of **temporary minor beneficial** significance at the **local level**. The Temporary Events Space has already received planning permission and is unchanged from that assessed within the 2013 ES and the effects therefore remain the same.

Completed Development

7.85. The Development would result in the comprehensive redevelopment of the Site. The employment led mixed use proposals include:

- Office (B1);
- Retail (A1 – A5);
- Leisure (D2);
- Residential (300 to 475 units);
- Public realm and open space; and
- Car parking.

7.86. The Completed Development would have a range of effects including employment generation, delivery of housing, effects on social infrastructure and the creation of new areas of open space and public realm.

Employment

7.87. The provision of office, retail and leisure floorspace would generate employment on Site. The minimum and maximum parameters would vary the level of employment generated by the commercial floorspace. Table 7.4 sets out the number of FTE jobs generated based on the minimum and maximum Gross External Area (GEA) floorspace proposed within the Development using standard job densities as set out in the Methodology Section.

Table 7.4 Proposed Floorspace & Job Creation

Name	Minimum GEA	Maximum GEA	Jobs Minimum	Jobs Maximum
Office (B1)	69,000	122,000	4,645	8,210
Retail (A1 – A4)	6000	13,500	255	605
Leisure (D2)	0	2,200	-	30
Car Parking	550 Spaces	1,000 Spaces	n/a	n/a
Residential	26,000	41,500	n/a	n/a
			4,900	8,845

- 7.88. Table 7.4 indicates that the Development would generate a minimum of 4,900 FTE jobs and a maximum of 8,845 FTE jobs through the commercial end uses. In addition, a small number of jobs would be created from car-parking and residential uses.
- 7.89. The effect of the additional employment created on Site, based on the minimum or maximum Development scenarios is considered to be of **substantial beneficial** significance in the **long term** at **district** level.
- 7.90. As the floor space areas for the land uses which would generate jobs (ie office, retail and leisure uses) remain the same as that of the SH3 Scheme, the number of jobs created by the proposed Development remain unchanged.

Demand for Housing

- 7.91. The Development would deliver a minimum of 300 and a maximum of 475 residential units. These would be one and two bedroom apartments and would include a percentage of affordable housing. These units would make a significant contribution towards Reading's annual housing targets, equating to between 6% and 9% of the of the ten year target for the period 2016 to 2026.
- 7.92. Due to the outline nature of this application the precise accommodation mix and proportion of affordable has not yet been determined. For the purpose of this assessment an indicative mix has been assumed as a base for the population modelling assuming 70% 2 bed units and 30% 1 bed units as shown in Table 7.5.

Table 7:5 Indicative Minimum and Maximum Housing Mix

Type	Minimum	Maximum
Units	300	475
1 Bed	90	143
2 Bed	210	332

- 7.93. The effect of the Development in delivering new housing is assessed to be of **moderate beneficial** significance in the **long term** at the **local** level.
- 7.94. The SH3 Scheme would deliver between 150 – 300 homes. The scale and significance of the assessment of effects remains unchanged from the previous assessment related to the consented SH3 Scheme.

Population

- 7.95. The expected residential population of the new housing is estimated to be between 540 and 855 people. This compares to an estimated population of between 255 and 510 residents for the SH3 Scheme. These new residents would potentially create demand for community facilities, particularly primary healthcare, education and open space. These are considered in further detail below.

Education

- 7.96. Using Reading Borough Council's methodology to assess the child yield from the Development it is estimated that there would be a minimum of 61 and a maximum 96 primary school children, a minimum of 11 and a maximum of 17 secondary school children and a minimum of 4 and a maximum of 7 post 16 aged children living within the new residential units.

- 7.97. The net demand for school places could be lower than the predicted 76-120 school age children as some children living within the Development are likely to have moved from within the local area and therefore already have a place in schools in the area.
- 7.98. As set out in the Baseline Section there are five primary schools within 1km of the Site. There are 235 surplus places within these schools. However surplus capacity at reception level is low. In addition the new residents which form the Future Baseline set out above, may take up some of the surplus capacity identified, therefore placing additional pressure on existing primary schools. Without mitigation increased demand for primary school places is assessed to be of **minor adverse** significance at the **local** level. Across Reading Borough there are seven secondary schools, which have 559 surplus places amongst them. It is therefore assessed that the Development (along with the Future Baseline) would not place significant pressure on secondary schools, and the effect of the Development under the minimum and maximum Development scenarios would be **negligible**.
- 7.99. The SH3 Scheme would generate demand for between 30 – 61 primary school ages children, 5 – 11 secondary school aged children and 2 – 4 post 16 aged children living within the development. It was assessed that this level of additional demand would be of minor adverse significance at the local level in relation to primary school places, and negligible at the borough level in relation to secondary school places. Therefore, the scale and significance of the assessment of effects remains unchanged from the previous assessment related to the consented SH3 Scheme.

Healthcare

- 7.100. The additional population could increase demand for primary healthcare facilities. As set out in the Baseline Section above, there is considered to be limited surplus capacity available locally based on the average number of patients per GP in the local surgeries compared to the HUDU benchmark of 1,800 patients per GP. However it must also be noted that these surgeries are still accepting new patients. Therefore an additional population of 540 - 855 residents may place additional pressure on existing facilities. The additional residents which form part of the Future Baseline Schemes, may also contribute to the pressure on existing healthcare facilities. Without mitigation the effect of the Development on demand for primary healthcare is therefore assessed to be of **minor adverse** significance at the **local** level.
- 7.101. The potential effect of the SH3 Scheme on healthcare was considered to be negligible as, at that time, there was surplus capacity in primary healthcare which would have catered for the additional demand. However, as there is no longer capacity available, the potential impact has increased.

Additional Spending

- 7.102. In addition to the direct effect of additional employment and housing on Site there are likely to be indirect spending effects as a result of the Development.
- 7.103. ONS data estimated that the average weekly household spending on local goods and services in the South East is £270 per week. Therefore the additional 300 - 475 residential units are estimated to generate spending of £4.2 million to £6.7 million per year.
- 7.104. Employees working on Site would also generate additional spending. As set out in the Assessment Methodology section above, research shows that on average workers spend £10.59 per day on food and drink alone in the area local to their place of employment. As a result of the Development local spending by employees could range from £11.4 million to £20.6 million per year.

- 7.105. Given the town centre location of this Site, it would be expected that a significant proportion of this spending would be captured locally.
- 7.106. The effect of the Development in the generation of additional spending is assessed to be of **minor beneficial** significance under the minimum Development scenario to **moderate beneficial** significance under the maximum Development scenario in the **long term** at the **local** level.
- 7.107. The SH3 Scheme would generate between £1.7 million - £3.4 million in household spending, and £6.5 million - £11.7 million per year in additional spending by employees. This was assessed to be of minor to moderate beneficial significance at the local level. The level of additional spending generated by the Development has increased compared to the SH3 Scheme however the scale and significance of the effect remains unchanged.

Open Space

- 7.108. There is currently no open space on the Site. The Development would include approximately 5,500m² of public realm. The design and layout of the public realm would significantly improve the routes through the Site. New public squares would be created within the Site in the Central Square and Station Square. A public route would be created through Friars Walk and Arcade.
- 7.109. In addition, shared or private amenity space would be provided for the residential units in the form of garden areas on the upper floors and/or balconies. The precise nature of provision would be confirmed at detailed design stage.
- 7.110. The effect of the Development in delivering open space and improved public realm under the minimum and maximum Development scenarios is assessed to be of **minor beneficial** significance in the **long term** at the **local** level.
- 7.111. The SH3 Scheme would deliver the same quantum of public realm and therefore the scale and significance of the effects remain unchanged.

Crime & Safety

- 7.112. The masterplan for the Development has considered various aspects of crime and safety in order to minimise opportunities for crime on Site. The proposed mix of uses would animate the Site which is currently vacant. Ground floor retail units would create a dynamic environment within the public routes through the Site, and the introduction of residential units would create a 24 hour presence. The combination of uses would maximise natural surveillance from commercial and residential occupiers thereby reducing opportunities for crime and improving perceptions of safety.
- 7.113. Secured by Design principles have been employed in the masterplanning process to achieve a high overall standard of security for the buildings and the spaces surrounding them. Public spaces would be open and well lit, with clear straight sight lines through public routes. CCTV would be used throughout the Development and residential entrances would be fitted with a PAC entry phone system.
- 7.114. It is therefore considered that the effect of the Development on Crime and Safety would be of **minor beneficial** significance in the **long term** at the **local** level.
- 7.115. The assessment of effect on Crime and Safety compared to the SH3 Scheme remains unchanged.

Mitigation

Demolition and Construction

- 7.116. The loss of existing employment on-site would have a temporary short term minor adverse effect until they have found a suitable alternative location. However in the longer term the Development will deliver a significant level of employment space therefore no mitigation is required.
- 7.117. No long term adverse socio-economic effects of the construction phase have been identified and therefore no mitigation is required.
- 7.118. However, the benefit of construction employment can be maximised at the local level by the implementation of job brokerage schemes, apprenticeships and training schemes.

Completed Development

- 7.119. Mitigation required to address potential capacity issues relating to demand for primary healthcare provision and primary school places would be made in the form of financial contributions through the Community Infrastructure Levy and, in relation to the SH3 Scheme, other than Plot E, contributions under the S106 Agreement.
- 7.120. The effect of the Development on the generation of employment, the delivery of housing, additional spending, open space, crime and safety and the effect on secondary school places is assessed as beneficial or negligible. Therefore, the effects do not require mitigation.

Residual Effects

Demolition and Construction

- 7.121. The loss of the existing employment on-site would have a temporary short term minor adverse effect at the local level, however in the long term this effect would be negligible. The construction of the Development would generate approximately 3,700 person years of employment, which equate to 370 FTE construction jobs. No mitigation is required, and the residual effect for the demolition and construction employment of the Development is considered to be **negligible** at the district level. The residual effect of the construction workforce spending would remain **temporary** and **minor beneficial** at the **local** level.

Interim Condition: Temporary Flexible Event Space

- 7.122. The generation of temporary employment and creation of community and cultural uses bringing part of the Site into early use is assessed as a **temporary minor beneficial** effect at the **local level**.

Completed Development

- 7.123. The Development is predicted to generate between 4,900 and 8,845 FTE jobs through the commercial end uses of the Development. The residual effect of the additional employment is considered to be of substantial **beneficial** significance in the **long term** at **district** level.
- 7.124. The proposed Development would deliver between 300 and 475 residential units. The residual effect of the housing delivery would be of **moderate beneficial** significant at the **local** level.

- 7.125. The proposed Development would generate a minimum of 61 and a maximum of 96 primary aged school children, a minimum of 11 and a maximum of 17 secondary school children and a minimum of 4 and a maximum of 7 post 16 aged children living within the new residential units. Following mitigation, the residual effect of these additional children on primary and secondary schools would be **negligible**.
- 7.126. The future population of the proposed Development is assessed to be between 540 and 855 residents. However, there is limited capacity within existing GP surgeries for this level of additional demand. Mitigation towards provision of additional healthcare provision would be provided through CIL and therefore the residual effect of the new population on primary healthcare facilities would therefore be **negligible**.
- 7.127. The Development would also give rise to additional spending in the local area from new residents and employees, totalling approximately £15.6 million to £27.3 million annually, which is considered to be of **minor beneficial** significance under the minimum Development scenario to **moderate beneficial** significance under the maximum Development scenario in the **long term** at the **local** level.
- 7.128. The effect of the Development in delivering open space and improved public realm, together with private amenity space is assessed to be of **minor beneficial** significance in the **long term** at the **local** level.
- 7.129. Provided, that the Development is designed to maximise natural surveillance together with the use of CCTV, the Development is anticipated to minimise opportunities for crime and increase perceptions of safety. This is assessed as **minor beneficial** residual effect at the **local level**.

Summary and Conclusions

Comparison of Effects between this ES and the Consented SH3 Scheme ES

- 7.130. The Development considered within this chapter is the previously consented SH3 Scheme, minus Plot E plus the Telecom House Plot/ E Scheme. The key differences between these two applications in relation to socio-economics impacts relate to the increased number of residential units. This results in the accommodation of more residents compared to the consented SH3 Scheme. However the scale and significance of potential socio-economic effects on employment, housing, spending, education and crime has not changed. There has been a change to the potential effect on healthcare prior to mitigation. However following mitigation through CIL the residual effect on healthcare remains as set out in the previous assessment related to the consented SH3 Scheme.

Summary of Potential Effects, Mitigation and Residual Effects

- 7.131. A summary of potential and residual socio-economic effects of the Development are summarised within Table 7.6.

Table 7.6: Summary of potential and residual socio-economic effects

Issue	Potential Effect	Mitigation	Residual Effect
Demolition and Construction			
Construction Employment	Negligible	None required. Consider implementation of job brokerage schemes, apprenticeships and training schemes	Negligible
Loss of Existing Employment	Temporary, short term, Minor, Adverse, Local. Long term, negligible	None required	Temporary, short term, Minor, Adverse, Local. Long term, negligible
Construction workforce spending	Temporary, Minor Beneficial, Local	None required	Temporary, Minor Beneficial, Local
Temporary Flexible Event Space			
Creation of Temporary employment and community and cultural uses.	Temporary, Minor Beneficial, Local	None required	Temporary, Minor Beneficial, Local
Completed Development			
Employment	Long Term, Substantial Beneficial, District	None required	Long Term, Substantial Beneficial, District
Housing	Long Term, Moderate Beneficial, Local	None required	Long Term, Moderate Beneficial, Local
Education (Primary)	Short term, Minor, Adverse, Local	Financial Contributions	Negligible
Education (Secondary)	Negligible	None required	Negligible
Healthcare	Short term, Minor, Adverse, Local	Financial Contributions	Negligible
Additional Spending	Long Term, Minor/ Moderate, Beneficial, Local	None required	Long Term, Minor/ Moderate, Beneficial, Local
Open Space	Long Term, Minor Beneficial, Local	None required	Long Term, Minor Beneficial, Local
Crime	Long Term, Minor Beneficial, Local	None required	Long Term, Minor Beneficial, Local

References

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- ¹ Department of Communities and Local Government, 2012, National Planning Policy Framework,
 - ² Reading Borough Council, 2008 (Updated 2015), Local Development Framework, Adopted Core Strategy
 - ³ Reading Borough Council, 2012 (updated 2015), Site and Detailed Policies Document
 - ⁴ Reading Borough Council, 2009, Reading Borough Local Development Framework, Reading Central Area Action Plan
 - ⁵ Station Hill South Planning and Urban Design Brief, adopted 2007
 - ⁶ Reading Borough Council, 2010, Station Area Framework
 - ⁷ Reading Borough Council, 2013, Affordable Housing Supplementary Planning Document
 - ⁸ Reading Borough Council, 2013, Employment, Skills and Training Supplementary Planning Document
 - ⁹ Census data ;
 - ¹⁰ Business Register and Employment Survey data (2013);
 - ¹¹ Indices of Multiple Deprivation (2010);
 - ¹² Claimant Count (JSA) data (April 2015);
 - ¹³ NHS Business Services (2015)
 - ¹⁴ Annual Schools Census (2014)
 - ¹⁵ Reading Primary & Secondary School Admissions (2014/15).
 - ¹⁶ Office for National Statistics, 2013, ONS Construction Statistics 2013 (Table No. 14)
 - ¹⁷ Business Register and Employment Survey Data (2013)
 - ¹⁸ Homes and Communities Agency (2010) Employment Densities, 2nd Edition
 - ¹⁹ Reading Borough Council, 2004. Supplementary Planning Guidance, Planning Obligations under Section 106 of the Town and Country Planning Act 1990.
 - ²⁰ Office for National Statistics, 2013, Family Sending.
 - ²¹ Visa Europe, 2014, UK Working Day Spend Report
 - ²² Office for National Statistics, 2012. Business Register Employment Survey-2010 Revised

8. Archaeology

Introduction

- 8.1. This Chapter, prepared by Foundations Archaeology, assesses the effects of the proposed Development upon known and potential archaeological deposits within the Site. In particular, it considers the likely significant effects of ground works (including excavation and sub-structure works) necessary for construction of the Development.
- 8.2. In particular, it considers the likely significant effects of ground works (including excavation and sub-structure works) necessary for construction of the Development.
- 8.3. The Chapter provides a summary of legislation and planning policy relevant to archaeological issues. A summary of the likely existing archaeological conditions of the Site and surrounds are presented based on a desk assessment and initial investigation. The Chapter then makes an assessment of the likely significant direct and indirect effects upon archaeological resources resulting from construction works and the completed Development, together with any mitigation measures required to prevent, reduce or offset any adverse effects. The resulting likely significant residual effects are also discussed.
- 8.4. This Chapter summarises and draws upon a desk-based Archaeological Assessment, originally carried out by Foundations Archaeology in October 2003 and subsequently updated in 2005, 2007, 2009, 2012 and 2015 to take into account updated information. This updated assessment is included within Appendix 8.1. An assessment of the effects of the proposed Development on the above-ground built heritage, is addressed in Volume 2: Townscape, Conservation and Visual Assessment

Legislation and Planning Policy Context

Legislation

Ancient Monuments and Archaeological Areas Act, 1979

- 8.5. Some nationally important archaeological remains are designated as Scheduled Monuments (SMs) under the Ancient Monuments and Archaeological Areas Act, 1979¹. Preservation of all SMs *in situ* is favoured over preservation by record.
- 8.6. The Act provides for the investigation, preservation and recording of matters of archaeological or historical interest. This relates not only to SMs but also to other monuments which the Secretary of State believes to be of sufficient importance.

National Planning Policy

National Planning Policy Framework, 2012

- 8.7. The National Planning Policy Framework² (NPPF) introduced in March 2012, amongst other things, replaced Planning Policy Statement 5: Planning and the Historic Environment (PPS5) as part of the Government's drive to streamline the Planning Process.
- 8.8. Policy 128 states:
"in determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to

understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation”.

8.9. Policy 129 states:

“Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset’s conservation and any aspect of the proposal”

8.10. The NPPF further notes the irreplaceability of heritage assets and states that LPAs should take account of the desirability of sustaining and enhancing the significance of heritage assets, the positive contribution that conservation of heritage assets can make to sustainable communities; and the desirability of new development making a positive contribution to local character and distinctiveness.

[The Code of Good Practice on Archaeological Heritage in Urban Development Policies, 2000](#)

8.11. The Code of Good Practice, established by the Cultural Heritage Committee of the Council of Europe³ states:

“...before taking decisions affecting the archaeological heritage, planners should obtain adequate information and advice, applying non-destructive methods of investigation wherever possible...the purpose [of assessment] will be not only to establish if it is necessary to dig but also to build a picture of the site’s morphology and its potential”.

Local Planning Policy

[Reading Borough Local Development Framework, Adopted Core Strategy, 2008 \(updated 2015\)](#)

8.12. RBC’s Local Development Framework (LDF), Adopted Core Strategy⁴ contains Policy CS33 (Protection and Enhancement of the Historic Environment). This notes:

“Historic features and areas of historic importance and other elements of the historic environment, including their settings, will be protected and where appropriate enhanced. This will include Listed Buildings, Conservation Areas and other features with local or national designation, such as sites and features of archaeological importance, and historic parks and gardens”.

8.13. It also states: *“Planning permission will only be granted where development has no adverse impact on historic assets and their settings”.*

[Reading Borough Local Development Framework, Sites and Detailed Policies Document, Adopted 2012 \(Updated 2015\)](#)

8.14. The RBC LDF Sites and Detailed Policy Document 2012⁵ contains information on heritage assets in Chapter 9 (Built and Natural Environment). Heritage Assets are covered in Section 9.1 which notes that *“for Reading Borough, designated heritage assets comprise Scheduled Monuments, listed buildings, Historic Parks and Gardens and Conservation Areas. There are also heritage*

assets, for example areas of archaeological importance or buildings which, while not listed, are of local historical or architectural significance. Undesignated heritage assets in Reading will in the main be identified through the process of decision-making, i.e. through the determination of planning applications, which importantly includes the pre-application stage”.

With specific relation to Archaeology, the Chapter details the advice set out in the National Planning Policy Framework. It states that there should be a presumption in favour of their conservation, and this presumption will become stronger according to the significance of the asset.

[Reading Borough Local Development Framework, Reading Central Area Action Plan, 2009](#)

- 8.15. RBC's Reading Central Area Action Plan (RCAAP)⁶ has no specific policies in relation to archaeology.

[Station Hill South Planning and Urban Design Brief, 2007](#)

- 8.16. The Station Hill South Planning and Urban Design Brief⁷ notes that the area is situated in an area of high archaeological potential, with strong potential for encountering significant archaeological remains. It states that if significant remains are discovered, preservation *in situ* will be considered as part of any redevelopment design, as appropriate.

[Station Area Framework, 2010](#)

- 8.17. The Station Area Framework⁸ considers the Historic Environment in Chapter 12. It notes that the Station Area is also part of an 'area of archaeological potential', where it is known that there is likely to be archaeological interest. The Framework states that an archaeological assessment and/or evaluation should be carried out in accordance with Core Strategy Policy CS33 prior to submission of an application that has the potential to affect an area of archaeological potential.

Assessment Methodology and Significance Criteria

[Assessment Methodology](#)

- 8.18. Foundations Archaeology undertook a desk-based Archaeological Assessment of the Site in 2012. This study was commenced originally in 2003, and most recently updated August 2015 to take account of additional archaeological information available, and to reflect the key parameters of the Development being sought for planning approval.
- 8.19. The updated 2015 Archaeological Assessment supersedes all previous archaeological studies for the Site and is included within Appendix 8.1.
- 8.20. The 2015 Archaeological Assessment has been carried out in accordance with the Chartered Institute for Archaeologists Standards and Guidance for Archaeological Desk Based Assessments⁹ and has been informed by the following sources of information:
- Foundations Archaeology Desk-Based Archaeological Assessments undertaken in 2003, and updated in 2005, 2007, 2009 and 2012;
 - Foundations Archaeology Evaluation and Excavation Report (2003) and Evaluation Report (2009);
 - Berkshire Historic Environment Record (HER) in 2003, 2005, 2007, 2009, 2012 and 2015;
 - National Monuments Record (NMR) of English Heritage (EH) in 2003, 2009, 2013, 2014 and 2015;

- Berkshire Record Office (for cartographic and other historical data) in 2003 and 2009;
- British Geological Survey records;
- Deeds, wills and other historical documentation;
- Regional and national journals; and
- Consultation with Berkshire Archaeology.

