4 PROPOSED DEVELOPMENT DESCRIPTION

Introduction

4.1 This chapter of the ES provides a description of the proposed development for the purposes of identifying and assessing the potential environmental impacts and likely environmental effects of the proposed development in the technical assessments of ES Volume 1 (Chapters 6-10) and ES Volume 2 (Chapters 1-2).

4.2 In accordance with the EIA Regulations, this chapter sets out the physical characteristics of the built development, the proposed access and egress arrangements, the landscaping strategy, utility requirements and estimated emissions and arisings.

4.3 A general description of the application site is provided in ES Chapter 1: Introduction, with more detailed descriptions provided in each technical assessment within ES Volume 1 and ES Volume 2, and is therefore not repeated here.

4.4 Further detailed information on the proposed development can be found within the following planning application documents:

- Design and Access Statement;
- Planning Statement;
- Development Parameters (Schedule and Plans);
- Design Code;
- Energy Strategy; and
- Utilities Strategy.

Proposed Development Description

4.5 As mentioned in ES Chapter 1: Introduction, the Applicant is submitting an outline planning application to enable the redevelopment of the application site. The application seeks permission for the following:

"Outline planning permission with the details of access, appearance, landscaping, layout and scale reserved for later determination. Demolition and redevelopment to comprise: up to [115,000] sqm GEA in one or more land uses comprising: Residential (Class C3 and including PRS); Offices (Use Class B1(a); development in Use Classes A1, A2, A3 (retail), A4 (public house), A5 (take away), C1 (hotel), D1 and D2 (community and leisure); car parking; provision of new plant and renewable energy equipment; creation of servicing areas and provision of associated services, including waste, refuse, cycle storage, and lighting; and for the laying out of the buildings; routes and open spaces within the development; and all associated works and operations including but not limited to: demolition; earthworks; provision of attenuation infrastructure; engineering operations. All development, works and operations to be in accordance with the approved Development Parameters Schedule and Plans."

4.6 The proposed development would comprise:

- Demolition of the existing buildings on the application site;
- Below ground excavation necessary for below ground surface water attenuation;
- Construction of up to four new buildings, up to approximately 112.9 meters above ordnance datum (m AOD);
- Delivery of a total maximum floorspace of up to 115,000 m^2 gross external area (GEA), which could include:
  - up to a maximum of 1,000 new residential units within a maximum floorspace of up to 100,000 m^2 GEA, provided within a range of apartment buildings of varying scale and a mix of unit sizes, including a proportion of affordable homes;
  - up to a maximum floorspace of 6,000 m^2 GEA flexible retail, leisure and community uses (Use Class A1-A5, D1-D2);
  - up to a maximum floorspace of 115,000 m^2 GEA office use (Use Class B1a);
  - up to a maximum floorspace of 7,000 m^2 GEA hotel use (Use Class C1);
- Delivery of up to 62 car parking spaces for blue badge and car club spaces;
- Delivery of cycle storage in line with current policy requirements; and
- Delivery of a mix of public and private open space, including children's playspace, equivalent to a minimum of 10 % of the application site area.

4.7 As the proposed development could be brought forward in a number of different forms within the extent of the minimum and maximum use class parameters, the EIA has been undertaken on the basis of adopting a 'worst-case' assessment approach, as described in ES Chapter 2: EIA Process and Methodology.

4.8 Given the degree of flexibility being sought at this outline stage, the proposed development could come forward in a range of different ways at the detailed design stage, including:

- A non-residential scheme delivering up to 115,000 m^2 GEA with one or more land uses comprising B1a, C1, A1-A5, D1-D2; or
- A residential-led scheme delivering up to 115,000 m^2 GEA including up to 100,000 m^2 GEA C3 land use with the remainder comprising one or more of B1a, C1, A1-A5, D1-D2; or
- A mixed-use scheme delivering up to 115,000 m^2 GEA including a mix of land uses comprising C3, B1a, C1, A1-A5, D1-D2.

4.9 The detailed layout, scale, appearance and landscaping of the proposed development would be subject to reserved matters submissions. Accordingly, for these matters, maximum parameters have been set within which the reserved matters applications (RMAs) would be brought forward.

4.10 The Development Parameters define the overall quantum and nature of the proposed development and provide a controlling set of design guidelines in relation to each plot, residential unit numbers and mix, within which the reserved matters would be brought forward. The RMAs must therefore accord with the development parameters. That is how the methodology used in this ES will be validated.

4.11 The Development Parameters that have been assumed for the EIA are outlined in Table 4.1 and are presented in Figures 4.1 – 4.7.

Table 4.1: Schedule of Parameter Plans

Dwg No.	Name	Description
PP-100 – Development Footprint (see Figure 4.1)	Development Footprint	Definition of the developable area within which the proposed development would be delivered, inclusive of buildings, landscaping and open space.
PP-101 – Site Access & Egress (see Figure 4.6)	Site Access & Egress	Definition of areas which site access and egress would be provided

Table 4.1: Schedule of Parameter Plans		
Dwg No.	**Name**	**Description**
PP-102 – Building Plots (see Figure 4.2)	Building Plots	Areas within which each plot would be delivered on the application site
PP-103 – Plot Heights Non-residential Use (see Figure 4.3)	Plot Heights Non-residential Use	Maximum heights of plots if non-residential uses were to be brought forward
PP-104 – Plot Heights Residential Use (see Figure 4.4)	Plot Heights Residential Use	Maximum heights of plots if residential uses were to be brought forward
PP-105 – Plot Heights Mixed Use (see Figure 4.5)	Plot Heights Mixed Use	Maximum heights of plots if a mix of uses were to be brought forward
PP-106 – Basement Footprint (see Figure 4.7)	Basement Footprint	Zones which could provide excavation for below ground flood attenuation

Site Arrangement and Land Use

4.12 The proposed development would be developed within the Development Footprint area shown in Figure 4.1 (Parameter Plan 100).

