

2 Project Description

Introduction

- 2.1 This chapter provides a description of the Proposed Development, or project, and forms the basis for the environmental assessment reported in this Environmental Statement (ES). Further information relating to the design of the development can be found in the appendices to this chapter (in Volume 3 of this ES) and in the Design and Access Statement that accompanies the planning application.
- 2.2 The effects of the Proposed Development have been assessed throughout the ES based on what is likely. For example, construction information is presented as the 'likely case'. A number of measures which would reduce or avoid adverse environmental effects arising have been included as part of the project design. Details of those measures are provided in this chapter and in each topic chapter. This chapter, together with the subsequent topic chapters, provide the data required to identify and assess the main and likely significant effects of the project in accordance with Regulation 18 and Schedule 4 of the EIA Regulations. Further details of the approach to EIA are set out in Chapter 4 of this ES.
- 2.3 This chapter provides a description of the site and the key components of the project, including an overview of the approach to construction.

The Site and Surrounding Area

Site Location

- 2.4 The proposed development site is located in the centre of Reading immediately north of Reading train station. The site is bounded to the west by Caversham Road, to the north by Vastern Court Retail Park, to the east by a multi-storey car park, and to the south by the main railway line between London and the South West and Wales. The site totals approximately 2.2 hectares and is broadly triangular in shape. The site location is shown on Figure 1.1.
- 2.5 The site currently comprises a large disused warehouse and three storey office building associated with, until recently, a Royal Mail sorting office and distribution centre. The total floor area of the existing buildings is 10,991 m² GEA (gross external area). The site also comprises areas of hardstanding for car parking and loading areas. Parts of the site have recently been used as a lay down and storage area by Network Rail during the electrification of the Great Western Railway (GWR). The southern boundary is currently bordered by a high wall which forms the boundary of the Network Rail land and the live GWR railway line beyond.
- 2.6 A number of trees line the western boundary of the site with Caversham Road, however there is no other existing vegetation within the site.
- 2.7 To the north of the site currently lies two large retail units and a restaurant facility known as Vastern Court Retail Park. It is understood that this area is likely to undergo development in the near future to accommodate up to 156,800 m² of retail, residential and office space. Further details of the likely development of Vastern Court Retail Park is provided in Appendix 4.6.

Geology and Topography

- 2.8 The site is underlain by Made Ground comprising brick, stone chippings, ashes and clinker at a depth between 1.6 and 2.2 metres. The 1:50,000 geological map shows that the superficial geology comprises the Langley Silt Member (made up of soft grey clay containing gravels and shells), which is underlain by River Terrace Deposits (RTD) (comprising medium to coarse gravels and sands and some shells) and the Upper Chalk Formation (Seaford Chalk Formation and Newhaven Chalk Formation).

Site History

- 2.9 An account of the history of the site from prehistoric times is provided in Chapter 5: *Historic Environment* and Appendix 5.1 of this ES. Over the last 150 years since the 1870's the site has been used in the past by GWR for a number of uses including: originally for sidings and a number of small buildings; a coal depot in the 1910's; and larger buildings and railway works in the 1950s and 1960s. The current layout of site as a Royal Mail sorting office and distribution centre dates back to the 1980's. Royal Mail when operations on the site ceased in 2009. While the site was in use by the Royal Mail a vehicle repair workshop and a fuel island were available for use by the mail vehicles.
- 2.10 The fuel tanks beneath the fuel island were decommissioned by a specialist contractor in December 2009. The tanks remain in situ and were foam filled after the removal of any bottom waste, further details of which together with further information on existing ground conditions are provided in Chapter 7: *Geology, Hydrogeology and Ground Conditions* of this ES

Planning Context

- 2.11 The site is located within Central Reading, as defined in the Reading Core Strategy (Reading Borough Council, 2015) and within a region marked as an area for major development for residential, retail, office and leisure facilities. These areas are also identified in the draft Reading Borough Local Plan (Reading Borough Council, 2017). The site is allocated in the Reading Central Area Action Plan under Policy RC1e. This policy relates to the land north of Reading station and states that:

"There will be retail and leisure development on the ground floor with other uses including residential and offices on upper floors."

- 2.12 The site area is allocated in the Draft Reading Borough Local Plan under Policy CR11e: North of Station. This policy states that:

"There will be retail and leisure development on the ground floor activating the streets and spaces including the new northern station square, with other uses including residential and offices on upper floors. Retail will have good pedestrian links to, and will not have a detrimental impact on, the rest of the retail core of the centre. Public car parking will be provided. A high quality route incorporating a green link should be provided through to the Thames. Development should take account of mitigation required as a result of a Flood Risk Assessment, and should consider opportunities to open up the culverted Vastern Ditch and enhance it as an ecological feature."

- 2.13 Further details of the planning policy relevant to the site is provided in Chapter 3: Need and Alternatives Considered and in the Planning Statement that accompanies the planning application.

Planning History

- 2.14 An outline planning application was submitted to Reading Borough Council for the development site in February 2011 (Ref: 11/00276/OUT) and was granted consent in March 2012. The application has since expired. The expired scheme description was as follows:

“All matters reserved with the exception of means of access, for the demolition of existing buildings; site preparation; and redevelopment of the application site for a mix of uses from amongst employment and business uses (use class B1) and residential accommodation (C3); Hotel (C1), retail floor space (A1), food and drink uses (A3, A4 and A5), leisure uses (D2), car parking, public and private open space, landscaping works, highways, access and associated works.”