8.21. The study area for this assessment includes the Site and a 500m radius around the Site.

Approach to Outline Assessment

8.22. The assessment of the Development has been based on the maximum footprints of buildings set out in Chapter 5: The Proposed Development, to identify the likely significant effects of the Development. As such, it is considered that the assessment represents the 'worst case'. However, owing to the small differences between the maximum and minimum parameters for building footprints, professional judgement leads to the conclusion that there would be no material change in the predicted effects between the maximum and minimum parameters of the Development. However, it should be noted that any intrusive grounds have the potential to affect any surviving archaeological deposits.

Limitations and Assumptions

8.23. The assessment has been undertaken in accordance with all appropriate legislation, standards and guidance. Nonetheless, archaeological assessment, by its nature, requires a significant degree of subjective interpretation based on existing data sources and professional judgement. To a large extent the actual archaeological resource which may be present is buried beneath modern development and the assessments of significance and potential are therefore extrapolations from known data both within and around the study area.

Consultations

- 8.24. Berkshire Archaeology, acting as archaeological advisor to RBC has been consulted with regard to the proposed Development and its comments included within this Chapter and the desk-based archaeological assessment (DBA) presented at Appendix 8.1.
- 8.25. A Scoping Report was prepared by Waterman EED and submitted to RBC, together with a request for a formal Scoping Opinion, in February 2012. In preparing their Scoping Opinion, RBC consulted Berkshire Archaeology. The Scoping Opinion for the Development received from RBC on 17th April 2012, included consultation comments from Berkshire Archaeology. A further Scoping Opinion for the Telecom House site contained additional comments from Berkshire Archaeology.
- 8.26. Berkshire Archaeology advised that the application in relation to the proposed Telecom House site was in an area of archaeological potential and that while a desk-based assessment may suffice, fieldwork may be required in advance of the application submission.
- 8.27. It has been highlighted that the area of the Site between Friar Street and Garrard Street is included within the medieval and post-medieval town limits, although the exact northern extent of these limits remains unknown. And so the Friars Walk area of the Site contains high potential for the presence of medieval remains.
- 8.28. Berkshire Archaeology also highlighted that in the event that relatively intact Viking fortifications are identified within the Site area, that preservation of these deposits may be required in situ. As such, archaeological investigation should be undertaken as soon as possible after the granting of

that permission so that the results of the investigation may inform the design of the reserved matters proposals to ensure that preservation *in situ* may be achieved if required.

- 8.29. Subsequently to the scoping consultation, discussions between Roy King of Foundations Archaeology and Fiona MacDonald of Berkshire Archaeology have noted that a number of animal bones and finds of leatherwork, which may be of medieval date, were recovered during road repair work in Friar Street on 20th February 2013, close to the junction with Station Road and therefore in close proximity to the Site. These finds appear to be related to leather working (particularly cobbling) and butchery. The former, in particular, may have some connection with activities taking place at Shoemiths Court, but in any event provide useful evidence for the nature of occupation in the area during the medieval or early post-medieval periods.
- 8.30. A 17th century Civil War ditch, which is shown on historic maps may pass east-west through the Plot E and Telecom House sites, somewhere between Friar Street and Garrard Street. The location of this ditch is not known precisely, but remnants of it were possibly uncovered during a 2003 evaluation excavation at Shoemiths Court.

Significance Criteria

- 8.31. Assessing the significance of likely archaeological effects resulting from the proposed Development employs a two-step process:
- Identification of the importance of known and potential archaeological features; and
 - Identification of the magnitude of the effect.
- 8.32. A professional judgement has been made as to the importance of known and potential archaeological features at the Site and within a 500m radius. Where features are statutorily or non-statutorily designated, this can assist in the grading of importance. For example, SM's are of a national importance, whilst locally designated archaeological sites are of local importance. However, not all archaeological features are designated. For these, relevant criteria as set out in Scheduled Monuments guidance (DCMS 2010¹⁰), referring to determining the suitability of a site for scheduling, have been referred to. These criteria include:
- Rarity;
 - Group value;
 - Survival/condition; and
 - Fragility / Vulnerability.
- 8.33. Having determined a level of importance to the archaeological feature(s), the assessment of likely potential and residual effects of the proposed Development upon archaeological resources was undertaken using the following five-level scale of significance. As archaeological remains are considered a finite and irreplaceable resource for which the preferred option is always preservation *in situ*, there can be no moderate or substantial beneficial effects to archaeological resources:
- **Minor beneficial:** A change in land use or management to enhance the preservation of the identified archaeological resource;
 - **Negligible:** No effects on known or predicted archaeological resources or their settings. Mitigation protects the resource from adverse effects;
 - **Minor adverse:** Effects to small areas of known or potential resources at a local level or where the archaeological resource is very truncated or fragmented. The monitoring of the effects and recording of

resources would be achieved by an archaeological watching brief. The removal of the resource would not affect future investigation and would increase archaeological knowledge;

- **Moderate adverse:** Adverse effects would occur on archaeological resources at a local level by engineering work that would have a detrimental impact on archaeological deposits but would leave some of the resource *in situ*; and
- **Substantial adverse:** Adverse effects caused to areas of high archaeological potential, Archaeological Priority Areas, SMs, including their settings and to other archaeological sites of importance in breach of relevant planning policies.

Baseline Conditions

Designated Sites

- 8.34. There are no designed SMs on the Site itself. There are two designated SMs within 500m of the Site; the ruins of Reading Abbey (SM 19019) and High Bridge (SM RE 31). Neither would be directly affected by the proposed Development and potential settings issues are discussed in Volume 2: Townscape, Heritage and Visual Assessment. The southern part of the Site falls within a designated Area of Archaeological Potential.

Historical Context and Record of Archaeological Finds

- 8.35. This section describes the historical evolution of the Site and its surrounds based upon the various information sources outlined previously. A more detailed description is provided in the desk-based assessment at Appendix 8.1. Figures 8.1 to 8.8. Figure 8.2 shows events identified from the Historic Environmental Record. As shown on Figures 8.3 to 8.5, no archaeological evidence has been identified on the Site from the Prehistoric, Roman or Saxon periods.
- 8.36. Although the area assessed involves the Site itself, this report provides a broad overview of the surrounding area, to place the site in its landscape and historical context. This document is not in itself intended to provide a history of Reading or to discuss the archaeological potential of the Saxon and Medieval town in any great detail. All distance given in this section of the report are approximate and centred on NGR: SU 7136 7375.
- 8.37. Subsequent to the previous assessment of the site in 2012, there have been seven new monument records added to the HER, and over 70 modified or updated records. Sixteen new events records have been added and 40 either modified or updated. These new data have been included in the Historic Environment Record Information in Appendix 8.2 and are presented in Figures 8.2 to 8.8.
- 8.38. The site is predominantly encompassed by an SMR record (MRM16015) that relates to the 2003 desk-based assessment (ERM500) undertaken by Foundations Archaeology. A subsequent desk-based assessment by Foundations Archaeology in 2009 is recorded on the HER as events ERM1325 and ERM1703. Ove Arup & Partners Ltd. also undertook a desk-based assessment relating to the Reading Station development (ERM1704). These assessments indicate low to moderate potential for the recovery of archaeological material across a range of periods with Medieval or Post-medieval material particularly likely. The desk-based assessment by Ove Arup & Partners Ltd. comments on the possible presence of a Danish camp near to Reading Abbey. The evaluation excavation (ERM483) in 2003, undertaken by Foundations Archaeology at 25-26 Friar

Street, possibly revealed the remnants of the Civil War ditch, running east-west across the site. The 2009 desk-based assessment by Foundations Archaeology predicted that the line of the Civil War ditch may pass through the proposed Development.

Prehistoric Period (480,000 BC – AD 43)

- 8.39. As Figure 8.3 shows, the river terrace gravels of the Kennet are known to have been a focus for prehistoric settlement and activity from the Palaeolithic period through to the Iron Age. There are five entries in the HER referring to the early Prehistoric period (Palaeolithic/Mesolithic/Neolithic), three of which relate to the Lower Palaeolithic period. An ovate handaxe (MRD9047) was found at Vachel Road in 1903, 181 m to the west of the Site. Another handaxe (MRD9049) was found at Station Road in 1904, 125m to the east of the Site. A finely struck Levalloisian flake (MRD9048) was found in Caversham Road, 284 m west of the Site.
- 8.40. The Neolithic period is represented in the HER by a flint axe (MRD11209) recovered in St Laurence's Churchyard and part of a ground axe (MRD11181) from Forbury, both 331 m and 429 m south east of the Site respectively. Other early prehistoric finds comprise a stone/flint net sinker or loomweight and a bone needle (MRD11197), which were found 261m south east of the site. A badly struck worked waste flake with an oblique platform (MRD11400) was recovered from St Mary's Church, 299m south of the Site.
- 8.41. The only evidence for activity during the Bronze Age comes from a single sherd of pottery recovered from the 1998-99 excavations (ERD153) of land at the rear of 1 Friar Street (MRD15735), 327m south east of the Site. Evidence in the HER for activity during the Iron Age is limited to stray finds. An Iron Age brooch (MRD11254) has been recovered from Friar Street, only 148 m south east of the Site. Two gold Iron Age coins (MRD11245), one of which was a stater of Commius (MRD15751) have been found approximately 400m south east of the site in Market Place. Historically, Commius was king of the Atrebates during the mid-1st century BC. During this period, the political centre of the Atrebates was at *Calleva* (Silchester), which is approximately 13.5 km south west of the Site.

Roman Period (AD 43 – AD 410)

- 8.42. *Calleva* continued as a political and administrative centre after the Roman conquest of AD 43 with the founding of *Calleva Atrebatum*, the *civitas capital* of the *Atrebates*. With *Calleva* the focus for urban settlement the remainder of the county was largely rural, as reflected in the number of known villa sites. Despite conjecture by the Victoria County History that Reading may have served as a trading-port on the Thames for *Calleva* (MRD3883), the only evidence for a possible Romano-British settlement in the HER (Figure 8.4) comes from finds of Roman brick and tile, dating to AD100-200 (MRD15664) from a 1997 archaeological evaluation (ERD101) at Forbury House, 495m south east of the Site.
- 8.43. The remaining Roman finds fall into two categories: pottery sherds (MRD11255, MRD11257, MRD15735 and MRM15805) and coins (MRD11258 and MRD11262). It is interesting to note that the distribution of these finds is to the south of the Site, mostly between Friar and Broad Streets, suggests that if a settlement was present during the Roman period, it was located in this area.
- 8.44. Figure 8.5 shows entries on the HER relating to the Saxon period. Reading is first documented in the Anglo-Saxon Chronicle for AD 870-871 as the site of a Danish winter camp (MRD3906). Asser in his *Life of Alfred* (AD 893) records that the Danes built a rampart between the Thames and the Kennet associated with their winter camp prior to the Battle of Ashdown in 871. The name could relate to a fortified structure at the Thames end of the rampart. The location of the rampart is

unknown, but it has been postulated that it may have been located within the Site, based on field name evidence. The northern part of the site falls into an area known as the Vastern Meadows (from the OE word *Faestern*, meaning 'stronghold'). Astil has reconstructed the possible line of the Danish defences (MRD15633) as following the route of Station Road, 123m east of the site. Archaeological work by Foundations Archaeology at 55-56 St. Mary's Butts (MRM 16505) has revealed two Saxon sunken-featured buildings cut by later Saxon ditches. It is probable that the features represent a Saxon settlement to the south of Friar Street and the Danish defences may incorporate this early settlement, which appears to lay to the west of St. Mary's Church. If so, then it is possible that the Danish defences could extent northwards into the site area and may pass through the Telecom House site, although this remains conjectural.

- 8.45. In the 10th century Reading may have been the site of a Late Saxon Borough (MRD3909), possibly focused on the Old Market, where the roads from Oxford to Winchester and London and Bath crossed near to St Mary's Church, around 436m south of the site. The town was captured by the Danes again in AD 1006 during Svein Forkbeard's campaigns of harrowing and eventual conquest of England. Astill has suggested that the northern extent of the Saxon town lies on the south side of Friar Street in which case the Site would lie outside the area of the Saxon town and the archaeological work by Foundations Archaeology at 55-56 St. Mary's Butts (MRM 16505) has confirmed Saxon settlement in this area. The possible extent of the Saxon town is reconstructed in Astil's (1978) *Historic Towns in Berkshire* (MRD15634).
- 8.46. Domesday mentions a pre-Conquest market (MRD3913) at Reading in 1086 and a nunnery (MRD3910) may have been founded at Reading during Edgar's reign (AD 959-978). Finds of coins indicate that a mint operated in during the early 11th century (MRD3914 and MRD3918) and a hoard of silver pennies (MRD11341) was found along with human remains in an early Medieval coffin in St. Mary's Churchyard, 343 m south of the Site. This evidence indicates that Reading was important politically and economically during the Late Saxon period.
- 8.47. Human bones from at least three individuals were recovered above a hearth during excavations of a section of the Plummery Wall (MRD1388), 390 m east of the Site. A radiocarbon assay on a sample of the human bone produced a date of cal. AD 630-780. A burial of a man and a horse, together with an 8th century sword was discovered near the engine sheds at Reading Station (MRD3891) in 1831.
- 8.48. During archaeological interventions (ERD83) at Forbury Square, 478 m, south east of the Site, early Medieval finds and features were recovered, including two pits, a posthole and a stakehole (MRD15662). Late Saxon pottery (MRD15745) was recovered from 90-93 Broad Street during an archaeological excavation (ERM866), 291 m south of the site.

Medieval Period (AD 1066 – AD 1500)

- 8.49. Figure 8.6 shows the HER entries for the Medieval period. The Domesday Survey of AD 1086 indicates that the town had the status of a borough by the time of the Conquest in AD1066 and the foundation of the Benedictine Abbey in 1125 led to further expansion. The Abbey remained an important and powerful influence upon the town until the Dissolution of the Monasteries from AD 1539. The remains of the Abbey (MRD1374) are a Grade I Listed Building and Scheduled Ancient Monument (SAM 19019) and lie only 500 m south east of the Site.
- 8.50. The Hospitium of St. John the Baptist for 13 poor people (MRD1374 and MRD15563) was founded by the Abbey in the 1190s to the north of St. Laurence's Church. The building is Grade II Listed and a SAM (1007932) and is located 323 m south east of the Site. A Medieval/Post-Medieval wall and gate-pier to the associated graveyard have also been identified (MRM15954).

A school (MRD3943) was founded at the request of Edward IV in AD 1468 in buildings that formerly comprised part of the hospital.

- 8.51. The Site was included in land given to the Friars Minor by the Abbot and Convent of Reading, when a Franciscan friary (MRD 3938) was built at the west end of Friar Street in 1233. However, parts of the land grant within the Site were not developed. After 1282 the friary building was moved to the east due to regular flooding and is located approximately 190 m west of the site. The structure was restored as Greyfriars Church (MRD 3939) in 1863 and contains the nave and west window of the friary. The building is considered one of the best surviving examples of Franciscan architecture in England and is a Grade I listed building. The relocation of the friary indicates that open land was available along Friar Street in the 1280's and may suggest that the northern side of Friar Street remained largely undeveloped at this time.
- 8.52. There are 76 entries in the HER pertaining to the Medieval period with a further 25 records relating to archaeological features that may have had their origins in the Medieval period, but continue into the Post-Medieval and Modern periods. The study area has also been the subject of numerous archaeological interventions. The quantity of data involved means that only an overview of the evidence for Medieval activity is given here.
- 8.53. A number of archaeological interventions have been undertaken within the Site. An evaluation (ERM1320) in 2009 by Foundations Archaeology within the boundary of the SH3 Scheme, 50 m south west of the centre of the Site, immediately north of Garrard Street, revealed a Medieval or early Post-Medieval pit (MRM16558) cut into the natural gravels and two layers of roughly contemporary date. An evaluation (ERM1325) in 2003, also by Foundations Archaeology, found backland activity on the same site dating back to the 14th century. A 2012 evaluation (ERM1648) by Foundations Archaeology on land at Greyfriars Church, Friar Street, uncovered a large cut feature (MRM17581) of probable Medieval date, although its form and function was unclear.
- 8.54. Other relevant archaeological investigations comprise an evaluation and watching brief (ERM1267) by John Moore Heritage Services in 2011 at the Greyfriars Day Nursery, approximately 220 m southwest of the Site. The evaluation uncovered an articulated skeleton (MRM16548) and an assemblage of pottery, which contained two Medieval sherds that had probably been redeposited (MRM16549). Greyfriars church itself was the subject of desk-based assessment by the same company in 2012 (ERM1322).
- 8.55. During evaluation work by Thames Valley Archaeological Services in 2003-2004 (ERM331), a number of hearths containing finds of Medieval pottery and tile were found on land to the rear of 7-9 Gun Street (MRM15805), 460 m south of the Site. It is also worth noting that Medieval occupation layers and a cut feature were recovered at 10-11 Gun Street in 1996 (MRM16503).
- 8.56. In 2002, an excavation (ERD94) by Oxford Archaeology at 90-93 Broad Street, 320 m south of the Site, revealed a series of features dating from the Late Saxon period through to the Late Medieval period (MRD15659). Finds included medieval and post-medieval pottery sherds and 74 fragments of animal bone. A 2001 evaluation (ERD78) by Thames Valley Archaeological Services at 7-8 Market Way (Broad Street), 370 m to the south east of the site, similarly revealed evidence of backland rubbish disposal in the form of a number of refuse pits (RD15623), which may date back to the Medieval period.
- 8.57. In 1998, an evaluation by Thames Valley Archaeological Services on land to the rear of 1 Friar Street, 280 m east of the Site, located a series of earthen and chalk floors, a probable chalk and flint wall, and a posthole and possible flint postpads (MRD15734). One of these deposits produced pottery of the 12th-13th century. Decorated floor tile was recovered from overlying deposits. Sherds of a Saxon pottery vessel were also recovered during these works (MRD15735).

- 8.58. In 1997 an excavation (ERD27 and ERM831) at 172 Friar Street, 250 m south east of the Site, by Oxford Archaeological Unit identified settlement activity from the 12th-14th century onwards (MRD15493-RD15508). A complex of cess and rubbish pits dating to the 13th-14th centuries is also known from 160-163 Friar Street (MRD3932), 220 m to the south east of the site. A section of flint walling believed to be of medieval date has also been discovered beneath Somerset House (the site of the Wheatsheaf) in Friar Street (MRD3933).
- 8.59. In 1995 Thames Valley Archaeological Services undertook an excavation (ERD33 and ERD34) at 99-105 Friar Street (MRD15512-MRD15551) 180 m to the south west of the Site. These works identified occupation on the southern street frontage with open plots of land to the rear. The earliest occupation dated to the 12th-13th century and the plots appeared to have been occupied thereafter.
- 8.60. Archaeological work undertaken in the St. Mary's Butts area of Reading have yielded finds, including pottery sherds from the Vicarage site (MRM16392), human remains from the Minster Church (MRM16314) and finds and features from 55-56 St. Mary's Butts (MRM 16505). Works at this latter site by Foundations Archaeology have identified Saxon-Medieval structural features and further human remains.
- 8.61. It is interesting to note that there is a reference to the recovery of medieval pottery in the eastern part of the Site, as shown on the 1957 Ordnance Survey map and which probably corresponds to HER record MRD11371. A number of other finds of the Medieval period are also recorded in the near vicinity of the Site. These comprise a medieval jug (MRD11365) in Blagrove Street; a coin (MRD11367) found at the site of the Great Western Hotel and pottery sherds from 10 Queen Victoria Street (MRD11369) and Wiston Terrace (MRD 11370).

Post Medieval (AD 1500 – present)

- 8.62. Figure 8.7 shows the HER entries for the Post-Medieval period. Tax returns show that by 1525 Reading was the largest town in Berkshire and the 10th largest town in England. By 1611, it had a population of over 5000 and had grown rich on its trade in cloth. Reading played an important role during the English Civil War. Documentary and archaeological evidence also indicates that the 17th century Civil War defences of the town (MRD15703) may run through the southern part of the Site on an east-west alignment, and may pass directly through the Telecom House/Plot E Scheme. However, the ditch may have been destroyed by the construction of basements in the existing buildings. It is interesting to note that St. Edmund's Chapel (MRD3979), 269 m west of the Site, was converted into a fort during the Civil War and may be on the line of the defences.
- 8.63. Cartographic evidence (Figures 8.9 to 8.24) shows that the area of the Telecom House/Plot E Scheme was urbanised by 1899, with the Site enclosed to the northern part of the site enclosed by public buildings and private dwellings. Reading's Post-Medieval urban infrastructure is well represented in the HER. Reading Station (MRD6024), the Reading to Mortimer Station (MRD6122), the South Eastern and Chatham Railway (MRD6125), and the steel girder Caversham Road underbridge (MRM16715), constructed c. 1890s, are all to the north of the Site.
- 8.64. The Market Place (MRD3970) at Abbey gates and the roads focussed on it (MRD3972) are to the south east. The Hall of the now demolished Corn Exchange, built in 1854, (MRD5534) and its campanile (MRD5535) are in the same area. Former buildings include the Victoria Building (MRD3988), Jackson's Department Store (MRM16665) and the Boots Building on Broad Street (MRD15744). The Cross Keys Pub (MRD5504) on the corner of Gun and Bridge Street was recorded by Berkshire Industrial Archaeological Group (BIAG).

