Land South of Gonerby Lane, West of the A1, Gonerby Moor

Representations to South Kesteven Local Plan Regulation 18 Consultation

Boyer

Prepared on behalf of Caddick Developments | April 24

REPORT CONTROL

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APPENDICES

1. INTRODUCTION

1.1 These representations have been prepared by Boyer on behalf of Caddick Developments ('Caddick') ('the Client') to respond to the South Kesteven District Council (SKDC) Regulation 18 Draft Local Plan Consultation.

1.2 Caddick are promoting 63.7 Ha Land South of Gonerby Lane, West of the A1, Gonerby Moor, Grantham ('the site') for employment use. This site has been put forward as a proposed draft employment allocation within the Regulation 18 Draft Plan under the reference SKPR-100 for B2 and B8 uses.

Caddick Developments

1.3 Caddick Developments are one of the largest, privately owned, multisector property developers, creating high quality places and spaces across the UK. Caddick are a trusted delivery partner, building institution-grade assets across the Country. Caddick's business specialises in the acquisition, development, construction, and management of residential, industrial and regeneration projects.

1.4 As a multi-sector developer and contractor, Caddick are well placed to maximise the full value from all elements of complex large-scale schemes. Caddick Land was established to formalise all promotion work and has a strong in-house planning and development experience, as well as a substantial track record of promoting industrial and logistics sites nationally, ranging from logistics, distribution and manufacturing, to film and television studio space, office and light industrial uses. Caddick currently have a promotion pipeline of over 19 million sq.ft. of industrial floor space at various stages of the planning and delivery process.

1.5 Caddick have always remained a family business, and despite their growth, it's still their people, their families and their communities that lie at the heart of everything they do. As Caddick have grown over the years, they have been able to make an even greater and more positive impact on people's lives whether they be their own staff, customers, occupiers, investors, or the communities in which they deliver their projects.

Scope and Structure of these Representations

1.6 These representations are made with respect to the ongoing promotion of the Land South of Gonerby Lane, West of the A1, Gonerby Moor ('the site'), for employment (B2 and B8) development, over which Caddick holds a specific land interest. These representations address topics within the South Kesteven District Council (SKDC) Local Plan Regulation 18 consultation, and its supporting evidence base, accordingly.

1.7 The purpose of these representations is to assist SKDC ('the Council') in formulating an approach within the emerging Local Plan that is both consistent with national planning policy and the tests of soundness. In this regard, our representations relate to the tests of soundness set out at paragraph 35 of the National Planning Policy Framework ('NPPF') (December 2023); namely, whether the emerging Local Plan is:

Positively prepared – providing a strategy which, as a minimum, seeks to meet the area's objectively assessed needs; and is informed by agreements with other authorities, so that unmet need from neighbouring areas is accommodated where it is practical to do so and is consistent with achieving sustainable development;

Justified – representing an appropriate strategy, taking into account the reasonable alternatives, and based on proportionate evidence;

Effective – deliverable over the plan period, and based on effective joint working on cross-boundary strategic matters that have been dealt with rather than deferred, as evidenced by the statement of common ground; and

Consistent with national policy – enabling the delivery of sustainable development in accordance with the policies in this Framework and other statements of national planning policy, where relevant.

1.8 At this early stage of plan-making, it is important that the Council pursues an approach that is consistent with national policy, effective, justified, and positively prepared, for the Local Plan to be found sound at Examination.

Policy Context

1.9 South Kesteven District Council (SKDC) adopted its 'Local Plan 2011-2036' in January 2020. The Plan sets out the spatial strategy to meet development needs across the District up to 2036.

1.10 The Town and Country Planning (Local Planning) (England) Regulations 2012 (as amended) requires local planning authorities to review local plans at least once every 5 years from their adoption date. This is intended to ensure that planning policies remain relevant and able to effectively meet the needs of the local community.

1.11 The Inspector's final report on the current Local Plan committed the Council to undertake an early review of the Local Plan from April 2020. The Local Plan, which is the subject of this Regulation 18 Consultation, represents the progression of this review process and enables necessary updates of evidence including housing and employment need.

1.12 In this regard, Caddick supports the Council's commitment to the review of the Local Plan to cover the South Kesteven administrative area.

Structure of Representations

1.13 Our representations are set within the context in which we seek to support the proposed allocation of the Land South of Gonerby Lane, West of the A1, Gonerby ('the site') for employment purposes, whilst making comments to assist the Council in producing a 'sound' Local Plan.

1.14 Accordingly, the following sections of these representations are set out as follows:

Section 2: A review of the Sustainability Appraisal

Section 3: A review of the Employment Evidence Base

Section 4: Comments On Other Policies

Section 5: Land South of Gonerby Lane, West of the A1, Gonerby Moor

Section 6: Conclusion

1.15 We trust that our comments are of assistance to the Council, in formulating an approach that is positively prepared, effective, justified, and consistent with national policy, as the emerging Local Plan progresses toward adoption.

2. SUSTAINABILITY APPRAISAL

2.1 The Interim Sustainability Appraisal ('SA') has been prepared by AECOM on behalf of the Council. The SA sets out the Scope and Framework for undertaking the assessment and provides the next steps of the further detail on the various topic areas to be assessed prior to the Regulation 19 consultation.

2.2 The Interim SA assesses the following in relation to each identified site and locations for growth:

- The environmental constraints of the main settlements in the District.
- The environmental constraints of the available site options for a potential allocation in this Local Plan Review.
- Potential site options for the Local Plan Review.
- The proposed updates to the Local Plan Review policies.

2.3 In relation to employment land the SA recognises that:

"The Local Plan Review allocates circa 338(ha) of new employment sites across the District. Whilst this is significantly higher than the requirement identified in the Employment Land Study (2023), the sites offer a suitable choice to the market through the identification of new land for a range of employment uses. This will ensure the further economic growth scenarios can be met by attracting substantial inward investment and providing a wide range of jobs in various sectors and industries to meet the allocated housing and population growth across South Kesteven." (SA, p. 16)

2.4 We support the approach the SA has set out, as allocating more land enables flexibility in the market and for sites in the most suitable locations to come forward, rather than being constrained to areas which are in less demand or attractive to employers and investors.

2.5 An SA Scoping Report was also produced to support the main Interim SA, this identified a range of sustainability issues to be focused on, which were translated into the SA Framework. The Framework identified 9 key areas for focus: Biodiversity and Geodiversity, Landscape, Historic Environment, Air, Land, Water and Soils Resources, Climate Change, Population and Community, Health and Wellbeing, Transport, and Economic Viability.

2.6 To further support the identified areas of focus, a Points of the Compass exercise was carried out, assessing the 20 main settlements of the District, to identify the most appropriate locations for growth. Further information regarding the Points of the Compass exercise is discussed below. We consider that the work undertaken as part of the SA and the Points of the Compass exercise is helpful and necessary to find the most sustainable locations for growth.

2.7 The SA recommends 2 alterations to be considered in the Regulation 18 Local Plan for the following identified key areas:

- Air, Land, Soil, and Water Resources – policies should be strengthened to require development above 1ha to be accompanied by an Agricultural Land Classification report.
- Transport – policies could be strengthened to improve connectivity within more rural locations.

2.8 We agree that these proposed recommendations are appropriate and will assist the Council in demonstrating that it has identified the most appropriate land for future growth.

2.9 The Appraisal scores the individual sites through a 5 point Red Amber Green (RAG) Rules system. This has been outlined in more detail below:

- **Dark Red:** Least well-performing sites
- **Light Red:** Less well-performing sites
- **Yellow:** Middle ranking sites
- **Light Green:** Better performing sites
- **Dark Green:** Best performing sites

2.10 This system helps to clearly highlight the benefits and constrains of each site. Further detail on the 'RAG Rules' is outlined within Table 3.1 of the SA Technical Annex (Appendix 1). After further review of the criteria listed as part of the constraints and opportunities RAG evaluation, this has highlighted that some of the criteria is based on data which is obsolete and last updated knowingly in 2006. We argue that several of the RAG ratings given in relation to our Client's site at Gonerby Moor (SKPR-100) are not accurate and therefore they do not reflect the true development potential.

SKPR-100: Land South of Gonerby Lane, West of the A1, Gonerby Moor, Grantham

2.11 Following a review of the RAG Assessment undertaken by the SA of the land south of Gonerby Lane, Gonerby Moor we strongly support the scoring and assessment that has been undertaken for the site. However there are several areas that our Client considers require review, mainly in relation to areas which have been labelled as Dark Red or Light Red.

Dark Red RAG Rating

2.12 Our client's site at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) has been given a dark red rating in relation to the distance from Local Nature Reserves (LNRs). Having reviewed the Council's Interactive Planning Map it highlights only one LNR within the whole District. This is located at Witham on the Hill. Having reviewed the 'RAG Rules' alongside the way in which sites are assessed against this particular criterion, it outlines that this is based on having good access to nature and therefore sites would score more favourably the more closely located they are to a LNR as this provides more opportunities and access.

2.13 On this basis, SKPR-100 along with other sites assessed against this methodology have scored negatively against this reading due to their only being one LNR within the whole District and distance from the site to it. The Council are basing the assessment, on sites scoring more favourably the closer in proximity they are to an LNR. We consider that there may be better weighting in sites, particularly which are for employment uses, to be located further away from LNRs as this would limit impact on them and any potential harm which may be caused. Therefore notwithstanding the Council's methodology for assessing LNRs, we consider that this should be adjusted to consider wider opportunities for access to nature and biodiversity enhancements that could be created through development proposals. Thereby, applying weighting to sites that are further away from sensitive ecological areas.

2.14 A dark red rating has also been given in relation to the proximity of bus stops from site SKPR-100, with the assessment stating that the closest bus stops are 995m away (calculated as the crow flies from the centre of the site). We consider this to be inaccurate as from our searches we note a bus stop being located at Downtown, the other side of the A1 adjacent to the site at Gonerby Moor. This bus stop is approximately 500m from the site (as the crow flies) and provides routine services to Grantham, Newark and Long Bennington.

2.15 Consideration should also be given for the outline planning permission granted in 2022 on the Downtown site (Council Ref: S17/2155), as per the agreed S106 this outlines further bus service enhancement measures which will be delivered as part of the site, this includes an enhanced service every 30 mins at peak times and a service every our in off peak times. We understand there is an aspiration to provide a new Railway Station and Park and Ride Facility as part of any future development at this location. The site at Gonerby Moor (SKPR-100) can therefore be easily linked to these existing bus routes and services through enhancements to the service provision and to extend the service over the A1 to the site. The Transport Appraisal (TA), commissioned by the Client in relation to the site, outlines how further opportunities to improve these services can be provided (Appendix 2).

2.16 The nearest open space has been recognised as being 1621m away at Belton Lane within the settlement of Great Gonerby. Although some distance from the site existing bridleways and footpaths connect directly from the site to the settlement of Great Gonerby. Furthermore, the nature of the scheme as a proposed employment allocation does not require open space provision as a residential development would and instead the development would provide significant enhancements to amenity open space provision through new structural soft landscaping to the boundaries of the site and to assist in breaking up the buildings within the development area. We consider that the Council should consider the proposed uses of the sites as part of their assessment as the outcome would change whether considering a residential or employment site use.

Light Red RAG Rating

2.17 SKPR-100 has been marked as light red in colour in relation to the proximity to the SSSI at Allington Meadows. The site is 1168 metres to the east of the SSSI. Allington Meadows, is a SSSI extending to 4.1 ha, and is a traditionally managed grassland, supporting plant communities typical of alluvial, calcareous clay and loam soils. The SSSI is comprised of five fields, the largest of which has ridge and furrow topography, the site is enclosed by mature hedges and bounded by Foston Beck on the eastern boundary.

2.18 We consider that the proposed employment allocation at Land South of Gonerby Lane would have limited impact on the SSSI. This is due to the traffic generated from the site being directed away from this location and towards the A1 and strategic road network to the east. Furthermore, the SSSI is separated from the site by an established farm and a number of small rural businesses which operate from smaller industrial units, namely an equestrian centre and farm equipment supplier. There is unlikely to be any direct or indirect impact on the SSSI and this will be carefully considered through detailed ecological assessments as part of any future planning application on the site. We consider that the rating should be adjusted to amber / green.

2.19 A light red rating has also been given in relation to the proximity to a primary service (shop) with the nearest being marked as 1847m away. We have reviewed the surrounding area and consider the services provided at the Moto (Grantham North) are located approximately 500m north east from the site (as the crow flies) and should be considered positively as part of this assessment. The Moto provides a range of eateries and convenience stores within walking / cycling distance from the site and is open 24/7. Furthermore, consideration should be given for the additional retail provision which will be delivered as part of the recently permitted Downtown development, which would also contribute towards a more positive rating. We consider the rating should be adjusted to green.

Summary

2.20 We consider for the RAG assessment to be robust and to accurately inform the SA, the above amendments should be made to reflect an accurate assessment of the site and to support its role as a proposed employment allocation in the emerging plan.

Points of the Compass

2.21 To support the Sustainability Appraisal, a Points of the Compass Assessment has been prepared (SA Technical Annex), which assesses the Grantham Sub Regional Centre and other Market Towns and Large Villages within the District.

2.22 The assessment appraises the 20 settlements against the following criteria:

a. Built environment designations; scheduled monuments, conservation areas, registered parks and gardens, and listed buildings.

b. Biodiversity designations; SSSIs, Priority Habitats, and RIGS.

c. Soil and water designations; SPZs, ALC, and Flood Zones

2.23 Grantham has been divided into 4 segments: Gra1, Gra2, Gra3 and Gra4. The site at Gonerby Moor, being promoted by Caddick, is located within the south-western corner of Gra4 and along with the other proposed draft employment allocations, is the only sole employment cluster being proposed for allocation within the Grantham area.

2.24 The assessment considers key constraints in each of the segmented areas. Below we have highlighted the main notable areas which may prohibit development in these other areas and highlight the suitability of the allocations proposed as part of Gra4 at Gonerby Moor.

Gra1

2.25 The broad area of Gra1 is largely constrained by Belton House Historic Park and Garden which covers a large proportion of this segment. Due to the historic nature of the area there are over 137 listed buildings and four conservation areas. Deciduous woodland is also largely scattered across this whole area.

2.26 Furthermore, this segment has limited connections to the strategic highway network.

2.27 We therefore view this broad location as unsuitable for development, with it being one of the most non-urban segments assessed as part of the wider Grantham Sub Area. We support the Council's approach to not allocate any sites here.

Gra2

2.28 The broad area of Gra2 is largely made up of the two large allocations of SKPR-65 (Prince William of Gloucester Barracks) and SKPR-278 (Spitalgate Heath Garden Village) as potential housing sites. This segment also contains two SSSI designations to the south.

2.29 We support the Council's assessment of this location and that this is the most suitable for future housing growth within the District and that this should be a focus over employment provision in this area.

2.30 This location is subject to works on the Grantham Southern Relief Road. However, delays in the progress and delivery of this, and the need for reinforcement work in connection to the bridge set to cross the railway and River Witham, causes concerns over large scale B8 and B2 traffic being served from these locations.

Gra3

2.31 The broad area Gra3 is largely made up of Harlaxton Manor Historic Park and Gardens, this segment also contains three conservation areas and three scheduled ancient monuments. There are 171 listed buildings within this broad area.

2.32 The landscape in this area was also considered to have moderate to high sensitivity.

2.33 We support the Council's assessment of this location and that development should be limited in this area due to the high historical importance and impact to heritage assets.

Gra4

2.34 The broad area Gra4 provides the majority of the proposed growth of all the other segments, for both housing and employment. This is due to it being the most suitable area for growth in the Grantham Sub Area.

2.35 Gra4 benefits from connections to the A1 and wider strategic road network.

2.36 The listed buildings in the area are restricted to the defined conservation areas. These conservation areas are largely protected by the A1 corridor and therefore this acts as a barrier and limits any impact of development at these locations.

2.37 A small part of the Allington Meadows SSSI falls within the north-western corner of the segment however the proposed allocations here would direct development towards the A1 and not towards this protected location. Whilst part of the Belton Historic Park & Gardens falls within the Gra4 sub area, only a small portion of the designation and the proposed allocations are located a considerable distance away from this sensitive area.

2.38 Our Client's site, at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) is located to the west of the A1 which is considered to have lower landscape sensitivity than the north and east and therefore supports development at this location. Within the Initial Landscape & Visual Technical Note (LVTN) commissioned by our Client in relation to the site (Appendix 3), it recognises the surrounding land use areas to the south of the site in the form of the railway line and solar farm which also limit the landscape sensitivity in this area.

2.39 The Council's Landscape Character Assessment being used in relation to the RAG Assessment is from 2007. Whilst the study is relevant and we agree with the conclusions reached within the Landscape Character Assessment we suggest for robustness that this should be reviewed / updated as necessary to ensure that the evidence base is as up-to-date as possible to inform the plan and allocation of sites. This is likely to assist the Council at the Examination stage to demonstrate that the plan is sound as it is based on an up-to-date and robust evidence base.

Summary

2.40 Overall, the Council have suitably demonstrated that Gra4 is the most suitable area within the Grantham Sub Regional Centre to accommodate employment provision and growth and we support these conclusions. The land proposed to be allocated around Gonerby Moor for employment purposes is linked to existing retail uses in the form of the Downtown development, is close the strategic highway network and is not constrained by important heritage assets in which other areas of Grantham are subject to. We support the Council's conclusions that Gonerby Moor is a suitable place within the District for growth to take place.

3. EMPLOYMENT EVIDENCE BASE

Employment Land Study (ELS) (2023)

3.1 The Employment Land Study (ELS) has been prepared by AECOM on behalf of SKDC to set out a detailed evidence base in which an appropriate supply and mix of employment land and premises can be planned for within the Local Plan Review.

3.2 The study focuses on the employment land use classes as defined by an Office (E(g)(i) and E(g)(ii)) and Industrial Land (E(g)(iii), B2 and B8) and does not consider retail uses.

3.3 The study undertook an Economic Development Needs Assessment to consider different approaches and establish which would be the most suitable to determine the future employment land requirement within South Kesteven. The three scenarios considered include:

- **Scenario 1 – Labour Demand:** using employment forecasts sources from Experian, the change in employment in South Kesteven (by industrial) is translated into the associated change in floorspace and land requirements.
- **Scenario 2 – Labour Supply:** this scenario uses population forecasts to understand the level of additional workforce that will be available on the labour market. Additional workforce is allocated to industries and translated into associated change in floorspace and land requirements.
- **Scenario 3 – Past Take-Up:** this scenario considers past net absorption of employment floorspace in South Kesteven and projects historical trend over the Plan Period. Future change in floorspace is then converted into future land requirement.

3.4 The preferred approach adopted by the Council is Scenario 1 Labour Demand, which is a business-as-usual approach and considers established forecasting assumptions which consider wider trends influencing growth in the District. This scenario has used Experian data which has been rebased for 2020 and 2021 using the Business Register and Employment Survey (BRES). This was undertaken due to the BRES showing employment in 2020 and 2021 being below the level predicted by Experian, therefore it has been rebased to take into consideration this discrepancy.

3.5 Although highlighting a modest amount of employment growth is required, we consider that Scenario 1 does not reflect the most accurate approach to employment provision across the District. This scenario is recognised as being a ‘business as usual’ approach and therefore does not consider “the impact of unforeseen economic shocks or policy strategy and intervention” (ELS, footnote 52, p. 104). Scenario 1 only seeks to reinforce the current economic and social challenges within the District that are caused by outward commuting, low economic growth and lack of high quality modern employment facilities in suitable locations.

3.6 This scenario does not consider economic shock factors, such as the Covid-19 pandemic, which generated a rapid acceleration of demand for large B8 strategic distribution sites (BPF & Savills, Levelling Up -The Logics of Logistics). By using Labour Demand to forecast growth may limit the consideration for jobs linked to the growing B8 market and therefore limit growth and allocation of appropriate provision in this use class as a result.

3.7 Scenario 1, taking a business as usual approach, simply reinforces the current economic and social challenges faced by the District. This includes outward commuting of the workforce to other surrounding authority areas, which in turn results in lower economic growth in the District. This is in part due to the lack of high quality employment facilities available which under this preferred scenario will not be delivered unless a pro-growth option is considered.

3.8 We consider the preferred scenario brought forward and identified within the ELS should be an aspirational scenario, we view that the 'business as usual approach' exhibited via Scenario 1 should be used as an absolute minimum for growth. Approaches need to be further considered which align with the growth aspirations of the District and to reinforce Grantham's role as an important sub-regional centre. At the current point in time although recognising some growth is needed in relation to employment provision, the Council have not taken into account the wider positive factors that could significantly influence growth in the region.

3.9 Our Client has commissioned Savills to produce a market study (Appendix 4) which considers the market case for the allocation of Land South and North of Gonerby Lane, Gonerby Moor (SKPR-100 & SKPR-202). This reviews the supply of sites which are of an appropriate strategic scale and the unmet need within wider Functional Economic Market Area (FEMA) (which includes surrounding authorities). The study recognises that historically there has been a supressed demand across the wider FEMA, which means sufficient supply has not been available to accommodate the necessary demand sought. Therefore, the use of historic take-up trends and the 'business as usual' approach as set out under Scenario 1, has only caused a further constriction of employment sites coming forward. This approach has limited supply where demand is strong, in turn causing strong rental growth but limited new sites. By considering supressed demand provides a more accurate projection of future requirements. Savills conclude that South Kesteven as a District are well below the ideal market equilibrium, at just 2.7% compared to the national level of 8% availability. As per Savills modelling data there is a significant shortfall of land across the FEMA, of which South Kesteven plays an important role.

3.10 We consider none of the scenarios considered within the ELS align with aspirations of the District to become a centre for growth and economic success. All of the methods considered are based on historic data which results in an employment requirement which is artificially lower than the required need and does not reflect broader issues beyond the District. This includes the recognised market demand and uptake in Industrial and Logistics (I&L) provision. Therefore, as expressed above we consider it would be better suited for the findings of the ELS to be an minimum starting point for the requirement of employment provision and significant allocations justified as the demand for employment provision is realised. An important aspect to note from the ELS is that regardless of which scenario is carried forward they all demonstrate a land requirement for B8 use in South Kesteven through to 2041. This therefore highlights a clear demand from the market for this type of development to be delivered within the District.

3.11 On top of the needs identified under the specified scenario's, the ELS also makes provision for two additional allowances: windfall losses and churn. Windfall losses considers where land originally earmarked for employment space may be lost to other uses and churn considers an acceptable level of vacancy to enable movement of businesses within and around current stock.

3.12 Taking into account the scenarios assessed as part of the ELS and the allowances for windfall losses and churn, this identifies and overall land requirement for employment purposes of between 79.5 – 89.1 Ha, depending on the scenario chosen.

3.13 There is a significant amount of windfall and churn allowed for within the above calculations within the ELS. We have calculated this to be 77.2 Ha from the figures provided within the ELS. This appears to be reflective of past speculative applications and loss of employment sites to other uses such as residential (c. 26.8 Ha based on 2015 – 2022, annualising this figure and averaging it over the plan period, the ELS states 3.8 Ha is estimated to be lost to other uses moving forwards each year, which equals 76.5 Ha in total).

3.14 Given the high level of windfall losses previously, and anticipated losses moving forwards through the plan period for employment land, this indicates that the Council are taking the right approach to allocating new employment land of a sufficient quantum to ensure that these losses are mitigated through the delivery of new employment land in the right locations.

3.15 Chapter 9 of the ELS considers sites across all areas within the District and recommends whether these should be: released from serving employment purposes, allocated for employment, not allocated or retained as an existing allocation. We support the review of the previous allocations and the release of these sites where they have not come forward for employment purposes. Furthermore, reviewing the scale of the sites released highlights that these would have not have been of a suitable scale or size to support the required employment growth in future. Therefore, it is logical that all sites deemed to be 'unsuitable' should be released and developed for other uses, and consider it to be appropriate for the Council to update their Plan accordingly.

3.16 The ELS goes onto consider how the Council should take into consideration the merits of each site:

"However, SKDC's Local Plan should take into consideration the opportunities of each site, their strengths and weaknesses as an employment location as well as the surrounding context and environment when making the new designations. For instance, it might be appropriate to release some existing allocated sites and allocate new sites. It would also be

recommended that SKDC protects the most suitable employment sites to ensure that unforeseen growth (or growth beyond the Plan Period) can be met." (ELS, p. 120)

3.17 Furthermore, the conclusions and policy recommendations of the ELS recognise there is strong market interest in employment land and growth in both the demand for B2 and B8 use. It is recommended in order to meet this demand:

"the Council should principally consider retaining the allocation of the majority of its employment sites coupled with selective changes in allocations," (ELS, p. 128)

3.18 The study concludes that a flexible approach should be taken which takes into account the merits of each individual site and what they would be most suited for. We agree with this approach and consider that the Council have responded effectively through allocating sufficient employment land in the right locations to ensure the employment land requirements of the district are likely to be met in full over the plan period.

Assessment of the ELS

3.19 From our assessment of the ELS, it is clear to see that although some allocations have been delivered and others released, many of the employment allocations identified within the adopted Local Plan are still yet to be developed (244 Ha as per the ELS study) and therefore are to be carried forward in the emerging Local Plan. The market in South Kesteven has not delivered the required or provided for amount of employment land over the last plan period. Despite this, the Council have proposed to carry forward the vast majority of existing allocations in addition to new proposed allocations. These employment sites have not come forward due to numerous reasons such as lack of infrastructure, or delays in the delivery of infrastructure, sites being situated in locations which are unsuitable for the desired demands of the employment market, or being of a scale which is not desired by the market. This has led to a backlog in pent up demand from the market which needs to be addressed through the continued provision of high quality employment land in suitable locations as required by the market.

3.20 Furthermore, although SKDC allocated sites in the last plan it seems these have not been delivered by developers on the ground, this may be due to a multitude of reasons. This could include changes in market requirements, as experienced through the Covid-19 pandemic, and the need for different types of employment uses such as larger scale strategic logistics and distribution sites.

3.21 The ELS highlights that the Council can remove allocations in favour of sites which provide higher merits and strengths. It is clear of the sites reviewed as part of the ELS for release from employment provision that these were mainly located in the larger market towns (of Bourne and Stamford). Within the Stamford Sub Area approximately 91% of the sites listed within Chapter 9 of the ELS were to be either deallocated or released, this is due to other development taking place on these sites, namely residential. This therefore highlights how small employment sites allocated closer to the market town within the District are needed for other uses and highlights how other sites which are more favourable may come forward in their place.

3.22 B2 and B8 uses, such as industrial and strategic distribution and logistics can provide a range of skilled and non-skilled jobs which support economic prosperity in the local area. According to the Office for National Statistics (ONS) data the average pay received from this industry is higher than the UK average, this is further illustrated in Figure 1 below.

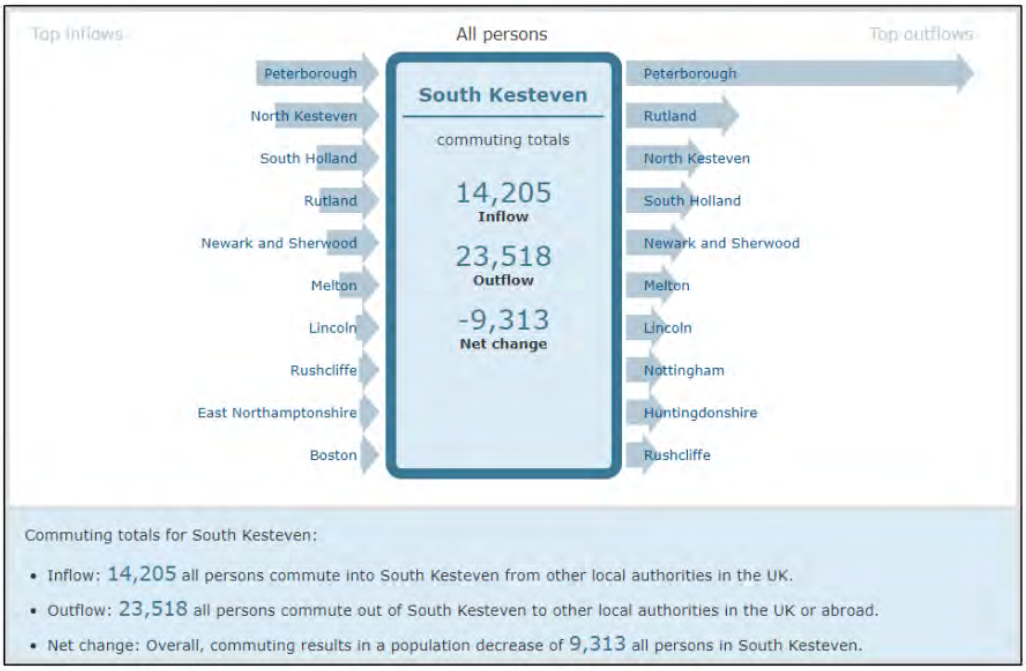
Figure 1. ONS data showing UK Gross Pay from Industrial & Logistics (I&L) jobs compared to other sectors

3.23 In addition to demonstrating the support for job growth, the 'Levelling Up – The Logic of Logistics' report produced by Savills (Appendix 5) further highlights the attributes of what constitutes an optimum industrial and logistics site location. This includes being close to the strategic highway network (Motorway or A-Road), the ability to serve surrounding markets within the country, of a suitable scale to provide employment units of a size required by the market and access to good sources of labour to help generate jobs which will allow upskilling of the local workforce. We consider our Client's site at Land South of Gonerby Lane, Gonerby Moor to be a suitable location to allow for this to take place.

3.24 In addition to supporting the above criteria, the site at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) would be of a strategic scale and would make a significant contribution to meeting market demands that would support a significant level of job creation. The location of this site is considered to be strategic in terms of the close access to the A1 which connects further onto the strategic road network. The site is located within the Grantham Sub-Regional Centre as defined by the Points of a Compass Assessment therefore it has access to the largest settlement in the district and which means there is a labour demand for accessible and quality jobs within the locality of the site.

3.25 Overall, the ELS only considers employment need at a localised level, whereas there is a clear demand for growth in industrial and logistics floorspace at a national level nationally due to businesses seeking an increased reliance in onshoring by holding stock within the country to minimise disruptions to supply chains. Therefore sites such as our Client's, South of Gonerby Lane Gonerby Moor (SKPR-100), is important to play a strategic role and support wider growth not just within the local District but also on a national level.

3.26 It is recognised within the ELS that South Kesteven is viewed to be connected to surrounding authorities as part of the wider Functional Economic Market Area (FEMA), which generates important connections in terms of economic governance, market characteristics and connectivity. This includes Peterborough, Rutland and South Holland. Figure 2 below highlights the inflows and outflows for people commuting to the South Kesteven area for work. It is clear that this shows a significantly higher proportion of people leaving to District to work in surrounding authorities than within the District itself, thereby highlighting there is a lack of jobs locally in order to support the population. As one of the Council's objectives is to increase economic activity within the District, reducing the level of outward commuting is key and one of the most effective ways to achieve this is through the provision of high quality employment uses in suitable locations.



Source: Office for National Statistics, (2011); Census 2011 – Origin-Destination data.

Figure 2. South Kesteven Inflow and Outflow Commuting Rates (ELS, p. 25).

3.27 The ELS further highlights, in Table 3.2, that only 56.6% of people who live in South Kesteven also work within the District (those who are of working age), which is below the Travel To Work Area (TTWA) as defined by the ONS of 66.7%. This illustrates how the District is not economically self-contained, as it is not providing sufficient employment for its own population. This exemplifies how strategic sites, such as our Client's site will play a significant local role in supporting economic growth in the District and assisting in reducing the level of outward commuting to the wider FEMA.

3.28 Furthermore, the market study produced by Savills (Appendix 4) outlines how strategic scale growth historically has been focused towards Peterborough. However, it is evident that there is very little supply left within Peterborough which is of a suitable strategic scale. Therefore, it is important that South Kesteven is able to support the demand for strategic sites in well located and deliverable locations to meet the needs of the wider FEMA. The letter from Savills further highlights how strategic sites are typically 25 Ha as a minimum and 50 Ha plus are required for larger units, by which there are very few sites across the FEMA which are of such a scale, highlighting the necessity and suitability of our Client's site at Land South of Gonerby Lane, Gonerby Moor in support of this.

3.29 The Final Report produced by the Inspector, in relation to the adopted South Kesteven Local Plan (published in January 2020) provides an assessment of soundness in relation to the previous over allocation of employment land. This therefore provides a useful contextual background for the District to over allocate employment provision within the emerging plan. The Inspector provided three reasons as to why the over-provision of employment land was not unsound:

1. The date of the previous ELS used to inform this provision was considered to be out of date and "relatively cautious, especially given the shifts to larger logistic and warehouse operations which South Kesteven is well-positioned to accommodate." (Inspector Report, p. 12). Therefore it was recommended that an up-to-date ELS be produced when the early review of the Local Plan was triggered.

2. Clear evidence of market demand in the District for sizeable premises for the industrial and logistics sector. The Inspector recognised the strategic position of South Kesteven with the A1 and East Coast Main Line and it having the ability to accommodate demand. It was therefore concluded by the Inspector that "it would seem prudent to err on the side of flexibility to support latest strategies and ambitions for economic growth rather than cut the cloth of employment land supply too tightly." (Inspector Report, p. 13).

3. The Inspector recognised the step-change in demand for employment provision compared to historic rates which includes the demand for industrial and logistics uses. Therefore "pointing to the need to avoid potentially constraining economic potential through appreciable de-allocations of proposed employment land." (Inspectors Report, p. 13).

3.30 Therefore, we consider the Council are justified in allocating more land than the scenarios within the ELS (2023) identify. Taking a counter approach to the assessment of soundness and conclusions reached by the Inspector for the adopted Local Plan, which was only 4 years ago, would mean not providing flexibility for economic growth particularly for the industrial and logistics industry would mean the Plan would not be positively prepared or found to be 'sound'.

South Kesteven's Economic Development Strategy (2016 – 2021)

3.31 The Economic Development Strategy outlines that there is a shortage of available serviced and well-located employment sites and premises, which is constraining the development of new employment opportunities in key locations across the district.

3.32 The Strategy also emphasises a focus on the "ambition to establish Grantham as a leading sub-regional centre" (Economic Development Strategy, p. 3) and to create "more and better jobs" (Economic Development Strategy, p. 3).

3.33 It is also recognised within the Strategy the importance of strategic development locations around the A1 to allow for future growth:

"*These unparalleled connections will allow the District to exploit direct housing and labour market linkages, enabling business growth in the towns and major business locations throughout the District."* (Economic Development Strategy, p. 2)

3.34 The Draft Local Plan also states that this Strategy is currently being updated to reflect the period of 2024-2028, in line with this, the updated study is set to ensure:

- The strongest economic metrics and performance throughout the District;
- The South Kesteven gateway is placed to lead and continue to drive economic growth and meet the needs for years to come;
- The strong foundation and ambitions are in place in which to deliver the economic vision within South Kesteven.

3.35 Given that the update to this study has not yet been published, we consider that it may provide a more reflective update on the opportunities across the District. Therefore, we consider that the Council should take the strategy into account during further stages of the plan preparation process to ensure the Local Plan in relation employment provision remains sound and informed by the most up to date evidence.

3.36 We consider the proposed allocation of our Client's site at Land south of Gonerby Lane, Gonerby Moor (SKPR-100) would help to meet the aims of the updated strategy by enabling the continued drive of economic growth and helping to deliver the economic vision of the District for future years to come.

The Greater Lincolnshire LEP's Strategic Economic Plan (2014 – 2030)

3.37 The Greater Lincolnshire LEP's Strategic Economic Plan sets out priorities for growth. This was developed through economic analysis and commissioning face-to-face interviews with local business leaders.

3.38 The LEP recognises how Greater Lincolnshire has high level Grade I agricultural land compared to the rest of England, it also has an important engineering heritage and a national importance in manufacturing. Therefore, the LEP aims drive growth in these three sectors: Agri-food, Visitor Economy and Power Engineering.

3.39 The main outcomes of the Plan include:

- To drive the growth of the area's defining and strongest sectors which offer the most competitive advantage;
- To grow specific opportunities identified as future defining features of the area;
- To drive this growth by putting expansion into new markets, modern telecommunications, infrastructure improvements and the skills of individuals and business owners, at the forefront of what we do;
- To promote Greater Lincolnshire as a place for sustainable growth through improved transport infrastructure to connect us with national and international markets, enabling wider enjoyment of our world-class heritage sites, culture and strong communities; and
- To recognise the need for new housing for the local population and potential movers to the area and support balanced housing and economic development through promoting the area's capacity to deliver high-quality economic growth.

3.40 The Plan aims to ensure there is sufficient and appropriate land to accommodate growth, this includes for employment land and housing. It also supports an area-based focus to align regeneration and growth in key towns, which includes that of Grantham. The Plan concludes for South Kesteven there is an ambition for 205 Ha of employment land by 2026.The proposed allocation of our Client's site at Land South of Gonerby Lane, Gonerby Moor would accord with and support the aims and objectives of the Greater Lincolnshire LEP's Strategic Economic Plan. Delivering new highly skilled jobs and investment into the site would support South Kesteven's role within Lincolnshire as a place for sustainable economic growth.

4. VISION AND DEVELOPMENT MANAGEMENT POLICIES

Chapter 3 – Vision and Strategic Objectives

4.1 Chapter 3 of the Regulation 18 Local Plan sets out the Vision and the Objectives the Plan seeks to meet and provide.

4.2 The Vision provided has been updated to reflect the Council's commitment to fight climate change, and create a successful and strong economy, whilst building sustainable communities that provide a high quality of life. The suggested Vision is realistic in its ability to be delivered through the provision of high quality housing in addition to the provision of employment types for a strong economy.

4.3 The Vision seeks to ensure there is a successful and diverse economy and recognises Grantham as a key area within the district which will enable the delivery of new employment opportunities.

4.4 The draft Plan also provides the strategic Objectives for the Local Plan moving forwards. The Objectives have been amended to emphasise the approach towards Biodiversity and Climate Change. Objectives 1 to 9 focus on economic aspects and the enhancement of prosperity within the District. We fully support what has been outlined in the objectives and we support the provision of a range of well-located sites for employment and that these should be of an adequate and appropriate scale and type to help stimulate the required economic growth within the District (Objectives 2 and 3). We also particularly agree with Objective 6 in that the focus for employment provision should be directed towards the Grantham Sub-Regional Centre, due to the locational context being within close proximity of the A1 and this acting as a key driver for growth in the employment sector in this location.

4.5 We are pleased to see that the Council have provided an approach and set Objectives which are largely pro-growth whilst requiring the provision of adequate and appropriate employment provision to meet the needs of the District.

Chapter 6 – Spatial Strategy

4.6 The NPPF aims to build a strong, competitive economy. We agree with the approach taken within Policy SP1: Spatial Strategy in that the local plan needs to include allocations for both housing and employment land in order to achieve sustainable growth across the District. We also support that the focus of this growth should be targeted toward the sub-regional centre of Grantham and that this be a focus for development.

4.7 This supports the findings of the evidence base, namely the Employment Land Study (ELS) (2023), the Interim Sustainability Appraisal and the South Kesteven Local Housing Needs Assessment (LHNA) (2023). All of these documents outline the important relationship between housing requirement and employment land delivery.

4.8 In particular the SA concludes the following:

“Approximately 81% of the potential residential site allocations (excluding windfall sites) are located in the district’s Sub-Regional Centre (Grantham, 50 percentage points) and three Market Towns…Additionally, at least 79.5 ha of new employment sites is allocated in the Regulation 18 Draft Local Plan. These sites are also predominantly located in Grantham and the district’s three Market Towns. Prioritising development in the district’s major centres offers significant advantages by ensuring that they are already located close to existing services and facilities.” (SA, p. 23)

“By focussing the potential residential and employment allocations in the district’s largest settlements, this minimises the need for long-distance travel. Travellers have easier access to existing public transport networks, reducing reliance on private vehicles and promoting more sustainable modes of transportation. Additionally, the proximity to larger settlements likely means that local transport infrastructure already exists (including roads, railways, footpaths, and bus routes), resulting in improved connectivity and efficiency for residents and commuters.” (SA, p. 25)

4.9 We therefore support the conclusions drawn from the evidence base and the importance of this being translated into the spatial strategy with development for employment land being focused to the Grantham Sub-Regional Centre as this supports the housing provision in the area by being a logical sustainable location within the District.

4.10 Policy SP2: Settlement Hierarchy sets out tiers in which the settlements across the district are ranked. This Policy recognises Grantham as sitting at the top of this hierarchy and therefore being the focus for the “majority of development”. We support this approach and agree that Grantham should be marked as the top of this hierarchy and deliver housing and employment development at a larger scale compared to the other areas within the District. This approach in turn results in the need to allocate new employment land of a sufficient scale and quantum to provide new jobs and employment opportunities, reduce outward commuting levels and to support a strong and competitive local economy.

Chapter 7 – Housing Need

4.11 Chapter 7 considers the housing need of the District. The existing and proposed supply set out within the Draft Plan recognises Grantham as supporting the most growth. Table 2 outlines proposed site allocations for 1,044 dwellings within the emerging plan to be provided at Grantham which is higher than all the other settlement’s and is over 36% of the overall provision. In total, including completions and current commitments this increases to 49% of the overall distribution of development being provided by the Grantham Sub-Area.

4.12 We support Grantham and the surrounding areas as being the primary focus for growth as this complements the spatial strategy as outlined above in terms of Grantham being the Sub-Regional Centre and focus for growth. This also supports the link between housing development being close to areas of employment provision to ensure appropriate labour supply and demand is accessible.

Chapter 9 – Employment and Economic Prosperity

4.13 The NPPF identifies the need to build a strong competitive economy as a key objective for the planning system, therefore it is important to ensure any plan coming forward as part of this process addresses the issues to ensure this can be fulfilled. This chapter of the draft plan seeks to set out the local policy framework to deliver a strong and sustainable local economy in South Kesteven.

Policy E1 – Grantham Southern Gateway Employment Opportunity

4.14 Policy E1 of the Draft Local Plan carries forward the strategic employment site of the Grantham Southern Gateway which was previously set out in the adopted local plan. This policy outlines that 118.19 Ha of B2/B8 use will be provided here. Outline planning permission was granted on part of the site in 2021 (Council Ref: S21/1057) and a subsequent reserved matters application recently approved in February 2024 (Council Ref: S23/1504). In addition to this a Hybrid Application was also approved in relation to the Grantham Designer Outlet Village (Council Ref: S17/1262) in which conditions are now being discharged. Although development is now coming forward on the site, this is for a mixed use and a significant element of retail provision. As this is not all B2/B8 uses as originally proposed, the site has not been delivering as per the previous policy.

4.15 The ELS (2023) states in relation to the site, that 51.2 Ha should be partially released from the original employment allocation due to consent being granted for housing and a retail park on the site (ELS, footnote 83, p. 126). On this basis, in accordance with the evidence presented within the ELS we consider that there is not a realistic prospect of 51.2 Ha delivering B2/B8 uses and this area should be removed from the employment allocation. The proposed summary of changes within the Draft Local Plan states how Policy E1 has been amended in line with the ELS, however this has not been the case as the 52.1 Ha has not been deallocated or released in line with this recommendation. We also consider this exemplifies the logical allocation of our Client's site at Gonerby Moor (SKPR-100) as helps to offset the employment land lost in the Grantham Sub Regional Centre from the Southern Gateway.

Policy E2 – Other Employment Sites

4.16 Policy E2 of the Draft Local Plan combines the new strategic employment sites put forward and the existing allocations contained in the adopted local plan. This policy recognises Grantham as a key area for growth and that the Grantham Southern Gateway along with the proposed allocations at Gonerby Moor will "provide considerable choice to the market and create a variety of jobs through B2, B8 and acceptable E(g) proposals." (Draft Plan, p. 75).

4.17 Part b. of the policy also states how employment sites will be supported where the "scale does not harm the character and/or amenities of the locality", However we suggest the Council amends this aspect of the policy as any development on greenfield land will inevitably lead to some harm to the character of an area and to be more positively worded this should be amended to state "does not unacceptably harm the character". This would support well designed and appropriate schemes to come forward on agricultural land where the harm to character is deemed to be not significant or can be mitigated against. This approach supports Chapter 6 of the NPPF which states “planning policies and decisions should recognise and address the specific locational requirements of different sectors. This includes making provision for clusters or networks of knowledge and data-driven, creative or high technology industries; and for storage and distribution operations at a variety of scales and in suitably accessible locations.” It is evident from the ELS and SA that the Grantham Sub Regional Centre, which includes our client’s site at Gonerby Moor, lies within a key location for strategic employment growth both regionally and nationally, with strong accessibility onto the highway network.

