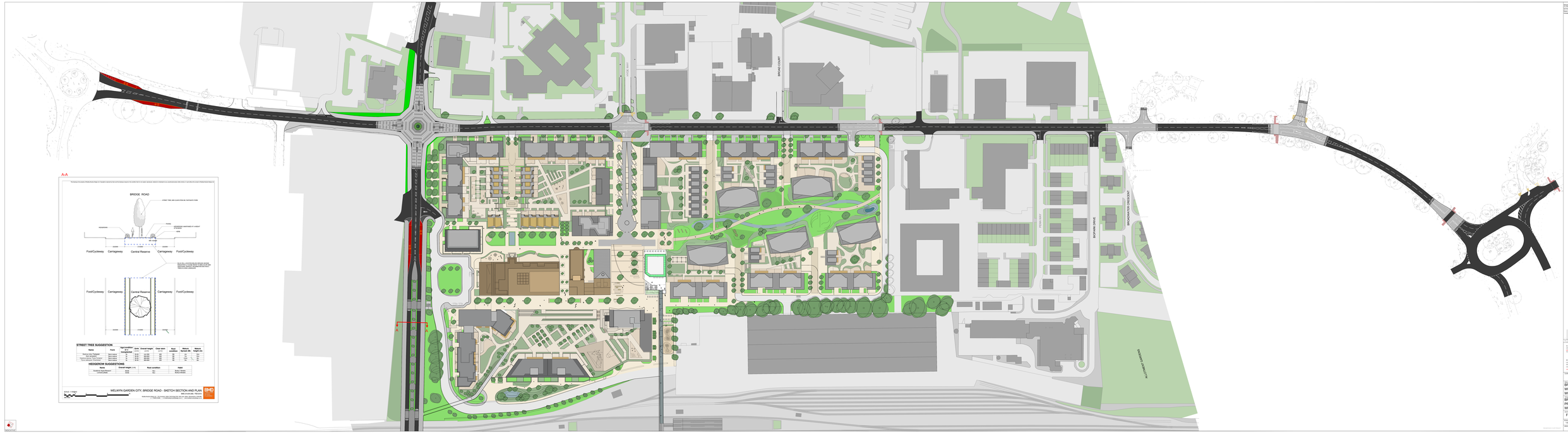
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BOFWIN DRIVE
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STREET TREE (SEE CLOUD STREET BY TOPSOIL)
HEDGEROW
HEDGEROW
HEDGEROW
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Foot/Cycleway
Carriageway
Central Reserve
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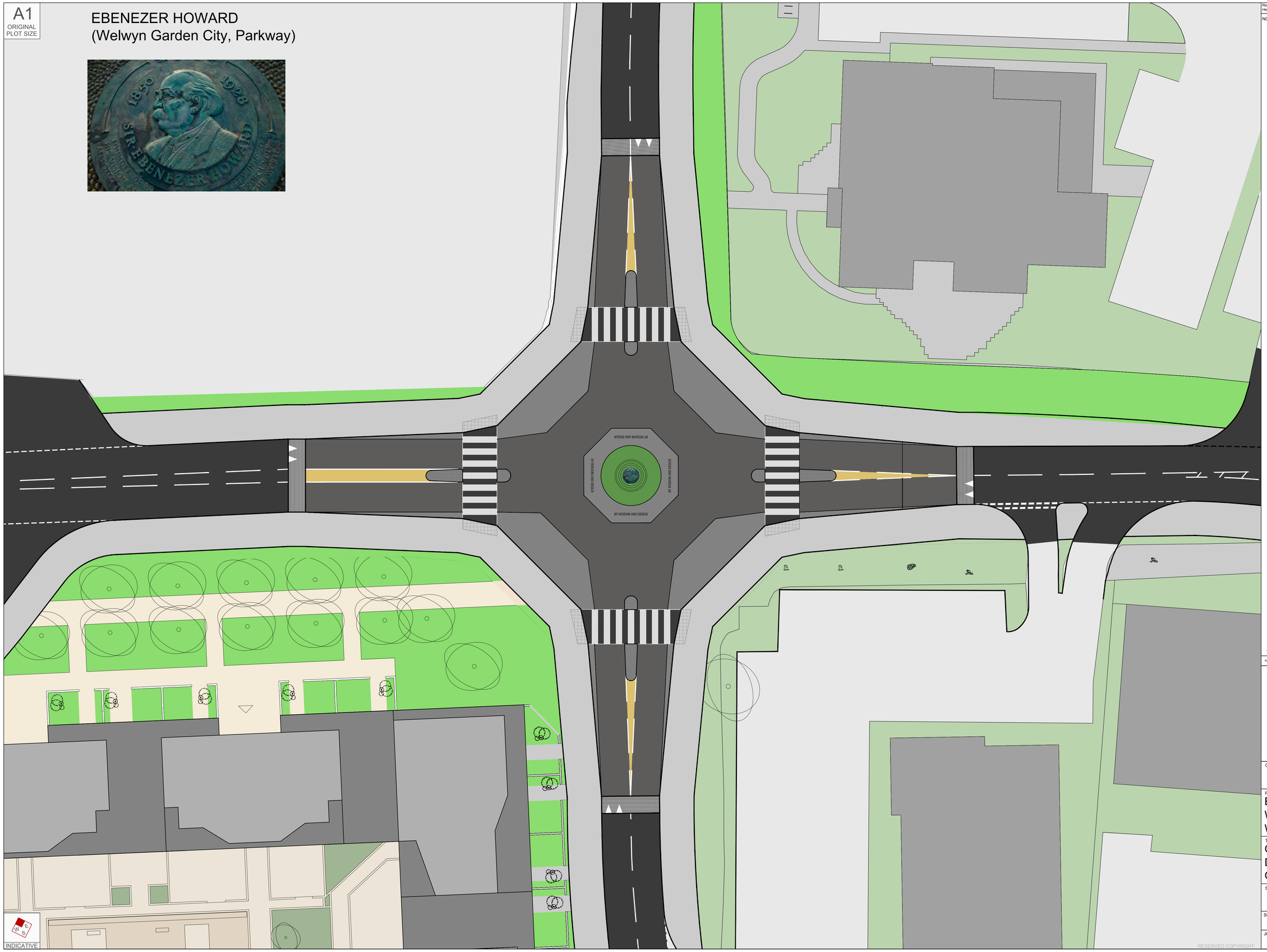
EBENEZER HOWARD
(Welwyn Garden City, Parkway)



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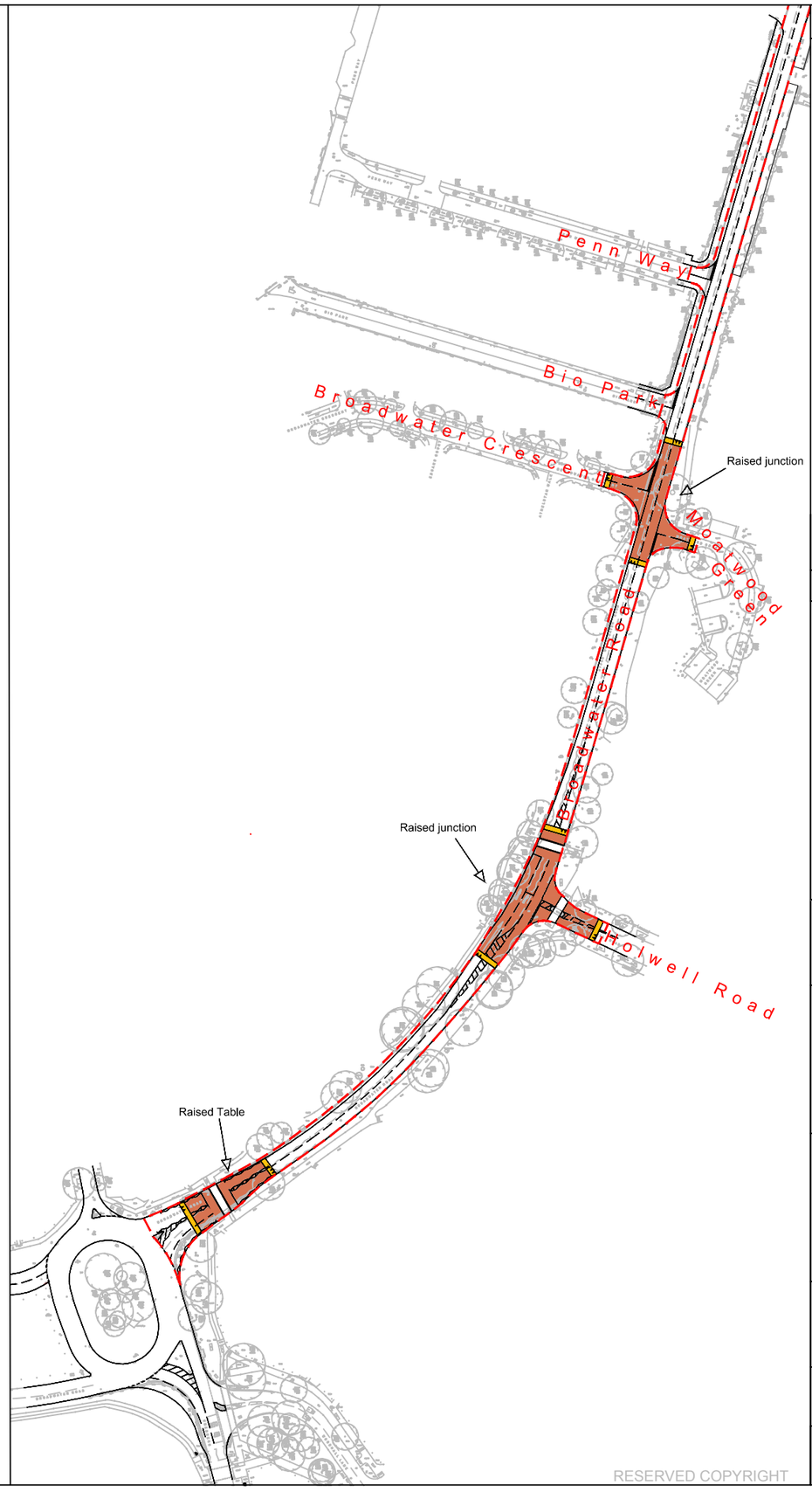

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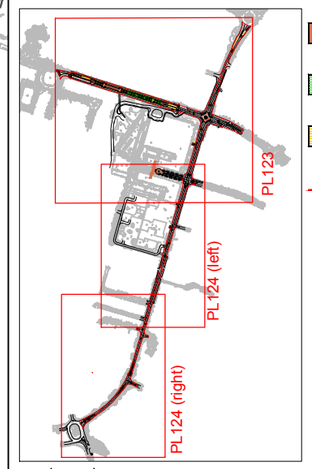

- Raised tables / junctions
- Landscaping
- Speed humps (ramps)
- Extent of highway works

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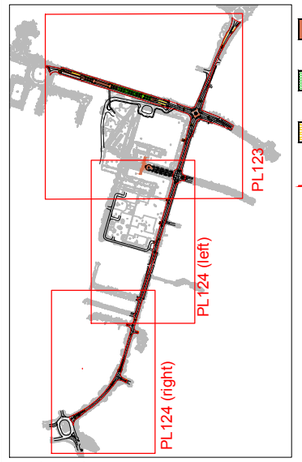

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Speed humps (ramps)

Extent of highway works

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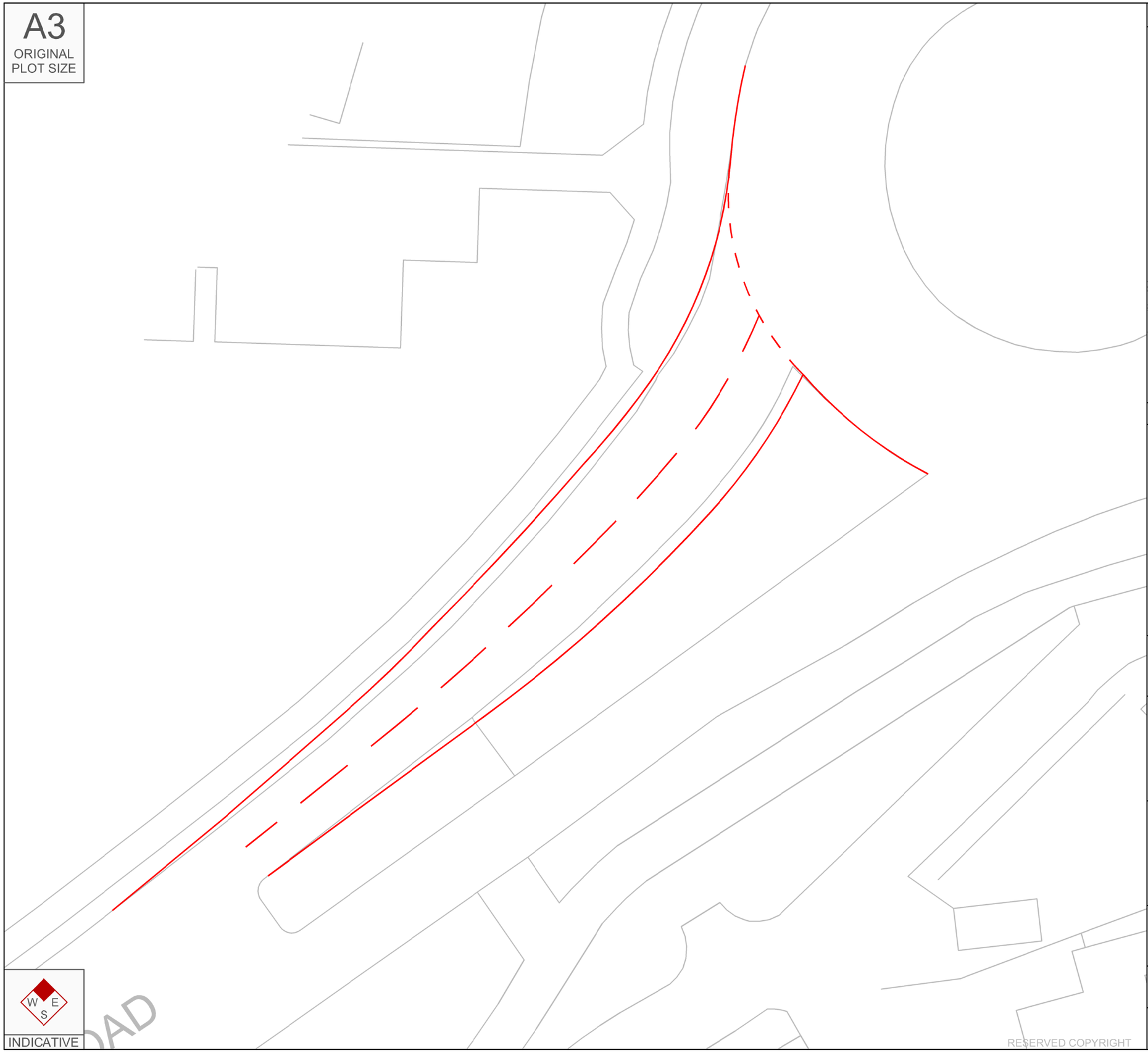

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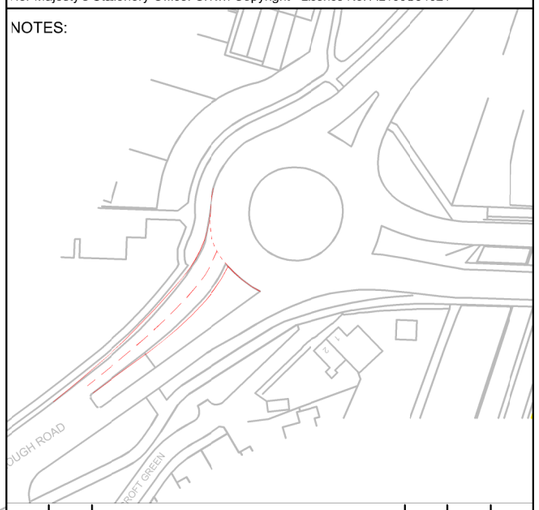

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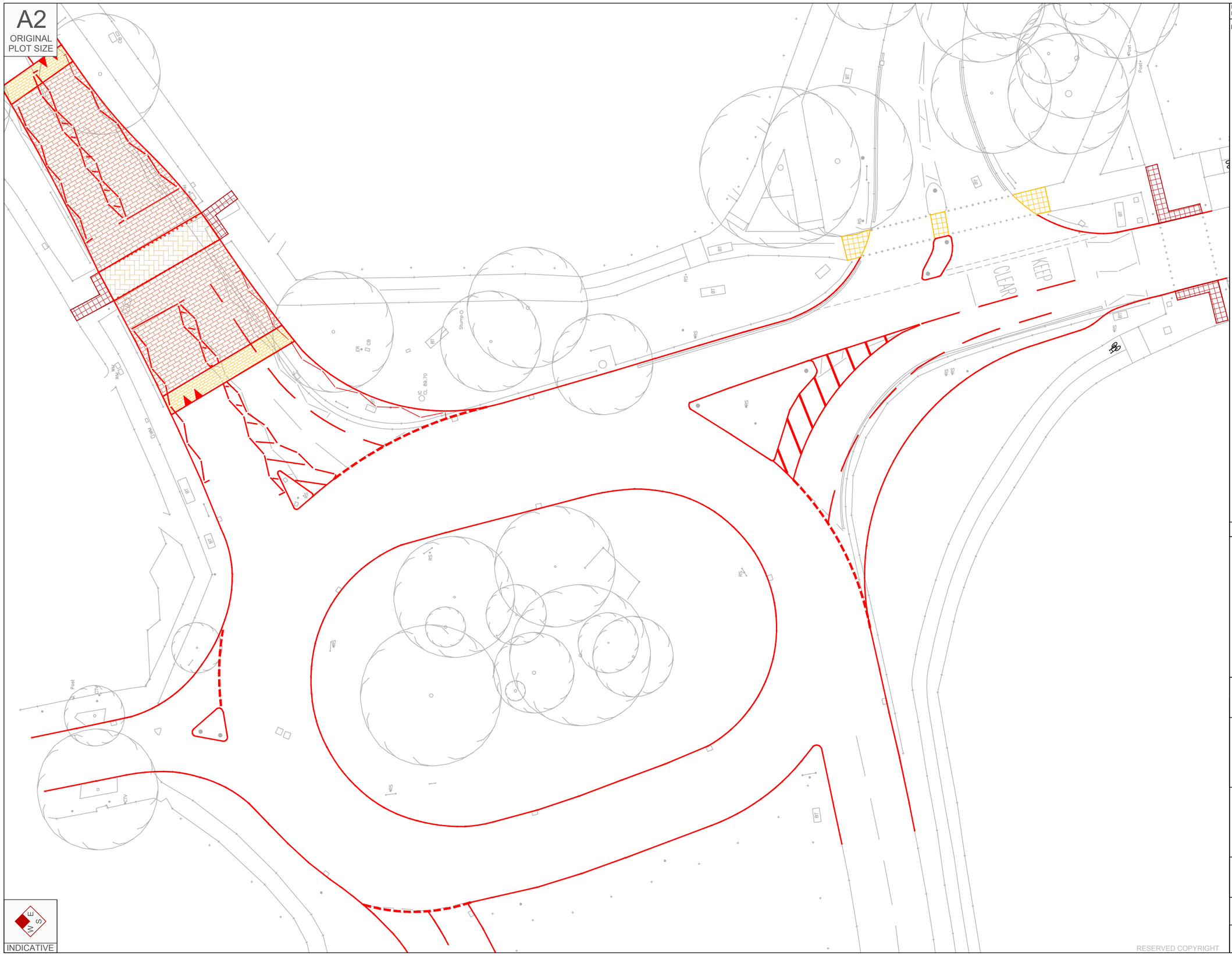

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1309-14	PL108	-

The Wheat Quarter, Welwyn Garden City

Residential led mixed-use development

FRAMEWORK TRAVEL PLAN

Prepared by: Entran Ltd

On behalf of: Plutus Estates (WGC) Ltd and Metropolitan Housing Trust

DATE: January 2018

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The Wheat Quarter, Welwyn Garden City

Residential led mixed-use development

FRAMEWORK TRAVEL PLAN

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V1	Dec 17	Draft	RAF	RLF	RGW
V2	Jan 18	Issue	RAF	RLF	RGW

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A Masterplan and schedules of accommodation

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1.0 INTRODUCTION

1.1 Overview

1.1.1 This Framework Travel Plan (FTP) has been prepared in support of a planning application for the redevelopment of the former Shredded Wheat Factory to provide a residential led mixed-use development. The proposed development is known as the Wheat Quarter.

1.1.2 The development Masterplan and further details of the application are included as **Appendix FTP-A**.

1.1.3 It is important to note that the site is in a highly accessible location very close to the rail station and bus station with excellent links to all public transport as well as walking and cycling infrastructure. There are few locations in Welwyn Garden City better suited to promoting car-free housing. The main highway corridors will be re-modelled as part of the development to reduce the dominance of vehicles and provide more space for pedestrians and cyclists. Therefore, given the highly sustainable location of the site and the parking restrictions in the area the proposal is to implement this as a low-car development.