- 8.65. The urban layout of later Post-Medieval Reading is well understood and consequently has only a limited bearing on an appraisal of the archaeological potential of the Site. More germane to this study are the archaeological interventions, which have revealed a series of Post-Medieval features. Of these, the evaluations during 2003 by Foundations Archaeology (ERM483 and ERM541) at 25-26 Friar Street and Shoemsmiths Court revealed 16th – 18th century pits and ditches (MRM16016). More significantly from the point of view of this study the 2003 evaluation excavation possibly revealed traces of the Civil War ditch shown on historic mapping, running east-east across the site. The 2009 desk-based assessment by Foundations Archaeology predicted that the Civil War would run through the proposed Development.
- 8.66. Evaluations by Oxford Archaeology (ERD27 and ERM831) in 1997 at 172 Friar Street, yielded activity from the 18th–19th centuries, including robbing pits (MRD15501 and MRD15502), wall foundations (MRD15503) and wall remains (MRD15504) and a possible tile hearth (MRD15505). Clay pipes dated to the 18th century came from one of the robbing pits. A pre 1920's phase (MRD15506) was the latest phase of activity, comprising a floor of bricks and a wall.
- 8.67. A 1995 excavation (ERD33 and ERD34) by Thames Valley Archaeological Services at 99-105 Friar Street uncovered a series of Post-medieval pits (MRD15548-51), one of which contained 16th–17th century pottery with four more containing 16th–18th century sherds.
- 8.68. A 2001 watching brief (ERD83) by AOC Archaeology in Forbury Square, 428 m south east of the Site, revealed a series of red brick footings and chalk and flint footings, and two circular brick wells (MRD15671). Several pits dating to the containing finds of clay pipe, mid-17th to 18th century pottery, building material and animal bone (MRD15670) were also uncovered. Close by, a Post-Medieval or Modern well (MRD3985) was discovered when 22 The Forbury was demolished. A possible stakehole and two sub-circular postholes (MRD15665) were revealed during the digging on nine test pits by AOC Archaeology (ERD101) during 1997. The mid-19th century public gardens, which occupied the former site of Reading Abbey (MRD6289) and the road (MRD3984) between the Forbury Gardens and Forbury Square, are also listed in the HER for this area. During the same phase of test-pitting the structural remains of the Sutton's Seeds factory (MRD15666) were present in seven of the test pits and can be correlated with buildings on the site in 1870 and 1895.
- 8.69. A desk-based assessment (ER283) and subsequent watching brief and evaluation (ERD284) were undertaken by Wessex Archaeology in 1997 at 21-23 Valpy Street. During the watching brief and evaluation, a number of Post-Medieval features were identified, including robber trenches (MRD7305 and MRD7306), a possible pit (MRD7308) with a single fill containing Post-Medieval pottery, animal bone and shell was uncovered along with a vertical sided pit (MRD7309) with four distinct fills and finds including animal bone, ceramic building material, nails and 17th-18th century pottery. A well (MRD3989) dating to c. 1700 was found while removing a floor beneath the Reading Chronicle building in Valpy Street.
- 8.70. During 2008 archaeological evaluation (ERM826) by Oxford Archaeology in advance of the redevelopment of the Hosier Street area of Reading and the construction of a new Civic Centre uncovered 17th century pits (MRM16213), an infilled cellar containing 18th century pottery (MRM16214) and a series of walls, and an associated soakaway (MRM16215). A rubbish pit was also revealed. The walls have been associated with St. Mary's School.
- 8.71. During 2001, test-pitting (ERD78) by Thames Valley Archaeological Services at 7-8 Market Way (Broad Street), revealed at least two 19th century basements (MRD15624). In the same location, an earlier evaluation (ERD156) between 1998 and 1999, also by Thames Valley Archaeological Services, revealed a building incorporating a cellar and a large cess pit (MRD15738), which was

in use in the early 17th century. Possible late medieval or post-medieval brick footings have been recorded by Reading Museum in Broad Street (MRD3973).

- 8.72. A 2010 evaluation (ERM1173) by Thames Valley Archaeological Services at the rear of 10-11 Gun Street uncovered Post-medieval brick walls, brick surfaces and artefacts (MRM16504). A further evaluation by Thames Valley Archaeological Services (ERM1630) in 2011 at 7-9 Gunn Street revealed possible early Post-medieval and Medieval deposits (MRM17565).
- 8.73. A Victorian well (MRD7368) was uncovered during an evaluation (ERM1267) by John Moore Heritage Services in 2011, at Greyfriars, Friar Street. A post-medieval well and post-medieval pottery sherds (MRM16550) were also found at Greyfriars.
- 8.74. Further evidence for Post-medieval structures have been recovered from the Old Market/St. Mary's Butts (MRD3965) and a V-shaped linear ditch containing post-medieval porcelain and earthenware (MRD6571) were recovered during a 1995 intervention (ERM249) by Wessex Archaeology at Vastern Road. During the same intervention, a layer of cinders and hoggin containing a ceramic drainpipe was also revealed (MRD6573).
- 8.75. Post-medieval burials are represented in the HER by human remains (MRM16314) from the Minster of St. Mary-the-Virgin. The remains of an articulated adult human skeleton and charnel remains were recovered during an archaeological watching brief. The remains predated the construction of the church tower, dated to 1550-1553. One hundred and forty-eight 18th-19th century burials (MRD6624) were recorded during exhumation (ERM279) by Thames Valley Archaeological service in 1994. In 1881, the remains of approximately six skeletons (MRD3978) were recovered in Friar Street, along with a farthing of Charles I and two brass hand-made pins.
- 8.76. Post-medieval roads through Reading are also recorded in the HER. The toll road to from Reading to Wallingford (MRD6180) went north west from Reading, through Pangbourne and Streatley to Wallingford. The A4 Bath Road from London to Bristol (MRD5909) was a coach road and a major route west, while Blagrove Street (MRD3987) is a post-medieval street in the centre of Reading.
- 8.77. A Post-medieval hoard (MRD11386) of 17 gold coins, dating from 1604 to 1632 and all struck at the Tower Mint, London, were found north west of Yield Hall in April 1934. A 17th century token (MRD11389) of Francis Brown of Reading was found at Chain Street/Broad Street.
- 8.78. Building recording (ERM1723) of the former ticket office (MRM17606) and west wing of the station (MRM17607) was carried out by Wessex Archaeology prior to demolition in 2011 as part of the Reading Station Area Redevelopment. The station dates to 1865-8 with the ticket office built in 1898.
- 8.79. Evidence for Modern activity: Archaeological evidence for Modern activity consists primarily of early 20th century floors (MRD15507 and MRD15508) uncovered at 172 Friar Street during the 1997 intervention by Oxford Archaeological Unit. A stall possibly built to serve the Market Place in Hosier Street (MRD5503) and two memorials: one commemorating the men of Reading and Berkshire who gave their lives during the First World War (1914-18) (MRM16508) and the other, erected in 1990, to commemorate the men and women involved in the Spanish Civil War (1936-1939) (MRM16206) complete the evidence for Modern activity in the HER.
- 8.80. Evidence for Undated activity: Various archaeological interventions have yielded undated material. Flint walls have been uncovered at 90-93 Broad Street (MRD15659) and Blagrove Street (MRD3964) and a 250mm thick brick wall (MRD6376) running out from Jacksons shop frontage on north side of King's Road was reported to Reading Museum in 1987. Flint lined wells have been found at the Butter Market (MRD3971) and St. Mary's Butts (MRD3966).

- 8.81. Undated human remains have been recovered from Greyfriars. Two extended skeletons were found during the digging of foundations for the new Greyfriars Vicarage (MRD4467) during the early 1960s. The remains of a suspected articulated skeleton (MRM16548) were discovered at Greyfriars Day Nursery during the 2011 evaluation by John Moore Heritage Services. Undated human remains (MRM16224) representing two individuals were revealed during an archaeological evaluation (ERM826) at Reading Civic Headquarters/Hosier Street. However, the bones were believed to be residual and had been redeposited into a modern pit. The upper part of a human cranium found at the back of Minster Street in 1939 (MRD3967).
- 8.82. The SH3 Scheme is encompassed by HER records (MRM16015 and ERM500) which relate to the 2003 desk-based assessment undertaken by Foundations Archaeology and the entire site is included under HER record ERM1325, which relates to the 2009 assessment.

Summary of Archaeological Potential

- 8.83. As previously noted, archaeological evidence has previously been recorded within the Site in the form of a probable medieval or post-medieval pit and two layers, as well as a single reference to medieval pottery in the north eastern corner of the Site on the 1957 OS plan (Figure 8.17) and the line of the Civil War ditch. Further archaeological evidence is present in the immediate vicinity of the Site in Friar Street and on the eastern side of Merchants Place, with a significant number of HER's recorded within 500m of the Site (refer to Figures 8.2-8.9). In the northern part of the Site the existing basements appear to have been constructed on the previous man-made land surface and there may have been little (if any) previous disturbance of the natural ground level; in these areas any surviving archaeological features are likely to be well preserved.
- 8.84. In the southern part of the Site (Friars Walk) basements have been terraced into the slope of the hill and would have consequently caused significant disturbance to any archaeological deposits.
- 8.85. Table 8.1 summarises the archaeological potential of the Site by Period.

Table 8.1: Archaeological Potential within the Site

Historic Period	Likely Archaeological Value	Potential for Remains: Friar Street to Garrard Street	Potential for Remains: Garrard Street to Station Hill
Prehistoric	Stray finds and/or features of local-regional importance.	Low-moderate	Low-moderate
Roman	Stray finds and/or features of local-regional importance.	Low	Low
Saxon/Viking	Viking fortifications of regional to potentially national important.	Low-moderate	Low-moderate
Medieval	Settlement and backland features of local-regional importance.	Moderate-High	Low-moderate
Post-medieval	Civil War ditch of regional importance.	Moderate-High	Low-moderate

Implications of the Future Baseline

- 8.86. As part of the 2013 ES, a future baseline scenario was considered because the Reading Mainline Station located immediately north of the Site was being redeveloped at that time (Planning Application Refs: 10/01270/LBC and 10/01269/FUL). These upgrade works have now been completed and are therefore included in the baseline conditions.
- 8.87. However, a number of other schemes within the vicinity of the Site are currently under construction. Given that these schemes have consent, are funded and are in the process of being implemented, they have been considered as the 'future baseline'. The future baseline therefore accounts for the full implementation of these schemes and where relevant, the Technical Assessments have taken account of them. As set out in Chapter 2: methodology the future baseline schemes are:
- Phase 2, Land at Chatham Place (Application Ref. 12/00798/FUL)
 - 21 Caversham Road (Application Ref. 110628): approved 09/02/2012)
 - Energis House, Forbury Road (Application Ref. 12/01856/FUL)
 - Thames Tower (Application Ref: 141043): approved 13/10/2014
 - Aldwych House 2 Blagrove Street Reading RG1 1AZ (Application number 101300 – approved November 2010)
- 8.88. Moreover, none of these developments will affect the Station Hill site. Consequently, there are no future implications for the baseline as set out in this Chapter.

Potential Effects

Demolition and Construction

- 8.89. The demolition of existing structures is generally unlikely to have an effect on any buried archaeological remains, although demolition of foundations and associated piling may result in some adverse effect. Any intrusive construction works beneath the current basement level (refer to Chapter 6: Development Programme and Construction) have the potential to cause the truncation of any existing archaeological deposits. The most destructive activities are likely to include:
- Engineering test holes, geotechnical boreholes and environmental site investigation works (contamination);
 - Demolition of existing foundations and associated piling;
 - Excavation of a maximum 1m depth of soil across the northern section of the Site. In the southern part of the Site, existing basements have been cut into the slope of the hill and would therefore have caused significant disturbance to any archaeological deposits.
 - Piling and foundation structures for the new buildings;
 - Installation and diversion of underground services, including the mains sewer; and
 - Grading of the Site to establish new street levels.
- 8.90. Well preserved and relatively undisturbed archaeological remains, as previously described, are known to exist within the northern part of the Site. Any further remains that may exist within the Site may also therefore be well preserved and relatively undisturbed. Any intrusive ground works beneath the existing ground level therefore have the potential to disturb, truncate or destroy

locally and regionally significant remains and in the event that Viking remains are present, nationally significant.

- 8.91. In the southern part of the Site (Friars Walk) there is localised high-moderate potential for archaeological remains of medieval and post-medieval date, including the Civil War ditch.
- 8.92. The potential direct, **permanent, regional** effect in the absence of mitigation is likely to be of a **moderate adverse** significance with limited potential for national effects of **substantial adverse** significance, in the event that Viking remains are present.

Interim Condition – Temporary Events Space

- 8.93. Once construction has been completed, the Temporary Events Space would not give rise to any further intrusive ground works or activities. Accordingly, it is considered that there would not be any further direct or indirect effects upon archaeological resources. Consequently, the potential effect of the completed Development would be **negligible**.

Completed Development

- 8.94. Once construction has been completed, the proposed Development would not give rise to any further intrusive ground works or activities. Accordingly, it is considered that there would not be any further direct or indirect effects upon archaeological resources. Consequently, the potential effect of the completed Development would be **negligible**.

Mitigation

Demolition and Construction

- 8.95. Although the Site is of overall moderate archaeological potential with localised areas of high-moderate potential, it has been concluded that any remains which survive are likely to be well preserved, other than in the central areas of Friars Walk Shopping Centre where preservation is likely to be poor. This, together with the scale of the proposed Development and the guidance set out in NPPF, necessitates the need for archaeological evaluation.
- 8.96. Limited trial excavations were undertaken in 2009 associated with the SH2 planning application. Due to various issues including on-going commercial activity on the Site, these were spatially limited and did not provide full information with regard to the archaeological resource. Although further pre-demolition evaluation might add additional information relating to the actual survival and condition of archaeological remains, the practical issues identified during the evaluative works in 2009 remain unchanged. It is therefore not recommended that any further archaeological evaluation take place until after the demolition of the existing Site buildings.
- 8.97. Discussions with the Berkshire Archaeology, archaeological advisors to RBC, have indicated that a programme of window sampling on the alluvium may provide useful information on the spatial extent of archaeological deposits and may be secured by planning condition. The method(s) for further evaluation would be confirmed with RBC under advisement from Berkshire Archaeology, with due consideration given to the necessary timescales of the overall demolition and construction programme and the existing Written Scheme of Investigation for Archaeological Evaluation (2009)¹¹. The results of the archaeological evaluation would be used to devise a suitable mitigation strategy, whereby any archaeological finds that cannot be protected *in situ* would be appropriately recorded, removed and deposited within a local museum or archive using specialist archaeological personnel. This process is likely to be through a programme of

archaeological works including strip, map and sample, watching brief and localised open area excavation.

- 8.98. Additional mitigation, in the form of alternative piling strategies, would also be devised in the event that relatively intact Viking fortifications which would be of national importance are identified within the Site, which require preservation *in situ*.
- 8.99. All measures as described above could be implemented by way of suitable planning conditions or obligations.

Interim Condition – Temporary Events Space

- 8.100. As no additional ground disturbance work would occur once construction of the Temporary Events Space, no further mitigation measures would be required.

Completed Development

- 8.101. As no additional ground disturbance work would occur once the proposed Development it competed, no further mitigation measures would be required.

Residual Effects

Demolition and Construction

- 8.102. It is inevitable that the disturbance and truncation of archaeological remains, where they are present, would result in a permanent and direct moderate or substantial adverse effect. However, implementation of mitigation measures, as outlined above, would ensure that any archaeological finds would be appropriately removed and recorded or preserved *in situ*. Although this would ameliorate any potential effects to archaeological resources identified, there is always the possibility that further unexpected archaeological finds may be uncovered during ground works. Consequently, a precautionary approach must be implemented. Following mitigation, the residual effect upon archaeological resources is likely to be reduced to a direct, **permanent** and **regional** effect of **minor adverse** significance, with **negligible** effects on national assets.

Interim Condition – Temporary Events Space

- 8.103. Archaeological impact would occur during the demolition and construction phases of the Temporary Events Space. Once these works are completed there would be no residual effects on archaeological resources.
- 8.104. As for the assessment of potential effects, the residual effect of the Temporary Events Space upon archaeology would remain **negligible**.

Completed Development

- 8.105. Archaeological impact would occur during the demolition and construction phases of the proposed Development. Once these works are completed there would be no residual effects on archaeological resources.
- 8.106. As for the assessment of potential effects, the residual effect of the proposed Development upon archaeology would remain **negligible**.

Summary and Conclusions

Comparison of Effects between this ES and the Consented SH3 Scheme ES

- 8.107. The levels of significance of effects remain unchanged from those reported in the 2013 ES.

Summary of Potential Effects, Mitigation and Residual Effects

- 8.108. The results of the 2015 Desk-Based Archaeological Assessment reveal that the Site has yielded direct archaeological evidence in the form of a pit and two layers, all probably of medieval/early post-medieval date, as well as a reference to medieval pottery on the OS plan of 1957 and the line of the Civil War ditch, which crosses the Site. However, a range of archaeological finds are present in the immediate vicinity of the Site, predominantly in the southern area around Friar Street and Merchants Place. Consequently it can be concluded that, overall, the Site has a low to moderate potential for archaeological remains, with localised areas of moderate to high potential.
- 8.109. In the northern part of the Site the construction of existing basements appears to have been undertaken in such a way that the historic ground surface is likely to have suffered significant disturbance. In the southern part of the Site, existing basements have been cut into the slope of the hill and would therefore have caused significant disturbance to any archaeological deposits.
- 8.110. The results of the 2015 desk-based assessment, which considered the implications of the inclusion of the Proposed Development into the SH3 Scheme, concluded that there would be no change to baseline conditions
- 8.111. The likely effects of the proposed Development on archaeological remains would be limited to disturbance during the demolition and construction works, essentially from piling and other intrusive ground works. However, a programme of further archaeological evaluation and mitigation would be undertaken during the demolition and construction works. This would record, report, store and appropriately preserve archaeological finds, as necessary.
- 8.112. An assessment of the effects of the demolition and construction works (including works associated with the Temporary events space), together with the completed Development has been undertaken. The potential effects, mitigation measures and resulting residual effects (accounting for mitigation) are summarised within Table 8.2.

Table 8.2: Summary of Potential Effects, Mitigation and Residual Archaeological Effects

Issue	Potential Effect	Mitigation	Residual Effect
Demolition and Construction			
Loss, disturbance and/or truncation of locally, regionally or nationally important archaeological deposits from the Prehistoric, Saxon/Viking, Medieval and Post-Medieval periods.	Permanent, regional, moderate adverse effect with limited potential for substantial adverse effect on national resources.	Archaeological evaluation post-demolition; archaeological watching brief during embankment reduction and/or strip, map and sample works during/after site clearance, localised archaeological excavation, archaeological watching brief during construction on areas as appropriate. Preservation <i>in situ</i> is unlikely to be required unless nationally important features are identified. The precise methodologies would be agreed in consultation with	Permanent, regional and of minor adverse significance, with a negligible effect on national resources.

Issue	Potential Effect	Mitigation	Residual Effect
		the archaeological advisors to RBC.	
Temporary Events Space (already consented)			
Loss, disturbance and/or truncation of locally, regionally or nationally important archaeological deposits from the Prehistoric, Saxon/Viking, Medieval and Post-Medieval periods.	Permanent, local moderate adverse effect with limited potential for substantial adverse effect on national resources.	Archaeological evaluation post demolition of former Station Hill retail parade (including 26 to 58 Station Hill)	Permanent minor adverse effect on local resources with a negligible effect on regional and national resources.
Completed Development			
No significant effects. These would occur only during the intrusive demolition and above construction works.	Negligible.	None required.	Negligible.

References

- ¹ Ancient Monuments and Archaeological Areas Act, 1979
- ² Department of Communities and Local Government, 2012, National Planning Policy Framework,
- ³ Cultural Heritage Committee of the Council of Europe, 2000, Code of Good Practice on Archaeological Heritage in Urban Development Policies
- ⁴ Reading Borough Council, 2008 (Updated 2015), Local Development Framework, Adopted Core Strategy
- ⁵ Reading Borough Council, 2012 (updated 2015), Site and Detailed Policies Document
- ⁶ Reading Borough Council, 2009, Reading Borough Local Development Framework, Reading Central Area Action Plan
- ⁷ Reading Borough Council, 2007 Station Hill South Planning and Urban Design Brief
- ⁸ Reading Borough Council, 2007, Station Area Framework, 2010
- ⁹ Chartered Institute for Archaeologists, 2014, Standards and Guidance for Archaeological Desk Based Assessments
- ¹⁰ Department for Culture, Media and Sport, 2010, Scheduled Monuments, Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979
- ¹¹ Foundations Archaeology, 2009, Written Scheme of Investigation for Archaeological Evaluation.

9. Transportation and Access

Introduction

- 9.1. This Chapter describes the assessment of the potential effects of the proposed Development upon transportation and access during the demolition and construction period, and on completion of the proposed Development. The Chapter has been written by Peter Brett Associates (PBA) and has been informed by the Transport Assessment, March 2013 (TA) for the SH3 development, Transport Statement, July 2015 (TS) for the proposed Development and Access Statement for the Temporary Flexible Event Space, March 2013 all undertaken by PBA. The TA, TS, Framework Travel Plan and Access Statement are included in Technical Appendices 9.1, 9.2, 9.3 and 9.4 respectively.
- 9.2. The Chapter outlines the policy context relevant to transportation and access, describes the methodologies applied within the TS, the existing (baseline) transport conditions at the Site and its surrounds and the potential effects associated with the proposed Development. Where appropriate, mitigation measures are stated. An assessment of the resulting residual effects is also presented.

Planning Policy Context

National Planning Policy

National Planning Policy Framework, 2012

- 9.3. Paragraph 17 of the National Planning Policy Framework (NPPF) published in March 2012¹, states that the Government expects the planning system to *“proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth. Plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business communities”*.
- 9.4. Paragraph 19 also highlights the importance of the planning system in supporting the delivery of economic growth: *“the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system”*.
- 9.5. The NPPF sets out a presumption in favour of sustainable development and in relation to decision making identifies the following approach:

“at the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.....

For decision-taking this means:

approving development proposals that accord with the development plan without delay; and

where the development plan is absent, silent or relevant policies are out of date, granting permission unless:

any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
specific policies in this Framework indicate development should be restricted”.

- 9.6. The NPPF confirms the need for Transport Assessments to be carried out for significant new developments and that these should account for opportunities for sustainable travel, safe access and cost effective improvements to limit the significant impacts of the development. The NPPF confirms that development should only be refused where the residual impact is severe. Paragraph 32 states that:

“all developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:

the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;

safe and suitable access to the site can be achieved for all people; and

improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe”.

- 9.7. Paragraph 29 states that:

“transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas”.

- 9.8. The document goes on to state that plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to:

“accommodate the efficient delivery of goods and supplies;

give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;

create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;

incorporate facilities for charging plug-in and other ultra-low emission vehicles; and

consider the needs of people with disabilities by all modes of transport”.