- 2.15 The expired scheme was smaller in scale than the proposed development and included a greater area for commercial and retail uses. The expired scheme was considered to be EIA development and an ES was submitted as part of the planning application in 2011.

Key Components

- 2.16 The Proposed Development includes the following key components:

- Demolition of existing buildings;
- Construction of nine buildings sub divided into various individual tower blocks varying from 7 storeys (66.2 mAOD) to up to 24 storeys (123.2 mAOD) above ground floor;
- Up to 1,889 m² GEA of retail (A1) and food and drink (A3, A4 and A5) floor space on the ground floor;
- Up to 16,604 m² of office (B1) floor space on the ground floor and levels 1 – 6;
- Up to 658 residential units (C3) (up to 58,545 m² GEA) comprising town house/duplex and studio, one-, two- and three-bed apartments;
- Provision of health and community centres (D1) on the ground floor (772 m² GEA);
- Up to 70 spaces in basement level parking and 24 surface parking spaces site wide;
- Combined heat and power plant (CHP) (at basement level);
- Associated infrastructure including refuse areas, cycle storage and plant;
- Access from the public highway for vehicles, pedestrians and cycles and a new high highway route (The Avenue) connecting Caversham Road to Trooper Potts Way;
- Private and public communal areas/gardens including rooftop amenity space; and

- Associated landscaping.

2.17 An indicative layout plan is provided in Figure 2.1. Further details of the key components are provided below.

Building Heights and Use

- 2.18 The proposed development comprises a mix of commercial (B1 office and A1, A3, A4 and A5 retail/food and drink), residential (C3) floor space and a health and community centre (D1). The proposed buildings are arranged to comprise two distinct areas arranged either side of a north-south internal access road, referred to as Middle Street.
- 2.19 Figure 2.1 shows the typical floor plan of a range of floor levels. Cross sections of the proposed development showing the heights of each building is provided in Figure 2.2.
- 2.20 A summary of building areas, heights and proposed uses is set out in Table 2.1. Buildings are referenced A to H and J. It is proposed that the development will be built out in three consecutive phases commencing at the eastern end of the site.
- 2.21 The most easterly building, building A, located on the north side of the site on The Avenue consists of four main elements. First, basement parking and location for an energy centre. Second, a ground floor retail unit, community facility and vehicular and pedestrian access to the basement level. Third, office space on levels 01 to 07. Fourth, a residential tower from levels 07 to 24 (to 123.18 mAOD), the tallest building of the Proposed Development.
- 2.22 Building B is proposed on the south-eastern side of the site adjacent to Reading Station and comprises a single residential tower of 16 storeys (to 90.18 mAOD).
- 2.23 Building C is proposed on the north side of the site at the junction of The Avenue with Middle Street adjacent to building A. Building C would be 11 storeys in height (to 74.18 mAOD) and would comprise a mixture of retail and office units on the ground floor and residential units on the upper floors.
- 2.24 Building D, located in the middle of the southern edge of the Proposed Development would comprise a standalone 12 storey (up to 77.18 mAOD) tower designated for residential units on all floors. Three townhouses (referenced as TH1) would be constructed between buildings B and D.
- 2.25 Buildings A, B and C together with the three townhouses between buildings B and D comprise Phase 1 of the Proposed Development.
- 2.26 Phase 2 of the Proposed Development comprises building D located on the south-east side of Middle Street. This building would comprise a 12 storey (up to 77.18 mAOD) residential tower.
- 2.27 The remaining buildings, E, F, G, H and J would be constructed during Phase 3 between Caversham Road and Middle Street together with four townhouse (TH2) between buildings F and J.
- 2.28 Building E on the north-west corner of Middle Street with its junction with The Avenue would comprise a 11 storeys high (up to 74.18 m AOD) residential tower with retail units on the ground floor.

- 2.29 To the south of building E on the south-western corner of Middle Street is a proposed residential tower, building F. This building is proposed to be a standalone tower, 11 storeys high (up to 74.18 mAOD).
- 2.30 The curved building on the north western corner of the Proposed Development at the junction of Caversham Road and The Avenue is building G. This building is proposed to contain a health centre on the ground floor fronting on to Caversham Road together with residential units and a small retail unit. The upper levels, up to 9 storeys (up to 66.18 mAOD), would entirely comprise of residential units.
- 2.31 Building H would be located on Caversham Road to the south of, and adjoining building G. It is proposed that building H would be 7 storeys (up to 68.18 mAOD) comprised of residential units.
- 2.32 The final building, building J located on the south western corner of the site on Caversham Road, is proposed to be entirely office space arranged over 7 storeys (up to 66.68 mAOD).
- 2.33 Four townhouses would be constructed between buildings F and J during Phase 3.
- 2.34 The basement level under building A would provide parking for up to 70 vehicles.
- 2.35 A summary of the building heights and their proposed uses is provided in Table 2.1.
- 2.36 Access to the higher floor office space and residential units would be provided on the ground floor of all buildings. The office, residential and retail entrances would be separated and would provide lift and stair access to the higher floors. The ground floor of each building would also provide areas for plant, refuse and cycle parking. Access to the basement parking level would be provided on the south side of building A.
- 2.37 Figures showing the indicative typical floor layout for Level B1 (basement), Level 00 (ground floor), Level 01, Level 06, Level 13, and a roof plan is provided in Figure 2.1a to Figure 2.1f respectively.