4.13 The arrangement of the proposed development across the application site is shown in Figure 4.2 (Parameter Plan 102). The proposed development would comprise four Plots (A-D). The Plots would comprise a maximum floorspace of 115,000 m^2.

Land Use Distribution

4.14 Figure 4.2 (PP-102) defines the maximum extents of Plots A-D. Table 4.2 describes the minimum separation distances between the Plots.

Table 4.2: Minimum Separation Distances between Development Plots			
Minimum Separate Distance Category	**Residential to Non-Residential**	**Residential to Residential**	**Non-Residential to Non-Residential**
Window to Window	20 m	20 m	15 m
Balcony to Balcony	n/a	16 m	n/a
Balcony to Window	18 m	18 m	n/a

4.15 There would be a minimum separation distance of 15 m between Plots to define the North-South routes when non-residential use is proposed on adjacent Plots. In the event that at least one of the adjacent Plots is developed for residential use, this distance would increase to 20 m to ensure privacy for residents.

4.16 The North-South route between Plots C and D links the town centre to the river, and would form part of the route of the proposed 'Kennet-Thames Spine'. This link is considered an important pedestrian thoroughfare and in this location the minimum permitted separation distances between Plots, irrespective of use, would be 23 m.

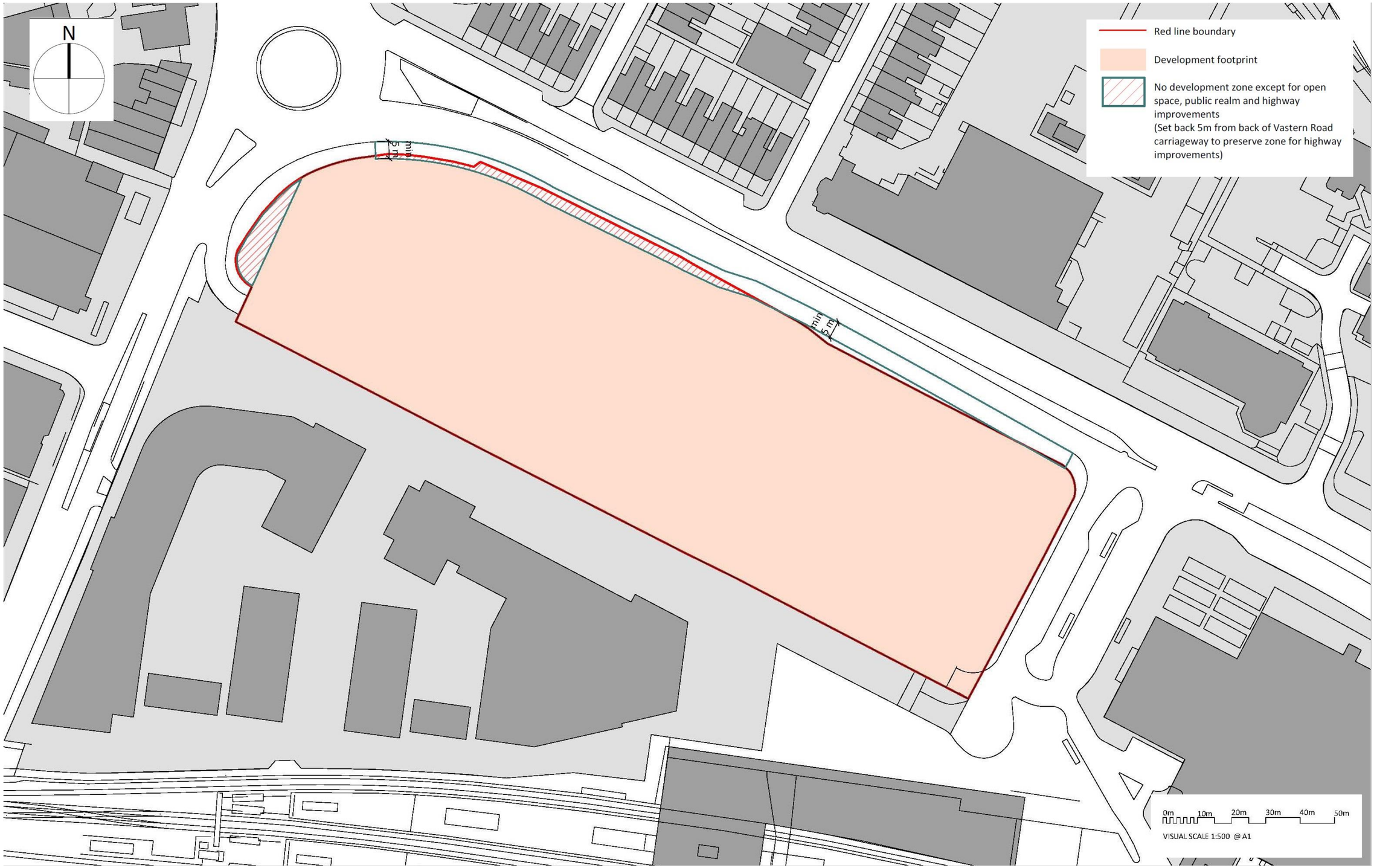

Figure 4.1: Parameter Plan 100 – Development Footprint

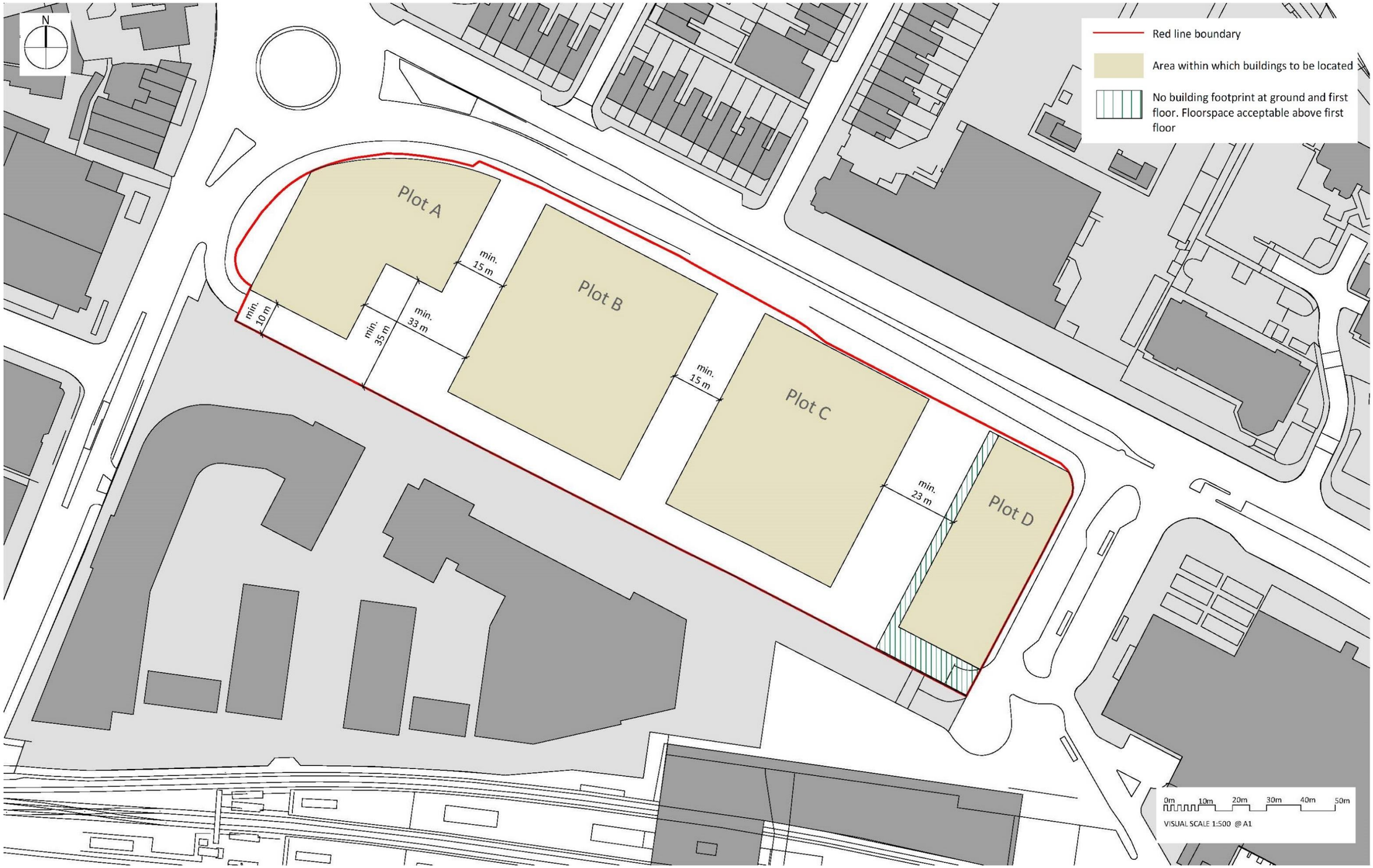

Figure 4.2: Parameter Plan 102 – Building Plot Allocation (Non-Residential)

Quantum and Use Classes

4.17 The total floorspace provided by the proposed development would not be more than 115,000 m^2 GEA. Table 4.3 outlines the minimum and maximum floorspace by Use Class which could be brought forward in order to achieve the overall maximum GEA of 115,000 m^2.

Table 4.3: Minimum and Maximum Floorspace by Land Use

Use Class		Plot A	Plot B	Plot C	Plot D	Total GEA
C3 Residential Units	Minimum	0	0	0	0	0
	Maximum	18,500	23,500	27,800	30,200	100,000
B1a Offices	Minimum	0	0	0	0	0