Local Planning Policy

Reading Borough Council Local Development Framework Adopted Core Strategy, 2008 (Updated 2015)

- 9.9. Policy CS20 (Implementation of the Reading Transport Strategy) of the Core Strategy² specifically relates to highways and provide guidance with regard to development proposals and their impact upon the highway network and the promotion of alternatives to the use of the private car.

- 9.10. The Core Strategy refers to the adoption of the development brief to guide the development of the Station Hill/Station South area and the Reading Central Area Action Plan³ (RCAAP)
- 9.11. Policy RC1 (Station Hill) of the RCAAP specifies that Station Hill will comprise of a mix use development, and will enhance north south links through the site.

[Local Transport Plan 3: Strategy 2011-2026, April 2011](#)

- 9.12. Reading's third Local Transport Plan⁴ (LTP3 covering the period 2011 to 2026) was published in April 2012.
- 9.13. The LTP3 Strategy Plan provides the context for Reading in terms of the economy, environment and quality of life. The long-term vision for transport in Reading is the aim of better 'connecting Reading' through a transport system that enables people to move around easily, safely, sustainably and in comfort promoting inclusion, intervention and innovation. This is reflected in the key LTP objectives which are:
- To facilitate more physically active travel for journeys in a healthy environment;
 - To improve personal safety on the transport network;
 - To provide affordable, accessible and inclusive travel options for everyone;
 - To ensure that the transport network operates safely and efficiently to meet the needs of all users;
 - To align transport and land use planning to enable sustainable travel choices, improve mobility, reduce the need to travel and preserve the natural environment;
 - To deliver balanced packages of value for money transport solutions and make best use of existing transport investment;
 - To offer sustainable transport choices for the Travel to Work Area and beyond, integrating within and between different types of transport;
 - To improve journey times, journey time reliability and the availability of information;
 - To reduce carbon emissions from transport, improve air quality and create a transport network which supports a mobile, affordable low carbon future.

[Reading Borough Council Local Development Framework, Reading Central Area Action Plan, Adopted January 2009](#)

- 9.14. The Reading Central Area Action Plan establishes a planning framework for the central area providing general guidelines and proposals for the area and also considers how these proposals should be implemented.
- 9.15. The vision for the centre and a set of key principles underpin the planning policy documents in the centre and inform development proposals. The transport related principles are listed below: The centre will contain a broad range of different but complementary uses within an area easily accessed by foot;
- Access to the centre by foot, cycle and public transport will be improved;
 - Access within the centre by foot and cycle will be improved and barriers to this improved access will be overcome, particularly in a north-south direction through the core;
 - Development in the centre will benefit from and contribute towards forthcoming major transport improvements.

- 9.16. Policy RC1 explains a number of transport related requirements that development in the Station/River Major Opportunity Area must meet including:
- Help facilitate greater pedestrian and cycle permeability, particularly on the key movement corridors. North-south links through the centre and across the railway line, IDR and River Thames centered on the new station are of particular importance;
 - Provide developments that front onto and provide visual interest to existing and future pedestrian routes and open spaces;
 - Safeguard land which is needed for:
 - Improvements to Reading station;
 - Reading station interchange; and
 - Mass rapid transit routes and stops;
 - Provide additional areas of open space where possible, including a direct green link between the station and the River Thames.
- 9.17. There is clearly focus on the need to improve accessibility by public transport and permeability for pedestrians and cyclists, particularly in the north-south direction between the shopping core, the station and the Thames.

[Station Hill South Planning and Urban Design Brief, Adopted, 2007](#)

- 9.18. Station Hill South Planning and Urban Design Brief⁵ provides specific urban design and planning principles for the Station Hill area for the improved freedom of movement, including the establishment of a high quality walking and cycling environment that is easy to use and understand, that is well designed, is attractive, safe and well integrated into the surrounding area.

Assessment Methodology and Significance Criteria

[Approach to Outline Assessment](#)

- 9.19. This Chapter has been prepared with reference to the Institute of Environmental Assessment document 'Guidelines for the Environmental Assessment of Road Traffic' (IEA, 1993) and has been informed by the TA for the consented SH3 scheme and TS prepared for the proposed Development, including the Telecom House site also undertaken by PBA. This Chapter includes a review of the anticipated impact during the demolition and construction of the proposed Development and the potential effects of the completed Development scheme separately.
- 9.20. As previously described the proposed Development (SH3 Scheme minus Plot E plus the Telecom House / Plot E Scheme) would result in an increase of the maximum number of residential dwellings over the consented SH3 scheme by 175 units. Through scoping undertaken with RBC's Transport Strategy and Development Control groups it was requested that the transport impact of the proposed Development be derived from an assessment comparing the net change in trips generated by the extant Telecom House site (should it be fully occupied) with the additional 175 units proposed. It was viewed by RBC that the scheme consented for SH3 should be dealt with as the extant use of the Station Hill site as demolition has begun.
- 9.21. The comparison between the trip generation of the extant Telecom House land uses with the additional 175 units within the proposed Development found that less trips were generated than the extant Telecom House land uses should it be fully occupied. This assessment accounts for changes to the mode-share of the whole site due to the adjustment to the distribution of the

maximum parking spaces across the site proposed for this proposed Development. This assessment is included within Appendix 9.2.

- 9.22. It was therefore not necessary to prepare a comprehensive TA as was prepared for the SH3 scheme. The TA supplemented by the TS considered is to be sufficient to assess the impact of transport of the proposed Development. Therefore it was not considered necessary to undertake additional traffic modelling due to the reduction in vehicle trips.
- 9.23. Due to the reduced assessment required to demonstrate the transport impact of the proposed Development; this Chapter of the ES appraises the transport impact of the proposed Development using the extensive traffic modelling undertaken to appraise the potential environmental impact of the consented SH3 scheme.
- 9.24. The traffic modelling undertaken for the SH3 scheme was assessed using Reading Borough Council's Development Control Forecast Model (included within the TA as the 'with development scenario'). The use of this scenario to compare the impact of the proposed Development against, is robust as the model includes all significant committed developments, changes between the SH3 scheme and proposed Development are considered insignificant from a transport perspective and the forecast year represents a robust future year between 2015 and 2026.
- 9.25. The results of the net change in trips due to the proposed Development have therefore been compared against the consented SH3 development and existing telecom House RTM scenario for both the AM and PM peak hours to determine the likely effects of the proposed Development on the highway network and quantify the potential environmental effects of the proposed Development on transportation. This sets out the likely significant effects with respect to transport for the proposed Development and that change between the schemes are insignificant.

Magnitude of Effects

- 9.26. This assessment has taken account of the Guidelines for the Environmental Assessment of Road Traffic (Guidance Note No. 16) prepared by The Institute of Environmental Assessment (IEA) (now The Institute of Environmental Management & Assessment). The IEMA Guidelines recommend two rules to be considered when assessing the impact of development traffic on a highway link:
- Rule 1: Include highway links where traffic flows will increase more than 30% (or the number of HGVs will increase by more than 30%); and
 - Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 9.27. The 30% threshold is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in indiscernible changes in the environmental effects of traffic. At a simple level, the guidance considers that projected changes in traffic flow of less than 10% create no discernible environmental effect, hence the second threshold as set out in Rule 2.
- 9.28. Column 3 in Table 2.1 of the IEMA Guidelines sets out a list of environmental effects which should be assessed for their significance. Indirect issues of noise and vibration, air quality and impact from increased traffic flows on cultural heritage interest and ecological interest is addressed in other chapters of this ES as relevant. There are no hazardous loads expected at the Site and as such this has been excluded from the assessment.

9.29. Definitions of each of the potential effects identified in the IEMA Guidelines are set out below along with explanatory text relating to assessment criteria. It is on this basis that the assessment in this chapter has been undertaken.

- **Driver Delay** - delay to drivers generally occurs at junctions where opposing vehicle manoeuvres are undertaken with vehicles having to give or receive priority depending upon the type of junction arrangement. The IEA guidance states that computer modelling programs can be used to assess the changes in driver delay on the network as a result of the proposed Development. The guidelines do not state specific thresholds to calculate the magnitude of the effect, however, it does advise that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system;
- **Severance** - is the perceived division that can occur within a community when it becomes severed by a major traffic artery. This may result from the difficulty in crossing of a heavily trafficked road or a physical barrier. Severance is difficult to measure and by its subjective nature is likely to vary between different groups within a single community. In addition to the volume, composition and speed of traffic, severance is also likely to be influenced by the geometric characteristics of a road, the demand for movement across a road and the variety of land uses and extent of community located on either side of a road. All these factors are considered when determining the likely severance effect. DMRB provides thresholds of community severance based on either the Annual Average Daily Traffic (AADT) or the length of diversion to cross a road. These are summarised in Table 9.1.

Table 9.1: DMRB Severance Criteria

Degree of Hazard	Annual Average Daily Traffic	Length of Diversion (m)
Significant (High)	>16,000	>500
Moderate (Medium)	8,000-16,000	250-500
Slight (Low)	<8,000	<250

9.30. The IEMA guidelines state that where changes AADT (as a result of the proposed Development) are 30%, 60% and 90% or higher, then these links can be regarded in this instance as producing 'low', 'medium' and 'high' changes in severance respectively. However, the guidance acknowledges that the accurate measurement and prediction of severance is extremely difficult:

- **Pedestrian Delay** - the delay incurred by pedestrians is generally a direct consequence of their ability to cross roads. Thus the provision of crossing facilities, the geometric characteristics of the road, and the traffic volume, composition and speed are all factors that can affect pedestrian delay and have been considered when assessing this effect;
- **Pedestrian Amenity** - is broadly defined as the relative pleasantness of a journey, it is affected by traffic flow, traffic composition and pavement width / separation from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. There are no commonly agreed thresholds for quantifying the significance of changes in pedestrian amenity, although the IEMA guideline suggests a useful study which could be referenced when considering any effect. These thresholds are replicated in Table 9.2.

Table 9.2: Fear and Intimidation Criteria

Degree of Hazard	Average traffic flow over 18 hr day (vehicles/ hour two-way)	18 hour HGV flow	Average Vehicle Speed over 18 hour day (mph)
Extreme (High)	+1,800	+ 3,000	+ 20
Great (Medium)	1,200 – 1,800	2,000 – 3,000	15 – 20
Moderate (Low)	600 – 1,200	1,000 – 2,000	10 – 15

- Accidents and Safety - the guidance states that overall changes in vehicle kilometres on account of the proposed Development may be used to assess the magnitude of impact on accidents and safety. However the guidance does not prescribe specific criteria, which can be applied to the changes in vehicle kilometres to identify impact magnitude dependent on local circumstances such as traffic speed, flow and composition as well as vehicle conflict and pedestrian activity. The guidelines state that it is this combination that enables a professional judgement to be made regarding the significance of the effect.
- Dust and Dirt - the impact of dust and dirt on the highway have been assessed in relation to the nature of development and in particular during the demolition and construction stages.

Receptor Sensitivity

- 9.31. The sensitivity of assessed links will vary depending on the surrounding conditions and receptors. The IEMA Guidelines identify groups and special interests which should be considered:
- People at home;
 - People in work places;
 - Sensitive groups including children, the elderly and disabled;
 - Sensitive locations e.g. hospitals, churches, schools, historical buildings;
 - People walking;
 - People cycling;
 - Open spaces, recreational sites, shopping areas;
 - Sites of ecological / nature conservation value; and
 - Sites of tourist / visitor attraction.
- 9.32. Categories of receptor sensitivity have been defined from the principles set out in the Guidelines for the Environmental Assessment of Road Traffic, and include the following:
- “the need to identify particularly groups or locations which may be sensitive to changes in traffic conditions;*
- the list of affected groups and special interests set out in the guidance;*
- the identification of links or locations where it is felt that specific environmental problems may occur; and*
- such locations would include accident blackspots, conservation areas, hospitals, links with high pedestrian flows etc”.*
- 9.33. These have been used to outline, in broad terms, the sensitivity of receptors to traffic for the categories of impact assessed in this chapter, although in detail, each receptor assessed will have a different sensitivity to each specific impact:

- 9.34. High sensitivity receptors include:
- Schools, colleges and other educational institutions;
 - Retirement / care homes for the elderly or infirm;
 - Roads used by pedestrians with no footways; and
 - Accident blackspots.
- 9.35. Medium sensitivity receptors include:
- Hospitals, surgeries and clinics;
 - Parks and recreation areas;
 - Shopping areas; and
 - Roads used by pedestrians with narrow footways.
- 9.36. Low sensitivity receptors include:
- Open space;
 - Tourist / visitor attractions;
 - Historical buildings; and
 - Churches.

Significance Criteria

- 9.37. Using the magnitude of effect and receptor sensitivity, Table 9.3 has been used to determine the significance of effects.

Table 9.3: Significance of Effect Categories

Sensitivity / Value of Receptor	Magnitude of Effect		
	High	Medium	Low
High (England/UK/International)	Major	Major / Moderate	Moderate
Medium (County/Regional)	Major / Moderate	Moderate	Moderate / Minor
Low (Local/Borough)	Moderate	Moderate / Minor	Minor

Limitations and Assumptions

- 9.38. As highlighted previously, RBC's Development Control Forecast Traffic Model (RTM) has been used to appraise the proposed Development. This traffic model includes projected background traffic growth to 2015 plus all committed developments and therefore reflects a year between 2015 and 2026. A list of the major developments included within the traffic model is included within the Reading Transport Model (RTM) outputs included within Appendix 9.1. These include the developments that were yet to receive consent but were included within the RTM (Chatham Place, Energis House, Thames Tower, Aldwych House). The delivery of these committed developments is subject to market demand and many other factors and therefore completion is not known. RBC advises that the model provides a worst case forecast scenario in terms of traffic flows for testing any development likely to be completed between 2015 and 2026. As the

proposed Development is scheduled for completion in 2018, it is considered that use of this model is appropriate.

Consultations

- 9.39. RBC has been consulted upon the scope of the TS and it was suggested that an assessment of the net difference between the extant Telecom House and the proposed increase of residential dwellings would be sufficient. In addition, an EIA Scoping Report was prepared by Waterman EED (now Waterman IE) and submitted to RBC, together with a request for a formal Scoping Opinion in October 2014. The Scoping Opinion set out that the Highways Authority had some concerns over the level of car parking provided within the multi-storey car park. A sensitivity test is included within the TS to show that ample car parking within Reading is available to serve the proposed Development and the public.

Future Baseline

- 9.40. This section sets out the Future Baseline from which the proposed Development has been appraised against. As stated previously within this chapter the transport impact assessment undertaken within the TS did not compare the proposed Development against the extant uses of the Site. However to ensure that the assessment within this ES chapter considers the future baseline set out in Chapter 2: Methodology and remains comparable with the ES as a whole the Future Baseline set out below has been included.
- 9.41. This Future Baseline assessed within the TA as 'Development Control Forecast Model with Extant uses' includes consideration of the Station Hill improvement works now complete and includes the since consented developments of (Chatham Place, Energis House, Thames Tower, Aldwych House). The use of this traffic model as stated elsewhere within this chapter is considered to be a robust reflection of the Future Baseline.

Future Baseline land uses

- 9.42. The existing site contains a mixture of office, retail and leisure land uses. The quantum of each land-use on site is detailed below in Table 9.4.

Table 9.4: Future Baseline Land Uses (Gross Floor Area)

Land Use	Extant Station Hill Floorspace (sqm)	Extant Telecom House (sqm)	Station Hill Development (sqm)
Retail & Related Uses (Use Class A1 – A5) m2	14,020	793	14,813
Leisure (Use Class D2) m2	3,568	-	3,568
Office (Use Class) m2	15,576	5,697	21,543

Future Baseline Trip Generation

- 9.43. As previously discussed the existing trip generation has been derived based upon the extant land-uses on site being fully occupied. Table 9.5 below shows the person trip generation based on the trip rates agreed with RBC and the extant floor areas.

Table 9.5: Future Baseline Person Trip Generation

Land Use	AM (IN)	AM (OUT)	PM (IN)	PM (OUT)
Retail	395	320	682	303
Office	415	30	24	373
Leisure	0	0	7	9
Public Car Park	268	11	28	196
Total	1078	361	741	881

Pedestrian Accessibility

- 9.44. The Site is located centrally within Reading town centre, Figure 9.1 indicates walking isochrones from the Site. These demonstrate that the Site is ideally located to encourage walking from a relatively large population catchment with all of the town centre amenities and shops within a 15 minute walk of the site. The proposed Development capitalises on its location within the centre of Reading acknowledging the role walking can play both in delivering accessibility at the local level and in contributing towards sustainable development patterns.

Cycling Accessibility

- 9.45. Cycle isochrones radiating from the Station Hill site are shown in **Figure 9.2**. This assumes a cycle speed of 16kph. The isochrones demonstrate that almost the entire RBC boundary is within a 20 minute cycle ride of the Site, making cycle trips to the Site a realistic mode of travel for a large number of people.
- 9.46. Central Reading currently has a good level of cycle connectivity to the south of the Site through a combination of 'Quiet Roads', cycle paths and cycle lanes within the carriageway. Beyond the immediate centre of Reading, dedicated cycle paths are present on the main routes into Reading, including via Oxford Road and Portman Road to the west; A33 to the south; and routes through Caversham and across Caversham Bridge to the north. Leisure routes are also present along the River Kennet and River Thames.

Bus Accessibility

- 9.47. The Site benefits to from excellent access to a wide choice of bus services due to its location centrally within the town centre and adjacent to Reading Railway Station. Approximately 100 buses per hour serve the area around the Site in the peak hours. The location of the Site in context to the town centre bus stops is highlighted on Figure 9.3.
- 9.48. Reading's bus services offer frequent, reliable services and also benefit from bus priority measures, real time information, and better provision for people with reduced mobility.
- 9.49. The wider bus network provides access to/from all of the Reading urban area as well as Bracknell, Twyford, Wokingham, Spencers Wood, Aldershot, Theale, Newbury, Pangbourne, Woodcote, Wallingford, Sonning Common, Henley-on-Thames and High Wycombe.
- 9.50. Strategic bus routes (including the 'Greenwave' services) operate along the A33 corridor between GreenPark, the Madjeski Park and Ride and Reading International Business Park (RIBP) from the interchange area adjacent to Reading Station and bus stops located throughout the town centre.

The main interchange area is located close to the Site to the east on Station Road and Forbury Road adjacent to Reading Station.

- 9.51. The 'Fasttrack' services provide connections between the Site and the Park and Ride site at Loddon Bridge to the east of the town centre as well as to the Madjeski Stadium. Stewarts Coaches operates services between the town centre and Thames Valley Park. Direct and frequent services operate along these routes.
- 9.52. The 'Rail-Air' Link, located outside Reading Station, provides a frequent coach service to and from Heathrow Airport.

Rail Accessibility

- 9.53. The Site is located close to Reading Station, which is identified as a regional transport hub and the focus of significant regeneration and redevelopment. The Station is the second busiest interchange in the UK outside London, with 60,000 passengers using the station daily.
- 9.54. Rail services from Reading Station provide connections to the regional and national rail network where the following train companies offer services to a variety of destinations:
- First Great Western operate trains to destinations which include London Paddington, Slough, Basingstoke, Gatwick Airport, Oxford, Hereford, Worcester, Bristol, South Wales and the South West of England;
 - Cross Country Trains operate trains to destinations including Bournemouth, Southampton, Guildford, Banbury, Coventry, Birmingham, the North of England and Scotland; and
 - South West Trains provides services to Wokingham, Staines, Richmond, Clapham Junction, London Waterloo, Basingstoke, Winchester, Southampton, Portsmouth and Brighton.

Strategic Highway Access

- 9.55. The existing highway access routes (to the Site) in a strategic context are shown in Figure 9.4. This shows the strong links to the strategic road network, such as the Inner Distributor Road (IDR) and a number of radial routes to/from Reading Town Centre.
- 9.56. The principal vehicle routes to the site are via the IDR. The IDR is, for the most part, a dual, two lane orbital route which provides the following connections into Reading town centre:
- North: Via Reading and Caversham Bridges;
- East: Via the A329 Kings Road and the A4 London Road;
 - South: Via the A33, leading to Junction 11 of the M4; and
 - West: Via the A4, the junctions with A4155 Castle Hill, and the A329 Chatham Street.

Local Highway Access

- 9.57. There are two existing points of access to the Site from the wider area via Garrard Street. The first is from the Tudor Road / IDR (Caversham Road) junction, from where traffic must travel along Tudor Road to access the Site. The second is via Greyfriars Road, which is a one-way street between Friar Street and Garrard Street and provides access for vehicles from the south. Access to Greyfriars Road is available from the grade separated Chatham Street roundabout.
- 9.58. All vehicles have to exit the Site onto Greyfriars Road (north of Garrard Street) and travel along Tudor Road to the Tudor Road junction with the IDR (Caversham Road). This junction allows access to the southbound carriageway only and drivers wishing to travel north must perform a U-

turn at the Chatham Street roundabout. The Stanshawe Road junction with the IDR is restricted to bus, taxi and cycle movements only.

- 9.59. Garrard Street is located to the north of Telecom House and provides access to the existing Site. Through movement between Greyfriars Road and Station Road is not possible for general traffic with access to Station Road at the eastern most end of Garrard Street restricted to buses and taxis only.
- 9.60. Vehicle access points provided into the Site are shown on Figure 9.5. Six of the access points are located on Garrard Street and one from Station Hill. The existing accesses currently serve:
- The Garrard Street multi-storey National Car Parking (NCP) car park in the east of the Site;
 - A separate egress to the Garrard Street car park, forming the access to the servicing and delivery area for Thames Tower adjacent to the east of the Site;
 - An access/egress to the Western Tower car park in the west of the Site; and
 - An access/egress to the Xfinity House office buildings situated on the western side of the Site;
 - An Access to the Telecom House building from Garrard Street;
 - An egress from the Telecom House building on to Garrard Street;
 - An access into the old bus depot is located from Station Hill with an access out of the depot.