4.18 We therefore support the Draft Plan in recognising and addressing the locational requirements strategic employment operators have and planning accordingly to meet the market demand in suitably accessible locations across the District. We consider that our Client’s site at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) will help to support the economic development needs of the area so that the local economy is not adversely impacted and hence is a suitable proposed allocation put forward by the Council.

4.19 We consider wording within the plan should be clarified. The Draft Plan allocates ‘circa 338 Ha’ of land for employment provision, however a large proportion of this is from previous allocations which have been carried over from the current adopted Local Plan. We suggest the Council should make a clear distinction between the new allocations as part of the Draft Plan, and those allocations that are being carried forward. This should be detailed specifically in hectares to clearly demonstrate how much new growth is being proposed and how much is being retained and carried forward.

4.20 Furthermore, as per our comments under Policy E1 we note the 51.2 Ha to be released from the Grantham Southern Gateway development, however the plan does not consider this release as part of this 338 Ha figure and this should be clarified. As expressed earlier in Section 3 in relation to the Employment Evidence Base this outlined how the Draft Local Plan had allocated significantly more land than the specified requirements outlined in the ELS. However, the supportive text of Policy E2 recognises the proposed sites for allocation “offer a suitable choice to the market through the identification of new land for a range of employment uses.” This “ensure[s] the further economic growth scenarios can be met by attracting substantial inward investment and providing a wide range of jobs in various sectors and industries to meet the allocated housing and population growth across South Kesteven.” (Draft Plan, p. 75)

4.21 The summary of proposed changes in relation to Policy E2, recognises that specifically sites BO-E1 and ST-E1 of the adopted Local Plan have been deallocated and removed as employment allocations, this is due to these sites being developed for residential uses as opposed to employment. This therefore supports the findings of the ELS that sites will continue to be released for other uses over the plan period and therefore an over provision of allocation of employment land helps to ensure the overall provision is still met.

4.22 Furthermore, the mixed-use allocation of Spitalgate Heath Garden Village (SKPR-278) is also referenced as part of this policy, it is outlined that as well as 3,700 new homes (1,350 within the plan period) that the site must also include a new employment area which equates to approximately 110,000 m2 of E(g), B2 and B8 uses. We consider this Policy needs to be clarified further, with the amount of employment provision expressed in Hectares. Hectares is the common measure of land throughout the rest of the Draft Plan, therefore for consistency and to avoid ambiguity it should be also applied here.

4.23 In addition, we consider this allocation for the level of employment provision proposed to be ambitious given the size and layout of the proposed site and potential for conflict between the residential and employment uses. Recent delays to the Grantham Southern Relief Road have prevented progress of development at this location and questions the suitability, availability and deliverability of this site for employment purposes.

Policy E6 – Loss of Employment Land and Buildings to Non-Employment Uses

4.24 As outlined within the ELS it is clear that certain sites previously proposed within the adopted Local Plan for employment purposes have since been brought forward for other uses, the two examples BO-E1 and ST-E1 have both been developed as residential sites and deallocated as a consequence. The ELS outlines a total of 141 Ha of employment land which has been released across the District from employment purposes.

4.25 We generally support the reasons for release as detailed within Policy E6, however we consider the Council's approach to Policy E6 could be more flexible in allowing the release of certain employment land. It is clear the Council have identified sufficient land to meet the employment requirement of the District, therefore smaller sites in more urban built up areas would perhaps be better suited to meet the housing needs of the District instead of employment. This supports the aspirations of the NPPF for seeking employment land which is well located and which is attractive to businesses. Therefore, if the land is not attractive to businesses in a certain location then it is potentially viewed as more beneficial for this to be released.

4.26 We also consider, that if the Council deems Policy E6 as necessary to protect employment sites across the plan period, then it is important that they allocate those sites which they know have a high chance of delivery and success for employment purposes. In line with this, the part of the Grantham Southern Gateway which has been released from employment purposes should be removed from the allocation in order to adhere to this Policy.

4.27 We therefore consider our Client's site to be more suited over smaller sites as does not run the risk of being brought forward for other uses due to the strategic scale of the site and connections to the strategic road network.

Chapter 10 – Protecting and Enhancing the Natural and Built Environments

Policy EN1 Landscape Character

4.28 Policy EN1 outlines how development must be appropriate to the character and significant natural, historic and cultural attributes and features of an area. This policy has been informed by the Landscape Character Assessment (2007) which forms part of the Council's evidence base. We consider the Landscape Character Assessment which is 17 years old should be updated to ensure robustness of the evidence base. Although the Council recognised: "This piece of evidence has not been updated since then" they consider "it comments on landscape character which has not significantly altered [therefore] this piece of evidence is not considered out of date." (Draft Local Plan, p. 91).

4.29 This policy outlines how the impact of proposed development must be assessed and relevant Landscape Character Appraisals considered as well as the Point of the Compass Assessments produced in line with the SA.

4.30 As referenced in Section 2 of these representations in relation to the Point of the Compass Assessment, we consider the landscape has in fact altered over this time period. In particular, in relation to the Client's site at Gonerby Moor and the Landscape Assessment produced by the Client (Appendix 3), this outlines how proposed development can be accommodated on this Site without detriment to localised or wider visual amenity and the integrity of the receiving landscape character can be respected and protected.

4.31 Furthermore, the outline planning permission granted for the Downtown development (Council Ref: S17/2155) which includes 20,479 sqm of retail, restaurants, café and garden centre uses will, once implemented, significantly alter and urbanise the landscape around this junction of the A1. In line with the Initial Landscape and Visual Assessment produced in relation to the site this also recognises the development of the solar farm to the south and railways which have significant impact on the landscape character of the area.

Policy EN3 Green Infrastructure

4.32 The Green Infrastructure and Biodiversity Interactive Map which supports this policy outlines the known existing areas of high biodiversity value and target for habitat creation.

4.33 We agree with the designations of this mapping, our Client's site is not included as part of this designation which we support due to the nature of this land being farmed historically this therefore does not generate a high biodiversity value on the site.

4.34 We consider as part of any development which may come forward on the site that this be an opportunity to introduce increased biodiversity on the site as the baseline is currently very low.

Chapter 12 – South Kesteven Communities - Grantham

4.35 This Chapter considers the distribution of growth throughout the District set out in the context of the main communities.

4.36 Grantham sits at the top of this, followed by the main market towns and then the larger villages. We support the density being sought in and around the Grantham Sub-Regional Centre and agree that by targeting growth here will help "to strengthen the District's economy and through the identification of a series of employment sites [will] seek to further enhance Grantham's local economy such that Grantham can sustain and develop its role as an effective sub-regional centre." (Draft Plan, p. 130). Therefore, in order to deliver the growth desired at this location employment sites are a very important contributor.

4.37 Within this Chapter the importance of supporting Grantham's economy is recognised. It is stated:

"In recognition of the new A1 junction being delivered in conjunction with developments to Grantham South, further land adjoining the strategic employment site is also identified for employment allocations. Delivery of employment generating uses on these sites will further support Grantham's economy, as well as the wider District's economy." (Draft Plan, p. 131)

4.38 This is in relation to the Grantham Southern Gateway Project, which whilst we agree with growth being targeted here it is evident that the site has come forward for other uses than originally specified. This is clear from the evidence outlined within the ELS in relation to the partial release of the site for retail and residential purposes.

4.39 Furthermore, strategic employment is also being proposed within the Spitalgate Heath mixed-use development. As discussed under Policy E2, we consider this site to be over ambitious given the size and layout of the land. Within the adopted Local Plan there is no requirement for the site to deliver any employment provision and this has only now been included as part of the Regulation 18 Draft Plan. The Council state, as part of their Draft Site Assessment that the principle of development has already been established on the site through the previous local plan process. However, we consider the development and requirements of the site have now changed as part of the New Local Plan and the requirement for employment provision to now be required which was not previously considered. We consider further works need to be undertaken to understand the suitability of employment provision at this location and is the rationale for allocating this site given the potential issues in respect of suitability and deliverability.

4.40 We also consider the timescale for the Spitalgate Heath Garden Village to be unrealistic due to the delays faced by the Grantham Southern Relief Road. As per the Lincolnshire County Council website, the timeline states the project is set to be complete by 'TBC 2025', however this webpage and timeline has not been updated in some time. An April 2024 update was provided on the progress of Phase 3 of the development and this outlines how further reinforcement works to the east side of the site are still underway.

4.41 Therefore, to successfully continue to support Grantham's economy, and in turn the wider District economy it is crucial further employment sites in the area come forward which are available, deliverable and achievable, and have been properly assessed for employment purposes as per the most up to date evidence. We consider our Client's site at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) to be able to provide the necessary strategic employment provision within the sub-regional centre which is required in order to sustain the economic prosperity in the Grantham Sub-Regional Centre.

Chapter 13 – Infrastructure and Developer Contributions

4.42 The need for infrastructure to be provided in a timely manner alongside growth and development is fundamental to achieving sustainable development and the Regulation 18 document correctly identifies that. Paragraph 13.1 of the Regulation 18 document provides examples of relevant infrastructure and we are broadly supportive of the types outlined but also acknowledge that each community across South Kesteven is unique and will require different provision at different times over the plan period.

4.43 Paragraph 13.16 of the Regulation 18 document confirms that the Council will continue to seek developer contributions through Section 106 and may consider the introduction of a Community Infrastructure Levy or a replacement tariff following the Governments national review. Although we broadly support this approach, the Local Plan needs to provide an indication as to the level of Section 106 that may be requested for different types of development in different parts of the plan area. Without this clarification, the Council's Viability Appraisal may be challenged because assumptions used in relation to planning obligations may not be accurate and therefore could be under or over stating requirements that need to meet the relevant tests for planning obligations.

4.44 Policy ID1: Infrastructure for Growth outlines the Council expectations for ensuring that the necessary infrastructure provision is provided at the appropriate time and in a suitable location. It is important that the policy and supporting text recognise that as part of development opportunities the provision of infrastructure is not solely within the "gift" of the developer/applicant. In most instances, the Section 106 obligation can provide the land and/or funds to aid the provision of infrastructure but often the service provider (such as education, highways etc) are responsible for the delivery of the infrastructure. As a result we suggest the policy wording should be updated to highlight those other bodies involved with bringing forward infrastructure.

4.45 Policy ID3: Broadband and Communications Infrastructure is intended to ensure that broadband connectivity in South Kesteven can meet the vital needs of all over the plan period. It is reasonable to identify this as a key policy consideration as all sectors of the community, both residents and businesses rely more than ever on access to broadband and communications networks. We are concerned however, that the policy and supporting text only focuses on what a developer is required to integrate into their development and fails to hold the communications providers to account for the overall network. The requirement to "future proof" is understood but this needs to be considered further to reflect that across South Kesteven the overall network will be mixed with some locations benefiting from greater connections than others, reflecting the urban and rural nature of the District.

5. LAND SOUTH OF GONERBY LANE, WEST OF THE A1, GONERBY MOOR (SKPR-100)

5.1 Land South of Gonerby Lane, West of the A1, Gonerby Moor, Grantham was submitted to South Kesteven as part of the 'Call for Sites' Consultation which took place in 2020 and again in September 2022. A Vision Document for the site has also been produced which outlines detail and illustrative information about the site proposals (Appendix 6).

5.2 The site is proposed to be allocated within the Regulation 18 Draft Local Plan for employment provision of 63.7 Ha of E(g), B2 and B8; under the reference SKPR-100. A number of evidence based documents which support the Draft Local Plan have considered the site in further detail. Our client is highly supportive of the Council's approach to allocating the site for commercial purposes with the Draft Local Plan.

5.3 As per the ELS produced by AECOM, this marks the site as part of a RAG assessment against a number of defined criteria. These have been summarised below:

RAG Rating Criteria	SKPR-100 Score (as per ELS)
Public Realm, Employment and Surroundings	
Suitability	
Accessibility	
Building Condition	N/A - site not yet developed
Redevelopment Potential	

Table 1. Summary of RAG table produced in relation to SKPR-100 within ELS.

5.4 It is clear the scores given to the site at Gonerby Moor are positive in comparison to the criteria, with the exception of the 'Public Realm, Environment and Surroundings'. However the ELS does state that: "Typically,…undeveloped sites have poor public realms but high potential for redevelopment." (p. 96), therefore this should be taken into consideration and the opportunity enhancing the environment and surroundings of the site is evident from the high quality development proposals that can be seen within the Vision Document (Appendix 6).

5.5 The ELS further makes reference to the site stating:

"Sites SKPR-100, SKPR-185, SKPR-202, and SKPR-41 comprise a suite of additional sites located around the A1 junction at Gonerby Moor and thus benefit from virtually direct access to the strategic road network and could facilitate intense HGV movements. The current low intensity of use on these sites, primarily for agriculture, presents opportunity for future development and intensification of use which, potentially in complement, could significantly increase the provision of employment land in this location. The adjacency of these sites indicates that, although suitable for a range of uses, industrial, storage and distribution functions could be successful here." (ELS, p. 101)

5.6 We agree with this statement which highlights the suitability of our Client's site at Land South of Gonerby Lane in particular. It reinforces Gonerby Moor as a location to provide a number of suitable sites of a strategic scale in which are appropriately connected to the highway network for ease of large scale HGV movements.

Site Characteristics and Context

5.7 As well as the Points of a Compass Assessment discussed under Section 2, a Draft Site Assessment has also been conducted by the Council in relation to the site (Appendix 7). This covers many of the same criteria as the Points of a Compass Assessment but provides further commentary in relation to the reasoning from the Council to the score provided. This confirms, in line with the Client's aspirations, that the site is deliverable in the short term, between 0 – 5 years.

5.8 One area we consider relevant for further discussion is surrounding the impact on the highway network. As part of this assessment, it identifies a major impact on the strategic and local highway network. This is in relation to the cumulative impacts of developments at this location from our Client's site and SPKR-202 and SKPR-185, therefore resulting in a need to upgrade the junction onto the A1. The Assessment also states how active travel modes would be unlikely and development would likely increase reliance on private car use.

5.9 The following technical work has been undertaken in relation to Land South of Gonerby Lane to inform the concept masterplan produced in the Vision Document (Appendix 6). We consider that this additional work undertaken resolves the concerns raised around the impact to the highway network. A summary of these technical highway work undertaken to-date includes:

- Transport Appraisal (produced by ADC) which was jointly produced with Harworth who are promoting land north of Gonerby Lane. The TA has been shared with Lincolnshire County Council (LCC) and National Highways (NH) and updated following feedback gained in relation to the suitability of proposals (TA located within Appendix 2 and feedback received from LCC and NH within Appendix 8).
    - The TA demonstrates both sites north and south of Gonerby Lane can be serviced and developed with the support of a 4-armed roundabout which the Highway Authority have deemed as suitable.
    - The traffic counts and modelling undertaken highlight that both sites, north and south of Gonerby Lane can be accommodated without unacceptable impact on the strategic road network and has capacity to support the development traffic.
    - Measures have been included to limit the amount of traffic routing through the nearby villages of Allington and Sedgebrook.
    - Further drawings have also been provided which show suitable pedestrian and cycle connectivity to the site. This includes infrastructure within the site and along Gonerby Lane in accordance with DfT's design standards. Large

areas of Grantham are within a reasonable cycling distance of the site and the provision of high quality infrastructure and cycle parking will encourage commuting by bicycle.

   - The TA demonstrates feasibility of the bus service being able to be extended as an enhanced connection from the new Downtown redevelopment. It outlines how these services could perform a loop with the proposed development before returning to their original route. Also, frequencies of these services could be increase at peak times if deemed necessary or altered to coincide with shift changeovers.

- Initial Landscape & Visual Technical Note (LVTN) – Aspect Landscape (Appendix 3) and further detail in Section 7 of the Vision Document)
   - The LVTN considers there to be sufficient intervening vegetation and topography to visually screen the site. It proposes a number of mitigation measures to improve the boundary planting and to integrate the development into the landscape.
   - The Note also considers the context of the site and other uses to the south in the form of a Solar Farm and Rail Line which help to enforce the use of the site for employment purposes.
- Preliminary Ecological Appraisal (PEA) – BWB (Appendix 9)
   - Due to the site being arable farmland the site the largely free of any potential habitat features apart from existing hedgerows, which will be retained and enhanced where possible. The site is presently of low ecological value and therefore any development would be landscape led and enhance the habitats on site, ensuring a biodiversity net gain.
   - It is acknowledged that there is some potential for Great Crested Newt habitat in the wider area, however this can be mitigated for appropriately as part of any development proposals.
- Flood Risk and Drainage Scoping Study – BWB (Appendix 10)
   - The site has been assessed in terms of both Surface Water and Foul Drainage.
   - The site has a low probability of flooding being located entirely within Flood Zone 1. A series of drainage ditches run adjacent and dissect the site and receive surface water flows. Sustainable Drainage Systems (SuDS) will be incorporated as part of any development to ensure run off does not exceed current rates.
   - The drainage assessment has identified multiple sewers for foul drainage which the site could utilise. Conversations are ongoing with Anglian Water to

identify the most appropriate point of connection. It is considered that a development of the site would be adequately served for foul drainage.

- Heritage and Archaeology Appraisal – BWB (Appendix 9)
    - The appraisal has found that there are no designated nor non-designated heritage assets within the site.
    - Due to the proximity to the A1 the site is viewed as having existing urbanised influences and therefore would be seen to blend in and would protect any views from Belvoir Castle.
    - Mitigation is proposed via screen planning and massing considerations to reduce any visual impact. It is considered that the proposed development could be accommodated positively without substantial harm to the setting of any heritage assets.
- Ground Condition Assessment – BWB (Appendix 9)
    - Concludes the sites has remained undeveloped and that the foundational requirements are optimal.
    - Soakaways are unlikely to be suitable as the majority of soils are typically cohesive with low permeability.
    - Further ground investigations will be undertaken as the site progresses to confirm the ground gas regime and allow for in-situ and laboratory testing to inform foundation design.

5.10 Further detail of these works can be found within the accompanying site Vision Document (Appendix 6) and within the relevant Appendices 2, 3, 9, & 10.

5.11 Overall, we consider the site has limited technical constraints and can incorporate appropriate mitigation as part of the future employment development proposals. As per the ELS the site is demonstrated to be suitable and has the necessary accessibility required for employment purposes.

Summary

5.12 The site at Land South of Gonerby Lane, West of the A1, Gonerby Moor (SKPR-100) is located within an identified future cluster of employment activity. Being adjacent to a junction of the A1 and the recently permitted development of the Downtown Retail Park, highlights the potential for future growth at this location and for this area to be a functional employment hub within the District.

5.13 In addition to supporting the above criteria, the site is of a strategic scale, and would make a significant contribution to meeting market demands, supporting a significant level of job creation. The location of this site is considered to be strategic in terms of the close access to the A1 and being adjacent to the main built-up area of Grantham. Therefore, there is a labour demand for accessible and quality jobs within the locality of the site.

5.14 The Vision Document produced (Appendix 6) demonstrates that the site at Land South of Gonerby Lane, Gonerby Moor (SKPR-100) is capable of delivering a landscape led strategic logistics and distribution development with provision to accommodate up to 2.7 million sqft of high value storage and distribution space.

5.15 The site is available and is being actively promoted by Caddick Developments, who have a significant and demonstrable track record of delivering strategic employment sites. The site is deliverable and there are no technical constraints identified that would prevent the delivery of the site coming forward early in the plan period. There has been market interest from operators seeking B2 and B8 employment units in this location and the site would be delivered out rapidly following the grant of a subsequent planning application.

5.16 We support the Council’s approach to allocating the site as an employment site in the emerging draft Local Plan in order to meet the District’s employment requirement and to support the growing economy of the Grantham Sub-Regional Centre. The site would make a significant and demonstrable contribution to the delivery of the vision and objectives of the overall Draft Plan.

6. CONCLUSION

6.1 These representations have been prepared by Boyer on behalf of Caddick Developments in response to the Regulation 18 Local Plan Review undertaken by South Kesteven District Council.

6.2 These representations are made with respect to the ongoing promotion of the Land South of Gonerby Lane, West of the A1, Gonerby Moor ('the site'), for 63.7 Ha of employment E(g), B2 and B8 use. This site has been put forward by the Council as a draft allocation within the draft Local Plan (SKPR-100) of which we are fully supportive.

6.3 We consider that the Employment Land Study (ELS) (2023) produced by AECOM, has set out the employment requirement for the District based on past delivery rates and labour demand and forms a suitable starting point for the evidence base which underpins the Council's proposed strategy. However, we consider this should be used as an absolute minimum. In order for the Council's growth ambitions for the District to be met, flexibility in the allocation of sites needs to be planned for to meet the future demand and growth of the industrial and logistics sector.

6.4 Our Client's site at Land South of Gonerby Lane, Gonerby Moor offers a highly suitable opportunity to create a modern logistics hub to meet the long term District need. There is a demand/desire for sites close to the strategic highway network and the site provides a locational solution whilst also assisting in meeting local employment need.

6.5 In conclusion, we consider that Land South of Gonerby Lane, West of the A1, Gonerby Moor would be suitable, available and deliverable for employment purposes within the plan period.

6.6 As detailed within our representations we consider the emerging Regulation 18 draft Plan to be sound and our comments raised are intended to assist the Council in strengthening the evidence that underpins the plan. We are fully supportive of the Council's approach to allocating the site for employment purposes and look forward to working with the Council further to bring the site forward through a planning application in due course once the plan has progressed through Examination.

APPENDIX 1. RAG RULES TABLE 3.1 – SUSTAINABILITY APPRAISAL TECHNICAL ANNEX

determining factor which may have a bearing on the significance of any impacts. In this way, the results of the assessment seek to provide a high-level indication of what potential impacts may occur if the sites are taken forward as allocations, with a view to aiding the site sifting process from a long list of sites (i.e., those included in this assessment) to a short-list of sites (i.e., those which will be considered in further detail by South Kesteven District Council through their ongoing discussions / engagement events and through the next stages of the SA process).

Evaluation of constraints and opportunities

3.12 The following criteria are proposed for evaluating the constraints and opportunities, utilising the 'RAG' approach to scorings. The criteria are organised by the 'themes' which are being considered through the SA process.

Table 3.1: Criteria used to evaluate the constraints and opportunities

Criteria	'RAG' rules
Air Quality	
Air Quality Management Areas (AQMA) Layer provided by South Kesteven District Council (SKDC); year of last known update is 2018.	Dark Red = direct overlap with an AQMA or up to 1,000m distance from an AQMA. Light Red = more than 1,000m and up to 3,000m distance from an AQMA. Yellow = more than 3,000m and up to 10,000m distance from an AQMA. Light Green = more than 10,000m and up to 15,000m distance from an AQMA. Dark Green = the nearest AQMA site is greater than 15,000m away.
Biodiversity and Geodiversity	
Internationally Protected Sites *(Ramsar Sites, Special Areas of Conservation, and Special Protection Areas)* Nationally available dataset.	Dark Red = up to 3,000m distance from an internationally protected site. Light Red = more than 3,000m and up to 5,000m distance from an internationally protected site. Yellow = more than 5,000m and up to 10,000m distance from an internationally protected site. Light Green = more than 10,000m and up to 15,000m distance from an internationally protected site. Dark Green = the nearest internationally protected site is greater than 15,000m away.
Sites of Special Scientific Interest (SSSI) Nationally available dataset.	Dark Red = direct overlap with an SSSI or up to 1,000m distance from an SSSI. Light Red = more than 1,000m and up to 2,000m distance from an SSSI. Yellow = more than 2,000m and up to 4,000m distance from an SSSI.

Criteria	'RAG' rules
	Light Green = more than 4,000m and up to 5,000m distance from an SSSI. Dark Green = more than 5,000m distance from an SSSI
Local Geological Sites (LGS) Layer provided by SKDC; year of last known update is 2020.	Dark Red = direct overlap with a local geological site or up to 100m distance from a local geological site. Yellow = all other sites.
Regionally Important Geological Sites (RIGS) Layer provided by SKDC; year of last known update is 2020.	Dark Red = direct overlap with a regionally important geological site or up to 100m distance from a regionally important geological site. Yellow = all other sites.
Local Wildlife Sites (LWS) Layer provided by SKDC; year of last known update is 2020.	Dark Red = direct overlap with a local wildlife site or up to 500m distance from a local wildlife site. Light Red = more than 500m and up to 1,000m distance from a local wildlife site. Yellow = more than 1,000m and up to 1,750m distance from a local wildlife site. Light Green = more than 1,750m and up to 2,500m distance from a local wildlife site. Dark Green = more than 2,500m distance from a local wildlife site.
Local Nature Reserves (LNR) *(N.B. Access to nature the key consideration with this layer – closer the site is to a local nature reserve suggests more opportunities for accessing, appreciating, and understanding nature – aligning with the purpose of these designations)* Nationally available dataset.	Dark Red = The nearest local nature reserve is more than 15,000m away. Light Red = more than 10,000m and up to 15,000m distance from a local nature reserve. Yellow = more than 6,000m and up to 10,000m distance from a local nature reserve. Light Green = more than 3,000m and up to 6,000m distance from a local nature reserve. Dark Green = up to 3,000m distance from a local nature reserve.
Ancient Woodland Nationally available dataset.	Dark Red = direct overlap with ancient woodland or up to 750m distance from an area of ancient woodland. Light Red = more than 750m and up to 1,500m distance from an area of ancient woodland. Yellow = more than 1,500m and up to 3,000m distance from an area of ancient woodland. Light Green = more than 3,000m and up to 5,000m distance from an area of ancient woodland. Dark Green = more than 5,000m distance from an area of ancient woodland.

Criteria	‘RAG’ rules
Priority Habitat Nationally available dataset.	Dark Red = direct overlap with (or adjacent to) an area of priority habitat. Light Red = up to 250m distance from an area of priority habitat. Yellow = more than 250m and up to 500m distance from an area of priority habitat. Light Green = more than 500m and up to 750m distance from an area of priority habitat. Dark Green = more than 750m distance from an area of priority habitat.
Historic Environment	
Grade I Listed Buildings Nationally available dataset.	Dark Red = up to 250m distance from a Grade I listed building. Light Red = more than 250m and up to 500m distance from a Grade I listed building. Yellow = more than 500m and up to 1,000m distance from a Grade I listed building. Light Green = more than 1,000m and up to 2,000m distance from a Grade I listed building. Dark Green = more than 2,000m distance from a Grade I listed building.
Grade II* Listed Buildings Nationally available dataset.	Dark Red = up to 250m distance from a Grade II* listed building. Light Red = more than 250m and up to 500m distance from a Grade II* listed building. Yellow = more than 500m and up to 1,000m distance from a Grade II* listed building. Light Green = more than 1,000m and up to 2,000m distance from a Grade II* listed building. Dark Green = more than 2,000m distance from a Grade II* listed building.
Grade II Listed Buildings Nationally available dataset.	Dark Red = direct overlap with a Grade II listed building or up to 200m distance from a Grade II listed building. Light Red = more than 200m and up to 400m distance from a Grade II listed building. Yellow = more than 400m and up to 600m distance from a Grade II listed building. Light Green = more than 600m and up to 1,000m distance from a Grade II listed building. Dark Green = more than 1,000m distance from a Grade II listed building.

Criteria	'RAG' rules
Scheduled Monuments Nationally available dataset.	Dark Red = direct overlap with a scheduled monument or up to 400m distance from a scheduled monument. Light Red = more than 400m and up to 800m distance from a scheduled monument. Yellow = more than 800m and up to 1,500m distance from a scheduled monument. Light Green = more than 1,500m and up to 2,250m distance from a scheduled monument. Dark Green = more than 2,250m distance from a scheduled monument.
Conservation Areas *(N.B. Whilst many of the available site options are located within or adjacent to a conservation area, this does not preclude high quality development taking place which reinforces the special historic interest of the area)* Layer provided by SKDC; year of last update is 2024.	Dark Red = direct overlap with (or adjacent to) a conservation area. Light Red = up to 400m distance from a conservation area. Yellow = more than 400m and up to 1,000m distance from a conservation area. Light Green = more than 1,000m and up to 2,500m distance from a conservation area. Dark Green = more than 2,500m distance from a conservation area.
Registered Historic Parks and Gardens Layer provided by SKDC; year of last known update is 2021.	Dark Red = direct overlap with a registered historic park and garden or up to 500m distance from a registered historic park and garden. Light Red = more than 500m and up to 2,000m distance from a registered historic park and garden. Yellow = more than 2,000m and up to 4,000m distance from a registered historic park and garden. Light Green = more than 4,000m and up to 6,000m distance from a registered historic park and garden. Dark Green = more than 6,000m distance from a registered historic park and garden.
Landscape	
Tree Preservation Orders (TPO) *(N.B. It is anticipated that trees with TPO designations will be incorporated into the design of any new development areas which come forward)* Layer provided by SKDC; year of last known update is 2022.	Dark Red = There is at least one tree with a TPO designation intersecting with the site boundary. Light Red = up to 50m distance from the nearest TPO designation. Yellow = all other sites

Criteria	'RAG' rules
Climate Change	
Flood Zone 2 Nationally available dataset.	Dark Red = direct overlap with an area of land within Flood Zone 2. Light Red = up to 250m distance from an area of land within Flood Zone 2. Yellow = more than 250m and up to 500m distance from an area of land within Flood Zone 2. Light Green = more than 500m and up to 1,000m distance from an area of land within Flood Zone 2. Dark Green = more than 1,000m distance from an area of land within Flood Zone 2.
Flood Zone 3 Nationally available dataset.	Dark Red = direct overlap with an area of land within Flood Zone 3. Light Red = up to 250m distance from an area of land within Flood Zone 3. Yellow = more than 250m and up to 500m distance from an area of land within Flood Zone 3. Light Green = more than 500m and up to 1,000m distance from an area of land within Flood Zone 3. Dark Green = more than 1,000m distance from an area of land within Flood Zone 3.
Land, Soil, and Water Resources	
Grade 1 Agricultural Land (ALC) Nationally available dataset.	Dark Red = direct overlap with areas of Grade 1 agricultural land. Yellow = all other sites.
Grade 2 Agricultural Land (ALC) Nationally available dataset.	Dark Red = direct overlap with areas of Grade 2 agricultural land. Yellow = all other sites.
Grade 3 Agricultural Land (ALC) Nationally available dataset.	Dark Red = greater than 50% and up to 100% direct overlap with areas of Grade 3 agricultural land. Light Red = greater than 0% and up to 50% direct overlap with areas of Grade 3 agricultural land. Yellow = all other sites.
Mineral Safeguarding Areas (MSA) Layer provided by SKDC; year of last known update is 2015.	Dark Red = 100% direct overlap with a mineral safeguarding area. Light Red = more than 0% and up to 99% overlap with a mineral safeguarding area. Yellow = all other sites.
Mineral Consultation Areas (MCA)	Dark Red = direct overlap with a mineral consultation area.

Criteria	'RAG' rules
Layer provided by SKDC; year of last known update is 2017.	Yellow = all other sites.
Water Resources *(N.B. Key consideration to the RAG rules is associated with potential disturbance to watercourses resulting from new development areas (e.g., from surface-water run-off, construction activities and noise, impacts to wildlife/habitats along the river corridor etc.), rather than the health benefits associated with living close to green and blue infrastructure).* Layer provided by SKDC; year of last known update is 2016.	Dark Red = direct overlap with a river (i.e., there is a watercourse passing through the site boundary). Light Red = up to 400m distance from a river. Yellow = more than 400m and up to 800m distance from a river. Light Green = more than 800m and up to 1,500m distance from a river. Dark Green = more than 1,500m distance from a river.
Groundwater Source Protection Zones (SPZ) Nationally available dataset.	Dark Red = direct overlap with source protection zone 1 (*N.B. recognising that the site may also overlap with source protection zone 2/2c and/or 3).* Light Red = direct overlap with source protection zone 2/2c and/or 3 *(N.B. these sites do not overlap with source protection zone 1).* Yellow = all other sites.
Community Wellbeing	
Employment Sites Layer provided by SKDC; year of last known update is 2020.	Dark Red = more than 10,000m distance from an employment site. Light Red = more than 6,000m and up to 10,000m distance from an employment site. Yellow = more than 3,000m and up to 6,000m distance from an employment site. Light Green = up to 3,000m distance from an employment site. Dark Green = The site is currently in employment use (i.e., the site directly overlaps with an area of employment land). *N.B. It is acknowledged that if the site(s) were taken forward for alternative uses, this could potentially result in the loss of employment land and lead to significant negative impacts.*
Primary Services: Shops Layer provided by SKDC; year of last known update is 2022.	Dark Red = more than 2,000m distance from a shop. Light Red = more than 1,000m and up to 2,000m distance from a shop. Yellow = more than 500m and up to 1,000m distance from a shop. Light Green = more than 250m and up to 500m distance from a shop.

Criteria	'RAG' rules
	Dark Green = The site directly overlaps with a shop, or the site is up to 250m distance from a shop. *N.B. It is acknowledged that if the site(s) which directly overlap with a shop are taken forward for alternative uses, this could potentially result in the loss of this community service and lead to significant negative impacts.*
Primary Services: Primary Schools Layer provided by SKDC; year of last known update is 2022.	Dark Red = more than 3,500m distance from a primary school. Light Red = more than 2,000m and up to 3,500m distance from a primary school. Yellow = more than 1,000m and up to 2,000m distance from a primary school. Light Green = more than 500m and up to 1,000m distance from a primary school. Dark Green = up to 500m distance from a primary school.
Primary Services: Secondary Schools Layer provided by SKDC; year of last known update is 2022.	Dark Red = more than 8,000m distance from a secondary school. Light Red = more than 4,000m and up to 8,000m distance from a secondary school. Yellow = more than 2,000m and up to 4,000m distance from a secondary school. Light Green = more than 1,000m and up to 2,000m distance from a secondary school. Dark Green = up to 1,000m distance from a secondary school.
Primary Services: Surgeries Layer provided by SKDC; year of last known update is 2022.	Dark Red = more than 5,000m distance from a surgery. Light Red = more than 3,000m and up to 5,000m distance from a surgery. Yellow = more than 1,500m and up to 3,000m distance from a surgery. Light Green = more than 750m and up to 1,500m distance from a surgery. Dark Green = The site directly overlaps with a surgery, or the site is up to 750m distance from a surgery. *N.B. It is acknowledged that if the site(s) which directly overlap with a surgery are taken forward for alternative uses, this could potentially result in the loss of this community service and lead to significant negative impacts.*
Town Centre Boundary Layer provided by SKDC; year of last known update is 2020.	Dark Red = more than 10,000m distance from a town centre boundary. Light Red = more than 5,000m and up to 10,000m distance from a town centre boundary.

Criteria	'RAG' rules
	Yellow = more than 3,000m and up to 5,000m distance from a town centre boundary. Light Green = more than 1,500m and up to 3,000m distance from a town centre boundary. Dark Green = direct overlap with a town centre boundary or up to 1,500m distance from a town centre boundary.
Green Infrastructure – Open Spaces Layer provided by SKDC; year of last known update is 2008.	Dark Red = more than 800m distance from an area of open space. Light Red = more than 400m and up to 800m distance from an area of open space. Yellow = more than 200m and up to 400m distance from an area of open space. Light Green = up to 200m distance from an area of open space. Dark Green = direct overlap with (or adjacent to) an area of open space. *N.B. It is acknowledged that if the site(s) which directly overlap with an open space are taken forward for alternative uses, this could potentially result in the loss of this community service and lead to significant negative impacts.*
Transportation	
Bus Routes Layer provided by SKDC; year of last known update is 2008.	Dark Red = more than 1,000m distance from the nearest bus route. Light Red = more than 500m and up to 1,000m distance from the nearest bus route. Yellow = more than 250m and up to 500m distance from the nearest bus route. Light Green = more than 100m and up to 250m distance from the nearest bus route. Dark Green = up to 100m distance from the nearest bus route.
Bus Stops Layer provided by SKDC; year of last known update is 2006.	Dark Red = more than 800m distance from the nearest bus stop. Light Red = more than 600m and up to 800m distance from the nearest bus stop. Yellow = more than 400m and up to 600m distance from the nearest bus stop. Light Green = more than 200m and up to 400m distance from the nearest bus stop. Dark Green = direct overlap with a bus stop (e.g., there is a bus stop within the site boundary) or up to 200m distance from the nearest bus stop.

Criteria	'RAG' rules
Train Stations Nationally available dataset.	Dark Red = more than 10,000m distance from the nearest train station. Light Red = more than 6,000m and up to 10,000m distance from the nearest train station. Yellow = more than 3,000m and up to 6,000m distance from the nearest train station. Light Green = more than 1,000m and up to 3,000m distance from a train station. Dark Green = direct overlap with a train station (e.g., there is a train station within the site boundary) or up to 1,000m distance from the nearest train station.
SKDC Public Rights of Way Layer provided by SKDC; year of last known update is 2021.	Dark Red = more than 600m distance from the nearest PRoW. Light Red = more than 400m and up to 600m distance from the nearest PRoW. Yellow = more than 200m and up to 400m distance from the nearest PRoW. Light Green = more than 100m and up to 200m distance from the nearest PRoW. Dark Green = up to 100m distance from the nearest PRoW.

APPENDIX 2. TRANSPORT APPRAISAL (TA) (ADC INFRASTRUCTURE)

TRANSPORT APPRAISAL

LAND AT GONERBY MOOR
GRANTHAM, LINCOLNSHIRE

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DRAWINGS

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APPENDICES

1.0 INTRODUCTION

1.1 Harworth Group and Caddick Land commissioned ADC Infrastructure Limited to provide transport and highways advice in support of a Regulation 18 Local Plan allocation submission, for land adjacent to the A1 at Gonerby Moor, Lincolnshire.

1.2 The proposed development site sits on land immediately west of the Gonerby Moor Interchange on the A1, approximately 6km northwest of Grantham. South Kesteven District Council (SKDC) are the local planning authority, and Lincolnshire County Council (LCC) are the local highway authority. The A1 and its slip roads are under the jurisdiction of National Highways.

1.3 Harworth Group's land sits north of Gonerby Lane, and Caddick Group's land is located to the south. The illustrative development masterplan prepared for Harworth Group indicates that their site could accommodate up 1.4million sqft (130,033sqm) of employment development. Caddick Groups land holding is larger, and their illustrative masterplan indicates that it could accommodate up to 2.3million sqft (213,677sqm) of employment development.

1.4 The two sites share a frontage of approximately 400m on Gonerby Lane. The intention is that the two landowners work together to promote forward a combined access strategy, via a new four arm roundabout, which would straddle Gonerby Lane and use land from each site.

1.5 This report examines the accessibility of the site by all modes of transport, undertakes an assessment of the potential traffic impact of the combined developments on the surrounding highway network, including a detailed analysis of the Gonerby Moor Interchange and proposes an appropriate access strategy, demonstrating that safe and suitable access can be achieved. The illustrative development masterplans are in **Appendix A**.

1.6 This Transport Appraisal has been shared with both LCC and NH, who have reviewed and commented on the initial proposals. Both responses were largely positive. The comments and suggestions contained within each response would be addressed as part of the Transport Assessment prepared in support of any future application. Both responses are at **Appendix B**.

2.0 OPPORTUNITIES FOR SUSTAINABLE TRAVEL

Site location and existing use

2.1 The general site location is shown in **Figure 1,** with an aerial photograph of the two sites at **Figure 2.**

Figure 1: general site location

2.2 Harworth's proposed development site comprises 29.9ha of land and is currently undeveloped arable farmland with a collection of farm buildings located towards the northern boundary, and a gated access on Gonerby Lane, which forms the southern boundary.

2.3 Caddick's site comprises 65.5ha of land, and similarly undeveloped arable farmland. It too has a gated access on Gonerby Lane.

2.4 The land to the east of each site belongs to National Highways and forms the embankments and associated infrastructure for the A1.

2.5 The Gonerby Moor interchange was constructed in 2008/09 as part of a major improvements scheme, which introduced grade-separation to several junctions along the A1. The junction has a single bridge deck over the A1 and two roundabouts located either side of the bridge. The western roundabout is the smaller of the two with an inscribed circle diameter (ICD) of 45m. There are single lanes on all approaches, on the circulatory and on the A1 northbound on-slip. The eastern roundabout is larger, with and ICD of 80m, and provides access to the B1174, the existing Grantham North motorway service area and Downtown Retail Park and an industrial estate via the B1174.

2.6 Alongside the Downtown Retail Park, the land east of the Gonerby Moor Interchange also houses several employment developments, primarily concerned with logistics and vehicle hire.

2.7 The Downtown Retail Park has planning consent for a significant redevelopment (planning ref S17/2155). The expansion would encompass the land south of the service station and the planning consent states that it would comprise the construction of a '*Designer Outlet Centre of up to 20,479 sqm (GEA) of floorspace comprising retail units (A1), restaurants and cafes (A3), and storage. Additional large goods retail (5,574 sqm GEA), garden centre (5,521 sqm GEA) and external display area for garden centre (1,393 sqm), tourist information and visitor centre, training academy, leisure unit and offices. Demolition of existing garden centre and sales area and existing warehouse*'

Figure 2: aerial photograph

Opportunities for pedestrian travel

2.8 For commuters without mobility impairment, up to 500 metres is the desirable walking distance, up to 1,000 metres is an acceptable walking distance, and up to 2,000 metres is the preferred maximum walking distance[1]. **Figure 3** shows a 2km pedestrian catchment from the centre of each site

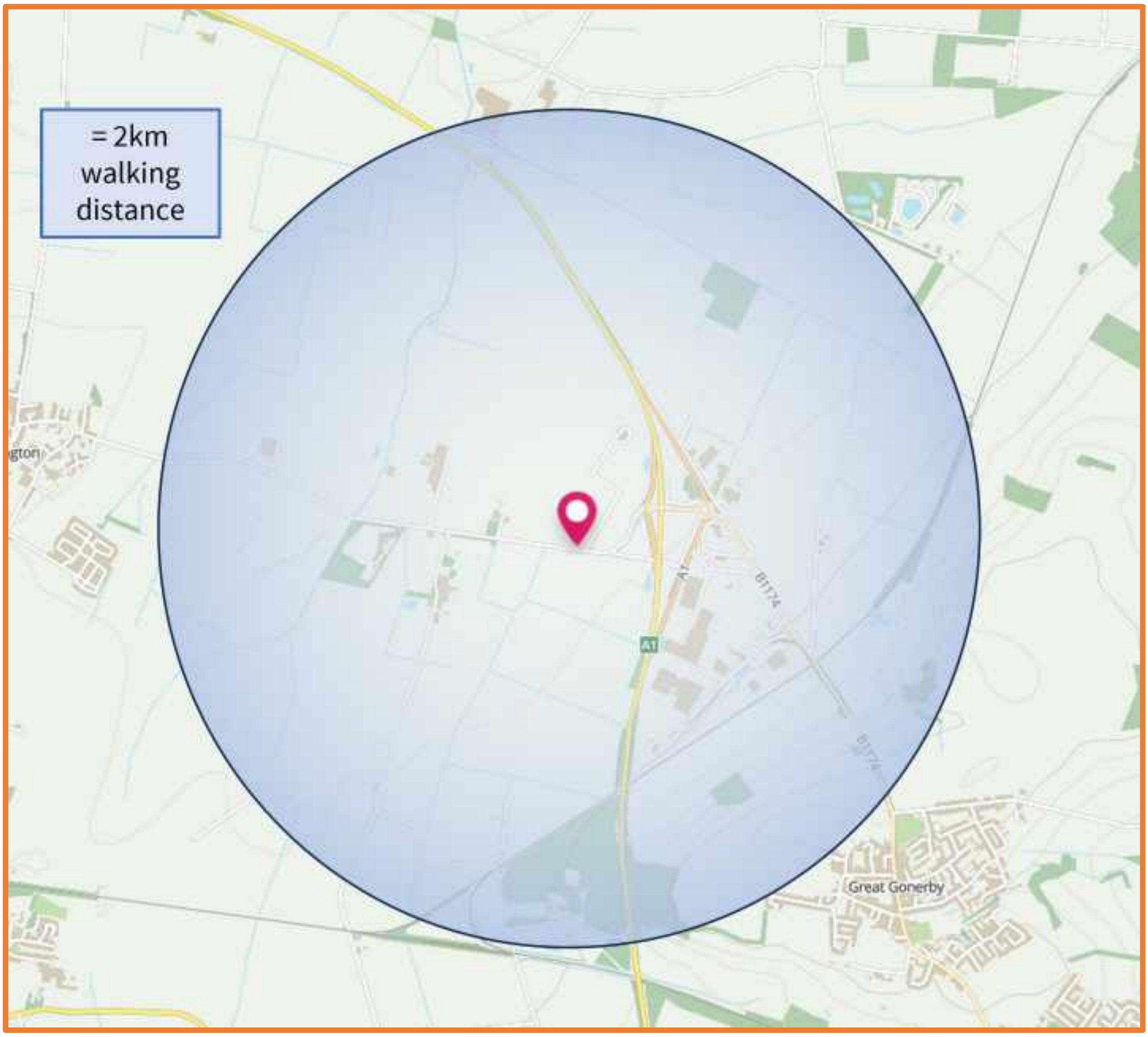


Figure 3: 2km walking distance from the site access.