	Maximum	20,000	31,000	35,000	29,000	115,000
C1 Hotel	Minimum	0	0	0	0	0
	Maximum	8,000	8,000	8,000	8,000	8,000
A1-A5, D1-D2	Minimum	2,000				2,000
	Maximum	7,000	7,000	7,000	7,000	7,000

Residential Unit Mix and Tenure

4.18 The proposed development could deliver up to 1,000 residential units. Residential dwellings would be provided through a range of apartments ranging from studio to 2+ bedroom apartments. The proposed tenure has been assumed to be the following for the purposes of the EIA:

- a minimum of 40 % studio and 1 bedroom apartments;
- a maximum of 60 % studio and 1 bedroom apartments; and
- a maximum of 60 % 2+ bedroom apartments shall be provided.

4.19 Of the residential units to be delivered, some would be affordable housing.

4.20 Should any of the non-residential land uses be brought forward, this would comprise one or more of the uses outlined within Table 4.3.

Built Form, Height and Massing

4.21 The maximum height of the proposed buildings with Plots A – D would depend on whether they are developed for 'residential use', or 'non-residential use', or a combination of the two in a 'mixed use'.

4.22 The maximum height of each Plot is defined in Figures 4.3 - 4.5 (PP-103 - PP-105). All roof plant and structures would be provided within the maximum height. Table 4.4 summarises the maximum height for each plot within the application site according to the potential future land use type.

Table 4.4: Maximum Plot Heights

Plot	Maximum Height Non-Residential Use	Maximum Height Residential Use	Maximum Height Mixed Use
A	83 m AOD	94.4 m AOD	94.4 m AOD
B	83 m AOD	92.8 m AOD	92.8 m AOD
C	87 m AOD	94.4 m AOD	94.4 m AOD
D	112.9 m AOD	112.9 m AOD	112.9 m AOD

4.23 It should be noted that these heights represent a maximum within which the detailed proposals would come forward and therefore do not represent the actual form in which the proposed development is likely to be delivered.

4.24 The Design Code makes commitments in respect of how the built form, height and massing could be delivered at the detailed design stage to facilitate a high quality and landmark development.