1.1.4 This report forms one element of a four-part Transport Implementation Strategy comprising:

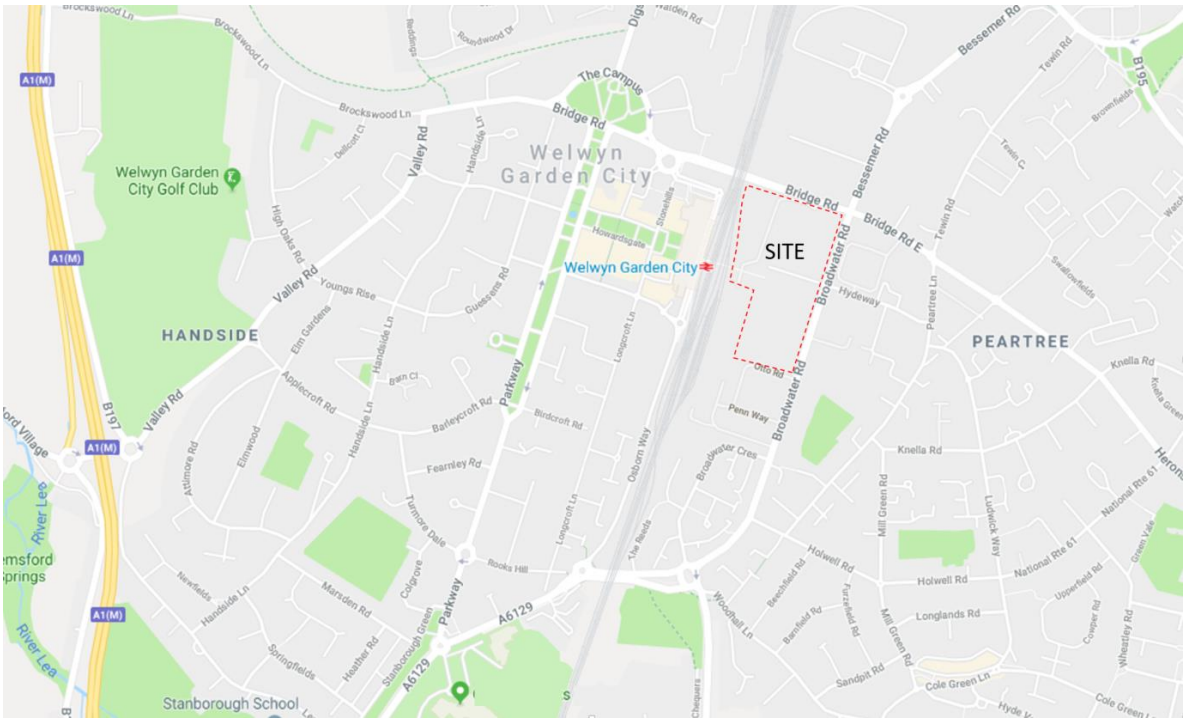
- Framework Travel Plan
- Delivery & Servicing Plan
- Construction Management Plan
- Car Parking Management Plan

2.0 SITE LOCATION AND DESCRIPTION

2.1 Strategic Site Location

2.1.1 The proposed development site consists of approximately 10.4 hectares (Ha) of brownfield land and is located on the eastern edge of Welwyn Garden City's town centre on Broadwater Road. The site is bounded by Bridge Road to the north, Broadwater Road to the east, residential developments to the south and the East Coast Mainline to the west. A location plan is included as figure 2.1 below:

Figure 2.1 – Site location



2.1.2 The northern portion of the site was previously occupied by the Nabisco Shredded Wheat Factory and includes some distinctive silos, which are listed buildings. The production building is also a grade 2 listed building and has been closed since 2008.

3.0 TRAVEL PLAN OVERVIEW

3.1 Purpose and Scope

3.1.1 This FTP forms part of a Transport Implementation Strategy (TIS) which seeks to influence how people travel rather than simply providing facilities based on current travel habits. This will encourage the use of sustainable travel modes from the outset. The TIS includes a Framework Travel Plan, A Delivery & Servicing Plan, a Construction Management Plan and a Car Parking Management Plan. The developer is committed to implementing and sustaining an effective Travel Plan to influence travel behaviour for residents, employees and visitors. This FTP provides a management plan for the movement of people, vehicles and goods.

3.1.2 The approach to the proposed development of the Wheat Quarter is to plan how people should travel to and from the development and then to provide the appropriate layout and infrastructure for them to do so. By planning the movement of people from the outset the scheme's layout and future management has been designed to influence modes of travel rather than simply reacting to them. The focus of any such plan is to reduce the need to travel, especially by car, and the provision of a mixed-use scheme incorporating commercial and residential properties with restrained parking levels in an area with excellent access to public transport is a fundamental element in achieving this objective.

3.1.3 This document has been prepared using the principles of a Framework Travel Plan rather than a full TP. This approach will allow the FTP to provide full details of the infrastructure and management processes so that detailed TPs may be prepared for the individual uses or occupiers prior to first occupation, using this main document for guidance.

3.1.4 The primary objective of the FTP will be to effect a change in both attitude to travel and more practically, a reduction in the use of single occupancy private car travel, thereby reducing total car mileage and the resultant impact on the environment. Additional, specific objectives are detailed in this FTP.

3.1.5 This is fully in accordance with the primary objectives of both the Government White Paper "A New Deal for Transport: Better for Everyone" (July 1998) and the National Planning Policy Framework (NPPF). This FTP has been prepared with reference to the Department for Transport guidance document 'The Essential Guide to Travel Planning' March 2008 and the DCLG guidance 'Travel plans, transport assessments and statements in decision taking' (2014).

3.1.6 The FTP will be a permanent and ongoing strategy for enabling residents and employees to travel to and from the site by more environmentally sustainable modes of transport and also to provide information and incentives to visitors.

3.2 Introduction to Travel Plans

3.2.1 A Travel Plan (TP) is a package of initiatives to tackle different aspects of transport, including commuter journeys, business travel and fleet management. The elements of a TP can vary depending on the nature of the development and local geography and circumstances.

3.2.2 A TP is typically a package of practical measures to encourage residents to choose an alternative to single-occupancy car-use, and to reduce the need to travel in connection with their work.

3.2.3 The TP should be tailored to a particular site and include a range of measures which will make a positive impact at that site, e.g. making best use of public transport; setting up a car sharing scheme; providing cycle facilities; restricting car parking or possibly setting up video conferencing facilities to cut travel to other sites. The purpose is to make the more sustainable transport modes safe and practical and therefore attractive to residents.

3.2.4 The key aspect of a TP is that it integrates the various ways people use transport in and around the development to ensure that they complement each other. A TP can have real benefits to the development, its residents and employees, and the local community.

3.3 The Benefits of a Travel Plan

3.3.1 The effects of travel choices on our environment, our health and our quality of life are well documented. Sources describe how increases in road traffic have produced unsustainable levels of congestion and pollution. The effects can be felt at a local level through poor air quality, noise and busier roads and at a global level through suggested linkages to climate change. Journeys by road are becoming slower and less reliable causing problems for the economy and stress to drivers.

3.3.2 There has been a significant increase in the proportion of individuals travelling to work or study by car. Throughout Hertfordshire over 80% of car journeys to work are driver only (single car occupancy). Even a small modal shift in home-work-home journeys away from the car would result in a considerable reduction in traffic congestion at peak times.

3.3.3 It is necessary to look at the way residents currently travel and consider ways of reducing the impact on the surrounding highway network of that travel. This means using more sustainable alternatives such as walking, cycling, bus or car-share in preference to single occupancy car use. The TP should cause residents, employees and visitors to reconsider how they make regular journeys.

3.3.4 If every car commuter used an alternative to the car on just one day a week, car usage levels for such journeys would be reduced by as much as 20% immediately, with parking requirements also reduced by up to 20%. In most towns a 20% reduction in peak hour travel is similar to the reduction experienced during school holidays.

3.3.5 Table 3.1, below, summarises some of the benefits of implementing a TP and indicates who will benefit.

Table 3.1: Who will benefit from the Travel Plan?

Benefit	Residents	Employees	Community/ Environment
Cost Savings	√	√	
Healthier staff/residents and reduced absenteeism	√	√	
Improved site access	√	√	√
Reduced Congestion	√	√	√
Reduced accidents	√	√	√
Improved staff morale		√	
Improved quality of life	√	√	√
Reduced stress	√	√	
Improved local air quality	√	√	√
Reduced noise			√

3.3.6 TPs can produce indirect but significant benefits, such as improving the punctuality of staff. For example, residents who cycle or walk to work will generally become fitter and by having a TP, the developer demonstrates a more responsible and caring attitude to residents and the local community.

3.3.7 Increasingly, educational, health and commercial organisations are incorporating TPs into their environmental strategy. It is an important way of demonstrating their commitment to improving the environment.

3.3.8 In addition, a TP is a good foundation for future business operations. Transport sustainability and costs are issues that will become ever more important.

3.3.9 The problems of traffic growth have been recognised from a global perspective, to a national level and down to local level in Hertfordshire. TPs are seen to be a key factor in tackling the ever-increasing problems caused by the over reliance upon the motor car and the reluctance to use public transport or walk.

3.3.10 Details of relevant national and local guidance are contained in Section 2 of this report.

3.3.11 NPPF explains the Government's principal policies relating to transport and planning. This places increased emphasis on TPs with recognition given to the role they play in delivering sustainable transport objectives.

3.4 Components of the Travel Plan

3.4.1 As explained earlier, this FTP accompanies the proposal for new mixed-use regeneration scheme called the Wheat Quarter and will set the parameters for future residents and commercial occupiers to develop detailed TP measures under the aegis of this main FTP. There are a number of key components required within such a TP to ensure that an effective and successful strategy is implemented. The key components include:

- **Background Information** – the existing travel habits of staff/residents/visitors must be identified and the reasons for them understood, before any attempt can be made to influence transport choices.

- **Objectives and targets** – once the existing conditions are known, realistic, attainable, time-bound objectives can be developed, in the light of operational and budgetary constraints. Objectives and targets may be different. Objectives may be as abstract as explaining the reason for implementing certain measures whereas targets may be measurable outcomes or goals.

- **Measures** – having set the objectives the appropriate measures required to attain them should be identified. This process will be an evolutionary one and the measures adopted may vary over time as new partners are found and the effectiveness of measures are evaluated. Therefore, both long and short term policies and initiatives need to be developed. The measures should be 'worked up' in partnership with the local highway and planning authorities.

  This FTP identifies two types of measure; secured and potential. The *secured* measures are those which are either already in place or will be delivered as part of the proposed redevelopment scheme. These may include both infrastructure and management practices. The *potential* measures area those which may be considered appropriate at some stage in the future but which will need to be reviewed following each survey and review session.

- **Raising awareness and Marketing** – it is essential, if the plan is to succeed, for the operators to "take ownership" of the plan. A wave of awareness and involvement must be created and the strategy to achieve this must be flexible, but an outline approach is set out within this FTP.

- **Monitoring and Review** – The range of success achieved and the need to adopt new tactics or focus on new sub-groups can only be recognised if attitudes to transport and the measures adopted are monitored from the beginning. This TP therefore sets a programme for surveys and reviews.

3.4.2 It should be noted that a TP is a document that will evolve over time as additional information becomes available and the travel habits of residents and visitors change. To consider any document to be the definitive TP for the development will lead to an ineffective, and ultimately, obsolete initiative. The plan needs to set out the policy objectives and initiatives, but allow them to develop and evolve over time.

3.4.3 All of the above issues are discussed in greater detail in the following sections.

4.0 POLICY AND BEST PRACTICE

4.1 National Policy

4.1.1 Travel plans play an important role in ensuring that national, regional and local transport policy objectives are achieved, and the planning process encourages more sustainable development. The **National Planning Policy Framework (NPPF)** emphasises the need for sustainable travel to be at the heart of any planning permission. Prior to it being superseded by NPPF, PPG13 stated that travel plans are a tool for the planning system to deliver sustainable transport objectives, including:

- Reductions in car usage (particularly single occupancy journeys) and increased use of public transport, walking and cycling.
- Reduced traffic speeds and improved road safety and personal security particularly for pedestrians and cyclists; and
- More environmentally friendly delivery and freight movements, including home delivery services.

4.1.2 In addition, a number of national policies, such as the **2004 Transport White Paper**, have influenced travel plan development and take-up. **The 2004 Public Health White Paper** also promoted the need to build cycling and walking into people's daily lives, to increase physical activity levels of the nation.

4.2 Best Practice Guidance

4.2.1 In recent years, guidance on best practice in travel planning has been issued at national, regional and local levels. In 2008, the Department for Transport published Guidance on securing travel plans through the planning system. This document provides guidance on the role and benefits of travel plans in the planning process, the way to secure them, their interrelationship with Transport Assessments. It also discusses the requirements and elements of an effective travel plan.

4.2.2 In 2014 DCLG produced guidance entitled 'Travel plans, transport assessments and statements in decision taking'. This is less prescriptive than the DfT guidance from 2008 but sets the current policy and practice framework against which any Travel Plans should be developed.

4.3 Hertfordshire's Travel Plan Guidance for Business and Residential Development

4.3.1 Hertfordshire County Council's (HCC's) travel plan guidance provides a background to the purpose and policy base as well as practical advice on design and content. Importantly, HCC's guidance sets out how Travel Plans fit in to the planning process including appropriate means for securing the plans as well as future monitoring and enforcement.

5.0 SITE ASSESSMENT

5.1 General

5.1.1 Broadwater Road forms part of the A1000 which links the A1(M), to the north of Welwyn Garden City, to the A414 and Hatfield to the south, before continuing on to north London.

5.1.2 Broadwater Road has a width of approximately 8.0m and is subjected to a 30mph speed limit, which is enforced by speed cameras. There are a number of roads joining of roads joining Broadwater Road which provides access to residential areas; there are also a number of employments sites with direct access on to Broadwater Road.

5.1.3 Hydeway had a width of approximately 6.75m and provides access from Broadwater Road to the footbridge over the railway line. The proposed development site lies on both sides of Hydeway and as such there are currently no properties served directly by Hydeway.

5.1.4 A significant number of Sheffield loop stands have been provided on the southern side of Hydeway. These are popular with commuters from the east of Welwyn Garden City who park their bicycles on Hydeway and cross the footbridge to the Station.

5.1.5 Bridge Road is a dual carriageway that runs from the east to west, with access to the town centre via Hunters Bridge which crosses the railway and is subjected to a 30mph speed limit. The width of the carriageway varies from 14m to 15.5m as the number of lanes changes from single to two lanes in either direction. There is a central reserve for the majority of its length.

5.1.6 The junction between Bridge Road and Broadwater Road is a four arm signal controlled junction with two approach lanes on Bridge Road east and three approach lanes on the other three arms. The signals include uncontrolled pedestrian crossings with central refuges on each arm.

5.2 Audit Process

5.2.1 Initial pedestrian, cycle and public transport audits have been carried out for the area surrounding the development site.

5.3 Pedestrian Movement

5.3.1 Acceptable journey distances on foot vary depending on the purpose of the journey, the environment in which the journey is taking place and of course the individual walking. Prior to being superseded by the National Planning Policy Framework (NPPF) PPG13 suggested that walking offers the greatest potential to replace short car trips for journeys less than 2km. The IHT guide ‘Providing for Journeys on Foot’ suggests that for commuting a desirable walking distance would be 500m, an acceptable walking distance would be 1km and the preferred maximum walking distance would be 2km, in line with the PPG13 advice.

5.3.2 The site is accessible to the town centre and surrounding areas and facilities through and extensive footway network, which includes the footbridge linking Hydeway to the railway station. The town centre and railway station are both within approximately 200m form the site, which is within the desirable walking distance for commuting and shopping.

5.3.3 There are footways along both sides of Broadwater Road, one with a grass verge between the carriageway and the footway, with the width varying from approximately 3.2m to 4m. Bridge Road has footways along both sides of the carriageway, with the width varying from approximately 2.6m to 2.9m. The footways continue along Bridge Road East, although the width varies from approximately 2.3m on the north side and 3.9m on the south side. Bessemer Road has footways of between 2.6m and 2.9m along both sides of the carriageway.

5.3.4 There are footways along both sides of Hydeway, with widths of between 2.4m and 2.5m.The footbridge which provides access to the railway station has a width of approximately 3m and is currently accessed on the site-side via a flight of steps, restricting access for wheelchair users and, making access for those with pushchairs difficult.

5.3.5 There are currently two signal controlled pedestrian crossings within 100m walk of the site providing access across Broadwater Road (south of Hydeway and north of Otto Way) as well as uncontrolled crossings at the junction between Broadwater Road, Bessemer Road and Bridge Road. All formal crossing points, whether controlled or uncontrolled, have flush dropped kerbs and tactile paving.

5.3.6 Overall the footways in the area around the site are generally in a reasonable state of repair and street lighting is provided.

5.3.7 Figure 5.1 below shows five, ten and fifteen minutes walking isochrones from the site to the surrounding area. This demonstrates that a wide range of facilities and transport hubs are within easy walking distance from the site. This includes the Howards Centre, railway station and bus station. Additional retail, food and drink, pharmacy and health facilities are within easy walking distance as well as education and employment.

Figure 5.1 – Walking times

5.3.8 It is important to recognise that the East Coast Rail line offers a degree of severance between the site and the town centre. There are two available crossing points; the first is Hunters Bridge and the second is an existing footbridge which spans the rail line between Hydeway and the rail station.

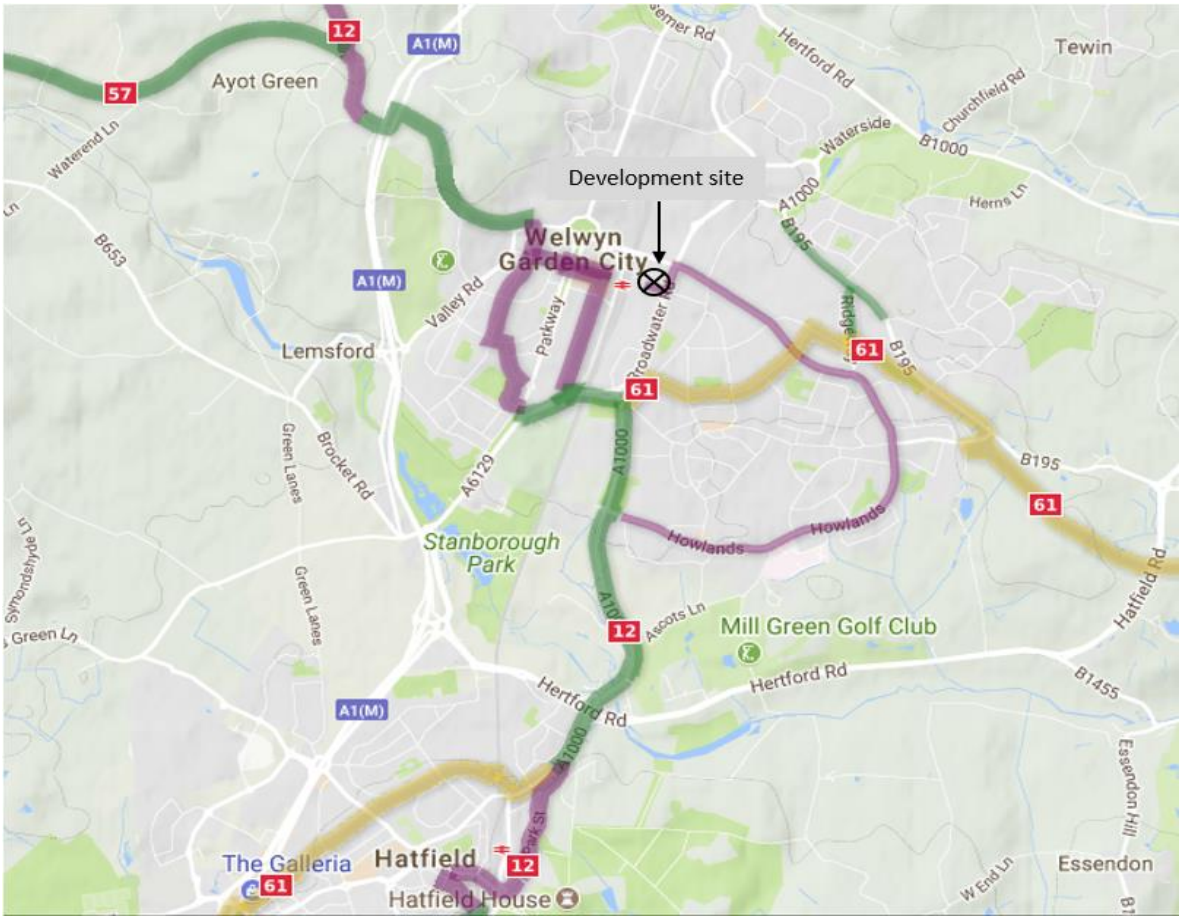
5.4 Cycle Movement

5.4.1 It is widely recognised that cycling has the potential to substitute for short car trips, particularly those that are less than 5km. The site lies within 5km of every point in Welwyn Garden City and as such all local facilities, such as schools, leisure and employment sites are all within an acceptable cycling distance.

5.4.2 Within the proposed development site, there is currently secure cycle parking for approximately 90 cycles along Hydeway. These stands are heavily utilised by commuters who park on Hydeway and then use the footbridge to access the railway station and Welwyn Garden City town centre.

5.4.3 Figure 5.2 below shows the site's proximity to the National Cycle Network. This demonstrates that a series of traffic-free (green) and lightly trafficked (purple) cycle routes provide access to a wider catchment by bike. The Great North Way, National Cycle Network Route 12 (NCN12) runs from Enfield Lock in north London to Spalding via Stevenage and Peterborough. NCN12 generally leads north to south and connects Route 61 (Cole Green Way) & 57; which lead east towards Hertford and west towards Harpenden respectively. The site benefits from the National Cycle Network as it is directly to the east and leads to Route 61 & 12.

Figure 5.2 – National Cycle Network (extract)



5.4.4 Hydeway (west) as it dissects the site is signed as an advisory cycle route to the station. The 'footway' on the southern side of Hydeway is signed as a cycle route. This is somewhat ambiguous as it should be signed as a shared cycleway footway.

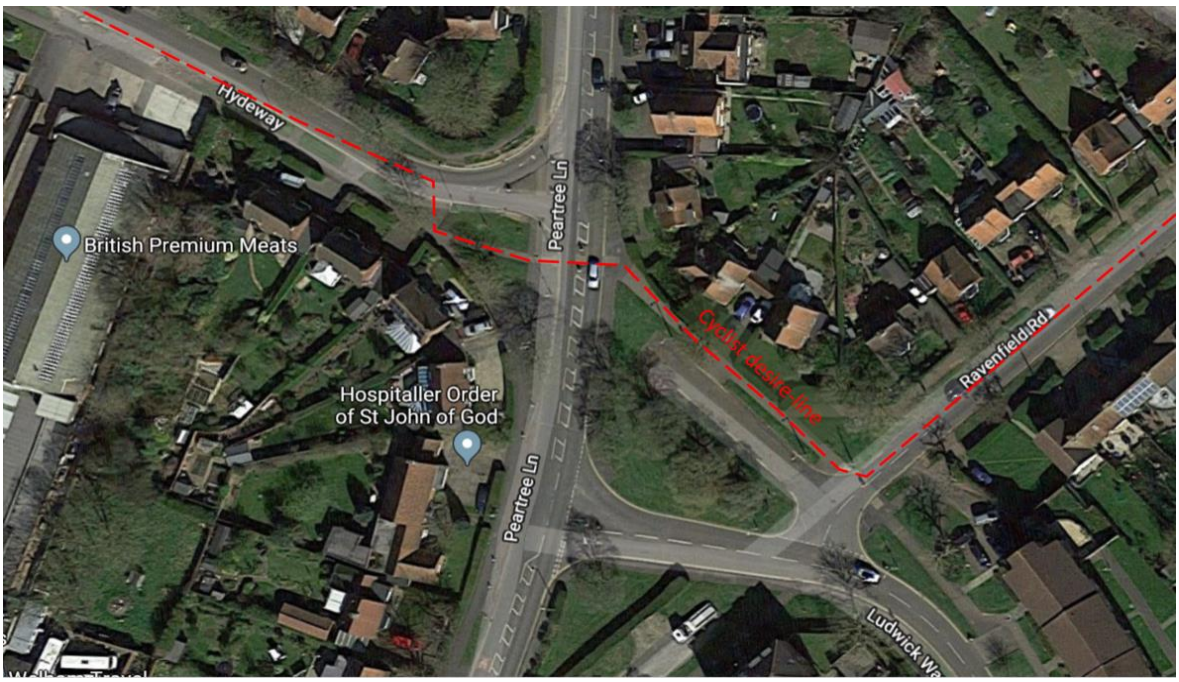
5.4.5 An extract from the WHBC Cole Green Way cycle map is shown in figure 5.3 below with the development site location indicated.