2.9 The sites are relatively remote from any settlements, and this naturally limits its accessibility on foot for most potential employees. Great Gonerby is approximately a 3km, or 40 minute walk from the centre of the site, with Grantham town centre approximately 6km (75 minutes' walk).

2.10 As part of the Gonerby Moor junction upgrades, a shared footway/cycleway was constructed, commencing approximately 50m east of the existing gated farm access, on the Caddick Land side of the carriageway. The shared infrastructure extends around the western dumbbell roundabout, across the overbridge, before terminating at the Motorway Service Area (MSA) access adjacent to the eastern dumbbell. Crossing the two slip roads is achieved via uncontrolled crossing points with dropped kerbs and tactile paving. Beyond the MSA there is a footway along the eastern side

[1] Guidelines for Providing for Journeys on Foot, Institution of Highways and Transportation, 2000

of the B1174 running south into Great Gonerby, and on into Grantham, although for the northern section it appears to be slightly substandard in width and may require upgrading.

2.11 This means that there is a footway connection between the site and Grantham town centre, however the existing infrastructure stops short of the proposed site accesses and would require extending to serve the proposed development. Allington is approximately 2.5km west of the site, however the lack of footway along Gonerby Lane makes walking the route unsafe. The existing infrastructure can be seen in **Figures 4** and **5**.

Figure 4: existing shared footway/cycleway on the southern side of Gonerby Lane, looking north towards the A1

Figure 5: existing footway along the B1174, looking south towards Great Gonerby

Opportunities for cycle travel

2.12 The National Travel Survey records that the average UK cycle journey for non-leisure purposes such as commuting to work is 5km each way, however many people will choose to cycle considerably further than this if the topography, highway conditions and general infrastructure both along the route and at their destination are favourable. **Figure 6** below shows a 5km catchment, measured from the site access roundabout.

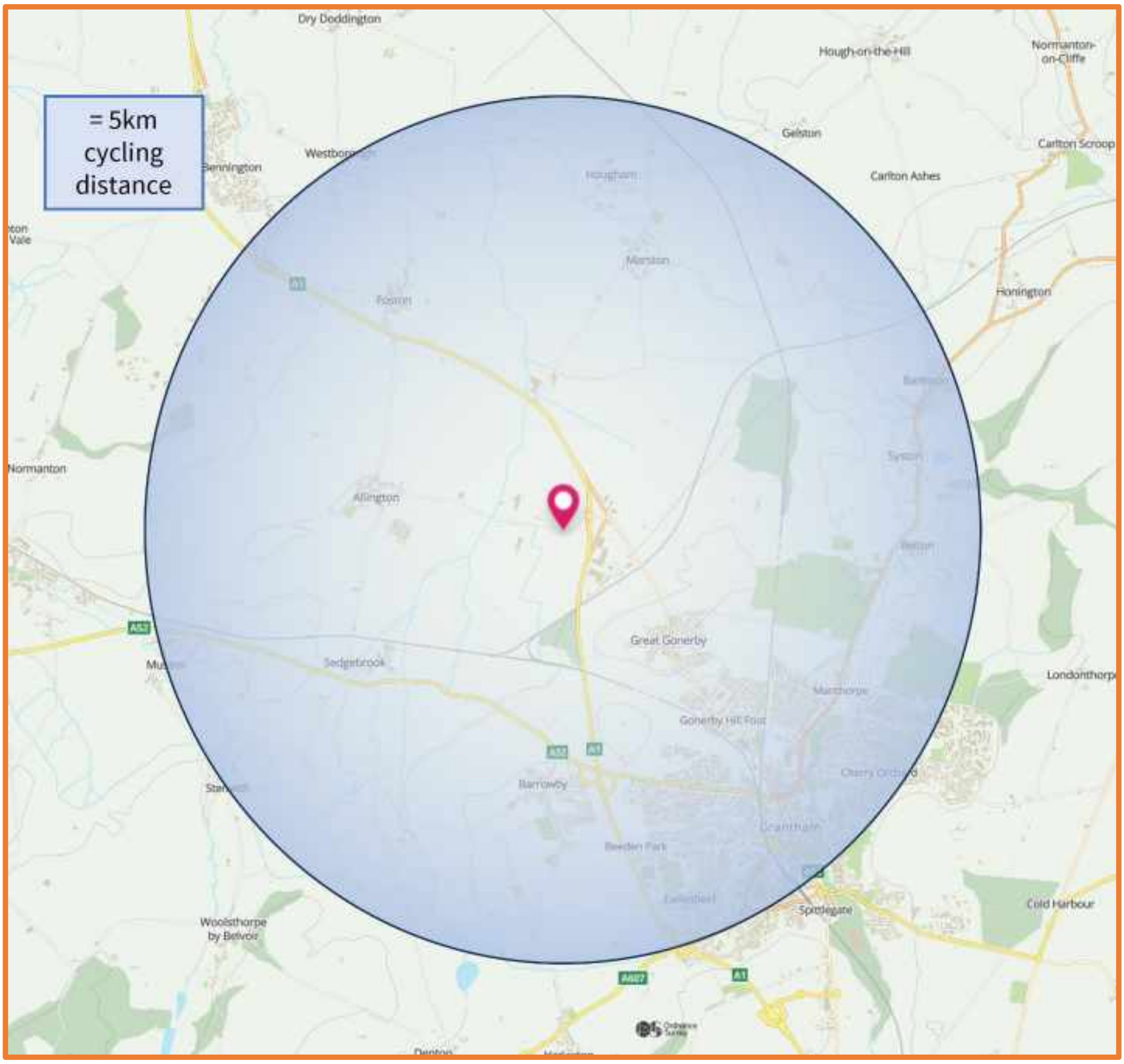


Figure 6: 5km cycling distance from the site access.

2.13 The local topography is relatively flat, although there is a ridge of land between the site and Grantham over which the B1174 passes, just north of Great Gonerby. There is a shared cycleway/footway along the southern edge of the carriageway around the Gonerby Moor Interchange, with uncontrolled crossing points on both roundabouts, however this terminates adjacent to the service station access.

2.14 Given the rural location of the site, aside from this short section, dedicated cycle infrastructure is understandably limited. West of the site, Gonerby Lane is lightly trafficked and relatively flat, meaning it is possible to cycle to the neighbouring villages of Allington and Sedgebrook. Barrowby is also within 5km as the crow flies, although to avoid cycling along the A52 a diversion is required that extends the distance beyond 5km and the journey takes approximately 40 minutes.

2.15 Upgrading the pedestrian and cycle connectivity between the site and the surrounding amenities would be a requirement of developing the land.

2.16 The Department for Transport's Local Transport Note 1/20 (LTN 1/20) sets the benchmark for sustainable transport infrastructure design, particularly for cycling infrastructure. A development of this scale would be expected to provide fully LTN 1/20 compliant infrastructure.

2.17 Table 5-2 of LTN 1/20 states that two way cycle track serving less than 1000 movements in a peak hour should be a minimum of 3m wide, with an absolute minimum width of 2m at constraints. The cycle track should be segregated from the carriageway by a buffer strip, which for a road of 40mph would need to be an absolute minimum of 0.5m in width. A 2m wide footway would be constructed adjacent to the cycle track, on the non-carriageway side.[2]

2.18 **Drawing ADC3103-DR-002-P2** shows an LTN 1/20 compliant footway/cycleway extending from both site access arms along Gonerby Lane to the west. The proposed infrastructure along the southern side of the carriageway is shown tying into the existing 3m wide shared facility shown on **Figure 4** above. On the northern side of the carriageway, the proposed segregated facility extends as far as the existing provision, at which points users would be required to cross the carriageway via an uncontrolled dropped kerb transition and join the existing provision on the southern side of the carriageway.

2.19 The existing infrastructure pre-dates LTN 1/20's standards, and while the current guidance leans towards fully segregated facilities of the type proposed at the site accesses, section 6.5 of the document states that shared use facilities may be appropriate in some situations, provided they are well designed and implemented. This includes situations where a length of shared use may be acceptable to achieve continuity of a cycle route.[3] The A1 overbridge is not wide enough to provide a fully segregated facility on each side of the carriageway. Both pedestrian and cyclist flows will be low enough that the existing shared facility will be acceptable.

Opportunities for rail travel

2.20 Grantham Railway Station is located approximately 6.5km to the southeast of the proposed development. The train station is a primary station on the East Coast Mainline and is managed by the London North Eastern Railway (LNER). The train station is served by trains operated by LNER, East Midlands Railway and Hull Trains with regular services to regional and national destinations. There are express intercity services between Grantham and London Kings Cross (approx. 1hr 5mins journey time) via Peterborough (19mins) and northbound to Edinburgh (3hrs 45mins) via Doncaster (20mins) and Leeds (45mins). East Midlands Railway operate an hourly regional service between Grantham and Nottingham (35mins).

2.21 The station is within 500m walking distance of the stop served by the 14 and 24 buses described below. It is a major regional commuter station, with 263 car parking spaces and 73 accessible parking spaces. There are 63 restricted access covered cycle stands. While the station is well beyond walking distance from the proposed development, there is the potential for train travel to form part of a multi-modal trip with either bus or perhaps bicycle.

[2] Cycle Infrastructure Design (publishing.service.gov.uk)p52
[3] Cycle Infrastructure Design (publishing.service.gov.uk) p67

ADC INFRASTRUCTURE

Opportunities for bus travel

2.22 As shown in **Figure 7,** the nearest bus stop to the site is in the Downtown Shopping Centre car park. The stop is served by the 14 and 24 bus services and is marked by a basic flag and pole arrangement, with timetabling but no shelter or real time information. The stop is approximately 1.6km walking distance from the centre of the site.

2.23 The number 14 is a local service operating between Grantham town centre and the nearby village of Great Gonerby. Once a day the service route is extended to call at the Downtown shopping centre, with the return service departing at 15:18.

2.24 The 24-bus service is a loop service between Grantham and Newark via Great Gonerby and Long Bennington. The service currently operates 6 times a day between Grantham town centre and the Downtown shopping centre. Currently only three services a day extend as far as Newark, with the remainder terminating at the village of Long Bennington. The journey time between the shopping centre and Grantham town centre is timetabled as taking 17 minutes meaning that the site has the potential to be easily accessible by bus.

2.25 Either of the two existing services could be extended to call at the site, performing a loop within the proposed developments before returning to their original route. Frequencies could increase at peak times if deemed necessary or be altered to coincide with shift changeovers to increase potential patronage.

2.26 The Downtown Retail Park expansion is subject to a Section 106 planning obligation which requires the provision of a new bus service. The terms of the S106 agreement require.

'such enhancements to result in the bus service linking the Development with Grantham Town Centre for a minimum period of three years from the first occupancy of the Development to operate at a frequency between the Site and Grantham Town Centre of:

- *One service every 30 minutes during the peak period of each day and that the development is open to the public and trading; and*
- *One service every 60 minutes during the off-peak period being the period during which the development is open to the public (except for any time falling within the peak periods) o each day that the development is trading.*

2.27 Depending on the timescales involved, the Downtown Retail Park with be significantly enhancing bus provision to the area, albeit the buses will only be calling at the retail park, which would still require a walk for anyone wishing to access the proposed development. There is the potential to extend this new service to serve both sites as well as the retail park or to provide a shuttle bus service between the two. The site is therefore accessible by bus, subject to these improvements.

Figure 8: Existing Bus stop locations

Accident record

2.28 The personal injury accident (PIA) data for the surrounding highway network has been examined, using Crashmap.co.uk, for the last 5 years to establish any existing clusters or areas of concern that may be made worse by the proposed development. The PIAs are shown in **Figure 9** below. The accident reports are at **Appendix C**.

Figure 9: PIA locations relative to the site

2.29 Two collisions occurred on the A1 overbridge, one of these was a rear end shunt type collision on the approach to the western dumbbell, which resulted in slight injuries to one individual. The other was a head on collision between a car and a good vehicle on the bridge, resulting in serious injuries to one individual.

2.30 Two collisions occurred at the eastern dumbbell roundabout. One involved a goods vehicle overrunning the roundabout and hitting the nearside kerb, resulting in serious injuries to one individual. The other involved a rear-end shunt type collision on the northbound approach, resulting in slight injuries to one individual.

2.31 One collision occurred on the A1 southbound off-slip no provisional details are available on the nature of the accident, however it occurred at night, in wet conditions.

2.32 One collision occurred on the A1 northbound off-slip and involved a rear end shunt type collision resulting in slight injuries to one individual.

2.33 One collision occurred on the A1 northbound mainline carriageway and involved a rear end shunt type collision resulting in slight injuries to one individual.

2.34 One collision occurred on the A1 southbound on-slip and involved a rear end shunt type collision resulting in slight injuries to two individuals.

2.35 The frequency, severity and causation factors of the collisions that have occurred do not point to an inherent highway safety problem at the junction that would be exacerbated by additional development generated traffic.

3.0 VEHICULAR ACCESS

Local highway network

3.1 Gonerby Lane forms the southern boundary of the site. It runs east-west between the A1 interchange and the village of Allington, which is approximately 2.5km to the west of the proposed development site. It is rural in character and flanked by high hedges in the vicinity of the site, and the carriageway is approximately 6m wide. To the west of the site, Gonerby Lane is extremely straight for approximately a kilometre with excellent forward visibility on the approach to the proposed site access. Immediately east of the site it turns almost 90 degrees north on the approach to the western dumbbell roundabout of the Gonerby Moor Interchange. Gonerby Lane has a weight restriction in place for vehicles greater than 7.5t, because west of the site it passes through the village of Allington, and the carriageway narrows as it passes through the centre of the village making it unsuitable for large vehicles.

3.2 The character of Gonerby Lane is clearly visible in **Figure 10** below, which was taken from the location of the existing access gate to the development land during a site visit in July 2022 and looks west towards Allington, and east towards the A1 junction.

Figure 10: Gonerby Lane looking west (on the left), and east (on the right) from the existing access

3.3 The Gonerby Moor Interchange was significantly upgraded in 2008, with grade-separation being introduced.

3.4 The B1174 runs south from the eastern roundabout into Grantham town centre, via the village of Great Gonerby. The B1174 is rural in character and governed by the national speed limit until it approaches Great Gonerby at which point the speed limit reduces to 30mph. It has a footway along the eastern edge of the carriageway and street lighting along its full length.

Vehicular access proposals

3.5 Access to the two development sites is proposed to be achieved via a new roundabout on Gonerby Lane. As Gonerby Lane is predominantly rural in character, has no footway provision and is governed by the national speed limit as it passes along the site frontage, it is therefore classified as a 'road' not a 'street'. Hence, both the site access junction design and its associated visibility requirements should be determined by the parameters set out in the Design Manual for Roads and Bridges (DMRB).

3.6 Although Gonerby Lane has a national speed limit, vehicle speeds along the site frontage will be lower than 60mph, given the proximity of the A1 junction and the ninety degree bend on the approach to the western roundabout. The construction of a new roundabout would also act as a speed constraint.

3.7 Ultimately, the speed limit along Gonerby Lane would be reduced to 40mph as part of the development proposals, with the speed limit change located well beyond the western boundary of the site. This requires the granting of a Speed Limit Order (SLO), which takes place independently of the planning application and cannot be guaranteed, particularly in advance of any determination. As such, it is necessary to design any new access to the standards associated with the existing design speed, to mitigate the risk of the SLO not being granted. In terms of roundabout design, the key elements affected by the design speed of the road are forward visibility and centreline radius. These parameters have been designed to the existing road speed of 100kph. The start of the weight restriction would also be moved westwards to allow HGV access to the sites.

3.8 **Drawing ADC3032-DR-002-P2** shows a four-arm roundabout spanning Gonerby Lane. The roundabout has been designed in accordance with the DMRB volumes CD109 and CD116. It has an inscribed circular diameter of 50m. Both the site access arms measure 7.3m in width, and Gonerby Lane would be widened to 7.3m, with the relevant widening through the bend between the site access and the western dumbbell roundabout to ensure two way HGV movements. Forward visibility of 215m can be comfortably achieved on both mainline approaches, and the required deflection achieved while maintaining a minimum centreline radius of 720m on each.

3.9 The drawing shows an LTN 1/20 compliant footway/cycleway extending from both site accesses along Gonerby lane towards and connecting into the existing infrastructure on the southern edge of Gonerby Lane.

4.0 OFF SITE HIGHWAY IMPACT

Background traffic

4.1 Junction turning counts were undertaken at each of the Gonerby Moor Interchange roundabouts during the week of 20th November 2023. These counts give a set of observed traffic flows for the morning and evening peak hours and are shown at **Diagrams 1 and 2** respectively. The raw count data is at **Appendix D**.

4.2 The next iteration of SKDC's local plan would run util 2041. Hence, 2041 has been used as the future year in which to model the impact of the development. The following growth factors have been derived from TEMPRO version 8.1, using the 2022 core scenario traffic projections.

NTEM Growth Factors: South Kesteven 002 MSOA: 2023-41	
AM Peak	1.1297
PM Peak	1.1333

4.3 The above growth factors demonstrate a predicted growth in background traffic of approximately 13% over the local plan period. The growth factors have been applied to the 2023 Observed flows to form the 2041 Base traffic flows, which are at **Diagrams 3 and 4** for the morning and evening peak hours respectively.

Committed developments

4.4 The traffic flows for the Downtown Retail Park redevelopment have been extracted from the Transport Assessment for that site and are at **Diagrams 5 and 6** for the morning and evening peak hours.

4.5 There are no other committed developments in the local area that would present an impact at the Gonerby Moor interchange. The additional traffic generated by developments further afield would be accounted for in the background growth from TEMPRO. The committed development flows have been added to the 2041 Base flows to give a 2041 Background flow set, shown at **Diagrams 7 and 8** for the morning and evening peak hours respectively.

Trip rates

4.6 The overall land use makeup of the proposed development has yet to be determined. However, in order to assess the potential trip generation, an arbitrary split has been applied, with 75% of the site being assessed as B8 Storage and Distribution uses, and the remaining 25% as B2 general industrial uses. This would be refined and adjusted as necessary as the development proposals progress.

4.7 With any potential employment site, it is important to derive trip generation profiles for both light vehicles and Heavy Goods Vehicles (HGVs), particularly so given that B8 developments generate significantly higher numbers of HGV trips as an overall percentage of their traffic. The TRICS database, version 7.10.3, has been consulted to establish a suitable trip rate for both land uses, for both light vehicle and HGVs, and the trip rates are shown in the tables below, with the TRICS reports at **Appendix E**.

B2 Trip Rates	Peak	Arrive	Depart	Two-way
Total Vehicle trip rates (per 100sqm GFA)	AM Peak	0.371	0.127	0.498
	PM Peak	0.110	0.355	0.465
Light Vehicle trip rates (per 100 sqm GFA)	AM Peak	0.346	0.106	0.452
	PM Peak	0.097	0.344	0.441
HGV trip rates (per 100 sqm GFA)	AM Peak	0.025	0.021	0.046
	PM Peak	0.013	0.011	0.024
B8 Trip Rates	**Peak**	**Arrive**	**Depart**	**Two-way**
Total Vehicle trip rates (per 100 sqm GFA)	AM Peak	0.063	0.037	0.100
	PM Peak	0.037	0.059	0.096
Light Vehicle trip rates (per 100 sqm GFA)	AM Peak	0.061	0.021	0.082
	PM Peak	0.019	0.044	0.063
HGV trip rates (per 100 sqm GFA)	AM Peak	0.002	0.016	0.018
	PM Peak	0.018	0.015	0.033

Trip generation – Harworth Land

4.8 Using the above trip rates, and a 75%/25% B8/B2 land use split, the proposed Harworth development site of 1.4million sqft (130,033sqm), as shown on the illustrative masterplan at **Appendix A**, would generate up to 259 and 245 two-way vehicle movements in the morning and evening peak hours, respectively. The breakdown of this traffic is shown in the table below.

Harworth Site Trip Generation						
Vehicle Trips	AM Peak Hour			PM Peak Hour		
130,033sqm	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Total Vehicles	182	77	259	72	173	245
Light Vehicles	172	55	227	50	155	205
HGVs	10	22	32	22	18	40

Trip generation – Caddick Land

4.9 As shown in their illustrative masterplan at **Appendix A,** the Caddick Developments' site comprises 2.3million sqft (213,677sqm) of mixed B2/B8 land uses.

4.10 Using the same trip rates displayed above, and assuming the same 75%/25% B8/B2 land use split, the Caddick site would generate up to 426 and 402 two-way vehicle movements in the morning and evening peak hours, respectively. The breakdown of this traffic is shown in the table below.

Caddick Site Trip Generation						
Vehicle Trips	AM Peak Hour			PM Peak Hour		
213,677sqm	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Total Vehicles	299	126	426	118	284	402
Light Vehicles	283	90	373	82	254	337
HGVs	16	37	53	36	30	66

Trip generation – Combined developments

4.11 The combined developments would generate up to 686 and 647 two-way vehicle movements in the morning and evening peak hours, respectively. The breakdown of this traffic is shown in the table below.

Combined Sites Trip Generation						
Vehicle Trips	AM Peak Hour			PM Peak Hour		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Total Vehicles	481	205	686	190	457	647
Light Vehicles	455	145	600	132	409	541
HGVs	26	59	86	58	48	106

Trip distribution – light vehicles

4.12 To determine the likely distribution pattern of the proposed development traffic, reference was made to the 2011 National Census 'Location of usual residence and place of work by method of travel to work' dataset (reference WU03EW). The data provides information on the origin/destination of trips for each middle layer super output area (MSOA) associated with journeys to work.

4.13 The site is in the 'South Kesteven 002' MSOA. Therefore, the data was examined to identify where people working within the South Kesteven 002 MSOA live. From this information the likely travel routes have been estimated using Google Maps, and the proportion using each route identified. A copy of the Census data and routing is in **Appendix F**. This approach is appropriate given that it is likely that new employees within the development will display similar travel patterns to existing employment sites, particularly those immediately east of the A1 interchange.

4.14 The development traffic will divide at the site access junctions, with 92% routing to/from the east along Gonerby Lane towards the A1 interchange, and the remaining 8% routing to/from the west in the direction of Allington.

4.15 At the A1 interchange the traffic will divide, with 36% routing to/from the north along the A1, and 32% routing along the A1 to/from the south. The remaining 24% would route along the B1174 to/from Grantham. This distribution pattern is shown in **Figure 11** below, with the two-way trip profile in the table beneath it.

Figure 11: light vehicle distribution routings

Route	A	B	C	D
Percentage of light vehicle traffic	24%	32%	36%	8%
Two-way movements AM peak - lights	144	192	216	48
Two-way movements PM peak - lights	130	173	194	43
Percentage of HGV traffic		50%	50%	
Two-way movements AM peak - HGV		43	43	
Two-way movements PM peak - HGV		53	53	

Trip distribution – HGVs

4.16 The weight restrictions on Gonerby Lane means that west of the site it is unsuitable for HGV traffic. For the purposes of this report, it has been assumed that all HGV traffic would route along the A1, and a 50/50 north/south split has been applied. The two-way trip profile is shown in the table above.

4.17 The distribution described above is shown in **Diagram 9**. The Harworth Group's development traffic assignment is at **Diagrams 10 and 11** and the Caddick Land development traffic is at **Diagrams 12 and 13**, for the morning and evening peak hours respectively. **Diagrams 14 and 15** show the total traffic assignment for the combined sites.

Minimising the impact on local villages.

4.18 It should be noted that Gonerby Lane provides a shortcut between the site and the A52, allowing traffic to bypass the Grantham North junction on the A1. To avoid HGV's routing through the village, an existing weight restriction is in place on Gonerby Lane, which would be relocated west of the site access roundabout. Additional measures to prevent HGVs routing west along Gonerby Lane would also ne considered, with potential options including physical barriers such as height or width restrictors, or Automatic Numberplate Recognition (ANPR) monitoring for HGV's.

4.19 Light vehicle traffic routing through Allington and Sedgebrook is also of considerable local concern.

4.20 LCC have acknowledged this in their initial response to the proposals, stating that *We would want to limit any traffic impact through the villages of Allington and Sedgebrook, the distribution results in nearly 50 additional vehicles in the peak hour along this route which should be compared to base flows. It may be a high percentage increase, and it would be helpful if consideration could be given to ways to reduce this impact.*

4.21 Detailed analysis of the background traffic through both villages will be undertaken as part of any TA for the developments. This will allow the increases to be quantified in percentage terms. Based on an initial analysis of the increases on Gonerby Lane, the development would result in approximately 15% more light vehicle traffic routing to/from the west.

4.22 The Downtown Retail Park was required by condition to implement a signage strategy to discourage drivers from using Gonerby Lane. It can be assumed then, that measures to minimise traffic routing through the nearby villages would be required for the proposed development, and these should be considered at an early stage, through discussion with LCC.

'With development' Traffic Flows

4.23 The combined traffic assignment at **Diagrams 14 and 15** has been added to the 2041 Background Traffic flows to give a 2041 With Development flow set, which is shown in **Diagrams 16 and 17**.

5.0 HIGHWAY IMPACT

Site Access Roundabout

5.1 The site access roundabout shown in **Drawing ADC3032-DR-001-P2** has been modelled using Junctions 9 ARCADY. The 2041 With Development flows have been modelled for both morning and evening peak hours. The results are shown in the tables below, and the full ARCADY report is at **Appendix G.**

	AM peak hour			PM peak hour		
	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity
2041 With Development						
A – Gonerby Lane Westbound	0.7	3.80	41%	0.3	3.32	24%
B – Caddick Access	0.1	3.48	12%	0.3	3.18	22%
C – Gonerby Lane Eastbound	0.1	2.81	12%	0.1	2.84	13%
D - Harworth Access	0.1	3.26	7%	0.2	3.24	15%

5.2 As shown in the table above, in all scenarios in both the morning and evening peak hours the site access junction is forecast to operate with a maximum ratio of flow to capacity (RFC) of 41% and therefore have plenty of spare capacity. There would be no material queuing or delay associated with the proposed site access junction, which can therefore comfortably accommodate all the proposed development traffic with no detriment to the wider highway network.

Gonerby Moor Interchange – Western Dumbbell

5.3 The western roundabout of the Gonerby Moor interchange has been modelled using Junctions 9 ARCADY. The 2023 Observed flows have been modelled, along with the 2041 Background and 2041 With Development flows, for both morning and evening peak hours. The results are shown in the tables below, and the full ARCADY report is at **Appendix H.**

	AM peak hour			PM peak hour		
	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity
2023 Observed						
A – A1 Overbridge	0.4	3.96	29%	0.5	4.02	34%
B – A1 Northbound Off- Slip	0.4	5.05	29%	0.3	4.93	24%
C – Gonerby Lane Eastbound	0.1	4.24	12%	0.2	4.32	15%
D - A1 Northbound On- Slip	Exit Only					
2041 Background						
A – A1 Overbridge	0.5	4.29	35%	0.9	5.02	47%
B – A1 Northbound Off- Slip	1.0	7.32	50%	0.7	7.11	43%
C – Gonerby Lane Eastbound	0.1	4.24	12%	0.3	5.71	22%
D - A1 Northbound On- Slip	Exit Only					
2041 With development						
A – A1 Overbridge	1.4	6.66	59%	1.4	6.56	58%
B – A1 Northbound Off- Slip	4.6	25.78	83%	1.5	11.68	60%
C – Gonerby Lane Eastbound	1.0	10.43	51%	5.5	33.00	86%
D - A1 Northbound On- Slip	Exit Only					

5.4 As shown in the table above, in the future year background scenario the roundabout is forecast to operate with a maximum ratio of flow to on any of its approaches of capacity (RFC) of 50% and therefore have plenty of spare capacity.

5.5 The addition of the combined development traffic would have an impact on the performance of the roundabout, as would be expected given its proximity to the site access. Crucially however, the roundabout would still operate within its maximum capacity in both peak hours with the development in place.

5.6 In the morning peak hour, as many vehicles arrive at the sites, the primary impact would be on the A1 Northbound off-slip, which would operate at 83% of its capacity, with an average delay of 25.78 seconds. Despite this, queuing on the slip road would still be low, with a predicted length of 4.6 PCU's. This equates to a queue of approximately 26m in length. The off slip has a length of approximately 290m, meaning it can comfortably accommodate the predicted queuing without impacting on the A1 mainline flow.

5.7 In the evening peak hour, the primary impact is on the Gonerby Lane approach as vehicles seek to leave the sites. It would operate at 86% of its capacity, with a delay of 33 seconds and a queue of 5.5 PCU's or approximately 32m in length. There is ample space between the roundabout and the proposed site access to accommodate the predicted queuing.

5.8 In both peak hours the A1 overbridge would continue to operate with ample spare capacity, and minimal queuing. There would be no adverse interaction between the two dumbbell roundabouts because of the development traffic.

5.9 The western dumbbell roundabout can therefore accommodate the developments traffic in its current form, without requiting mitigation.

Gonerby Moor Interchange – Eastern Dumbbell

5.10 The eastern roundabout of the Gonerby Moor interchange has been modelled using Junctions 9 ARCADY. The 2023 Observed flows have been modelled, along with the 2041 Background and 2041 With Development flows, for both morning and evening peak hours. The results are shown in the tables below, and the full ARCADY report is at **Appendix I.**

	AM peak hour			PM peak hour		
	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity	Queue (PCUs)	Delay (secs)	Ratio of Flow to Capacity
2023 Observed						
A – B1174 Great North Road	0.3	2.23	25%	0.4	2.16	27%
B – A1 Southbound On- Slip	Exit Only					
C – A1 Overbridge	0.2	1.95	17%	0.2	1.84	15%
D – A1 Southbound Off-Slip	0.2	2.11	19%	0.2	1.91	18%
2041 Background						
A – B1174 Great North Road	0.5	2.66	34%	0.9	3.12	48%
B – A1 Southbound On- Slip	Exit only					
C – A1 Overbridge	0.4	2.17	27%	0.3	2.00	23%
D – A1 Southbound Off-Slip	0.4	2.66	28%	0.3	2.26	24%
2041 With development						
A – B1174 Great North Road	0.9	3.82	46%	1.4	4.53	58%
B – A1 Southbound On- Slip	Exit Only					
C – A1 Overbridge	0.5	2.46	34%	0.5	2.43	35%
D – A1 Southbound Off-Slip	0.7	3.58	42%	0.5	3.26	35%

5.11 As shown in the table above, in all scenarios in both the morning and evening peak hours the eastern roundabout of the Gonerby Moor Interchange is forecast to operate with a maximum ratio of flow to capacity (RFC) of 58% and therefore have plenty of spare capacity. There would be no material queuing or delay associated with the proposed site access junction, which can therefore comfortably accommodate all the proposed development traffic with no detriment to the wider highway network.

A1 Merge/Diverge Assessment

5.12 The A1 southbound merge and diverge, and the A1 northbound merge and diverge movements have all been examined. The 2041 Background and With Development traffic flows have been used to determine the merge and diverge requirements to and from the mainline A1 in accordance with *Figure 3.12a* and *Figure 3.26a* of CD122. The resulting diagrams are provided at **Appendix J.**

5.13 The A1 morning and evening peak hour mainline upstream and downstream flows were obtained from two DfT count points on the count A1. Count point 81401 is located south of the Gonerby Moor interchange, and count data was last recorded in 2019. Count point 92082 is located north of the Gonerby Moor interchange, and count data was last recorded in 2022. The count data for the 08:00-09:00 and 17:00-18:00 at each count point was then growthed to 2041 levels using the TEMPRO growth rates detailed below, for Trunk Roads in the Soth Kesteven 002 MSOA. The traffic flows on the slip roads were extracted from the relevant traffic flow diagrams.

NTEM Growth Factors: South Kesteven 002 MSOA: Trunk Roads: 2019-41	
AM Peak	1.1917
PM Peak	1.1969
NTEM Growth Factors: South Kesteven 002 MSOA: Trunk Roads: 2022-41	
AM Peak	1.1729
PM Peak	1.1770

5.14 Based on the traffic forecasts, for the worst case peak hour, the required layout of each merge and diverge is shown in the table below.

	A1 northbound diverge		A1 northbound merge	
	AM	PM	AM	PM
2041 background	Type A	Type A	Type A	Type A
2041 with development	Type A	Type A	Type A	Type A

	A1 southbound diverge		A1 southbound merge	
	AM	PM	AM	PM
2041 background	Type A	Type A	Type A	Type A
2041 with development	Type A	Type A	Type A	Type A

5.15 The table shows that the merge and diverge requirements are the same for all assessment scenarios. This means that there would be no change between the merge and diverge requirements based on the opening year or future year, either with or without the development.

5.16 Overall, the addition of the development traffic would not alter the level of compliance with CD122 regarding the merge/diverge layout requirements for the slip roads. Therefore, no mitigation measures are proposed.

6.0 SUMMARY AND CONCLUSIONS

6.1 Harworth Group and Caddick Group commissioned ADC Infrastructure Limited to provide transport and highways advice in support of a Local Plan allocation submission, for land adjacent to the A1 at Gonerby Moor, near Grantham, Lincolnshire.

6.2 The proposed development site sits on land immediately west of the Gonerby Moor Interchange on the A1, approximately 6km northwest of Grantham. South Kesteven District Council (SKDC) are the local planning authority, and Lincolnshire County Council (LCC) are the local highway authority. The A1 and its slip roads are under the jurisdiction of National Highways.

6.3 Harworth Group's land sits north of Gonerby Lane, and Caddick Group's land is located to the south. The illustrative development masterplan prepared for Harworth Group indicates that their site could accommodate up 1.4million sqft (130,033sqm) of employment development. Caddick Groups land holding is larger, and their illustrative masterplan indicates that it could accommodate up to 2.3million sqft (213,677sqm) of employment development.

6.4 The two sites share a frontage of approximately 400m on Gonerby Lane. The intention is that the two landowners work together to promote forward a combined access strategy, via a new four arm roundabout, which would straddle Gonerby Lane and use land from each site. This access strategy is shown in **Drawing ADC3032-DR-001-P2**. The proposed roundabout has been in accordance with the Design Manual for Roads and Bridges.

6.5 The site is relatively remote from any settlements, and as such sustainable transport provision is currently limited. The A1 interchange has shared footway/cycleways with uncontrolled crossing points on the slip roads, and the B1174 between the junction and Grantham has footway provision along its eastern edge. Therefore, the site is accessible by foot from nearby residential areas, albeit Grantham town centre is over hours walk from the site.

6.6 Cyclists are served by the shared footway/cycleway described above, however this infrastructure ceases beyond the A1 interchange and cyclists are required to rejoin the carriageway on the B1174. The roads around the site (with the exception of the A1) are, by and large, rural and lightly trafficked and are therefore suitable for use by cyclists. Grantham is approximately 6km from the site, via the B1174, so is within cycling distance for many potential employees, provided adequate facilities such as good quality cycle parking, showering, and changing facilities are installed at their destination. **Drawing ADC3032-DR-001-P2** shows the provision of a segregated cycleway with and adjected footway extending from both site accesses, along Gonerby Lane to the East, where it would tie into the existing infrastructure.

6.7 The proposed developments will need to be accessible by public transport, either via an existing service or a by the creation of a new one. The nearest bus stop to the site is in the Downtown Shopping Centre car park. The stop is served by the 14 and 24 bus services and is marked by a basic flag and pole arrangement, with timetabling but no shelter or real time information. The stop is approximately 1.6km walking distance from the centre of the site. As it currently stands, either of the two existing services could be extended to call at the site. The Downtown Shopping Centre has planning consent for a significant redevelopment, which is anticipated to commence in the near future. A condition of this consent is the provision of a new bus service linking the site to Grantham town centre. There is potential that this new service could ultimately be extended to call at the proposed development.

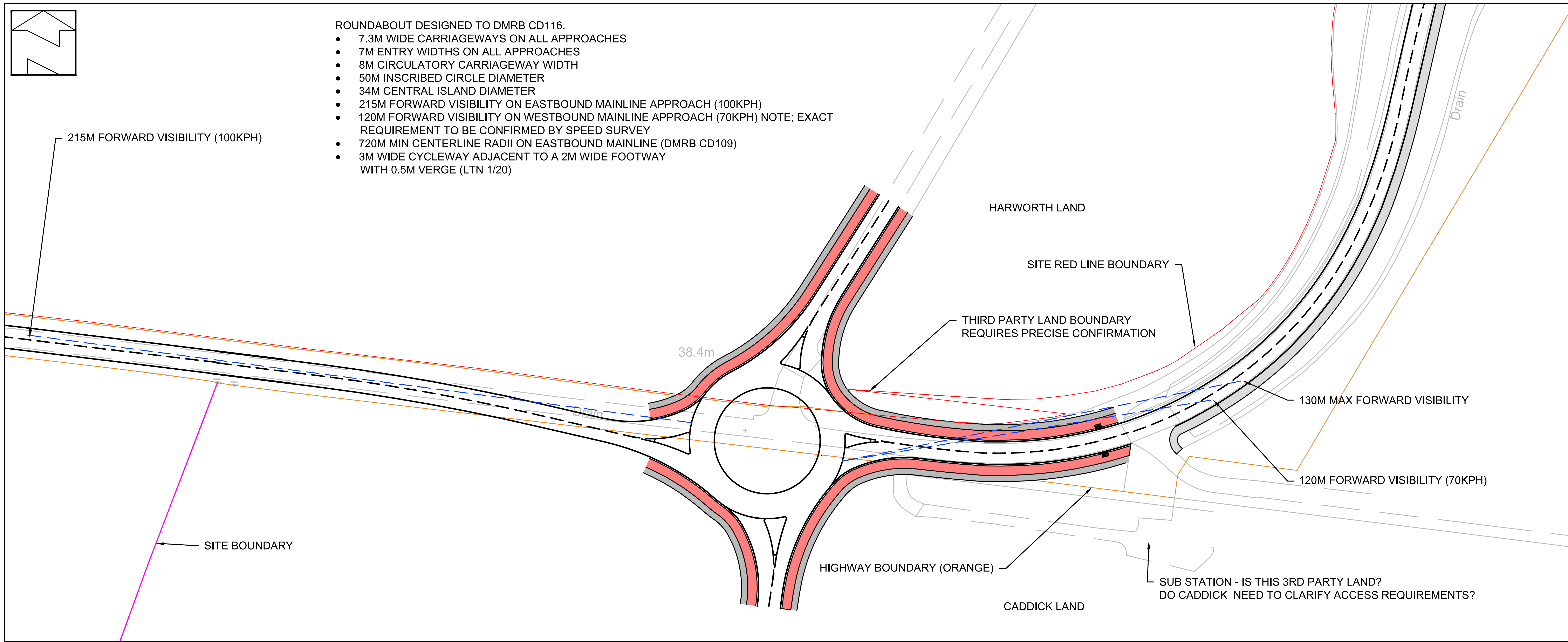
6.8 Based on a split of 75% B8, and 25% B2 land uses, the combined developments would generate up to 686 and 647 two-way vehicle movements in the morning and evening peak hours, respectively.

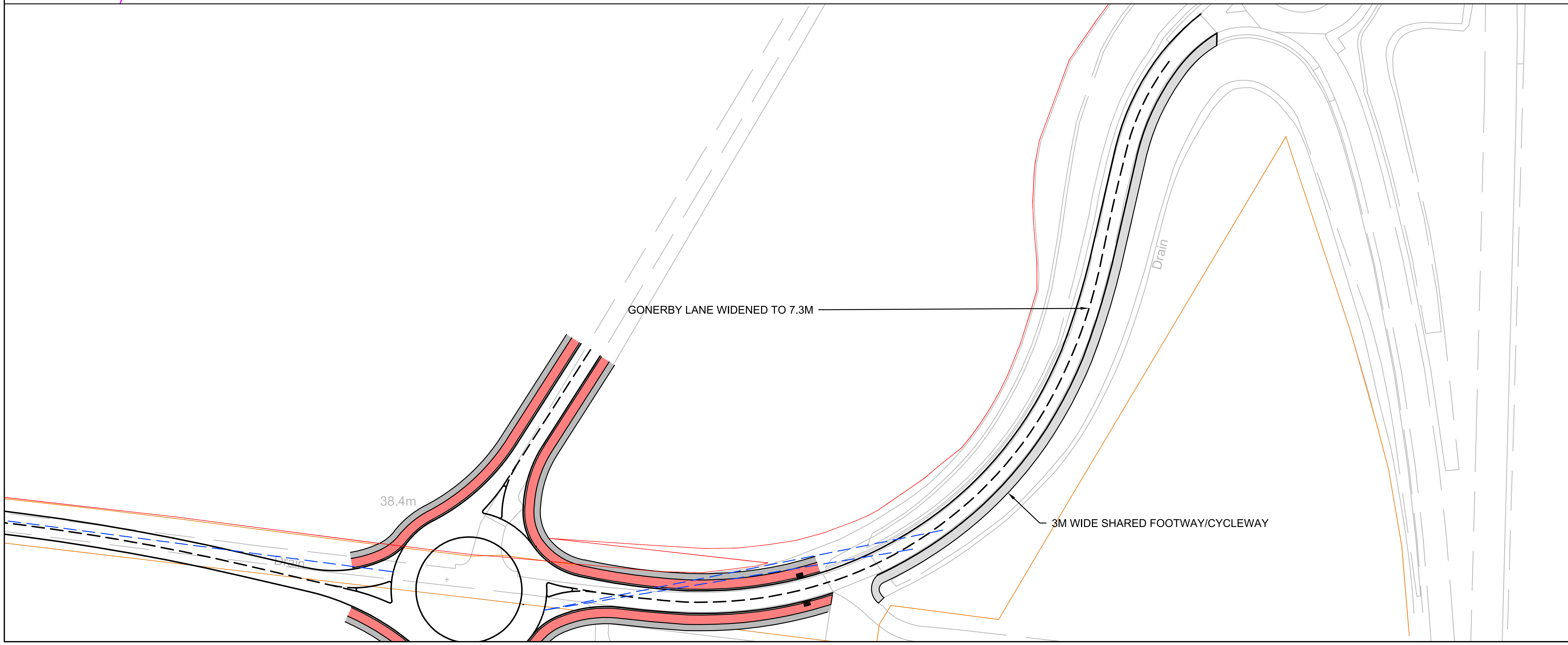
6.9 Traffic counts were undertaken in November 2023 at the Gonerby Moor Interchange roundabouts. Currently, background traffic is relatively light, and the junctions operate with ample spare capacity. The new SKDC local plan would run until 2041, and so 2041 has been used as a future year from which to model the impact of the combined development sites traffic.

6.10 The impact of the proposed development has been modelled at both A1 interchange roundabouts, as well as at the proposed site access roundabout to ensure it can accommodate both sites. The modelling shows that when assessed with the land use split described above, the roundabouts would continue to operate with a spare capacity in the future assessment year, with both developments in place.

6.11 Overall, safe and suitable access can be provided for all highway users. The development would be deliverable in transport terms, and there is no reason to prevent its allocation on highways grounds.