Table 2.1: Summary of Building Heights and Uses

Building	No. of Storeys (inc ground)	Approximate Max Height (mAOD)	Use
A	24	123.18	Retail (ground floor) Community facility Office and residential entrances (ground floor) Basement level parking access Energy centre (basement) Office floorspace (levels 01 – 7) Up to 150 residential units (levels 01 – 27)
B	16	90.18	Residential entrances (ground floor) Refuse, plant and cycle parks (ground floor) Up to 90 residential units (levels 00 – 16)
C	11	74.18	Retail and office floorspace (ground floor)

Building	No. of Storeys (inc ground)	Approximate Max Height (mAOD)	Use
			Office and residential entrances (ground floor) Refuse, plant and cycle parks (ground floor) Up to 56 residential units (levels 01 – 11)
D	12	77.18	Residential entrances (ground floor) Refuse, plant and cycle parks (ground floor) Up to 85 residential units (levels 00 – 12)
E	11	74.18	Retail (ground floor) Residential entrances (ground floor) Refuse, plant and cycle parks (ground floor) Up to 89 residential units (levels 00 – 10)
F	11	74.18	Residential entrances (ground floor) Refuse, plant and cycle parks (ground floor) Up to 77 residential units (levels 00 – 11)
G	9	66.18	Health centre (ground floor) Refuse, plant and cycle parks (ground floor) Up to 59 residential units (levels 00 – 07)
H	7	68.18	Residential entrances (ground floor) Up to 45 residential units (levels 00 – 07)
J	7	66.68	Office floor space (levels 00 – 07)

- 2.38 Three town houses are proposed between buildings B and D and a further four between buildings F and J.
- 2.39 The residential units would comprise studio, one-, two- and three-bed apartments. The proposed residential mix for Reading Metropolitan is presented in Table 2.2.

Table 2.2: Proposed Residential Mix

Housing Type	No. of Units	Approximate Percentage of Units
Studio Apartment	79	12%
1 Bed Apartment	227	34.5%
2 Bed Apartment	335	51%
3 Bed Apartment	10	1.5%
Town House/Duplex	7	1%
Total	658	100%

Community and Health Facilities

- 2.40 It is proposed to develop space for a community centre and health facilities on the ground floor of the proposed development. The space for a health facility would be provided in building G fronting on to The Avenue and Caversham Road. The space would be made available for take up by the Local Authority.

Access and Parking

- 2.41 Access to the site would be via a newly constructed highway as part of the proposed development. The new highway, referred to as The Avenue, would permit one way vehicular access from Caversham Road in the west to Trooper Potts Way in the east. The Avenue would provide a dedicated cycle lane permitting cycle movements in both directions.
- 2.42 Pedestrian access to the site would be provided via The Avenue, Station Square and Caversham Road. A pedestrian through route would be provided from Caversham Road in the west to the Reading Station underpass located to the east of the development.
- 2.43 The proposed development would include the provision of up to 70 parking spaces at basement level of the eastern building. Vehicular access to the basement would be granted from The Avenue, routing through the centre of the site along the Middle Street and entering the basement via a ramp on the southern aspect of building A. Middle Street would be a shared space providing access to vehicles, cycles and pedestrians.
- 2.44 The strategy for Reading Metropolitan would be to provide a sustainable development served by public transport. The location of the development adjacent to Reading Station and close to the town centre encourages the use of local amenities accessible by foot or cycle and travel further afield via the railway network. Reading Station is strategically placed on the rail network providing direct trains to London Paddington (25 minutes), Bristol Temple Meads (75 minutes), Cardiff Central (90 minutes) and Birmingham New Street (90 minutes).

Transport Management

- 2.45 A Transport Assessment has been prepared for the Proposed Development and accompanies the planning application. A conclusion of the Transport Assessment is that there will be a much lower impact upon the surrounding highway network than the 2012 outline planning permission, and that as the impacts of 2012 consent were considered acceptable, it follows that the impacts of the current proposals should also be acceptable.

Appearance and Design

- 2.46 A Design and Access Statement has been prepared for the Proposed Development and accompanies the planning application.

Sunlighting / Daylighting

- 2.47 As assessment of potential daylight, sunlight and overshadowing effects of the Proposed Development has been undertaken. Those potential effects are reported in Appendix 2.1 of this ES.

- 2.48 The assessment noted that the site to the north (Vastern Court Retail Park) could be developed in the future and thus consideration of the hypothetical massing along the boundary has also been explored in order to establish the potential light impacts created by the proposal on the emerging area. Given the above, the following scenarios the assessment considered the following aspects:
- True existing site condition v potential light effects (to all existing neighbouring buildings) produced by the implementation of the proposed scheme.
 - The effective development of the northern site (hypothetical massing) and existing baselines of the Reading Metropolitan site v the potential lights effects (to all existing neighbouring buildings) produced by the implementation of the proposed scheme.
 - A daylight study to establish the potential light effects on the hypothetical blocks for the northern site.
- 2.49 The assessment was undertaken in accordance with the BRE report entitled 'Site layout planning for daylight and sunlight: A guide to good practise', more commonly known as "The BRE Guidelines".
- 2.50 The results for the daylight/sunlight assessments indicate full BRE compliance with no change in light to any of the neighbouring residential properties exceeding the tests outlined within the guidance.
- 2.51 The daylight amenity levels within the proposed residential units are considered good (95% BRE Compliant) with a high percentage of rooms tested meeting or exceeding the recommendations of the BRE guidelines. The proposed scheme performs very well in overshadowing terms with all the neighbouring amenity areas exceeding the suggested BRE Guidelines.