Figure 4.3: Parameter Plan 103 - Building Maximum Heights for Non-Residential Use

Figure 4.4: Parameter Plan 104 - Building Maximum Heights for Residential Use

Figure 4.5: Parameter Plan 105 - Building Maximum Heights for Mixed Use

Material Palette and Façade Detailing

4.25 For the proposed development, different options have been selected in respect of materiality, architectural style and detailing, to be implemented through the Design Code.

4.26 The Design Code states that the design of the buildings would be coherent and familial throughout the proposed development. All buildings would share key elements such as materials, colour, proportion or graphic elements that provide a uniform appearance. The main materials for facades would be brick, concrete, wood, glass, metal.

Open Space and Public Realm

4.27 The proposed development would provide 10 % of the application site area (0.177 hectares) for Open Space provision. Within that area, no built development would be permitted other than:

- Hard and soft landscaping;
- Public realm;
- Amenity spaces (inclusive of playspace provision);
- Structural planting;
- Footpaths and cycleways and their associated apparatus;
- Creations of roads and footpaths in order to provide connections for the built development; and
- Creation of ecological habitats (including landscape planting with known biodiversity value, trees, hedges and shrubs).

4.28 The Design Code makes commitments in respect of delivering a high quality design in order to create a distinct sense of place.

Landscape and Biodiversity Enhancement

4.29 At this outline stage, the precise habitats, species mix, locations and areas of landscape planting are not yet fixed and would be confirmed at the detailed design stage and would be subject to reserved matters applications.

4.30 The proposed development would result in the loss of 15 trees. The majority of the tree removals from within the application site are of relatively low amenity value. The most significant tree removals would be on the boundary of the Vastern Road. Trees, especially mature specimens on the boundary of the application site, would be retained wherever possible as per advice provided in the Arboriculture Impact Assessment that accompanies the application.

4.31 Proposed tree planting would strengthen and enhance the characteristics of the existing tree stock and appropriate species would be selected to complement the application site.

Lighting

4.32 As stated in the Design Code, the proposed development would deliver appropriately designed external lighting to ensure a safe environment for site users. Any external lighting would comply with the Institute of Lighting Professionals, Guidance Notes for the Reduction of Obtrusive Light GN01:2011[1]. The proposed development would also seek to minimise upwards light and obtrusive light and avoid light spill onto trees, hedges and bird and bat boxes wherever possible.

Access and Egress

4.33 The Access and Egress parameter plan (PP-101), as shown in Figure 4.6, outlines the proposed site access and egress points for the proposed development.

Vehicular Access

4.34 The main access point to the proposed development would be off Caversham Road via the existing access to the application site on the western site boundary, shown as Zone A in PP-101 on Figure 4.6.

4.35 A separate point of vehicular egress would be provided on to Vastern Road, in a similar type of arrangement to the existing, allowing only left-turn (westbound) movements out of the application site, shown as Zone B in PP-101 in Figure 4.6. Traffic heading east from the application site would need to make a U-turn at the Caversham Road / Vastern Road roundabout.

4.36 The internal roads would provide access to the small amount of car parking proposed and also provide access for service/delivery vehicles. The internal road layout and arrangement would be confirmed at the detailed design stage.

Pedestrian and Cycle Access

4.37 The proposed development would provide pedestrian and cycle access through the application site. Pedestrians and cyclists would access the application site from Caversham Road, Trooper Potts Way, and Vastern Road. As indicated in the Design Code, the internal layout would be designed to give priority to pedestrian and cycle movement through the provision of shared surfaces, surface treatments and landscaping provision.

4.38 It is understood that a new pedestrian/cycle crossing on Vastern Road is being sought by RBC in conjunction with this and also the Scottish and Southern Energy (SSE) development opposite to the north. The precise location of the crossing has yet to be determined.

Emergency Vehicle Access

4.39 Emergency vehicles would be able to access and navigate the proposed development using the same access and egress points, and internal road network as discussed above.

Parking

Car Parking

4.40 The number of parking spaces would be determined as part of an RMA. However, for the purposes of the EIA, it has been assumed that a maximum of 50 Blue Badge spaces would be provided for the potential residential uses, with four additional Blue Badge spaces assumed for each of the non-residential uses (office, retail, hotel), totalling a maximum of 62 spaces (100 % Blue Badge). The RBC's Blue Badge parking requirements are set out in their 'Parking Standards and Design' SPG[2]. However, the quantum for the various land uses is expressed in relation to the total number of ordinary spaces, which, in the case of the application site, would be zero. However, it is stated that all developments should provide a minimum of three disabled spaces and therefore the proposed provision exceeds this minimum requirement.

[1] Institute of Lighting Professionals, 2011. Guidance Notes for Reduction of Obtrusive Light.

[2] Reading Borough Local Development Framework, 2011. Revised Parking Standards and Design. RBC 2011.

Cycle Parking

4.41 The proposed development would provide cycle parking in accordance with the adopted standards present at the time of making a Reserved Matters submission. The RBC's current standards would require 0.5 - 1 space per unit for flats; for B1 office it is 1 space per 200 m^2 Ground Floor Area (GFA), whilst for retail it is generally one space per six staff plus one space per 300 m^2 GFA. For hotels the standard is one space per six staff.