Accidents and Safety

- 9.61. An analysis of Personal Injury Accidents in the vicinity of the site has been undertaken within the TA. This analysis found that a total of 67 personal injury accidents were recorded in and around the site area during the five year period between January 2008 and December 2012. It was concluded within the analysis that there were no existing safety concerns within the local area; and therefore no additional analysis was undertaken for the proposed Development because there has been only a modest time lapse since the PIA review was undertaken within the TA.
- 9.62. The recently completed Station upgrade works and town centre public realm improvements may make the recent accident records untypical in the location for consideration.

Parking

- 9.63. The existing Station Hill development site has 1,463 car parking spaces across the site, the allocation of these spaces is as follows:
- Garrard Street Multi-Storey Car Park – 950 Spaces;
 - Friars Walk – 94 Spaces located on the roof that can be accessed from Garrard Street Car Park;
 - Western Tower – 280 Spaces;
 - Xfinity House – 81 Spaces;
 - Telecom House – 58 space.
- 9.64. It should be noted that the 94 spaces located above Friars Walk have been inaccessible to the public for some time. The spaces were previously accessed from Garrard Street car park and provided additional car parking for the retail uses within Friars Walk. Due to the period of time this area of the car park has been inaccessible these parking spaces have not been accounted for

within the baseline trip generation assessment, in order to evaluate a current 'worst case' impact assessment.

Local Highway Network and Traffic Flows

- 9.65. The key highway links that were assessed within the TA and 2013 ES have been retained for comparison within this ES and are presented within Table 9-6.
- 9.66. Table 9.6 provides a summary of the traffic flows on the key links within the study area in the SH3 Consented RTM scenario. The AM peak hour included within the RTM is 0800-0900 and 1700-1800 for the PM peak.

Table 9.6: Future Baseline RTM Two-Way Traffic Flows

Link	All Vehicles			HGV		
	AM flow	PM flow	AADT	AM flow	PM flow	AADT
Vastern Road	3114	3124	47034	74	43	938
Garrard Street	490	443	7041	1	0	8
Greyfriars Road North	230	452	5140	22	16	301
Tudor Road	215	456	5060	6	2	60
Friar Street EB	390	59	3392	9	4	104
Mill Lane EB (App CP)	1199	1016	16707	15	3	137
Mill Lane EB (App IDR)	897	744	12369	14	3	135
Bridge Street	416	702	8429	16	15	246
Queens Road	2188	2527	35555	46	25	564
Caversham Road	3817	3395	54377	136	73	1671
Grey Friars Road South	364	51	3130	9	9	145
Castle Street	623	513	8564	31	25	445

Driver Delay

- 9.67. The key links have been allocated a level of driver delay based on the results of the RTM, these are 15-30 seconds, 30-60 seconds and 61 seconds or more and represent a 'low', 'medium' and 'high' level of driver delay. Any driver delay below these thresholds is considered 'not significant'.
- 9.68. Table 9.7 below shows the vehicle delay, reserve capacity (V/C) and driver delay significance during both the AM and PM peak hours for the Future Baseline.

Table 9-7: Future Baseline RTM Driver Delay

Link	AM Peak			PM Peak		
	Delay (seconds)	Reserve Capacity % (V/C)	Driver Delay Significance	Delay (seconds)	Reserve Capacity % (V/C)	Driver Delay Significance
Vastern Road	9	57	Not Significant	8	50	Not Significant
Garrard Street	7	36	Not Significant	13	67	Not Significant
Greyfriars Road North	42	34	Medium	71	91	High
Tudor Road	21	17	Low	24	57	Low
Friar Street EB	12	50	Not Significant	8	8	Not Significant
Mill Lane EB (App CP)	7	76	Not Significant	5	64	Not Significant
Mill Lane EB (App IDR)	15	87	Low	11	66	Not Significant
Bridge Street	2	17	Not Significant	2	33	Not Significant
Queens Road	116	102	High	92	101	High
Caversham Road	12	69	Not Significant	11	58	Not Significant
Greyfriars Road South	12	51	Not Significant	4	11	Not Significant
Castle Street	12	44	Not Significant	9	22	Not Significant

- 9.69. During the AM peak hour driver delay across the key links is generally 'not significant', Tudor Road and Mill Lane (approaching the IDR) has a baseline driver delay within the 'low threshold'. Greyfriars Road north has a 'medium' driver delay and Queens Road is showing a 'high' level of driver delay. It can be seen from the V/C information that the traffic demand along Queens Road is exceeding its capacity with the V/C in excess of 100%.
- 9.70. The PM peak shows similar levels of driver delay with most links being categorised as 'not significant'. Tudor Road has a 'low' driver delay, with Greyfriars Road having a 'high' driver delay as the link approaches capacity. Queens Road continues to operate over capacity with a 'high' driver delay during the PM peak.

Severance

- 9.71. Table 9.8 summaries the calculated severance levels at links surrounding the proposed Development Site and at town centre car parks for the Future Baseline.

Table 9.8: Future Baseline Two-Way Traffic Flows and Severance Level

Link	AADT	Severance (Daily Traffic)
Vastern Road	47034	High
Garrard Street	7041	Low
Greyfriars Road North	5140	Low
Tudor Road	5060	Low
Friar Street EB	3392	Low
Mill Lane EB (App CP)	16707	High
Mill Lane EB (App IDR)	12369	Medium
Bridge Street	8429	Medium
Queens Road	35555	High
Caversham Road	54377	High
Grey Friars Road South	3130	Low
Castle Street	8564	Medium

- 9.72. Based upon the thresholds set out under 'Magnitude of Effects', the table shows that Vastern Road, Queens Road and Caversham Road accommodate traffic flows that result in a high level of severance to pedestrians. The traffic flows on Mill Lane approach, Bridge Street and Castle Street will cause a medium level of severance. Other links are low in terms of severance.

Pedestrian Delay and Amenity

- 9.73. Walking and cycling play an important role in healthy and active lifestyles. In this town centre location there is a significant opportunity to promote these means of travel, potentially reducing the impact of the Development to the local highway network.
- 9.74. Pedestrian access to and from the site is very good, but current access through the site is considered to be very limited. The site therefore acts as a barrier between the existing retail and leisure activities on Friar Street and the main public transport interchange at Reading Station.
- 9.75. In the future base scenario, when reviewing the links (likely to be effected by future development of the Station Hill), the highest peak hour two-way traffic flow arises on Vastern Road, Caversham Road or Queens Road. These traffic flows are approximately 1.5 to 2 times the levels required for a crossing delay to occur, however, there are footways on either side of the carriageway and crossing facilities available.
- 9.76. All other links accommodate significantly lower traffic flows, which should not cause significant delay to pedestrians crossing the routes.

Fear and Intimidation

- 9.77. The Future Baseline flows have been analysed to determine the fear and intimidation thresholds. The thresholds are categorised based on the degree of hazard detailed within Table 9.2 and are presented in Table 9.9.

Table 9.9: Future Baseline Two-Way Traffic Flows, 18 Hour HGV flow, Speeds and Related Degree of Hazard

Link	Average traffic flow over 18hr day (vehicles/hour two-way)	Degree of hazard	Total 18 hour HGV flow	Degree of hazard	Average Speed in the peak hours (mph)	Degree of hazard
Vastern Road	2615	High	878		20	High
Garrard Street	391		8		17	Medium
Greyfriars Road North	286		281		16	Medium
Tudor Road	281		57		16	Medium
Friar Street EB	189		97		17	Medium
Mill Lane EB (App CP)	929	Low	128		18	Medium
Mill Lane EB (App IDR)	688	Low	126		20	High
Bridge Street	469		230		16	Medium
Queens Road	1977	High	528		29	High
Caversham Road	3023	High	1564	Low	19	Medium
Grey Friars Road South	174		136		15	Medium
Castle Street	476		416		16	Medium

- 9.78. Table 9.11 shows that the links with a 'high' levels of fear and intimidation level are the Vastern Road, Queens Road and Caversham Road when considering traffic flow levels. The Mill Lane approach would be identified as 'high' when considering speeds. All other links have 'low' or 'negligible' levels of fear and intimidation, when considering traffic flow and HGV levels, but 'medium' when considering traffic flows.

Accidents and Safety

- 9.79. PBA have obtained collision records for all the roads within the study area. These have been obtained for the five year period from 1st January 2008 to 31st December 2012, a copy of which is attached in the TA. This information was obtained from Reading Borough Council. As previously stated more recent collision statistics were not analysed due to the Station improvement works been undertaken during this time.
- 9.80. The collisions are classified into three categories: slight, serious and fatal, a definition of which is provided below:
- Slight Injury: Injuries of a minor nature, such as sprains, bruises, or cuts not judged to be severe, or slight shock requiring only roadside attention (medical treatment is not a pre-requisite for an injury to be defined as slight);
 - Serious Injury: Injuries for which a person is detained in hospital, as an in-patient, or any of the following injuries, whether or not a person is detained in hospital; fractures, concussion, internal injuries, severe cuts and lacerations, severe general shock requiring medical treatment

and injuries which result in death 30 days after the collision. The serious category, therefore, covers a very broad range of injuries; and

- Fatal Injury: Injuries which cause death either immediately or any time up to 30 days after the collision.

- 9.81. A summary of five years of annual rolling 12 month collision data (January to December) within the study area is provided within Table 9.10.

Table 9.10: Summary of Collision within Study Area

Casualty	Severity of Casualty	Year					Total
		1	2	3	4	5	
All Collisions	Fatal	1	0	0	0	0	1
	Serious	2	0	0	0	5	7
	Slight	11	10	14	11	13	59
	Total	14	10	14	11	18	67
Pedestrians	Fatal	0	0	0	0	0	0
	Serious	2	0	0	0	4	6
	Slight	2	3	6	4	6	21
	Total	4	3	6	4	10	27
Cyclist	Fatal	0	0	0	0	0	0
	Serious	0	0	0	0	1	1
	Slight	0	2	4	1	6	13
	Total	0	2	4	1	7	14

Source: TRAFFMAP AccsMap – Accident Analysis System

- 9.82. Table 9.10 shows that during the 60 month period between the 1st January 2008 to 31st December 2012 there were 67 recorded collisions resulting in 1 (<1%) fatality, 7 (10%) serious injuries and 59 (88%) slight injuries.

- 9.83. A detailed review is included in the SH3 Scheme TA (Appendix 9.1). A summary of the collision contributing factors with the study area is provided within Table 9-13.

Table 9-11: Summary of Collision Contributory Factors

	Very Likely	Possible	Total
Road Environment Contributed	5	0	5
Vehicle Defects	0	1	1
Injudicious Action	12	2	14
Driver Rider Error or Reaction	43	24	67
Impaired or Distraction	9	4	13
Behaviour or Inexperience	9	6	15

Vision Affected by	3	3	6
Pedestrian Only	27	8	35
Special Codes	0	1	1
Total	108	49	157

- 9.84. Over the entire 60 month period 75% (43) of the collisions were very likely attributed to driver/rider error or reaction. This is similar to the national average of driver / rider error or reaction contributory factors of 72% (calculated from Road Casualties GB 2011, Table RAS50001).
- 9.85. Table 9.11 shows that 3% collisions were attributed to the road environment over the entire 5 year period. This is lower than the national average of 13% (calculated from Road Casualties GB 2011, Table RAS50001).
- 9.86. Analysis of the collision records (included in the Transport Assessment included in Technical Appendix 9.1) has not identified any specific concern with regard to the geometric design / road layout of the local highway network. There are no recurring patterns of the frequency of severity of collisions recorded. The data does not highlight any specific concerns to clustering of collisions or locations within the study area.

Potential Effects

Comparison of the Consented SH3 Scheme with the proposed Development

- 9.87. As discussed previously the TS assessed the difference in transport impacts for the extant Telecom House against the proposal for an additional 175 residential dwellings for the Telecom House / Plot E Scheme, and the net difference between the consented SH3 Scheme (and the extant Telecoms House site) and the proposed Development. Table 9.12 summarises the results of the net difference in trips between the Consented SH3 Scenario, and the proposed Development against the previous use of the Site.

Table 9-12: Net Difference between the Consented SH3 Scheme and that of the proposed Development

Mode	Consented SH3 Net Difference against extant baseline		Proposed Development Net Difference against Consented SH3		Difference Between SH3 Scheme and proposed Development	
	AM 2-Way	PM 2-Way	AM 2-Way	PM 2-Way	AM 2-Way	PM 2-Way
From Home	12	11	16	15	4	4
Underground	2	2	2	2	0	0
Train	764	698	780	697	17	-1
Bus	804	735	776	692	-28	-42
Taxi	3	3	4	3	0	0
Motorcycle	12	11	12	10	0	0
Car Driver	35	45	-3	12	-38	-33
Car Passenger	-1	2	-11	-7	-10	-9

Bicycle	83	75	81	72	-2	-3
Foot	425	388	417	374	-8	-14
Other	4	4	5	4	1	0

- 9.88. As shown in the above table and further detailed in the TS, there will be an overall reduction in trips as a result of this proposal against the consented SH3 masterplan Scheme, particularly private vehicle and bus trips. It is therefore considered that the previous modelling for the EIA for the consented SH3 would demonstrate a 'worse case' scenario. Therefore the impacts assessed for the previous EIA, for the consented SH3 scheme, are considered to accurately represent the likely significant effects of the proposed Development

Demolition and Construction

- 9.89. An assessment of the demolition and construction traffic on the transport networks has been undertaken. This has been considered below prior to the implementation of mitigation measures.
- 9.90. Construction of the Station Hill development began in May 2015 and works will be phased, commencing with demolition and earthworks. It is anticipated that at times several areas will be progressed concurrently. Construction is expected to continue over 5 years.

Local Highway Network and Traffic Flows

- 9.91. It is not possible to use Reading Station for the movement of construction materials; the highway network is considered the only viable form of transportation for demolition and construction activities.
- 9.92. Construction vehicles would access the site using Tudor Road / IDR (Caversham Road) from the north or via Greyfriars Road via the grade separated Chatham Street roundabout from the south. All vehicles are required to exit the Site via Greyfriars Road (north of Garrard Street) and travel via Tudor Road to the Tudor Road junction with the IDR (Caversham Road). These traffic routes avoid Reading's central area, thereby reducing potential disruption to the commercial core.
- 9.93. The average volume of Heavy Goods Vehicles (HGVs) movements associated with the demolition/construction activities (based on the average number of construction vehicles for the 'peak' period of construction activity) have been assessed to be in the region of 35 vehicles per day. This is the same number of construction vehicles as for the consented SH3 Scheme. This is because peak construction output is unlikely to change although the time period within which peak construction activity would occur may be longer. This additional volume is considered insignificant in relation to the volume of existing HGVs, which on the IDR is in excess of 1700 vehicles (2 way) during the day. The potential effect of demolition and construction generated traffic would therefore be **negligible**.

Driver Delay

- 9.94. The proposed Development includes the reconfiguration of Garrard Street car park; this may result in the need for car park users to find alternative car parking in the town centre while the works are being undertaken.

- 9.95. Road closures and traffic diversions required as part of the demolition and construction works would not be unusual given the scale and nature of the demolition and construction works. In addition, given that road closures and traffic diversions would be well planned and agreed with RBC and other affected parties, the potential effect of the demolition and construction works would be considered to be **temporary** over the **short to medium** term, **local** in extent and of **minor adverse** significance.

Severance

- 9.96. The traffic levels during the demolition and construction phases would represent an increase of less than the 30% threshold for low impact. It is considered that the increase in traffic on severance is **negligible** during the construction and demolition phases.

Pedestrian Delay and Amenity

- 9.97. Future demolition and construction works may result in the need to introduce, temporary short-term footpath closures or diversions. Access to properties and transport facilities would be maintained where required.
- 9.98. Road closures and traffic diversions would be well planned and agreed with RBC and other affected parties. Therefore the potential effect of the demolition and construction works would be considered to be **temporary** over the **short to medium** term, **local** in extent and of **moderate adverse** significance.

Fear and Intimidation

- 9.99. The IEA guidelines suggest that changes in two-way average hourly traffic flows of between +600 and +1,200 vehicles hourly, or between 1,000 and 2,000 HGVs daily, or an average speed of 10-15 mph measured over an 18-hour period would result in a moderate increase in fear and intimidation.
- 9.100. During the demolition and construction phases, there will be a higher proportion of HGVs. However, given the anticipated 5 year phasing programme, the level of impact is below the thresholds detailed above. Therefore based on the above, the impact on fear and intimidation is **negligible**.

Accidents and Safety

- 9.101. A greater number of HGV movements will be generated during the demolition and construction phases of the proposed Development than during the operational phase of the proposed Development. This increase in HGV traffic could lead to increased conflict with pedestrians and cyclists within the vicinity of the Site. It is considered that the increased number of HGVs could affect accidents and safety. Given the quantity and nature of the traffic levels associated with the construction and demolition of the proposed Development, it is considered that the impact associated with construction and demolition on accidents and safety would be **temporary** over the **short to medium** term, **local** in extent and of **minor adverse** significance.

Interim Condition: Temporary Flexible Event Space

- 9.102. The proposed Development proposes to create an area for temporary events situated adjacent to the lowered station interchange. This Flexible Space is to be constructed either during or prior to the first phase of the main Development scheme. The Flexible Space can be used for a variety of uses such as street markets, performances, arts and sport events. Eventually this area of Flexible Space will be redeveloped as part of the proposed Development.
- 9.103. The potential effects of this scheme have been considered within the Access Statement included within Technical Appendix 9.4.
- 9.104. The Flexible Space is situated outside Reading Station and is highly visible for people arriving by bus and train and lends itself well to the type of uses proposed, attracting people already travelling into Reading for business, leisure or retail uses. The possible uses (Arts, Performance, Markets etc...) likely to occupy the proposed space are not anticipated to attract primary trips into Reading, with people drawn to the attraction from pass-by trips while travelling for other purposes, or from existing town centre retail trips.
- 9.105. Access to the site for the general public/visitors is to be solely facilitated by foot, with no general vehicular access. There will be no general traffic access or public parking at the proposed area. The only vehicles able to access the space will be associated with the setting up or removal of uses being undertaken within the space.
- 9.106. The potential effect of the Flexible Space therefore relates to the potential conflict between people and vehicles accessing the site to set up or remove the uses being undertaken. The Flexible Space is therefore considered to have a **temporary** impact over the **short** term, **local** in extent and of **minor adverse** effect due to the potential conflict between pedestrians and vehicles.

Completed Development

Development Proposals

- 9.107. Table 9.13 summarises the proposed net change in Land Uses across the whole masterplan.

Table 9-13: proposed Development Land Uses (Gross Floor Area)

Land Use	Consented SH3 Scheme (GFA)	SH3 with Telecom House / Plot E Scheme (GFA)	Net Change (GFA)
Retail & Related Uses (Use Class A1 – A5) m ²	11,475m ²	11,475m ²	0
Leisure (Use Class D2) m ²	1,870m ²	1,870m ²	0
Residential (Use Class C3) m ²	300 Dwellings	475 Dwellings	+ 175 Dwellings
Office (Use Class) m ²	103,700m ²	103,700m ²	0

- 9.108. The rationale that underpins the transport proposals for the proposed Development has been based on the concept of a Transport Development Area – a high density mixed use development located in a highly accessible area. The approach has been to ensure that the proposed Development can work in and take advantage of these very high accessibility levels at Reading

Station, whilst providing sufficient flexibility to support emerging longer-term transport proposals. In essence this approach has been based around the following:

- Placing Reading Station at the heart of the access and movement strategy and integrating the proposed Development with the station; and
- Integrating the proposed Development with the newly improved South Western Interchange and associated improvements in the station area.

9.109. In addition, the proposed Development has been designed to integrate with wider interchange and public realm proposals delivered by RBC. These proposals provide a series of high quality streets and squares to strengthen the north-south axis linking the River Thames, station area and central Reading.

9.110. A diagram showing the transport plan for Station Hill, in the wider context is shown in Figure 9.6.

Trip Generation

9.111. The person trips likely to be generated by the proposed Development are included in Table 9.14. These have been calculated using the agreed trip rates and assumes the maximum floor areas and car parking spaces are delivered, i.e. the worst case assessment.

Table 9-14: Development Person Trips Generation

Location	AM (IN)	AM (OUT)	PM (IN)	PM (OUT)
Retail	357	289	615	607
Office	2271	166	135	2043
Residential	49	264	183	106
Leisure	0	0	46	34
Public Car Parking	117	5	12	86
Total	2794	723	991	2875

9.112. The mode share has been based upon 2001 and 2011 Census data. The town centre ward within which the Site is located, Abbey ward, has been analysed to determine the mode share of home to work trips from the ward. The residential mode share has been based upon this analysis taken from 2011 Census data.

9.113. The town centre output area, which covers all employment within the boundary of the IDR has been analysed to determine the mode share for the employment, retail, and leisure trips. As this dataset is yet to be released for the 2011 Census data the 2001 Census was used.

9.114. The agreed person trips generated by the offices have been converted by mode, on the basis that the office parking would be fully utilised and the remaining trips would arrive/depart by the other modes in the same relative proportions as census data. The proposed car driver mode share has therefore been capped at a level that could be accommodated within the car park and the other modes have been adjusted on a pro-rata basis. A detailed description of this methodology is included within Technical Appendix 9.1.

9.115. In addition, due to the location of the Site next to Reading Station and the recent improvements undertaken, it is assumed that travelling by rail has become more attractive. This will mean a

reduction in the mode share on other modes, which will also occur on a pro-rata basis. This is discussed in greater detail within Technical Appendix 9.1.

- 9.116. As stated previously, Table 9.12 shows that the proposed Development would result in a reduction in car driver trips compared with the consented SH3 Scheme. Therefore the previous ES 2013 represents a 'worst case' scenario, and has therefore been referred to when assessing the traffic impacts for the proposed Development.

Local Highway Network and Traffic Flows

- 9.117. It was considered that the consented SH3 scheme within the 2013 ES would not significantly alter traffic levels across the local network and had a negligible effect. This is the same as the effect assessed as part of this proposed Development; the proposed Development would result in a **negligible** reduction in two way vehicle trips compared with the consented SH3 Scheme.