Pedestrian Wind Assessment

- 2.52 A qualitative desk-based assessment of the wind microclimate at street level of the Proposed Development has been undertaken. Those potential effects are reported in Appendix 2.2 of this ES. Further quantitative assessment of wind conditions will be undertaken using wind tunnel tests to optimize the mitigation measures and ensure comfortable wind conditions in all areas. The conclusions of the pedestrian wind assessment were as follows.
- 2.53 Meteorological data for the site indicates prevailing winds from the south-west throughout the year, with colder north-easterly winds during the spring months.
- 2.54 For the existing site the wind microclimate at ground level is expected to be acceptable for the required use during the windiest season, as the existing buildings are not tall or exposed.
- 2.55 The massing of the proposed buildings is highly beneficial for the prevailing south-westerly winds, as the buildings gradually increase in height from west to east. This will create a degree of mutual shelter between buildings.
- 2.56 The site is exposed in the north-easterly wind direction, prior to the construction of the Aviva Site (Vastern Court Retail Park) development. Building A, which will be the tallest building on the site, is expected to be very exposed and without any intervention could create unsafe wind conditions around the southeast and northeast corners of the site. However, the design of building A incorporates large solid canopies on three sides building A and an arrangement of staggered

porous screens near the southern corner which will effectively mitigate the wind conditions. The precise size and location of these measures will be confirmed through wind tunnel testing carried out in the next design stages.

- 2.57 The amenity spaces are largely protected from the prevailing winds by the proposed buildings, and therefore conditions are expected to be acceptable in most ground-level amenity spaces. The landscape features will also play a beneficial role, and it is suggested that these be planted in semimature form to provide shelter immediately after the completion of the development.
- 2.58 While a large majority of entrances will have acceptable wind conditions, the office entrances beneath building J will be exposed to prevailing southwest winds and will require localized shelter in the form of porous screens. Other residential entrances on the west and south sides of the site would also benefit from localized screening or landscaping.
- 2.59 The detailed design and the mitigation for the Proposed Development will be developed using wind tunnel testing, in order to ensure safe and comfortable wind conditions at the Site.

Landscape and Open Space Strategy

- 2.60 The Proposed Development would include a number of open spaces accessible by the public as well as private gardens for residents. These, and the associated landscape strategy are described in the Design and Access Statement. In the eastern extents of the site an area referred to as Station Square is proposed, which would provide a pedestrian linkage between the Reading Station underpass and the Proposed Development. The square would comprise areas of soft and hard landscaping including amenity grass, trees and seating areas. Station Square would provide pedestrian and cycle access to The Avenue, Caversham Road and link to the wider existing pedestrian network including access to the Thames.
- 2.61 It is proposed that newly planted trees would line The Avenue and the internal roads servicing the Proposed Development. Trees would also be planted along the boundary with Caversham Road where practicable. Garden spaces would be provided in the courtyard style areas between the buildings which would be available as communal space for residents. Private garden space would be provided for the Town Houses and some of the ground floor residential units. Further amenity space would be provided on the rooftops of a number of the blocks, accessible by the office space and residential units. The illustrative landscape strategy is set out in Figure 2.3.
- 2.62 The open space areas would incorporate Sustainable Drainage System (SuDS) attenuation features.

Drainage and Flood Risk

- 2.63 The proposed drainage strategy for the development would adopt the same regime as the current site, with surface water runoff being drained to the existing culvert running through the site. The culvert currently running through the middle of the site would be diverted to avoid proposed buildings and foundations. It is assumed that the site would be mainly hard surfaced and the proposed drainage strategy would attenuate the runoff before discharging to the culvert.
- 2.64 The proposed drainage strategy also includes Sustainable urban Drainage Systems (SuDS) features. The development and ground conditions prohibit the use of infiltration techniques, but

SuDS in the form of green roofs, rainwater harvesting and underground attenuation tanks would be employed. Permeable paving would be used where possible and whilst these areas would not drain directly into the ground, they would provide attenuation of the surface water runoff before discharging to the drainage network. Further details on the SuDS techniques incorporated into the proposed drainage strategy for the site are outlined below and described in more detail in paragraphs 8.31 to 8.81 in Chapter 8: *Hydrology and Flood Risk*.

Rainwater Harvesting Tanks

- 2.65 This SuDS method involves collecting rainwater from the roofs of buildings and storing this run-off in underground storage tanks. This rainwater would undergo a filtration process before being recycled back into the building to be used to flush toilets.

Green Roof

- 2.66 Green roofs comprise a vegetative cover over a drainage layer which mimics the natural drainage regime of a Greenfield site, through absorption by the plants and retention of precipitation within the growing medium. This reduces the volume of runoff and attenuates peak flows. Green roofs can also provide ecological benefits through providing replacement and additional habitat within developments. Furthermore, green roofs can facilitate the reduction of a building's carbon footprint by removing CO₂ and reducing energy demand owing to the thermal benefits.

Permeable Paving

- 2.67 Permeable paving is a load bearing construction surfaced with materials that allow surface water to enter the underlying construction. It consists of block pavements that have slots cut into their sides, allowing surface water to drain between the blocks and into a granular sub base, from where infiltration into the underlying subsoil can occur.