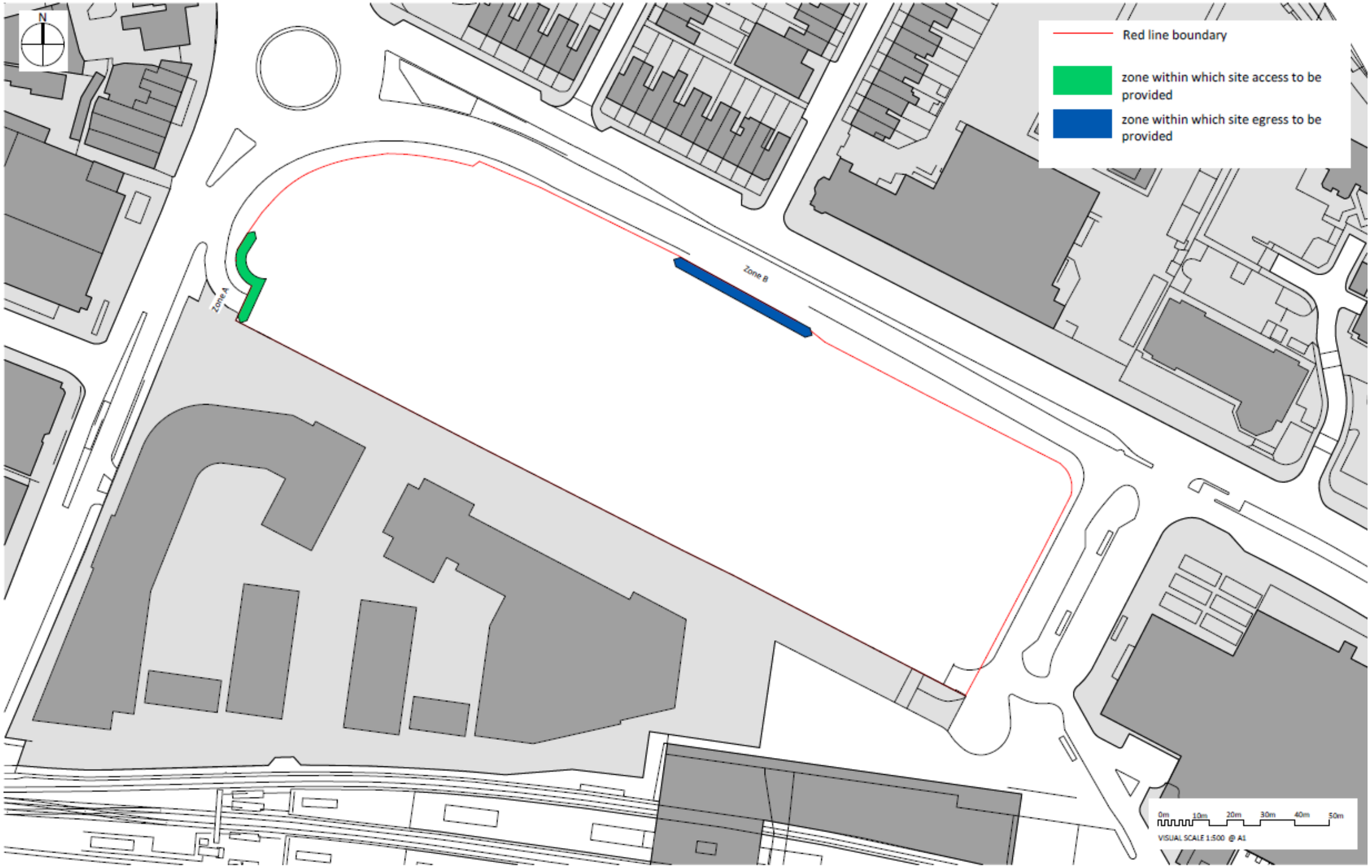

Figure 4.6: Parameter Plan 101 - Proposed Site Access and Egress

Servicing and Deliveries

4.42 All servicing and deliveries would be accommodated within the site through a combination of dedicated loading bays and/or informal on-street loading/unloading. Servicing and delivery vehicles would access the proposed development in the same way as other traffic i.e. in via Caversham Road and out via Vastern Road. In the event that the proposed development comes forward as either a mixed-use or residential scheme, the layout would be designed such that delivery vehicles would be able to get sufficiently close to the residential cores, whilst adequate turning space would be provided for refuse vehicles etc.

Waste Management

Waste Arisings

4.43 The total estimated waste arising for the proposed development has been calculated in accordance with good practice guidance and is detailed in the Operational Waste Management Plan (OWMP) that accompanies the planning application.

4.44 Due to the outline nature of the application and the range of floor areas that could be delivered as part of the scheme, waste arisings were calculated for three potential schemes: a residential led scheme; and commercial-led scheme; and a mixed-use scheme. Through this exercise, it was calculated that the worst-case scenario for waste arisings would be the commercial-led scheme.

4.45 To illustrate a worst-case scenario, it was assumed that a maximum of 7,000 m^2 of A3 land use would be delivered as A3 land uses (food and drink establishments) are likely to give rise to the highest volumes of waste per m^2 of floor area. The estimated waste arisings for the various scenarios considered, including the commercial scenario, are shown in Table 4.5.

Table 4.5: Worst Case Proposed Development Waste Arisings

Land Use	Floor Area	Weekly Waste Arisings (L)			
		Residual	MDR*	Food	Total
Scenario 1 - Residential					
Residential (1,000 units)	400 x 1 Bed	20,000	20,000	2,000	42,000
	600 x 2 Bed	51,000	51,000	3,000	105,000
B1 Office	8,000 m^2 GEA (6,460 m^2 NIA)	13,458	13,458	n/a	26,917
A3	7,000 m^2 GEA (5,652.5 m^2 NIA)	70,656	28,263	42,394	141,312
Total					315,229
Scenario 2 - Commercial					
Residential	0	0	0	0	0
B1 Office	108,000 GEA (87,210 m^2 NIA)	181,688	181,688	n/a	363,375
A3	7,000 m^2 GEA (5,652.5 m^2 NIA)	70,656	28,263	42,394	141,312
Total					504,687
Scenario 3 – Mixed Use					
Residential (500 units)	200 x 1 Bed	10,000	10,000	1,000	21,000
	300 x 2 Bed	25,500	25,500	1,500	52,500

Table 4.5: Worst Case Proposed Development Waste Arisings

Land Use	Floor Area	Weekly Waste Arisings (L)			
		Residual	MDR*	Food	Total
B1 Office	54,000 m^2 GEA (43,605 m^2 NIA)	90,844	90,844	n/a	181,688
A3	7,000 m^2 GEA (5,652.5 m^2 NIA)	70,656	28,263	42,394	141,312
Total					396,500

*Mixed-dry recyclables (MDR)

4.46 The estimates provided in the Table 4.5 are for illustrative purposes and show that the volume and composition of waste varies greatly according to the proposed land uses. Furthermore, wastes from retail and offices would differ further in their composition with the office being mainly paper waste, whereas the retail waste is likely to be mostly packaging and possibly some food residues. Restaurants and food establishments generate a substantial proportion of food waste.