DRAWINGS





Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Rev	Date	Description	Dr	Rev
P3	03/04/ 2024	Roundabout adjusted slightly to avoid 3rd party land	DH	TC
P3	20/03/ 2024	Roundabout relocated to reflect Harworth Layout - Test	DH	TC
P2	30/11/ 2023	Roundabout relocated to span both sites	DH	TC

Client:

Harworth Group & Caddick Land

Project:

Land at Gonerby Moor

Title:

Access Roundabout

ADC INFRASTRUCTURE

Drawn: DH
Reviewed: TC
Size: A2
Scale: 1:1000
Date: 15 / 08 / 2022
Status: PRELIMINARY ISSUE

Project Reference	Type	Number	Revision
ADC3032	DR	002	P4

TRAFFIC FLOW DIAGRAMS

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	105	233	338
B	235		24	0	259
C	101	0		8	109
D	0	0	0		0
Total	336	0	129	241	706

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	104	207	311
B	212		24	0	236
C	99	0		7	106
D	0	0	0		0
Total	311	0	128	214	653

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	1%	11%
B	10%		0%	0%
C	2%	0%		13%
D	0%	0%	0%	

Junction 2 HGV

Frm/To	A	B	C	D	Total
A		0	1	26	27
B	23		0	0	23
C	2	0		1	3
D	0	0	0		0
Total	25	0	1	27	53

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A		222	271	0	493
B	0		0	0	0
C	274	71		0	345
D	286	29	49		364
Total	560	322	320	0	1202

Junction 3 Light Vehicles

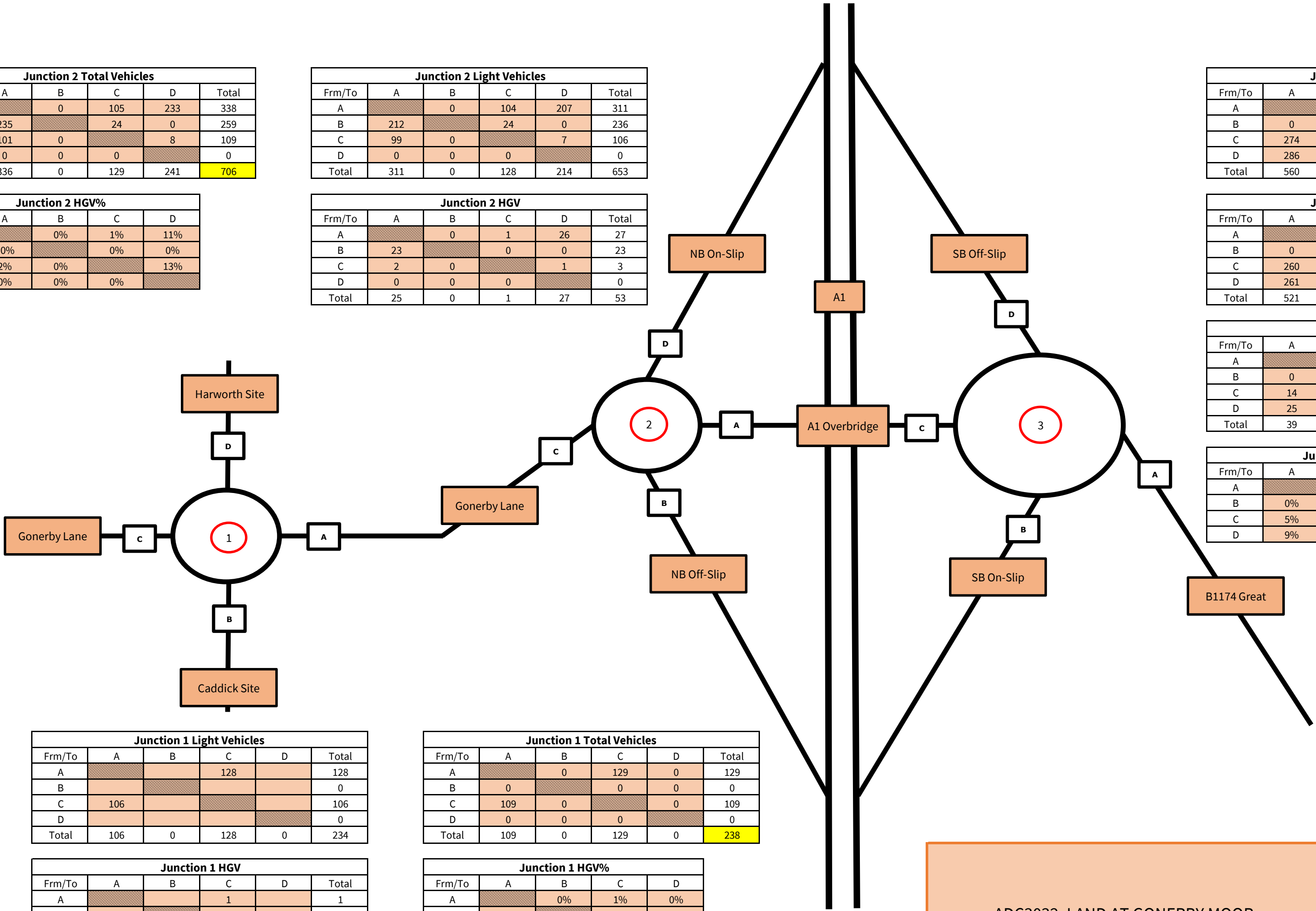
Frm/To	A	B	C	D	Total
A		187	248	0	435
B	0		0	0	0
C	260	55		0	315
D	261	22	46		329
Total	521	264	294	0	1079

Junction 3 HGV

Frm/To	A	B	C	D	Total
A		35	23	0	58
B	0		0	0	0
C	14	16		0	30
D	25	7	3		35
Total	39	58	26	0	123

Junction 3 HGV%

Frm/To	A	B	C	D
A		16%	8%	0%
B	0%		0%	0%
C	5%	23%		0%
D	9%	24%	6%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A			128		128
B					0
C	106				106
D					0
Total	106	0	128	0	234

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	129	0	129
B	0		0	0	0
C	109	0		0	109
D	0	0	0		0
Total	109	0	129	0	238

Junction 1 HGV

Frm/To	A	B	C	D	Total
A			1		1
B					0
C	3				3
D					0
Total	3	0	1	0	4

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	3%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

Diagram 1: 2023 Observed AM Peak

Junction 2 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	86	325	411
B	192		13	4	209
C	121	0		8	129
D	0	0	0		0
Total	313	0	99	337	749

Junction 2 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	85	315	400
B	172		13	3	188
C	121	0		8	129
D	0	0	0		0
Total	293	0	98	326	717

Junction 2 HGV%				
Frm/To	A	B	C	D
A		0%	1%	3%
B	10%		0%	25%
C	0%	0%		0%
D	0%	0%	0%	

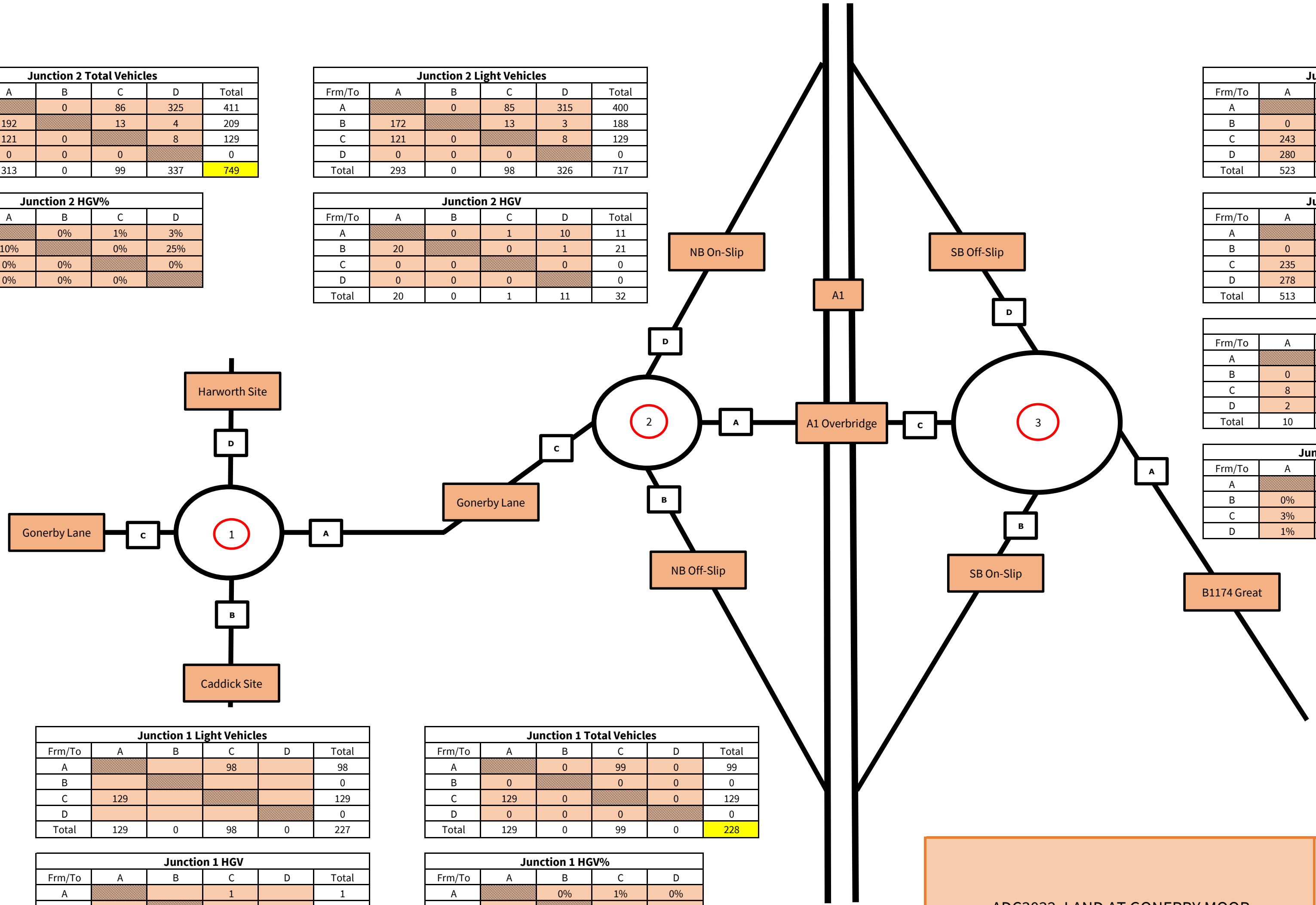
Junction 2 HGV					
Frm/To	A	B	C	D	Total
A		0	1	10	11
B	20		0	1	21
C	0	0		0	0
D	0	0	0		0
Total	20	0	1	11	32

Junction 3 Total Vehicles					
Frm/To	A	B	C	D	Total
A		216	351	0	567
B	0		0	0	0
C	243	72		0	315
D	280	28	56		364
Total	523	316	407	0	1246

Junction 3 Light Vehicles					
Frm/To	A	B	C	D	Total
A		199	339	0	538
B	0		0	0	0
C	235	64		0	299
D	278	21	54		353
Total	513	284	393	0	1190

Junction 3 HGV					
Frm/To	A	B	C	D	Total
A		17	12	0	29
B	0		0	0	0
C	8	8		0	16
D	2	7	2		11
Total	10	32	14	0	56

Junction 3 HGV%				
Frm/To	A	B	C	D
A		8%	3%	0%
B	0%		0%	0%
C	3%	11%		0%
D	1%	25%	4%	



Junction 1 Light Vehicles					
Frm/To	A	B	C	D	Total
A			98		98
B					0
C	129				129
D					0
Total	129	0	98	0	227

Junction 1 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	99	0	99
B	0		0	0	0
C	129	0		0	129
D	0	0	0		0
Total	129	0	99	0	228

Junction 1 HGV					
Frm/To	A	B	C	D	Total
A			1		1
B					0
C	0				0
D					0
Total	0	0	1	0	1

Junction 1 HGV%				
Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	0%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

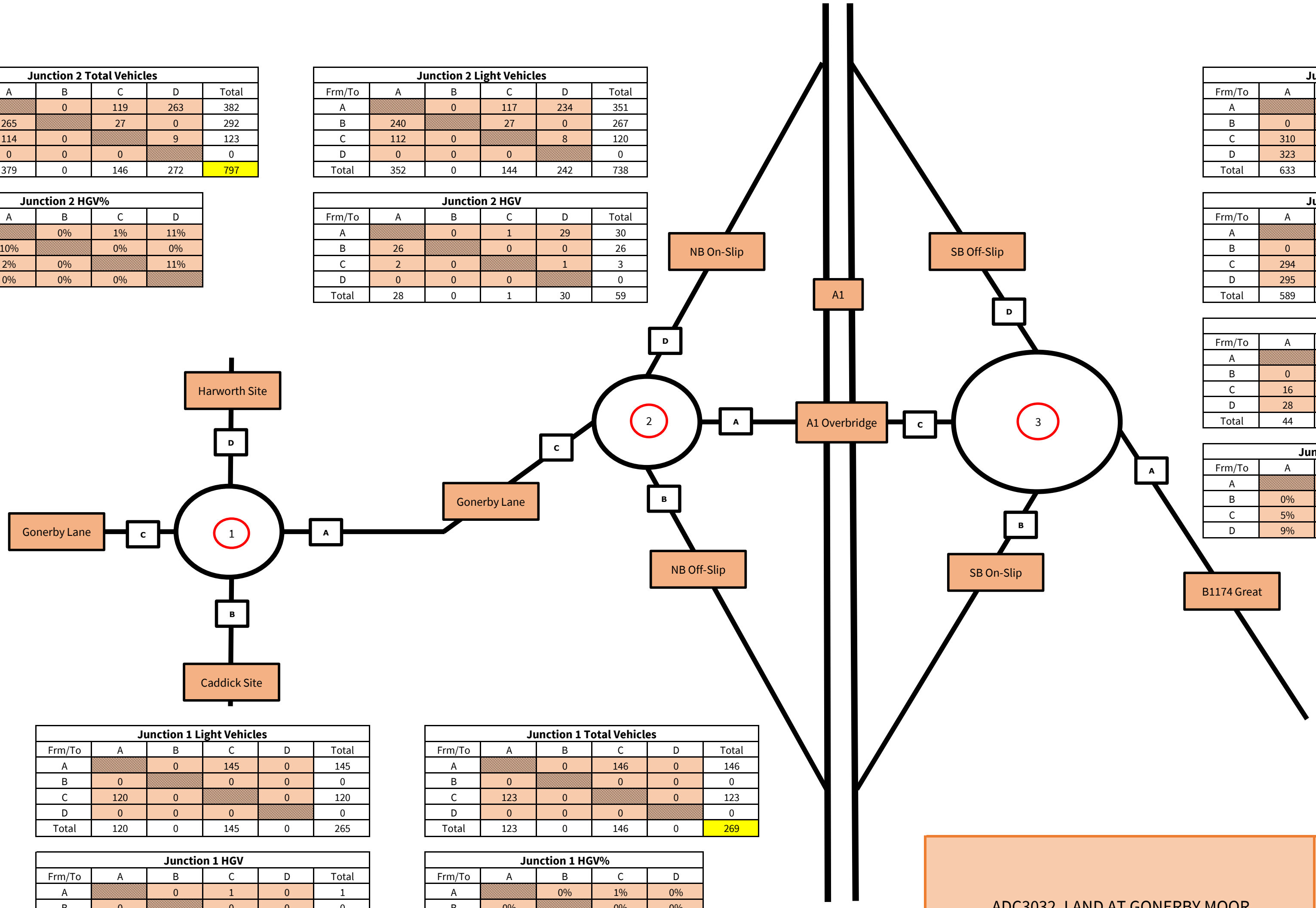
Diagram 2: 2023 Observed PM Peak

Junction 2 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	119	263	382
B	265		27	0	292
C	114	0		9	123
D	0	0	0		0
Total	379	0	146	272	797

Junction 2 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	117	234	351
B	240		27	0	267
C	112	0		8	120
D	0	0	0		0
Total	352	0	144	242	738

Junction 2 HGV%				
Frm/To	A	B	C	D
A		0%	1%	11%
B	10%		0%	0%
C	2%	0%		11%
D	0%	0%	0%	

Junction 2 HGV					
Frm/To	A	B	C	D	Total
A		0	1	29	30
B	26		0	0	26
C	2	0		1	3
D	0	0	0		0
Total	28	0	1	30	59



Junction 3 Total Vehicles					
Frm/To	A	B	C	D	Total
A		251	306	0	557
B	0		0	0	0
C	310	80		0	390
D	323	33	55		411
Total	633	364	361	0	1358

Junction 3 Light Vehicles					
Frm/To	A	B	C	D	Total
A		211	280	0	491
B	0		0	0	0
C	294	62		0	356
D	295	25	52		372
Total	589	298	332	0	1219

Junction 3 HGV					
Frm/To	A	B	C	D	Total
A		40	26	0	66
B	0		0	0	0
C	16	18		0	34
D	28	8	3		39
Total	44	66	29	0	139

Junction 3 HGV%				
Frm/To	A	B	C	D
A		16%	8%	0%
B	0%		0%	0%
C	5%	23%		0%
D	9%	24%	5%	

Junction 1 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	145	0	145
B	0		0	0	0
C	120	0		0	120
D	0	0	0		0
Total	120	0	145	0	265

Junction 1 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	146	0	146
B	0		0	0	0
C	123	0		0	123
D	0	0	0		0
Total	123	0	146	0	269

Junction 1 HGV					
Frm/To	A	B	C	D	Total
A		0	1	0	1
B	0		0	0	0
C	3	0		0	3
D	0	0	0		0
Total	3	0	1	0	4

Junction 1 HGV%				
Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	2%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

Diagram 3: 2041 Base AM Peak

Junction 2 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	97	368	465
B	218		15	5	238
C	137	0		9	146
D	0	0	0		0
Total	355	0	112	382	849

Junction 2 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	96	357	453
B	195		15	3	213
C	137	0		9	146
D	0	0	0		0
Total	332	0	111	369	812

Junction 3 Total Vehicles					
Frm/To	A	B	C	D	Total
A		245	398	0	643
B	0		0	0	0
C	275	82		0	357
D	317	32	63		412
Total	592	359	461	0	1412

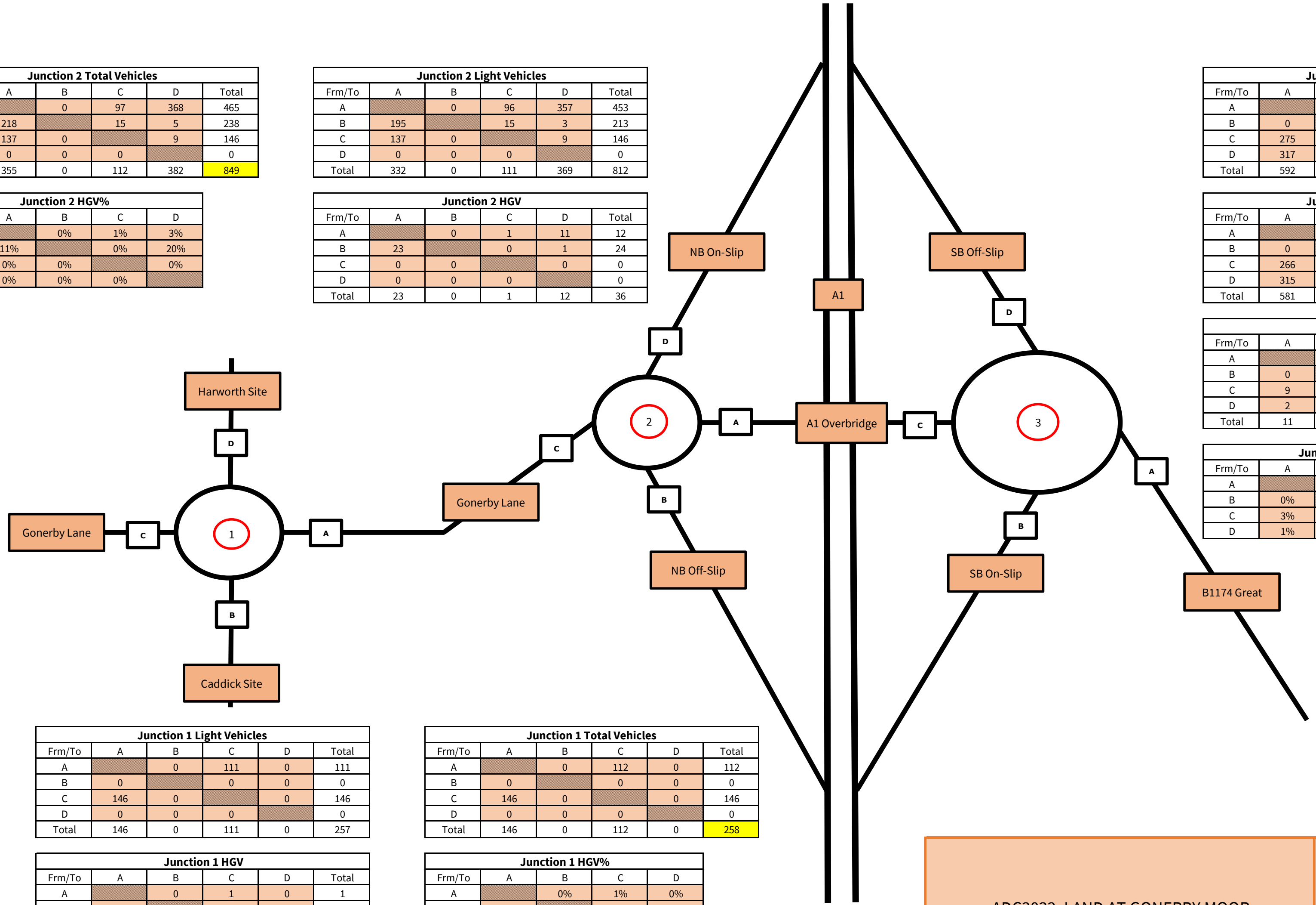
Junction 2 HGV%				
Frm/To	A	B	C	D
A		0%	1%	3%
B	11%		0%	20%
C	0%	0%		0%
D	0%	0%	0%	

Junction 2 HGV					
Frm/To	A	B	C	D	Total
A		0	1	11	12
B	23		0	1	24
C	0	0		0	0
D	0	0	0		0
Total	23	0	1	12	36

Junction 3 Light Vehicles					
Frm/To	A	B	C	D	Total
A		226	384	0	610
B	0		0	0	0
C	266	73		0	339
D	315	24	61		400
Total	581	323	445	0	1349

Junction 3 HGV					
Frm/To	A	B	C	D	Total
A		19	14	0	33
B	0		0	0	0
C	9	9		0	18
D	2	8	2		12
Total	11	36	16	0	63

Junction 3 HGV%				
Frm/To	A	B	C	D
A		8%	4%	0%
B	0%		0%	0%
C	3%	11%		0%
D	1%	25%	3%	



Junction 1 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	111	0	111
B	0		0	0	0
C	146	0		0	146
D	0	0	0		0
Total	146	0	111	0	257

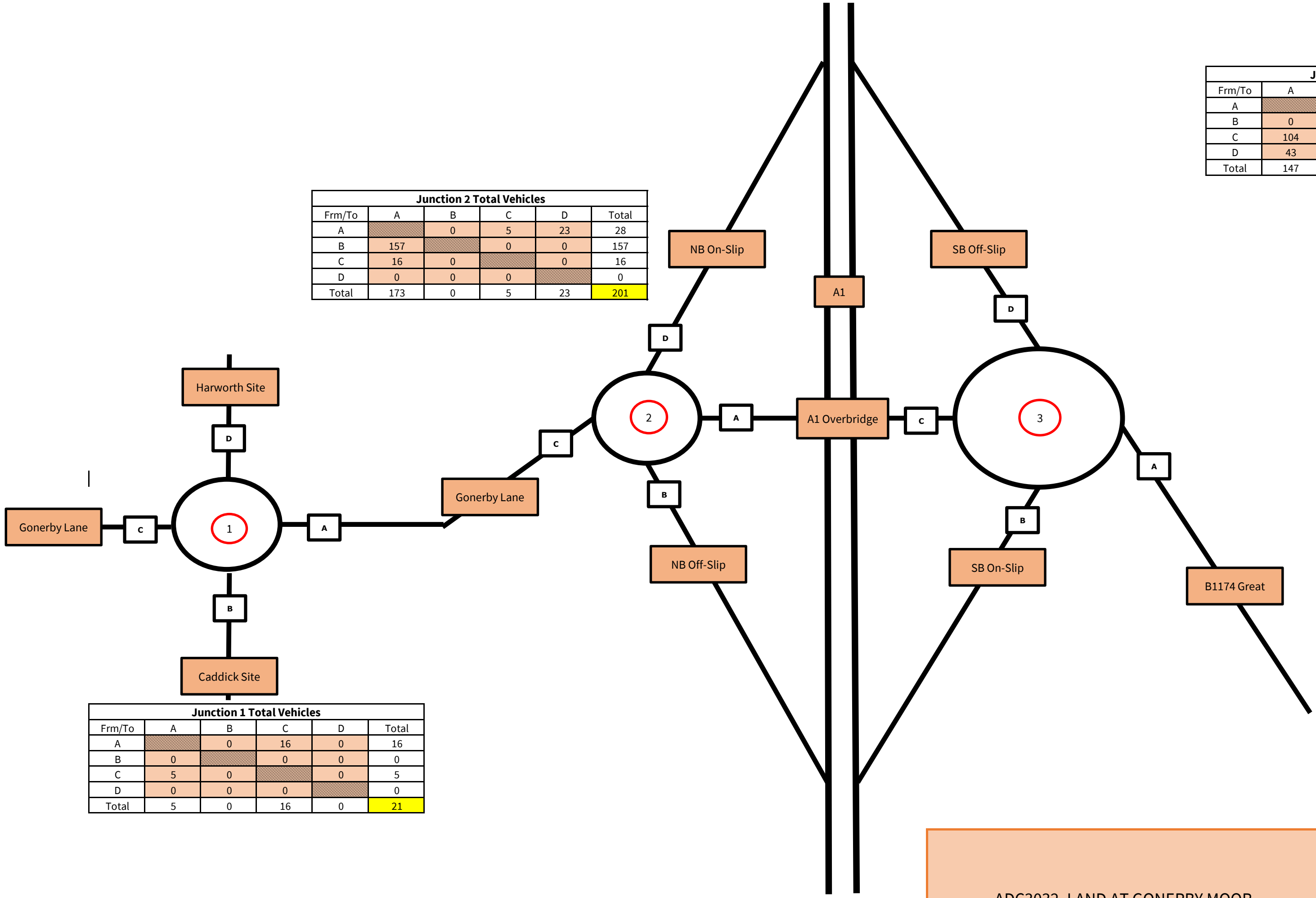
Junction 1 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	112	0	112
B	0		0	0	0
C	146	0		0	146
D	0	0	0		0
Total	146	0	112	0	258

Junction 1 HGV					
Frm/To	A	B	C	D	Total
A		0	1	0	1
B	0		0	0	0
C	0	0		0	0
D	0	0	0		0
Total	0	0	1	0	1

Junction 1 HGV%				
Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	0%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

Diagram 4: 2041 Base PM Peak



Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	16	0	16
B	0		0	0	0
C	5	0		0	5
D	0	0	0		0
Total	5	0	16	0	21

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	5	23	28
B	157		0	0	157
C	16	0		0	16
D	0	0	0		0
Total	173	0	5	23	201

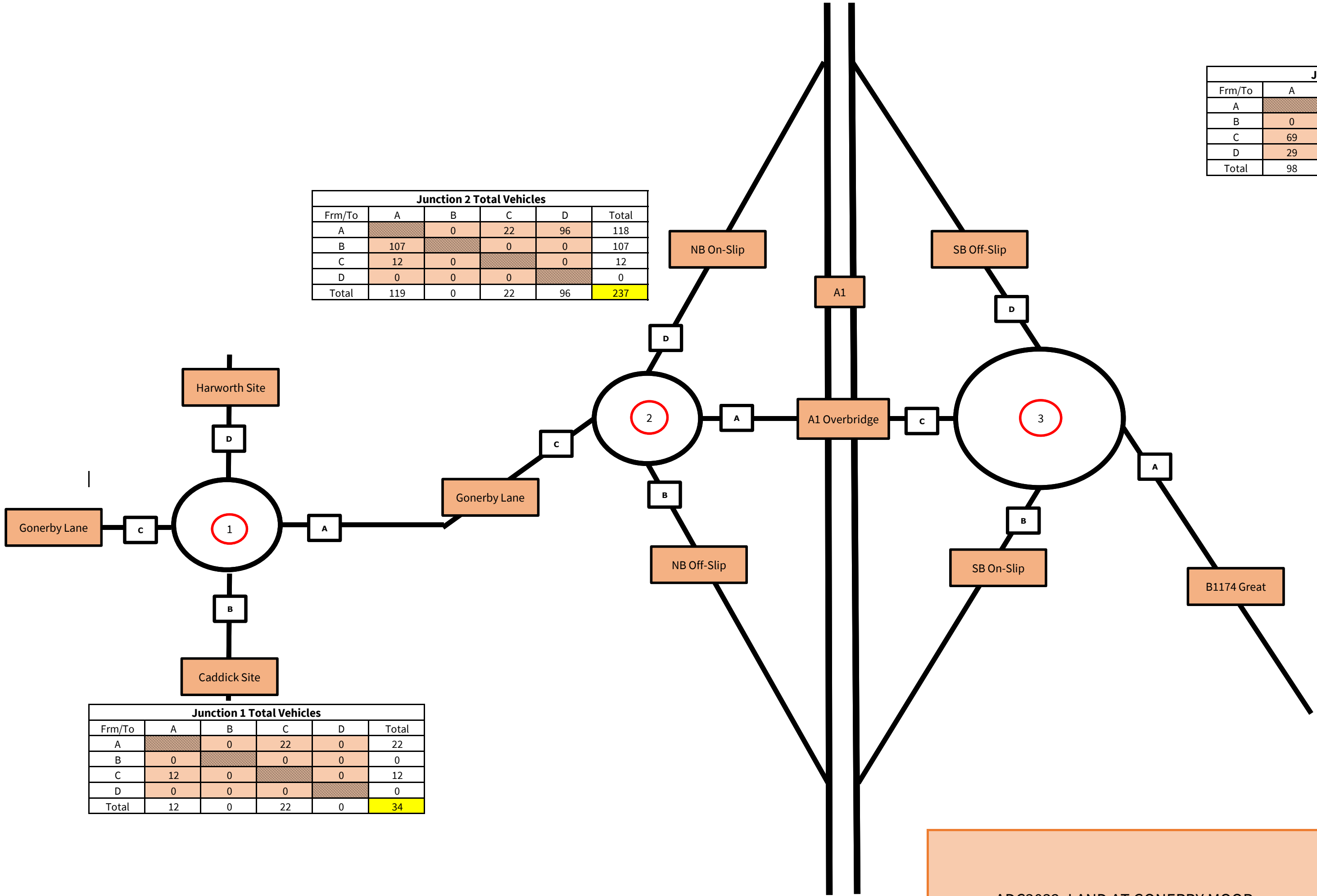
Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A		47	28	0	75
B	0		0	0	0
C	104	69		0	173
D	43	29	0		72
Total	147	145	28	0	320

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 5: COMMITTED DEVELOPMENT FLOWS. DOWNTOWN SHOPPING VILLAGE S17/2155. AM PEAK HOUR



Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A		199	119	0	318
B	0		0	0	0
C	69	50		0	119
D	29	23	0		52
Total	98	272	119	0	489

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	22	96	118
B	107		0	0	107
C	12	0		0	12
D	0	0	0		0
Total	119	0	22	96	237

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	22	0	22
B	0		0	0	0
C	12	0		0	12
D	0	0	0		0
Total	12	0	22	0	34

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 6: COMMITTED DEVELOPMENT FLOWS. DOWNTOWN SHOPPING VILLAGE S17/2155. PM PEAK HOUR

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	123	286	409
B	423		27	0	450
C	130	0		9	139
D	0	0	0		0
Total	553	0	150	295	998

Junction 2 HGV%

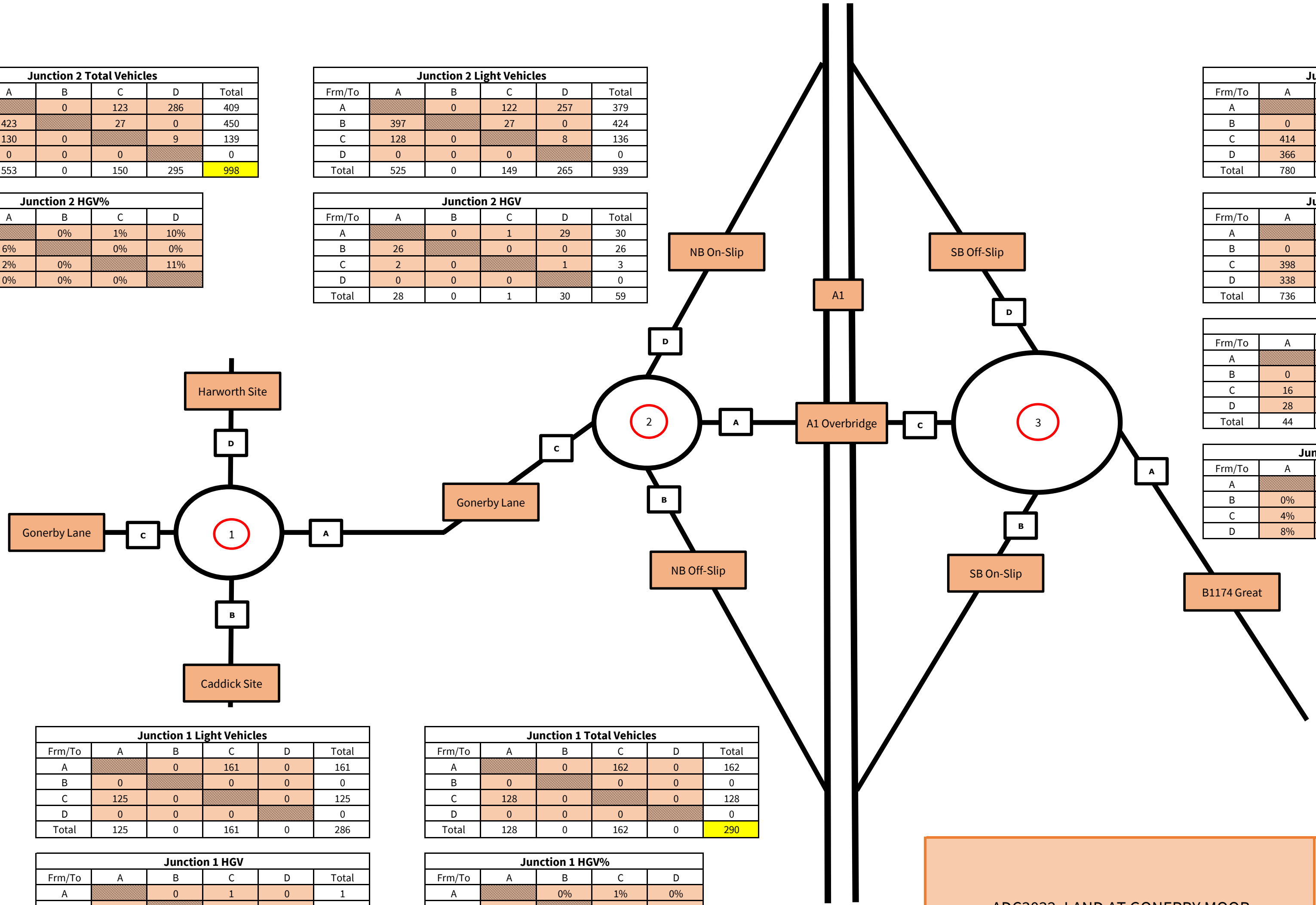
Frm/To	A	B	C	D
A		0%	1%	10%
B	6%		0%	0%
C	2%	0%		11%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	122	257	379
B	397		27	0	424
C	128	0		8	136
D	0	0	0		0
Total	525	0	149	265	939

Junction 2 HGV

Frm/To	A	B	C	D	Total
A		0	1	29	30
B	26		0	0	26
C	2	0		1	3
D	0	0	0		0
Total	28	0	1	30	59



Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A		298	334	0	632
B	0		0	0	0
C	414	149		0	563
D	366	62	55		483
Total	780	509	389	0	1678

Junction 3 Light Vehicles

Frm/To	A	B	C	D	Total
A		258	308	0	566
B	0		0	0	0
C	398	131		0	529
D	338	54	52		444
Total	736	443	360	0	1539

Junction 3 HGV

Frm/To	A	B	C	D	Total
A		40	26	0	66
B	0		0	0	0
C	16	18		0	34
D	28	8	3		39
Total	44	66	29	0	139

Junction 3 HGV%

Frm/To	A	B	C	D
A		13%	8%	0%
B	0%		0%	0%
C	4%	12%		0%
D	8%	13%	5%	

Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	161	0	161
B	0		0	0	0
C	125	0		0	125
D	0	0	0		0
Total	125	0	161	0	286

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	162	0	162
B	0		0	0	0
C	128	0		0	128
D	0	0	0		0
Total	128	0	162	0	290

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		0	1	0	1
B	0		0	0	0
C	3	0		0	3
D	0	0	0		0
Total	3	0	1	0	4

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	2%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

DIAGRAM 7: 2041 BACKGROUND AM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	119	464	583
B	325		15	4	344
C	149	0		9	158
D	0	0	0		0
Total	474	0	134	477	1085

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	1%	2%
B	7%		0%	25%
C	0%	0%		0%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	118	453	571
B	302		15	3	320
C	149	0		9	158
D	0	0	0		0
Total	451	0	133	465	1049

Junction 2 HGV

Frm/To	A	B	C	D	Total
A		0	1	11	12
B	23		0	1	24
C	0	0		0	0
D	0	0	0		0
Total	23	0	1	12	36

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A		444	517	0	961
B	0		0	0	0
C	344	132		0	476
D	346	55	63		464
Total	690	631	580	0	1901

Junction 3 Light Vehicles

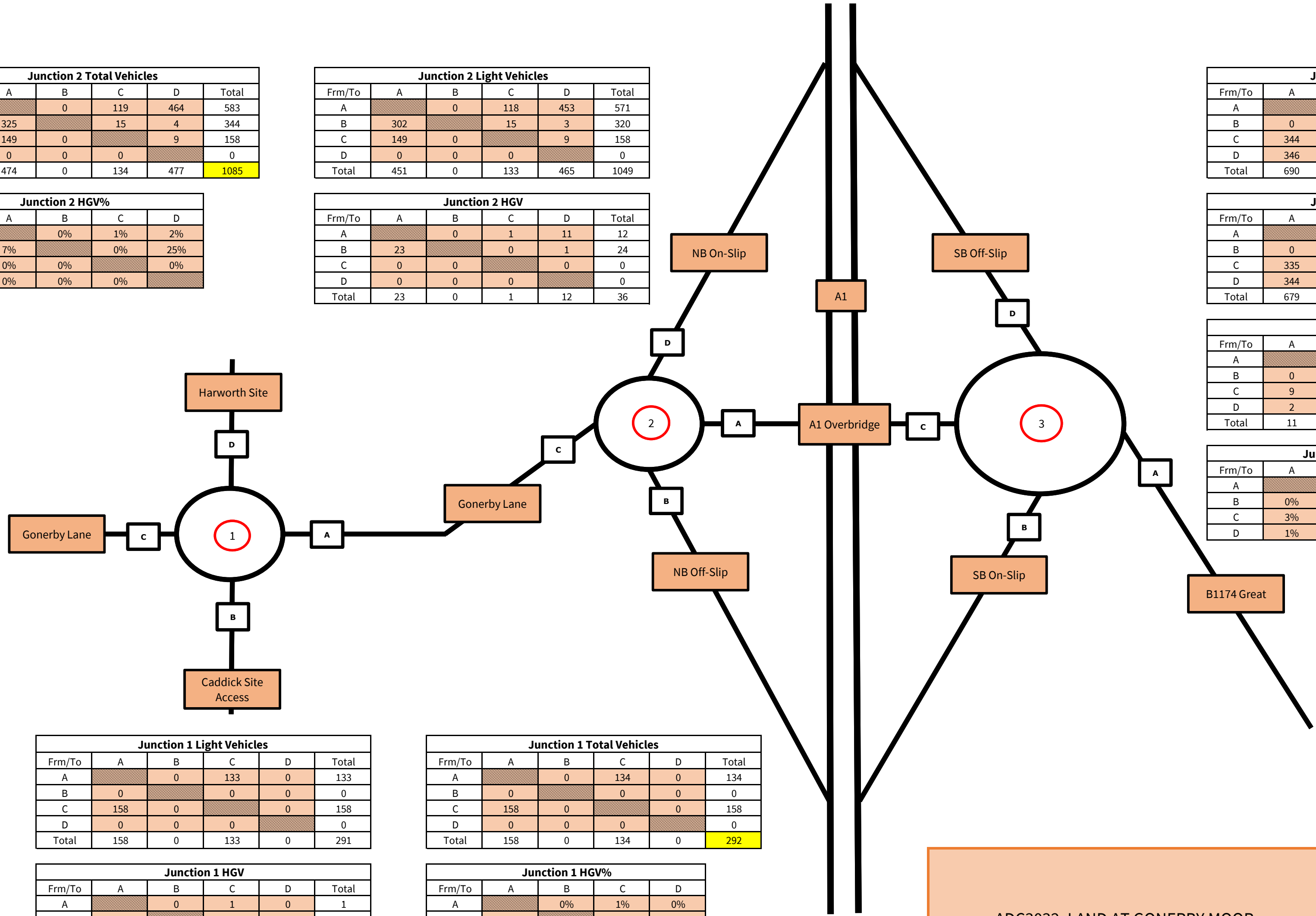
Frm/To	A	B	C	D	Total
A		425	503	0	928
B	0		0	0	0
C	335	123		0	458
D	344	47	61		452
Total	679	595	564	0	1838

Junction 3 HGV

Frm/To	A	B	C	D	Total
A		19	14	0	33
B	0		0	0	0
C	9	9		0	18
D	2	8	2		12
Total	11	36	16	0	63

Junction 3 HGV%

Frm/To	A	B	C	D
A		4%	3%	0%
B	0%		0%	0%
C	3%	7%		0%
D	1%	15%	3%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	133	0	133
B	0		0	0	0
C	158	0		0	158
D	0	0	0		0
Total	158	0	133	0	291

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	134	0	134
B	0		0	0	0
C	158	0		0	158
D	0	0	0		0
Total	158	0	134	0	292

Junction 1 HGV

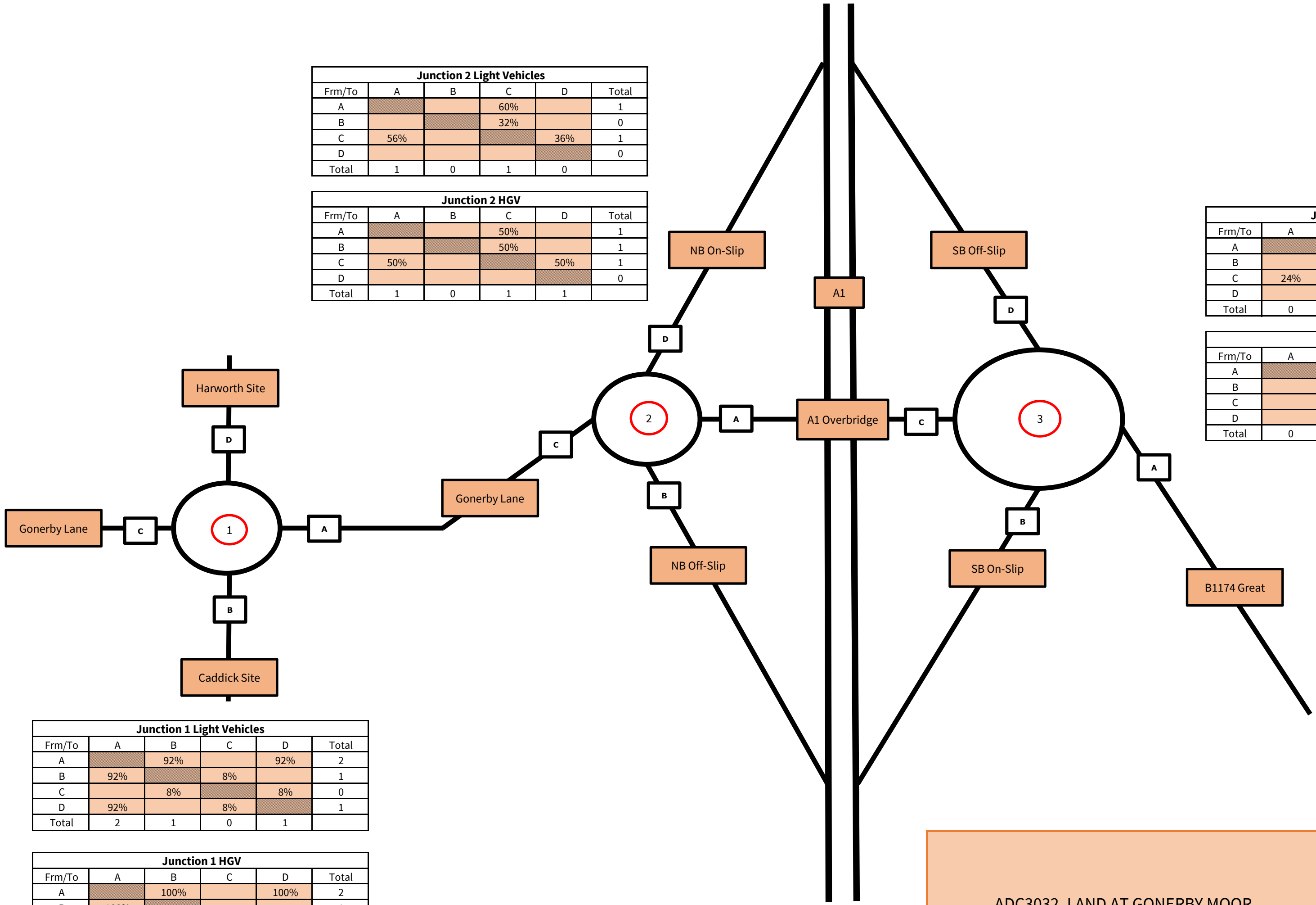
Frm/To	A	B	C	D	Total
A		0	1	0	1
B	0		0	0	0
C	0	0		0	0
D	0	0	0		0
Total	0	0	1	0	1