Cellular Attenuation

- 2.68 Cellular attenuation units are plastic tanks that are installed below ground and can be used to provide storage before discharge. Cellular units can be placed in all external areas where a minimum cover of 600mm can be accommodated. It is recognised that these measures are considered less sustainable than other methods of attenuation as they provide no water quality, amenity or habitat benefits. However, where surface water runoff cannot be controlled through more sustainable drainage techniques (SuDS), the option of attenuation tanks has been considered.
- 2.69 A total of four attenuation tanks have been included within the proposed drainage strategy located beneath the proposed landscaped areas of the site. The tanks would provide up to 1,216 m³ of storage.

Lighting

- 2.70 The project would require street lighting. A full lighting strategy will be submitted to Reading Borough Council for agreement prior to the site becoming operational.
- 2.71 The lighting strategy will aim to ensure adequate safety and security for residents while minimising energy use and light pollution and creating an attractive environment. Specific care will be taken to light the pedestrian access route to the south of the blocks from Caversham Road to the

underpass to ensure the route remains safe and attractive for use by pedestrians during hours of darkness. Light fittings in external communal areas would be selected to reflect light to focus on the areas where light is required and to avoid light straying. All external lighting and lighting to common areas in dwellings would be fitted with low energy lamps with movement or daylight sensors to prevent lights being left on unnecessarily.

- 2.72 The key principles of a lighting strategy are set out for key locations – Station Square, The Avenue, Middle Street, Railway Walk – in the Design and Access Statement that accompanies the planning application.

Sustainability

- 2.73 The Proposed Development has been designed taking into account the findings of the environmental assessment process and based on the principles of good design. Key sustainability measures that form part of the project include:

- Provision of a range of housing to suite local need and demand;
- Sustainable access linkages into the established road, cycle and pedestrian network;
- Provision of public open space areas;
- Provision of flood mitigation measures in the form of an integrated drainage strategy, accounting for climate change. As set out above, the drainage strategy for the project incorporates the use of SuDS reducing the rate of runoff from hard standing surfaces and providing water quality treatment;
- Water recycling would be encouraged, including the use of rainwater harvesting tanks;
- Provision of appropriate cycle storage and easy access to Reading Station to encourage sustainable forms of transport; and
- Provision of appropriate waste storage areas allowing the separation of recyclables from general waste.

Energy Demand

- 2.74 The project is a mixed use development comprising commercial and residential areas. The key energy demand during the operation of the project would therefore relate to the use of energy by residents/businesses. The energy strategy would focus primarily on energy efficiency in building fabric and services.
- 2.75 In addition to energy efficiency it is proposed to provide a communal district heat network to serve the dwellings within the Proposed Development from a gas fired CHP, sized to meet domestic hot water baseload. The initial energy modelling results have shown that the proposed CHP system is expected to contribute to reducing domestic CO₂ emissions by some 34%. The total reduction in domestic carbon emissions due to the proposed strategy is 36%, in excess of the 19% Code 4 equivalent target performance level for all dwellings.

- 2.76 The non-domestic buildings within the proposed development would also benefit from energy efficient design measures in terms of layout, form and fabric specification. Further reductions can be achieved through an energy efficient fit-out utilising low energy lighting, advanced controls and heat recovery technologies.
- 2.77 Through innovation, smart design and research into both new and existing technologies the baseline energy performance of the buildings would be reduced. The design approach would be based upon an effective, pragmatic and long term approach to reducing baseline energy consumption (and consequently, the operational costs and carbon emissions).
- 2.78 Fundamentally it is more effective (in terms of both cost and carbon emissions) to eliminate the energy demand first, then increase the efficiency of the building services, before considering alternative energy sources, such as renewables. This approach results not only in lower capital investment (as the low or zero carbon technologies have less demand to fulfil), but once a quantity of energy is 'designed out', the reduction in energy consumption, fuel costs to the residents and carbon emissions would be ongoing for the lifetime of the buildings.
- 2.79 The interior design and orientation of rooms and openings can make significant differences to the energy demands and quality of life for new residents. The design of the tower blocks would aim to introduce as much natural light into the main living spaces and would comply with the recommendations for daylight levels (see Appendix 2.1 for more details).
- 2.80 There are a range of approaches and technologies that would allow compliance with the Building Regulations and planning policy in relation to carbon emission reduction targets. Detailed energy statements will be provided for the project prior to construction. Each building will then require standard assessment to establish carbon emission reduction standards in line with the Building Regulations at that time.

Waste

- 2.81 The project comprises residential and commercial development and would not, therefore, be of a type to give rise to production process waste or hazardous waste.
- 2.82 In relation to the operational phase of the project, sufficient space would be made available for indoor and outdoor waste storage and waste receptacles to allow the project to meet the requirements of the Reading Borough Council waste segregation policy. Suitable bins would be provided for each residential unit commercial areas with information on the Council segregation policy and advice on good recycling practice and Council run recycling schemes.

Use of Natural Resources

- 2.83 The EIA Directive refers to the use of land, soil and biodiversity resources. The Proposed Development comprises residential and commercial use and would not, therefore, require the use of these resources during its operational phase.
- 2.84 The Proposed Development would be designed to minimise water demand and reuse rainwater where possible. In order to manage water demand on the site, the following would be addressed:
- Actions to minimise the predicted use of water within the site and to maintain this in future ownership and maintenance of any shared facilities;

- Design options to reduce the water demand in landscaping, any other predicted water use and on-site collection/storage opportunities; and
- Targets for water use in dwellings within the site.