4.47 The strategy for disposing, storing and collecting waste would be determined at the detailed design stage and a detailed Operational Waste Strategy will accompany the RMAs. This strategy is to be secured by means of an appropriately worded planning condition.

4.48 Due to the large quantities of waste likely to be generated by the proposed development it is likely that waste would require compaction on-site prior to collection. Compacting waste into bins allows a direct reduction of the number of bins requiring collection and therefore reduces the storage space required, as well as the time required to service developments.

4.49 Each individual housing unit and business unit would be required to sort their waste internally into the following categories:

- Dry Mixed Recycling;
- Organic Waste (Food and Garden); and
- Mixed Non-Recycling Waste.

4.50 All waste will be managed in accordance with the requirements of British Standard 5906:2005 Waste Management in Buildings, Code of Practice (BS 5906:2005), Part H6 of the Building Regulations (2010) and RBC Waste Management Guidance. The proposed development would be designed to be compliant with all relevant waste management policy and to encourage a high level of reuse and recycling. These commitments would be secured by means of an appropriately worded planning condition.

Plant and Ventilation

Heating

Residential

4.51 Each of the residential blocks would have their own centralised heating and cooling system located at roof level. The proposed system utilises air to water based heat pumps to serve an energy loop passing throughout the building to serve each residential apartment. Within each apartment, an individual heat pump system would provide heating/cooling along with domestic hot water utilising the energy loop as the prime energy source. Final delivery of heating and cooling within each apartment would be by radiators and fan convectors.

Non-residential

4.52 A similar system would be adopted for the non-residential buildings, with the exception of, using a fan coil unit as the emitter for the commercial areas to provide heating and cooling instead of a radiator.

Cooling and Ventilation

Residential

4.53 Each of the residential apartments would be fitted with openable windows; the specification of which would be determined during detailed design and informed by the noise assessment within this ES. In addition, residential units would be designed to be dual aspect in nature and to permit through ventilation. All apartments would also have openable windows to improve the circulation of clean-air though each of the units.

Non-Residential

4.54 In the event of a non-residential development, mechanical ventilation would be provided to the offices. A number of air handling units would be provided to serve each block independently. Each air handling unit would be complete with a thermal wheel to provide heat recovery and benefit from the free heat generated by the proposed development. Tempered air would be provided to each office floor from the air handling units by a range of galvanized ductwork passing through the building. The air handling units would be located at roof level and each plot would have stand-alone units. The intake and exhaust ductwork would be suitably located to ensure there is no re-circulation or near external pollutants.

Utilities

Electricity

4.55 The main electrical point of connection (POC) to each block would be from proposed new SSE (Scottish and Southern Electricity Network) substations located around the application site. These connections would be in addition to the existing supplies which would be retained to provide temporary power during construction.

4.56 The electrical demand of the proposed development would be 9 MVA, which exceeds the existing supply and therefore upgrade works to the electricity network would be required for the proposed development in order to meet the future electrical demand.

Gas

4.57 Gas is not proposed for the proposed development.

Water

Potable Water

4.58 The point of connection for the water supply would be located along Vastern Road, taken from the existing Thames Water owned water main.

4.59 The water demand of the proposed development would be calculated through the size and number of the proposed residential units. Upgrade work may be required for the proposed development to the existing local mains and this would be subject to detailed development. As is standard practice, ongoing consultations would be undertaken with Thames Water to agree the necessary scope of works.

Foul Water

4.60 It is proposed that foul flows from the development are drained into a traditional below ground network of gravity drained pipework prior to discharging to the existing Thames Water foul sewer which currently serves the application site. Where the sewer is located within the application site and affected by the development proposals it would be diverted via agreement with Thames Water.

4.61 Consultation with Thames Water based on initial development proposals established modelling and potential off-site improvement works would be required to ensure the receiving sewer could accommodate the increase in foul flows. As is standard practice, ongoing consultations would be undertaken to agree the necessary scope of works.

Surface Water Management

4.62 The results of the FRA concludes that there are a number of SuDS options that are feasible within the proposed development to limit surface water flows to a peak flow rate of 3.5 litres per second (l/s), providing a significant reduction in comparison to pre-development rates from the application site.

4.63 The surface water discharged from the proposed development would be limited as close as practically possible to greenfield runoff rates and discharged via gravity to a culverted watercourse located south-east of the application site.

4.64 The SuDS measures to be incorporated into the proposed development would comprise:

- Green / blue roofs;
- Below ground geocellular attenuation tanks;
- Permeable paving; and
- Filter strips, Tree pits / Bioretention systems.

4.65 Three geocellular attenuation tanks are proposed to store and attenuate surface water flows for all storm events up to and including the 1 in 100 year + 40 % allowance for increase in peak rainfall intensity over the lifetime of the development. The locations of these are not set but would be positioned below areas of landscaping within the areas shown in Figure 4.7 (Parameter Plan 106).

4.66 All car parking areas would comprise of permeable paving, whilst surface water runoff generated from access roads would be managed by filter strips, tree pits / bioretention systems where possible, which in turn would discharge to the below ground network of surface water drainage.

4.67 Attenuated flows would be restricted by a Hydrobrake flow control device which would be fitted within a catchpit manhole prior to discharging flows to the culverted watercourse.