Figure 5.3 – Extract from Cole Green Way cycle map

5.4.6 This plan shows the existing traffic-free cycle routes in Welwyn Garden City and also shows a proposed cycle route running along the western side of Broadwater Road. This was proposed as part of the consented Shredded Wheat development.

5.4.7 Additional signage directs cyclist from the junction with Broadwater road, east along Hydeway (east) towards Bridge Road East. We understand from local ward Councillors that this results in cyclists using the footway between Peartree Lane and Ravenfield Road. This is illustrated in Figure 5.4 below.

Figure 5.4 – Cyclist desire line from Hydeway east.



5.4.8 The combination of the National Cycle Network, local cycle routes, proposed routes and lightly trafficked residential roads make proposed development site a suitable location to promote travel by bike.

5.5 Bus Provision

5.5.1 The nearest bus stops are located Broadwater Road, Bridge Road and Osborn Road. The entire site is within 200m of six bus stops; these are served by 14 bus routes in total. Bus stop on Broadwater Road is served by the bus 601 with majority of the services severed by the bus stop of Bridge Road. The bus services, duration and frequency can be seen on table 5.1. Full, current bus timetables can be found at arrivabus.co.uk, centrebus.info, greenline.co.uk, tfl.gov.uk and unobus.info. These bus services are summarised below:

Table 5.1 – Bus route summary

No	Details	Duration	Frequency
201	Welwyn Garden City – Welham Green	0923 – 1004	1 trip per day (Tuesday and Friday)
203	Welwyn Garden City – Watton at Stone	1245 - 1323	1 trip per day (Thursday only)
206	Welwyn Garden City – Panshanger Circular	0845 - 1505	2 trips per day (Tuesday, Thursday & Friday)
242	Welwyn Garden City – Waltham Cross	0814 - 1840	2 hours
300	Hemel Hempstead - Stevenage	0540 - 1953	20 – 30 mins
301	Hemel Hempstead - Stevenage	0547 - 2348	20 – 30 mins
314	Welwyn Garden City – Hitchin	0740 - 0825	8 trips per day
315	Kimpton - Welwyn Garden City	0700 - 1825	4 trips per day
330	St. Albans – Welwyn Garden City	0800 – 1500	30 mins
366	Luton – Welwyn Garden City - Hatfield	0606 - 1907	1 per hour
388	Herford - Welwyn Garden City - Stevenage	0637 - 0825	1 trip (Schooldays only)
401	Welwyn Garden City – Panshanger Circular	0610 - 1950	20 – 30 mins
403	Woodhall and Haldens Circular	0721 - 1904	30 – 40 mins
404	Welwyn Garden City – South Hatfield	0900 - 1755	2 hours
405	Welwyn Garden City – South Hatfield	1000 – 1655	2 hours
601	Borehamwood – St Albans - Welwyn Garden City	0616 - 2026	20 – 30 mins
653	Welwyn Garden City – New Greens	0548 - 2247	20 mins
724	Heathrow Airport - Harlow	0315 - 2209	20 -30 mins

5.5.2 It is clear that the site is well served by frequent bus service which are located in close proximity to the site. The services in table 5.1 connect with the bus station allowing passengers to connect to the wider local bus network. The bus station is less than 500m walk from the site.

5.5.3 Works to improve the Bus station are due for completion at the end of March 2018. The new bus station layout will segregate pedestrians and buses in order to improve safety and ensure ease of access for all bus passengers. A custom designed bus shelter will be provided for all six bus stops and will contain seating, lighting and bus information.

Figure 5.5 – Artists impression of bus station improvements

5.6 Rail services

5.6.1 The nearest rail station is Welwyn Garden City, located to the west of the site and accessed via the footbridge which connects the site to the town centre. The stations is served by the Great Northern Route (southern end of East Coast Main Line). Welwyn Garden City train station benefits from a bus terminus, taxi rank and secure, covered cycle parking. Trains from Welwyn Garden City provide a direct link to London King's Cross station to the south and Peterborough to the north. The journey times to main destinations can be found in Table 5.2.

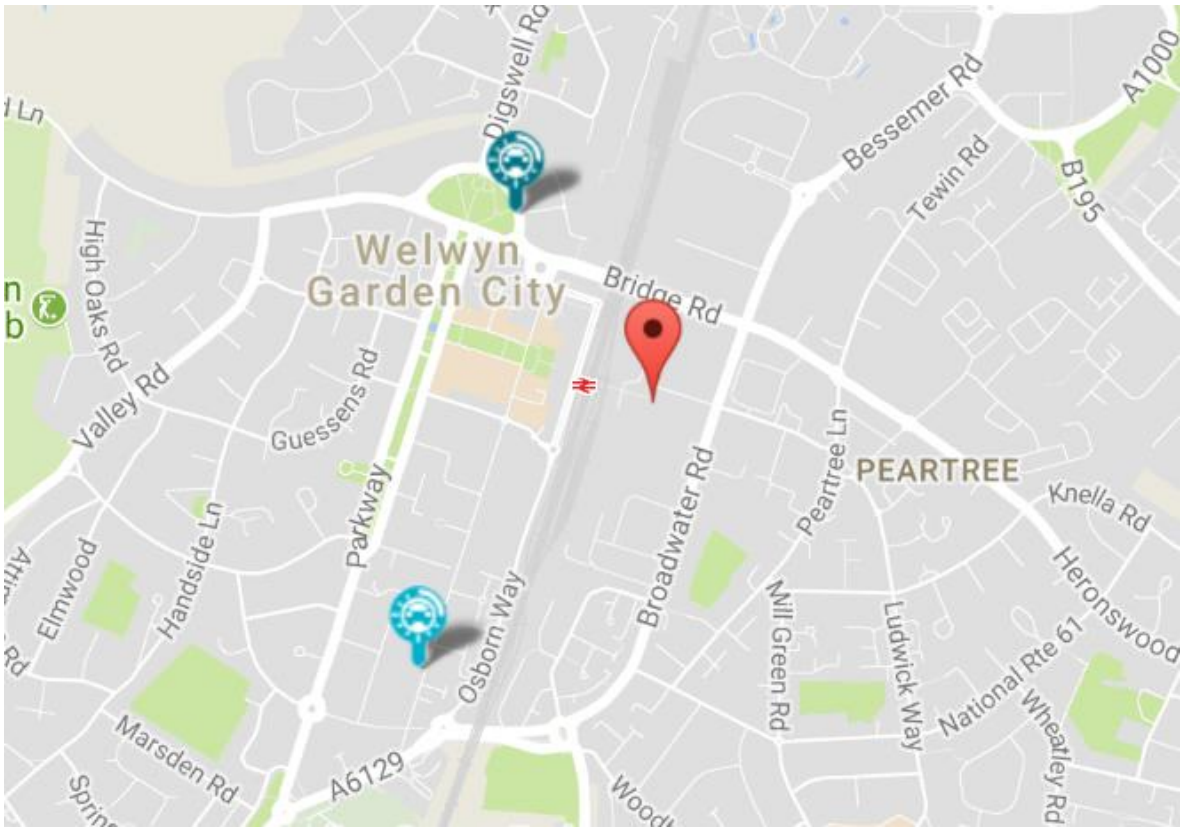
Table Error! No text of specified style in document.**.1 - Train journeys from WGC train station**

Destination	Duration
London King's Cross	23 mins
Moorgate	47 mins
Cambridge	57 mins
Peterborough	1hr 4mins
Stevenage	10 mins

5.7 Car Clubs

5.7.1 There are two Car Clubs operating in the Welwyn Garden City area including E-Car and Hiya Car. The closest of these is the E-Car space in the WHBC car park, the second is a Hiya car space is on Longcroft Lane, 1.1km (15 minutes' walk) from the site.

Figure 5.6 – Existing Car Club locations



5.8 Accessibility Audit Summary

5.8.1 The site is well linked to Welwyn Garden City town centre and surrounding residential areas on foot and by cycle. In addition, Cole Green Way cycle route links to the National Cycle Network providing direct and convenient links to Hertford and Harpenden.

5.8.2 The site is well served by frequent bus services and the town centre bus station is due to be upgraded by Spring 2018.

5.8.3 The site has excellent access to Welwyn Garden City rail station from where trains can be taken to London, Cambridge, Peterborough and Stevenage.

5.8.4 The site is very well located to promote travel by sustainable modes of transport and would reduce the need to travel by car.

6.0 PROPOSED DEVELOPMENT

6.1 Development description

6.1.1 The proposed development comprises the creation of a mixed-use quarter including the erection of 1,340 residential dwellings of which 414 (31%) will be affordable dwellings (Use class C3); 114 extra care homes (use class C2); the erection of a civic building including health (D1), community use (D1), office (B1), retail (A1) and food and drink (A3-A5) uses. The alterations, additional and change of use of the Grade II Listed Building and retained silos provide flexible business space (B1), combined heat and power (Sui Generis), International Art Centre (D1) Gymnasium (D2), restaurant/coffee shop/bar (A1-A5), Crèche and Network Rail TOC building. The development includes car and cycle parking, access, landscaping, public art and other supporting infrastructure.

6.1.2 The development is generally sub-divided into two halves, north and south of Hydeway. The south site comprises residential development only whereas the north site represents the mixed-use area of the development with residential, commercial and community uses.

6.1.3 The proposed schedules of accommodation and masterplan are included as **Appendix FTP-A**.

6.2 Cycle parking provision

6.2.1 The total residential cycle parking provision across the Wheat Quarter will therefore be 1454 spaces. In line with local and national guidance the cycle parking has been disaggregated into smaller secure cycle stores close to the residential cores. Best practice suggests that smaller stores are more secure and more likely to be used. The decision to place them next to the residential cores not only makes the journey between store and apartment shorter, it also means that the residents are more likely to be sharing the cycle store with immediate neighbours and those who they meet on a daily basis. This also adds to a feeling of security and increases the usage of the cycle stores.

6.2.2 All cycle stores will be secure and well-lit. Figure 6.1 below is an extract from the Design and Access Statement and illustrates the disaggregation of residential cycle parking across the site.

Figure 6.1 – Residential cycle parking locations

6.2.3 The commercial cycle parking provision is divided into Long-stay and Short-stay. For the proposed commercial and community uses the long stay parking requirement is for one space per 10 members of staff on site. For the 'A' class uses, due to the size of the individual units this generally equates to a single space so the long-stay staff cycle parking will be incorporated into the back of house component of the units. The B1 office has a requirement for 18 long-stay spaces so these will be provided in the form of 9 stands at ground floor level. The D2 arts and leisure uses have a requirement for 11 long-stay staff spaces so these will be provided at ground floor level.

6.2.4 In addition to the long-stay spaces a total of 180 short-stay spaces will be provided across the development. Of these 100 spaces will be provided to serve the function of the existing Hydeway cycle parking. Around 20 of these will be provided on Hydeway itself as Sheffield loop stands and a further 80 will be provided beneath the new steps up to the footbridge. These will be in a variety of formats including lockers and stands.

6.2.5 A further 80 short-stay visitor space will be provided across the development, close to the entrances to the non-residential uses. These will be standard Sheffield loop stands, located in well-lit, well supervised areas.

6.3 Car parking

6.3.1 The south site will include 472 residential car parking spaces of which 10% will be visitor spaces and 6% will be Car Club spaces.

6.3.2 The majority of parking across the south site is provided in the form of undercroft parking beneath podium landscape areas. This ensures parking will be provided sensitively.

6.3.3 The north site will include 521 residents parking spaces of which 6% will be Car Club spaces. A further 142 non-residential parking spaces will be provided for the employment and community uses.

6.3.4 The majority of parking across the north site is provided in the form of basement or undercroft parking. The large basement beneath blocks 6 and 7 dramatically reduces the need to provide on-street or open plan parking. In addition, the car park beneath blocks 2 and 3 is masked from the public squares by landscape structures such as tiered landscaping, steps and ramps. This is a common approach in major cities throughout the UK and Europe and ensures high quality parking provision but minimises the dominance of parking on the public realm. This ensures parking will be provided sensitively.

6.3.5 Hydeway has been re-modelled to include 16 short-stay parking spaces, oriented at 45 degrees to the carriageway to facilitate a one-way system into and out of Hydeway. This reduces the overall corridor width of Hydeway (compared to parking at 90 degrees) and allows for a tree planting and landscaped areas. These short-stay spaces are expected to allow parking up to 15 minutes. This is sufficient for those collecting passengers arriving at the station and also for those visiting the convenience stores as part of a pass-by trip on their way to or from work.

6.3.6 In addition, a new over-sized turning circle has been provided at the head of Hydeway. This facilitates the one-way operation but also allows cars to stop against the kerb to set down passengers who may work within the development site or be walking through to the station or town centre. The 'kiss-and-ride' facility was incorporated into the approved scheme and has been retained in the current proposals. The turning circle has been designed so that if a large car is setting down a passenger, another car can still pass on the inside.

6.3.7 A further six spaces have been provided down the middle of Hydeway. The proposal is that these spaces will be taxi spaces. Hydeway will become a private road so the provision of these spaces on private land will function in a similar manner to taxi rank spaces on Network Rail land at many rail stations. The operation of these spaces will be agreed and secured by means of the Car Parking Management Plan. This will be secured by planning condition.

1.1. All Car Club spaces and 20% of all other spaces will be provided with electric vehicle charging points (EVCP). Where practicable, a further 20% will have passive EVCP provision.

6.3.8 Undercroft residential parking areas in the south site and basement residential parking areas in the north site will have gates set back from the carriageway. These will be electronically operated either by keypad or transponder.

6.4 Transport improvements

6.4.1 The Wheat Quarter proposal will deliver all of the off-site transport improvements agreed as part of the consented scheme. It will also fund some additional off-site improvements. These are set out below:

Road hierarchy

6.4.2. The access from Bridge Road will remain as a private road with a minimum width of 6m. A 2m footway will be provided along the western side of the carriageway.

6.4.3. The southern access from Broadwater Road will be a major access road with a width of 6.0m where cars are parked at 90 degrees and a minimum of 4.8m otherwise. The carriageway has localised widening on bends where necessary. In addition there will be a segregated footway provided through the central landscape area and to each of the residential blocks.

6.4.4. The three Mews / Streets, which form part of the internal road network, will all be shared surfaces with a width of approximately 6m.

6.4.5. All accesses from Broadwater Road will have raised entrance tables to assist pedestrian/cycle movement along Broadwater Road.

Broadwater Road improvements

6.4.6. The redevelopment proposals would reallocate the existing highway land along Broadwater Road so that there is greater provision for pedestrians and cyclists. The existing carriageway would be narrowed to 6.75m while a 4m foot/cycleway would be provided along both sides of the carriageway across the site frontage, where possible.

6.4.7. The narrowing of Broadwater Road would continue along its entire length, providing the opportunity to widen pedestrian and cycle facilities along the length of Broadwater Road as the area is redeveloped in the future, subject to land ownership.

6.4.8. The existing pedestrian crossing facilities along Broadwater Road will be retained, although the signalised crossing south of Hydeway will be relocated further north.

Bridge Road / Hunters Bridge improvements

6.4.9. Overall traffic calming measures proposed along Broadwater Road will be extended to include Bridge Road and Hunters Bridge so that the characteristics of these roads are changed from being vehicle dominant to an area which is more attractive to pedestrians and cyclists.

6.4.10. The proposals will narrow the highway land allocated to vehicles so that there is a single 3m lane in either direction. This in turn allows the foot/cycleways to be widened to 4m along both sides of the carriageway and a central pedestrian area of approximately 5.7m will also be provided.

Rail bridge

6.4.11. The existing rail bridge between the site and the railway station will be refurbished as part of the development. This will include demolishing the existing steps on the site side of the rail lines and replacing them with a new set of much wider steps directly onto the newly created public square. The stops will include provision to wheel bicycles up onto the bridge. A range of bespoke cycle parking facilities will be provided beneath the steps. A lift will also be provided to allow access for the mobility impaired or for those with pushchairs for example. The bridge itself will be refurbished in agreement with Network Rail. Full details of the bridge refurbishment are submitted in support of the planning application.

Broadwater Road / Bridge Road junction

6.4.12. The existing signalised crossroads of Broadwater Road / Bridge Road and Bessemer Road will be altered to a shared space 'octabout'.

6.4.13. The proposed octabout will operate along the same principals as a roundabout albeit on a less formal basis, as the intention is to introduce controlled uncertainty to drivers which will result in slower vehicle speeds and a more agreeable environment for pedestrians and cyclists.

Broadwater Road / Osborne Way / Stanborough Road junction

6.4.14. The Stanborough Road arm of the Broadwater Road / Osborn Way / Stanborough Road roundabout will be widened to 8.5m to increase the approach capacity.

Broadwater Road / A1000 Chequers roundabout

6.4.15. The Broadwater Road and A1000 Chequers arms of the Broadwater Road / Broadwater crescent / A1000 Chequers roundabout will be improved to increase the flare lengths on both arms to increase the entry capacity.

Hydeway west

6.4.16. The kerb radii on the entry to Hydeway west will be increased to improve entry / egress for HGVs. The radii on the western arm of Hydeway will also be altered and the whole junction will become a raised table.

6.4.17. Highway rights will be extinguished (stopped-up) from Hydeway west so that the road will become private in line with the other access roads into the Wheat Quarter. A 3m wide shared cycleway/footway will be provided along the southern side which will remain a public right of way between Broadwater Road and the new steps to the rail bridge.

Peartree Lane / Ravenfield cycle route

6.4.2 The existing pedestrian crossing over Peartree Lane at the eastern end of Hydeway will be upgraded to allow cyclists to cross and then to use the carriageway of the cul-de-sac section of Peartree Lane rather than the footway.

7.0 DEVELOPMENT OF THE TRAVEL PLAN

7.1 Approach to the Development of the Travel Plan

7.1.1 This FTP is provided as a starting point from which operational Travel Plans will be continually "worked up" in partnership with the local highway and planning authorities.

7.1.2 The TPs will be secured by planning condition which requires the documents to be submitted to the planning authority prior to each phase of development being occupied.

7.2 Objective of the Plan

7.2.1 In line with Central Government, HCC and WHBC policies and guidance, the primary objectives of the FTP are to:

- Remove travel as a barrier to social inclusion;
- Reduce the need to travel;
- Discourage the use of unsustainable modes of transport and enable residents, employees and visitors to make travel choices that benefit themselves and their community;
- Raise awareness of alternative modes of transport and thus encourage a modal shift towards more sustainable travel modes.

7.3 Travel Plan Management

7.3.1 Each element of the development will require a different structure in terms of administration and responsibilities as set out below.

7.3.2 Marketing is an important element of travel planning as it is important for potential residents and employees to be informed about the travel choices the site offers and that it is appropriate for households who choose not to own a car.

7.3.3 A Travel Plan Co-ordinator (TPC) will be appointed for the whole site. At this stage it is not possible to specify who this person will be; however, as the flats will either be rented or leasehold there will always be a management body responsible for the residential element of the development who will take on responsibility for appointing the residential TPC. The TPC will be a named person whose contact details will be provided to all residents. The TPC will not be a full-time position but the named TPC will be available full-time. The TPC will have responsibility for provision of information to residents and staff and for carrying out travel surveys and reporting their results to the planning authority.

7.3.4 Each occupier (residential management company, businesses, retailers, arts centre etc.) will be responsible for developing their own travel plan under the aegis of this framework within three months of occupation. The site TPC will co-ordinate those plans and be responsible for reporting and liaising with HCC and WHBC.

8.0 TARGETS

8.1 Travel Plan Targets

8.1.1 Targets must be SMART (specific, measurable, attainable, realistic, and time-bound). For this reason targets here are for a five year time frame following first occupation, with interim targets at three years. After the first five years the future targets will be reviewed, taking account of success to-date and the rate of phased construction across the site.

8.1.2 As the development is yet to be built there are no mode share surveys to act as a baseline. However, the Framework TP which accompanied the previous development on this site did set out the potential mode share for the site. The current Wheat Quarter development is predicted to be more sustainable than the approved scheme so it is possible to use the previous 'potential' mode share figures as the baseline mode share target, but to aim for improvements at year three and five as follows:

Table 7.1: Residential mode share targets

	Driver/passenger	Walk	Cycle	Bus	Rail	Other
Baseline	59%	14%	4%	4%	10%	9%
3 years	54%	16%	5%	5%	11%	9%
5 years	49%	17%	6%	6%	13%	9%

8.1.3 These targets would result in an increase in cycling and public transport patronage and would result in a reduction in car occupant trips.

8.1.4 It is not possible to set mode share targets for the employment uses until the first travel survey has been carried out. This will be within 6 months of first occupation. However, whereas the initial travel survey is required in order to set a baseline, it is possible to set provisional targets for modal shift, whatever that baseline may show.

8.1.5 Tables 8.2 below shows provisional modal shift targets for each mode for three and five years after occupation. The baseline mode share will be derived from the first travel survey at which time these modal shift targets can be assessed and adjusted if necessary to ensure they remain SMART :

Table 7.2: Non-residential mode shift targets

	Driver	Car pass'	Walk	Cycle	Bus	Rail
Baseline	TBC	TBC	TBC	TBC	TBC	TBC
3 years	-5%	-2%	+2%	+1%	+2%	+2%
5 years	-10%	-5%	+5%	+2%	+4%	+4%

8.1.1 The TPC will need to identify modal shifts for each of the uses by co-ordinating with the commercial and residential occupiers in order to measure the combined mode share of the site.