Bus Access

- 9.118. The analysis of trip modes has shown that buses would be one of the dominant means of travel to the Site. This could impact on the existing capacity of the bus network. However, given the commercial nature of bus services and Reading's role as a regional transport hub, it is expected that local bus operators will respond to the additional demand generated (and associated income from fares) by the proposed Development.
- 9.119. The potential effect within the 2013 ES for the consented SH3 on bus capacity is considered to be **long-term, local to district** and of **minor adverse** significance. This is unchanged from the proposed Development; as shown in Table 9.12 the proposed Development would result in a negligible reduction in two way bus trips compared with the consented SH3 Scheme.

Rail Network

- 9.120. The Site is located adjacent to Reading Mainline Station and the analysis of the trip modes has shown that a high proportion of trips from the Site would use the rail network.
- 9.121. The Reading Station area major upgrade scheme is practically complete and has removed the significant operational bottleneck at this key junction on the Trans European Network (TEN). The improvements include track grade separation, new platforms, replacement depot, signalling and a new passenger transfer deck to access the platforms. It is understood that the new station has been designed to accommodate a doubling of passenger numbers from today's figures.
- 9.122. The potential effects on the rail network are therefore considered to be **negligible** given the additional capacity currently being created. This is unchanged from that of the SH3 Scheme; as shown in Table 9.12 the proposed Development would result in a slight increase of 17 two way rail trips compared with the consented SH3 Scheme. However, due to the scale and capacity of Reading Station following its upgrade, it is considered that there would be no change to the assessment of effects.

Driver Delay

- 9.123. The 2013 ES found that driver delay on the key links all remained the same apart from Greyfriars Road that reduced from a 'high' driver delay to 'medium' driver delay during the PM peak hour.

This was considered to result in a long-term, local effect of **minor beneficial** significance in relation to the local highway network. As shown in Table 9.12, the two way vehicle trips associated with the proposed Development would be slightly less than that of the consented SH3 Scheme and so the effect is considered to be the same for the proposed Development.

Severance

- 9.124. Table 9.12 shows that the proposed Development would result in a small reduction in the number of two way vehicle trips.
- 9.125. It is therefore considered that the proposed Development results in a **negligible** effect to severance which remains consistent with the assessment set out in the 2013 ES.

Pedestrian Delay and Amenity

- 9.126. The benefit of the new attractive link from the Station included within the proposed Development outweighs the slight delay crossing Garrard Street therefore creating a **long-term, local** effect of **minor beneficial** significance in relation to pedestrian delay as set out within the 2013 ES. With vehicle and pedestrian trips not increasing due to the proposed Development as set out within Table 9.12 this effect stays the same.

Fear and Intimidation

- 9.127. Table 9.12 shows that the proposed Development would result in a slight reduction in two way trips. The 2013 ES showed that the SH3 scheme did not alter the degree of hazard on the key links assessed and therefore had a **negligible** effect on fear and intimidation. Given the proposed Development results in a slight reduction in in two way trips the effect is considered to remain the same.

Accidents and Safety

- 9.128. The 2013 ES showed there to be an increase in pedestrian activity to the Site with a potential uplift in pedestrian traffic directly onto Friar Street, resulting in a likely increase in pedestrian and vehicle conflict at the Garrard Street pedestrian crossing. This was stated as being **negligible** overall in relation to accidents and safety. Given the estimated reduction in trips associated with the proposed Development this remains consistent with the assessment of the consented SH3 Scheme.

Mitigation

- 9.129. Given that the proposed Development does not alter the effects in comparison to those identified within the 2013 ES the mitigation measures included throughout this section are the same as those considered acceptable for the consented SH3 scheme.

Demolition and Construction

- 9.130. The demolition and construction works necessary for the proposed Development would have some effect on the local transport network, although disruptions would be managed and any changes required agreed with RBC.
- 9.131. No major mitigation measures have been identified as being necessary at this stage, although the detailed arrangements for any changes required for the partial road closures and the resulting implications on the local transport system will be provided in a Construction Method Statement, and Construction Traffic Management Plan.
- 9.132. The measures which will be included in these documents are summarised below:
- Delivery routes, access points and hours;
 - Phased deliveries on a controlled basis will be undertaken to minimise deliveries, all being clearly marked to show their destination and entry gate number; and
 - In the event of unusual activities or events that can be anticipated, RBC and the relevant adjacent property owners or occupiers would be notified, in advance of the activity, wherever possible.
- 9.133. The defined HGV routes set out within the Construction Traffic Management Plan will ensure vehicles are driven slowly and cautiously, and that drivers will be familiar with the routes and any potential risks associated with them. The routes which HGVs will be travelling along will already have pedestrians and cyclist facilities, such as footways, cycle routes and crossings. This will mitigate the risk of conflict between vehicles and pedestrians and cyclists.
- 9.134. In addition, the passage of vehicular traffic to and from the Site would adhere to the construction method statement, to be agreed with RBC, and which would be applicable to all contractors involved in the proposed Development.

Interim Condition: Temporary Flexible Event Space

- 9.135. Vehicular access will be infrequent and managed with retractable bollards to prevent unauthorised access. To prevent conflict between vehicles and pedestrians using the footway, access will be managed and restricted to times outside of peak periods. Vehicles will not be able to access the site while the temporary space is being used by large numbers of members of the public. It is likely that the majority of vehicle movements to the site would be early morning or during the evening.

Completed Development

Local Highway Network and Traffic Flows

- 9.136. A Site-Wide Framework Travel Plan (SWFTP) has been prepared and is included within Technical Appendix 9.3. The objectives of the SWFTP (as stated in the SWFTP) are to achieve:
- A framework for the promotion of sustainable travel to and from the Site;
 - The establishment of a series of specific measures to manage, in particular, single car occupancy to the Site by employees, visitors and residents;
 - A feasible ongoing co-ordination process to ensure that initiatives and their impacts are maintained and monitored;
 - To contribute to local sustainable transport objectives, and in particular to contribute to the overall accessibility of the Site within the context of the Local Transport Plan process; and
 - Ensure that residents, visitors and employees at the Site have appropriate accessibility to local services.

Bus Access

- 9.137. The potential minor adverse effect identified relates to the increased demand for bus services. Bus operators are likely to respond to this increased demand through provision of additional services if needed, mitigating any impacts. Therefore no mitigation is proposed as part of the proposed Development.

Rail Network

- 9.138. No mitigation is required, as the proposed Development causes a negligible impact on the available rail network capacity.

Driver Delay

- 9.139. No mitigation is required, as the development proposals cause a negligible impact on driver delay.

Severance

- 9.140. No mitigation is required, as the development proposals cause a negligible impact on severance. The proposals result in improved pedestrian accessibility, delivering connections between Friar Street and the railway station.

Pedestrian Delay and Amenity

- 9.141. A wide crossing facility is proposed at Garrard Street as part of the Future Baeline to accommodate the increased pedestrian flows between Friar Street and the Railway Station and raise driver awareness of pedestrians in this location.
- 9.142. New east-west connections through the Site are also proposed as part of the proposed Development to increase connectivity. Active frontages and public realm improvements will also improve overall amenity throughout the Site.

Fear and Intimidation

- 9.143. No mitigation is required, as the development proposals cause a negligible impact on fear and intimidation.

Accidents and Safety

- 9.144. No mitigation is required, as the development proposals cause a negligible impact on fear and intimidation.

Residual Effects

Demolition and Construction

Local Highway Network and Traffic Flows

- 9.145. Based on the predicted HGV flows for the proposed Development, the potential effect of demolition and construction generated traffic would be **negligible**.

Driver Delay

- 9.146. The potential effect of the demolition and construction works on driver delay is considered to be **temporary** over the **short to medium** term, **local** in extent and of **minor adverse** significance.

Severance

- 9.147. It is considered that the increase in traffic on severance would be **negligible** during the construction and demolition phases.

Pedestrian Delay and Amenity

- 9.148. The potential effect of the demolition and construction works on pedestrian delay and amenity is considered to be **temporary** over the **short to medium** term, **local** in extent and of **minor adverse** significance.

Fear and Intimidation

- 9.149. The effect on fear and intimidation is considered to be **negligible**.

Accidents and Safety

- 9.150. Given the quantity and nature of the traffic levels associated with the construction and demolition of Station Hill and the proposal for a Construction Method Statement and Construction Traffic Management Plan, it is considered that the impact associated with construction and demolition on accidents and safety would be **negligible**.

Interim Condition: Temporary Flexible Event Space

- 9.151. The management of vehicular access to reduce conflict between pedestrians and vehicles would mitigate any temporary effects. The residual effect of the Flexible Space would therefore be **negligible**.

Completed Development

Local Highway Network and Traffic Flows

- 9.152. The proposed Development would not significantly alter traffic levels across the local network and would have a **negligible** effect.

Bus Access

- 9.153. The residual effect of the proposed Development on the bus network would be negligible given that the local bus operators will gain from additional patronage and revenue and are likely to respond to the additional demand with new service if needed.

Rail Network

- 9.154. The Reading Station upgrade scheme has provided sufficient capacity to accommodate the passenger demand from the proposed Development; therefore the residual effect would therefore be negligible.

Driver Delay

- 9.155. Driver delay would not significantly alter, apart from Greyfriars Road that would reduce; therefore it is considered that the proposed Development could potentially result in a **long-term, local** effect of **minor beneficial** significance in relation to the local highway network.

Severance

- 9.156. None of the links were predicted to result in an AADT change greater than 30% and it is therefore considered that the proposed Development would result in a **negligible** effect to severance.

Pedestrian Delay and Amenity

- 9.157. The benefit of the new connection from the Station to the town centre and other links to be provided throughout the Site (east-west link, active frontages and public realm improvements) outweigh the slight delay crossing Garrard Street therefore creating a **long-term, local** effect of **minor beneficial** significance in relation to pedestrian delay.

Fear and Intimidation

- 9.158. The changes in traffic flows will not result in any change to the degree of hazard and have a **negligible** effect on fear and intimidation.

Accidents and Safety

- 9.159. The proposed Development would result in a **negligible** effect in relation to Accidents and Safety.

Summary and Conclusion

- 9.160. A summary of the potential and residual effects of the proposed Development is provided in Table 9.15.

Table 9.15: Summary of Potential Effects, Mitigation and Residual Effects

Issue	Potential Effect	Mitigation	Residual Effect
Demolition and Construction			
Local Highway Network and Traffic Flows	Negligible	construction method statement, and construction traffic management plan	Negligible
Driver Delay	temporary over short to medium term, local in extent and of minor adverse significance	construction method statement, and construction traffic management plan	temporary over short to medium term, local in extent and of minor adverse significance
Severance	Negligible	construction method statement, and construction traffic management plan	Negligible
Pedestrian Delay and Amenity	temporary over the short to medium term, local in extent and of moderate adverse significance	construction method statement, and construction traffic management plan	Temporary over the short to medium term, local in extent and of minor adverse significance
Fear and Intimidation	Negligible	construction method statement, and construction traffic management plan	Negligible
Accidents and Safety	temporary over the short to medium term, local in extent and of minor adverse significance	construction method statement, and construction traffic management plan	Negligible
Interim Condition: Temporary Flexible Event Space			
Change in traffic flows	Temporary over the short term, local in extent and of minor adverse significance	managed vehicular access	Negligible
Completed Development (SH3 with PlotE/TH)			
Local Highway Network and Traffic Flows	Negligible	Site wide Travel Plan	Negligible
Bus Access	Minor adverse	-	Negligible
Rail Network	Negligible	-	Negligible
Driver Delay	Minor beneficial	-	Minor beneficial
Severance	Negligible	-	Negligible
Pedestrian Delay and Amenity	Minor beneficial	-	Minor beneficial
Fear and Intimidation	Negligible	-	Negligible
Accidents and Safety	Negligible	-	Negligible

References

- ¹ National Planning Policy Framework, March 2012
- ² Reading Borough Council Local Development Framework Adopted Core Strategy, 2008 (Updated 2015)
- ³ Reading Borough Council Local Development Framework, Reading Central Area Action Plan, Adopted January 2009
- ⁴ Local Transport Plan 3: Strategy 2011-2026, April 2011
- ⁵ Station Hill South Planning and Urban Design Brief, Adopted, 2007
- ⁶ Institute of Environmental Assessment (1993) Guidance Notes 1 'Guidelines for the environmental assessment of road traffic, 1993'

10. Air Quality

Introduction

- 10.1 This Chapter, written by Waterman Infrastructure & Environment Ltd, assesses the effects of the Development upon local air quality. In particular, it considers pollution effects from changes in road traffic movements as a result of the construction and operation of the Development, as well as potential effects from dust emissions generated during the demolition and construction activities at the Site. In addition, it considers the potential emissions from plant and ventilation systems associated with the proposed Development.
- 10.2 This air quality assessment is based upon the modelling detailed within the 2013 ES for the consented SH3 Scheme but includes the addition of new existing sensitive receptors as agreed with Reading Borough Council (RBC) during consultation (see Appendix 2.4 and 2.5). As discussed in **Chapter 9: Transportation and Access** and the accompanying Transport Statement, the traffic data has not changed from that used for the SH3 Scheme and as such the revised modelling uses the traffic data and same modelling methodology as presented in the 2013 ES.
- 10.3 The relevant legislation, policy context and methods used to assess the effects are described together with the baseline conditions that would exist in the area in the absence of the Development. Potential effects of the Development are discussed, together with mitigation measures to prevent, reduce or offset these effects. Finally, the residual effects accounting for the implementation of the identified mitigation measures are presented.
- 10.4 This Chapter is supported by Appendix 10.1: Air Quality Modelling Study.

Legislation and Planning Policy Context

Legislation

European Legislation

- 10.5 Air pollutants at high concentrations can give rise to adverse effects on the health of humans and ecosystems. European Union (EU) legislation on air quality forms the basis for national UK legislation and policy on air quality.
- 10.6 The European Union Framework Directive 2008/50/EC¹ on ambient air quality assessment and management came into force in May 2008 and had to be implemented by Member States, including the UK, by June 2010. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants.

National Legislation

Air Quality Standards Regulations

- 10.7 The Air Quality Standards Regulations 2010² implement limit values prescribed by the Directive 2008/50/EC. The limit values are legally binding and the Secretary of State, on behalf of the UK Government, is responsible for their implementation.

The UK Air Quality Strategy

- 10.8 The Environment Act 1995³ required the preparation of a national air quality strategy setting health-based air quality objectives for specified pollutants and outlining measures to be taken by local planning authorities (LPA) in relation to meeting these (the Local Air Quality Management (LAQM) system).
- 10.9 The UK Air Quality Strategy⁴ (AQS) adopted in 1997, was subsequently reviewed and revised in 2000 as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland⁵, and an amendment to the Strategy was published in 2003⁶. The current UK AQS was published in July 2007⁷ and updates the original strategy to set out new objectives for LPAs in undertaking their local air quality management duties. The 2007 UK AQS introduced a national level policy framework for exposure reduction for fine particulates. Objectives in the current UK AQS are in some cases more onerous than the limit values set out within the relevant EU Directives and the Air Quality Standards Regulations 2010. In addition, objectives were established for a wider range of pollutants.
- 10.10 The limit values and objectives of air pollutants relevant to this assessment are summarised in Table 10.1.

Table 10.1: National air quality strategy objectives for the purposes of local air quality management

Pollutant	Objective / Limit Value		Objective date
	Concentration*	Measured as *	
Nitrogen dioxide (NO ₂)	200µg/m ³	1 hour mean not to be exceeded more than 18 times per year	31/12/2005
	40µg/m ³	Annual mean	31/12/2005
Particulate Matter (PM ₁₀)	50µg/m ³	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40µg/m ³	Annual mean	31/12/2004
Particulate Matter (PM _{2.5})	Target of 15% reduction in concentrations at urban background locations	Annual mean	Between 2010 and 2020
	Variable target of up to 20% reduction in concentrations at urban background locations^	Annual mean	Between 2010 and 2020
	25µg/m ³	Annual mean	01/01/2020

Note: * how the objectives are to be measured is set out in the UK Air Quality (England) Regulations (2000)
 ^ aim not to exceed 18µg/m³ by 2020

- 10.11 There are currently no statutory UK standards in relation to deposited dust and its propensity to cause nuisance, although an annual deposition rate of 200mg/m²/day averaged over a month is sometimes used as a threshold value for potentially significant nuisance effects⁸.

Local Planning Authority Responsibility

- 10.12 Part IV of the Environment Act 1995 provides a system of LAQM under which local authorities are required to review and assess the future quality of the air within their administrative boundaries by

way of a staged process. In the event that this process suggests that any of the Air Quality Strategy objectives will not be met by the target dates, the Local Authority must consider the declaration of an Air Quality Management Area (AQMA) and the subsequent preparation of an Air Quality Action Plan to improve the air quality in that area in pursuit of the objectives.

- 10.13 RBC has designated the whole town centre as an AQMA for NO₂. A summary of RBC's review and assessment of air quality is provided in the 'Baseline Conditions' section. As a result of the declaration of an AQMA RBC are required to produce an Air Quality Action Plan (AQAP) which sets out measures to reduce pollution within the Borough, a summary of the AQAP is provided in the 'Local Planning Policy' section.

National Planning Policy

National Planning Policy Framework, 2012

- 10.14 Published in March 2012, the National Planning Policy Framework (NPPF) ⁹ replaced with immediate effect the majority of existing national planning policy guidance, including Planning Policy Guidance and Planning Policy Statements.
- 10.15 The NPPF identifies that the planning system should aim to conserve and enhance the natural and local environment by:
- ...“preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of land, air, water or noise pollution or land instability.”
- 10.16 Furthermore, it states:
- “Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan”.

National Planning Practice Guidance, 2014

- 10.17 The Government's online Planning Practice Guidance¹⁰ (PPG) states that air quality concerns are more likely to arise where development is proposed within an area of existing poor air quality, or where it would adversely impact upon the implementation of air quality strategies and / or action plans.
- 10.18 The PPG notes that when deciding whether air quality is relevant to a planning application, considerations would include whether the development would lead to:
- significant effects on traffic, such as volume, congestion, vehicle speed, or composition;
 - the introduction of new point sources of air pollution, such as furnaces, centralised boilers and Combined Heat and Power (CHP) plant; and
 - exposing occupants of any new developments to existing sources of air pollutants and areas with poor air quality.

Local Air Quality Management Policy Guidance LAQM.PG(09), 2009

- 10.19 The LAQM Policy Guidance PG(09)¹¹ provides additional guidance on the links between transport and air quality. LAQM.PG(09) describes how road transport contributes to local air pollution and how transport measures may bring improvements in air quality. Key transport-related

Government initiatives are set out, including regulatory measures and standards to reduce vehicle emissions and improve fuels, tax-based measures and the development of an integrated transport strategy.

- 10.20 LAQM.PG(09) also provides guidance on the links between air quality and the land use planning system. The guidance advises that air quality considerations should be integrated within the planning process at the earliest stage, and is intended to aid local authorities in developing action plans to deal with specific air quality issues and create strategies to improve air quality. LAQM.PG(09) summarises the means by which the land use planning system can help deliver compliance with the air quality objectives.

[Environmental Protection UK and Institute of Air Quality Management, Land-Use Planning & Development Control: Planning for Air Quality, May 2015](#)

- 10.21 The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning for Air Quality Guidance sets out the criteria for when an air quality assessment should be undertaken and the methodology that should be updated. The EPUK and IAQM Guidance, advises that:

"In arriving at a decision about a specific proposed development the local planning authority is required to achieve a balance between economic, social and environmental considerations. For this reason, appropriate consideration of issues such as air quality, noise and visual amenity is necessary. In terms of local air quality, particular attention should be paid to:

- *Compliant with national air quality objectives and of EU Limit Values;*
- *Whether the development will materially affect any air quality action plan or strategy;*
- *The overall degradation (or improvement) in local air quality; or*
- *Whether the development will introduce new public exposure into an area of existing poor air quality".*

- 10.22 Based on the EPUK and IAQM Guidance, consideration should be given to the wider benefits from the Development.

[Institute of Air Quality Management: Guidance on the Assessment of Dust from Demolition and Construction, 2014](#)

- 10.23 The Institute of Air Quality Management (IAQM) Construction Dust Guidance¹² provides guidance to consultants and Environmental Health Officers (EHOs) on how to assess air quality impacts from construction related activities. The guidance provides a risk based approach based on the potential dust emission magnitude of the site (small, medium or large) and the sensitivity of the area to dust impacts. The importance of professional judgement is noted throughout the guidance. The guidance recommends that once the risk class of the site has identified, the appropriate level of mitigation measures are implemented to ensure that the construction activities have no significant impacts.

Local Planning Policy

[Reading Borough Council Local Development Framework, Adopted Core Strategy, 2008 \(Updated 2015\)](#)

- 10.24 The RBC Local Development Framework (LDF) Core Strategy¹³ was adopted in January 2008. One of its Environmental Objectives is to: *"Minimise air, water, soil/ ground and noise pollution*

and address the factors that contribute to climate change, recognising the heightened knowledge of the severity of climate change related impacts”.

Reading Borough Council Local Development Framework, Sites and Detailed Policies Document, Adopted 2012 (Updated 2015)

- 10.25 The RBC Sites and Detailed Policies Document (SDPD) ¹⁴, adopted on the 23rd October 2012, forms part of the development plan for the purpose of determining planning applications. It sets out detailed policies for use in decisions on planning applications and identifies sites for development, protection and for the application of specific policies. Policy DM19: Air Quality states:

“Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

- i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:*
 - Whether the proposal, including when combined with the cumulative effect of other developments already permitted would significantly reduce air quality;*
 - Whether the development is within, or accessed via, an Air Quality Management Area; and*
 - Whether it can be demonstrated that a local reduction in air quality would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*
- ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application.*
- iii. Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring.”*

Reading Borough Council Local Development Framework, Reading Central Area Action Plan, 2009

- 10.26 Policy RC9: Living in the Centre, of Reading Central Area Action Plan¹⁵ states that: *“Proposals for new residential development within the central area will be required to demonstrate how the issue of potential noise disturbance from neighbouring land uses and other sources, and air quality implications of residential development, have been considered and if necessary, mitigated. New residential development should not be located next to existing town centre uses where those uses would give rise to unacceptable levels of noise and disturbance to the occupiers of the new scheme, unless this can be mitigated.”*

Station Hill South Planning and Urban Design Brief, 2007

- 10.27 The RBC Station Hill South Planning and Urban Design Brief¹⁶ states that: *“Reading Borough Council has recently carried out a detailed assessment of air quality in accordance with the Environment Act 1995. The study area is potentially in an area where it is indicated that the levels of NO₂ are close to or in excess of the National Air Quality Objectives. At present an Air Quality Management Area has not been declared pending a consultation period in the area. PPS23 and the NSCA guidance “Development Control - Planning for Air Quality” recommend that new exposure to poor air quality should be considered as a material planning consideration. It is*

recommended that applicants contact Reading Borough Council's Environmental Protection Team to discuss the Air Quality issues."