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	1%	0%
B	0%		0%	0%
C	0%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

DIAGRAM 8: 2041 BACKGROUND PM



Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			60%		1
B			32%		0
C	56%			36%	1
D					0
Total	1	0	1	0	

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			50%		1
B			50%		1
C	50%			50%	1
D					0
Total	1	0	1	1	

Junction 3 Light Vehicles

Frm/To	A	B	C	D	Total
A			24%		0
B					0
C	24%	32%			1
D			36%		0
Total	0	0	1	0	

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		50%			1
D			50%		1
Total	0	1	1	0	

Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		92%		92%	2
B	92%		8%		1
C		8%		8%	0
D	92%		8%		1
Total	2	1	0	1	

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		100%		100%	2
B	100%				1
C					0
D	100%				1
Total	2	1	0	1	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 9: TRIP DISTRIBUTION

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A			108		108
B			60		60
C	42			31	73
D					0
Total	42	0	168	31	241

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	5%	0%
B	0%		8%	0%
C	27%	0%		36%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			103		103
B			55		55
C	31			20	51
D					0
Total	31	0	158	20	209

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			5		5
B			5		5
C	11			11	22
D					0
Total	11	0	10	11	32

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A			41		41
B					0
C	13	29			42
D			67		67
Total	13	29	108	0	150

Junction 3 Light Vehicles

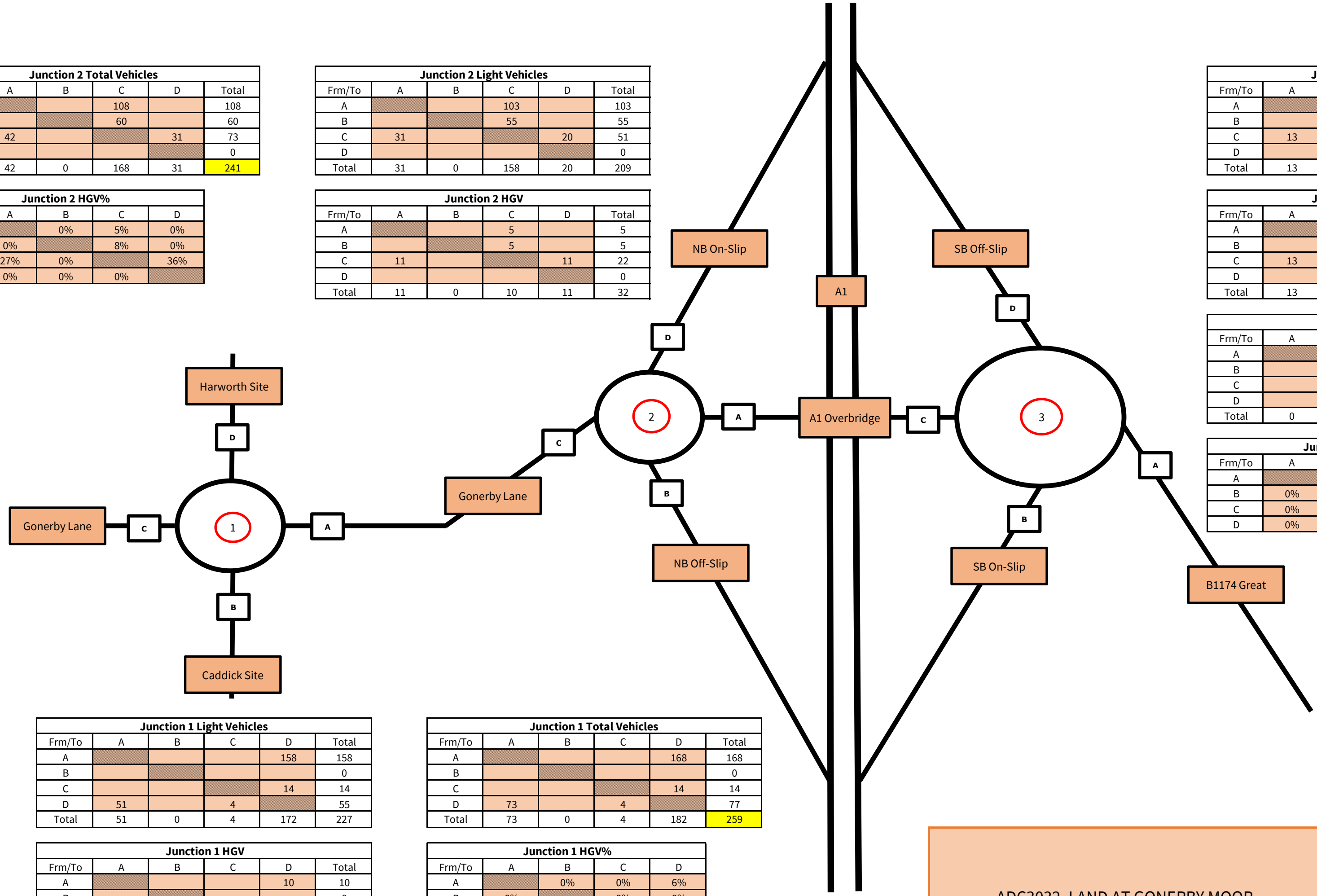
Frm/To	A	B	C	D	Total
A			41		41
B					0
C	13	18			31
D			62		62
Total	13	18	103	0	134

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		11			11
D			5		5
Total	0	11	5	0	16

Junction 3 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	39%		0%
D	0%	0%	7%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A				158	158
B					0
C				14	14
D	51		4		55
Total	51	0	4	172	227

Junction 1 HGV

Frm/To	A	B	C	D	Total
A				10	10
B					0
C					0
D	22				22
Total	22	0	0	10	32

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A				168	168
B					0
C				14	14
D	73		4		77
Total	73	0	4	182	259

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	0%	6%
B	0%		0%	0%
C	0%	0%		0%
D	31%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 10: HARWORTH TRAFFIC ASSIGNMENT AM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A			41		41
B			27		27
C	96			65	161
D					0
Total	96	0	68	65	228

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			30		30
B			16		16
C	87			56	142
D					0
Total	87	0	46	56	188

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	27%	0%
B	0%		40%	0%
C	10%	0%		14%
D	0%	0%	0%	

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			11		11
B			11		11
C	9			9	18
D					0
Total	9	0	22	9	40

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A			12		12
B					0
C	37	59			96
D			29		29
Total	37	59	41	0	137

Junction 3 Light Vehicles

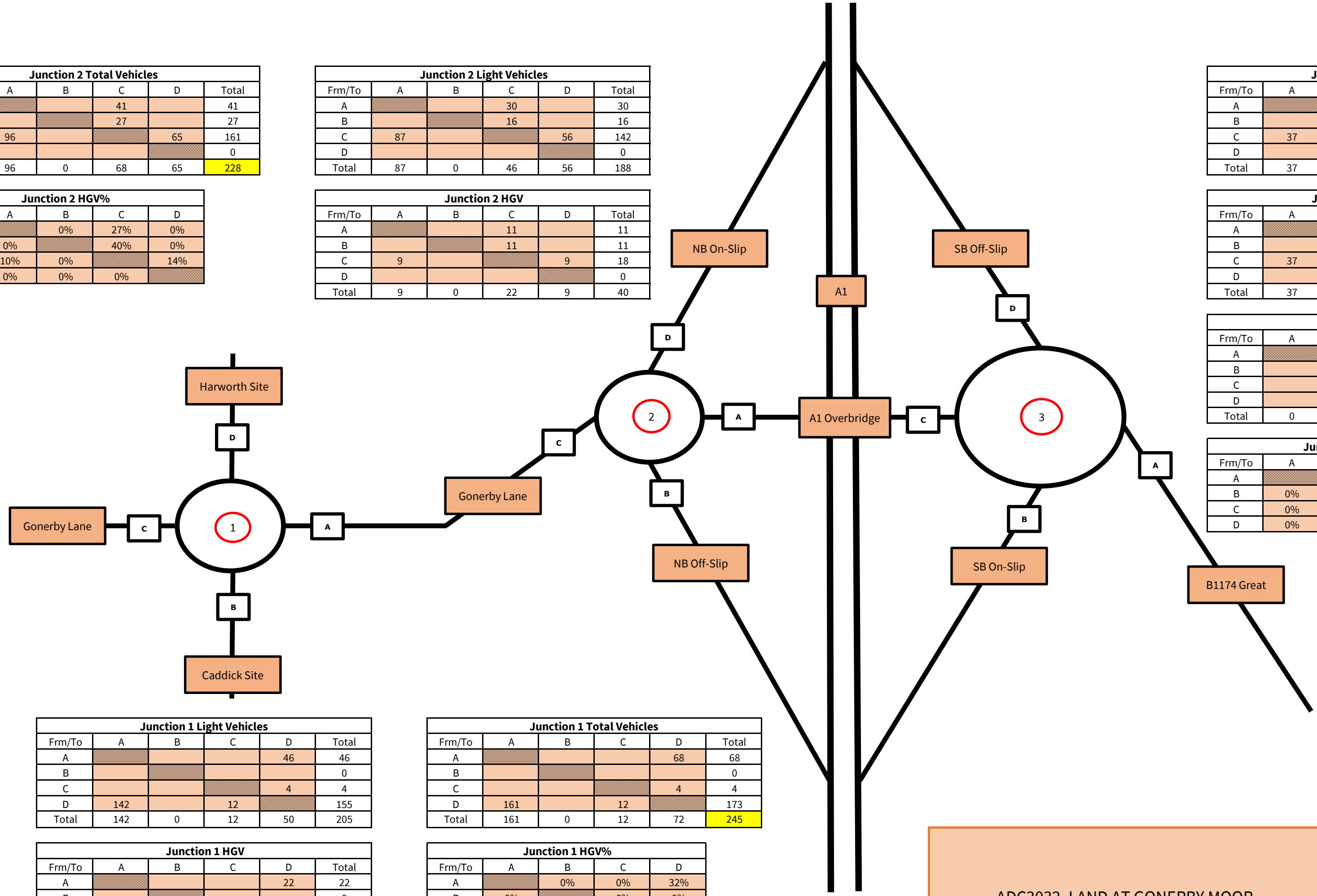
Frm/To	A	B	C	D	Total
A			12		12
B					0
C	37	50			87
D			18		18
Total	37	50	30	0	117

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		9			9
D			11		11
Total	0	9	11	0	20

Junction 3 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	16%		0%
D	0%	0%	38%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A				46	46
B					0
C				4	4
D	142		12		155
Total	142	0	12	50	205

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A				68	68
B					0
C				4	4
D	161		12		173
Total	161	0	12	72	245

Junction 1 HGV

Frm/To	A	B	C	D	Total
A				22	22
B					0
C					0
D	18				18
Total	18	0	0	22	40

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	0%	32%
B	0%		0%	0%
C	0%	0%		0%
D	11%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 11: HARWORTH TRAFFIC ASSIGNMENT PM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A			178		178
B			99		99
C	69			51	120
D					0
Total	69	0	277	51	396

Junction 2 HGV%

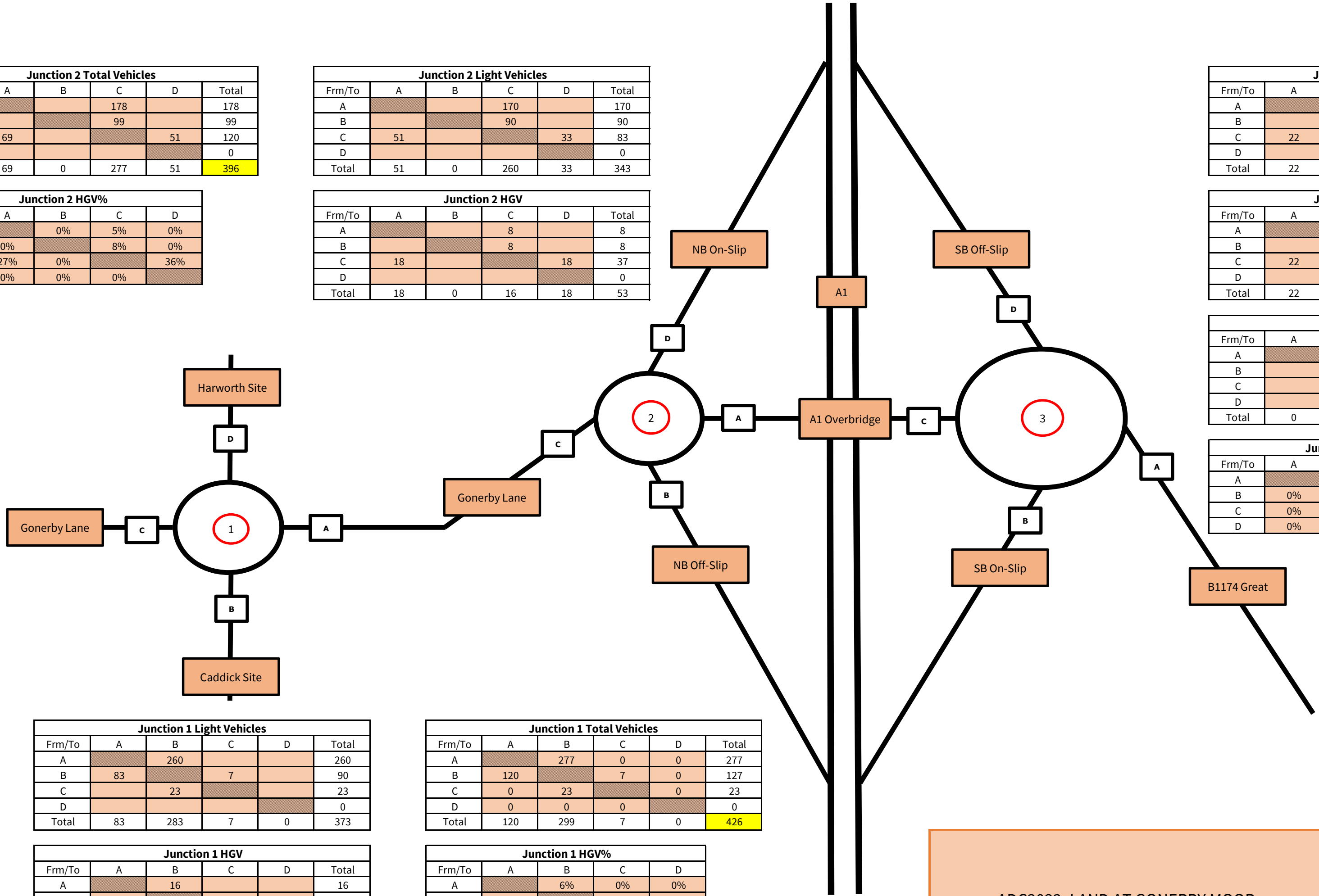
Frm/To	A	B	C	D
A		0%	5%	0%
B	0%		8%	0%
C	27%	0%		36%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			170		170
B			90		90
C	51			33	83
D					0
Total	51	0	260	33	343

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			8		8
B			8		8
C	18			18	37
D					0
Total	18	0	16	18	53



Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A			68		68
B					0
C	22	47			69
D			110		110
Total	22	47	178	0	247

Junction 3 Light Vehicles

Frm/To	A	B	C	D	Total
A			68		68
B					0
C	22	29			51
D			102		102
Total	22	29	170	0	220

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		18			18
D			8		8
Total	0	18	8	0	27

Junction 3 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	39%		0%
D	0%	0%	7%	

Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		260			260
B	83		7		90
C		23			23
D					0
Total	83	283	7	0	373

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		16			16
B	37				37
C					0
D					0
Total	37	16	0	0	53

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		277	0	0	277
B	120		7	0	127
C	0	23		0	23
D	0	0	0		0
Total	120	299	7	0	426

Junction 1 HGV%

Frm/To	A	B	C	D
A		6%	0%	0%
B	31%		0%	0%
C	0%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 12: CADDICK TRAFFIC ASSIGNMENT AM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A			67		67
B			44		44
C	157			106	264
D					0
Total	157	0	111	106	375

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	27%	0%
B	0%		40%	0%
C	10%	0%		14%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			49		49
B			26		26
C	142			92	234
D					0
Total	142	0	76	92	310

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			18		18
B			18		18
C	15			15	30
D					0
Total	15	0	36	15	66

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A			20		20
B					0
C	61	96			157
D			48		48
Total	61	96	67	0	225

Junction 3 Light Vehicles

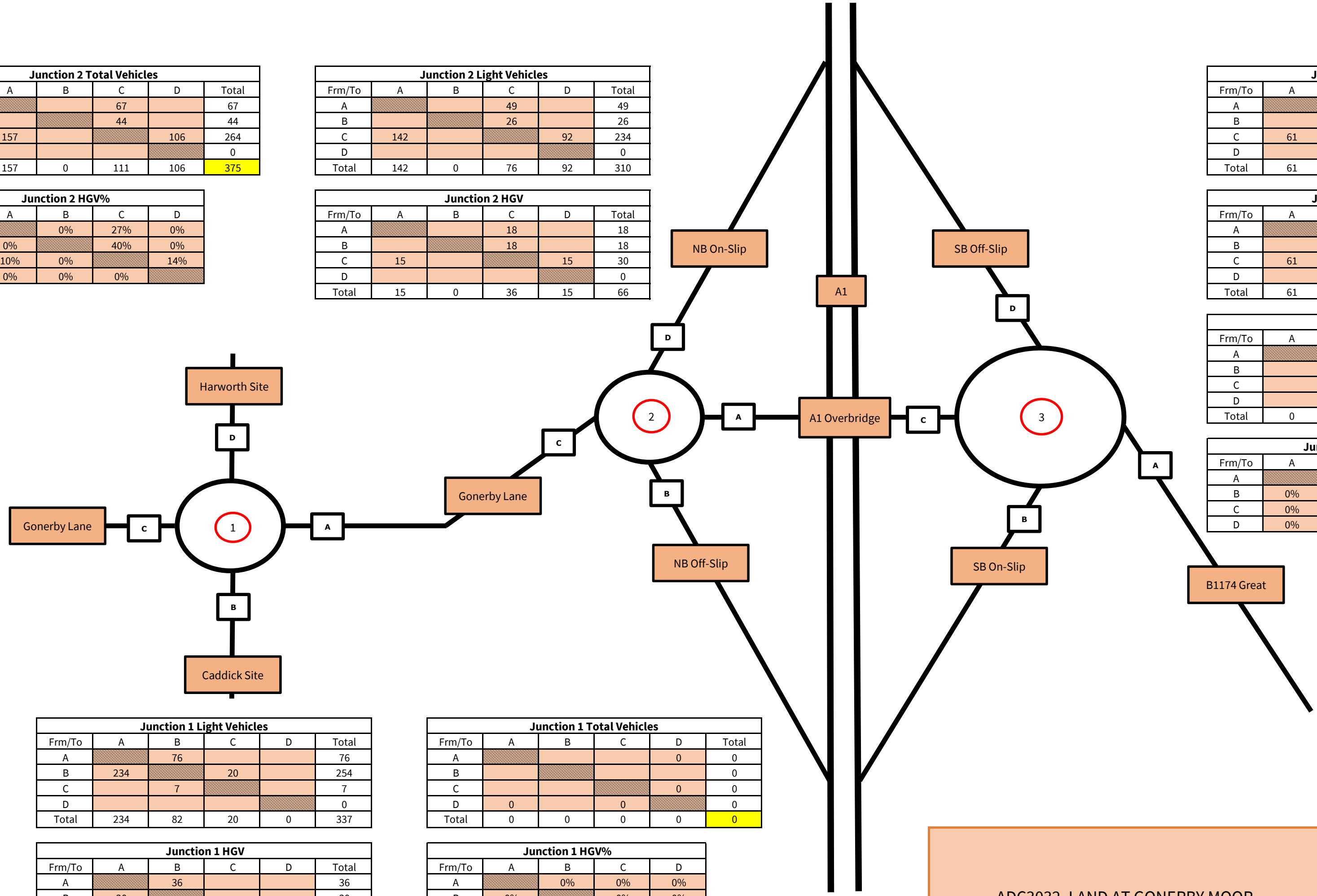
Frm/To	A	B	C	D	Total
A			20		20
B					0
C	61	81			142
D			30		30
Total	61	81	49	0	192

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		15			15
D			18		18
Total	0	15	18	0	33

Junction 3 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	16%		0%
D	0%	0%	38%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		76			76
B	234		20		254
C		7			7
D					0
Total	234	82	20	0	337

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A				0	0
B					0
C				0	0
D	0		0		0
Total	0	0	0	0	0

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		36			36
B	30				30
C					0
D					0
Total	30	36	0	0	66

Junction 1 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	0%		0%
D	0%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

DIAGRAM 13: CADDICK TRAFFIC ASSIGNMENT PM

Junction 2 Total Vehicles					
Frm/To	A	B	C	D	Total
A			286		286
B			159		159
C	111			82	193
D					0
Total	111	0	445	82	638

Junction 2 Light Vehicles					
Frm/To	A	B	C	D	Total
A			273		273
B			146		146
C	81			52	134
D					0
Total	81	0	418	52	552

Junction 2 HGV%				
Frm/To	A	B	C	D
A		0%	5%	0%
B	0%		8%	0%
C	27%	0%		36%
D	0%	0%	0%	

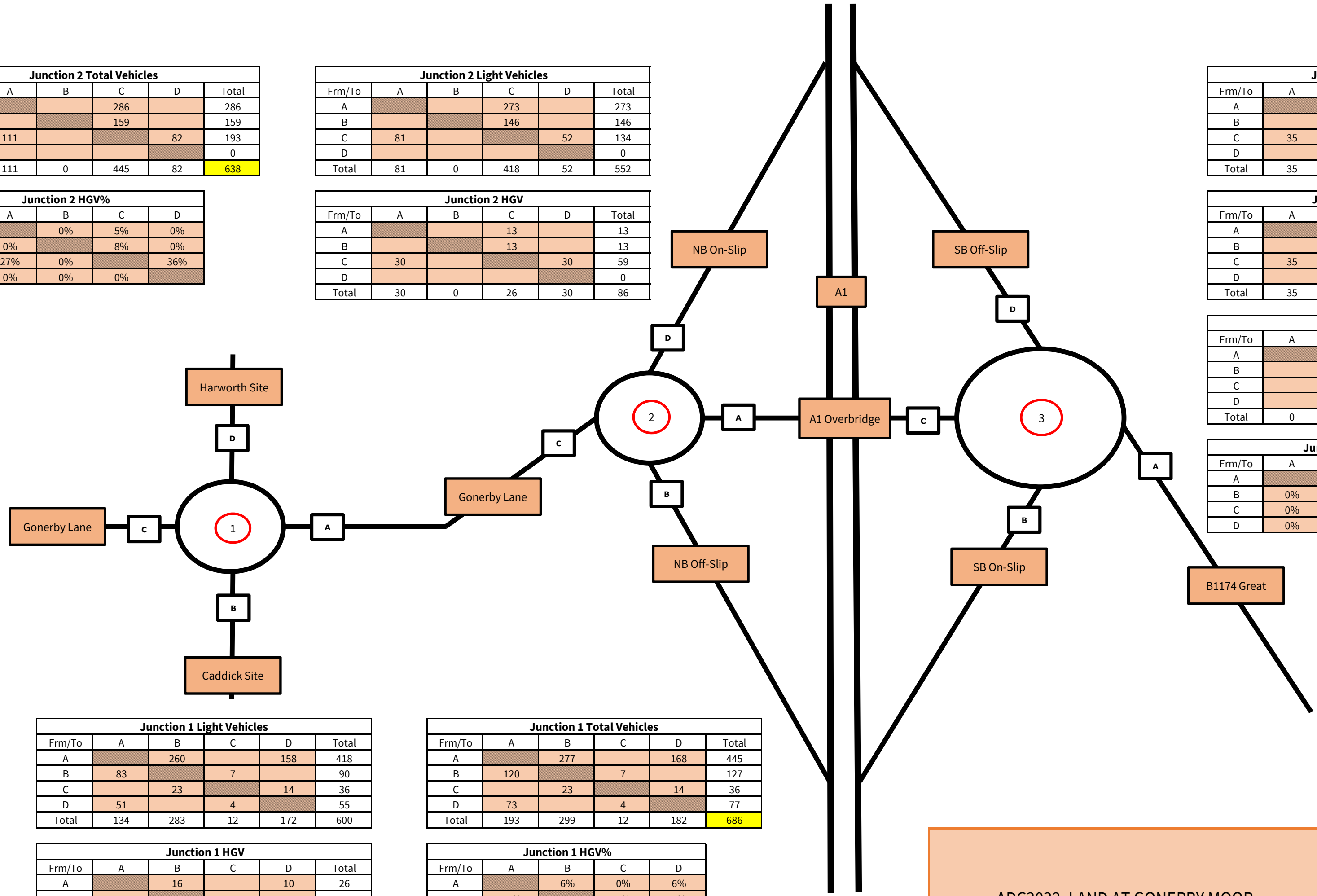
Junction 2 HGV					
Frm/To	A	B	C	D	Total
A			13		13
B			13		13
C	30			30	59
D					0
Total	30	0	26	30	86

Junction 3 Total Vehicles					
Frm/To	A	B	C	D	Total
A			109		109
B					0
C	35	76			111
D			177		177
Total	35	76	286	0	397

Junction 3 Light Vehicles					
Frm/To	A	B	C	D	Total
A			109		109
B					0
C	35	46			81
D			164		164
Total	35	46	273	0	354

Junction 3 HGV					
Frm/To	A	B	C	D	Total
A					0
B					0
C		30			30
D			13		13
Total	0	30	13	0	43

Junction 3 HGV%				
Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	39%		0%
D	0%	0%	7%	



Junction 1 Light Vehicles					
Frm/To	A	B	C	D	Total
A		260		158	418
B	83		7		90
C		23		14	36
D	51		4		55
Total	134	283	12	172	600

Junction 1 Total Vehicles					
Frm/To	A	B	C	D	Total
A		277		168	445
B	120		7		127
C		23		14	36
D	73		4		77
Total	193	299	12	182	686

Junction 1 HGV					
Frm/To	A	B	C	D	Total
A		16		10	26
B	37				37
C					0
D	22				22
Total	59	16	0	10	86

Junction 1 HGV%				
Frm/To	A	B	C	D
A		6%	0%	6%
B	31%		0%	0%
C	0%	0%		0%
D	31%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 14: COMBINED SITES TRAFFIC ASSIGNMENT AM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A			108		108
B			71		71
C	253			171	424
D					0
Total	253	0	179	171	604

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	27%	0%
B	0%		40%	0%
C	10%	0%		14%
D	0%	0%	0%	

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A			79		79
B			42		42
C	229			147	376
D					0
Total	229	0	122	147	498

Junction 2 HGV

Frm/To	A	B	C	D	Total
A			29		29
B			29		29
C	24			24	48
D					0
Total	24	0	58	24	106

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A			32		32
B					0
C	98	155			253
D			76		76
Total	98	155	108	0	361

Junction 3 Light Vehicles

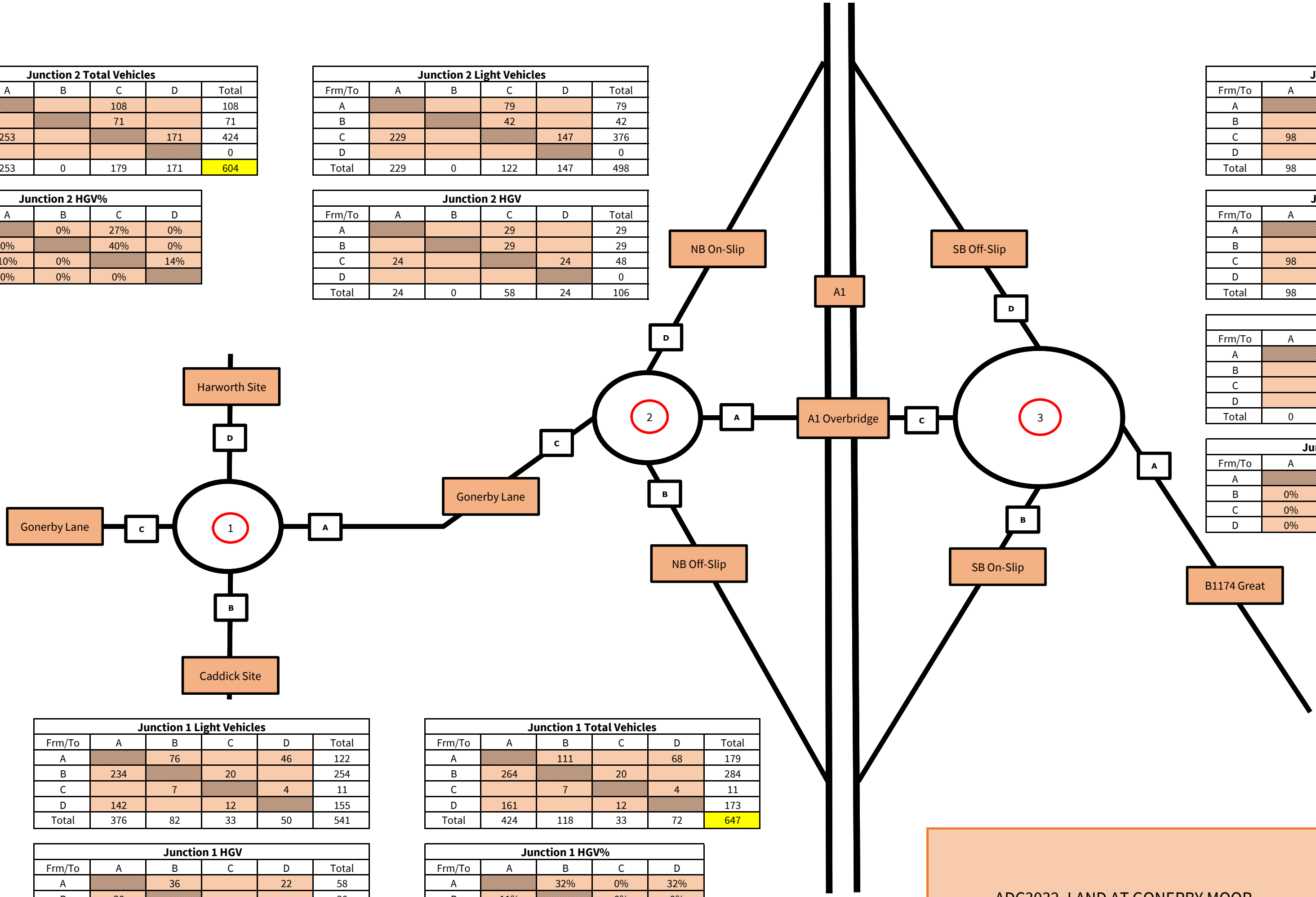
Frm/To	A	B	C	D	Total
A			32		32
B					0
C	98	131			229
D			48		48
Total	98	131	79	0	308

Junction 3 HGV

Frm/To	A	B	C	D	Total
A					0
B					0
C		24			24
D			29		29
Total	0	24	29	0	53

Junction 3 HGV%

Frm/To	A	B	C	D
A		0%	0%	0%
B	0%		0%	0%
C	0%	16%		0%
D	0%	0%	38%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		76		46	122
B	234		20		254
C		7		4	11
D	142		12		155
Total	376	82	33	50	541

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		36		22	58
B	30				30
C					0
D	18				18
Total	48	36	0	22	106

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		111		68	179
B	264		20		284
C		7		4	11
D	161		12		173
Total	424	118	33	72	647

Junction 1 HGV%

Frm/To	A	B	C	D
A		32%	0%	32%
B	11%		0%	0%
C	0%	0%		0%
D	11%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 15: COMBINED SITES TRAFFIC ASSIGNMENT PM

Junction 2 Total Vehicles

Frm/To	A	B	C	D	Total
A		0	409	286	695
B	423		186	0	609
C	241	0		91	332
D	0	0	0		0
Total	664	0	595	377	1636

Junction 2 Light Vehicles

Frm/To	A	B	C	D	Total
A		0	395	257	652
B	397		173	0	570
C	209	0		60	270
D	0	0	0		0
Total	606	0	567	317	1491

Junction 2 HGV%

Frm/To	A	B	C	D
A		0%	3%	10%
B	6%		7%	0%
C	13%	0%		34%
D	0%	0%	0%	

Junction 2 HGV

Frm/To	A	B	C	D	Total
A		0	14	29	43
B	26		13	0	39
C	32	0		31	62
D	0	0	0		0
Total	58	0	27	60	145

Junction 3 Total Vehicles

Frm/To	A	B	C	D	Total
A	0	298	443	0	741
B	0		0	0	0
C	449	225		0	674
D	366	62	232		660
Total	815	585	675	0	2075

Junction 3 Light Vehicles

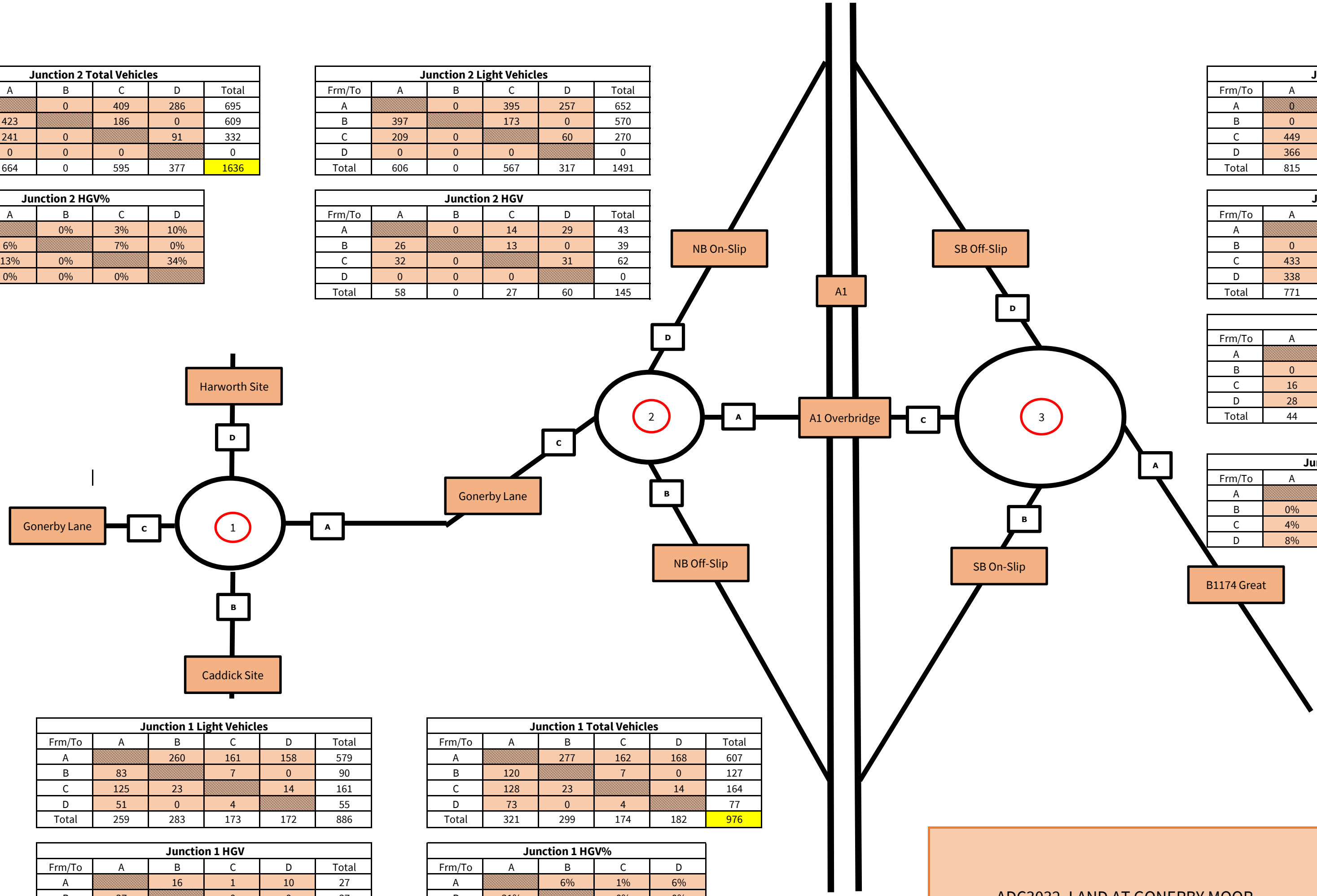
Frm/To	A	B	C	D	Total
A		258	417	0	675
B	0		0	0	0
C	433	177		0	610
D	338	54	216		608
Total	771	489	633	0	1893

Junction 3 HGV

Frm/To	A	B	C	D	Total
A		40	26	0	66
B	0		0	0	0
C	16	48		0	64
D	28	8	16		52
Total	44	96	42	0	182

Junction 3 HGV%

Frm/To	A	B	C	D
A		13%	6%	0%
B	0%		0%	0%
C	4%	21%		0%
D	8%	13%	7%	



Junction 1 Light Vehicles

Frm/To	A	B	C	D	Total
A		260	161	158	579
B	83		7	0	90
C	125	23		14	161
D	51	0	4		55
Total	259	283	173	172	886

Junction 1 Total Vehicles

Frm/To	A	B	C	D	Total
A		277	162	168	607
B	120		7	0	127
C	128	23		14	164
D	73	0	4		77
Total	321	299	174	182	976

Junction 1 HGV

Frm/To	A	B	C	D	Total
A		16	1	10	27
B	37		0	0	37
C	3	0		0	3
D	22	0	0		22
Total	62	16	1	10	90

Junction 1 HGV%

Frm/To	A	B	C	D
A		6%	1%	6%
B	31%		0%	0%
C	2%	0%		0%
D	31%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

DIAGRAM 16: 2041 WITH DEVELOPMENT AM

Junction 2 Total Vehicles					
Frm/To	A	B	C	D	Total
A		0	227	464	691
B	325		86	4	415
C	402	0		180	582
D	0	0	0		0
Total	727	0	313	648	1689

Junction 2 Light Vehicles					
Frm/To	A	B	C	D	Total
A		0	197	453	650
B	302		57	3	362
C	378	0		156	534
D	0	0	0		0
Total	680	0	255	612	1547

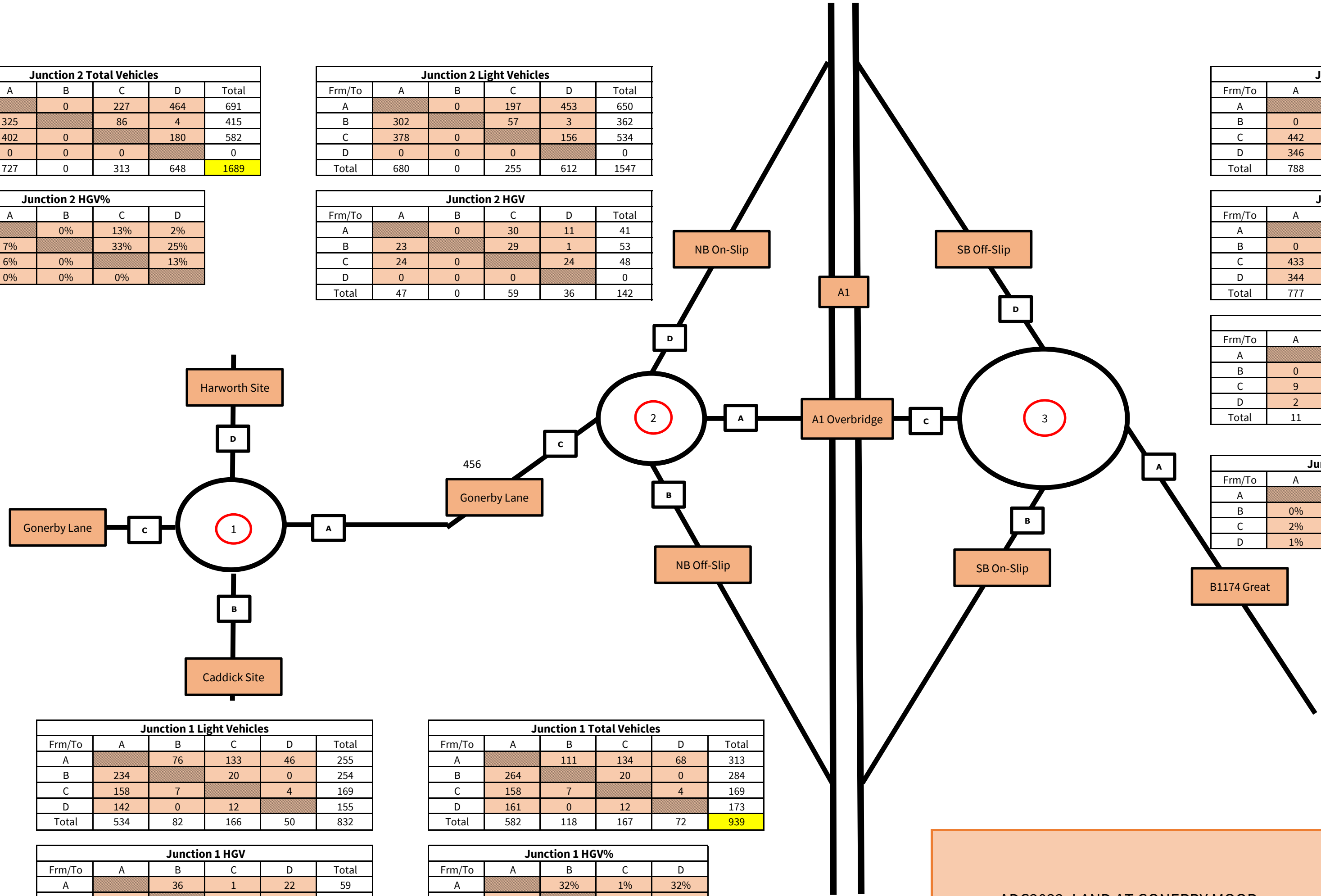
Junction 2 HGV%				
Frm/To	A	B	C	D
A		0%	13%	2%
B	7%		33%	25%
C	6%	0%		13%
D	0%	0%	0%	

Junction 2 HGV					
Frm/To	A	B	C	D	Total
A		0	30	11	41
B	23		29	1	53
C	24	0		24	48
D	0	0	0		0
Total	47	0	59	36	142

Junction 3 Total Vehicles					
Frm/To	A	B	C	D	Total
A		444	549	0	993
B	0		0	0	0
C	442	287		0	729
D	346	55	139		540
Total	788	786	688	0	2262

Junction 3 Light Vehicles					
Frm/To	A	B	C	D	Total
A		425	535	0	960
B	0		0	0	0
C	433	254		0	687
D	344	47	109		500
Total	777	726	643	0	2146

Junction 3 HGV					
Frm/To	A	B	C	D	Total
A		19	14	0	33
B	0		0	0	0
C	9	33		0	42
D	2	8	31		41
Total	11	60	45	0	116



Junction 3 HGV%				
Frm/To	A	B	C	D
A		4%	3%	0%
B	0%		0%	0%
C	2%	12%		0%
D	1%	15%	22%	

Junction 1 Light Vehicles					
Frm/To	A	B	C	D	Total
A		76	133	46	255
B	234		20	0	254
C	158	7		4	169
D	142	0	12		155
Total	534	82	166	50	832

Junction 1 Total Vehicles					
Frm/To	A	B	C	D	Total
A		111	134	68	313
B	264		20	0	284
C	158	7		4	169
D	161	0	12		173
Total	582	118	167	72	939

Junction 1 HGV					
Frm/To	A	B	C	D	Total
A		36	1	22	59
B	30		0	0	30
C	0	0		0	0
D	18	0	0		18
Total	48	36	1	22	107

Junction 1 HGV%				
Frm/To	A	B	C	D
A		32%	1%	32%
B	11%		0%	0%
C	0%	0%		0%
D	11%	0%	0%	

ADC3032. LAND AT GONERBY MOOR

ADC INFRASTRUCTURE

DIAGRAM 17: 2041 WITH DEVELOPMENT PM

APPENDIX A

ILLUSTRATIVE DEVELOPMENT MASTERPLANS

Notes:

1. This drawing is subject to copyright and is not to be reproduced in part or whole without approval.
2. Do not scale this drawing - check all dimensions on site.