9.0 MEASURES

9.1 Measures

9.1.1 The development will deliver a series of infrastructure improvements and management measures to influence travel behaviour. The programme of surveys and monitoring therefore not only needs to identify travel behaviour but also attitudes to travel and key motivators for change.

9.1.2 Notwithstanding this, the TP measures are divided into sub-categories:

- **Hard measures** – these are infrastructure provision or improvements;
- **Soft measures** – these are management measure, incentives, marketing initiatives etc.;
- **Secured measures** – these are either existing measures or those to be delivered by the development;
- **Potential measures** – these are an 'arsenal' of measures available to the TPC to be chosen according to survey feedback so that resources can be targeted towards those measures found to be most effective.

9.1.3 Travel planning must be realistic and should not expect to remove car usage altogether. Instead, an effective TP will maximise the use of sustainable travel achieve more sensible and appropriate use of the private car. If every car commuter used an alternative to the car on just one day a week, car usage levels for commuting would be reduced by as much as 20% immediately, with commuter parking requirements also reduced by up to 20%. In a highly accessible location such the Wheat Quarter however, low-car and car-free housing is a realistic prospect.

9.1.4 Unlike employment, retail or educational sites it is not possible to dictate to residents how they should travel. For this reason residential travel plans are based on the provision of infrastructure and information rather than the imposition of management procedures. It is important that the proposed development capitalises on its excellent links to public transport and close proximity to retail, employment and education facilities.

9.1.5 Similarly, retail and community uses cannot dictate to their customers how they should travel but they can provide information, infrastructure and incentives to influence their travel behaviour.

9.1.6 Based on available empirical evidence Colin Buchanan and Partners published a document commissioned by the Scottish Executive Development Department. This contains a table (Table 1, "*Planning for Mode Share in New Development*") which illustrates the relative effectiveness of various trip reduction measures.

9.1.7 The table, part of which is reproduced below as Table 9.1, indicates that restrictive parking measures are the most effective way of discouraging single occupancy car use. The next most effective measures are new public transport infrastructure and a reduction in the prices of public transport services by 30% or more.

Table 9.1: Trip Reduction Measures

Measure	Score
Major new public transport infrastructure	3
Minor new infrastructure e.g. bus stops, cycle racks	1
1-2 new or enhanced public transport services	2
More than 2 new or enhanced public transport services	2
Reduction in prices of public transport services by 30% or more	3
Restrictions on effective parking availability	5
Promotional activities e.g. Green Transport Week	1
Consultation with Staff	2
Public transport information	1
Car Sharing scheme	1-2

9.2 General Considerations for the Identifications of Measures

9.2.1 The following general points are based on previous experience and are included to highlight potential issues.

9.2.2 **Walking:** Many staff or residents may be prepared (or possibly have no other option) to walk more than a mile and walking may be an area which can be further encouraged. Potential modal shift "gains" could be made, if those who occasionally walk were persuaded to make walking their normal transport mode. However, it is also clear that many people who normally walk are occasionally "lost" to car or bus use. The principal reasons are likely to be convenience, lateness, things to carry and inclement weather.

9.2.3 **Cycling:** Cycling can be unpopular for reasons other than distance, possibly due to the topography of the surrounding area; the risks associated with cycling in traffic; and perhaps some residents do not own cycles. The Wheat Quarter has good links to the National Cycle Network which provides direct and convenient access to a range of employment, retail and leisure facilities by bike.

9.2.4 **Taxis** relieve parking demand and could be used on a "car share" basis by those who would like to share, but do not always have access to a shared car. However, for the purposes of this section of the report they will be considered as public transport, despite the fact that they are often used to transport a single person. It should be noted that taxis can provide a valuable link to bus and ferry locations, allowing the greater part of a journey to be undertaken by public transport.

9.2.5 One of the key practical factors controlling modal choice is the distance to be travelled. The other principal limiting factor is the time taken to make the trip. As a rough guide we should consider 30 minutes to be a reasonable length of time to commute. Depending on the local conditions this could represent:-

- Walking up to 2km (taking 3mph or 1.4m/s as a typical walking speed implies a journey of up to 24 minutes);
- Cycling up to 6km (taking 10mph or 4.7m/s as a typical cycling speed implies a journey of up to 22 minutes);
- Taking a bus up to five miles or 8.3km (assuming an average bus speed of 20mph or 9.3m/s and a five minute walk at each end of the journey as well as a five minute wait for the bus implies a journey of 30 minutes);
- Driving up to ten miles (assuming car speeds around town are similar to bus speeds, implies a journey time of 30 minutes).

9.2.6 The development will deliver a range of measures designed to encourage travel by sustainable modes of transport. Other potential measures are identified below; these are not intended to be exhaustive or prescriptive but will inform the development process.

9.3 Infrastructure

9.3.1 A key element of the proposed development is the introduction of appropriate infrastructure to encourage sustainable travel. The Wheat Quarter is a complex development site with a number of constraints including listed buildings and structures and proximity to rail infrastructure. The footbridge link to the town centre is owned by Network Rail so its refurbishment requires third party agreement.

9.3.2 However, the redevelopment of the former Shredded Wheat factory site offers an opportunity to make significant improvements to the local transport infrastructure both in terms of enhancing travel by sustainable modes but also providing localised highway improvements. Some measures are required to mitigate the additional travel demand generated by the development, but others will enhance the travel opportunities for the new and existing community.

9.4 Sustainable transport initiatives

9.4.1 **New public realm** – The most significant improvement to the transport network is the introduction of the new public realm that will be delivered by the redevelopment of the Wheat Quarter. This not only provides improved pedestrian and cycle routes along Broadwater Road and Bridge Road, and new public squares within the development, but also provides a traffic-free network of routes which create a highly permeable, high-quality environment for pedestrians and cyclists. This not only benefits those living or working in the new development but also benefits the local community who will be able to access the town centre and rail station through the new network of high quality routes.

9.4.2 **Cycle parking** – The development will not only provide secure and covered cycle parking for the new residents and businesses but will also provide cycle parking for visitors close to each access into the site. These will be secure cycle parking locations (Sheffield loop stands) available for anyone visiting the Wheat Quarter.

9.4.3 Additional secure cycle parking will replace the stands currently located along Hydeway. The new cycle parking will be provided in a range of formats including stands, lockers and cages.

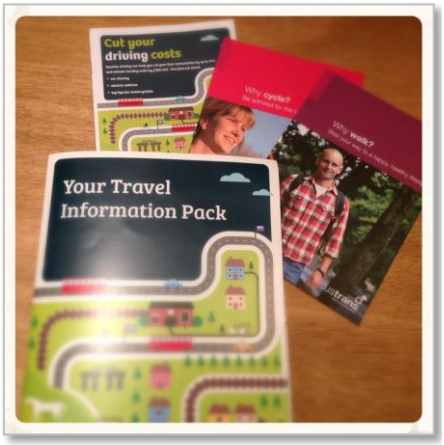
9.5 Residents' Travel Pack

9.5.1 It will be the responsibility of the developer to ensure that residents are provided with an information pack containing details of public transport timetables and maps, as well cycling and pedestrian infrastructure when they move in to the new flats.

9.5.2 The buildings will be maintained by a management company. The management company will be obliged to provide an update to the 'Residents Travel Pack' once every twelve months in order that any new residents are made aware of their local transport options.

9.5.3 The travel pack will include information and incentives for all occupiers. The information will enable the new residents to make informed decisions about their modes of travel. The incentives will be provided by the developer in the first instance and will be dependent on negotiating suitable packages with local shops and services. The likely content of the Residents' Travel Pack will be:

- Car Club membership and information;
- WGC and Hertfordshire Cycle Network information;
- Sustrans leaflets on the beneficial effects of walking and cycling ;
- Free or discounted reflective clothing i.e. cycle bib, arm bands etc.;
- Free or discounted bicycle locks/helmets;
- Developer to negotiate local cycle shop discount;
- Details of local cycle groups;
- Details of BikeBUDi travel system ;
- Bus route/timetable information;
- Free bus 'taster' tickets;
- Rail timetables and route information;
- Details of car-sharing website (e.g. www.Liftshare.com);
- Details of CarBUDi travel system;
- Notice/message board in foyer of flats to allow people to car share/walk/cycle together (perhaps at night for safety);
- Developer to negotiate preferential rates at local car-hire company;
- Taxi company information – possible discount vouchers for a taxi company;
- Details of TaxiBUDi travel system;
- Supermarket home delivery details.



9.5.4 This list is not exhaustive or a prescriptive list of what will be in the travel pack but provides details of the likely content of the pack. Details of the final pack will be agreed in partnership with WHBC.

9.6 Marketing

9.6.1 The development will have residential car parking provision at a ratio of less than one parking space per dwelling which reflects predicted future car ownership levels whilst deliberately applying an element of restraint. The new residents would not be eligible for on-street residents' parking permits if a CPZ was ever applied to the roads surrounding the site. The site will be marketed in such a way that prospective purchasers will be made aware of the level of parking provision as well as the viable alternative travel opportunities. The marketing will not seek to 'target' people without a car but will explain to all prospective purchasers and tenants that the new dwellings are suitable for households with one vehicle or no vehicles.

9.6.2 The employment uses will have parking provision to meet their operational needs but staff will be required to use sustainable modes of travel whenever possible. There will be dedicated visitor parking spaces on-site for the community and employment uses, but only limited parking for the retail as this will generally be ancillary to the other uses. Many of the customers will be residents or employees on the site but those visiting the site from the town centre will do so on foot. It is important that this message is very clear in all marketing material.

9.6.3 Travel plan coordinators who have run vigorous marketing campaigns have shown that strong promotion translates into greater uptake of sustainable travel. The hallmarks of successful travel plan marketing are lively presentation, persistence and a readiness to use a variety of marketing tools and techniques. These include branding the travel plan and building brand recognition, promotional events, incentives, special offers and prizes. Maximum visibility can be achieved through electronic media, leaflets, posters, displays, give-away freebies or messages on pay slips.

9.6.4 Plenty of strong facts and figures are readily available to support the TPC's case. For example:

- One-quarter of all car journeys are less than 2 miles and over half are less than 5 miles;
- Half an hour of daily exercise, such as a walk or cycle ride to work, can halve your risk of heart disease.

9.6.5 Special promotions will be needed for individual initiatives. Commitment to a long term communication effort is necessary to bring about the cultural change and behaviour shift that the travel plan aims for. New campaigns will be needed every so often to refresh and revitalise the TP

9.6.6 Appropriate information will need to be provided at point of first contact (i.e. sales and marketing material; staff website etc.) as well as continued, on-going marketing.

9.6.7 The TPC will also need to actively market the TP rather than assume staff and residents will find the information themselves. This can include one-off events, regular events (e.g. walkers and cyclists' breakfast first Wednesday of the month) and competitions.

9.7 Branding

9.7.1 The term 'Travel Plan' can turn people off the idea so it may be that the residents can produce a Wheat Quarter smarter-travel brand more relevant to themselves. The development can take advantage of a strong brand identity for its travel plan communications. The travel plan communications can be fully branded so that the residents and staff can see that all the initiatives, information and messages are linked to the travel plan, which has its own style but is also recognisably part of the site's sustainable image.

9.7.2 The TPC can then use e-shots to keep residents informed of news, timetable changes, or new items on the travel plan notice boards.

THE WHEAT QUARTER

9.8 Legal Obligations

9.8.1 Circular 05/2005 produced by the Office of the Deputy Prime Minister (now DCLG) sets the policy background for planning obligations.

9.8.2 The developer will enter into a legal agreement pursuant to Section 106 of the Town and Country Planning Act preventing residents of the development applying for on-street residents' parking permits. This would ensure the intended low-car and car-free housing remains so in perpetuity or unless the Council wishes to remove the restriction. Any such legal obligation would run with the property irrespective of ownership.

9.8.3 A financial contribution may also be required which could be paid towards strategic sustainable travel initiatives.

9.9 Future Success

9.9.1 Residents purchasing one of the flats will do so as a lease-hold purchase and will therefore be bound by certain requirements imposed by the free-hold owner. The nature of the buildings will mean that a management company will be responsible for the maintenance of the communal areas. This management company will also be given a brief to ensure that upon the re-sale of any of the dwellings any new purchasers will be provided with an up to date Residents' travel pack.

9.9.2 The employment uses will manage their premises including communicating with staff and visitors. It is most likely that either the arts centre or the employment use (jointly or alone) will co-ordinate the employment TPs but the residential management company will be the overall co-ordinating body.

9.9.3 This co-ordinating body will ensure the future success of the parking and travel strategy through the promotion of the readily accessible alternative modes of transport.

9.10 Action Plan

9.10.1 Those measures specified as *Secured* will be delivered by the developer prior to first occupation as part of the capital expenditure of the development. Those measures referred to as *Potential* are available for the TPC to consider as part of the year 3 and year 5 review process. The Potential measures are available to the TPC if the mode share targets have not been met. These additional measures must be carefully matched against the 'key motivators' identified in the staff and resident surveys. Potential measures will be funded by the management company through a levy charged to residents and commercial tenants as part of their normal service charge. The action plan is therefore as illustrated in Table 9.2 below:

Table 9.2: Action Plan

Timescale	Measures	Delivery
Development	Secured	Developer
Year 3	Potential (as required)	Management company
Year 5	Potential (as required)	Management company

9.10.2 Tables 9.3 to 9.6 below summarise those measures secured as part of the development as well as potential future measures at the disposal of the TPC:

Table 9.3: Measures to Encourage Walking

Hard measures	
Secured	**Potential**
• High quality new public realm; • New links to existing highway network; • Improved junction design; • Improved junction crossings; • Improvements to Broadwater Road and Bridge Road; • Footbridge refurbishment; • Well-lit pedestrian routes; • Improved pedestrian waymarking between Wheat Quarter and town centre.	• Enhanced surfacing on strategic routes; • Further signage and/or waymarking
Soft measures	
Secured	**Potential**
• Residents' Travel Pack • Car Park Management Plan • Marketing – promotional material • To influence local stakeholders such as local authorities to achieve any desired improvements in the public realm in terms, for example of security, safety and lighting of local environs. • To publicise the benefits to health of walking.	• Financial incentives for walkers; • Free or subsidised wet weather/high vis clothing; • Walking clubs; • Events to encourage walking (walkers' breakfast first Wednesday of the month etc.) • Personalised travel planning;

Table 9.4: Measures to Encourage Cycling

Hard measures	
Secured	**Potential**
• High quality new public realm; • New links to existing cycle network • Improvements to Broadwater Road and Bridge Road; • Footbridge refurbishment; • Secure, covered, lit cycle parking for every residential dwelling; • Secure, well supervised cycle parking for commercial uses; • Secure public cycle parking close to footbridge; • Good on-site lighting; • Lockers and storage areas for commercial units; • Showers and changing areas for staff.	• Additional cycle signage; • Drying areas for clothes; • Off-site localised cycle improvements at identified junctions;
Soft measures	
Secured	**Potential**
• Marketing – promoting cycling in all written and electronic material; • Promotion of Herts cycle maps in lobbies etc.; • Travel pack (including cycle route info, leaflets on the beneficial effects of cycling etc.) and personalised travel planning;	• Financial incentives for cyclists (e.g. mileage rate for work related journeys); • Free or subsidised wet weather/high vis clothing; • Bicycle user group (BUG); • Training for those who are not confident cyclists; • Provision of, or payment for, bike maintenance (possibly on site as part of course); • Negotiated discount with local bike shop – additional special rate for folding bikes; • Events to encourage cycling (cyclists' breakfast first Wednesday of the month etc.)

Table 9.5: Measures to Encourage Public Transport Use

Hard measures	
Secured	**Potential**
• Refurbished footbridge to rail station and bus station;	• Possible S106 contribution towards strategic public transport improvements.
Soft measures	
Secured	**Potential**
• Website and email communication to visitors to refer to sustainable modes and discourage driving; • Marketing – promoting the use of public transport in all written and electronic material; • Bus routes identified on website; • Residents Travel Pack including 'taster' tickets.	• Discount on bus/ferry season tickets; • Employees Travel pack (including bus routes and timetable info); • Personalised travel planning;

Table 9.6: Measures to reduce use of vehicles to core activity (plus disabled)

Hard measures	
Secured	**Potential**
• Managed car parking provision; • Car Club; • Car Park Management Plan; • Residential parking allocation protocol; • Electric Vehicle Charging Points.	• Motorcycle parking provision. • Additional EVCP subject to TP monitoring. • S106 agreement prohibiting residents and businesses from being eligible for on-street parking permits.
Soft measures	
Secured	**Potential**
• Website and email communication to visitors to refer to sustainable modes and discourage driving; • Promote car sharing; • Marketing – promoting the use of sustainable transport in all written and electronic material;	• Personalised travel planning;

10.0 CAR CLUB

10.1 Overview

10.1.1 There are two Car Clubs operating in the Welwyn Garden City area including E-Car and Hiya Car. The closest of these is the E-Car space in the WHBC car park, the second is a Hiya car space is on Longcroft Lane, 1.1km (15 minutes' walk) from the site.

10.2 Parking provision

10.2.1 Carplus is an independent body which promotes shared mobility including car clubs, 2+ sharing, bike sharing and taxi sharing. Part of Carplus' work is research, best practice and technical advice. They state that on average one Car Club vehicle removes the need for between 10 and 20 private parking spaces.

10.2.2 Recent developments in Hertfordshire which have included Car Clubs have suggested that each Car Club space would equate to at least 6 car parking spaces. This is well below the advice from Carplus but still demonstrates the benefits of providing Car Club spaces rather than allocated car parking spaces. Each Car Club spaces therefore equates to anything from 6 to 20 residential parking spaces.

10.3 Operation

10.3.1 The development will deliver a new community Car Club with a range of spaces across the site, including electric vehicle charging points (EVCP). Three Car Club operators have reviewed the proposed development, assessed the accessibility of the area and calculated the viability of a Car Club in this location. They have confirmed they would be pleased to provide new Car Club vehicles at a ratio of 6% for the residential development. The decision as to which company will operate the Car Club will be down to a commercial decision by the developer. The obligation to provide the Car Club will fall to the developer who will be required to let a contract with a commercial operator which would be expected to include:

- Free 3 year membership for new residents providing access to cars on site, the rest of Hertfordshire and the UK ;
- First car to be delivered by first occupation;
- Bespoke marketing material and membership certificates;
- Briefing of sales staff at the development on the car club and attendance at promotional events;
- 24/7 customer service team;
- 24/7 booking system including mobile booking site (IOS and Android) and iPhone app;
- Vehicle insurance;
- Vehicle maintenance;
- Creation of reports and statistics for the developer and Council;

10.3.2 In accessible areas Car Clubs allow residents who only require occasional use of a vehicle to make the choice not to own a vehicle themselves. Equally, many two-car households only use 1.1 cars on a regular basis so the provision of a Car Club allows them to own a single vehicle and use the Car Club as often as they like on a pay-as-you-go basis.

11.0 MONITORING AND REVIEW

11.1 Overview

11.1.1 The effectiveness of the Travel Plan and the measures proposed will need to be monitored and reviewed in partnership with HCC and WHBC. This review process will identify the most effective measures and key motivators influencing people's travel choices. A sample questionnaire, obtained from iBase Systems Ltd and compatible with iTrace, is included as **Appendix FTP-B** to this report.

11.1.2 Identifying these 'key motivators' is very important as it will allow the TPC to focus funds and resources on those areas most likely to affect people's travel choices. For example, there is no benefit in providing excessive cycle storage or discounted bus travel if the early surveys show that such very expensive measures would have little or no influence on occupiers' desire use those modes of transport. Instead, the measures should be tailored to the findings of the surveys and needs of staff and residents. DfT guidance is clear that Travel Plans and their measures must not be based on a 'one size fits all' approach. Of course, if such measures score highly in future surveys then they will need to be included in the TPC's regular reviews of targets and measures as set out below.

11.2 Travel Survey

11.2.1 It will be the responsibility of the Travel Plan Co-ordinator to conduct surveys of staff, visitors and residents' travel patterns. The surveys will aim to establish:

- Current modal split
- Modes used occasionally
- Reasons for modal choice
- Attitudes to more sustainable modes
- What measures would persuade people to change to more sustainable modes

11.2.2 A number of suggestions for improvements could be included within the travel survey. The list need not be exhaustive, but should provide an insight into the type of measures that would be required to cause worthwhile modal shift towards each of the more sustainable modes of transport.

11.2.3 In addition to annual surveys the TPC can carry out interim spot counts to monitor progress if necessary. The first surveys will take place once 75% of the Phase 1 dwellings are occupied, or 6 months after the first occupation of any part of the site – whichever is first.

11.2.4 The schedule of monitoring and review will be as follows:

Table 11.1: Schedule of surveys

Survey	Review / report
1. Occupation of 75% of Phase 1 residential dwellings (or 6 months, whichever is first)	• Include questions about current travel and intended travel. • Review survey findings and report to local authority within 1 month of survey. • Feedback findings to staff and residents within 1 month of local authority review. • TPC to implement review outcomes prior to Survey 2.
2. Three years after survey 1.	• Identify actions from Review 1 • Review survey 2 findings, and report to local authority within 1 month of survey. • Feedback findings to staff and residents within 1 month of local authority review. • TPC to implement review outcomes prior to Survey 3
3. Five years after survey 1.	• Identify actions from Review 2 • Review survey 3 findings, and report to local authority within 1 month of survey. • Feedback findings to residents within 1 month of local authority review. • TPC to implement review outcomes

11.2.5 The schedule of monitoring and review should be augmented by interim spot counts to review progress throughout the year.

11.2.6 Upon completion of Survey 3 the future monitoring requirements should be reviewed based on the Survey 3 findings and the phased development construction progress.

12.0 SECURING AND ENFORCEMENT

12.1 General

12.1.1 This FTP will be secured by planning condition which requires the document to be submitted to the planning authority prior to the first occupation of Phase 1.

12.1.2 The schedule of monitoring and review will be the responsibility of the TPC and will ensure an on-going partnership between the Council and the site occupiers. Any enforcement of the planning condition will fall within the jurisdiction of the local planning authority.