2.85 The detailed design of the residential and commercial developments, would aim to reduce the potable water used within the project through the use of efficient fittings such as low flush WCs and flow restrictors where feasible.

Residues and Emissions

2.86 Details of residues and emissions in relation to soil; water; air (e.g. dust); and noise and vibration are set out in Chapters 7, 8, 10 and 11 of this ES respectively. Details of lighting are outlined within this chapter and considered within Chapter 6: Townscape and Visual Resource where relevant. As set out in Chapter 4: Environmental Assessment Methodology of this report, the project is not likely to give rise to heat or radiation emissions during its construction or operational phases.

Resilience to Climate Change

2.87 The Proposed Development is located within Flood Zone 2 with a probability of flooding between 1% and 0.1%. Climate change can increase the risk of surface water flooding during storm events. As set out above, greenfield runoff rates would be maintained using SuDS methods in order to mimic or improve the existing situation and ensure that the risk of flooding downstream of the project is not increased. The outline drainage strategy would incorporate drainage techniques to reduce surface water runoff rates from the site to a rate not greater than the existing discharges, for storm return periods up to the 1 in 100 year event with an allowance of up to 40% for future climate change.

2.88 Further details in relation to operational flood risk and the proposed drainage strategy are provided in Chapter 8: *Hydrology and Flood Risk* of this ES.

Vulnerability to Accidents and Disasters

2.89 The EIA Regulations require consideration of the effects on the environment deriving from the vulnerability of the project to risks from major accidents and/or disasters where these are relevant to the project concerned.

2.90 This section considers the potential accidents and disasters that could affect the project or the environment. However, it is stressed that such events are not considered likely. Further details of accidents and/or disasters relevant to each topic area are discussed in Chapter 5 – 12 of this ES.

Flood Risk

2.91 According to the Environment Agency flood map, the site is located within Flood Zone 2, which is classified as having between 1% and 0.1% probability of flooding. The site also lies in an area that has a low probability of flooding from other sources such as groundwater, sewer and artificial waterbodies.

- 2.92 As set out above, the project includes a drainage strategy, which aims to ensure that the development would be safe for its lifetime, taking into account the proposed land uses and without increasing flood risk elsewhere.
- 2.93 Further details in relation to operational flood risk are provided in Chapter 8: *Hydrology and Flood Risk* of this ES.

Pollution

- 2.94 The project includes residential and commercial development and, as such, it would not require the handling of hazardous substances during operation. The proposed drainage strategy would include measures to protect ground and surface water from any pollutants within site runoff, such as pollutants from vehicle use of the proposed roads. The quality of surface water runoff would be ensured through the discharge of runoff via filters and attenuation tanks, which would offer removal of contaminants/sediments.
- 2.95 Further details in relation to the proposed control measures are provided in Chapter 8: *Hydrology and Flood Risk* of this ES.

Fire

- 2.96 The project would not include any new hazardous land uses that would result in any unusual fire risk. The potential fire risk associated with the project would not therefore be any greater than generally associated with these land uses.
- 2.97 The design of the tower blocks would need to comply with the building regulations, which are enforced by local building control bodies. The design and construction would therefore take into account relevant legislation and guidance including the following (or their replacement versions at the time of construction):
- Building Regulations 2010; and
 - Approved Document B (Fire Safety) – Volume 1 Dwellinghouses (HM Government, 2013).

Transport

- 2.98 The design of the internal roads and junctions with the existing highway network would be in accordance with standards and dimensions agreed with the local highways authority. New junctions would be subject to road safety audits to ensure that the design is suitable.

Summary of Key Parameters

- 2.99 Table 2.3 provides a summary of the key parameters which, together with Figures 2.1a to 2.1f, Figures 2.2a to 2.2e and Figure 2.3 have formed the basis for the assessment of effects.

Table 2.3: Key Parameters for Environmental Assessment

Element of the Development	Key Parameter for EIA
Site area	2.2 hectares
Total number of residential units	658
Total retail floor space	1,889 m ²
Total office floor space	16,604 m ²
Floor space for other uses	772 m ²

Element of the Development	Key Parameter for EIA
Maximum building height	123.18m AOD
Car parking provision	94 spaces

Demolition and Construction

- 2.100 The details of construction methods, timing and phasing are necessarily broad at this stage. The limits of the assessment, however, have been set sufficiently wide to allow a robust assessment to be undertaken of a reasonable worst case scenario.
- 2.101 The project is anticipated to utilise standard construction methodologies (including piling) for infrastructure. Appendix 2.3 describes an indicative construction methodology and Appendix 2.4 sets out a draft Code of Construction Practice (CoCP).

Indicative Phasing of Construction Works

- 2.102 The timing of the project would be dependent on securing planning permission and the discharge of planning conditions and reserved matters. The indicative construction programme sets out a programme of approximately 6 years duration. It is assumed that the construction is likely to be phased from east to west over three phases. Each phase would be self sufficient meaning no phase would rely on a future phase to be completed prior to it becoming operational. Each phase would provide enough drainage attenuation features to control surface water runoff generated from that phase. Further details of the construction phasing and drainage design is provided in the sections below and summarised in Table 2.4.