4.68 The SuDS proposals would provide high levels of treatment to surface water runoff generated from roof areas and parking / access roads, which would improve the quality of runoff discharged to the culverted watercourse. Furthermore, the SuDS proposals would assist in maximising and enhancing amenity and biodiversity potential across the application site.

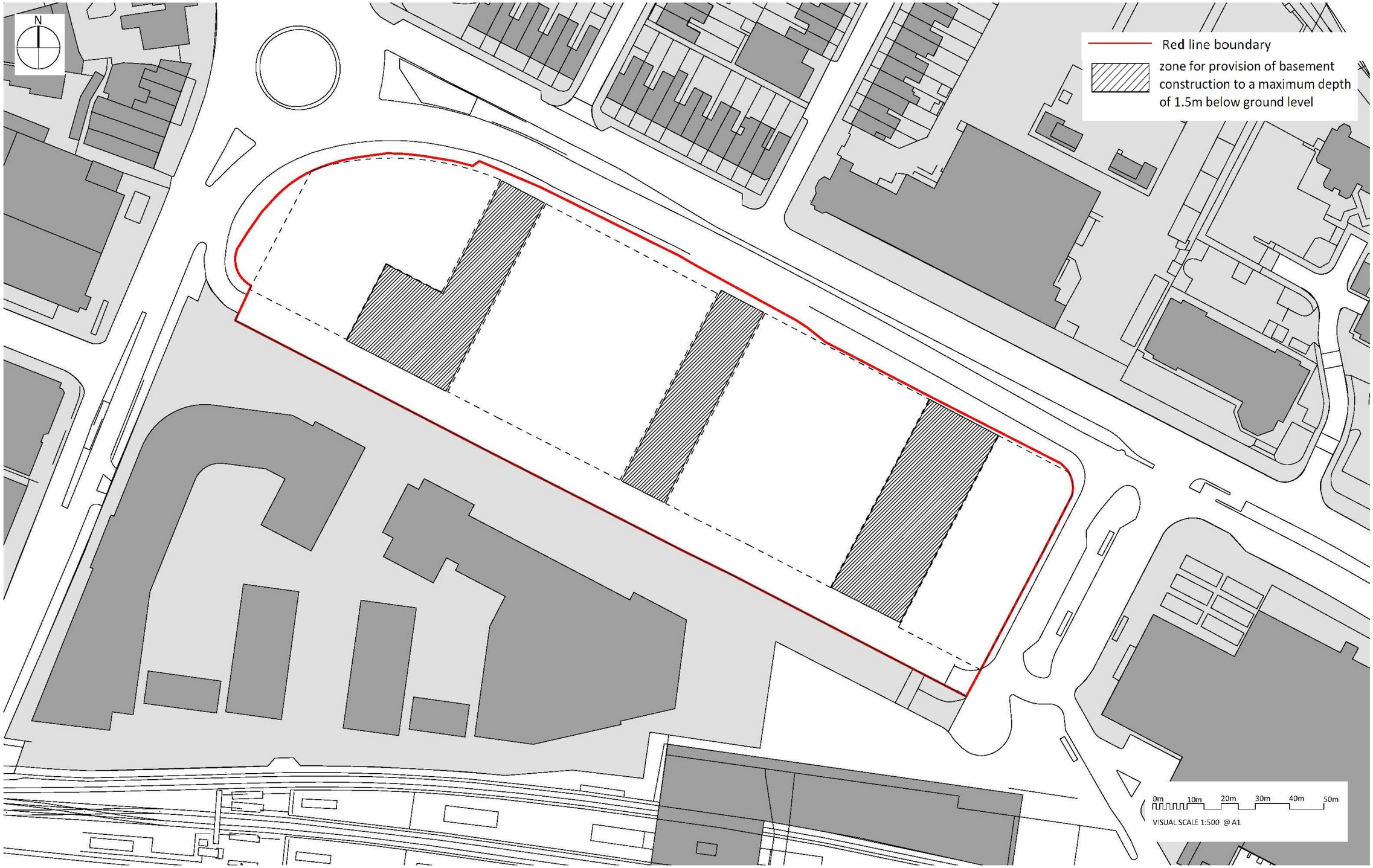

Figure 4.7: Parameter Plan 106 - Excavation Zone for Below Ground Attenuation

Resources, Emissions and Residues

Resource Use

Energy

4.69 A Residential Energy Strategy and a Non-Residential Energy Strategy are accompanying the application and demonstrates how the proposed development would use passive and low energy design technologies to reduce baseline energy demand and CO_2 emissions followed by the application of low and zero carbon technologies.

4.70 The energy strategies have been designed in accordance with the following energy efficiency hierarchy:

- Lean: Maximise passive design to minimise energy usage: return on investment.
- Clean: Ensure any technologies added into the building are efficient and well designed.
- Green: Once development has been as efficient as possible through passive design, less renewables are required to achieve the energy benchmark, therefore reducing capital cost.

4.71 The residential energy strategy would achieve a 35% CO2 emission reduction against the Building Regulations Approved Document L2A : 2013 baseline. The non-residential energy strategy would exceed the Building Regulations 2013 compliant baseline scheme by 15.59%.

Potable Water

4.72 The residential units would have water efficient sanitary fittings installed to meet a water consumption rate of 110 litre (l) or less per person per day.

Materials

4.73 During the detailed design and RMA stages, material optimisation and opportunities to promote a circular economy would be considered as part of the proposed development. Where feasible, the design team would prioritise materials that:

- have a low embodied energy, including those that can be re-used intact or recycled at the end of their useful life and therefore support the circular economy in construction;
- achieve a rating of A+ to D in the BRE's The Green Guide for key building elements - external walls, windows roof, upper floor slabs, internal walls, floor finishes / coverings;
- can be sustainably sourced: 100 % of timber and timber products should be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source; materials that are BES6001 (min very good) where possible or ISO14001 certified;
- are durable to cater for their level of use and exposure; and
- will not release toxins into the internal and external environment, including those that deplete the earth's stratospheric ozone layer.