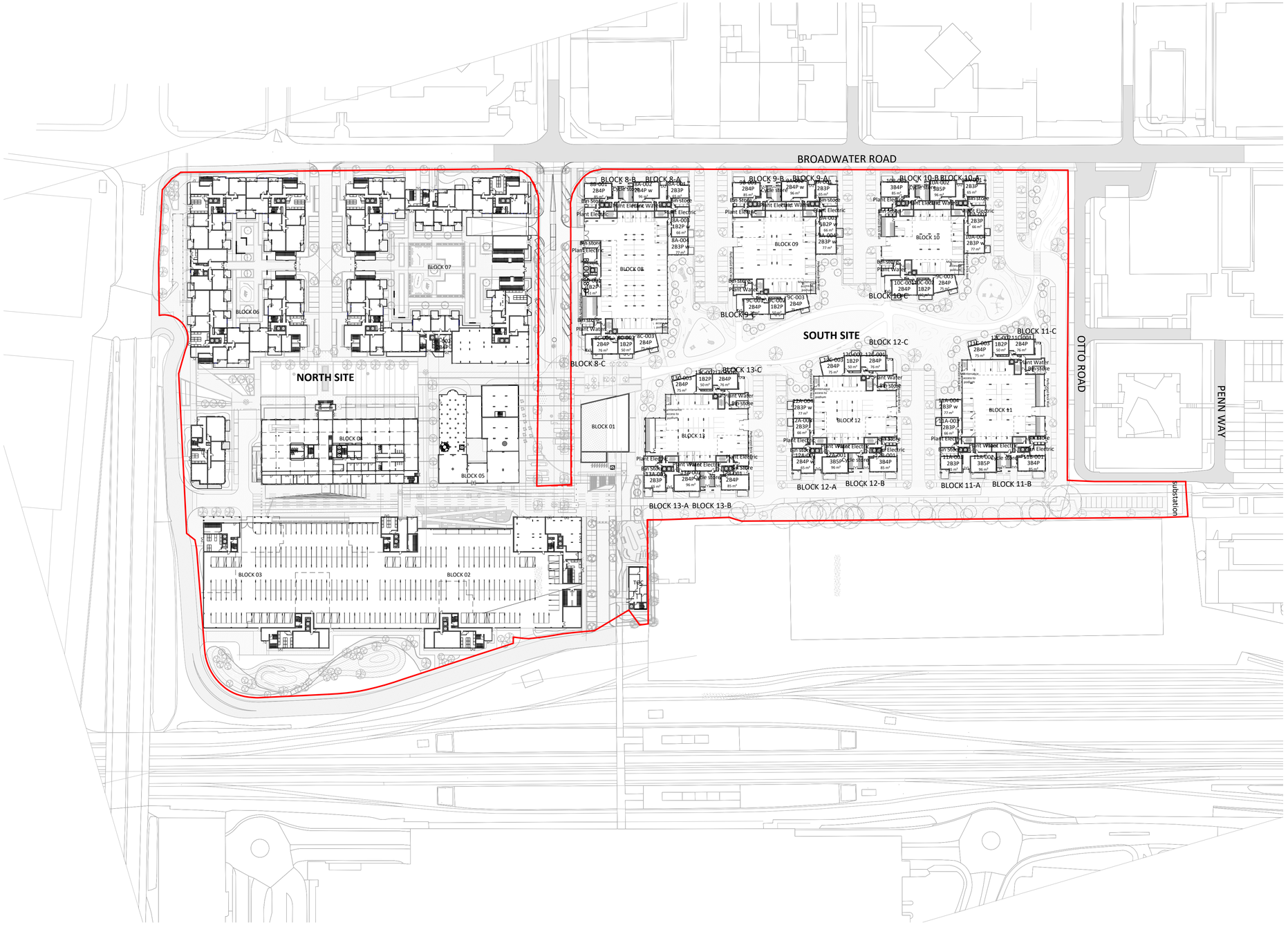
12.1.3 The developer will enter into a legal agreement pursuant to Section 106 of the Town and Country Planning Act preventing residents of the development applying for residents' parking permits. This would ensure the intended low-car and car-free housing remains so in perpetuity or unless the Council wishes to remove the restriction. Any such legal obligation would run with the property irrespective of ownership.

12.1.4 The S106 agreement may also include obligations to provide funding towards enhancing sustainable transport in Welwyn Garden City.

12.1.5 This FTP sets out the basis upon which specific measures will be developed by the occupiers so that the preliminary survey and administrative matters will be in undertaken as soon as the majority of the units have been occupied. This will encourage the use of sustainable travel modes from the outset.

12.1.6 This FTP has been prepared in such a way that it can be used as a management 'toolkit' for the new Wheat Quarter development. This FTP supports the TA which accompanies the planning application. By this method the travel planning process will seek to influence how people travel in and around Welwyn Garden City rather than simply reacting to how they have travelled in the past.

Appendix FTP-A



1 Site Masterplan (Ground Floor)

1 : 1000 @A1

NOTES
- Do not scale from this drawing
- Check all dimensions on site
- Subject to site inspection
- This document is for information only and is subject to a preliminary risk analysis to be carried out by all relevant consultants

AREAS
- Refer to area schedule

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Rev	Notes	Date	By	Auth
1	DRAFT issue for Planning	17-12-12	CS	FvB
2	Planning Submission	18-01-12	CS	FvB

NOTES
Any decisions to be made on the basis of this drawing, whether as to project viability, pre-letting, lease agreements and the like, should make allowance for:
- Design development
- Accurate surveys
- Accurate bundary/site ownership documentation
- Construction methods and building tolerances
- Local Authority/Statutory consents

0m 20m 40m 60m 80m 100m

VISUAL SCALE 1:1000 @ A1

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Date: 09/11/17
Drawn By: Author
Checked By: Checker
Scale @ A1: 1 : 1000
Scale @ A3: 1 : 1250
CAD File No:

Plutus Estates (WGC) Limited and Metropolitan Housing Trust
Former Shredded Wheat Factory
Site Masterplan (Ground)

PRELIMINARY
16037 P0-001

2
Revision

Welwyn Garden City 16037
Area Schedule - P2
Residential
12 01 2018

NORTH SITE

ColladoCollinsArchitects

BLOCK 2	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 1P	1 Bed 2P	2 Bed 3P (1 bath)	2 Bed 4P (2 baths)	3 Bed 5P (2 baths)	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Ground	863.6	*9,296*	856.9	*9,224*	0.0	*0*						**0**	0	0
First	2034.9	*21,904*	1874.9	*20,181*	1477.1	*15,900*	6	8	9	4		**27**	79	92
Second	2034.9	*21,904*	1874.9	*20,181*	1512.8	*16,284*	6	6	9	6		**27**	81	96
Third	2034.9	*21,904*	1874.9	*20,181*	1513.1	*16,287*	6	6	9	6		**27**	81	96
Fourth	2034.9	*21,904*	1874.9	*20,181*	1513.1	*16,287*	6	6	9	6		**27**	81	96
Fifth	2034.9	*21,904*	1874.9	*20,181*	1513.1	*16,287*	6	6	9	6		**27**	81	96
Sixth	1014.7	*10,922*	927.0	*9,978*	717.8	*7,726*	4	4	6			**14**	38	44
Seventh		*0*		*0*	0.0	*0*						**0**	0	0
TOTAL	**12052.8**	***129736***	**11158.4**	***120109***	**8247.0**	***88771***	**34**	**36**	**51**	**28**	**0**	**149**	**441**	**520**
							22.8%	24.2%	34.2%	18.8%	0.0%	100.0%		
							70		**79**		**0**	**149**	**441**	**520**
percentage of units by type							47.0%		53.0%		0.0%	**100.0%**		

BLOCK 3 (C2)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 1P	1 Bed 2P	2 Bed 3P (1 bath)	2 Bed 4P (2 baths)	3 Bed 5P (2 baths)	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Ground	610.2	*6,568*	546.8	*5,886*		*0*						**0**	0	0
First	1852.3	*19,938*	1719.5	*18,509*	1084.9	*11,678*	4	8	6	2		**20**	58	66
Second	1527.6	*16,443*	1411.4	*15,192*	1154.7	*12,429*	4	4	6	6		**20**	62	74
Third	1527.6	*16,443*	1411.4	*15,192*	1154.7	*12,429*	4	4	6	6		**20**	62	74
Fourth	1527.6	*16,443*	1411.4	*15,192*	1154.7	*12,429*	4	4	6	6		**20**	62	74
Fifth	1527.6	*16,443*	1411.4	*15,192*	1154.7	*12,429*	4	4	6	6		**20**	62	74
Sixth	1014.7	*10,922*	927.0	*9,978*	718.9	*7,738*	4	4	6			**14**	38	44
Seventh		*0*		*0*	0.0	*0*						**0**	0	0
TOTAL	**9587.6**	***103201***	**8838.9**	***95142***	**6422.6**	***69133***	**24**	**28**	**36**	**26**	**0**	**114**	**344**	**406**
							21.1%	24.6%	31.6%	22.8%	0.0%	100.0%		
							52		**62**		**0**	**114**	**344**	**406**
percentage of units by type							45.6%		54.4%		0.0%	**100.0%**		

Welwyn Garden City 16037
Area Schedule - P2
Residential
12 01 2018

NORTH SITE

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BLOCK 6	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 1P	1 Bed 2P	2 Bed 3P (1 bath)	2 Bed 4P (2 baths)	3 Bed 5P (2 baths)	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Ground	3644.4	*39,228*	3402.8	*36,628*	1967.3	*21,176*	9	10	8	4	2	**33**	96	112
First	3606.3	*38,818*	3359.1	*36,157*	2702.8	*29,093*	10	16	12	4	3	**45**	132	154
Second	3606.3	*38,818*	3359.1	*36,157*	2686.8	*28,921*	10	16	12	4	3	**45**	132	154
Third	3486.8	*37,532*	3241.0	*34,886*	2578.4	*27,754*	10	17	10	4	3	**44**	129	149
Fourth	3486.8	*37,532*	3241.0	*34,886*	2578.4	*27,754*	10	18	9	4	3	**44**	129	148
Fifth	1766.0	*19,009*	1624.6	*17,487*	1284.5	*13,826*	6	11	3	1	2	**23**	66	74
Sixth	1766.0	*19,009*	1624.6	*17,487*	1284.7	*13,829*	6	11	3	1	2	**23**	66	74
Seventh	413.2	*4,448*	376.8	*4,056*	282.3	*3,039*		3	2			**5**	15	17
Eighth	413.2	*4,448*	376.8	*4,056*	282.3	*3,039*		3	2			**5**	15	17
TOTAL	**22189.0**	***238842***	**20605.8**	***221801***	**15647.5**	***168430***	**61**	**105**	**61**	**22**	**18**	**267**	**780**	**899**
							22.8%	39.3%	22.8%	8.2%	6.7%	100.0%		
							166		**83**		**18**	**267**	**780**	**899**
percentage of units by type							62.2%		31.1%		6.7%	**100.0%**		

BLOCK 7	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 1P	1 Bed 2P	2 Bed 3P (1 bath)	2 Bed 4P (2 baths)	3 Bed 5P (2 baths)	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Ground	3180.2	*34,232*	2868.6	*30,878*	1501.8	*16,165*	9	10	4	3	1	**27**	76	85
First	3728.9	*40,138*	3460.2	*37,246*	2761.5	*29,725*	13	14	11	7	2	**47**	137	159
Second	3728.9	*40,138*	3460.2	*37,246*	2763.4	*29,745*	13	14	11	7	2	**47**	137	159
Third	3609.3	*38,851*	3342.1	*35,974*	2655.0	*28,578*	13	15	9	7	2	**46**	134	154
Fourth	3609.3	*38,851*	3342.1	*35,974*	2655.0	*28,578*	13	16	8	7	2	**46**	134	153
Fifth	2228.9	*23,992*	2053.0	*22,098*	1611.5	*17,346*	8	13	3	3	2	**29**	84	94
Sixth	2228.9	*23,992*	2053.0	*22,098*	1611.5	*17,346*	8	13	3	3	2	**29**	84	94
Seventh	413.2	*4,448*	376.8	*4,056*	282.3	*3,039*		3	2			**5**	15	17
Eighth	413.2	*4,448*	376.8	*4,056*	282.3	*3,039*		3	2			**5**	15	17
TOTAL	**23140.8**	***249088***	**21332.8**	***229626***	**16124.3**	***173562***	**77**	**101**	**53**	**37**	**13**	**281**	**816**	**932**
							27.4%	35.9%	18.9%	13.2%	4.6%	100.0%		
							178		**90**		**13**	**281**	**816**	**932**
percentage of units by type							63.3%		32.0%		4.6%	**100.0%**		

Welwyn Garden City 16037
Area Schedule - P2
Residential
12 01 2018

NORTH SITE

ColladoCollinsArchitects

TOTAL	GIA / NSA PROPOSED					
	GEA		GIA		NSA	
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*
Block 2	12052.8	*129,736*	11158.4	*120,109*	8247.0	*75,401*
Block 3	9587.6	*103,201*	8838.9	*95,142*	6422.6	*74,433*
Block 6	22189.0	*238,842*	20605.8	*221,801*	15647.5	*168,430*
Block 7	23140.8	*249,088*	21332.8	*229,626*	16124.3	*173,562*
TOTAL	**66970.2**	***720867***	**61935.9**	***666678***	**46441.4**	***491826***

APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
1 Bed 1P	1 Bed 2P	2 Bed 3P (1 bath)	2 Bed 4P (2 baths)	3 Bed 5P (2 baths)	**TOTAL**		
No.	No.	No.	No.	No.	No.	No.	No.
34	36	51	28	0	**149**	441	520
24	28	36	26	0	**114**	344	406
61	105	61	22	18	**267**	780	899
77	101	53	37	13	**281**	816	932
196	**270**	**201**	**113**	**31**	**811**	**2381**	**2757**
24.2%	33.3%	24.8%	13.9%	3.8%	100.0%		

percentage of units by type (incl. 10% wheelchair units)	**466**	**314**	**31**	**811**	**2381** / **2757**
	57.5%	38.7%	3.8%	**100.0%**	

Ground Floor Parking Block 2 + 3		
Parking Spaces	209.0	
Parking Ratio	0.79	spaces per unit

Basement Parking Block 6 + 7		
Parking Spaces	312.0	
Parking Ratio	0.57	spaces per unit

Commercial Parking	
Parking Spaces	142.0

Total Parking	*663*

Average Hab Rooms per unit	2.94
Average Bed Spaces per unit	3.40

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BLOCK 13 (Ex-A)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 4P	3 Bed 5P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	407.0	*4,381*	374.0	*4,026*	161.0	*1,733*		1	1			**2**	6	7
First	686.0	*7,384*	641.0	*6,900*	487.0	*5,242*	4	4				**8**	20	20
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Fourth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fifth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Sixth	448.0	*4,822*	404.0	*4,349*	304.0	*3,272*	3	1	1			**5**	12	13
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*			1			**1**	3	4
First	518.0	*5,576*	485.0	*5,221*	371.0	*3,993*	2	3	1			**6**	16	17
Second	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
Third	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
Fourth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		2			**3**	8	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**9127.0**	***98,243***	**8454.0**	***90,999***	**6228.0**	***67,038***	**40**	**31**	**25**		**2**	**98**	**256**	**283**
							40.8%	31.6%	25.5%	0.0%	2.0%	100.0%		

	40	**56**	**2**	**98**	**256**	**283**
percentage of units by type	40.8%	57.1%	2.0%	**100.0%**		

BLOCK 12 (Ex-B)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 4P	3 Bed 5P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	587.0	*6,318*	540.0	*5,813*	304.0	*3,272*		3			1	**4**	13	14
First	686.0	*7,384*	638.0	*6,867*	487.0	*5,242*	4	4				**8**	20	20
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fourth	695.0	*7,481*	648.0	*6,975*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Fifth	695.0	*7,481*	648.0	*6,975*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Sixth	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Seventh	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*				1		**1**	4	4
First	518.0	*5,576*	485.0	*5,221*	371.0	*3,993*	2	3		1		**6**	17	17
Second	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Third	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Fourth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
													0	0
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		1	1		**3**	9	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**9779.0**	***105,261***	**9049.0**	***97,403***	**6721.0**	***72,345***	**35**	**29**	**18**	**12**	**7**	**101**	**287**	**312**
							34.7%	28.7%	17.8%	11.9%	6.9%	100.0%		
							35	**47**		**19**		**101**	**287**	**312**
percentage of units by type							34.7%	46.5%		18.8%		**100.0%**		

BLOCK 11 (Ex-C)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 4P	3 Bed 5P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	587.0	*6,318*	540.0	*5,813*	304.0	*3,272*		3			1	**4**	13	14
First	686.0	*7,384*	638.0	*6,867*	487.0	*5,242*	4	4				**8**	20	20
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Fourth	695.0	*7,481*	648.0	*6,975*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Fifth	695.0	*7,481*	648.0	*6,975*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Sixth	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Seventh	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*				1		**1**	4	4
First	518.0	*5,576*	485.0	*5,221*	371.0	*3,993*	2	3		1		**6**	17	17
Second	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Third	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Fourth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		1	1		**3**	9	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**9779.0**	***105,261***	**9049.0**	***97,403***	**6721.0**	***72,345***	**35**	**30**	**17**	**12**	**7**	**101**	**287**	**311**
							34.7%	29.7%	16.8%	11.9%	6.9%	100.0%		

	35	**47**	**19**	**101**	**287**	**311**
percentage of units by type	34.7%	46.5%	18.8%	**100.0%**		

BLOCK 10 (Ex-D)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 4P	3 Bed 5P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	587.0	*6,318*	540.0	*5,813*	304.0	*3,272*		3			1	**4**	13	14
First	686.0	*7,384*	638.0	*6,867*	487.0	*5,242*	4	4				**8**	20	20
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Fourth	695.0	*7,481*	647.0	*6,964*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Fifth	695.0	*7,481*	647.0	*6,964*	520.0	*5,597*	1	2	2	1	1	**7**	22	25
Sixth	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Seventh	454.0	*4,887*	411.0	*4,424*	317.0	*3,412*	1			2	1	**4**	14	15
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*				1		**1**	4	4
First	518.0	*5,576*	485.0	*5,221*	371.0	*3,993*	2	3		1		**6**	17	17
Second	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Third	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Fourth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Fifth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	1	1		**6**	17	18
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		1	1		**3**	9	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**10297.0**	***110,837***	**9532.0**	***102,602***	**7099.0**	***76,414***	**37**	**32**	**18**	**13**	**7**	**107**	**304**	**329**
							34.6%	29.9%	16.8%	12.1%	6.5%	100.0%		

	37	**50**	**20**	**107**	**304**	**329**
percentage of units by type	34.6%	46.7%	18.7%	**100.0%**		

BLOCK 9 (Ex-E)	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 4P	3 Bed 5P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	587.0	*6,318*	540.0	*5,813*	304.0	*3,272*	1	2	1			**4**	11	12
First	686.0	*7,384*	638.0	*6,867*	487.0	*5,242*	4	3	1			**8**	20	21
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fourth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fifth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Sixth	448.0	*4,822*	404.0	*4,349*	304.0	*3,272*	3	1	1			**5**	12	13
Seventh	448.0	*4,822*	404.0	*4,349*	304.0	*3,272*	3	1	1			**5**	12	13
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*			1			**1**	3	4
First	518.0	*5,576*	485.0	*5,221*	371.0	*3,993*	2	3	1			**6**	16	17
Second	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
Third	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
Fourth	518.0	*5,576*	485.0	*5,221*	378.0	*4,069*	2	2	2			**6**	16	18
													0	0
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		2			**3**	8	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**9755.0**	***105,003***	**9021.0**	***97,102***	**6675.0**	***71,850***	**44**	**30**	**29**	**0**	**2**	**105**	**273**	**304**
							41.9%	28.6%	27.6%	0.0%	1.9%	100.0%		

	44	**59**	**2**	**105**	**273**	**304**
percentage of units by type	41.9%	56.2%	1.9%	**100.0%**		

BLOCK 8 (Ex-F)	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 5P	3 Bed 4P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Core A														
Ground	587.0	*6,318*	540.0	*5,813*	304.0	*3,272*	1	2	1			**4**	11	12
First	686.0	*7,384*	638.0	*6,867*	487.0	*5,242*	4	4				**8**	20	20
Second	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	4	1			**8**	21	22
Third	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fourth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Fifth	689.0	*7,416*	641.0	*6,900*	510.0	*5,490*	3	3	2			**8**	21	23
Sixth	443.0	*4,768*	407.0	*4,381*	304.0	*3,272*	3	1	1			**5**	12	13
Seventh	448.0	*4,822*	404.0	*4,349*	304.0	*3,272*	3	1	1			**5**	12	13
Core B														
Ground	364.0	*3,918*	336.0	*3,617*	85.0	*915*			1			**1**	3	4
First	384.0	*4,133*	357.0	*3,843*	263.0	*2,831*	1	1	2			**4**	11	13
Second	385.0	*4,144*	360.0	*3,875*	263.0	*2,831*	1	1	2			**4**	11	13
Third	385.0	*4,144*	360.0	*3,875*	263.0	*2,831*	1	1	2			**4**	11	13
Fourth	385.0	*4,144*	360.0	*3,875*	263.0	*2,831*	1	1	2			**4**	11	13
Fifth	385.0	*4,144*	360.0	*3,875*	263.0	*2,831*	1	1	2			**4**	11	13
Sixth	385.0	*4,144*	360.0	*3,875*	263.0	*2,831*	1	1	2			**4**	11	13
Core D														
Ground	234.0	*2,519*	205.0	*2,207*	51.0	*549*	1					**1**	2	2
First	444.0	*4,779*	410.0	*4,413*	311.0	*3,348*	1	3	1			**5**	14	15
Second	447.0	*4,812*	413.0	*4,446*	318.0	*3,423*	1	2	2			**5**	14	16
Third	447.0	*4,812*	413.0	*4,446*	318.0	*3,423*	1	2	2			**5**	14	16
Fourth	447.0	*4,812*	413.0	*4,446*	318.0	*3,423*	1	2	2			**5**	14	16
Fifth	447.0	*4,812*	413.0	*4,446*	318.0	*3,423*	1	2	2			**5**	14	16
Core C														
Ground	424.0	*4,564*	381.0	*4,101*	199.0	*2,142*	1		2			**3**	8	10
First	545.0	*5,866*	505.0	*5,436*	396.0	*4,263*	3		2		1	**6**	16	19
Second	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Third	550.0	*5,920*	509.0	*5,479*	416.0	*4,478*	4	1	2			**7**	17	19
Fourth	325.0	*3,498*	291.0	*3,132*	219.0	*2,357*	1		1		1	**3**	9	11
TOTAL	**12453.0**	***134,044***	**11508.0**	***123,872***	**8382.0**	***90,224***	**48**	**40**	**41**	**0**	**2**	**131**	**253**	**290**
							36.6%	30.5%	31.3%	0.0%	1.5%	100.0%		

	48	**81**	**2**	**131**	**253**	**290**
percentage of units by type	36.6%	61.8%	1.5%	**100.0%**		

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TOTAL	GIA / NSA PROPOSED						APARTMENT NUMBERS						Habitable Rooms	Bed Spaces
TOTAL	GEA		GIA		NSA		1 Bed 2P	2 Bed 3P	2 Bed 4P	3 Bed 5P	3 Bed 4P	TOTAL		
	sq m	*sq ft*	sq m	*sq ft*	sq m	*sq ft*	No.	No.	No.	No.	No.	No.	No.	No.
Block 13	9127.0	*98,243*	8454.0	*90,999*	6228.0	*67,038*	40	31	25	0	2	**98**	256	283
Block 12	9779.0	*105,261*	9049.0	*97,403*	6721.0	*72,345*	35	29	18	12	7	**101**	287	312
Block 11	9779.0	*105,261*	9049.0	*97,403*	6721.0	*72,345*	35	30	17	12	7	**101**	287	311
Block 10	10297.0	*110,837*	9532.0	*102,602*	7099.0	*76,414*	37	32	18	13	7	**107**	304	329
Block 9	9755.0	*105,003*	9021.0	*97,102*	6675.0	*71,850*	44	30	29	0	2	**105**	273	304
Block 8	12453.0	*134,044*	11508.0	*123,872*	8382.0	*90,224*	48	40	41	0	2	**131**	253	290
TOTAL	**61190.0**	***658,649***	**56613.0**	***609,382***	**41826.0**	***450,215***	**239**	**192**	**148**	**37**	**27**	**643**	**1660**	**1829**
							37.2%	29.9%	23.0%	5.8%	4.2%	100.0%		

	239	**340**	**64**	**643**	**1660**	**1829**
percentage of units by type	37.2%	52.9%	10.0%	**100.0%**		

Parking	**Ground fl. GIA (m2)**	**Spaces**		
Block 13		41		
Block 12		35		
Block 11		42		
Block 10		24		
Block 9		45		
Block 8		66		
Subtotal undercroft parking		**253**		
On street parking		**203**		
South west strip of land		**16**		
Total		**472**		

Parking Spaces	472.0
Parking Ratio	0.73 spaces per unit
Average Hab Rooms per unit	2.58
Average Bed Spaces per unit	2.84
Wheelchair units (10%)	**64**

The NSA is the sum of the all of the GIAs of the individual apartments
The areas have been measured as shown on the following drawings: **P0(S)-100 ;P0(S)-101 ; P0(S)-102; P0(S)-103; P0(S)-104 ; P0(S)-105; P0(S)-106; P0(S)-107**
The areas are approximate and relate to the likely areas of the building at the current state of the design.
The standard RICS Code of Practice for measuring areas has been used with the exception that internal balconies are not included in GIA/NSA
Any decisions to be made on the basis of these predictions, whether as to project viability,
pre-letting, lease agreements and the like, should make allowance for the following:

Appendix FTP-B

STAFF TRAVEL SURVEY

All staff are being surveyed on the way that they travel to work. The data will be used exclusively to develop and promote measures to improve the journey to work for all employees and visitors.