Table 2.4: Summary of Construction Phasing

Project Phase	Duration and Indicative Start Date	Use	Floor space (m ²) or no. units
Site Enabling and Demolition	18 – 20 months Q3 2019		
Construction Phase 1	24 – 26 months Q1 2020	Residential	299
		Office	10,065 m ²
		Retail	1,684 m ²
		A1/2/3 or D1 use	263 m ²
		Basement parking	2,347 m ²
Construction Phase 2	18 – 20 months TBC	Residential	85
		Office	0
		Retail	0
Construction Phase 3	22 – 24 months TBC	Residential	274
		Office	6,509 m ²
		Retail	205 m ²
		A1/2/3 or D1 use	509 m ²

Phase 1

- 2.103 Prior to construction of the built development this phase would involve the demolition of existing buildings and levelling of the site. The first phase of construction would include buildings A, B and C together with the associated highway and utility infrastructure including drainage.

Phase 2

- 2.104 The second phase on construction would likely comprise building D only. It is anticipated that construction of Phase 2 would take 2 years and would take place following completion of Phase 1.

Phase 3

- 2.105 The third phase of construction would include the entirety of the western part of the Proposed Development, buildings E; F, G, H and J.

Construction sequence

- 2.106 The broad sequence of construction activities for each phase is likely to be:
- Construction of main site access to allow access for construction vehicles (to be done prior to phase 1 across the whole site);
 - Demolition of existing buildings and removal of demolition materials (to be done prior to phase 1 across the whole site);
 - Diversion of existing culvert;
 - Setting up of working areas and earthworks/regarding of the site;
 - Infrastructure works, including construction of The Avenue and internal roads, drainage works and sewage works for each phase;
 - Construction of substructures;
 - Erection of superstructures and building finishes; and
 - Planting in accordance with the landscape strategy.
- 2.107 The construction area for each phase would be fenced during construction. It is the intention of the applicant that the site would be registered under the Considerate Constructors Scheme or locally recognised certification scheme.

Construction Working Hours

- 2.108 Working hours would be 07:00 to 19:00 hours Monday to Friday, 07:00 to 13:00 hours on Saturday and at no time on Sundays or on public or bank holidays. These hours would be subject to agreement with the local planning authority. In the event that works are required outside of these hours in exceptional circumstances, this would be agreed with the local planning authority prior to commencement of the activity.

Environmental Management during Construction

- 2.109 Construction would be undertaken in accordance with the Code of Construction Practice (CoCP) provided at Appendix 2.4 of this ES. The CoCP sets out the key management measures that contractors would be required to adopt and implement. These measures have been developed based on those identified during the EIA process and set out in the topic chapters of this ES. They

include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable.

- 2.110 This CoCP would form the basis of more detailed plans and method statements, including a Construction Environmental Management Plan (CEMP), to be prepared during the pre-construction period once a Principal Contractor has been appointed. The final CEMP would be agreed with Reading Borough Council.

Construction Working Areas

- 2.111 All the construction works would be undertaken within the defined project area that forms the basis of this assessment no additional land would be required for construction compounds.
- 2.112 A number of temporary facilities would be required during construction including:
- Temporary offices and welfare facilities;
 - Storage area for materials, fuels, plant and equipment;
 - Waste management areas; and
 - Car parking facilities.

- 2.113 Such storage areas would be bunded to mitigate any spillages of potential contaminants and would avoid being located in key drainage areas.

Construction Access

- 2.114 The main construction access point would be off Caversham Road close to the north-western corner of the site.
- 2.115 Every effort would be taken to minimise the effects of traffic associated with the construction phase of the Proposed Development. Materials and resources would be sourced locally where possible and deliveries and construction traffic would endeavour to avoid travel during commuter peaks.
- 2.116 Every effort would be taken to minimise the effects of traffic associated with the construction phase of the project. Materials and resources would be sourced locally where possible and deliveries and construction traffic would endeavour to avoid travel during commuter peaks.

Construction Vehicles

- 2.117 The type of construction vehicles would be selected by the contractor prior to and during the construction phase. However, the following vehicles would typically be used during construction:
- Excavators;
 - Dumpers;
 - Concrete crushing plant;
 - Mobile/tower cranes (required for assembly and erection);

- Piling rigs and scaffolding;
- Low loaders (required for transport of construction equipment and plant);
- Concrete lorries;
- Tipper lorries; and
- Construction staff vehicles.

2.118 Although it is not expected that the project would generate any abnormal loads, if this was required, the routing and nature of such loads would be agreed with the highway authority prior to work commencing.

2.119 It is anticipated that the peak periods for traffic movements associated with the construction phase would be 07.00-08.00 and 15.00-16.00. Further details of predicted traffic flows associated with the project are provided in Chapter 9: Traffic and Transport of this ES.

Drainage

2.120 The construction phase would incorporate pollution prevention and flood response measures to ensure that the potential for any temporary effects on water quality or flood risk are reduced as far as practicable.