Station Area Framework, 2010

- 10.28 The Reading Station Area Framework Supplementary Planning Document¹⁷ sets out the principles and guidelines for how development around Reading Mainline Station should take shape, it focuses particularly on the area to the north and supplements the Reading Central Area Action Plan, which allocated this area for development. No specific reference to air quality is made within the document.

Reading Borough Council Air Quality Action Plan, 2009

- 10.29 The RBC Air Quality Action Plan¹⁸ was adopted in January 2009 and details measures to tackle air quality problems within the Borough, classified in three major groups:
- Measures relating to transport sources: The transport policies are supported by a wide range of planning policies, either saved from the Local Plan or introduced in the emerging LDF;
 - Measures relating to other sources, i.e. home energy use (smoke control areas, home insulation) and management of Reading Festival; and
 - Measures relating to land use planning, to ensure through the planning process that future development does not result in any further deterioration of air quality and where possible, results in an improvement in overall environmental quality.

Assessment Methodology and Significance Criteria

Assessment Methodology

- 10.30 This air quality assessment has been undertaken using information from a variety of sources including:
- Consultation with RBC to agree the methodology to be used within the assessment;
 - A review of RBC's statutory air quality documents in order to identify the baseline conditions in and surrounding the Site;
 - Traffic flow data from the transport consultants for the Development Peter Brett Associates (PBA), and a review of information presented in the Transport Assessment (TA) for the Development;
 - Application of atmospheric dispersion modelling using the ADMS-Roads model¹⁹ to predict the likely pollutant concentrations at the Site and the effect of the completed Development on local air quality in terms of traffic and heating plant emissions generated. The 2012 NO₂ from NO_x Calculator (Version 3.2, September 2012) available from the Defra website²⁰ has been applied to derive the road-related NO₂ emissions from the NO_x outputs. Whilst there is a later version of the NO₂ from NO_x calculator (Version 4.1, June 2014), the same version as used in the 2013 ES was used for consistency. However, this is considered unlikely to significantly alter the assessment of effects;
 - Comparison of the predicted air pollutant concentrations with RBC monitoring results, the UK air quality objectives and the EPUK significance criteria;
 - A review of construction information, plant, activities and environmental management controls likely to be employed during the demolition and construction phase of the works;
 - Assessment of the heating plant within the completed Development; and

- Identification of mitigation measures, where appropriate.

- 10.31 The UK AQS identifies the pollutants associated with road traffic emissions and local air quality as nitrogen oxides (NO_x), particulate matter (as PM₁₀ (particles with a diameter up to 10µm) and PM_{2.5} (particles with a diameter up to 2.5µm), carbon monoxide (CO), 1,3-butadiene and benzene. Emissions of total NO_x from motor vehicle exhausts comprise nitric oxide (NO) and NO₂. NO oxidises in the atmosphere to form NO₂.
- 10.32 RBC has declared the whole town centre as an AQMA for NO₂, attributable to road traffic emissions (discussed further in the Baseline Conditions section). The most significant pollutants associated with road traffic emissions, in relation to human health, are NO₂ and particulate matter. The assessment will therefore focus on these pollutants.
- 10.33 Emissions from diesel locomotives using the Reading Mainline Station to the north of the Site has not been considered further in this air quality assessment as following guidance set out in the DEFRA guidance document LAQM.TG(09) the proposed Development does not introduce exposure within 15m of the stationary locomotives.

Demolition and Construction

- 10.34 The major influences on air quality throughout the demolition and construction works are likely to be dust-generating activities and vehicles emissions, from plant and vehicles both on and around the Site. The emphasis of the construction phase would be to minimise the potential effects at source, through appropriate site management and control practices, including controls on vehicle movements.
- 10.35 Potentially, nuisance can be caused by the deposition of construction dust. Construction derived dust effects cannot be easily quantified and therefore a more qualitative approach has been employed to predict potential effects from these works. The emphasis of this approach lies in the minimisation of potential dust effects at source through appropriate environmental management controls relating to, at least, 'good practice' site management practices. In particular, this included:
- Identification of good working practices and suitable mitigation measures in order to minimise the potential for dust emissions, and nuisance risk; and
 - The likely generation of construction vehicle movements.
- 10.36 Premises and occupants within 100m of a construction site are generally considered to experience the most significant effects from construction dust. Examples of dust-sensitive receptors are listed in Table 10.2²¹.

Table 10.2: Dust sensitive receptors

High Sensitivity	Medium Sensitivity	Low Sensitivity
Hospitals and Clinics	Schools	Farms
Retirement Homes	Residential Areas	Light and Heavy Industry
Hi-Tech Industries	Food Retailers	Outdoor Storage
Food Processing	Offices	

- 10.37 The proximity of sensitive receptors and their orientation in relation to the prevailing wind, in addition to the scale and duration of demolition and construction activities, would have a bearing on potential nuisance effects.

Completed Development

- 10.38 The effect on local air quality in relation to the completed Development was assessed using the advanced atmospheric dispersion model, ADMS-Roads, as agreed with the environmental health officer (EHO) at RBC. This included the effect of traffic generated by the proposed Development on the surrounding road network and heating plant emissions. Appendix 10.1 presents the details of the ADMS-Roads modelling.
- 10.39 Traffic data for the local road network were provided by PBA (see Appendix 10.1 for further details). The baseline year of 2011 was assessed (as this is the latest year for which data is available).
- 10.40 The 'without Development' and 'with Development' scenarios for the year 2018 were also assessed, to represent a year of completion of the Development. Whilst the year of completion is now anticipated to be later, 2018 was chosen to remain consistent with the ES of the consented SH3 Scheme. As set out in the Transport Chapter of this ES, the forecast traffic data remains valid up to 2026 and the air quality model assumes that there would be improvements in air quality year on year. Use of 2018 as the year of opening is therefore considered to represent a worst case assessment. The traffic data was used within the ADMS-Roads model to assess the potential for significant effects from additional traffic movements generated by the Development on future local air quality.
- 10.41 Data relating to the proposed energy plant for the Development, to be located within proposed Building Plots A, B, C, D and F were provided by Hoare Lea (the energy consultants for the Development) (see Appendix 10.1 for further details). The proposed heating plant includes five gas-fired boilers and a gas-fired CHP.
- 10.42 The traffic and heating plant data was used within the ADMS-Roads model to assess the potential for significant effects from additional traffic movements and heating plant emissions generated by the Development on future local air quality.
- 10.43 The ADMS-Roads dispersion model predicts how emissions from roads and small-scale industrial sources combine with local background pollution levels, taking account of meteorological conditions, to affect local air quality. As the ADMS-Roads model has been run for the assumed completion year, 2018, 2018 background data and 2018 vehicle emission rates have been used as inputs. For the verification assessment in 2011 (refer to later in this report), 2011 background data and 2011 vehicle emission rates have been used, which would be higher than the 2018 data. The model output allows pollution levels to be quantified at a number of specific receptor locations which facilitates the assessment of effects at potentially sensitive receptor locations.
- 10.44 Full details of the ADMS-Roads modelling study, including the heating plant and traffic data used in the assessment, are presented within Appendix 10.1.

Model Uncertainty

- 10.45 Recent analyses of historical monitoring data by DEFRA²² have identified a disparity between measured NO_x and NO₂ concentrations and the projected decline associated with emission forecasts which form the basis of air quality modelling as described above. The precise reason for the disparity is not fully understood but is thought to be related to the on-road performance of certain vehicles compared to calculations based on Euro standards which inform emission forecasts.
- 10.46 A recent DEFRA Note on Projecting NO₂ Concentrations provides a number of alternative approaches that can be undertaken by LPAs within their review and assessment process in

relation to concerns about future NO₂ concentrations. This includes the use of revised background maps, alternative projection factors and revised emission factors. However, the DEFRA Note does not form part of statutory guidance and no prescriptive method is recommended for use in an air quality assessment.

- 10.47 This air quality assessment has been based on current guidance, i.e., with reduced emission rates and background concentration to the completion year of 2018. However, in addition, a sensitivity analysis has been undertaken on the basis of no future reductions (i.e. considering the potential effect of the Development against the current baseline, 2011, conditions). The sensitivity approach presented in this air quality assessment has been agreed with the EHO at RBC and provides a clear method for quantifying the uncertainty in future NO_x and NO₂ concentrations with the Development. The sensitivity analysis presents the worst case results assuming no projected decline in NO_x and NO₂ concentrations from technological advances in vehicle emissions. The sensitivity analysis is presented in Appendix 10.1.

Pollutant Background Concentrations

- 10.48 The ADMS-Roads model requires the use of background pollutant concentration data to which the model adds contributions from nearby roads and small-scale industrial plant. Full details in relation to the background data used within the air quality assessment are included in Appendix 10.1.

Model Verification

- 10.49 Model verification is the process of comparing monitored and modelled pollutant concentrations in order to give confidence in the accuracy of the modelling results. The model was verified by comparing the modelled annual mean NO₂ concentrations for 2011, with the monitoring undertaken by RBC in the Town Centre. The verification and adjustment process is described in detail in Appendix 10.1.

Potentially Sensitive Receptors

- 10.50 The approach adopted by the Air Quality Strategy is to focus on areas where members of the public, (in a non-occupational capacity) at locations close to, or at, ground level, are likely to be exposed to over the averaging time of the objective in question, i.e. over 1-hour, 24-hour or annual periods as appropriate. Objective exceedances principally relate to the NO₂ and PM₁₀ annual means and daily mean PM₁₀. The potentially sensitive locations relate mainly to residential properties and locations such as schools and hospitals, where the public may be exposed for protracted periods.
- 10.51 Table 10.3 presents potentially sensitive receptors that have been selected for the completed development air quality assessment. The receptors are presented in Figures 10.1 and 10.2. Additional sensitive receptors (receptors 23 to 35) have been added since the 2013 ES due to additional receptors being identified or new developments occurring since the 2013 ES.
- 10.52 Receptors 1 to 35 relate to existing residential properties where people may be exposed to pollution over the relevant periods of time and a children's nursery. These locations are within the Reading town centre AQMA and have been selected on the basis of their proximity to the local road network where effects from traffic generated by the proposed Development would potentially be the greatest. Predicted changes in pollutant concentrations have been quantified at the identified existing sensitive receptor locations.

- 10.53 Locations which are representative of sensitive uses proposed within the Development itself (i.e. proposed residential locations) were also considered (Receptors 36 to 40). These represent areas of the proposed Development that are likely to be exposed to the worst-case air quality conditions, i.e. the lowest levels of the Development, where residential receptors are present, that would be the nearest to road traffic and the nearest to the heating plant emissions. The locations of proposed receptors assessed at varying heights across the Site are presented in Appendix 10.1.

Table 10.3: Selected Residential Receptor Locations

Receptor Number	Address	Grid Reference	Height above ground(m)
1	1 st Floor Flat, 125 Friar Street	471634, 173582	3
2	54 Russell Street	470729, 173023	0
3	107 Castle Hill	471041, 173009	0
4	Alms House Castle Street	471222, 173110	0
5	41 Bath Road	470126, 172621	0
6	96 Berkeley Avenue	470221, 172558	0
7	88 Queens Road	472250, 173270	0
8	Grantley Heights	472203, 173315	0
9	90 Kings Road	472103, 173398	0
10	Forbury Hill School	472008, 173642	0
11	119 Caversham Road	471279, 174212	0
12	20-30 New Bright Street	471261, 172934	0
13	10-20 Hieatt Close	471919, 172684	0
14	44 Crown Street	471717, 172856	0
15	6 Tilehurst Road	470633, 173075	0
16	Blenheim Terrace, Castle Street	471061, 173018	0
17	162 Castle Hill	470835, 172992	0
18	31a Vastern Road	471416, 174134	0
19	68 George Street	471913, 174490	0
20	10 Trinity Place	470738, 173433	0
21	33 Caversham Road	471123, 173734	0
22	Merchants Place	471439, 173648	0
23	The Gateway Public House, 31 Greyfriars Road	471259, 173732	3
24	Malthouse Public House, 53 Greyfriars Road	471273, 173798	3
25	Projection West	471425, 173634	0
26	25a-25b Friar Street	471487, 173592	0
27	32-34 Friar Street	471425, 173591	0
28	36-137 Friar Street	471439, 173577	0
29	144 Friar Street	471484, 173577	0
30	Bridewell House/Samuel House	471271, 173577	0

Receptor Number	Address	Grid Reference	Height above ground(m)
31	20 Stanshawe Road	471213, 173766	0
32	Terrace House, Vachel Road	471174, 173702	0
33	Kennet House, 80-82 Kings Road	472024, 173363	0
34	15-21 Tudor Road	471199, 173841	0
35	Projection East	471443, 173633	0
36	Proposed: Residential Building E 1 st Floor (Garrard Street Façade)	471352, 173684	3
37	Proposed: Residential Building E 1 st Floor (Friar Street Façade)	471360, 173587	3
38	Proposed: Residential Building F1 st Floor (Garrard Street Façade)	471399, 173689	3
39	Proposed: Residential Building F 1 st Floor (Friar Street Façade)	471380, 173632	3
40	Proposed: Residential Building F 14 th Floor (Merchants Place Façade)	471417, 173678	42

Approach to Future Baseline

- 10.54 The traffic impact assessment undertaken for SH3 used the Reading Transport Development Control Forecast Model. This includes background traffic growth to 2015 plus all committed development. Chatham Place, Aldwych House and Caversham Road were all committed developments at that time and would therefore have been included. Additionally the Thames Tower and Energis House schemes while not consented when the RTM was run, as part of the SH3 supporting assessment, were included within the RTM. The included floor area of the Energis scheme reflects the current consent, while the Thames Tower Scheme now consented is for a slightly larger scheme although this is not considered to materially increase traffic generation. It is therefore considered that the traffic data upon which the air quality assessment is based, incorporates the change in traffic flows as a result of the future baseline schemes.

Approach to Outline Assessment

- 10.55 The assessment of the Development has been based on the parameter plans and maximum area schedules set out in Chapter 5: Description of Development, to identify the likely worst case significant effects.
- 10.56 The traffic modelling undertaken for the TA by Peter Brett Associates is based on the maximum floor space areas proposed under the outline application. The air quality assessment utilises traffic data provided by Peter Brett Associates. As such, the TA and the air quality assessment represent a 'worst-case' scenario in respects of traffic generation.

Limitations and Assumptions

- 10.57 The assessment of air quality effects has been based on the traffic data provided by Peter Brett Associates. The trip generation for the completed, occupied and operational Development has been based on the maximum floor space areas proposed as defined by the parameter plans and area schedules, as detailed in Chapter 5: Description of the Development.
- 10.58 There are no significance criteria for the new PM_{2.5} exposure reduction objective.

10.59 Other key assumptions in the assessment are set out above.

Consultations

10.60 The scope and methodology of the air quality assessment was agreed with the Environmental Health Officer at RBC. A copy of the consultation is presented in Appendix 10.1.

10.61 In addition, an EIA Scoping Report was prepared by Waterman EED (now Waterman IE) and submitted to RBC, together with a request for a formal Scoping Opinion in February 2012. No comments were made in relation to air quality. A further Scoping Request was submitted in June 2014 (refer to Appendix 2.3). The Environmental Health Officer commented in the Scoping Opinion (Appendix 2.4) that justification should be provided as to the use of 2011 for the baseline year. As discussed in the response to the Scoping Opinion (refer to Appendix 2.5), the air quality assessment is based upon the traffic data. The traffic data was taken from a borough wide model and it is not proposed to update this borough wide model. The air quality monitoring data was also reviewed and the current data were found to be similar to those of 2011. The use of 2011 as a baseline year is therefore considered acceptable. This was agreed with the Environmental Health Officer.

Significance Criteria

Demolition and Construction

10.62 The assessment of demolition and construction effects has been based on:

- Consideration of likely demolition and construction activities; and
- A review of the sensitive uses in the area immediately surrounding the Site in relation to their distance and orientation.

10.63 The significance of effect has been concluded through professional judgement based on the following:

- The baseline air quality conditions in the area surrounding the Site;
- The mitigation measures that would be proposed; and
- The knowledge of how such mitigation measures are routinely and successfully applied to construction projects throughout the UK.

10.64 In addition to the above, the classification system provided in Table 10.4 was adopted, again based on professional judgement, for the assessment of potential adverse air quality effects arising from dust generated by demolition and construction activities associated with the proposed Development.

Table 10.4: Demolition and construction significance criteria

Effect Significance	Definition
Major adverse	Receptor is less than 10m from a major active construction or demolition site.
Moderate adverse	Receptor is 10m to 100m from a major active construction or demolition site, or up to 10m from a minor active construction or demolition site.
Minor adverse	Receptor is between 100m and 200m from a major active construction or demolition site or 10m to 100m from a minor active construction site or demolition site.
Negligible	Receptor is over 100m from any minor active construction or demolition site or over 200m from any major active construction or demolition site.

Completed Development

- 10.65 The significance of any changes in local air quality that are predicted, based on background pollutant concentrations and predicted traffic flows, can be established through the consideration of the following factors:
- Geographical extent (local, district or regional);
 - Duration (temporary or long term);
 - Reversibility (reversible or permanent);
 - Magnitude of pollution concentration changes;
 - Exceedence of standards (e.g. Air Quality Objectives); and
 - Changes in pollutant exposure.
- 10.66 The Environmental Protection UK Guidance 'Development Control: Planning for Air Quality (2010) Update' ^{Error! Bookmark not defined.} provides an approach to defining magnitude of changes and describing the air quality effects at specific receptors recommended by the Institute of Air Quality Management (IAQM).
- 10.67 Table 10.5 below presents the magnitude of change descriptors, based on the change in concentration predicted to be brought about by a scheme as a percentage of the assessment level (i.e. the UK Objective, Limit Value of Environmental Assessment Level). Tables 10.6 and 10.7 present the effect significance descriptors that take account of the magnitude of changes (both positive and negative) given in Table 10.5, and the concentration in relation to the air quality objective. The term 'slight' has been replaced with the term 'minor' to be consistent with the scale of significance detailed in Chapter 2: EIA Methodology.

Table 10.5: Magnitude of change descriptor in relation to changes in concentrations of NO₂ and PM₁₀

Magnitude of Change	Annual Mean NO ₂ /PM ₁₀	Days PM ₁₀ > 50µg/m ³
Large	Increase/decrease > 10% (>4µg/m ³)	Increase/decrease >4 days
Medium	Increase/decrease 5-10% (2-4µg/m ³)	Increase/decrease 2-4 days
Small	Increase/decrease 1-5% (0.4-2µg/m ³)	Increase/decrease 1-2 days
Imperceptible	Increase/decrease < 1% (<0.4µg/m ³)	Increase/decrease <1 days

Note: Percentage calculated as a change of the level of assessment

Table 10.6: Effect significance criteria for NO₂ and PM₁₀

Concentration in Relation to Standard	Small	Medium	Large
Decrease with Development			
Above objective without development (>40µg/m ³)	Minor beneficial	Moderate beneficial	Major beneficial
Just below without development (36-40µg/m ³)	Minor beneficial	Moderate beneficial	Moderate beneficial
Below objective without development (30-36µg/m ³)	Negligible	Minor beneficial	Minor beneficial
Well below objective without scheme (<30µg/m ³)	Negligible	Negligible	Minor beneficial
Increase with Development			
Above objective with development (>40µg/m ³)	Minor adverse	Moderate adverse	Major adverse
Just below with development (36-40µg/m ³)	Minor adverse	Moderate adverse	Moderate adverse
Below objective with development (30-36µg/m ³)	Negligible	Minor adverse	Minor adverse
Well below objective with scheme (<30µg/m ³)	Negligible	Negligible	Minor adverse

Note: an imperceptible change would be described as 'negligible'

Table 10.7: Effect significance criteria for PM₁₀ Daily Mean

Concentration in Relation to Standard	Small	Medium	Large
Decrease with Development			
Above objective without development (>35days)	Minor beneficial	Moderate beneficial	Major beneficial
Just below without development (32-35 days)	Minor beneficial	Moderate beneficial	Moderate beneficial
Below objective without development (26-32 days)	Negligible	Minor beneficial	Minor beneficial
Well below objective without scheme (<26 days)	Negligible	Negligible	Minor beneficial
Increase with Development			
Above objective with development (>35days)	Minor adverse	Moderate adverse	Major adverse
Just below with development (32-35 days)	Minor adverse	Moderate adverse	Moderate adverse
Below objective with development (26-32 days)	Negligible	Minor adverse	Minor adverse
Well below objective with scheme (<26 days)	Negligible	Negligible	Minor adverse

Note: an imperceptible change would be described as 'negligible'

- 10.68 Whilst new significance criteria has been adopted since 2013²³, to allow a comparison between the SH3 Scheme and the Development, the previous significance criteria (as described above) has been used. This is considered appropriate as the current guidance states “*a judgement of the significance should be made by a competent professional who is suitably qualified. The reasons for reaching the conclusions should be transparent and set out logically. Whilst the starting point for the assessment of significance is the degree of impact...this should be seen as one of the factors for consideration, not least because the outcome of this assessment procedure applies to a receptor and not the overall impact.*”

Baseline Conditions

Reading Borough Council Review and Assessment Process

- 10.69 On completion of RBC's Stages 1 to 3 Review and Assessment of air quality in 2000, RBC concluded that the air quality objectives would be met for all pollutants and that there would be no requirement to consider the designation of AQMAs.
- 10.70 The RBC Updating and Screening Assessment (USA) published in 2003²⁴ concluded that, although it was necessary to undertake further investigation into roadside locations where concentrations of NO₂ were close to objective levels, no further action was required with regard to other pollutants.
- 10.71 The USA 2003 Supplement²⁵ identified potential 'hot spots' for NO₂ and PM₁₀ which were further examined with the use of the Design Manual for Roads and Bridges (DMRB) air quality screening model. Of relevance to the Site was that Caversham Road (200m west of the Development) was predicted to have NO₂ levels close to objective levels in 2004. An Air Quality Progress Report published in 2004²⁶ found that there were numerous diffusion tube monitoring locations which recorded levels of NO₂ exceeding the annual mean Air Quality Objectives throughout the Borough.
- 10.72 A Detailed Assessment of Air Quality was completed by RBC in December 2005²⁷. This included a detailed dispersion modelling assessment that identified twelve areas in the Borough where one or both of the NO₂ air quality objectives were predicted to be exceeded in 2005. As a result of these findings, six AQMAs were declared across the Borough. The nearest AQMA was located approximately 200m west of the Site (Tudor Road and Caversham Road between Tudor and Vachel Roads). The Detailed Assessment predicted NO₂ annual mean concentrations of 37- 40 µg/m³ at the Site (40µg/m³ being the objective level).
- 10.73 Additionally to these findings, the 2006 USA and the Detailed Assessment in 2008²⁸ recommended that an AQMA be declared for NO₂ along Oxford Road, which is likely to extend from 744 Oxford Road (close to the Oxford Road/Beresford Road/Edinburgh Road junction) to the Oxford Road/Chatham Street junction, which at its closest part is located approximately 220m south-west from the Site.
- 10.74 Following the 2008 Further Assessment²⁹ RBC declared a new AQMA in 2009 which encompasses the whole town centre and the major roads within the town. The AQMA covers a greater area than the area of known exceedences by covering the major transport routes throughout the district in order to address the possibility of moving hotspots from one area to another following implementation of the AQAP. This AQMA replaces the six previously declared AQMAs. The Site is located within this AQMA.