This drawing has been superimposed onto an Ordnance Survey dataset and is therefore subject to a detailed boundary and levels survey of the site. It is also subject to confirmation of legal ownership boundaries, approvals and agreements of all statutory authorities and undertakers necessary for all supplies, wayleaves and diversions, all of which are unknown at the time of preparing this drawing.

Development layouts are shown indicatively and subject to design review.

Rev:	Date:	Status/Amendments:	By:
P01	21.03.24	INITIAL ISSUE	AE

mosodi TECHNICAL
Manchester 0161 413 5168
Leeds 0113 323 0854

Client: Harworth

Project: Gonerby Moor

Drawing Title: Illustrative Masterplan showing possible access roundabout location

Drawn By:	Checked By:	Approved By:
AE	AE	AE
Scale: 1:2500	*Paper Size:* A1	*Date Created:* 20.03.24
Drawing Number: 24003-MOS-SI-XX-SK-A-0001		*Drawing Revision:* P01

APPENDIX B

LCC AND NATIONAL HIGHWAYS RESPONSES

David Hobday

From:	Ian Field [redacted]>
Sent:	26 January 2024 10:19
To:	David Hobday
Subject:	RE: Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

Hi Dave,
I write in reply to your enquiry regarding this site and your initial Transport Appraisal. In general, the assessment is acceptable but I have the following comments:

- The 4 arm site access roundabout shown on Drawing ADC3032-DR-002-P2 is preferred form of access for the development. In Appendix A, priority junctions are shown as access points for the northern site and this would need further evidence as to their suitability.
- The pedestrian and cycle improvements shown on Drawing ADC3032-DR-002-P2 are necessary, also the widening of the carriageway to 7.3m to the roundabout.
- The distribution proposed seems reasonable. We would want to limit any traffic impact through the villages of Allington and Sedgebrook, the distribution results in nearly 50 additional vehicles in the peak hour along this route which should be compared to base flows. It may be a high percentage increase, and it would be helpful if consideration could be given to ways to reduce this impact.
- A McDonalds fast food and drive-thru has been consented on Allington Lane East and the junction with the B1174 is to be upgraded to a roundabout. The flows from this committed development should be included in any assessment.
- The junction of Newark Hill / Belton Lane will need including in an assessment.
- Parking provision should be considered in the appraisal. Whilst LCC does not have parking standards, the amount of parking proposed should be justified by comparison to other sites (used for trip rates in TRICS). The provision should correlate with the trip rates used, and ideally parking provision should be limited as far as possible.

Please let me know if you have any queries.
Regards
Ian

Ian Field CEng, BEng(Hons), MCIHT, ACGI
Growth Manager (Special Projects)

Lincolnshire County Council
County Offices, Newland, Lincoln LN1 1YL

[redacted]

Teams: Chat with me
Website: www.lincolnshire.gov.uk

Lincolnshire
COUNTY COUNCIL
Working for a better future

David Hobday

From:	Catherine Townend [redacted]
Sent:	29 January 2024 09:45
To:	David Hobday
Subject:	National Highway response - Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

Good morning Dave,

Thank you for your below email in relation to pre-application consultation in support of a Regulation 18 Local Plan allocation submission for land adjacent to the A1 at Gonerby Moor, Lincolnshire.

Our consultants AECOM have reviewed your submitted transport appraisal note and more information is required as set out below:

Trip Generation and Distribution

We welcome the applicant using the TRICS database to identify the trip rates for each possible land use proposed at the development site. We recommend trip rates are derived using the latest available version of TRICS (v7.10.4) and that surveys carried out on Monday, Friday and weekends are omitted from the TRICS site selection.

The proposed area for B8 warehouse use in both the Harworth Group's land and Caddick Group's land exceeds the maximum gross floor area surveyed in TRICS. We recommend the applicant obtains trip rates (total, light vehicles and HGVs) from other sites with similar characteristics (e.g. land use, size, proximity to the SRN) for comparison with the trip rates available in TRICS to ensure that the traffic generation predicted is accurate for assessing the potential impact from the development on the adjacent SRN.

We also note that an arbitrary split between B8 Storage and Distribution and B2 General Industrial Uses is defined as 75% and 25% respectively. We suggest the applicant updates the traffic assessment with a more accountable split when available.

Furthermore, committed developments within the surrounding area should also be included in the vehicle trip assessment. Details of these developments should be confirmed with the Local Planning Authority.

We are content with the use of the national census data at MSOA level to derive the traffic distribution for the light vehicles.

In relation to the approach of adopting a 50% north and 50% south distribution of HGVs as proposed in the appraisal report, we recommend the applicant reviews the observed directional split of HGVs in order to justify the proposed methodology or to update the proposed directional splits as appropriate.

Junction Assessments

TEMPro Growth Factor - National Highways are content with the use of TEMPro Version 8.1 and the use of South Kesteven 002 MSOA for the background traffic growth. However, it is recommended that ‘Trunk Road’ is used for the TEMPro forecasts instead of ‘All Roads’ due to the vicinity of the site to the Strategic Road Network and the higher traffic growth it forecasts. We feel this would provide a more robust assessment.

Committed Development - All committed development traffic has been assigned as “cars”. This has therefore meant that the heavy vehicle percentages have reduced accordingly. The applicant should provide all committed development traffic in cars / Light Vehicles and heavy vehicles for our review.

Further clarification is required to understand how the peak periods of 08:15 – 09:15 and 16:30 – 17:30 have been selected for the assessment. National Highways requires the highest combined peak period to be selected from background traffic plus development traffic.

Traffic Merge Assessment Flows – The slip road merge assessments have been reviewed. It appears that due to the location of the DfT traffic count sites, additional calculations were undertaken to identify the Upstream Mainline flows for the assessments. National Highways requires further clarity on how this has been calculated. We recommend the applicant submits the calculation spreadsheets for our review.

Traffic Modelling Geometry Measurements – Following independent measurements being undertaken, a few geometry measurements require a further review:

Western Dumbell Roundabout

- The entry width of the Gonerby Lane approach needs revising with an approximate width of 3.96 metres being identified.
- The entry radius on the A1 off-slip requires amendment with an approximate radius of 11.4 metres being identified.

National Highways also recommends that an annotated drawing of the geometry measurements for the roundabouts are provided to support the measurements used within the modelling.

I trust the above comments are helpful in progressing the representation of this site for the Regulation 18 Site Allocation process for the South Kesteven Local Plan. Should you have any questions please get in touch.

Kind regards

Catherine Townend
Spatial Planner
Operations Directorate (Midlands) – *Nottinghamshire, Derbyshire, Lincolnshire & Rutland*
[redacted]
Web: www.nationalhighways.co.uk

My working days are Monday to Thursday

APPENDIX C

PERSONAL INJURY COLLISION DATA

crashmap.co.uk

Validated Data

Crash Date:	Thursday, June 14, 2018	**Time of Crash:**	1:19:00 PM	**Crash Reference:**	**2018320274860**

Highest Injury Severity:	Serious	**Road Number:**	A1	**Number of Casualties:**	1
Highway Authority:	Lincolnshire			**Number of Vehicles:**	1
Local Authority:	South Kesteven District			**OS Grid Reference:**	488856 340011
Weather Description:	Fine without high winds				
Road Surface Description:	Dry				
Speed Limit:	30				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Roundabout				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Roundabout				
Junction Control:	Give way or uncontrolled				

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
To subscribe to unlimited reports using CrashMap Pro visit *www.crashmap.co.uk/Home/Premium_Services*

powered by agilysis

crashmap.co.uk

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Goods vehicle 7.5 tonnes mgw and over	1	Male	26 - 35	Vehicle is in the act of turning right	Nearside	Journey as part of work	Kerb	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

crashmap.co.uk

Validated Data

Crash Date: Tuesday, August 07, 2018 **Time of Crash:** 7:20:00 PM **Crash Reference:** **2018320374356**

Highest Injury Severity: Slight

Road Number: A1

Number of Casualties: 1

Highway Authority: Lincolnshire

Number of Vehicles: 2

Local Authority: South Kesteven District

OS Grid Reference: 488617 340007

Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 70

Light Conditions: Daylight: regardless of presence of streetlights

Carriageway Hazards: Other object in carriageway

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Dual carriageway

Junction Control: Not Applicable

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Goods vehicle 7.5 tonnes mgw and over	5	Male	26 - 35	Vehicle proceeding normally along the carriageway, on a right hand bend	Front	Journey as part of work	Parked vehicle	None
2	Car (excluding private hire)	15	Male	46 - 55	Vehicle is parked in the carriageway	Back	Unknown	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

crashmap.co.uk

Validated Data

Crash Date:	Wednesday, August 14, 2019	**Time of Crash:**	1:39:00 PM	**Crash Reference:**	**2019320431127**

Highest Injury Severity:	Serious	**Road Number:**	B1174	**Number of Casualties:**	1
Highway Authority:	Lincolnshire			**Number of Vehicles:**	2
Local Authority:	South Kesteven District			**OS Grid Reference:**	488588 340010

Weather Description:	Raining without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Roundabout
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	1	Male	21 - 25	Vehicle proceeding normally along the carriageway, not on a bend	Front	Unknown	None	None
2	Goods vehicle 7.5 tonnes mgw and over	1	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Male	21 - 25	Unknown or other	Unknown or other

Provisional Data does not include vehicle and casualty records

Crash Date:	Tuesday, January 05, 2021	**Time of Crash:**	12:50:00 AM	**Crash Reference:**	**2021320006180**

Highest Injury Severity:	Slight	**Road Number:**	A1	**Number of Casualties:**	1
Highway Authority:				**Number of Vehicles:**	1
Local Authority:				**OS Grid Reference:**	488794 340102

Weather Description:	Fine without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	70
Light Conditions:	Darkness: no street lighting
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Dual carriageway
Junction Control:	Not Applicable

crashmap.co.uk

Provisional Data does not include vehicle and casualty records

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Validated Data

Crash Date:	Saturday, August 21, 2021	**Time of Crash:**	9:21:00 AM	**Crash Reference:**	**2021320479063**

Highest Injury Severity:	Slight	**Road Number:**	A1	**Number of Casualties:**	1
Highway Authority:	Lincolnshire			**Number of Vehicles:**	2
Local Authority:	South Kesteven District			**OS Grid Reference:**	488874 339983

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Roundabout
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Roundabout
Junction Control:	Give way or uncontrolled

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Van or goods vehicle 3.5 tonnes mgw and under	-1	Unknown	36 - 45	Vehicle is slowing down or stopping	Front	Unknown	None	None
2	Car (excluding private hire)	6	Female	56 - 65	Vehicle is slowing down or stopping	Back	Unknown	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Female	56 - 65	Unknown or other	Unknown or other

crashmap.co.uk

Validated Data

Crash Date: Friday, October 22, 2021 **Time of Crash:** 7:50:00 PM **Crash Reference:** **2021320615868**

Highest Injury Severity: Slight **Road Number:** A1 **Number of Casualties:** 2

Highway Authority: Lincolnshire **Number of Vehicles:** 2

Local Authority: South Kesteven District **OS Grid Reference:** 488706 339720

Weather Description: Fine without high winds

Road Surface Description: Wet or Damp

Speed Limit: 70

Light Conditions: Darkness: no street lighting

Carriageway Hazards: None

Junction Detail: Slip road

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Dual carriageway

Junction Control: Give way or uncontrolled

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
To subscribe to unlimited reports using CrashMap Pro visit *www.crashmap.co.uk/Home/Premium_Services*

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	9	Female	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Commuting to/from work	None	None
2	Car (excluding private hire)	1	Female	66 - 75	Vehicle proceeding normally along the carriageway, not on a bend	Back	Unknown	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Female	56 - 65	Unknown or other	Unknown or other
2	2	Slight	Driver or rider	Female	66 - 75	Unknown or other	Unknown or other

Validated Data

Crash Date:	Thursday, July 21, 2022	**Time of Crash:**	2:00:00 PM	**Crash Reference:**	**2022320421331**

Highest Injury Severity:	Slight	**Road Number:**	A1	**Number of Casualties:**	1
Highway Authority:	Lincolnshire			**Number of Vehicles:**	2
Local Authority:	South Kesteven District			**OS Grid Reference:**	488600 339702

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	70
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Slip road
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Dual carriageway
Junction Control:	Give way or uncontrolled

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	1	Female	Over 75	Vehicle is slowing down or stopping	Back	Unknown	None	None
2	Car (excluding private hire)	8	Male	66 - 75	Vehicle proceeding normally along the carriageway, not on a bend	Front	Unknown	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Female	Over 75	Unknown or other	Unknown or other

crashmap.co.uk

Validated Data

Crash Date:	Monday, August 29, 2022	**Time of Crash:**	9:40:00 AM	**Crash Reference:**	**2022320502701**

Highest Injury Severity:	Slight	**Road Number:**	A1	**Number of Casualties:**	1
Highway Authority:	Lincolnshire			**Number of Vehicles:**	2
Local Authority:	South Kesteven District			**OS Grid Reference:**	488610 339926

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	70
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Dual carriageway
Junction Control:	Not Applicable

Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	6	Female	66 - 75	Vehicle proceeding normally along the carriageway, not on a bend	Front	Unknown	None	None
2	Goods vehicle over 3.5 tonnes and under 7.5 tonnes mgw	7	Male	36 - 45	Vehicle proceeding normally along the carriageway, not on a bend	Back	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Female	66 - 75	Unknown or other	Unknown or other

APPENDIX D

TRAFFIC COUNT DATA

Gonerby Moor, Thursday 23rd November 2023

Junction: **1** Western dumbell roundabout
Approach: **A1 North**

	Left to B1174								Ahead to A1 (S)								Right to Gonerby Lane							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 - 07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 - 07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 - 08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 - 08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 - 08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 - 09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 - 09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 - 09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00 - 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15 - 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30 - 18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45 - 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Gonerby Moor, Thursday 23rd November 2023

Junction: **1**   Western dumbell roundabout

Approach: **B1174**

	Left to A1 (S)								Ahead to Gonerby Lane								Right to A1 (N)								U-Turn							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	0	0	0	0	0	0	0	2	12	1	0	0	0	15	0	0	36	11	3	4	0	54	0	0	0	0	0	0	0	0
07:15 - 07:30	0	0	0	0	0	0	0	0	0	0	8	6	0	0	0	14	0	1	55	13	0	2	1	72	0	0	0	0	0	0	0	0
07:30 - 07:45	0	0	0	0	0	0	0	0	0	0	17	4	0	0	2	23	0	0	48	12	1	4	0	65	0	0	0	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0	0	0	0	0	0	8	2	0	0	1	11	0	0	45	10	3	1	0	59	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**45**	**13**	**0**	**0**	**3**	**63**	**0**	**1**	**184**	**46**	**7**	**11**	**1**	**250**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 - 08:15	0	0	0	0	0	0	0	0	0	0	13	2	0	0	1	16	0	0	38	6	3	3	0	50	0	0	0	0	0	0	0	0
08:15 - 08:30	0	0	0	0	0	0	0	0	0	0	21	4	0	0	1	26	0	0	36	8	1	0	0	45	0	0	0	0	0	0	0	0
08:30 - 08:45	0	0	0	0	0	0	0	0	0	0	21	3	0	0	0	24	0	0	50	4	1	8	0	63	0	0	0	0	0	0	0	0
08:45 - 09:00	0	0	0	0	0	0	0	0	0	0	29	3	0	0	0	32	0	0	49	9	4	4	0	66	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**84**	**12**	**0**	**0**	**2**	**98**	**0**	**0**	**173**	**27**	**9**	**15**	**0**	**224**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	22	1	0	0	0	23	0	0	44	7	3	4	1	59	0	0	0	0	0	0	0	0
09:15 - 09:30	0	0	0	0	0	0	0	0	0	0	14	3	0	0	0	17	0	0	32	13	1	10	0	56	0	0	1	0	0	0	0	1
09:30 - 09:45	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	11	0	0	40	9	5	3	0	57	0	0	0	0	0	0	0	0
09:45 - 10:00	0	0	0	0	0	0	0	0	0	0	7	3	1	0	0	11	0	0	35	3	2	6	0	46	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**54**	**7**	**1**	**0**	**0**	**62**	**0**	**0**	**151**	**32**	**11**	**23**	**1**	**218**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**183**	**32**	**1**	**0**	**5**	**223**	**0**	**1**	**508**	**105**	**27**	**49**	**2**	**692**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	23	4	0	0	1	28	0	0	80	10	0	3	1	94	0	0	0	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	24	6	0	0	0	30	0	0	59	12	1	1	4	77	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0	0	0	0	0	0	14	7	0	0	0	21	0	0	58	10	1	2	0	71	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	22	3	0	0	0	25	0	0	75	12	0	1	1	89	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**20**	**0**	**0**	**1**	**104**	**0**	**0**	**272**	**44**	**2**	**7**	**6**	**331**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	14	1	0	0	1	16	0	1	74	5	0	1	1	82	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	24	0	1	71	10	1	1	1	85	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	10	0	0	52	4	1	2	0	59	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	12	0	0	40	3	2	1	0	46	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**57**	**4**	**0**	**0**	**1**	**62**	**0**	**2**	**237**	**22**	**4**	**5**	**2**	**272**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00 - 18:15	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	17	0	0	34	1	0	1	0	36	0	0	0	0	0	0	0	0
18:15 - 18:30	0	0	0	0	0	0	0	0	0	0	18	1	0	0	0	19	0	0	33	1	0	2	1	37	0	0	0	0	0	0	0	0
18:30 - 18:45	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	12	0	0	35	3	0	2	0	40	0	0	0	0	0	0	0	0
18:45 - 19:00	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	0	0	31	4	0	4	0	39	0	0	1	0	0	0	0	1
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**1**	**0**	**0**	**0**	**53**	**0**	**0**	**133**	**9**	**0**	**9**	**1**	**152**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**192**	**25**	**0**	**0**	**2**	**219**	**0**	**2**	**642**	**75**	**6**	**21**	**9**	**755**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

Gonerby Moor, Thursday 23rd November 2023

Junction: 1
Approach: A1 South   Western dumbell roundabout

	Left to Gonerby Lane								Ahead to A1 (N)								Right to B1174							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	11	3	0	7	0	21
07:15 - 07:30	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	16	3	0	4	0	23
07:30 - 07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	3	0	6	0	23
07:45 - 08:00	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	33	4	3	6	0	46
Hourly Total	**0**	**0**	**3**	**1**	**0**	**1**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**74**	**13**	**3**	**23**	**0**	**113**
08:00 - 08:15	0	0	4	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	33	5	3	5	0	46
08:15 - 08:30	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	47	6	0	8	0	61
08:30 - 08:45	0	0	5	2	0	0	0	7	0	0	0	0	0	0	0	0	0	0	71	6	1	5	0	83
08:45 - 09:00	0	0	10	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	46	5	2	5	0	58
Hourly Total	**0**	**0**	**22**	**2**	**1**	**0**	**0**	**25**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**197**	**22**	**6**	**23**	**0**	**248**
09:00 - 09:15	0	0	3	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	27	4	0	2	0	33
09:15 - 09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	5	0	7	0	34
09:30 - 09:45	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	21	4	2	8	0	35
09:45 - 10:00	0	0	1	3	0	1	0	5	0	0	1	0	0	0	0	1	0	0	21	7	0	7	0	35
Hourly Total	**0**	**0**	**7**	**4**	**0**	**1**	**0**	**12**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**91**	**20**	**2**	**24**	**0**	**137**
TOTAL	**0**	**0**	**32**	**7**	**1**	**2**	**0**	**42**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**362**	**55**	**11**	**70**	**0**	**498**

16:00 - 16:15	0	0	4	0	0	0	0	4	0	0	3	0	0	0	0	3	0	0	37	8	2	3	0	50
16:15 - 16:30	0	0	5	0	0	0	0	5	0	0	1	0	0	0	0	1	0	0	30	7	0	2	0	39
16:30 - 16:45	0	0	2	1	0	0	0	3	0	0	0	1	0	0	0	1	0	0	29	9	0	5	0	43
16:45 - 17:00	0	0	2	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	37	7	1	3	1	49
Hourly Total	**0**	**0**	**13**	**1**	**0**	**0**	**0**	**14**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**133**	**31**	**3**	**13**	**1**	**181**
17:00 - 17:15	0	0	3	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	42	6	0	4	0	52
17:15 - 17:30	0	0	4	0	0	0	0	4	0	0	0	1	0	1	0	2	0	0	37	5	1	4	1	48
17:30 - 17:45	0	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	30	2	0	5	0	37
17:45 - 18:00	0	0	4	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	32	4	1	4	0	41
Hourly Total	**0**	**0**	**15**	**2**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**0**	**141**	**17**	**2**	**17**	**1**	**178**
18:00 - 18:15	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	21	3	0	6	0	30
18:15 - 18:30	0	0	3	0	0	0	0	3	0	0	1	0	0	0	0	1	0	0	18	1	0	3	0	22
18:30 - 18:45	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	18	0	0	2	0	20
18:45 - 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	0	2	0	17
Hourly Total	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**71**	**5**	**0**	**13**	**0**	**89**
TOTAL	**0**	**0**	**35**	**3**	**0**	**0**	**0**	**38**	**0**	**0**	**6**	**2**	**0**	**1**	**0**	**9**	**0**	**0**	**345**	**53**	**5**	**43**	**2**	**448**

Gonerby Moor, Thursday 23rd November 2023

Junction: 1

Approach: Gonerby Lane   Western dumbell roundabout

	Left to A1 (N)								Ahead to B1174								Right to A1 (S)							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	2	0	0	0	0	**2**	0	0	7	1	0	0	0	**8**	0	0	0	0	0	0	0	**0**
07:15 - 07:30	0	0	1	0	0	0	0	**1**	0	0	15	0	0	0	0	**15**	0	0	0	0	0	0	0	**0**
07:30 - 07:45	0	0	0	0	0	0	0	**0**	1	0	20	3	0	0	0	**24**	0	0	0	0	0	0	0	**0**
07:45 - 08:00	0	0	1	0	0	0	0	**1**	0	0	27	3	0	1	0	**31**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**69**	**7**	**0**	**1**	**0**	**78**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 - 08:15	0	0	1	0	0	0	0	**1**	0	0	21	3	0	0	0	**24**	0	0	0	0	0	0	0	**0**
08:15 - 08:30	0	0	1	0	0	0	0	**1**	0	0	22	1	0	0	0	**23**	0	0	0	0	0	0	0	**0**
08:30 - 08:45	0	0	1	0	0	0	0	**1**	0	0	25	1	0	0	0	**26**	0	0	0	0	0	0	0	**0**
08:45 - 09:00	0	0	3	0	0	0	0	**3**	0	0	23	1	1	0	0	**25**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**91**	**6**	**1**	**0**	**0**	**98**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00 - 09:15	0	0	2	0	1	0	0	**3**	0	0	24	2	0	1	0	**27**	0	0	0	0	0	0	0	**0**
09:15 - 09:30	0	0	1	0	0	0	0	**1**	0	0	17	4	0	1	0	**22**	0	0	0	0	0	0	0	**0**
09:30 - 09:45	0	0	3	0	0	0	0	**3**	0	0	12	2	0	0	1	**15**	0	0	0	0	0	0	0	**0**
09:45 - 10:00	0	0	0	0	0	0	0	**0**	0	0	17	2	0	0	0	**19**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**6**	**0**	**1**	**0**	**0**	**7**	**0**	**0**	**70**	**10**	**0**	**2**	**1**	**83**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**16**	**0**	**1**	**0**	**0**	**17**	**1**	**0**	**230**	**23**	**1**	**3**	**1**	**259**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 - 16:15	0	0	1	0	0	0	0	**1**	0	0	9	4	0	0	0	**13**	0	0	0	0	0	0	0	**0**
16:15 - 16:30	0	0	1	1	0	0	0	**2**	0	0	22	6	0	0	0	**28**	0	0	0	0	0	0	0	**0**
16:30 - 16:45	0	0	1	0	0	0	0	**1**	0	0	35	3	0	0	0	**38**	0	0	0	0	0	0	0	**0**
16:45 - 17:00	0	0	3	0	0	0	0	**3**	0	1	25	5	0	0	0	**31**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**6**	**1**	**0**	**0**	**0**	**7**	**0**	**1**	**91**	**18**	**0**	**0**	**0**	**110**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00 - 17:15	0	0	3	0	0	0	0	**3**	0	0	31	4	0	0	0	**35**	0	0	0	0	0	0	0	**0**
17:15 - 17:30	0	0	1	0	0	0	0	**1**	0	0	15	3	0	0	0	**18**	0	0	0	0	0	0	0	**0**
17:30 - 17:45	0	0	1	0	0	0	0	**1**	0	0	12	3	0	0	0	**15**	0	0	0	0	0	0	0	**0**
17:45 - 18:00	0	0	2	0	0	0	0	**2**	0	0	14	2	0	0	0	**16**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**72**	**12**	**0**	**0**	**0**	**84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00 - 18:15	0	0	0	0	0	0	0	**0**	0	0	9	2	0	0	0	**11**	0	0	0	0	0	0	0	**0**
18:15 - 18:30	0	0	2	0	0	0	0	**2**	0	0	8	0	0	0	0	**8**	0	0	0	0	0	0	0	**0**
18:30 - 18:45	0	0	1	1	0	0	0	**2**	0	0	7	3	0	0	0	**10**	0	0	0	0	0	0	0	**0**
18:45 - 19:00	0	0	0	0	0	0	0	**0**	0	0	10	0	0	0	0	**10**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**4**	**0**	**0**	**34**	**5**	**0**	**0**	**0**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**16**	**2**	**0**	**0**	**0**	**18**	**0**	**1**	**197**	**35**	**0**	**0**	**0**	**233**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Gonerby Moor, Thursday 23rd November 2023

Junction: **2** Eastern Dumbbell roundabout

Approach: **A1 North**

	Left to B1174 Great North Road								Ahead to A1 (S)								Right to B1174							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	26	10	2	1	0	39	0	0	1	0	1	3	0	5	0	1	2	2	1	0	0	6
07:15 - 07:30	0	0	48	10	0	2	2	62	0	0	6	0	0	4	1	11	0	0	3	2	0	1	1	7
07:30 - 07:45	0	0	63	16	1	2	0	82	0	0	2	1	0	3	0	6	0	0	7	3	0	3	1	14
07:45 - 08:00	0	0	67	13	1	3	2	86	0	0	2	0	0	1	0	3	0	0	5	2	0	0	0	7
Hourly Total	**0**	**0**	**204**	**49**	**4**	**8**	**4**	**269**	**0**	**0**	**11**	**1**	**1**	**11**	**1**	**25**	**0**	**1**	**17**	**9**	**1**	**4**	**2**	**34**
08:00 - 08:15	0	0	71	10	3	3	5	92	0	0	2	0	1	2	1	6	0	0	8	1	0	1	1	11
08:15 - 08:30	0	0	63	5	0	6	0	74	0	0	3	0	0	1	0	4	0	0	7	3	0	0	0	10
08:30 - 08:45	0	0	45	8	0	4	0	57	0	0	9	1	1	1	0	12	0	0	12	1	1	0	0	14
08:45 - 09:00	0	0	52	7	3	1	0	63	0	0	5	2	0	0	0	7	0	0	11	3	0	0	0	14
Hourly Total	**0**	**0**	**231**	**30**	**6**	**14**	**5**	**286**	**0**	**0**	**19**	**3**	**2**	**4**	**1**	**29**	**0**	**0**	**38**	**8**	**1**	**1**	**1**	**49**
09:00 - 09:15	0	0	45	4	1	2	0	52	0	0	5	0	0	2	0	7	0	0	13	1	2	2	0	18
09:15 - 09:30	0	0	38	14	0	3	0	55	0	0	3	0	1	1	0	5	0	0	11	3	0	2	0	16
09:30 - 09:45	0	0	54	9	0	0	0	63	0	0	3	0	1	1	0	5	0	0	9	0	1	1	0	11
09:45 - 10:00	0	0	49	15	2	4	0	70	0	0	4	1	0	2	0	7	0	0	6	1	0	2	0	9
Hourly Total	**0**	**0**	**186**	**42**	**3**	**9**	**0**	**240**	**0**	**0**	**15**	**1**	**2**	**6**	**0**	**24**	**0**	**0**	**39**	**5**	**3**	**7**	**0**	**54**
TOTAL	**0**	**0**	**621**	**121**	**13**	**31**	**9**	**795**	**0**	**0**	**45**	**5**	**5**	**21**	**2**	**78**	**0**	**1**	**94**	**22**	**5**	**12**	**3**	**137**
16:00 - 16:15	0	0	43	11	1	3	0	58	0	0	6	1	0	2	0	9	0	0	8	2	0	1	0	11
16:15 - 16:30	0	0	44	10	0	0	0	54	0	0	6	0	1	2	0	9	0	0	5	4	0	0	0	9
16:30 - 16:45	0	0	74	7	1	0	0	82	0	0	4	2	0	2	0	8	0	0	7	4	0	1	0	12
16:45 - 17:00	0	0	53	7	0	0	0	60	0	0	2	1	0	1	0	4	0	0	20	2	1	0	0	23
Hourly Total	**0**	**0**	**214**	**35**	**2**	**3**	**0**	**254**	**0**	**0**	**18**	**4**	**1**	**7**	**0**	**30**	**0**	**0**	**40**	**12**	**1**	**2**	**0**	**55**
17:00 - 17:15	0	1	72	11	0	1	0	85	0	0	6	0	0	1	0	7	0	0	11	1	0	0	0	12
17:15 - 17:30	0	0	57	5	0	0	0	62	0	0	5	0	0	0	0	5	0	0	12	3	0	1	1	17
17:30 - 17:45	0	0	55	7	0	3	0	65	0	0	3	0	0	2	0	5	0	0	6	1	0	0	0	7
17:45 - 18:00	0	0	54	8	1	2	0	65	0	0	5	0	0	2	0	7	0	0	3	2	1	1	0	7
Hourly Total	**0**	**1**	**238**	**31**	**1**	**6**	**0**	**277**	**0**	**0**	**19**	**0**	**0**	**5**	**0**	**24**	**0**	**0**	**32**	**7**	**1**	**2**	**1**	**43**
18:00 - 18:15	0	0	55	3	0	2	0	60	0	0	6	0	0	2	0	8	0	0	5	0	0	0	0	5
18:15 - 18:30	0	0	35	6	0	0	0	41	0	0	2	1	0	1	0	4	0	0	8	0	0	3	0	11
18:30 - 18:45	0	0	45	4	0	0	0	49	0	0	2	1	0	2	0	5	0	0	8	0	0	0	0	8
18:45 - 19:00	0	0	34	0	1	1	0	36	0	0	4	0	0	1	0	5	0	0	5	0	0	0	0	5
Hourly Total	**0**	**0**	**169**	**13**	**1**	**3**	**0**	**186**	**0**	**0**	**14**	**2**	**0**	**6**	**0**	**22**	**0**	**0**	**26**	**0**	**0**	**3**	**0**	**29**
TOTAL	**0**	**1**	**621**	**79**	**4**	**12**	**0**	**717**	**0**	**0**	**51**	**6**	**1**	**18**	**0**	**76**	**0**	**0**	**98**	**19**	**2**	**7**	**1**	**127**

Gonerby Moor, Thursday 23rd November 2023

Junction: 2 Eastern Dumbbell roundabout

Approach: B1174 Great North Road

	Left to A1 (S)								Ahead to B1174								Right to A1 (N)							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	16	2	2	5	0	25	0	1	45	10	2	4	0	62	0	0	0	0	0	0	0	0
07:15 - 07:30	0	0	18	8	1	8	0	35	0	1	61	16	0	1	0	79	0	0	0	0	0	0	0	0
07:30 - 07:45	0	0	18	6	1	9	1	35	0	0	57	13	1	1	1	73	0	0	0	0	0	0	0	0
07:45 - 08:00	0	0	26	4	1	9	0	40	0	0	49	11	3	1	1	65	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**78**	**20**	**5**	**31**	**1**	**135**	**0**	**2**	**212**	**50**	**6**	**7**	**2**	**279**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 - 08:15	0	0	24	4	2	8	0	38	0	0	42	7	3	2	0	54	0	0	0	0	0	0	0	0
08:15 - 08:30	0	0	38	6	0	8	0	52	0	0	50	9	1	0	1	61	0	0	0	0	0	0	0	0
08:30 - 08:45	0	0	47	3	0	7	0	57	0	0	59	6	1	8	0	74	0	0	0	0	0	0	0	0
08:45 - 09:00	0	0	60	5	3	5	2	75	0	0	66	9	3	4	0	82	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**169**	**18**	**5**	**28**	**2**	**222**	**0**	**0**	**217**	**31**	**8**	**14**	**1**	**271**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00 - 09:15	0	0	24	5	2	4	0	35	0	0	55	7	1	2	1	66	0	0	0	0	0	0	0	0
09:15 - 09:30	0	0	10	2	2	4	0	18	0	0	38	13	1	8	0	60	0	0	0	0	0	0	0	0
09:30 - 09:45	0	0	13	7	2	10	0	32	0	0	42	9	4	2	0	57	0	0	0	0	0	0	0	0
09:45 - 10:00	0	0	7	5	0	6	0	18	0	0	34	5	3	4	0	46	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**54**	**19**	**6**	**24**	**0**	**103**	**0**	**0**	**169**	**34**	**9**	**16**	**1**	**229**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**301**	**57**	**16**	**83**	**3**	**460**	**0**	**2**	**598**	**115**	**23**	**37**	**4**	**779**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:00 - 16:15	0	0	52	5	0	3	0	60	0	0	97	13	0	2	3	115	0	0	0	0	0	0	0	0
16:15 - 16:30	0	0	46	4	2	1	0	53	0	0	78	13	1	1	3	96	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	46	5	1	4	0	56	0	0	65	13	1	1	0	80	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	49	6	1	4	0	60	0	0	75	13	0	1	1	90	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**193**	**20**	**4**	**12**	**0**	**229**	**0**	**0**	**315**	**52**	**2**	**5**	**7**	**381**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00 - 17:15	0	0	41	2	0	4	0	47	0	1	77	5	0	1	2	86	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	40	1	0	2	0	43	0	1	81	7	0	0	0	89	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	39	2	2	3	0	46	0	0	54	4	1	2	0	61	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	32	1	0	1	0	34	0	0	50	3	1	0	0	54	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**152**	**6**	**2**	**10**	**0**	**170**	**0**	**2**	**262**	**19**	**2**	**3**	**2**	**290**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00 - 18:15	0	0	20	1	0	1	0	22	0	0	47	1	0	1	0	49	0	0	0	0	0	0	0	0
18:15 - 18:30	0	0	23	0	0	8	0	31	0	0	43	1	0	0	1	45	0	0	0	0	0	0	0	0
18:30 - 18:45	0	0	20	1	0	1	0	22	0	0	39	4	0	1	0	44	0	0	0	0	0	0	0	0
18:45 - 19:00	0	0	12	0	0	2	0	14	0	0	32	4	0	4	0	40	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**75**	**2**	**0**	**12**	**0**	**89**	**0**	**0**	**161**	**10**	**0**	**6**	**1**	**178**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**420**	**28**	**6**	**34**	**0**	**488**	**0**	**2**	**738**	**81**	**4**	**14**	**10**	**849**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Gonerby Moor, Thursday 23rd November 2023

Junction: **2** Eastern Dumbbell roundabout

Approach: **A1 South**

	Left to B1174								Ahead to A1 (N)								Right to B1174 Great North Road							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 - 07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 - 07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08:00 - 08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 - 08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 - 08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 - 09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 - 09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 - 09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18:00 - 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15 - 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30 - 18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45 - 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Gonerby Moor, Thursday 23rd November 2023

Junction: 2 Eastern Dumbbell roundabout
Approach: B1174

	Left to A1 (N)								Ahead to B1174 Great North Road								Right to A1 (S)							
TIME	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
07:00 - 07:15	0	0	0	0	0	0	0	0	0	0	14	1	0	3	0	18	0	0	4	2	0	3	0	9
07:15 - 07:30	0	0	0	0	0	0	0	0	0	0	22	4	0	4	0	30	0	0	9	0	0	1	0	10
07:30 - 07:45	0	0	0	0	0	0	0	0	1	0	30	4	0	2	0	37	0	0	5	2	0	4	0	11
07:45 - 08:00	0	0	0	0	0	0	0	0	0	0	51	6	2	3	0	62	0	0	8	1	1	4	0	14
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**117**	**15**	**2**	**12**	**0**	**147**	**0**	**0**	**26**	**5**	**1**	**12**	**0**	**44**
08:00 - 08:15	0	0	0	0	0	0	0	0	0	0	47	8	0	2	0	57	0	0	6	0	3	3	0	12
08:15 - 08:30	0	0	0	0	0	0	0	0	0	0	66	6	0	3	0	75	0	0	5	1	0	4	0	10
08:30 - 08:45	0	0	0	0	0	0	0	0	0	0	72	4	0	4	0	80	0	0	23	3	1	2	0	29
08:45 - 09:00	0	0	0	0	0	0	0	0	0	0	51	6	1	4	0	62	0	0	17	0	2	1	0	20
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**236**	**24**	**1**	**13**	**0**	**274**	**0**	**0**	**51**	**4**	**6**	**10**	**0**	**71**
09:00 - 09:15	0	0	0	0	0	0	0	0	0	0	35	6	0	1	0	42	0	0	16	0	0	3	0	19
09:15 - 09:30	0	0	0	0	0	0	0	0	0	0	27	3	0	4	0	34	0	0	12	6	0	3	0	21
09:30 - 09:45	0	0	0	0	0	0	0	0	0	0	24	6	2	3	0	35	0	0	11	0	0	6	1	18
09:45 - 10:00	0	0	0	0	0	0	0	0	0	0	27	8	0	2	0	37	0	0	10	1	0	4	0	15
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**113**	**23**	**2**	**10**	**0**	**148**	**0**	**0**	**49**	**7**	**0**	**16**	**1**	**73**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**466**	**62**	**5**	**35**	**0**	**569**	**0**	**0**	**126**	**16**	**7**	**38**	**1**	**188**
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	39	7	1	1	0	48	0	0	8	2	1	2	0	13
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	44	13	0	1	0	58	0	0	7	2	0	1	0	10
16:30 - 16:45	0	0	0	0	0	0	0	0	0	1	48	11	0	1	0	61	0	0	15	1	0	4	0	20
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	44	13	1	2	0	60	0	0	18	0	0	1	1	20
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**175**	**44**	**2**	**5**	**0**	**227**	**0**	**0**	**48**	**5**	**1**	**8**	**1**	**63**
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	52	10	0	3	0	65	0	0	21	0	0	1	0	22
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	33	5	1	2	0	41	0	0	20	2	0	1	1	24
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	35	3	0	3	0	41	0	0	8	1	0	3	0	12
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	40	8	1	2	0	51	0	0	5	0	0	2	0	7
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**160**	**26**	**2**	**10**	**0**	**198**	**0**	**0**	**54**	**3**	**0**	**7**	**1**	**65**
18:00 - 18:15	0	0	0	0	0	0	0	0	0	0	22	3	0	2	0	27	0	0	7	2	0	4	0	13
18:15 - 18:30	0	0	0	0	0	0	0	0	0	0	21	1	0	1	0	23	0	0	5	0	0	2	0	7
18:30 - 18:45	0	0	0	0	0	0	0	0	0	0	19	3	0	2	0	24	0	0	6	0	0	0	0	6
18:45 - 19:00	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	13	0	0	12	1	0	2	0	15
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**75**	**7**	**0**	**5**	**0**	**87**	**0**	**0**	**30**	**3**	**0**	**8**	**0**	**41**
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**410**	**77**	**4**	**20**	**0**	**512**	**0**	**0**	**132**	**11**	**1**	**23**	**2**	**169**

APPENDIX E

TRICS REPORTS

Calculation Reference: AUDIT-855401-231128-1106

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : D - INDUSTRIAL ESTATE

TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	EX	ESSEX	1 days
03	**SOUTH WEST**		
	NS	NORTH SOMERSET	1 days
	SD	SWINDON	1 days
	SM	SOMERSET	1 days
04	**EAST ANGLIA**		
	NF	NORFOLK	1 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	1 days
06	**WEST MIDLANDS**		
	WK	WARWICKSHIRE	4 days
	WO	WORCESTERSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	AL	CALDERDALE	1 days
	KS	KIRKLEES	1 days
	NY	NORTH YORKSHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Gross floor area
Actual Range:	10000 to 150564 (units: sqm)
Range Selected by User:	10000 to 167416 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/15 to 15/09/22

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Wednesday	5 days
Thursday	5 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	14 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	12
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	7
Residential Zone	1
Out of Town	3
No Sub Category	3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	4 days - Selected
Servicing vehicles Excluded	15 days - Selected

Secondary Filtering selection:

Use Class:

n/a	1 days
Not Known	13 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:
All Surveys Included

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
5,001 to 10,000	5 days
10,001 to 15,000	3 days
15,001 to 20,000	1 days
20,001 to 25,000	2 days
25,001 to 50,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	2 days
50,001 to 75,000	2 days
75,001 to 100,000	3 days
100,001 to 125,000	1 days
125,001 to 250,000	5 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	10 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	14 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	14 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 **AL-02-D-01** **INDUSTRIAL ESTATE** **CALDERDALE**
MILL LANE
HALIFAX

Edge of Town
No Sub Category
Total Gross floor area: 11305 sqm
Survey date: WEDNESDAY 17/10/18 *Survey Type: MANUAL*

2 **EX-02-D-04** **INDUSTRIAL ESTATE** **ESSEX**
PASTURE ROAD
WITHAM

Edge of Town
Industrial Zone
Total Gross floor area: 37130 sqm
Survey date: THURSDAY 10/05/18 *Survey Type: MANUAL*

3 **KS-02-D-02** **INDUSTRIAL ESTATE** **KIRKLEES**
LAW STREET
CLECKHEATON

Edge of Town
Industrial Zone
Total Gross floor area: 23226 sqm
Survey date: THURSDAY 15/09/16 *Survey Type: MANUAL*

4 **LN-02-D-03** **INDUSTRIAL ESTATE** **LINCOLNSHIRE**
DEACON ROAD
LINCOLN

Edge of Town
Industrial Zone
Total Gross floor area: 11265 sqm
Survey date: FRIDAY 28/06/19 *Survey Type: MANUAL*

5 **NF-02-D-04** **INDUSTRIAL ESTATE** **NORFOLK**
DRAYTON HIGH ROAD
NORWICH

Edge of Town
No Sub Category
Total Gross floor area: 10673 sqm
Survey date: WEDNESDAY 14/09/22 *Survey Type: MANUAL*

6 **NS-02-D-01** **INDUSTRIAL ESTATE** **NORTH SOMERSET**
WINTERSTOKE ROAD
WESTON-SUPER-MARE
OLDMIXON
Edge of Town
Industrial Zone
Total Gross floor area: 27000 sqm
Survey date: THURSDAY 15/09/22 *Survey Type: MANUAL*