2.121 Such measures would be implemented through the CoCP and subsequent Construction Environmental Management Plan (CEMP) produced by the appointed main civils contractor, which will require the following:

- Installation of wheel washing facilities at the entrance to the construction compounds;
- Covers for lorries transporting materials to / from site to prevent releases of dust/sediment to nearby watercourses/drains;
- Bulk storage areas to be secured and provided with secondary containment (in accordance with the Oil Storage Regulations and best practice);
- Storage of oils and chemicals away from existing drainage infrastructure;
- Concrete to be stored and handled appropriately to prevent release to drains;
- Preparation of a flood response plan in the event of flooding during construction works. This would include a procedure for securing or relocating materials stored in bulk;
- Treatment of any runoff water that gathers in the trenches would be pumped via settling tanks or ponds to remove any sediment;
- Obtain consent for any works (e.g. discharge of surface water) that may affect an existing watercourse. The conditions of the consent will be specified to ensure that construction does not result in significant alteration to the hydrological regime or an increase in fluvial risk;

- Use of a documented spill procedure and use of spill kits kept in the vicinity of chemical/oil storage;
- Storage of stockpiled materials on an impermeable surface to prevent leaching of contaminants and use of covers when not in use to prevent materials being dispersed and to protect from rain; and
- Stockpiles to be kept to minimum possible size with gaps to allow surface water runoff to pass through.

Construction and Demolition Waste

- 2.122 Where practicable, as much demolition waste as possible would be recycled to reduce the volume disposed of by landfill. The residual waste would be removed from site in line with the CoCP.
- 2.123 Construction waste is likely to include timber, concrete, inert waste, ceramic waste, insulation, plastic packaging, metal, plaster and cement. All waste, except the inert waste, some packaging and any miscellaneous waste, could be recycled. A range of waste management measures would be proposed for the project. A Site Waste Management Plan will be developed prior to the commencement of construction.

Use of Natural Resources

- 2.124 The CoCP requires the contractor to identify the main types and quantities of materials required for the project in order to assess potential for sourcing materials in an environmentally responsible way. The construction specification would place preference, when options are available, on the use of materials with a high recycled content.
- 2.125 The Considerate Contractors Scheme includes measures relating to the use of resources, including categories in relation to minimising the use of water. All timbers used as primary structural elements would be required to be Forest Stewardship Council (FSC) certified.
- 2.126 The construction process would take into account the principles of good practice in soil handling and restoration set out in the following documents, wherever possible, to reduce the possibility of damage to soil materials during the construction process:
- MAFF (2000) Soil Handling Guide; and
 - DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

- 2.127 The EIA Directive also refers to the use of land and biodiversity resources. Further details are provided in Chapter 7: Geology, Hydrogeology and Ground Conditions of this ES.

Residues and Emissions

- 2.128 Details of residues and emissions in relation to soil, water, air (e.g. dust) and noise and vibration are set out in Chapters 7, 8, 10 and 11 of this ES respectively. Details of lighting are provided within this chapter and considered within Chapter 6: Townscape and Visual of this ES, where

relevant. As set out in Chapter 4 of this ES, the project is not likely to give rise to heat or radiation emissions during its construction phase.

Utilities

- 2.129 A search for location of utilities was undertaken in 2011. The results of this search have been considered as development constraints at the initial masterplanning stage.
- 2.130 Existing utilities are included along Caversham Road to the west of the Site and Vastern Road to the north. An existing culvert is currently routed through the site which would be diverted as part of the Proposed Development

Vulnerability to Accidents and Disasters

- 2.131 This section considers the potential accidents and disasters that could affect the project or the environment during the construction phase. However, it is stressed that such events are not considered likely.

Flood Risk

- 2.132 Temporary drainage infrastructure would be installed at an early stage of construction to ensure that appropriate drainage measures are in place throughout the construction phase. The diversion of the culvert would occur following the demolition phase and would become fully operational prior to the commencement of construction. Any discharges, including runoff/groundwater collecting in excavations, would be filtered using a suitable on-site method before reintroduction to the existing drainage regime. The temporary drainage system would be installed at an early stage of construction to ensure there would be no increase in flood risk during construction works.

Pollution

- 2.133 The CoCP and subsequent CEMP would set out best practice measures to be implemented during the construction phase. Should any previously unidentified contamination be detected at the site during the construction phase, a formal remediation strategy would be submitted to and agreed with the local planning authority prior to any remediation works being undertaken.
- 2.134 With respect to potential spillages or runoff affecting water quality, the CoCP includes pollution prevention/construction best practice methods to ensure that good practice guidance is adhered to throughout the construction phase. The CoCP and subsequent CEMP are considered to adequately control potential releases of any contaminant or sediment-laden runoff during the construction phase. These measures would also limit the potential for spills or releases of materials to surface water or groundwater.

Traffic

- 2.135 The effects associated with construction traffic are set out in Chapter 9: Traffic and Transport of this ES. Construction traffic flows are predicted to result in imperceptible effects on the existing road network such that there would be no significant effect in relation to road safety.

Construction Safety

- 2.136 Normal construction good practice would be followed to ensure on-site safety of the workforce in accordance with the Construction (Design and Management) Regulations 2015. In addition, it is

the intention of the applicant that the site would be registered under the Considerate Constructors Scheme or locally recognised certification scheme.

Operation and Maintenance

- 2.137 A long term management strategy would be formulated for the project to service and manage the Proposed Development during operation. Measures would be put in place to ensure that new planting is monitored for a period of at least five years following practical completion of each phase of construction to ensure it is established and, if required, any failed tree/shrub stock or newly landscaped areas would be replaced.

References

DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

HM Government (2013) Approved Document B (Fire Safety) – Volume 1 Dwellinghouses (2006 edition, incorporating 2013 and 20132 amendments).

MAFF (2000) Soil Handling Guide

Reading Borough Council (2015) Core Strategy

Reading Borough Council (2018) Submission Draft Reading Borough Local Plan