Please take five minutes to complete the questionnaire and return it to the main office in the envelope provided.

Company Name : …….. Location/Site : ……

Journey to Work Details

1. Home Postcode (required for mapping purposes only) ☐☐☐☐ ☐☐☐

2. How do you normally travel to work? *(Please tick appropriate box)*

- Car (Driver) ☐
- Car (Passenger) ☐
- Bus ☐
- Train ☐
- Motorcycle ☐
- Cycle ☐
- Walk ☐
- Other ☐

3. If you normally travel to work by car do you ever use public transport? *(Please tick one box)*

Yes ☐ No ☐

If yes, how often do you use public transport to travel to work? *(Please tick one box)*

- One or two times a week ☐
- Once a week ☐
- Once a fortnight ☐
- Less frequently ☐

4. Does your journey to or from work include a school (or other) drop off or pick up? *(Please tick one box)*

Yes ☐ No ☐

5. How far do you travel to work? ☐☐☐ Km's ☐☐☐ miles

6. How long does it normally take you to travel to work, door to door? ☐☐☐ mins

7. Where do you usually park if you drive to work? *(Please tick appropriate box)*

- Company car park ☐
- Public Car Park ☐
- On-Street paid parking ☐
- On-street free ☐

8. Do you usually pay to park? *(Please tick one box)*

Yes ☐ No ☐

If you usually pay to park, how much do you normally pay?

Cost(pence) ☐☐☐

9. Do you currently give a colleague a lift to or from work? *(Please tick one box)*

Most Days ☐ Occasionally ☐ Never ☐

Personal Transport Options

10. How often is a car available to you for commuting to work? *(Please tick one box)*

- Most days ☐
- Occasionally ☐
- Never ☐

11. How often is a bicycle available to you for commuting to work? *(Please tick one box)*

- Most days ☐
- Occasionally ☐
- Never ☐

12. If you drive to work is the car that you use a company car? *(Please tick one box)* Yes ☐ No ☐

13. Why do you normally travel to work the way you do? *(Please tick up to three boxes)*

- No alternative ☐
- No public transport nearby ☐
- Cheapest way ☐
- Quickest way ☐
- Gives me flexibility ☐
- Reliable ☐
- Health reasons ☐
- Need car for work in the day ☐
- Other ☐

14. Which of the following would encourage you to use the bus or train more for your journey to work? *(Please tick up to three boxes)*

- More direct bus routes ☐
- More frequent bus services ☐
- Better facilities at bus shelters ☐
- Discount tickets/passes from work ☐
- More convenient bus drop-off points ☐
- More frequent rail services ☐
- Better connections from work to rail ☐
- Better bus/rail information at work ☐
- Nothing ☐
- Other ☐

15. Which of the following changes would encourage you to cycle to work more? *(Please tick up to three boxes)*

- Improved cycle paths ☐
- Improved cycle parking at work ☐
- Improved changing/showering facilities ☐
- More lockers at work ☐
- Arrangements to buy bicycles at a discount ☐
- Nothing ☐
- Other ☐

16. Have your patterns of travel to work changed in the last twelve months? *(Please tick one box)* Yes ☐ No ☐

If yes which of the following is applicable? *(Please tick one box)*

- Drive more ☐
- Use public transport more ☐
- Walk/cycle more ☐
- Drive less ☐
- Use public transport less ☐
- Walk/cycle less ☐

17. Would you be prepared to car share? *(Please tick one box)* Yes ☐ No ☐

If yes then what would be most likely to encourage you to car share? *(Please tick more than one box)*

- Help in finding sharers ☐
- Free taxi travel home if let down by sharer ☐
- Reserved parking for car sharers ☐
- Reduced parking charges for car sharers ☐
- Other ☐

Work Details

18. Job Title :

19. What hours do you normally work? Start time ☐☐☐☐ Finish time ☐☐☐☐

20. Do you work flexi-time? *(Please tick one box)* Yes ☐ No ☐

21. Do you use a vehicle in the course of your work? *(Please tick one box)* Yes ☐ No ☐

Personal Details

Male ☐ Female ☐

Age *(Please tick relevant box)*

Under 24 ☐ 25 - 34 ☐ 35 - 44 ☐ 45 - 54 ☐ Over 55 ☐

Miscellaneous

Do you have any general comments about your journey to work that you would like to make, or are there any particular issues that you feel could be addressed in the development of the company travel plan.

Thank You for your cooperation.
We would like to ensure you that all of your answers will remain confidential and will only be used to assist in the development of a company travel plan.
Please return your completed form to the main office.

APPENDIX 8

AIR QUALITY

APPENDIX 8.1

Term	Definition
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
Exceedence	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
LAQM	Local Air Quality Management.
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
O_3	Ozone.
Percentile	The percentage of results below a given value.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
ppb parts per billion	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppb means that for every billion (10^9) units of air, there is one unit of pollutant present.

Term	Definition
ppm parts per million	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppm means that for every billion (10^6) units of air, there is one unit of pollutant present.
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
µg/m^3 micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
UKAS	United Kingdom Accreditation Service.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy', and has replaced it on recent European legislation.
USA	Updating and Screening Assessment.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

APPENDIX 8.2 – SUMMARY OF TRAFFIC DATA

Table 8.2.1: Traffic Data used in Modelling

Description	Average Speed (kph)	2016 Base		2025 Future Base plus committed devs		2025 With Development	
		Total Vehicle Flow (24hr AADT)	% HDV	Total Vehicle Flow (24hr AADT)	% HDV	Total Vehicle Flow (24hr AADT)	% HDV
1a Bridge Road West, west of site entrance	56.2	14610	5.2	15533	5.5	16024	5.5
1b Bridge Road West, west of site entrance (section approaching entrance)	16.1	14610	5.2	15533	5.5	16024	5.5
2 Bridge Road West, east of site entrance	16.1	14610	5.2	15533	5.5	17967	5.5
3a Bridge Road East (section approaching junction)	16.1	11987	6.9	12744	7.4	13776	7.4
3b Bridge Road East	56.2	11987	6.9	12744	7.4	13776	7.4
4a Bessemer Road (section approaching junction)	16.1	11552	3.1	12281	3.3	15118	3.3
4b Bessemer Road	40.3	11552	3.1	12281	3.3	15118	3.3
5a Broadwater Road, north of Hydeway (section approaching junction with Bridge Road)	16.1	12600	3.1	13396	3.3	17737	3.3

5b Broadwater Road, north of Hydeway	40.3	12600	3.1	13396	3.3	17737	3.3
6 Broadwater Road, south of Hydeway	40.3	12600	3.1	13396	3.3	17668	3.3
7 Broadwater Road, south of Site	40.3	12911	3.1	13726	3.3	17972	3.3

APPENDIX 8.3 – VERIFICATION AND ADJUSTMENT OF MODELLED CONCENTRATIONS

Nitrogen Dioxide (NO_2)

Most nitrogen dioxide (NO_2) is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions. Verification of concentrations predicted by the ADMS model has followed the methodology presented in LAQM.TG(16).

The model has been run to predict annual mean road-NO_x concentrations at a diffusion tube site located close to the Site.

The model output of road-NOx (i.e. the component of total NO_x coming from road traffic) has been compared to the 'measured' road-NO_x (Figure 8.3.1). The 'measured' road NO_x has been calculated from the measured NO_2 concentrations by using the Defra NO_x from NO_2 calculator available on the UK-AIR website.

Table 8.3.1: Comparison of Modelled and Monitored NOx concentrations

Monitoring Location	Total Monitored NO_2	Background NO2	Monitored Road NOx	Modelled Road NOx	Ratio
WH18	40	21	43.53	14.83	2.94

Figure 8.3.1: Comparison of Modelled Road NO_x with measured Road NO_x

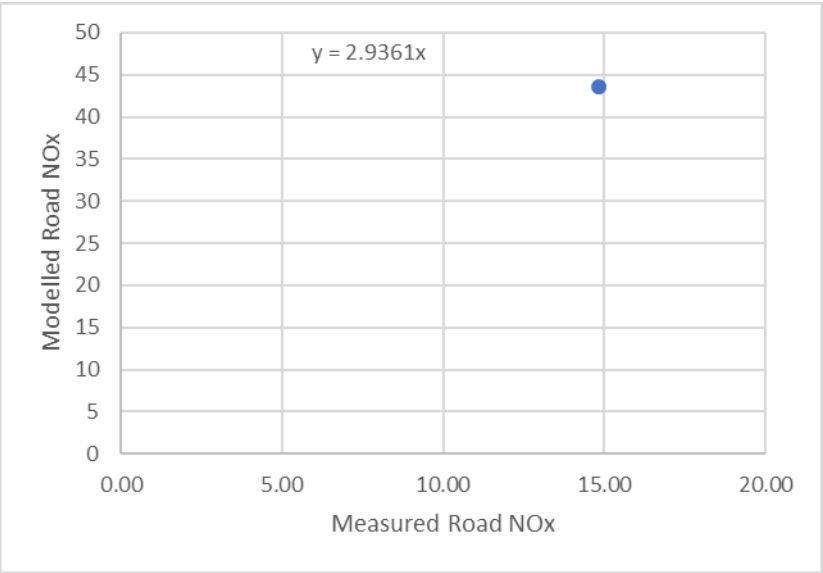


Figure 8.3.1 shows that the ADMS model under-predicted the road NO_x concentrations at the selected monitoring site. An adjustment factor was therefore determined as the ratio between the measured road-NO_x contribution and the modelled road-NO_x contribution, forced through zero (2.94). This factor has then been applied to the modelled road-NO_x concentration for each location to provide an adjusted modelled road-NO_x concentration.

The annual mean road-NO_2 concentration was determined using the Defra NO_x:NO_2 spread sheet calculation tool and added to the background NO_2 concentration to produce a total adjusted NO_2 concentration.

Particulate Matter (PM_{10} and $PM_{2.5}$)

There was insufficient roadside monitoring data available against which the modelling could be verified. Consequently, the verification factor determined above for adjusting the road-NO_x contribution has been applied to the predicted road-PM_{10} and road-$PM_{2.5}$ contributions, consistent with guidance provided in LAQM.TG(16).

APPENDIX 8.4 – AIR QUALITY STRATEGY OBJECTIVES

Table 8.4.1: Release Parameters

Parameter	CHP	Boilers (Combined Flues)[a]
Number of Units	1	3
Operational Hours per year	6570	4380
Stack Height (m)	36.63	36.63
Stack Diameter (m)	0.15	0.35
Temperature of Release (K)	303	342
Actual Flow Rate (Am^3/s)	0.26	1.40
Emission Velocity at Stack Exit (m/s)	14.9	14.6

Table 8.4.2: Emissions

Pollutant		CHP	Boilers (Combined Flues)[a]
NO_x	Short-term (g/s) Long-term (g/s)	0.0095 0.0071	0.0151
CO	Short-term (g/s)	0.0285	

(a) Four boiler units will be installed but only three boilers will be operating at any given time. Emissions calculated on this basis.

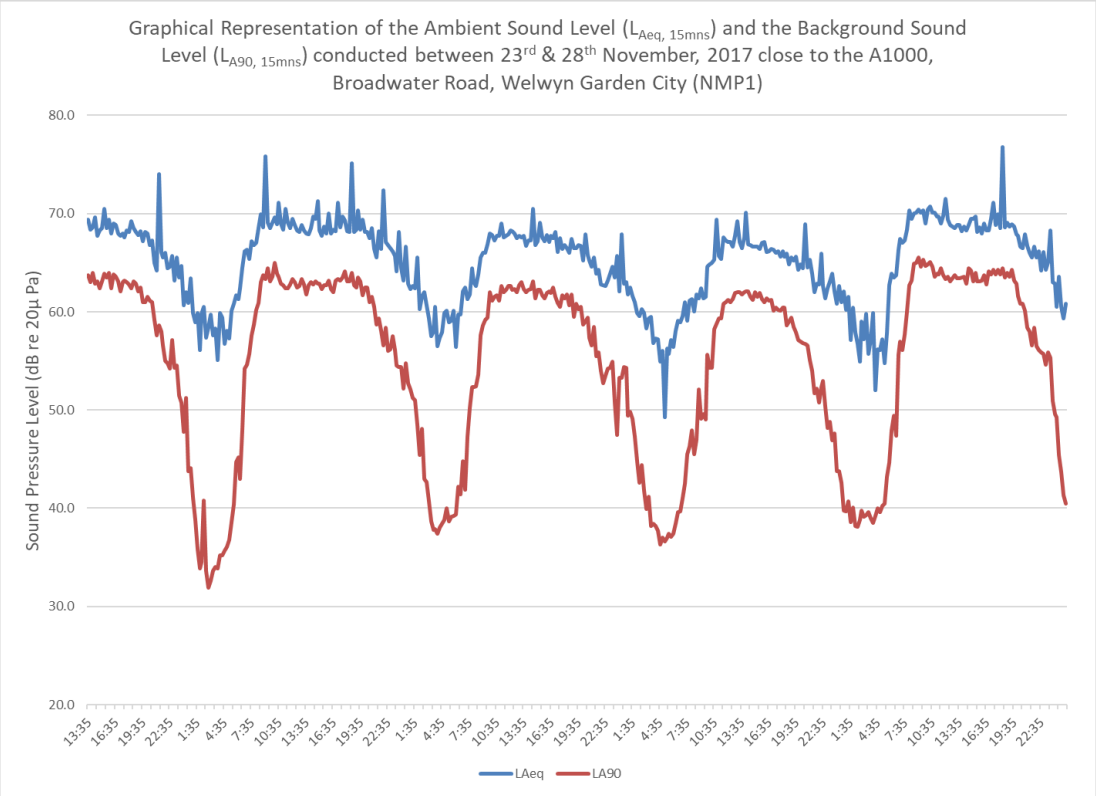
APPENDIX 8.5 - AIR QUALITY ASSESSMENT LEVELS

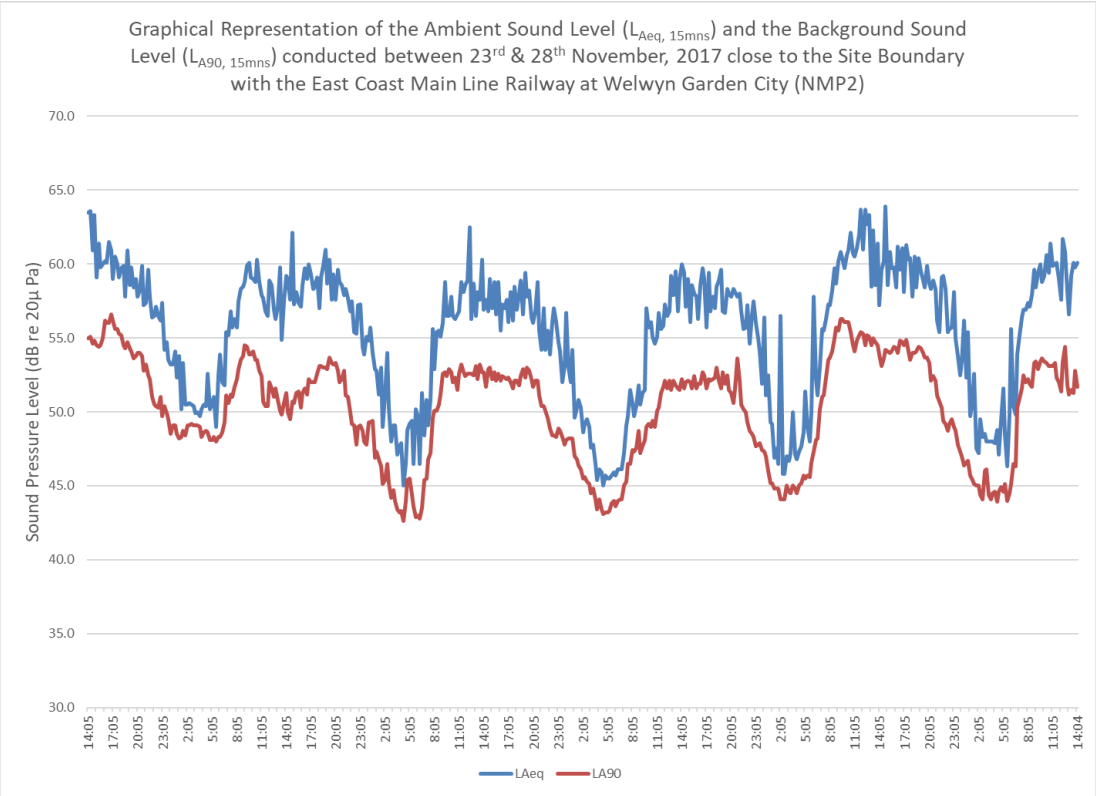
Air Quality Strategy Objective Levels			
Pollutant	**Standard (µg/m³)**	**Averaging Period**	**No. of Permitted Exceedances**
NO_2	200 (a)	1-Hour	18 per annum (99.8th percentile)
	40 (a)	Annual	-
PM_{10}	200 (a)	24-Hour	35 per annum (90.4th percentile)
	50 (a)	Annual	-
$PM_{2.5}$	25 (a)	Annual	-
CO	10000 (a)	8-hour	
(a) Air Quality Standards Regulations (2010) (b) EU Directive Limit Value			

APPENDIX 10

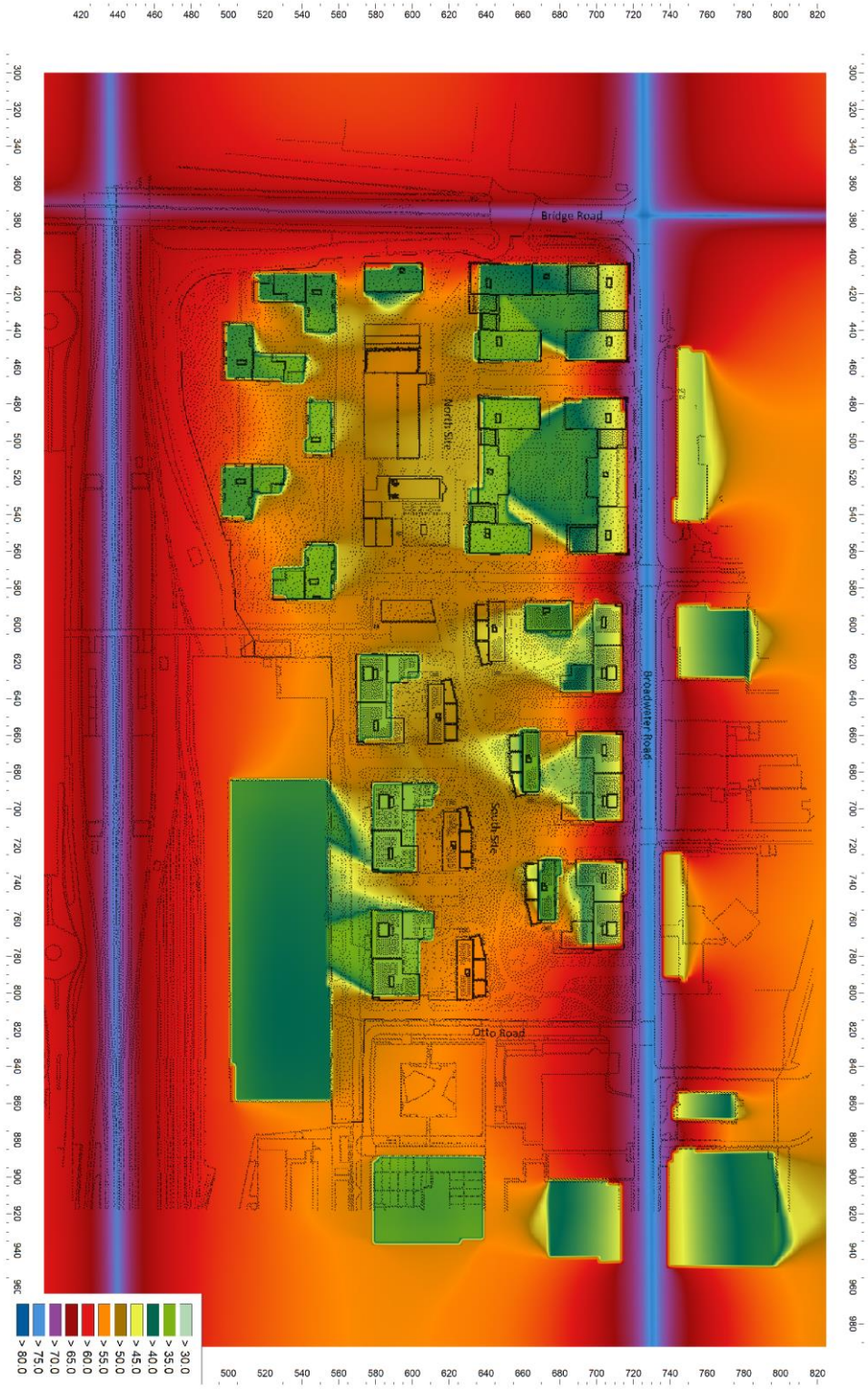
NOISE AND VIBRATION

APPENDIX 10.1 - GRAPHICAL REPRESENTATION OF THE BASELINE NOISE LEVELS.