- 10.75 The 2009 USA³⁰, 2010 Progress Report³¹ and 2011 Progress Report³² did not find any significant changes within the Borough to suggest the likelihood of further exceedences outside of the new AQMA declaration.
- 10.76 The 2012 USA³³ highlighted a concern over the daily mean PM₁₀ objective in the Caversham Road area, although the data used in the report was still provisional and because of the low data capture rate the data should be used with caution. Additionally, there had been no exceedences in the previous five years and RBC concluded that the nearby work to widen Cow Lane Bridges as part of the Reading Mainline Station expansion work was responsible for the increase in PM₁₀. RBC concluded that it was not necessary to progress immediately to a Detailed Assessment but if the trend was found to continue in 2012 a Detailed Assessment would be completed.

Local Monitoring

- 10.77 RBC conducts an extensive air quality monitoring programme throughout the Borough measuring roadside and background concentrations of PM₁₀ and NO₂. There are four automatic monitoring stations within the Borough (see Figure 10.3) as follows:
- Caversham Road Roadside, located 660m from the Site;
 - King's Road Roadside, located 1.7km from the Site;
 - Oxford Road, Roadside, located 2.6km from the Site; and
 - New Town, AURN, Urban Background, located 2km from the Site.
- 10.78 The results from the most recent PM₁₀ and NO₂ monitoring from these automatic monitors are presented in Table 10.8.

Table 10.8: Annual Mean PM₁₀ and NO₂ concentrations at Caversham roadside automatic monitors (µg/m³) (**Exceedances of the objective are shown in bold**)

Pollutant	Averaging Period	AQS Objective	2011	2012	2013	2014
Caversham Road (Roadside)						
NO ₂	Annual Mean (µg/m ³)	40µg/m ³	46	47	43	41
	Hourly (No. of Hours)	200µg/m ³ not to be exceeded more than 18 times a year	1	0	1	0
PM ₁₀	Annual Mean (µg/m ³)	40µg/m ³	32*	32	29	33
	24 Hour Mean (µg/m ³)	50µg/m ³ not to be exceeded more than 35 times per year	30*	26	21	19
King's Road (Roadside)						
NO ₂	Annual Mean (µg/m ³)	40µg/m ³	53*	54	61	49
	Hourly (No. of Hours)	200µg/m ³ not to be exceeded more than 18 times a year	0*	0	6	1
PM ₁₀	Annual Mean (µg/m ³)	40µg/m ³	31	29	24	31
	24 Hour Mean (µg/m ³)	50µg/m ³ not to be exceeded more than 35 times per year	29	18	11	28
Oxford Road (Roadside)						
NO ₂	Annual Mean (µg/m ³)	40µg/m ³	37	38	No Monitoring Data	35
	Hourly (No. of Hours)	200µg/m ³ not to be exceeded more than 18 times a year	0	0		0
PM ₁₀	Annual Mean (µg/m ³)	40µg/m ³	25	24		21
	24 Hour Mean (µg/m ³)	50µg/m ³ not to be exceeded more than 35 times per year	16	12		4
New Town, AURN (Urban Background)						
NO ₂	Annual Mean (µg/m ³)	40µg/m ³	27	25	27	27
	Hourly (No. of Hours)	200µg/m ³ not to be exceeded more than 18 times a year	2	0	0	0
PM ₁₀	Annual Mean (µg/m ³)	40µg/m ³	19	18	16	14
	24 Hour Mean (µg/m ³)	50µg/m ³ not to be exceeded more than 35 times per year	8	Data Unavailable		

*data capture below 90%

** Data capture less than 75% Air Quality Archive will not return a valid figure

Source: Available from <http://www.airqualityengland.co.uk/local-authority>

- 10.79 The PM₁₀ results shown in Table 10.8 indicate that in recent years both at background and roadside locations the annual mean values are below, or well below, the PM₁₀ annual mean objective for all locations. Table 10.8 shows that there are no exceedances in background NO₂ annual mean concentrations; while there have been exceedances at two of the three roadside locations.
- 10.80 The RBC diffusion tube monitoring results, in proximity to the Site, are presented in Table 10.9 and shown on Figure 10.3. A number of these locations are representative of sensitive receptor (i.e. residential) locations considered in this assessment.

Table 10.9: Annual Mean NO₂ monitoring data from the roadside diffusion tube locations (µg/m³)

Parameters	Distance to Site (m)	2010	2011	2012	2013	Objective
33 Caversham Road	260	50	47	69	49	40
59a Caversham Road	230	39	44	46	43	40
Station Hill	70	66	53	-	-	40
Vachel Road	220	35	34	-	36	40
Sackville Street	240	43	39	44	41	40
40 George Street	900	45	48	50	44	40

Exceedences of the objective are presented in **BOLD**

- 10.81 The NO₂ roadside annual mean concentrations in Table 10.9 indicate that concentrations have been met between 2010 and 2013 at the Vachel Road monitoring location, at all other locations the concentrations were close to or exceeded the annual mean objective (40µg/m³) between 2010 and 2013, which is consistent with the RBC AQMA declared for the whole of the town centre in respect to NO₂.
- 10.82 As discussed in paragraph 10.61, the most recent available monitoring data is similar to the 2011 data. The use of 2011 as a baseline year is therefore considered acceptable and was agreed with the Environmental Health Officer.

Potential Effects

Demolition and Construction - Wider Development

- 10.83 Chapter 6: Development Programme Demolition and Construction describes the anticipated programme of construction works, which could take approximately 60 to 70 months to complete. Key activities that would be undertaken on the Site during this period are also described, as are likely options for sequencing of activities. The demolition and construction works would be split into two indicative phases. Given the timeframe over which the Development is anticipated to be constructed and the size of the Development it is considered to be a major construction site, for the purposes of the assessment criteria described in Table 10.4.
- 10.84 The demolition and construction works in relation to the Development have the potential to have effects on local air quality conditions, as follows:
- Dust generated from demolition and construction activities;
 - Emissions from demolition and construction plant e.g. piling rigs, compressors, excavators, concrete mixers and generators; and
 - Emissions from vehicles (e.g. lorries, cars and vans) associated with the construction of the Development and removal of waste materials, accessing and egressing the Site on the local road network.

Nuisance Dust

- 10.85 The National Air Quality Objectives seek to address the health implications of fine particulate matter, which comes largely from combustion sources such as motor vehicle engines. In the case of particles released from ground excavation works and construction, the majority of these would tend to be larger particles, which generally settle out close to the works and may cause

annoyance due to their soiling capability. In this respect, there are no formal standards or criteria for adverse effects caused by deposited particulate matter.

- 10.86 Dust from construction activities within the urban environment generally does not arise at distances beyond approximately 200m from the works (in the absence of mitigation), and the majority of any deposition that might give rise to significant soiling tends to occur within 50 to 100m³⁴. Receptors that are downwind of a construction site are at more risk of dust effects than those that are upwind. The occupiers of residential properties tend to be more sensitive to dust than occupiers of commercial properties. In addition, in built up areas, neighbouring buildings will limit the movement of dust by acting as a 'screen'.
- 10.87 The area surrounding the Site is predominantly commercial, however, there are residential properties located to the west, particularly on Stanshawe Road and Tudor Road, to the south-west along Vachel Road and Sackville Street, to the east in Garrard House and Projection East, and limited residential properties on Shoemiths Court to the south-east. The closest of these residential properties are approximately 15m from the Site boundary to the west along Greyfriars Road.
- 10.88 The first phase of Site preparation and demolition would involve Site enabling works, the demolition of the Western Tower and its connecting low rise block, the western side of the NCP car park, the former Bus Station and Mecca Bingo building. Phase 1 construction activities would include the creation of the Temporary Events space plus construction, cladding and fit-out of Building Plots A, B, D and the car park (Plot G). No residential properties are located downwind of these works, but residential properties are located within Garrard House to the east of works, on Stanshawe Road and Tudor Road, approximately 30-70m to the west of the works and Shoemiths Court is approximately 50m to the south-west of the works and therefore could be affected during these works.
- 10.89 The second phase of site preparation and demolition would involve demolition of buildings associated with Building Plots E and F. Phase 2 construction activities would include construction, cladding and fit out of Building Plots E and F, and completion of the pedestrian route from Friar Street through the Site to Reading Mainline Station. Again, no residential properties are located downwind of these works but residential properties are located on Friar Street, approximately 30m to the south of the works and Merchants Place and Garrard House, approximately 20m east of the works and therefore could be affected during these works.
- 10.90 Demolition and excavations works are those which have the most potential for causing dust nuisance (refer to Chapter 6: Development Programme Demolition and Construction for further information): All of the above mentioned properties are between 10m and 100m of a major active construction site. Therefore, in the worst-case, when prevailing weather conditions are conducive for dust deposition (dry and windy conditions), without mitigation, there would be the potential for a **temporary, local** and **adverse effects** of a **moderate** significance during Phase 1 and 2 of the site preparation and demolition works.

Vehicle Emissions

- 10.91 Plant operating on the Site and construction vehicles entering and leaving the Site would have the potential to contribute to local levels of air pollution, particularly NO₂ and PM₁₀. It is estimated, in Chapter 9: Transportation and Access, that the average volume of daily construction traffic would peak at around 35 vehicles/day (70 daily movements) during the peak construction period. Whilst these additional traffic movements are considered insignificant in relation to the volume of existing traffic flows on the surrounding road networks (see Chapter 9: Transportation and Access), given the town centre AQMA it is considered that there would be the potential for a **temporary, local**

and **adverse effect** of a **minor** significance on air quality from construction vehicles, in the peak construction period. The effect would be **negligible** outside the peak construction period for the remaining time, especially in the context of existing local background pollutant concentrations and local road traffic emissions.

- 10.92 Any emissions from plant operating on the Site would also be small in comparison to the emissions from the road traffic movements on the main roads adjacent to the Site. The potential to affect local air quality is therefore considered to be **negligible**.

Interim Condition: Temporary Flexible Event Space

- 10.93 The Temporary Flexible Event Space is situated outside Reading Mainline Station and would be highly visible for people arriving by bus and train. The possible uses are not anticipated to attract primary trips into Reading and rather people would be drawn to the attraction from pass-by trips while travelling for other purposes, or from existing town centre trips. On this basis traffic generated from the Site would be limited to low levels of servicing. Given the effects of traffic are considered to be **negligible**, as set out in Chapter 9: Transportation and Access, the resultant effect from traffic emissions on air quality is also considered to be **negligible**.

Completed Development

- 10.94 Operational effects on local air quality associated with the completed Development would result from changes to traffic flows associated with the Development and emissions from the operation of the heating plant.
- 10.95 The results of the ADMS-Roads air quality modelling, which has included operational traffic (based on current guidance, i.e. with reduced emission rates and background concentration to the assumed completion year of 2018), and the proposed heating plant, are presented in Table 10.10.
- 10.96 Table 10.10 presents predicted concentrations at the receptors introduced as part of the Development for the lowest residential floors and the 14th floor of Building F as this represents a worst case assessment of road traffic and heating plant emissions. Modelled concentrations at other floor levels across the Development are presented in Appendix 10.1. .

Table 10.10: Results of the ADMS-Roads Modelling at Sensitive Receptors

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 1: 1st Floor Flat, 125 Friar Street				
2011 Existing	30.41	21.64	6	15.46
2018 Without Development	24.84	19.73	3	13.49
2018 With Development	24.88	19.74	3	13.49
2018 Change	0.04	-	-	-
Receptor 2: 54 Russell Street				
2011 Existing	38.04	26.98	18	18.94
2018 Without Development	30.41	25.08	13	16.59
2018 With Development	30.43	25.09	13	16.59
2018 Change	0.02	0.01	-	0.01

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 3: 107 Castle Hill				
2011 Existing	40.14	28.44	22	19.91
2018 Without Development	30.85	25.33	13	16.73
2018 With Development	30.88	25.34	13	16.74
2018 Change	0.03	0.01	-	0.01
Receptor 4: Alms House, Castle Street				
2011 Existing	36.81	26.30	16	18.50
2018 Without Development	28.83	23.64	9	15.75
2018 With Development	28.89	23.68	9	15.78
2018 Change	0.06	0.04	-	0.02
Receptor 5: 41 Bath Road				
2011 Existing	31.52	22.99	8	16.30
2018 Without Development	25.70	20.96	5	14.20
2018 With Development	25.70	20.96	5	14.20
2018 Change	-	-	-	-
Receptor 6: 96 Berkeley Ave				
2011 Existing	30.12	22.05	6	15.69
2018 Without Development	24.85	20.16	4	13.73
2018 With Development	24.85	20.16	4	13.73
2018 Change	-	-	-	-
Receptor 7: 88 Queens Road				
2011 Existing	39.18	28.48	22	19.94
2018 Without Development	30.51	25.65	14	16.93
2018 With Development	30.53	25.65	14	16.93
2018 Change	0.02	-	-	-
Receptor 8: Grantley Heights				
2011 Existing	35.55	26.35	16	18.56
2018 Without Development	28.23	23.69	9	15.81
2018 With Development	28.26	23.69	9	15.81
2018 Change	0.03	-	-	-
Receptor 9: 90 Kings Road				
2011 Existing	36.64	24.64	12	17.50
2018 Without Development	28.18	22.04	6	14.84
2018 With Development	28.21	22.04	6	14.84
2018 Change	0.03	0.01	-	-

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 10: Forbury Hill School				
2011 Existing	35.73	25.99	15	18.27
2018 Without Development	29.07	23.89	10	15.90
2018 With Development	29.13	23.90	10	15.91
2018 Change	0.06	0.01	-	-
Receptor 11: 119 Caversham Road				
2011 Existing	38.51	27.25	18	19.13
2018 Without Development	29.64	24.26	11	16.12
2018 With Development	29.68	24.26	11	16.12
2018 Change	0.04	-	-	-
Receptor 12: 20-30 New Bright Street				
2011 Existing	41.75	31.17	32	21.61
2018 Without Development	31.99	28.07	21	18.31
2018 With Development	32.02	28.08	21	18.31
2018 Change	0.03	0.01	-	0.01
Receptor 13: 10-20 Hieatt Close				
2011 Existing	33.81	24.30	11	17.20
2018 Without Development	27.67	22.21	7	14.94
2018 With Development	27.68	22.21	7	14.94
2018 Change	0.01	-	-	-
Receptor 14: 44 Crown Street				
2011 Existing	39.63	27.84	20	19.52
2018 Without Development	30.07	24.60	11	16.31
2018 With Development	30.10	24.62	11	16.32
2018 Change	0.03	0.02	-	0.01
Receptor 15: 6 Tilehurst Road				
2011 Existing	35.44	25.23	13	17.79
2018 Without Development	28.59	23.33	9	15.57
2018 With Development	28.61	23.34	9	15.58
2018 Change	0.02	0.01	-	0.01
Receptor 16: Blenheim Terrace, Castle Street				
2011 Existing	41.96	29.76	27	20.78
2018 Without Development	32.03	26.42	16	17.37
2018 With Development	32.06	26.44	16	17.38
2018 Change	0.03	0.02	-	0.01

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 17: 162 Castle Hill				
2011 Existing	35.57	25.33	13	17.86
2018 Without Development	28.08	22.88	8	15.31
2018 With Development	28.11	22.88	8	15.31
2018 Change	0.03	0.01	-	0.01
Receptor 18: 31a Vastern Road				
2011 Existing	39.09	28.40	22	19.86
2018 Without Development	32.21	26.67	17	17.52
2018 With Development	32.32	26.70	17	17.54
2018 Change	0.11	0.04	-	0.02
Receptor 19: 68 George Street				
2011 Existing	36.64	26.23	16	18.47
2018 Without Development	30.90	24.81	12	16.46
2018 With Development	30.93	24.81	12	16.46
2018 Change	0.03	-	-	-
Receptor 20: 10 Trinity Place				
2011 Existing	37.20	27.09	18	19.00
2018 Without Development	29.15	24.46	11	16.22
2018 With Development	29.16	24.45	11	16.22
2018 Change	0.01	-	-	-
Receptor 21: 33 Caversham Road				
2011 Existing	38.25	27.41	19	19.20
2018 Without Development	29.40	24.55	11	16.27
2018 With Development	29.44	24.57	11	16.29
2018 Change	0.04	0.03	-	0.02
Receptor 22: Merchants Place				
2011 Existing	29.52	21.31	5	15.22
2018 Without Development	24.36	19.51	3	13.36
2018 With Development	24.35	19.50	3	13.35
2018 Change	-0.01	-0.01	-	-0.01
Receptor 23: Gateway, 31 Greyfriars Road				
2011 Existing	31.80	22.89	8	16.26
2018 Without Development	25.89	20.92	5	14.18
2018 With Development	25.84	20.87	5	14.15
2018 Change	-0.05	-0.04	-	-0.03

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 24: Malthouse Public House, 53 Greyfriars Road				
2011 Existing	32.19	23.05	8	16.37
2018 Without Development	26.09	21.03	5	14.24
2018 With Development	26.05	20.99	5	14.22
2018 Change	-0.04	-0.04	-	-0.02
Receptor 25: Projection West				
2011 Existing	29.69	21.38	5	15.27
2018 Without Development	24.44	19.57	3	13.39
2018 With Development	24.43	19.56	3	13.39
2018 Change	-0.01	-0.01	-	-
Receptor 26: 25a-25b Friar Street				
2011 Existing	34.67	23.19	8	16.49
2018 Without Development	26.70	20.84	5	14.12
2018 With Development	26.70	20.84	5	14.12
2018 Change	-	-	-	-
Receptor 27: 32-34 Friar Street				
2011 Existing	34.12	23.03	8	16.37
2018 Without Development	26.46	20.75	4	14.07
2018 With Development	26.45	20.74	4	14.07
2018 Change	-0.01	-0.01	-	-
Receptor 28: 36-137 Friar Street				
2011 Existing	31.60	22.04	6	15.71
2018 Without Development	25.26	20.03	3	13.65
2018 With Development	25.26	20.02	3	13.65
2018 Change	-	-0.01	-	-
Receptor 29: 144 Friar Street				
2011 Existing	31.28	21.89	6	15.71
2018 Without Development	25.10	19.90	3	13.65
2018 With Development	25.10	19.90	3	13.65
2018 Change	-	-	-	-
Receptor 30: Bridewell House/ Samuel House				
2011 Existing	36.61	24.58	11	17.43
2018 Without Development	28.20	22.11	6	14.87
2018 With Development	28.08	22.01	6	14.81
2018 Change	0.17	-0.10	-	-0.06

	NO ₂ Annual Mean (µg/m ³)	PM ₁₀ Annual Mean (µg/m ³)	PM ₁₀ - Number of Days >50µg/m ³	PM _{2.5} Annual Mean (µg/m ³)
Receptor 31: 20 Stanshawe Road				
2011 Existing	33.78	24.15	10	17.08
2018 Without Development	26.90	21.93	6	14.76
2018 With Development	26.90	21.93	6	14.76
2018 Change	-	-	-	-
Receptor 32: Terrace House, Vachel Road				
2011 Existing	35.82	25.89	15	18.20
2018 Without Development	28.32	23.52	9	15.68
2018 With Development	28.32	23.53	9	15.68
2018 Change	-	0.01	-	-
Receptor 33: Kennet House, 80-82 Kings Road				
2011 Existing	32.49	22.75	8	16.20
2018 Without Development	25.95	20.62	4	14.01
2018 With Development	25.95	20.62	4	14.01
2018 Change	-	-	-	-
Receptor 34: 15-21 Tudor Road				
2011 Existing	47.03	34.25	4	23.70
2018 Without Development	35.93	30.77	3	19.89
2018 With Development	35.83	30.68	3	19.84
2018 Change	-0.10	-0.09	-	-0.05
Receptor 35: Projection East				
2011 Existing	29.70	21.36	5	15.25
2018 Without Development	24.43	19.54	3	13.38
2018 With Development	24.42	19.54	3	13.37
2018 Change	-0.01	-	-	-0.01
Receptor 36: Proposed Residential Building E 1st Floor (Garrard Street Façade)				
2018 With Development	25.24	20.36	4	13.86
Receptor 37: Proposed Residential Building E 1st Floor (Friar Street Façade)				
2018 With Development	25.26	20.11	4	13.70
Receptor 38: Proposed Residential Building F 1st Floor (Garrard Street Façade)				
2018 With Development	25.01	20.14	4	13.72
Receptor 39: Proposed Residential Building F 1st Floor (Friar Street Façade)				
2018 With Development	24.48	19.64	3	13.43
Receptor 40: Proposed Residential Building F 14th Floor (Merchants Place Façade)				
2018 With Development	25.75	18.31	2	12.66