7 **NY-02-D-03** **INDUSTRIAL ESTATE** **NORTH YORKSHIRE**
RACECOURSE ROAD
RICHMOND

Edge of Town
Out of Town
Total Gross floor area: 35183 sqm
Survey date: THURSDAY 05/05/22 *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

8 **SD-02-D-01** **INDUSTRIAL ESTATE** **SWINDON**
HEADLANDS GROVE
SWINDON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 10000 sqm
Survey date: TUESDAY 20/09/16 Survey Type: MANUAL

9 **SM-02-D-01** **INDUSTRIAL ESTATE** **SOMERSET**
A359
YEOVIL
SPARKFORD
Free Standing (PPS6 Out of Town)
Out of Town
Total Gross floor area: 12000 sqm
Survey date: WEDNESDAY 03/04/19 Survey Type: MANUAL

10 **WK-02-D-01** **INDUSTRIAL ESTATE** **WARWICKSHIRE**
CASTLE MOUND WAY
RUGBY

Edge of Town
Industrial Zone
Total Gross floor area: 150564 sqm
Survey date: WEDNESDAY 27/06/18 Survey Type: MANUAL

11 **WK-02-D-02** **INDUSTRIAL ESTATE** **WARWICKSHIRE**
OVERVIEW WAY
RUGBY

Edge of Town
Industrial Zone
Total Gross floor area: 90535 sqm
Survey date: WEDNESDAY 27/06/18 Survey Type: MANUAL

12 **WK-02-D-03** **INDUSTRIAL ESTATE** **WARWICKSHIRE**
EASTBORO WAY
NUNEATON

Edge of Town
Industrial Zone
Total Gross floor area: 20860 sqm
Survey date: THURSDAY 26/09/19 Survey Type: MANUAL

13 **WK-02-D-04** **INDUSTRIAL ESTATE** **WARWICKSHIRE**
ABELES WAY
ATHERSTONE

Edge of Town
No Sub Category
Total Gross floor area: 17500 sqm
Survey date: FRIDAY 27/09/19 Survey Type: MANUAL

14 **WO-02-D-03** **INDUSTRIAL ESTATE** **WORCESTERSHIRE**
MILLENNIUM WAY
EVESHAM

Edge of Town
Out of Town
Total Gross floor area: 84575 sqm
Survey date: TUESDAY 26/06/18 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
NM-02-D-01	Covid restrictions
TV-02-D-03	Covid restrictions

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	5	22243	0.068	5	22243	0.023	5	22243	0.091
06:00 - 07:00	6	20414	0.126	6	20414	0.046	6	20414	0.172
07:00 - 08:00	14	38701	0.284	14	38701	0.079	14	38701	0.363
08:00 - 09:00	**14**	**38701**	**0.371**	14	38701	0.127	**14**	**38701**	**0.498**
09:00 - 10:00	14	38701	0.262	14	38701	0.162	14	38701	0.424
10:00 - 11:00	14	38701	0.207	14	38701	0.169	14	38701	0.376
11:00 - 12:00	14	38701	0.201	14	38701	0.182	14	38701	0.383
12:00 - 13:00	14	38701	0.200	14	38701	0.237	14	38701	0.437
13:00 - 14:00	14	38701	0.244	14	38701	0.217	14	38701	0.461
14:00 - 15:00	14	38701	0.185	14	38701	0.252	14	38701	0.437
15:00 - 16:00	14	38701	0.156	14	38701	0.238	14	38701	0.394
16:00 - 17:00	14	38701	0.163	14	38701	0.292	14	38701	0.455
17:00 - 18:00	14	38701	0.110	**14**	**38701**	**0.355**	14	38701	0.465
18:00 - 19:00	14	38701	0.077	14	38701	0.142	14	38701	0.219
19:00 - 20:00	6	20414	0.091	6	20414	0.110	6	20414	0.201
20:00 - 21:00	6	20414	0.024	6	20414	0.051	6	20414	0.075
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.769			2.682			5.451

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	10000 - 150564 (units: sqm)
Survey date date range:	01/01/15 - 15/09/22
Number of weekdays (Monday-Friday):	14
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	2

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE

OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	5	22243	0.002	5	22243	0.003	5	22243	0.005
06:00 - 07:00	6	20414	0.006	6	20414	0.008	6	20414	0.014
07:00 - 08:00	14	38701	0.017	14	38701	0.013	14	38701	0.030
08:00 - 09:00	14	38701	0.025	14	38701	0.021	14	38701	0.046
09:00 - 10:00	**14**	**38701**	**0.032**	14	38701	0.025	**14**	**38701**	**0.057**
10:00 - 11:00	14	38701	0.029	14	38701	0.026	14	38701	0.055
11:00 - 12:00	14	38701	0.025	14	38701	0.024	14	38701	0.049
12:00 - 13:00	14	38701	0.029	14	38701	0.027	14	38701	0.056
13:00 - 14:00	14	38701	0.025	**14**	**38701**	**0.028**	14	38701	0.053
14:00 - 15:00	14	38701	0.026	14	38701	0.025	14	38701	0.051
15:00 - 16:00	14	38701	0.023	14	38701	0.027	14	38701	0.050
16:00 - 17:00	14	38701	0.017	14	38701	0.020	14	38701	0.037
17:00 - 18:00	14	38701	0.013	14	38701	0.011	14	38701	0.024
18:00 - 19:00	14	38701	0.010	14	38701	0.011	14	38701	0.021
19:00 - 20:00	6	20414	0.002	6	20414	0.002	6	20414	0.004
20:00 - 21:00	6	20414	0.002	6	20414	0.001	6	20414	0.003
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.283			0.272			0.555

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Calculation Reference: AUDIT-855401-231128-1156

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : F - WAREHOUSING (COMMERCIAL)

TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	HF	HERTFORDSHIRE	1 days
03	**SOUTH WEST**		
	DV	DEVON	1 days
04	**EAST ANGLIA**		
	SF	SUFFOLK	1 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	DR	DONCASTER	1 days
09	**NORTH**		
	TV	TEES VALLEY	1 days
	TW	TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Gross floor area
Actual Range:	22270 to 80100 (units: sqm)
Range Selected by User:	15000 to 80100 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 22/11/21

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	2 days
Thursday	2 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	4
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	4
Commercial Zone	1
Out of Town	1
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	2 days - Selected
Servicing vehicles Excluded	5 days - Selected

Secondary Filtering selection:

Use Class:

B8	7 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:
All Surveys Included

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	4 days
10,001 to 15,000	2 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	1 days
100,001 to 125,000	2 days
125,001 to 250,000	2 days
250,001 to 500,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	5 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	6 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	7 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 DR-02-F-01 TESCO DISTRIBUTION CENTRE DONCASTER
MIDDLE BANK
DONCASTER

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 80100 sqm
Survey date: TUESDAY 21/09/21 Survey Type: MANUAL

2 DV-02-F-03 LIDL DISTRIBUTION CENTRE DEVON
CHILLPARK BRAKE
NEAR EXETER
CLYST HONITON
Free Standing (PPS6 Out of Town)
Out of Town
Total Gross floor area: 49081 sqm
Survey date: MONDAY 22/11/21 Survey Type: MANUAL

3 HF-02-F-03 DISTRIBUTION CEN. HERTFORDSHIRE

HATFIELD
HATFIELD BUSINESS CEN.
Edge of Town
Commercial Zone
Total Gross floor area: 80000 sqm
Survey date: THURSDAY 10/07/08 Survey Type: MANUAL

4 LN-02-F-01 BOOK SERVICE LINCOLNSHIRE
TRENT ROAD
GRANTHAM

Edge of Town
No Sub Category
Total Gross floor area: 32300 sqm
Survey date: MONDAY 29/11/10 Survey Type: MANUAL

5 SF-02-F-02 WAREHOUSING SUFFOLK
WALTON ROAD
FELIXSTOWE

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 22270 sqm
Survey date: THURSDAY 11/07/13 Survey Type: MANUAL

6 TV-02-F-02 ARGOS WAREHOUSE TEES VALLEY
ROUNDHOUSE ROAD
DARLINGTON
FAVERDALE
Edge of Town
Industrial Zone
Total Gross floor area: 80066 sqm
Survey date: TUESDAY 07/10/08 Survey Type: MANUAL

7 TW-02-F-01 ASDA DISTRIBUTION CENTRE TYNE & WEAR
MANDARIN WAY
WASHINGTON
PATTISON IND. ESTATE
Edge of Town
Industrial Zone
Total Gross floor area: 31000 sqm
Survey date: FRIDAY 13/11/15 Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	**3**	**50484**	**0.124**	3	50484	0.039	3	50484	0.163
06:00 - 07:00	3	50484	0.054	3	50484	0.093	3	50484	0.147
07:00 - 08:00	7	53545	0.065	7	53545	0.043	7	53545	0.108
08:00 - 09:00	7	53545	0.063	7	53545	0.037	7	53545	0.100
09:00 - 10:00	7	53545	0.062	7	53545	0.047	7	53545	0.109
10:00 - 11:00	7	53545	0.055	7	53545	0.054	7	53545	0.109
11:00 - 12:00	7	53545	0.049	7	53545	0.047	7	53545	0.096
12:00 - 13:00	7	53545	0.056	7	53545	0.067	7	53545	0.123
13:00 - 14:00	7	53545	0.088	7	53545	0.073	7	53545	0.161
14:00 - 15:00	7	53545	0.063	**7**	**53545**	**0.101**	**7**	**53545**	**0.164**
15:00 - 16:00	7	53545	0.063	7	53545	0.074	7	53545	0.137
16:00 - 17:00	7	53545	0.047	7	53545	0.065	7	53545	0.112
17:00 - 18:00	7	53545	0.037	7	53545	0.059	7	53545	0.096
18:00 - 19:00	7	53545	0.021	7	53545	0.047	7	53545	0.068
19:00 - 20:00	3	50484	0.032	3	50484	0.037	3	50484	0.069
20:00 - 21:00	3	50484	0.033	3	50484	0.038	3	50484	0.071
21:00 - 22:00	1	22270	0.031	1	22270	0.018	1	22270	0.049
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.943			0.939			1.882

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	22270 - 80100 (units: sqm)
Survey date date range:	01/01/08 - 22/11/21
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

OGVS

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	3	50484	0.015	3	50484	0.013	3	50484	0.028
06:00 - 07:00	3	50484	0.022	3	50484	0.020	3	50484	0.042
07:00 - 08:00	7	53545	0.021	7	53545	0.016	7	53545	0.037
08:00 - 09:00	7	53545	0.019	7	53545	0.016	7	53545	0.035
09:00 - 10:00	7	53545	0.026	7	53545	0.022	7	53545	0.048
10:00 - 11:00	**7**	**53545**	**0.027**	**7**	**53545**	**0.028**	**7**	**53545**	**0.055**
11:00 - 12:00	7	53545	0.019	7	53545	0.018	7	53545	0.037
12:00 - 13:00	7	53545	0.019	7	53545	0.023	7	53545	0.042
13:00 - 14:00	7	53545	0.017	7	53545	0.019	7	53545	0.036
14:00 - 15:00	7	53545	0.020	7	53545	0.019	7	53545	0.039
15:00 - 16:00	7	53545	0.022	7	53545	0.018	7	53545	0.040
16:00 - 17:00	7	53545	0.018	7	53545	0.012	7	53545	0.030
17:00 - 18:00	7	53545	0.018	7	53545	0.015	7	53545	0.033
18:00 - 19:00	7	53545	0.009	7	53545	0.017	7	53545	0.026
19:00 - 20:00	3	50484	0.014	3	50484	0.022	3	50484	0.036
20:00 - 21:00	3	50484	0.015	3	50484	0.020	3	50484	0.035
21:00 - 22:00	1	22270	0.027	1	22270	0.004	1	22270	0.031
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.328			0.302			0.630

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

APPENDIX F

CENSUS DISTRIBUTION DATA

WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)

population	All usual residents aged 16 and over in employment the week before the census
units	Persons
date	2011
place of work	E02005477 : South Kesteven 002 (2011 super output area - middle layer)

usual residence	**Driving a car or van**	A	B	C	D
Newark and Sherwood	326			326	
E02005477 : South Kesteven 002	271		68	136	68
E02005481 : South Kesteven 006	173	87	87		
E02005479 : South Kesteven 004	170	85	85		
North Kesteven	156	78		78	
E02005482 : South Kesteven 007	124	62	62		
E02005478 : South Kesteven 003	113	113			
E02005480 : South Kesteven 005	110		110		
E02005476 : South Kesteven 001	94	47		47	
Melton	67		67		
E02005484 : South Kesteven 009	56		28		28
Rushcliffe	47		24		24
Lincoln	44			44	
Nottingham	31		16		16
West Lindsey	26			26	
Mansfield	19			19	
South Holland	18	9	9		
Gedling	17		4	9	4
E02005483 : South Kesteven 008	16	8	8		
Bassetlaw	13			13	
East Lindsey	12	6		6	
E02005488 : South Kesteven 013	11		11		
Derby	10		5		5
Broxtowe	10		5		5
E02005490 : South Kesteven 015	8		8		
Ashfield	8			4	4
Peterborough	7		7		
Rutland	6		6		
E02005487 : South Kesteven 012	5		5		
E02005486 : South Kesteven 011	5	3	3		
Doncaster	5			5	
Boston	5	5			
Stoke-on-Trent	4		2		2
North West Leicestershire	4		2		2
E02005485 : South Kesteven 010	4		4		
Erewash	4		2		2
South Derbyshire	4		2		2
Hinckley and Bosworth	4		2		2
Bolsover	4			4	
E02005491 : South Kesteven 016	3		3		
Warrington	3		1	2	1
North Lincolnshire	3			3	
Rotherham	3			3	
Leicester	3		2		2
Huntingdonshire	3		3		
Staffordshire Moorlands	2		1	1	1
E02005489 : South Kesteven 014	2		2		
Rossendale	2			2	
North East Lincolnshire	2			2	
Hambleton	2		2		
Harrogate	2			2	
Sheffield	2			2	
Leeds	2			2	
Wakefield	2			2	
Amber Valley	2		1	1	1
Harborough	2		2		
Northampton	2		2		
Broadland	2	1	1		
TOTALS	2,055	503	649	737	167
% using each route		24%	32%	36%	8%

APPENDIX G

ARCADY REPORT. SITE ACCESS ROUNDABOUT

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: 231128 Site Access Roundabout.j9
Path: C:\Users\ADC\ADC Infrastructure Dropbox\ADC Projects\ADC3032 Gonerby Moor\Calculations\Junction Modelling
Report generation date: 29/11/2023 09:46:43

»Traffic - 2041 With Development, AM
»Traffic - 2041 With Development, PM

Summary of junction performance

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
	Traffic - 2041 With Development					
Arm 1	0.7	3.80	0.41	0.3	3.32	0.24
Arm 2	0.1	3.48	0.12	0.3	3.18	0.22
Arm 3	0.1	2.81	0.12	0.1	2.84	0.13
Arm 4	0.1	3.26	0.07	0.2	3.24	0.15

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Site access
Location	Grantham
Site number	
Date	27/11/2023
Version	v1
Status	preliminary
Identifier	
Client	Harworth
Jobnumber	ADC3032
Enumerator	ADC-TOSHIBA-AIO\ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2041 With Development	AM	ONE HOUR	08:00	09:30	15	✓
D2	2041 With Development	PM	ONE HOUR	15:45	17:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Traffic	✓	100.000	100.000

Traffic - 2041 With Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site access	Standard Roundabout		1, 2, 3, 4	3.54	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Gonerby Lane East	
2	Caddick site access	
3	Gonerby Lane West	
4	Site access	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.65	7.09	12.8	20.0	50.0	22.5	
2	3.65	7.27	12.9	20.0	50.0	17.5	
3	3.65	7.19	12.6	20.0	50.0	22.5	
4	3.65	7.28	12.8	20.0	50.0	17.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.618	1710
2	0.632	1757
3	0.619	1715
4	0.631	1755

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2041 With Development	AM	ONE HOUR	08:00	09:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	607	100.000
2		ONE HOUR	✓	127	100.000
3		ONE HOUR	✓	165	100.000
4		ONE HOUR	✓	77	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	277	162	168
	2	120	0	7	0
	3	128	23	0	14
	4	73	0	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	6	1	6
	2	31	0	0	0
	3	2	0	0	0
	4	31	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.41	3.80	0.7	A	557	835
2	0.12	3.48	0.1	A	117	175
3	0.12	2.81	0.1	A	151	227
4	0.07	3.26	0.1	A	71	106

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	457	114	20	1622	0.282	455	241	0.0	0.4	3.083	A
2	96	24	251	1232	0.078	95	225	0.0	0.1	3.166	A
3	124	31	216	1535	0.081	124	130	0.0	0.1	2.550	A
4	58	14	203	1242	0.047	58	137	0.0	0.0	3.039	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	546	136	24	1619	0.337	545	288	0.4	0.5	3.349	A
2	114	29	300	1207	0.095	114	269	0.1	0.1	3.292	A
3	148	37	259	1505	0.099	148	155	0.1	0.1	2.652	A
4	69	17	243	1220	0.057	69	163	0.0	0.1	3.128	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	668	167	30	1616	0.414	668	353	0.5	0.7	3.791	A
2	140	35	367	1173	0.119	140	330	0.1	0.1	3.483	A
3	182	45	317	1464	0.124	182	190	0.1	0.1	2.806	A
4	85	21	298	1189	0.071	85	200	0.1	0.1	3.258	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	668	167	30	1616	0.414	668	353	0.7	0.7	3.797	A
2	140	35	368	1173	0.119	140	330	0.1	0.1	3.483	A
3	182	45	317	1464	0.124	182	190	0.1	0.1	2.807	A
4	85	21	298	1189	0.071	85	200	0.1	0.1	3.259	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	546	136	24	1619	0.337	546	289	0.7	0.5	3.359	A
2	114	29	301	1207	0.095	114	270	0.1	0.1	3.294	A
3	148	37	259	1505	0.099	148	156	0.1	0.1	2.656	A
4	69	17	244	1220	0.057	69	164	0.1	0.1	3.129	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	457	114	20	1622	0.282	457	242	0.5	0.4	3.095	A
2	96	24	252	1232	0.078	96	226	0.1	0.1	3.168	A
3	124	31	217	1535	0.081	124	130	0.1	0.1	2.554	A
4	58	14	204	1242	0.047	58	137	0.1	0.0	3.043	A

Traffic - 2041 With Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site access	Standard Roundabout		1, 2, 3, 4	3.18	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2041 With Development	PM	ONE HOUR	15:45	17:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	313	100.000
2		ONE HOUR	✓	284	100.000
3		ONE HOUR	✓	169	100.000
4		ONE HOUR	✓	173	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	111	134	68
	2	264	0	20	0
	3	158	7	0	4
	4	161	0	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	32	1	32
	2	11	0	0	0
	3	0	0	0	0
	4	11	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.24	3.32	0.3	A	287	431
2	0.22	3.18	0.3	A	261	391
3	0.13	2.84	0.1	A	155	233
4	0.15	3.24	0.2	A	159	238

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	236	59	14	1433	0.164	235	438	0.0	0.2	3.004	A
2	214	53	161	1492	0.143	213	89	0.0	0.2	2.813	A
3	127	32	249	1537	0.083	127	125	0.0	0.1	2.553	A
4	130	33	322	1395	0.093	130	54	0.0	0.1	2.846	A

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	281	70	17	1431	0.197	281	524	0.2	0.2	3.130	A
2	255	64	192	1472	0.173	255	106	0.2	0.2	2.958	A
3	152	38	298	1502	0.101	152	149	0.1	0.1	2.665	A
4	156	39	385	1356	0.115	155	65	0.1	0.1	2.998	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	345	86	21	1429	0.241	344	641	0.2	0.3	3.318	A
2	313	78	235	1444	0.216	312	130	0.2	0.3	3.180	A
3	186	47	365	1454	0.128	186	183	0.1	0.1	2.838	A
4	190	48	472	1303	0.146	190	79	0.1	0.2	3.235	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	345	86	21	1429	0.241	345	642	0.3	0.3	3.318	A
2	313	78	236	1444	0.217	313	130	0.3	0.3	3.180	A
3	186	47	366	1454	0.128	186	183	0.1	0.1	2.838	A
4	190	48	472	1303	0.146	190	79	0.2	0.2	3.235	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	281	70	17	1431	0.197	282	525	0.3	0.2	3.131	A
2	255	64	193	1472	0.173	256	106	0.3	0.2	2.962	A
3	152	38	299	1502	0.101	152	149	0.1	0.1	2.667	A
4	156	39	386	1356	0.115	156	65	0.2	0.1	3.002	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	236	59	14	1433	0.164	236	439	0.2	0.2	3.007	A
2	214	53	161	1492	0.143	214	89	0.2	0.2	2.819	A
3	127	32	250	1536	0.083	127	125	0.1	0.1	2.554	A
4	130	33	323	1394	0.093	130	54	0.1	0.1	2.848	A

APPENDIX H

ARCADY REPORT. A1 INTERCHANGE WESTERN ROUNDABOUT

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 231128 Western Dumbell Roundabout.j9
Path: C:\Users\ADC\ADC Infrastructure Dropbox\ADC Projects\ADC3032 Gonerby Moor\Calculations\Junction Modelling
Report generation date: 29/11/2023 09:45:49

»Traffic - 2023 Observed, AM
»Traffic - 2023 Observed, PM
»Traffic - 2041 Background, AM
»Traffic - 2041 Background, PM
»Traffic - 2041 With Development, AM
»Traffic - 2041 With Development, PM

Summary of junction performance

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
	Traffic - 2023 Observed					
Arm A	0.4	3.96	0.29	0.5	4.02	0.34
Arm B	0.4	5.05	0.29	0.3	4.93	0.24
Arm C	0.1	4.24	0.12	0.2	4.32	0.15
	Traffic - 2041 Background					
Arm A	0.5	4.29	0.35	0.9	5.02	0.47
Arm B	1.0	7.32	0.50	0.7	7.11	0.43
Arm C	0.2	5.38	0.19	0.3	5.71	0.22
	Traffic - 2041 With Development					
Arm A	1.4	6.66	0.59	1.4	6.56	0.58
Arm B	4.6	25.78	0.83	1.5	11.68	0.60
Arm C	1.0	10.43	0.51	5.5	33.00	0.86

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Gonerby Moor Interchange/Gonerby Lane
Location	Grantham
Site number	
Date	10/11/2023
Version	v1
Status	preliminary
Identifier	
Client	Harworth
Jobnumber	ADC3032
Enumerator	ADC-TOSHIBA-AIO\ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 Observed	AM	ONE HOUR	08:00	09:30	15
D2	2023 Observed	PM	ONE HOUR	15:45	17:15	15
D3	2041 Background	AM	ONE HOUR	08:00	09:30	15
D4	2041 Background	PM	ONE HOUR	15:45	17:15	15
D5	2041 With Development	AM	ONE HOUR	08:00	09:30	15
D6	2041 With Development	PM	ONE HOUR	15:45	17:15	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Traffic	100.000

Traffic - 2023 Observed, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	4.40	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	A1 Overbridge	
B	A1 Off slip	
C	B1174 Gonerby Lane	
D	A1 On slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	3.73	5.15	5.7	18.4	45.0	26.0	
B	3.75	5.43	1.6	19.6	45.0	15.3	
C	3.20	4.56	11.9	25.7	45.0	23.0	
D							✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.569	1383
B	0.568	1317
C	0.563	1316
D		

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 Observed	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	338	100.000
B		✓	259	100.000
C		✓	109	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	105	233
	B	235	0	24	0
	C	101	0	0	8
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	1	11
	B	10	0	0	0
	C	2	0	0	13
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.29	3.96	0.4	A
B	0.29	5.05	0.4	A
C	0.12	4.24	0.1	A
D				

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	254	0	1282	0.199	253	0.2	3.498	A
B	195	253	1065	0.183	194	0.2	4.129	A
C	82	351	1068	0.077	82	0.1	3.650	A
D		252						

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	304	0	1282	0.237	304	0.3	3.681	A
B	233	304	1037	0.225	233	0.3	4.475	A
C	98	420	1026	0.096	98	0.1	3.878	A
D		302						

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	372	0	1282	0.290	372	0.4	3.955	A
B	285	372	999	0.286	285	0.4	5.039	A
C	120	515	969	0.124	120	0.1	4.240	A
D		369						

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	372	0	1282	0.290	372	0.4	3.958	A
B	285	372	998	0.286	285	0.4	5.046	A
C	120	515	969	0.124	120	0.1	4.242	A
D		370						

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	304	0	1282	0.237	304	0.3	3.686	A
B	233	304	1037	0.225	233	0.3	4.485	A
C	98	421	1025	0.096	98	0.1	3.882	A
D		303						

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	254	0	1282	0.199	255	0.2	3.505	A
B	195	255	1064	0.183	195	0.2	4.143	A
C	82	353	1067	0.077	82	0.1	3.655	A
D		253						

Traffic - 2023 Observed, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	4.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 Observed	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	411	100.000
B		✓	209	100.000
C		✓	129	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	86	325
	B	192	0	13	4
	C	121	0	0	8
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	1	3
	B	10	0	0	25
	C	0	0	0	0
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.34	4.02	0.5	A
B	0.24	4.93	0.3	A
C	0.15	4.32	0.2	A
D				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	309	0	1348	0.230	308	0.3	3.460	A
B	157	308	1037	0.152	157	0.2	4.084	A
C	97	391	1084	0.090	97	0.1	3.644	A
D		235						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	369	0	1348	0.274	369	0.4	3.678	A
B	188	369	1005	0.187	188	0.2	4.404	A
C	116	468	1038	0.112	116	0.1	3.905	A
D		281						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	453	0	1348	0.336	452	0.5	4.016	A
B	230	452	961	0.240	230	0.3	4.922	A
C	142	573	975	0.146	142	0.2	4.318	A
D		344						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	453	0	1348	0.336	453	0.5	4.020	A
B	230	453	961	0.240	230	0.3	4.928	A
C	142	574	975	0.146	142	0.2	4.322	A
D		345						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	369	0	1348	0.274	370	0.4	3.681	A
B	188	370	1004	0.187	188	0.2	4.412	A
C	116	469	1037	0.112	116	0.1	3.911	A
D		282						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	309	0	1348	0.230	310	0.3	3.470	A
B	157	310	1036	0.152	158	0.2	4.097	A
C	97	393	1083	0.090	97	0.1	3.656	A
D		236						

Traffic - 2041 Background, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	5.80	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2041 Background	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	409	100.000
B		✓	450	100.000
C		✓	139	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	123	286
	B	423	0	27	0
	C	130	0	0	9
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	1	10
	B	6	0	0	0
	C	2	0	0	11
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.35	4.29	0.5	A
B	0.50	7.32	1.0	A
C	0.19	5.38	0.2	A
D				

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	308	0	1289	0.239	307	0.3	3.660	A
B	339	307	1070	0.317	337	0.5	4.901	A
C	105	531	969	0.108	104	0.1	4.159	A
D		414						

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	368	0	1289	0.285	367	0.4	3.906	A
B	405	367	1035	0.391	404	0.6	5.700	A
C	125	636	907	0.138	125	0.2	4.599	A
D		496						

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	450	0	1289	0.349	450	0.5	4.288	A
B	495	450	987	0.502	494	1.0	7.278	A
C	153	779	823	0.186	153	0.2	5.368	A
D		607						

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	450	0	1289	0.349	450	0.5	4.293	A
B	495	450	987	0.502	495	1.0	7.323	A
C	153	781	822	0.186	153	0.2	5.380	A
D		609						

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	368	0	1289	0.285	368	0.4	3.912	A
B	405	368	1034	0.391	406	0.6	5.743	A
C	125	639	906	0.138	125	0.2	4.615	A
D		499						

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	308	0	1289	0.239	308	0.3	3.671	A
B	339	308	1069	0.317	340	0.5	4.942	A
C	105	535	967	0.108	105	0.1	4.175	A
D		417						

Traffic - 2041 Background, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	5.81	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2041 Background	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	583	100.000
B		✓	344	100.000
C		✓	158	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	119	464
	B	325	0	15	4
	C	149	0	0	9
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	1	2
	B	7	0	0	25
	C	0	0	0	0
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.47	5.02	0.9	A
B	0.43	7.11	0.7	A
C	0.22	5.71	0.3	A
D				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	439	0	1358	0.323	437	0.5	3.899	A
B	259	437	996	0.260	258	0.3	4.869	A
C	119	594	968	0.123	118	0.1	4.235	A
D		355						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	524	0	1358	0.386	524	0.6	4.309	A
B	309	524	949	0.326	309	0.5	5.619	A
C	142	712	899	0.158	142	0.2	4.755	A
D		425						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	642	0	1358	0.473	641	0.9	5.010	A
B	379	641	885	0.428	378	0.7	7.076	A
C	174	871	805	0.216	174	0.3	5.697	A
D		521						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	642	0	1358	0.473	642	0.9	5.024	A
B	379	642	885	0.428	379	0.7	7.112	A
C	174	873	804	0.216	174	0.3	5.711	A
D		522						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	524	0	1358	0.386	525	0.6	4.327	A
B	309	525	948	0.326	310	0.5	5.655	A
C	142	715	897	0.158	142	0.2	4.771	A
D		427						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	439	0	1358	0.323	440	0.5	3.921	A
B	259	440	994	0.260	260	0.4	4.904	A
C	119	598	966	0.123	119	0.1	4.255	A
D		358						

Traffic - 2041 With Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	14.46	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2041 With Development	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	695	100.000
B		✓	609	100.000
C		✓	332	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	409	286
	B	423	0	186	0
	C	241	0	0	91
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	3	10
	B	6	0	7	0
	C	13	0	0	34
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.59	6.66	1.4	A
B	0.83	25.78	4.6	D
C	0.51	10.43	1.0	B
D				

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	523	0	1306	0.401	521	0.7	4.568	A
B	458	521	944	0.485	455	0.9	7.301	A
C	250	530	838	0.298	248	0.4	6.088	A
D		496						

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	625	0	1306	0.478	624	0.9	5.270	A
B	547	624	886	0.618	545	1.6	10.472	B
C	298	635	784	0.381	298	0.6	7.388	A
D		595						

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	765	0	1306	0.586	763	1.4	6.609	A
B	671	763	807	0.831	660	4.3	22.905	C
C	366	772	714	0.512	364	1.0	10.224	B
D		722						

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	765	0	1306	0.586	765	1.4	6.656	A
B	671	765	806	0.832	669	4.6	25.785	D
C	366	780	710	0.514	365	1.0	10.429	B
D		730						

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	625	0	1306	0.478	627	0.9	5.314	A
B	547	627	884	0.619	559	1.7	11.432	B
C	298	646	779	0.383	300	0.6	7.546	A
D		606						

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	523	0	1306	0.401	524	0.7	4.610	A
B	458	524	942	0.487	461	1.0	7.529	A
C	250	536	835	0.299	251	0.4	6.170	A
D		502						

Traffic - 2041 With Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Gonerby Moor Interchange Small Roundabout	Standard Roundabout		A, B, C, D	16.98	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2041 With Development	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	691	100.000
B		✓	415	100.000
C		✓	582	100.000
D				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	0	227	464
	B	325	0	86	4
	C	402	0	0	180
	D	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	13	2
	B	7	0	33	25
	C	6	0	0	13
	D	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
A	0.58	6.56	1.4	A
B	0.60	11.68	1.5	B
C	0.86	33.00	5.5	D
D				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	520	0	1309	0.397	518	0.7	4.533	A
B	312	518	894	0.349	310	0.5	6.143	A
C	438	594	895	0.490	434	0.9	7.753	A
D		543						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	621	0	1309	0.474	620	0.9	5.217	A
B	373	620	840	0.444	372	0.8	7.684	A
C	523	711	831	0.629	520	1.6	11.479	B
D		651						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	761	0	1309	0.581	759	1.4	6.519	A
B	457	759	766	0.597	454	1.4	11.468	B
C	641	870	745	0.860	627	5.0	27.822	D
D		789						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	761	0	1309	0.581	761	1.4	6.563	A
B	457	761	765	0.598	457	1.5	11.683	B
C	641	873	744	0.862	639	5.5	33.000	D
D		799						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	621	0	1309	0.474	623	0.9	5.261	A
B	373	623	838	0.445	376	0.8	7.827	A
C	523	716	829	0.631	538	1.8	12.994	B
D		666						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	520	0	1309	0.397	521	0.7	4.575	A
B	312	521	892	0.350	314	0.5	6.233	A
C	438	599	892	0.491	441	1.0	8.035	A
D		550						

APPENDIX I

ARCADY REPORT. A1 INTERCHANGE EASTERN ROUNDABOUT

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.5.0.6896 © Copyright TRL Limited, 2018
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Filename: 231128 Eastern Dumbell Roundabout.j9
Path: C:\Users\ADC\ADC Infrastructure Dropbox\ADC Projects\ADC3032 Gonerby Moor\Calculations\Junction Modelling
Report generation date: 29/11/2023 09:47:23

Summary of junction performance

	AM		
	Queue (Veh)	Delay (s)	RFC
	2023 Observed AM - 2023 Observed		
Arm A	0.3	2.23	0.25
Arm C	0.2	1.95	0.17
Arm D	0.2	2.11	0.19

	PM		
	Queue (Veh)	Delay (s)	RFC
	2023 Observed PM - 2023 Observed		
Arm A	0.4	2.16	0.27
Arm C	0.2	1.84	0.15
Arm D	0.2	1.91	0.18

	AM		
	Queue (Veh)	Delay (s)	RFC
	2041 Background AM - 2041 Background		
Arm A	0.5	2.66	0.34
Arm C	0.4	2.17	0.27
Arm D	0.4	2.66	0.28

	PM		
	Queue (Veh)	Delay (s)	RFC
	2041 Background PM - 2041 Background		
Arm A	0.9	3.12	0.48
Arm C	0.3	2.00	0.23
Arm D	0.3	2.26	0.24

	AM		
	Queue (Veh)	Delay (s)	RFC
	2041 With Development AM - 2041 With Development		
Arm A	0.9	3.82	0.46
Arm C	0.5	2.46	0.34
Arm D	0.7	3.58	0.42

	PM		
	Queue (Veh)	Delay (s)	RFC
	2041 With Development PM - 2041 With Development		
Arm A	1.4	4.53	0.58
Arm C	0.5	2.43	0.35
Arm D	0.5	3.26	0.35

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	A1/B1174 Gonerby Moor Interchange/Great North Road
Location	Grantham
Site number	
Date	22/11/2023
Version	v 1
Status	preliminary
Identifier	
Client	Harworth
Jobnumber	ADC3032
Enumerator	ADC-TOSHIBA-AIO\ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Observed	AM	ONE HOUR	07:45	09:15	15	✓
D2	2023 Observed	PM	ONE HOUR	16:00	17:30	15	✓
D3	2041 Background	AM	ONE HOUR	07:45	09:15	15	✓
D4	2041 Background	PM	ONE HOUR	16:00	17:30	15	✓
D5	2041 With Development	AM	ONE HOUR	07:45	09:15	15	✓
D6	2041 With Development	PM	ONE HOUR	16:00	17:30	15	✓

2023 Observed AM - 2023 Observed , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set (s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	2023 Observed AM	✓	✓	D1	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	2.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	75	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	1.034	2604
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Observed	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	493	100.000
B					
C		ONE HOUR	✓	345	100.000
D		ONE HOUR	✓	364	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	222	271	0
	B	0	0	0	0
	C	274	71	0	0
	D	286	29	49	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	16	8	0
	B	0	0	0	0
	C	5	23	0	0
	D	9	24	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.25	2.23	0.3	A	452	679
B						
C	0.17	1.95	0.2	A	317	475
D	0.19	2.11	0.2	A	334	501

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	371	93	112	2212	0.168	370	421	0.0	0.2	1.954	A
B			240				242				
C	260	65	0	2224	0.117	259	240	0.0	0.1	1.831	A
D	274	69	259	2234	0.123	273	0	0.0	0.1	1.835	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	443	111	134	2188	0.203	443	503	0.2	0.3	2.063	A
B			288				289				
C	310	78	0	2224	0.139	310	288	0.1	0.2	1.879	A
D	327	82	310	2179	0.150	327	0	0.1	0.2	1.943	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	543	136	164	2155	0.252	542	616	0.3	0.3	2.232	A
B			352				354				
C	380	95	0	2224	0.171	380	352	0.2	0.2	1.951	A
D	401	100	380	2104	0.190	401	0	0.2	0.2	2.113	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	543	136	164	2155	0.252	543	617	0.3	0.3	2.232	A
B			352				355				
C	380	95	0	2224	0.171	380	352	0.2	0.2	1.951	A
D	401	100	380	2104	0.190	401	0	0.2	0.2	2.113	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	443	111	134	2187	0.203	444	504	0.3	0.3	2.065	A
B			288				290				
C	310	78	0	2224	0.139	310	288	0.2	0.2	1.880	A
D	327	82	310	2179	0.150	327	0	0.2	0.2	1.945	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	371	93	112	2211	0.168	371	422	0.3	0.2	1.958	A
B			241				243				
C	260	65	0	2224	0.117	260	241	0.2	0.1	1.834	A
D	274	69	260	2233	0.123	274	0	0.2	0.1	1.836	A

2023 Observed PM - 2023 Observed , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set (s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	2023 Observed PM	✓	✓	D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	2.00	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	78	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	1.033	2603
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 Observed	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	567	100.000
B					
C		ONE HOUR	✓	315	100.000
D		ONE HOUR	✓	364	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	216	351	0
	B	0	0	0	0
	C	243	72	0	0
	D	280	28	56	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	8	3	0
	B	0	0	0	0
	C	3	11	0	0
	D	1	25	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.27	2.16	0.4	A	520	780
B						
C	0.15	1.84	0.2	A	289	434
D	0.18	1.91	0.2	A	334	501

Main Results for each time segment

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	427	107	117	2354	0.181	426	393	0.0	0.2	1.867	A
B			306				237				
C	237	59	0	2306	0.103	237	306	0.0	0.1	1.738	A
D	274	69	237	2410	0.114	274	0	0.0	0.1	1.684	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	510	127	140	2328	0.219	509	470	0.2	0.3	1.979	A
B			366				284				
C	283	71	0	2306	0.123	283	366	0.1	0.1	1.778	A
D	327	82	283	2359	0.139	327	0	0.1	0.2	1.771	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	624	156	172	2294	0.272	624	576	0.3	0.4	2.155	A
B			448				348				
C	347	87	0	2306	0.150	347	448	0.1	0.2	1.836	A
D	401	100	347	2288	0.175	401	0	0.2	0.2	1.906	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	624	156	172	2294	0.272	624	576	0.4	0.4	2.155	A
B			448				348				
C	347	87	0	2306	0.150	347	448	0.2	0.2	1.836	A
D	401	100	347	2288	0.175	401	0	0.2	0.2	1.906	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	510	127	140	2328	0.219	510	470	0.4	0.3	1.980	A
B			366				284				
C	283	71	0	2306	0.123	283	366	0.2	0.1	1.781	A
D	327	82	283	2358	0.139	327	0	0.2	0.2	1.774	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	427	107	117	2353	0.181	427	394	0.3	0.2	1.868	A
B			307				238				
C	237	59	0	2306	0.103	237	307	0.1	0.1	1.739	A
D	274	69	237	2409	0.114	274	0	0.2	0.1	1.688	A

2041 Background AM - 2041 Background, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set (s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	2041 Background AM	✓	✓	D3	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	2.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	133	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	1.023	2591
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2041 Background	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	632	100.000
B					
C		ONE HOUR	✓	563	100.000
D		ONE HOUR	✓	483	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	298	334	0
	B	0	0	0	0
	C	414	149	0	0
	D	366	62	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	13	8	0
	B	0	0	0	0
	C	4	12	0	0
	D	8	13	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.34	2.66	0.5	A	580	870
B						
C	0.27	2.17	0.4	A	517	775
D	0.28	2.66	0.4	A	443	665

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	476	119	200	2142	0.222	475	586	0.0	0.3	2.158	A
B			292				382				
C	424	106	0	2278	0.186	423	292	0.0	0.2	1.939	A
D	364	91	423	2097	0.173	363	0	0.0	0.2	2.075	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	568	142	239	2102	0.270	568	701	0.3	0.4	2.346	A
B			349				457				
C	506	127	0	2278	0.222	506	349	0.2	0.3	2.031	A
D	434	109	506	2008	0.216	434	0	0.2	0.3	2.286	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	696	174	293	2047	0.340	695	858	0.4	0.5	2.661	A
B			428				560				
C	620	155	0	2278	0.272	620	428	0.3	0.4	2.170	A
D	532	133	620	1887	0.282	531	0	0.3	0.4	2.656	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	696	174	293	2047	0.340	696	859	0.5	0.5	2.664	A
B			428				560				
C	620	155	0	2278	0.272	620	428	0.4	0.4	2.170	A
D	532	133	620	1886	0.282	532	0	0.4	0.4	2.656	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	568	142	239	2102	0.270	569	702	0.5	0.4	2.350	A
B			350				458				
C	506	127	0	2278	0.222	506	350	0.4	0.3	2.033	A
D	434	109	506	2008	0.216	435	0	0.4	0.3	2.289	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	476	119	200	2142	0.222	476	588	0.4	0.3	2.163	A
B			293				383				
C	424	106	0	2278	0.186	424	293	0.3	0.2	1.941	A
D	364	91	424	2096	0.174	364	0	0.3	0.2	2.080	A

2041 Background PM - 2041 Background, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set (s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	2041 Background PM	✓	✓	D4	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	2.63	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	125	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	1.024	2593
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2041 Background	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	961	100.000
B					
C		ONE HOUR	✓	476	100.000
D		ONE HOUR	✓	464	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	444	517	0
	B	0	0	0	0
	C	344	132	0	0
	D	346	55	63	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	4	3	0
	B	0	0	0	0
	C	3	7	0	0
	D	1	15	3	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.48	3.12	0.9	A	882	1323
B						
C	0.23	2.00	0.3	A	437	655
D	0.24	2.26	0.3	A	426	639

Main Results for each time segment

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	723	181	188	2305	0.314	722	518	0.0	0.5	2.271	A
B			436				474				
C	358	90	0	2322	0.154	358	436	0.0	0.2	1.832	A
D	349	87	358	2287	0.153	349	0	0.0	0.2	1.856	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	864	216	225	2266	0.381	863	620	0.5	0.6	2.564	A
B			521				567				
C	428	107	0	2322	0.184	428	521	0.2	0.2	1.899	A
D	417	104	428	2210	0.189	417	0	0.2	0.2	2.007	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	1058	265	275	2212	0.478	1057	759	0.6	0.9	3.113	A
B			638				694				
C	524	131	0	2322	0.226	524	638	0.2	0.3	2.001	A
D	511	128	524	2104	0.243	511	0	0.2	0.3	2.259	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	1058	265	275	2212	0.478	1058	760	0.9	0.9	3.118	A
B			639				695				
C	524	131	0	2322	0.226	524	639	0.3	0.3	2.001	A
D	511	128	524	2104	0.243	511	0	0.3	0.3	2.259	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	864	216	225	2266	0.381	865	621	0.9	0.6	2.571	A
B			522				568				
C	428	107	0	2322	0.184	428	522	0.3	0.2	1.902	A
D	417	104	428	2209	0.189	417	0	0.3	0.2	2.010	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	723	181	188	2305	0.314	724	520	0.6	0.5	2.279	A
B			437				475				
C	358	90	0	2322	0.154	359	437	0.2	0.2	1.835	A
D	349	87	359	2286	0.153	350	0	0.2	0.2	1.861	A

2041 With Development AM - 2041 With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	2041 With Development AM	✓	✓	D5	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	3.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	260	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.999	2561
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2041 With Development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	741	100.000
B					
C		ONE HOUR	✓	674	100.000
D		ONE HOUR	✓	660	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	298	443	0
	B	0	0	0	0
	C	449	225	0	0
	D	366	62	232	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	13	6	0
	B	0	0	0	0
	C	4	21	0	0
	D	8	13	7	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.46	3.82	0.9	A	680	1020
B						
C	0.34	2.46	0.5	A	618	928
D	0.42	3.58	0.7	A	606	908