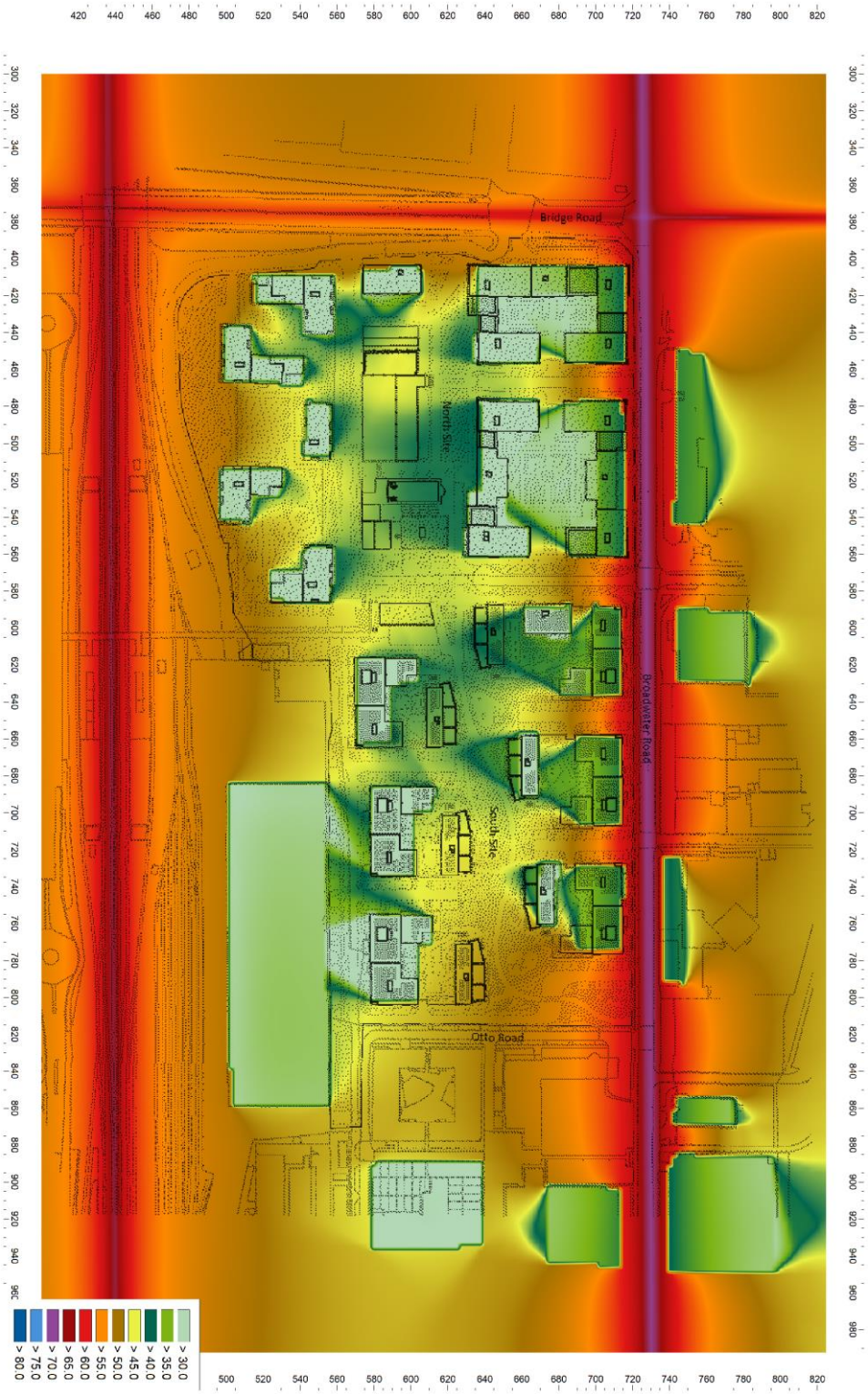




APPENDIX 10.2 – PREDICTIVE NOISE CONTOURS (DAYTIME 2025).



APPENDIX 10.3 – PREDICTIVE NOISE CONTOUR (NIGHT-TIME 2025).



APPENDIX 11

TOWNSCAPE AND VISUAL AMENITY

APPENDIX 11.1 – TVIA METHODOLOGY

INTRODUCTION

This assessment aims to identify and describe the nature and significance of the effects likely to arise as a result of the Proposed Development on the existing landscape / townscape and the visual amenity of people.

The Site and its environs are located wholly within an urban context and so this assessment necessarily focuses on 'townscape' matters (i.e. the relationship between built form, street and spaces) more than 'landscape' issues.

Approach

This methodology has been developed in accordance with the principles of good practice set out in the following published guidance produced by the relevant professional organisations concerned with landscape / townscape and visual impact assessment:

- Guidelines for Landscape and Visual Impact Assessment Third Edition (2013), (GLVIA3), published by the Landscape Institute and the Institute of Environmental Management & Assessment;
- GLVIA3 Statement of Clarification 1/13 (2013), published by the Landscape Institute;
- Landscape Institute Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment (2011), published by the Landscape Institute.

The GLVIA3 states that:

"Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity."

Whilst the GLVIA3 guidance states LVIA is used for the assessment of the effects of development on the landscape, it also confirms that there are different forms of landscape, including townscape and seascape. Townscape is defined paragraph 2.7 of the GLVIA3 as:

> *"Townscape refers to areas where the built environment is dominant. Villages, towns and cities often make important contributions as elements in wider-open landscapes but townscape means the landscape within the built-up area, including the buildings, the relationship between them, the different types of urban open spaces, including green*

spaces, and the relationship between buildings and open spaces. There are important relationships with the historic dimensions of landscape and townscape, since evidence of the way that villages, towns and cities change and develop over time contributes to their current form and character."

This assessment is defined therefore as a Townscape and Visual Impact Assessment (TVIA) rather than a LVIA however, the approach remains unchanged from that applied for an LVIA, with conventional 'landscape' issues outlined within the assessment where applicable.

The overall approach used to identify and assess townscape and visual effects is summarised as follows:

- Collate baseline information through desk study research and field based survey work, select appropriate townscape and visual receptors and establish their value;
- Review the proposed development and determine susceptibility of townscape and visual receptors to the type of change proposed;
- Combine value with susceptibility to determine sensitivity of townscape and visual receptors to the nature of development proposed;
- Describe the nature and magnitude of change likely to be experienced by townscape and visual receptors as a result of the proposed development;
- Describe any measures to avoid or reduce the magnitude of any adverse change;
- Assess the significance of effects for townscape and visual receptors in relation to the proposed development through a clear description of judgements on sensitivity and magnitude; and
- Identify those effects that are considered important to decision making.

Purpose of TVIA

The overriding aim of TVIA is to draw out the key townscape and visual issues that are likely to arise as a result of a development and to ensure that the significance of effects and the scope for reducing any adverse effects are properly understood by the public and the competent authority. Whilst it is important to identify the range of effects likely to be experienced by receptors, the aim should be to identify and describe in detail any significant effects that are likely to be most relevant to decision making.

Professional Judgement in TVIA

The GLVIA3 asserts that professional judgement is a very important part of LVIA / TVIA as, much of the assessment must rely on qualitative judgements about the nature of change and

whether it is positive, neutral or negative. However; professional judgement must be informed by clear and transparent methods, as clarified in paragraph 2.24 of the GLVIA3:

> *"In all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others."*

Limitations of TVIA

Landscape / townscape results from the interplay between the natural, physical and cultural components of the environment and as such the assessment of townscape and visual effects is a process closely linked with other topics, notably ecology and the historic environment. Whilst each of these topics can influence the character of the townscape and contribute to the sensitivity and value of townscape resources and visual amenity, the assessment of likely effects on the components of these topic areas is not part of the scope of TVIA.

Scope of Assessment

Spatial Scope

A preliminary study area has been identified, the extent of which considers the nature and scale of the Proposed Development in relation to the existing physical characteristics of the townscape as well as existing townscape studies and assessments. The preliminary study area is based on an approximate radius of 5km from the centre of the Site, which is considered to be sufficient to account for potential effects that may arise as a result of the Proposed Development.

Zones of Theoretical Visibility

Zones of theoretical visibility (ZTV) were modelled digitally to identify those areas of the townscape and landscape that theoretically are visually connected with the Site and Development in order to refine the extent of the study area. **Figure 11.9: Zone of Theoretical Visibility** illustrates an overlay of the ZTV for three scenarios.

ZTV 1, represents areas where only the existing built form on the Site is theoretically visible, based on existing building heights from topographical survey data, excluding the existing chimney and silos.

ZTV 2, represents areas where only the existing chimney and silos on the Site are theoretically visible, based on existing building heights from topographical survey data, set at circa 38m for the chimney and 30m for the silos, excluding the remaining built form within the Site.

ZTV 3, represents the proposed built form within the Site (excluding the existing built form, chimney and silo within the Site) that would theoretically be visible, based on the proposed building heights and parameter plans. This illustrates the potential visibility of the individual proposed built form based on the parameter building envelope and storey heights as illustrated in Appendix 5.

The ZTVs take account of the effect that adjacent built form surrounding the Site, residential settlements and significant woodland blocks / belts would have on views toward the Proposed Development and therefore illustrates a reasonable assumption of an area within which the Development could theoretically be visible.

The ZTVs were modelled using the Key Terra-Firma ZTV module for AutoCAD 2015 and are based on the following parameters and data sources:

- Ordnance Survey mapping at 1:25,000 scale;
- Ordnance Survey Landform Profile contour data at 5m height intervals;
- Viewer eye height set at 1.7m above landform;
- The built form developable extent is based on plans from ColladoCollins Architects, which illustrate the parameter building envelope and building heights for the Site as defined in **Chapter 5** of the ES;
- The adjacent built form surrounding the Site is set at the approximate building height assumed from onsite observations, following landform and are visually impermeable;
- The wider built form and settlements are assumed as 9m high following landform and are considered to be visually impermeable;
- Woodland blocks are assumed as 12m high following landform and are considered to be visually impermeable.

Whilst the ZTV indicated that the Proposed Development might be visible beyond 1km of the Site, it is considered that any views experienced by potential receptors in these areas would be either very distant or largely screened and that the magnitude of change would be lower than that experienced by receptors located within the study area. Following a request from Historic England and due to the ZTV indicating potential visibility, long distance views from Hatfield House and Gardens, a Registered Park and Garden of Historic Interest and popular tourist attraction, were considered as part of the assessment.

Determining the Study Area

The final 1km extent of the study area has been determined by considering together the preliminary study area, the results of the ZTV modelling and the initial findings of the baseline appraisal and assessment process. The townscape assessment covers a 1km radius, with the

assessment of visual amenity largely limited to 1km, with the exception of selected viewpoints from Hatfield House and Gardens located approximately 4.2km away. It should be noted that the boundary of the study area does not define the area beyond which there would be no impact. Rather it defines the area within which all of the likely significant townscape and visual effects could occur.

It is considered that any direct or indirect landscape / townscape effects arising as a result of the proposed development at a distance of greater than 1km would be negligible and are therefore not included within this assessment.

Temporal Scope

This assessment considers townscape and visual effects at the following stages of the Proposed Development:

- Effects during construction: Assesses the likely impact of temporary construction activities and considers the changing nature of the Application Site itself;
- Effects during operation at Year 0: Assesses the completed proposed development assuming vegetative landscape treatments would have been implemented and would be establishing, albeit not to a level sufficient to provide a screening or substantially softening function;
- Effects during operation at Year 15: Assumes vegetative landscape treatments would have reached semi-maturity allowing for an assessment of likely townscape and visual effects that takes established mitigation measures into account;
- Effects during summer and winter are considered where these would substantially differ as a result of vegetation growth or leaf cover.

Determining Baseline Conditions

Information has been collated through desk study and field survey in order to describe the baseline situation in relation to townscape character, landscape / townscape features and elements and the visual amenity of people within the study area.

Desk Study

A variety of sources have been reviewed to gain an understanding of the quality, variety and sensitivity of the features and elements that contribute toward townscape character and visual amenity in order to identify potential townscape and visual receptors.

These include relevant published local policy and guidance documents, Ordnance Survey mapping and aerial photography. The relevant departments of Welwyn Hatfield Borough Council were consulted to identify the presence of designated or undesignated assets not recorded in Proposed Development plan or other guidance documents (e.g. Tree Preservation Orders).

Data Sources

The desk study has included a review of the following sources of information:

- The National Planning Policy Framework (2012)
- Saved policies of Welwyn Hatfield District Local Plan (2005)
- Broadwater Road West, Supplementary Planning Guidance, Welwyn Hatfield Borough Council (2008)
- Welwyn Garden City Conservation Area Appraisal, Welwyn Hatfield Borough Council (2007)
- Ordnance Survey Mapping at 1:25,000 and 1:10,000 scale
- Aerial photography of the Application Site and wider area (Google Earth, www.maps.google.co.uk and www.bing.com/maps)
- Multi Agency Geographic Information for the Countryside (MAGIC) interactive mapping (www.magic.gov.uk)
- National Heritage List for England Map Search, Historic England (http://www.historicengland.org.uk)

Site Survey

Initial field work provides a context for TVIA and helps to identify likely opportunities and constraints for a development. In best practice, the findings of initial field work can be used to influence and guide the design of the Proposed Development in order to avoid or reduce potential impacts and to achieve the best fit with the landscape / townscape. Survey work for this TVIA was undertaken in November 2017 in order to further identify those features or elements that contribute to the character of the area and determine the potential visibility of the proposed development.

Photography

A series of representative and specific viewpoint photographs were captured during field work using a digital SLR camera with a fixed 50mm lens (equivalent focal length) at approximately 1.6m in height. The method used to capture and present the photographs as consistent with Landscape Institute Advice Note 01/11. These are presented in the Wireline Assessment included at Appendix 11.3 and have been used to inform the assessment.

Wirelines

A selection of the more sensitive viewpoints, as agreed in consultation with Welwyn Hatfield Borough Council and Historic England as part of the previous application for the Site, were identified as part of the assessment to have a wireline overlaid, illustrating the Proposed Development outline. The wirelines give an indication of the mass, scale and location of the Proposed Development in relation to the baseline view. The wirelines are based on the architects three dimensional (3D) massing model.

To achieve this, a series of computer generated images are taken from the exact viewpoint locations as the baseline photography and have cylindrical projection applied before photo-stitching to match the panoramic photographs, thus creating a 'virtual' panorama of the proposed development. With the virtual and photographic images overlaid with each other, common reference points (taken from the local site survey) are used to align both the virtual and actual images. The wireline is then drawn onto the existing photograph.

Selection of Townscape and Visual Receptors

Townscape and visual receptors were identified during desk study and have been verified during field survey work to provide a baseline against which to describe those effects likely to arise as a result of the Proposed Development. Receptors used within this assessment include:

- Townscape character types or areas drawn from published documents;
- Physical townscape / landscape features and elements; and
- Views experienced by people and their visual amenity.

Determining Visual Receptors

The baseline situation for visual receptors is described through a series of viewpoint photographs taken from publicly accessible locations, which illustrate the views likely to be experienced by these people. Where limitations to public access have prevented the capture of photographs that would have more accurately described the view of a receptor(s), every effort has been made to capture viewpoint photographs that are representative of the view the receptor(s) is likely to experience.

Viewpoints have been selected to identify the visual effects likely to arise as a result of the proposed development. As noted above, viewpoints have been agreed further to consultation with Welwyn Hatfield Borough Council and Historic England.

The visual assessment identified views from Welwyn Conservation Area, where appropriate, that are identified in the Conservation Area Appraisal as 'important key views and vistas' located in key areas of urban open land (Policy OS1 of the Local Plan).

The viewpoint photographs were taken in November 2017 in winter to provide a worst case visual scenario when trees and vegetation are not in leaf.

Determining Local Townscape Character Areas

To provide a finer grain of baseline detail at a local level, BMD carried out a townscape character assessment of the local area within 1km radius of the Site. This was conducted following the Government's planning and development guidance 'Landscape and Seascape Character Assessments' (Natural England and Department for Environment, Food and Rural Affairs, 2014).

The analysis undertaken by BMD was based on desktop study information, site visits and consideration of the Welwyn Garden City Conservation Area Appraisal and has identified 14 Local Townscape Character Areas (LTCA). A smaller zone of influence (0.5km) was also drawn, identifying those LTCA likely to be affected by the Proposed Development. Those parts of the study area that have not been assessed are areas where impacts would be negligible due to distance and / or the presence of intervening built form.

Establishing Value

Townscape Value

Townscape value describes the relative level of value or importance attached to a townscape or feature that would potentially be affected by the Proposed Development by considering the different stakeholders and parts of society that use or experience that townscape resource.

Factors that have been considered in the determination of townscape value include townscape designations and the level of importance that they signify (i.e. whether international, national or local), relevant local planning policy and guidance, the quality, condition and rarity of individual features or elements within the townscape and any verifiable local community interest (e.g. town square, allotments, parks etc.). The value of townscape receptors are determined against the criteria set out in Table A.01 in order to establish a consistent and objective baseline against which the potential effects arising as a result of the Proposed Development can be assessed. Professional judgement is applied to determine the value attributed in response to these criteria. The factors listed below are not considered to be exhaustive and for any one receptor, these factors may overlap between degrees of value. Therefore not all criteria need to be attributed to any one receptor for that value to be assigned.

Table A.01: Criteria Used to Determine Townscape Value

Value	Criteria
High	– International or National level designated areas (e.g. World Heritage Sites, National Parks, AONBs, Listed Buildings, Scheduled Monuments and/or Registered Historic Park and Gardens etc) are present within the receptor. – The area is considered to be an important component of the country's character and is experienced by a high number of tourists. – Rare and/or distinctive elements and / or features are key components that contribute to the character of the area / quality of the townscape resource. – Areas containing strong structures with noteworthy features or elements exhibiting a sense of place. – A townscape of high quality and condition primarily containing valued components combined in an aesthetically pleasing composition and lacking prominent disruptive visual detractors
Medium	– Regional, County or Local level designated areas (e.g. Conservation Areas, Green Belt, and/or Country Parks etc) are present within the receptor. – The area is considered to be an important component of the region or county's character and is experienced by a reasonable proportion of its population. – A townscape of medium quality and condition containing valued components combined in an aesthetically pleasing composition with low levels of disruptive visual detractors, exhibiting a recognisable visual cohesion or structure. – The townscape, or areas within it, may have a moderate level of tranquillity. – Rare or distinctive elements and / or features may be present and would contribute to the character of the area / quality of the townscape resource.
Low	– No townscape and/or landscape designations are present but the townscape may be valued locally (e.g. town square, allotments and/or public open spaces etc). – Use of the area is likely to be limited to the local community. – A townscape of low quality with limited distinctiveness and features – The condition of the townscape and its individual elements is poor and is generally poorly maintained or damaged / degraded. – An area containing some valued features but lacking a coherent and aesthetically pleasing composition with frequent or dominant detracting visual elements.

<u>Value attached to Views</u>

The value attached to a view has regard to formal designation and indicators of value attached to views by people. Table A.02 sets out the criteria that have been considered when determining the value attached to the views of visual receptors in order to establish a consistent and objective baseline against which the potential impacts arising as a result of the Proposed Development can be assessed. As noted for Townscape Value above, the list of factors noted in the criteria

below is not considered exhaustive and professional judgement is applied to determine an appropriate value for each view.

Table A.02: Criteria for determining value attached to views

Value	Criteria
High	– Views from / over / toward a townscape / landscape of national importance recognised through National designation such as National Parks, AONBs, Listed Buildings and/ or Historic Parks & Gardens. – Views from / over / toward townscape / landscape viewpoints within highly popular visitor attractions / tourist destinations. – Protected views. – Views with important and / or national cultural associations. – Views to which receptors have a proprietary interest.
Medium	– Views from / over / toward townscape / landscape of regional or local importance, which may be subject to local designation. – Views from / over / toward townscape / landscape viewpoints within moderately popular visitor attractions / tourist destinations. – Views with local cultural associations.
Low	– Views from / over / toward townscape / landscape with no designations and of at most local importance. – Views from / over / toward townscape / landscape viewpoints which are not particularly popular or recognised as being destinations in their own right. – Views with no cultural associations

Assessment of Likely Effects

Having determined the baseline conditions for the Site and study area, the assessment process then follows the following stages:

- Evaluate the sensitivity of landscape / townscape and visual receptors in relation to the Proposed Development;
- Assess the magnitude of change arising as a result of the Proposed Development in relation to townscape character, physical features and elements of the townscape and the visual amenity and views of people; and
- Combine judgements on the nature of receptors (sensitivity) with the nature of change (magnitude) to arrive at a clear and reasoned professional judgement regarding the significance of effects.

The criteria used for each of these stages of the assessment process in relation to both townscape and visual receptors are detailed in the following section of the methodology and are arranged in word scales in line with the preferred approach described within the GLVIA3.