4.74 Material efficiencies would be integrated with the waste hierarchy principles, identifying opportunities to reuse existing materials and reducing construction waste.

4.75 The opportunity to locally source materials would be investigated during the detailed design stage.

4.76 Durable materials would be sought to reduce degradation and reduce the need to use additional materials over the proposed development's lifetime.

4.77 These commitments would be secured by means of an appropriately worded planning condition.

Emissions

To Air

4.78 The proposed development would target an overall 15 % reduction in Regulated CO_2 emissions through energy efficiency measures using hybrid evaporative free cooling and future provision of district heating network.

4.79 Operational air emissions would primarily arise from road traffic. These are summarised in Chapter 7: Air Quality.

To Sewers and Water

4.80 An FRA has been undertaken for the proposed development which includes an assessment of surface water runoff. The results of the FRA were used to inform and ensure measures for reduced surface water runoff were integrated into the design of the proposed development. The total maximum surface water discharge rate for the proposed development as a whole would be 4.2 litres per second (l/s).

4.81 All proposed buildings would be connected to a traditional network of below ground gravity drained pipework for the discharge of foul water. The existing foul sewer where affected within the site would be diverted under agreement with Thames Water, whilst the existing outfall from the site along Trooper Potts Way would be retained and utilised via the construction of a new manhole.

4.82 In total, the proposed development would have a maximum peak foul water flow of approximately 42.0 l/s; however this would be subject to the final selected development uses.

4.83 Thames Water have advised modelling and potential off-site reinforcement works could be required to ensure the foul flows from the proposed development could be accommodated within the foul sewer network. As is standard practice, ongoing consultations would be undertaken to agree the necessary scope of works.

To Land

4.84 No routine emissions to land are anticipated with the operational stage of the proposed development.

Sustainability Proposals

4.85 The sustainability strategy follows the hierarchy set by Reading Policy which incorporates the principals of Lean, Clean and Green to demonstrate the methods to reduce the carbon emissions from the proposed development.

4.86 At this stage, three development options are presented within the parameters mix-use, office or residential scheme options.

4.87 The following energy efficiency measures would be incorporated into the selected scenario:

- Enhancing the building fabric envelope thermal performance by introducing thermal insulation to achieve lower capacity heating systems thereby reducing energy consumption;
- Providing new high performance glazing in order to reduce solar heat gains thereby lowering the size of cooling plant and hence reducing energy consumption and CO_2 emissions for the operational building;
- Selecting high efficiency plant together with using high efficiency motors serving pumps, compressors and fans;
- Heat recovery within the ventilation plant;
- Increasing the size of air and water distribution ductwork and pipework in order to reduce the system resistance thereby allowing smaller pump and fan motors to be used reducing energy consumption;
- Increasing the thermal insulation performance on distribution pipework and ductwork to reduce standing heat losses/gains;
- Providing occupancy detection and automatic daylight dimming within the office area lighting control system;

- Using variable speed drive motors serving pumps and fans that allows the flow rates to be varied to match the building requirements reducing energy consumption;
- Using low energy high efficiency lamp sources;
- Maximising the use of daylighting within the building; and
- Improving building air leakage.

4.88 These measures would be secured by means of an appropriate worded planning condition.

Operational Provisions and Controls

Operational Management

4.89 As is standard practice, open space and public amenity areas would be managed and maintained by the landowner(s).

4.90 Aspects of operational management incorporated into the residential and non-residential uses would include technological and Integrated Electronic Security Systems, such as closed-circuit television (CCTV) cameras.

Emergency and Disaster Management

4.91 During the detailed design and RMA stages, consideration would be given to the following:

- Fire: All internal roads within the proposed development would be accessible by emergency vehicles and all buildings would be designed to be compliant with relevant Fire Safety Regulations;
- Flooding:
  - All finished floor levels would be at least 0.15 m above adjacent external ground levels;
  - The external ground profile around buildings would, where possible, be designed such that surface water would be directed away from buildings;
  - Extensive landscaping would be introduced at the detailed design stage which would reduce run-off rates; and
  - A combination of SuDS features would be used throughout the proposed development in order to minimise the rate of discharge and volume of runoff. SuDS features proposed for the proposed development would potentially include: green roofs; soakaways/infiltration trenches and filter drains; permeable paving; and swales and basins.

Travel Plan

4.92 As part of the proposed development, the Applicant has developed an Interim Travel Plan to encourage the use of non-car modes of travel and ensure the sustainability of the proposed development.

4.93 The Travel Plan would provide a package of measures to encourage commercial users, staff and residents to use alternatives to single-occupancy car-use. The measures are as follows:

- Provision of secure cycle parking for residents, staff and visitors;
- Regular monitoring of cycle parking use;
- Provision of a 'car-lite' development which would have 100 % Blue Badge parking spaces;
- Promotion of flexible working arrangements.

4.94 Furthermore, the Interim Travel Plan proposes marketing and awareness raising strategies which would be implemented, namely:

- Distribution of Travel Information Packs (TIP) to all future residents and employees of the proposed development (to include maps, public transport routes and frequencies and details of local amenities); and
- Display of Travel Plan posters and leaflets in reception areas, public notice boards and communal areas.

4.95 An Interim Travel Plan will be submitted alongside the planning application. The Final Travel Plan would be secured by means of an appropriately worded planning condition.

Delivery and Servicing Management Plan

4.96 A Delivery and Servicing Management Plan (DSMP) would be developed at the reserved matters stage. The objective of the DSMPs would be to manage deliveries and servicing to the application site in order to ensure efficient and successful operations (including refuse storage and collection). Effective management would ensure that the potential for vehicle conflicts is avoided and that the proposed development would have the minimum impact on both the surrounding highway network and pedestrian network.

4.97 The DSMPs will include details such as where deliveries and servicing would be undertaken from, who would be responsible for ensuring operations run effectively, what size vehicles are anticipated to require access and what frequency of vehicle movements are expected and would be secured by an appropriately worded planning condition.