Criteria detailed within these scales provide examples of the different thresholds used within the assessment process. It is important to note that these criteria act as a guide for professional judgement but do not replace it.

Assessment of Townscape Effects

Townscape Sensitivity

In TVIA, the sensitivity of townscape receptors is specifically related to the particular development that is being proposed and its location. Whilst townscapes generally have some intrinsic sensitivity, townscape receptors have different features and elements that can accommodate different types of development and levels of change.

The sensitivity of receptors is assessed by combining judgements on the value attached to the townscape resource and its susceptibility to the type of change proposed, i.e. a judgement about the nature of the Proposed Development in relation to the baseline capacity of the townscape to accept that type of change. The sensitivity of townscape receptors would therefore vary depending on the type and nature of development proposed.

Townscape Susceptibility

Townscape susceptibility describes the ability of a townscape receptor to accommodate change (i.e. the Proposed Development) without undue consequences for the maintenance of the baseline situation and / or the achievement of townscape and/ or landscape planning policies or strategies.)

Table A.03 sets out the criteria that have been considered when determining townscape susceptibility. As noted for Townscape Value, the criteria for judging susceptibility are not considered exhaustive and are applied using professional judgement.

Table A.03: Criteria for determining townscape susceptibility

Susceptibility	Criteria
High	– The proposed development would conflict with relevant or specific local planning policies or strategies. – The scale or enclosure of the area means the receptor has a low ability to accept the type of development proposed due to the interactions between landform, vegetation cover and built form. – There is little or no existing reference or context within the receptor to the type of development proposed.

Susceptibility	Criteria
	– The majority of existing element(s) would not be easy to replace (e.g. ancient woodland, mature trees etc). – Detracting features or major infrastructure is not present in the area or, where present, these have little influence on the character or experience of the townscape.
Medium	– The proposed development would not be supported by specific local planning policies or strategies but may be in line with general policy, guidance or strategies. – The scale or enclosure of the area means the receptor has a medium ability to accept the type of development proposed due to the interactions between landform, vegetation cover and built form. – There is some existing reference or context within the receptor to the type of development proposed. – Existing townscape and/or landscape elements can be relatively easily replaced. – Detracting features or major infrastructure is present in the area and these have a noticeable influence on the character or experience of the townscape.
Low	– The proposed development would be in line with local planning policies, strategies or guidance and the Application Site may be allocated for the type of development proposed. – The scale or enclosure of the area means the receptor has a high ability to accept the type of development proposed due to the interactions between landform, vegetation cover and built form. – The proposed development would be in keeping with the land use of the existing context of the receptor. – Few / no existing townscape and/or landscape elements are present (e.g. brownfield sites) or, where these are present, these can easily be replaced. – Existing features are detracting and / or major infrastructure is present which heavily influences the character or experience of the townscape.

Sensitivity of Townscape Receptors

Receptors are selected to describe the likely effects on the townscape resource arising as a result of the Proposed Development at a range of scales and can include wider townscape character areas / types as well as specific features or elements within the Application Site and the surrounding area.

Sensitivity is specific to each townscape receptor and reflects a balanced judgement on the value attached to the receptor and its susceptibility to the type of change proposed. Refer to the matrix in Table A.04 which illustrates how sensitivity is determined by a combination of value and susceptibility of the landscape receptor.

Sensitivity is specific to each townscape receptor and reflects a balanced judgement on the value attached to the receptor and its susceptibility to the type of change proposed. The sensitivity of townscape receptors is described using a three point word scale. Intermediate levels of sensitivity can also be attributed to receptors where relevant. Sensitivity is assessed to be either high, medium / high, medium, low/ medium, or low.

Table A.04: Criteria for determining townscape sensitivity

		VALUE		
SUSCEPTIBILITY		Low	Medium	High
	Low	Low	Medium	Medium
	Medium	Medium	Medium	High
	High	Medium	High	High

Magnitude of Townscape Change

The magnitude of townscape change is influenced by a number of factors including the extent to which townscape and/or landscape features are lost and / or altered, the introduction of new features into the townscape and the resulting change in the physical and / or perceptual characteristics of the townscape. The magnitude of townscape impact is determined by, but not necessarily limited to:

- The size and scale of the impact;
- The extent of the geographical area over which change is likely to be felt;
- The duration of the impact and its potential reversibility; and
- The proximity of the townscape receptor to the Site and the nature of the effect.

Consideration has been given to the location of character areas in relation to the Proposed Development as it is recognised that townscape and / or landscape features in close proximity to a development would usually have a much stronger influence on the sense of the townscape character than more distant features. It is however acknowledged that more distant features can also have an influence.

The magnitude of townscape change is described using a four point word scale. Intermediate levels of magnitude can also be attributed to receptors where relevant. Magnitude is assessed as being high, medium / high, medium, low / medium, low or negligible.

The magnitude of townscape change has been assessed with reference to the criteria set out in Table A.05, with professional judgement applied in its determination.

Table A.05: Criteria for determining magnitude of townscape change

Value	Criteria
High	– The size and scale of change is considered to be high due to the extent and proportion of existing townscape and/or landscape feature(s) or elements that would be lost / gained and the degree of alteration to aesthetic or perceptual qualities of the townscape; both of which would change key characteristics critical to the character of the receptor. – The geographical extent of change would influence the townscape at a regional level. – Effects would be considered long term and would either be irreversible or very difficult to reverse in practical terms.
Medium	– The size and scale of change is considered to be medium due to the extent and proportion of the existing townscape and/or landscape feature(s) or elements that would be lost/ gained and the degree of alteration to aesthetic or perceptual qualities of the townscape; both of which would influence key characteristics of the character of the receptor. – The geographical extent of change would influence the townscape at a local level. – Effects would be considered medium term and would potentially be reversible, although it may not be practical to do so.
Low	– The size and scale of change is considered to be low due to the extent and proportion of the existing townscape and/or landscape feature(s) or elements that would be lost/ gained and the degree of alteration to aesthetic or perceptual qualities of the townscape; both of which would be unlikely to influence the key characteristics of the receptor. – The geographical extent of change would influence the immediate setting of the proposed development. – Effects would be considered short term, would potentially be reversible and in practical terms would easily be achievable.
Negligible	– The size and scale of change is considered to be very low due to the extent and proportion of the existing townscape and/or landscape feature(s) or elements that would be lost/ gained and the degree of alteration to aesthetic or perceptual qualities of the townscape; neither of which would have any influence on the key characteristics of the receptor. – The geographical extent of change would influence the Application Site only. – Effects would be considered short term / temporary and / or easily reversible and in practical terms would very easily be achievable.

Assessment of Visual Effects

Visual Sensitivity

Visual receptors are people and comprise individuals or groups of people who are likely to be affected by the Proposed Development at specific viewpoints or a series of viewpoints. The sensitivity of visual receptors is determined by balancing judgements about the susceptibility of receptors to changes in their views and visual amenity (i.e. the Proposed Development) with the baseline value attached to the view by the receptor. The sensitivity of visual receptors will therefore vary depending on the type and nature of development proposed.

Susceptibility of Visual Receptors

The susceptibility of different receptors to changes in their views and visual amenity is a function of the occupation or activity of people experiencing a view at a particular location and the extent to which their attention is focussed on the view and visual amenity they experience.

Table A.06 sets out the criteria that have been considered when determining the susceptibility of visual receptors to change. As noted for the value of views, the criteria for determining susceptibility are not considered exhaustive and are applied using professional judgement.

Table A.06: Criteria for determining susceptibility of visual receptors

Susceptibility	Criteria
High	– Occupiers of residential properties. – People engaged in outdoor recreation whose attention is likely to be focussed on the townscape and/or landscape and / or particular views, or for whom their appreciation of views is an important factor in the enjoyment of the activity. – Tourists and visitors to heritage assets or other attractions where views of the surroundings are an important part of the experience. – People travelling through the townscape on roads, rail or other routes on recognised scenic routes or where there is a distinct awareness of views of their surroundings and their visual amenity.
Medium	– People at work and in educational institutions for whom the appreciation of – setting is important to the quality of working / school life – People staying in hotels and healthcare institutions who are likely to appreciate views of their surroundings. – People engaged in outdoor recreation or sport which involves an appreciation of views. – People travelling through the townscape on roads, rail or other routes who are likely to experience views of their surroundings.
Low	– People at their place of work where the appreciation of the setting is not important to the quality of working life. – People engaged in outdoor recreation or sport which does not involve an appreciation of views. – People travelling through the townscape who are unlikely to experience views of their surroundings or for whom the appreciation of views is not an important part of their journey.

Sensitivity of Visual Receptors

Receptors have been selected to describe the range of likely effects on the views of people and their visual amenity arising as a result of the proposed development, taking into account a range of factors including the number and sensitivity of viewers likely to be affected.

Sensitivity is specific to each visual receptor and reflects a balanced judgement on the value attached to the receptor and its susceptibility to the type of change proposed. Refer to matrix in Table A.07 which illustrates how visual sensitivity is determined by a combination of value and susceptibility of the visual receptor.

The sensitivity of visual receptors is described using a three point word scale. Intermediate levels of sensitivity can also be attributed to receptors where relevant. Sensitivity is assessed to be either high, medium / high, medium, low / medium, or low.

Table A.07: Criteria for determining visual sensitivity

		VALUE		
SUSCEPTIBILITY		Low	Medium	High
	Low	Low	Medium	Medium
	Medium	Medium	Medium	High
	High	Medium	High	High

Magnitude of Visual Change

The impact on visual receptors is assessed with regard to the magnitude of change to the views and visual amenity of people arising as a result of the Proposed Development. The magnitude of visual change is evaluated in relation to the size or scale of the impact, the geographical extent of the change and the duration and reversibility of the impact.

The magnitude of townscape visual change is described using a four point word scale. Intermediate levels of magnitude can also be attributed to receptors where relevant. Magnitude is assessed as being high, medium / high, medium, low / medium, low or negligible.

The magnitude of visual change has been assessed with reference to the criteria set out in the Table A.08, with professional judgement applied in its determination.

Table A.08: Criteria for Determining Magnitude of Change

Value	Criteria
High	– The size and scale of change is considered to be high due to the extent of loss / addition / alteration of features within the view, the change to the composition of the view, the degree of contrast / integration of the proposal with the baseline situation and the nature of the view. – The geographical extent of change is considered to be high due to very close proximity of the receptor to the proposed development, the angle of view and the substantial extent of the view that would change as a result of the proposed development. – Effects would be considered long term and would either be irreversible or very difficult to reverse in practical terms.

Value	Criteria
Medium	– The size and scale of change is considered to be medium due to the reasonable extent of loss / addition / alteration of features within the view, the change to the composition of the view, the degree of contrast / integration of the proposal with the baseline situation and the nature of the view. – The geographical extent of change is considered to be high due to close proximity of the receptor to the Proposed development, the angle of view and the reasonable extent of the view that would change as a result of the Proposed development. – Effects would be considered medium term and would potentially be reversible, although it may not be practical to do so
Low	– The size and scale of change is considered to be low due to the limited extent of loss / addition / alteration of features within the view, the change to the composition of the view, the degree of contrast / integration of the proposal with the baseline situation and the nature of the view. – The geographical extent of change is considered to be low due to distance of the receptor from the Proposed development, the angle of view and the minimal extent of the view that would change as a result of the Proposed development. – Effects would be considered short term, would potentially be reversible and in practical terms would easily be achievable.
Negligible	– The size and scale of change is considered to be very low due to the barely perceptible extent of loss / addition / alteration of features within the view, the change to the composition of the view, the degree of contrast / integration of the proposal with the baseline situation and the nature of the view. – The geographical extent of change is considered to be barely perceptible due to distance of the receptor from the Proposed development, the angle of view and the extent of the view that would change as a result of the Proposed development. – Effects would be considered short term or temporary, would easily be reversible and in practical terms would very easily be achievable.

Definitions of Terms used to Describe Change

The GLVIA3 emphasises the importance of clarifying any assumptions underlying professional judgements, therefore where verbal scales are used to describe the nature and magnitude of changes likely to occur as a result of the Proposed Development, in addition to the previously defined scales, the following definitions apply.

Nature of Change

The nature of change is defined as follows:

- Direct (resulting directly from the proposed development) or Indirect (consequential change resulting from the proposed development);
- Permanent or Temporary (if temporary a timescale will be described); and
- Positive, Negative or Neutral.

The GLVIA3 acknowledges that determining whether change is positive, negative or neutral is a challenging issue and requires informed professional judgements to be made with reference to the following criteria as a minimum:

- The degree to which the proposal fits with existing townscape character; and
- The contribution to the townscape that the proposed development may make in its own right, usually by virtue of good design, even if it is in contrast to the existing character of the townscape.

Nature of View

This criterion describes the nature and relative amount of time over which views of the proposed development are likely to be experienced. Views are described as being:

- Full: views would be relatively open / unscreened and of a duration sufficient to appreciate the scale of the proposed development;
- Partial: views of the proposed development would be partially screened / filtered and / or would be of a limited duration that would not allow the full scale of the proposed development to be fully appreciated;
- Glimpsed: views of the proposed development would be largely screened and / or the duration of views would be so limited that the scale of the proposed development cannot be appreciated by the receptor; or
- Sequential: receptors may move along a route (e.g. footpath, bridleway, cycleway, road or railway), with their sensitivity and experience of the proposed development likely to vary along the route.

Distance of Receptor from Site Boundary

This is expressed in metres or kilometres and considers the following thresholds in relation to the Site boundary:

- Adjacent: next to or in very close proximity to the Application Site;
- Near Distance: up to 500m;
- Middle Distance: between 500m and 2km; or
- Long Distance: 2km and above.

Area of Townscape Affected

This criterion provides thresholds that describe the geographical extent of the townscape and landscape over which change arising as a result of the proposed development would be felt. Change is described as being of the following scales:

- Regional: likely to influence the Borough and/or District of the town;
- Local: at the scale of a townscape character area;
- Immediate Setting: within close proximity to the Site; or
- Site only: within the proposed development itself.

Angle of View of Visual Receptors

This criterion describes the angle of the view toward the proposed development that a visual receptor is likely to experience in relation to the activity they are undertaking, e.g. walking along a public footpath or pavement and driving along a road etc:

- Direct: in line with the activity being undertaken.
- Indirect: not in line with the activity being undertaken.

Duration of Impact

The duration of impacts are considered against the following thresholds:

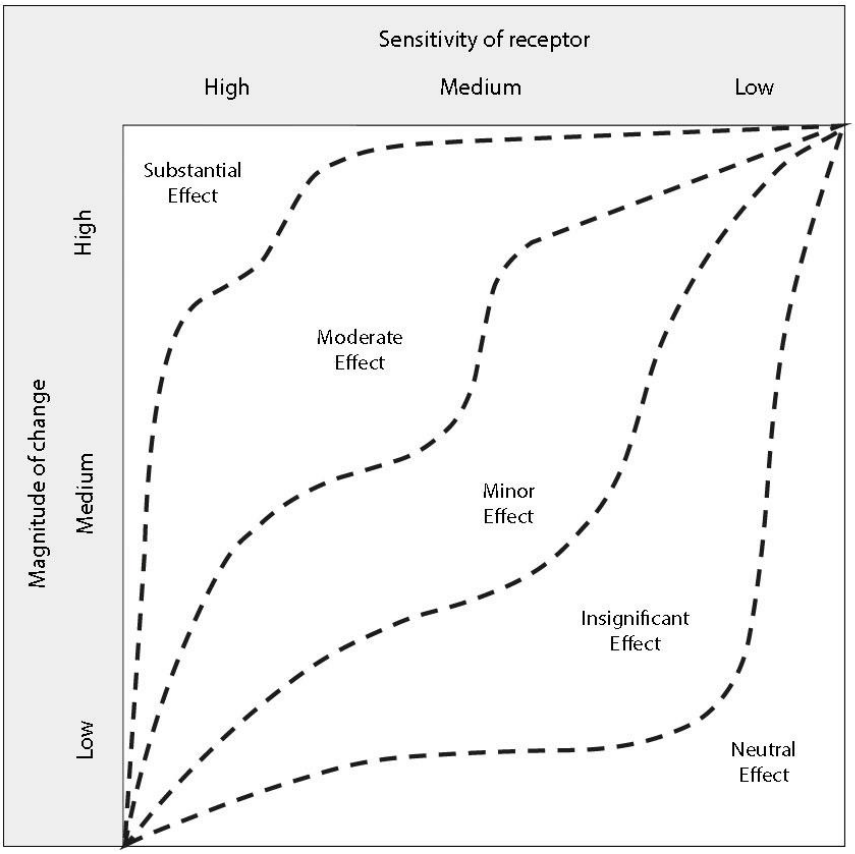
- Short term: up to 5 years
- Medium term: between 5 and 10 years
- Long term: over 10 years

The reversibility of impacts is also considered. These are recorded as either reversible or irreversible and comprise a judgement about the prospects and practicality of a particular impact being reversed over a defined timescale.

Determining the Significance of Effects

The final conclusions for both townscape and visual effects are based on a combination of sensitivity and magnitude of change (impact). The overall judgement on the nature and level of these effects, referred to as significance, is based on the sequential combination of each criteria, leading to a balanced justification as described by the criteria provided in Tables A.10 & A.11, with professional judgement applied to inform this determination. The matrix in Table A.09 provides an indicative illustration of how the effect is determined by this combination of sensitivity and magnitude but is not applied without due consideration of the specific details of the site and proposed development under assessment.

Table A.09: Determination of significance matrix



Describing the effects likely to arise as a result of the Proposed Development and determining their significance requires the application of professional judgement to weigh the findings of the sensitivity of receptors against the predicted magnitudes of change, which can be beneficial, adverse or neutral.

The significance of townscape and visual effects are described using a four point word scale. Intermediate levels of significance can be attributed where relevant. Significance of townscape effects is assessed as being substantial, moderate / substantial, moderate, minor / moderate, minor, insignificant / minor, insignificant. A judgement of neutral effect can also be determined where there is no discernible change.

The criteria used to determine the significance of both townscape and visual effects are set out in Tables A.10 and A.11 and are derived from guidance provided within the GLVIA3.

Table A.10: Criteria for determining significance of townscape effects

Effect	Criteria
Adverse Effect of Substantial Significance	– Be at considerable variance with the character of the townscape. – Degrade or diminish the integrity of a wide range of characteristic features and elements. – Substantially damage the sense of place.
Adverse Effect of Moderate Significance	– Conflict with the character of the townscape. – Have an adverse effect on some characteristic features and elements – Diminish the sense of place.
Adverse Effect of Minor Significance	– Not quite fit with the character of the townscape. – Be at variance with some characteristic features and elements – Detract from the sense of place
Insignificant Adverse Effect	– Result in a barely perceptible deterioration of townscape character. – Have a barely perceptible effect on characteristic features and elements. – Barely effect on the sense of place.
Neutral	– Maintain the character of the townscape. – Blend in with characteristic features and elements. – Enable the sense of place to be retained.
Insignificant Beneficial Effect	– Result in a barely perceptible improvement to townscape character. – Provide limited enhancement of characteristic features and elements. Barely improve the sense of place.
Beneficial Effect of Minor Significance	– Complement the character of the townscape. – Enhance characteristic features or elements. – Slightly enhance the sense of place.
Beneficial Effect of Moderate Significance	– Slightly enhance the character of the townscape. – Enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development. – Enhance the sense of place.
Beneficial Effect of Substantial Significance	– Enhance the character of the townscape. – Enable the restoration of characteristic features and elements completely lost or diminished as a result of changes from inappropriate management or development. – Greatly enhance the sense of place.

Table A.11: Criteria for determining significance of visual effects

Effect	Criteria
Adverse Effect of Substantial Significance	– Cause a major deterioration to the view of a receptor of medium to high sensitivity that would constitute a total change in the view or would introduce a major discordant element into the view.
Adverse Effect of Moderate Significance	– Cause an obvious deterioration to the view of a receptor of low to medium sensitivity or a perceptible deterioration to the view of a highly sensitive receptor that would constitute a clear change in the view or would introduce a discordant element into the view.
Adverse Effect of Minor Significance	– Cause limited deterioration to the view of a receptor of medium to high sensitivity or greater deterioration to the view of a receptor of low to medium sensitivity that would constitute a noticeable change in the view or would introduce uncharacteristic features or elements into the view.
Insignificant Adverse Effect	– Result in a barely perceptible adverse change in the view associated with the introduction of uncharacteristic features or elements.
Neutral	– Not be visible to the receptor. Any associated mitigation would represent an indiscernible change to the baseline situation.
Insignificant Beneficial Effect	– Result in a barely perceptible beneficial change in the view associated with the introduction of characteristic features or elements.
Beneficial Effect of Minor Significance	– Result in the perceptible improvement to the view of a receptor of medium to high sensitivity, a limited improvement to the view of a receptor of low to medium sensitivity or greater improvement to the view of a receptor of low sensitivity.
Beneficial Effect of Moderate Significance	– Result in the limited improvement to the view of a receptor of high sensitivity, an obvious improvement to the view of a receptor of low to medium sensitivity or the major improvement to the view of a receptor of low sensitivity.
Beneficial Effect of Substantial Significance	– Result in a major improvement to the view of a receptor of medium to high sensitivity.

Describing the Importance of Effects

For the purposes of this assessment, the significance of effects are described in relation to their importance to decision making and have been defined as follows:

- **Substantial** – Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy and/or standards
- **Moderate** – noticeable effect (by extent, duration or magnitude) which may be considered significant.
- **Minor/ Moderate** or **Minor**– slight, very short or highly localised effect of low significance
- **Insignificant** – No significant effect (either adverse or beneficial) to an environmental resource or receptor.

TVIA and the Design Process

Mitigation and Enhancement Measures

Mitigation measures are proposed to prevent, reduce and where possible offset any adverse townscape and visual effects and are typically developed in collaboration with members of the design team, environmental specialists and statutory consultees.

In terms of TVIA, the aims of mitigation are to ensure the Proposed Development achieves the best fit with the local townscape character, retains and makes best use of existing townscape and landscape features and provides adequate screening for visual receptors. The type(s) of mitigation measures proposed would be influenced by the surrounding townscape character and where possible would address opportunities to enhance biodiversity and improve nature conversation.

Enhancement relates to any proposals that seek to improve the townscape and / or visual amenity of the Site and its wider setting beyond its original baseline condition and as such is not specifically related to the mitigation of adverse effects.

For the purposes of this TVIA it has been assumed that mitigation and enhancement measures would be implemented during the construction phase and would be in place at completion. Mitigation is therefore considered within this assessment as an integral part of the development proposals.