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	558	139	390	1947	0.287	556	612	0.0	0.4	2.587	A
B			507				439				
C	507	127	0	2204	0.230	506	507	0.0	0.3	2.119	A
D	497	124	506	1993	0.249	496	0	0.0	0.3	2.401	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	666	167	466	1867	0.357	666	732	0.4	0.6	2.995	A
B			606				526				
C	606	151	0	2204	0.275	606	606	0.3	0.4	2.251	A
D	593	148	606	1883	0.315	593	0	0.3	0.5	2.788	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	816	204	571	1757	0.464	815	896	0.6	0.9	3.813	A
B			742				643				
C	742	186	0	2204	0.337	742	742	0.4	0.5	2.461	A
D	727	182	742	1733	0.419	726	0	0.5	0.7	3.571	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	816	204	571	1757	0.464	816	897	0.9	0.9	3.824	A
B			743				644				
C	742	186	0	2204	0.337	742	743	0.5	0.5	2.461	A
D	727	182	742	1732	0.419	727	0	0.7	0.7	3.578	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	666	167	467	1866	0.357	667	734	0.9	0.6	3.006	A
B			608				527				
C	606	151	0	2204	0.275	606	608	0.5	0.4	2.253	A
D	593	148	606	1882	0.315	594	0	0.7	0.5	2.796	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	558	139	391	1945	0.287	558	614	0.6	0.4	2.596	A
B			509				441				
C	507	127	0	2204	0.230	508	509	0.4	0.3	2.123	A
D	497	124	508	1991	0.250	497	0	0.5	0.3	2.410	A

2041 With Development PM - 2041 With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Large Roundabout	Arm B - Large roundabout data	Large Roundabout Circulating Flow is zero for one or more arms.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	2041 With Development PM	✓	✓	D6	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Large Roundabout		A, B, C, D	3.54	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1174 Great North Road	
B	A1 SB On Slip	
C	A1 Overbridge	
D	A1 SB Off Slip	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.00	6.40	28.4	20.0	80.0	27.0	
B							✓
C	4.30	6.00	9.0	12.0	80.0	26.0	
D	6.00	6.00	0.0	43.7	80.0	26.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A	241	23.00
B	0	0.00
C	0	20.00
D	0	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	1.003	2566
B		
C	0.968	2418
D	1.090	2760

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2041 With Development	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	993	100.000
B					
C		ONE HOUR	✓	729	100.000
D		ONE HOUR	✓	540	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	444	549	0
	B	0	0	0	0
	C	442	287	0	0
	D	346	55	139	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	4	3	0
	B	0	0	0	0
	C	2	12	0	0
	D	1	15	22	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A	0.58	4.53	1.4	A	911	1367
B						
C	0.35	2.43	0.5	A	669	1003
D	0.35	3.26	0.5	A	496	743

Main Results for each time segment

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	748	187	361	2077	0.360	745	592	0.0	0.6	2.699	A
B			516				590				
C	549	137	0	2282	0.240	548	516	0.0	0.3	2.074	A
D	407	102	548	1973	0.206	406	0	0.0	0.3	2.295	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	893	223	432	1998	0.447	892	708	0.6	0.8	3.252	A
B			618				706				
C	655	164	0	2282	0.287	655	618	0.3	0.4	2.212	A
D	485	121	655	1858	0.261	485	0	0.3	0.4	2.621	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	1093	273	529	1889	0.579	1091	867	0.8	1.4	4.497	A
B			756				864				
C	803	201	0	2282	0.352	802	756	0.4	0.5	2.432	A
D	595	149	802	1701	0.350	594	0	0.4	0.5	3.251	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	1093	273	530	1889	0.579	1093	868	1.4	1.4	4.525	A
B			757				865				
C	803	201	0	2282	0.352	803	757	0.5	0.5	2.432	A
D	595	149	803	1700	0.350	595	0	0.5	0.5	3.255	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	893	223	433	1997	0.447	895	709	1.4	0.8	3.275	A
B			620				708				
C	655	164	0	2282	0.287	656	620	0.5	0.4	2.215	A
D	485	121	656	1857	0.261	486	0	0.5	0.4	2.628	A

17:15 - 17:30

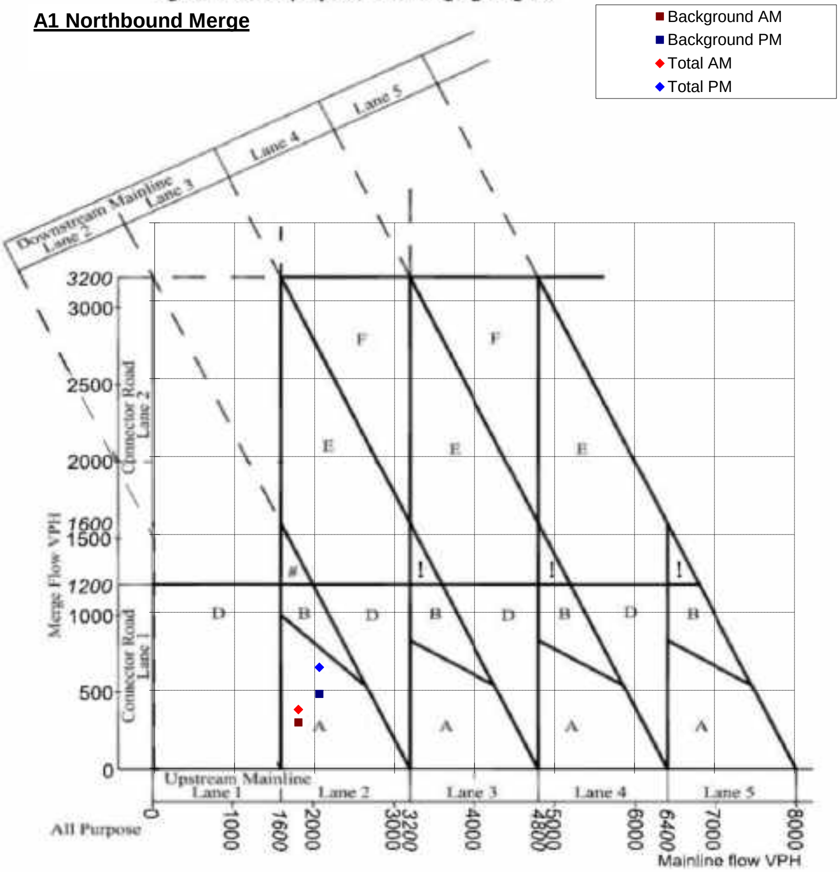
Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A	748	187	362	2075	0.360	749	594	0.8	0.6	2.714	A
B			519				592				
C	549	137	0	2282	0.240	549	519	0.4	0.3	2.077	A
D	407	102	549	1972	0.206	407	0	0.4	0.3	2.301	A

APPENDIX J

A1 MERGE/DIVERGE ASSESSMENT

A1 Northbound Merge Assessment

Figure 3.12a All-purpose road merging diagram



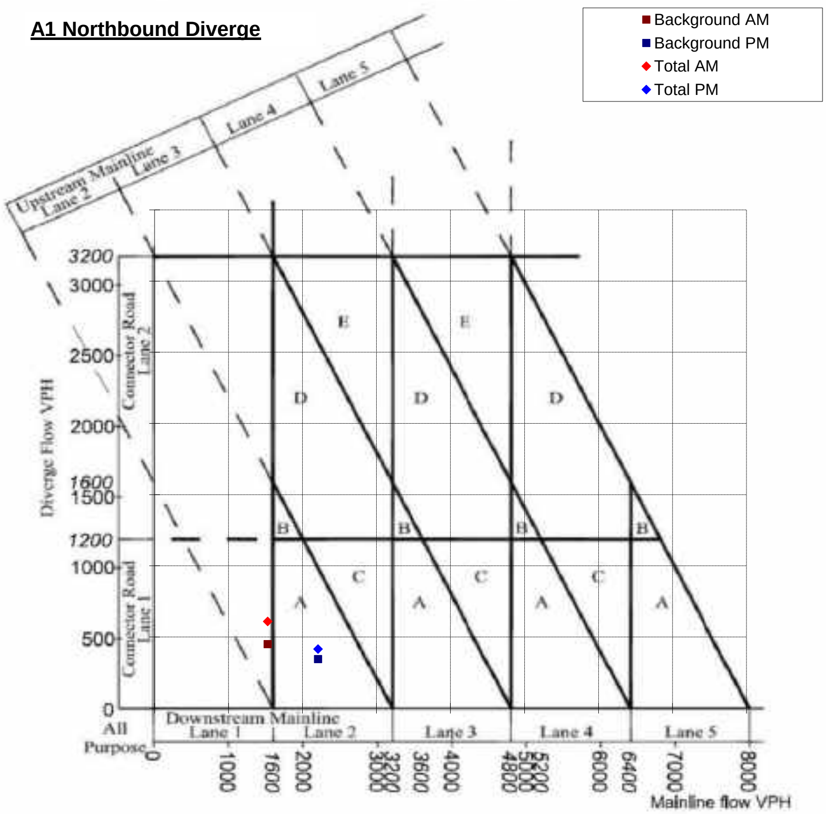
Background AM		
	1799	295
Background PM		
	2061	477
Total AM		
	1799	377
Total PM		
	2061	648
	Upstream Mainline	Merging Slip

A1 Northbound Merge Assessment

A1 Northbound Diverge Assessment

CD 122 Version 1.1.1 3. Full grade separated: merges and diverges

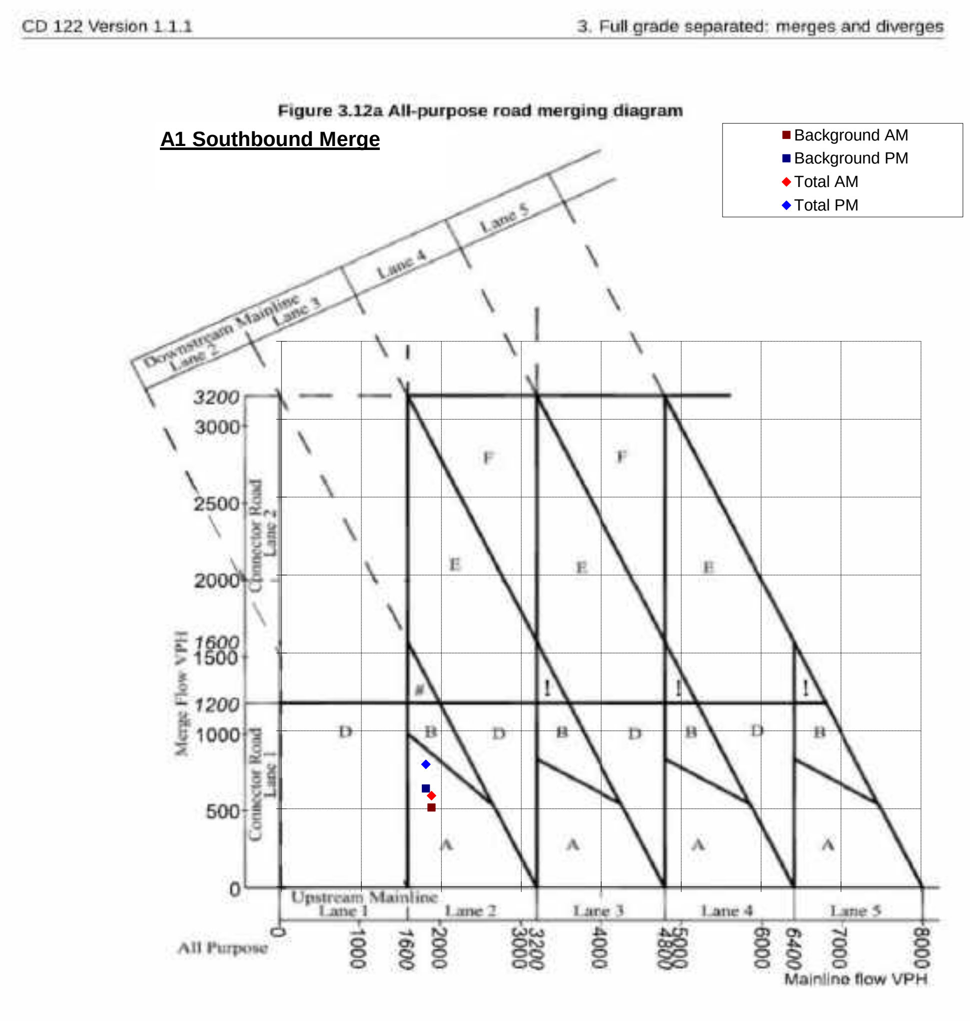
Figure 3.26a All-purpose road diverging diagram



	Downstream Mainline	Diverge Slip
Background AM	1528	450
Background PM	2209	344
Total AM	1528	609
Total PM	2209	415

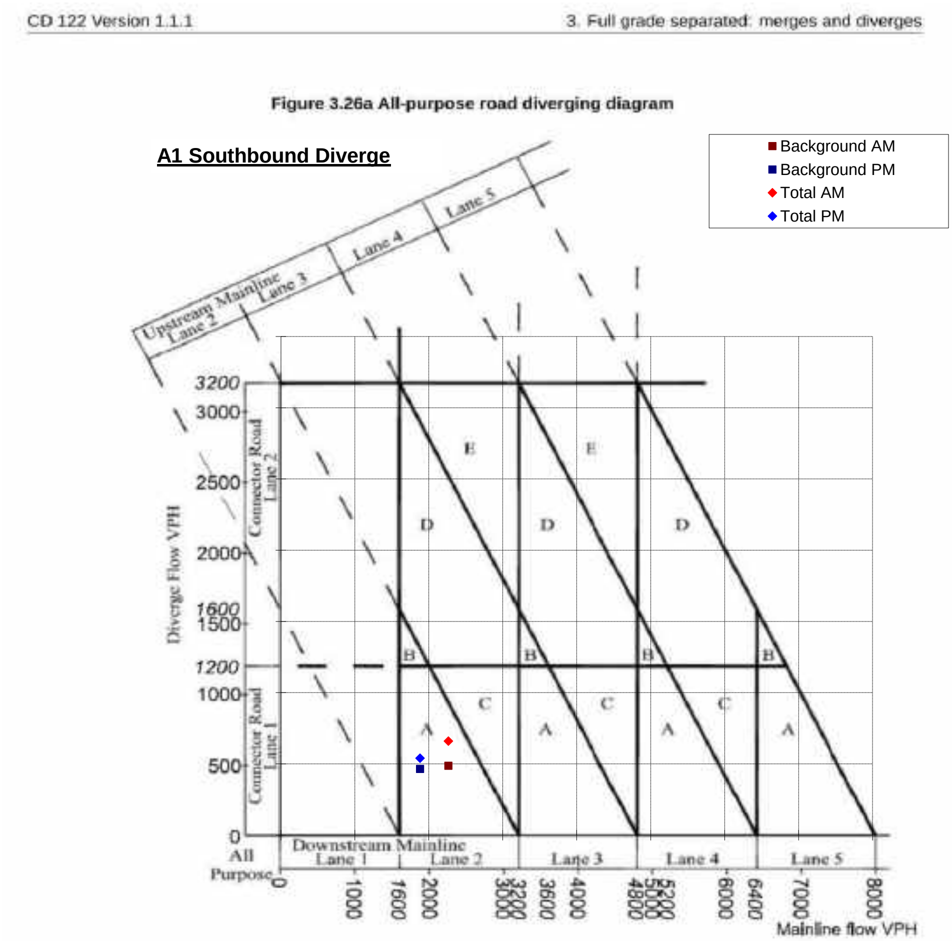
A1 Southbound Merge Assessment

A1 Southbound Diverge Assessment



Background AM		
	1878	509
Background PM		
	1807	631
Total AM		
	1878	585
Total PM		
	1807	786
	Upstream Mainline	Merging Slip

A1 Southbound Diverge Assessment



	Downstream Mainline	Diverge Slip
Background AM	2263	486
Background PM	1879	464
Total AM	2263	660
Total PM	1879	540

APPENDIX 3. INITIAL LANDSCAPE & VISUAL TECHNICAL NOTE (LVTN) (ASPECT LANDSCAPE PLANNING)

Initial Landscape & Visual Technical Note

Caddick Group – Land south of Gonerby Lane, Gonerby Moor

June 2022

1 Introduction

1.1. It is understood that the Caddick Group require initial input to support local plan promotion discussions for a 2.5m + sq. ft. development of strategic B8 / B2 land use at land south of Gonerby Lane, Gonerby Moor. Aspect Landscape Planning Ltd has been commissioned to review potential landscape and visual matters and provide an overview of any likely landscape constraints and opportunities present within the site. A desktop study and site visit have been undertaken alongside a high-level review of the landscape and visual situation in order to provide recommendations for developing the site and any necessary landscape mitigation that may be required.

1.2. This technical note provides an overview of the baseline landscape and visual situation and potential landscape and visual effects providing further information to support the associated Landscape Opportunities and Constraints Plan attached. It is anticipated that a full Landscape and Visual Impact Assessment will be undertaken at the appropriate planning stage.

2 Baseline Assessment

2.1. The site is in Lincolnshire 3 miles north of Grantham on the B1174 or via the A1. The site is immediate southwest of the A1 / B1174 junction which gives access to Great Gonerby. The site is a rectilinear shaped parcel of open land that comprises of three large, grassed fields. The land falls from higher ground east of the A1, and the escarpment of Great Gonerby, towards lower and more even ground to the west. The site is adjacent to A1 on its eastern boundary, Gonerby Lane on its northern boundary, Pasture Farm and Vale Farm to the west, and the East Midlands railway line between Ancaster and Grantham to the south.

2.2. The site is presently used for arable agriculture and is open ground. The boundaries of the site consist of remnant hedgerow species in places but are largely open with field ditches separating them. A landscape buffer of new tree planting screens the site from the traffic of the A1 on its eastern boundary. Beyond the north-eastern corner of site, adjacent to the A1 junction, is a small triangle of land outside agricultural use that has reverted to partial scrub with seeded hedgerow species, bramble, and taller grasses. This also acts as a landscape buffer for the site from the A1 and its junction.

2.3. Features of note within the vicinity of site include the Grantham Moor retail estate which houses the Boundary Outlet shop and Downtown Garden Centre. This is located on the eastern side of the A1 adjacent to the site. To the south of the retail park is an industrial estate containing businesses like DLS Plastics and Fresh Fayre, Grantham. To the north of the retail park, is a service station and Travelodge on the eastern side of the A1 junction. To the southeast of the site, elevated on an escarpment, is the village of Great Gonerby. This village is a satellite settlement from Grantham which is a much larger settlement further south. To the south of the site, is the village of Barrowby another small rural village in an elevated position overlooking the Vale of Belvoir and another satellite village of Grantham. To the west of the site, is open countryside with a range of irregular field sizes and mix of pasture and arable fields. This landscape contains an SSSI at Allington meadows, Equestrian centre, agriculture related businesses like Solis Tractors and Allington Gardens retirement park. Within this landscape are also the villages of Allington and Sedgebrook.

2.4. There are two vehicular access points onto the site from Gonerby Lane on the northern boundary. One of these gives direct access to the top field of the site but is presently blocked off. The second is an access road that leads to a small attenuation pond adjacent to the A1 in the north-eastern corner of the site. On the western boundary, there is a track access to the site that passes through the yard of Pasture Farm. On the southern boundary, Allington Lane terminates close to the southern boundary of site providing access to a solar farm that is adjacent to the southern boundary and the railway line. The A1 is a barrier to access along the eastern boundary of site.

2.5. The localised landscape has a varied topography of hills, slopes, and low-lying waterbodies. Generally, the site slopes down from its southern eastern corner towards the northwest falling from 50 AOD to 35 AOD. To the east of the site, beyond the A1, the land rises steeply to form an escarpment aligned northeast / southwest. The village of Great Gonerby is perched on the top of this escarpment at 100m AOD with views towards the site. On the far side of this escarpment, the river Witham meanders through the landscape heading north towards Lincoln via the centre of Grantham. To the west of the site, is Foston Beck, a chalk stream and tributary of the river Witham which it joins 5km to the north. The open field ditches around the site, and adjacent fields to the west, form a network of watercourses that connect into the Foston Beck. The other water body of note, within the vicinity of the site, is the Grantham Canal which runs 5 km to the south.

2.6. Overall, the landform and vegetation structure result in views towards and over the site being most open from the countryside in the west, and from Gonerby Lane in the north. The site is also open to views from the elevated ground in the east, but as the landform slopes away from the A1, it is often obscured by intervening buildings, topography, or vegetation.

2.7. The location and context of the site is illustrated on **ASP1** Site Location Plan and **ASP2** Site and Setting Plan.

Vegetation Cover

2.8. Internally, vegetation cover is mainly absent from the site because of agricultural land use. The boundaries are partially edged by hedgerow with the most continuous sections found along the eastern edge of the site providing screening from the A1. Additionally, on this boundary there are some tree planting strips also planted to screen the A1. The only other hedgerows adjacent to site are found along the western and southwestern edge of the top field, which seem to be a remnant of past agricultural field use, and newly planted hedgerow around the solar farm to the south of the site. One mature tree (possibly sycamore) has been retained in the top field of the site.

Public Rights of Way (PRoW)

2.9. There is one PRoW on the site (GtGo/1/2) which is classed as a bridleway and runs from Gonerby Lane in the north-eastern corner of the site parallel with the A1 along the eastern boundary of the site. This route was not obvious from Gonerby Lane and looked like a privately accessible access road to the attenuation pond. It did not look regularly used possibly due to the proximity of the A1 and the consequent traffic noise. The other PRoW near the site is GtGo 2/6 which passes between the retail and industrial estate on the eastern side of the site on the opposite side of the A1. The route begins in Great Gonerby on elevated ground with long views over the countryside but ends in the retail estate where again it did not look like a well-used route and was heavily overgrown. The reason for this was again likely to be the unattractive environment of the route, the impact of traffic noise and the difficulty of crossing the A1 safely with very fast-moving traffic.

2.10. In the wider area, there is a restricted byway that heads west from Great Gonerby towards Thorns farm. This route was well used by dog walkers to access the woodland of Barrowby Thorns which is on the slope adjacent to the A1. This route does not connect well with its continuation west over the A1 due to the lack of a pedestrian crossing point and the fast-moving traffic. Consequently, this route did not look well used and its approaches to the A1 were overgrown and poorly accessible.

2.11. In the countryside to the west of the site, PRoW (Alli/4/5) leads from the village of Allington past the Allington Park Gardens retirement village towards Vale farm and Allington Lane. Where this route crosses Foston Beck, it becomes classed as a restricted byway Barr/2/4. This route looks like it receives some use from walkers from the retirement village who may use it to walk to the village of Barrowby.

Landscape Related Policy

Lincolnshire County Council - Corporate Environmental Policy

2.12. The County council has ten principles in place to protect the local environment and minimise the impact of development on the county. These include reducing greenhouse gas emissions, minimising water consumption, using sustainable materials, responsible waste management, and minimising pollution. The principle of most direct relevance to the landscape is protecting and enhancing the natural, historic, and built environment. The aim of this principle is to '**protect and enhance Lincolnshire's distinctive natural and historic landscape character; promote renewable energy; encourage wildlife and increase biodiversity and protect, enhance, and conserve the buildings and on its land.**'

2.13. Lincolnshire County Council – Green Masterplan (2020 – 2025)

2.14. The county council has a multi-year programme of projects that will run until 2050 to ensure that the council meets national carbon reduction targets. This includes reducing carbon dioxide emissions by 20%, utilising LED lighting, installing low carbon heating, solar panels, electric vehicles, smart working and using a climate change risk assessment. While many of these measures are internal, they reflect the council's priority of promoting environmentally responsible development.

South Kesteven Adopted Core strategy (July 2010)

2.15. Policy ENV1 Protection and Enhancement of the Character of the District states that '**all development must be appropriate to the character and significant natural, historic and cultural attributes and features of the landscape within which it is situated, and contribute to its conservation, enhancement or restoration.'** It then lists the criteria that development proposals and site allocations will be assessed in relation to. This includes local distinctiveness and sense of place; historic patterns and layouts; layout and scale of buildings; quality and character of the built fabric; condition of the landscape; biodiversity and ecological networks; public access; remoteness and tranquillity; visual intrusion; and protection of open space.

2.16. Policy ENV4 Sustainable construction and design states that '**all proposals for new development should consider and demonstrate how the design of buildings and site layouts use energy, water, minerals, materials, and other natural resources appropriately, efficiently and with care and take account of the effects of climate change in accordance with other core strategy policies.'**

Landscape Character

2.17. The National Character Area (NCA) produced by Natural England places the development site within area 48: Trent and Belvoir Vales.

- **A gently undulating and low-lying landform in the main, with low ridges dividing shallow, broad river valleys, vales, and flood plains.**
- **Agriculture is the dominant land use, with most farmland being used for growing cereals, oilseeds, and other arable crops. While much pasture has been converted to arable use over the years**
- **A regular pattern of medium to large fields enclosed by hawthorn hedgerows, and ditches in low-lying areas, dominates the landscape.**
- **Very little semi-natural habitat remains across the area; however, areas of flood plain grazing marsh are still found in places along the Trent.**
- **A predominantly rural and sparsely settled area with small villages and dispersed farms linked by quiet lanes, contrasting with the busy market towns of Newark and Grantham**

2.18. The opportunities for this landscape area are identified as including:

- **Protecting and expanding areas of pasture and grassland habitats to counter the shift away from mixed farming, which has had an impact on local character, biodiversity, and ecosystem services**
- **Working with farmers and landowners to protect and enhance habitat networks through the farmed landscape to enhance ecosystem services, such as intercepting surface water to improve water quality and provide more habitats for pollinator and pest-regulating species.**
- **Increasing the area and network of habitats for pollinators and pest regulating species throughout the farmed landscape, for example by increasing the amount of flower-rich field margins, hedgerows, and species-rich grasslands**

2.19. The South Kesteven Landscape Character Assessment (Jan 2017) also places the development site in the Trent and Belvoir Vale character area. In this study, the A1 is the boundary of this character area which separates it from the Grantham Scarps and Valleys character area in the east. The proposed development will, therefore, be in a different landscape character area from the adjacent retail / commercial development at the A1 junction.

2.20. The Trent and Belvoir Vales key characteristics are described as:

- **A relatively simple, medium to large-scale, open arable or mixed farming landscape.**
- **Flat or very gently undulating topography**
- **Simple regular fields enclosed by hawthorn hedges.**
- **Relatively few hedgerow trees and virtually no woodland.**
- **Small villages typically located on slightly rising land.**
- **Church towers and spires visible across the landscape.**
- **Buildings styles vary, but a high proportion of brick with dark red pantiles**

2.21. The Trent and Belvoir Vale area is described as having a simple and sometimes weak landscape pattern with few woodlands meaning that views are mostly open. The landscape contains relatively few sensitive features, but this means there is little structure to help assimilate new development. Generally, there are few urbanising influences in this location, but power lines are prominent in some locations. Woodlands and trees where they are found are usually associated with settlement edges.

2.22. Overall, the area is identified as having a **medium** sensitivity to residential and employment related development. It is suggested that development is kept away from sensitive settlements and located closer to existing human influences such as the A1 and power lines which are likely to offer more appropriate locations. It is also suggested that trees and woodland because these are associated with settlement edges could be planted in these locations to mitigate development proposals.

2.23. The management objectives for the Trent and Vale area are described as:

- **Maintain and improve field boundary condition.**
- **Retain ditch patterns.**
- **Maintain wet grassland areas.**
- **Protect any woodland cover.**
- **Maintain existing hedgerow trees and plant new hedgerow trees.**
- **Provide new woodland planting with any new largescale agricultural buildings.**
- **Maintain views to elevated villages and churches.**

2.24. As the proposed development site is on the boundary between character areas, it is also worth considering the key characteristics of the Grantham Scarps and Valleys character area as this is the backdrop or context to many of the views of the proposed site. The key characteristics of the Grantham Scarps and Valleys character area are:

- **Steep scarp slopes with woodland or pasture cover**
- **Medium scale arable fields with relatively few hedgerow trees**
- **Small villages, separated from Grantham town by narrow areas of open countryside**

2.25. The management recommendations for Grantham Scarps and Valleys character area include:

- **Protect and enhance woodlands and parklands.**
- **Protect and manage field boundaries and hedgerow trees.**
- **Protect and enhance watercourses.**
- **Soften harsh urban edges by new woodland planting.**
- **Avoid built development encroaching on the higher scarp slopes, or 'skylining'.**
- **Use new development, and associated structural landscape, to soften existing harsh urban edges.**
- **Consider opportunities for enhanced access to the countryside around the edge of town.**

The Visual Environment

2.26. An initial site visit has been undertaken and the Photographic Record is appended to this technical note. Views of the site are most prominent from the north on Gonerby Lane (VP 9) and from the slip road of the A1 junction. As VP 8 shows, the vegetation between the slip road and A1 on the north-east boundary of the site provides some screening of the site from the road and has the potential to be tree planted to enhance the height of this screening.

2.27. From the east, the escarpment of Great Gonerby provides elevated ground that it was anticipated would provide clear views of the site. However, as VP 1 shows, where the site can be seen, it is viewed in the context of a foreground of industrial and commercial buildings with the open countryside in the distant background. In other locations on the escarpment (VP2) the site is blocked from view by woodland on the slope (Barrowby Thorns / Knox plantation) or by the topography itself which is much higher than the development site.

2.28. Close views towards the site, from the east, from the retail / commercial park (VP14, VP15) or from the A1 show that there is dense boundary vegetation in this location to screen the impact of the A1 and this would provide some screening to the site assuming it is retained and enhanced.

2.29. To the south, near views like those from Thorns Farm (VP3) or near Knowles Farm on Thorns Lane (VP4) are screened by intervening vegetation and the raised railway embankment which is also vegetated. The intervening vegetation is often that around the farmsteads that are dotted through this landscape. Long views from the south (VP5, VP6 and VP7) are also screened by intervening vegetation and the trees of Barrowby thorns on the Great Gonerby escarpment.

2.30. From the west, despite the open countryside, long views of the site are also largely screened by intervening vegetation in the form of field boundaries or the rolling topography (VP11, VP12). From the edge of Allington, views from the PRoW towards the site, are partially screened by the retirement village in the foreground (VP10). VP 12 also shows the prominence of pylons through the landscape in some locations.

2.31. From the south, views from Green Lane show that the open countryside from this direction also has sufficient intervening vegetation to largely screen the site but due to the whiteness of the business units around the A1 junction, mean that they stand out on the horizon in the context of the darker tree lines surrounding them (VP 16, VP17). This issue was also apparent from Belvoir Castle which is about 10km to the southwest of the site. From the terrace facing the Vale of Belvoir looking towards the site (VP 13), it is possible to see the existing buildings around the A1 junction as they stand out against the darker backdrop of the rising landscape behind them.

2.32. Overall, despite the open countryside that surrounds the site from the north, south and west, there is sufficient intervening vegetation and topography to screen the site from view in most situations. Improvements to boundary planting, internal planting within the development, and planting along the A1 corridor will help to integrate any development and visually connect the landscape with the escarpment vegetation near Great Gonerby. The design and colour of the proposed building cladding should break up the scale and massing of the proposed buildings and visually blend with the colour of the escarpment behind.

3 Landscape and Visual Review and Opportunities & Constraints

3.1. With a development of this type and scale there is a risk of adverse landscape and visual effects if the proposals are not carefully and sympathetically designed. However, it is envisaged that the development of this site will adopt a high quality, landscape-led approach ensuring that the proposals are integrated without significant adverse effects upon the receiving landscape character or visual environment. Refer **ASP3** Landscape Opportunities and Constraints Plan.

3.2. Any development within the site should incorporate the following elements:

- Retention of the existing field boundaries and associated hedgerow planting.
- Re-plant and reinforce the existing hedgerow planting on all boundaries.
- Retention and extension of the existing landscape buffer adjacent to the A1 with additional tree planting along the bridleway.
- Reinforce wildlife value of field ditches with native planting including hedgerow species. Incorporate or link them to SUDS systems.
- Ensure pedestrian access and links from the development to the Bridleway with possible A1 crossing and link to Thorns Lane in the south.

- Avoid buildings that break the skyline of the escarpment of Barrowby Thorns.
- Avoid cladding that stands out against the vegetation of the escarpment possibly grading the colour of the units in bands to break up their mass and blend more compatibly with their surroundings.

3.3. This assessment of the landscape opportunities and constraints should feed into the emerging masterplan to ensure that a sympathetic layout that respects its landscape and visual context can be achieved.

4 Summary

4.1. As set out above, the District and Local authority policy places an emphasis on sustainable and environmentally responsible design. Development proposals should be appropriate to the character and significant natural, historic, and cultural attributes and features of the landscape**.** Developments should also increase the area and network of habitats and support biodiversity.

4.2. The strength of the development site is its accessibility to the A1 and the Gonerby Moor junction which has supported the development of many businesses and the adjacent retail and business park. Potentially, the site offers the developer the same access to the road network.

4.3. The site will be located adjacent to established retail and commercial premises. It is also surrounded by the urbanising infrastructure of a solar farm, railway line and dual carriageway.

4.4. The South Kesteven Landscape Character Assessment (Jan 2017) suggests that residential and commercial development is kept away from sensitive settlements and located closer to existing human influences such as the A1 and power lines which are likely to offer more appropriate locations. The survey undertaken by Aspect identified that the site is heavily influenced by the A1, with PRoW, for example, underutilised and negatively impacted, and this makes it an appropriate location for the development proposed.

4.5. The site is in the Trent and Belvoir landscape character area which is characterised by open countryside with few landscape features, and a weak landscape structure. This openness could make the integration of large-scale development a challenge, but fortunately, in this location, the site is adjacent to the Grantham Scarps and Valleys character area and the escarpment of Great Gonerby. The woodland of its slope and the elevated ground of the escarpment provides the site with a landscape structure that has the potential to help integrate it into its surroundings.

4.6. Landscape-wise, it is considered that the site has the capacity to accommodate a sensitively designed development if it utilises the escarpment setting and extends tree planting along its eastern boundary and southern boundary. Potentially, the site could act as a bridge between the two landscape areas by showing characteristics of both i.e., the tree planting of the Scarps and the hedgerows and field patterns of the Vale.

4.7. Visually, the site is exposed to close views from Gonerby Lane in the north which can be screened with landscape buffer planting along the A1 and boundary planting along Gonerby Lane. Generally, all the boundaries of the site should be strengthened, and the field boundaries retained to connect the site into the wider Vale landscape. With regards to long views, it was found during the survey that there is generally sufficient intervening vegetation from field boundaries and trees adjacent to dwellings to provide some screening to the site within the wider landscape. However, new development will need to avoid breaking the escarpment skyline and be sensitively clad to break up the proposed buildings mass and scale and to blend visually with the surrounding landscape.

4.8. Subject to the consideration of the landscape and visual issues outlined above, it is considered that development can be accommodated in this location without detriment to the localised or wider visual amenity and that the integrity of the receiving landscape character can be respected.

4.9. In summary, the adoption of a sensitive, landscape-led approach to the development proposals will ensure it is successfully integrated into this changing location without significant adverse landscape or visual effects.

Aspect Landscape Planning Ltd

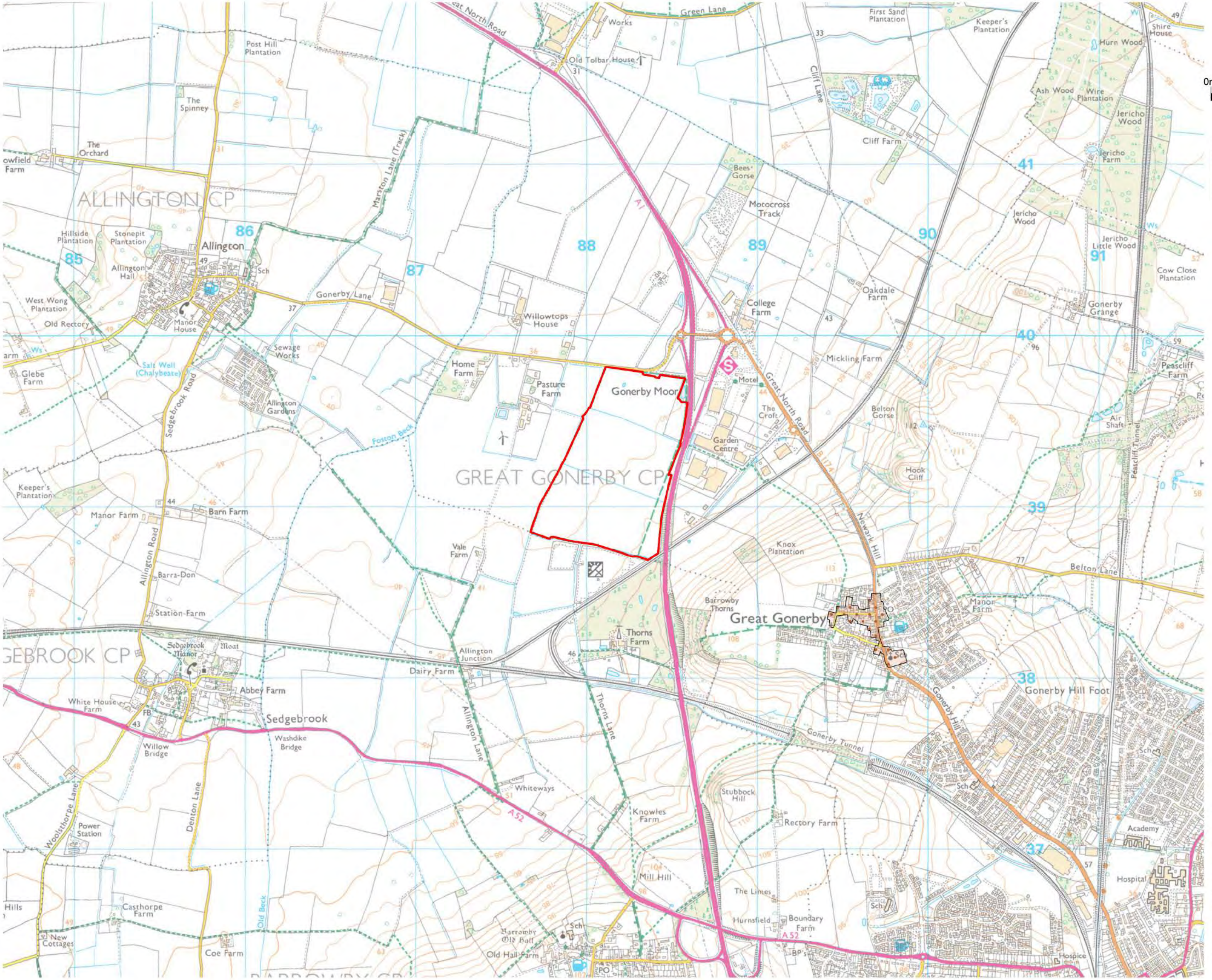
June 2022

Enclosed:

Plan ASP1 Site Location
Plan ASP2 Site and Setting Plan
Plan ASP3 Landscape Opportunities & Constraints
Photographic Record

Enclosure 1 – Aspect Plans

Aspect Landscape Planning ● Hardwick Business Park ● Noral Way ● Banbury ● OX16 2AF ● Tel: 01295 276066 ● www.aspect-landscape.com



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0m 200m 400m 1km

Key:

- Application Site Boundary
- Conservation Area

REV	DATE	NOTE	DRAWN	CHK'D

REVISIONS

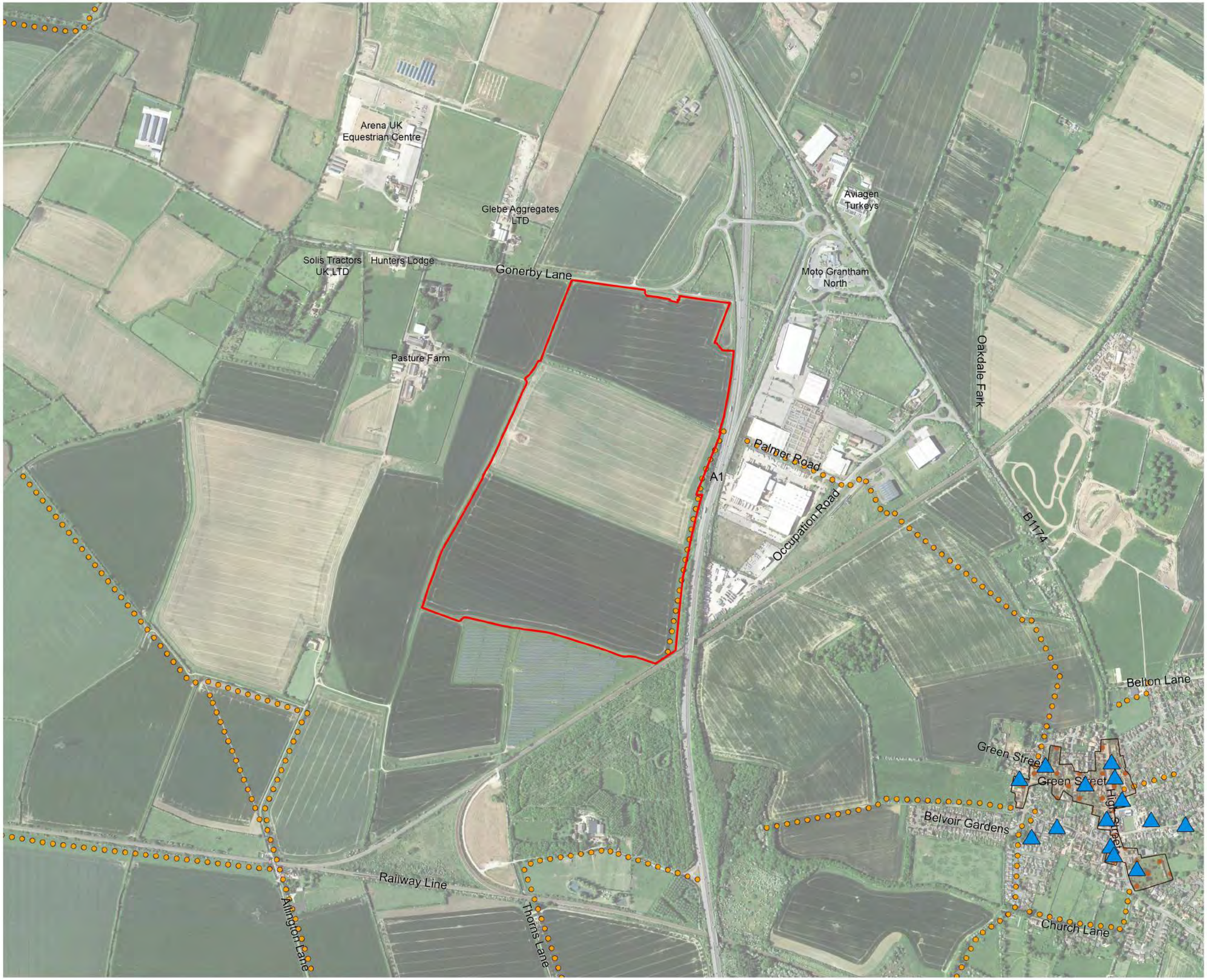
aspect landscape planning

TITLE
Gonerby Moor, Grantham
Site Location Plan

CLIENT
Caddick Developments Ltd

SCALE	DATE	DRAWN	CHK'D
1:20,000@ A3	MAY 2022	EL	CJ

DRAWING NUMBER	REVISION
7924 / ASP1 / SLP	



0m 100m 200m 400m

Key:

- Application Site Boundary
- Public Rights of Way
- Listed Buildings
- Conservation Area

REV	DATE	NOTE	DRAWN	CHK'D

REVISIONS

aspect landscape planning

TITLE
Gonerby Moor, Grantham
Site & Setting Plan

CLIENT
Caddick Developments Ltd

SCALE	DATE	DRAWN	CHK'D
1:10,000 @ A3	MAY 2022	EL	CJ
DRAWING NUMBER		REVISION	
7924 / ASP2 / SS			

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0m 50m 100m 200m

Key:

- Application Site Boundary
- Public Rights of Way
- Existing Vegetation
- Main Road Corridor
- Road Corridor
- Train Line
- Proposed Landscape Buffer
- Existing Drainage Ditches to be Enhanced with hedgerow Planting
- Potential Access
- Landfall Direction
- Contours
- Long Distance Views
- Close Views
- Potential Area for Attenuation
- Proposed Woodland Buffer Planting

REV	DATE	NOTE	Drawn	Chk'd

REVISIONS

aspect landscape planning

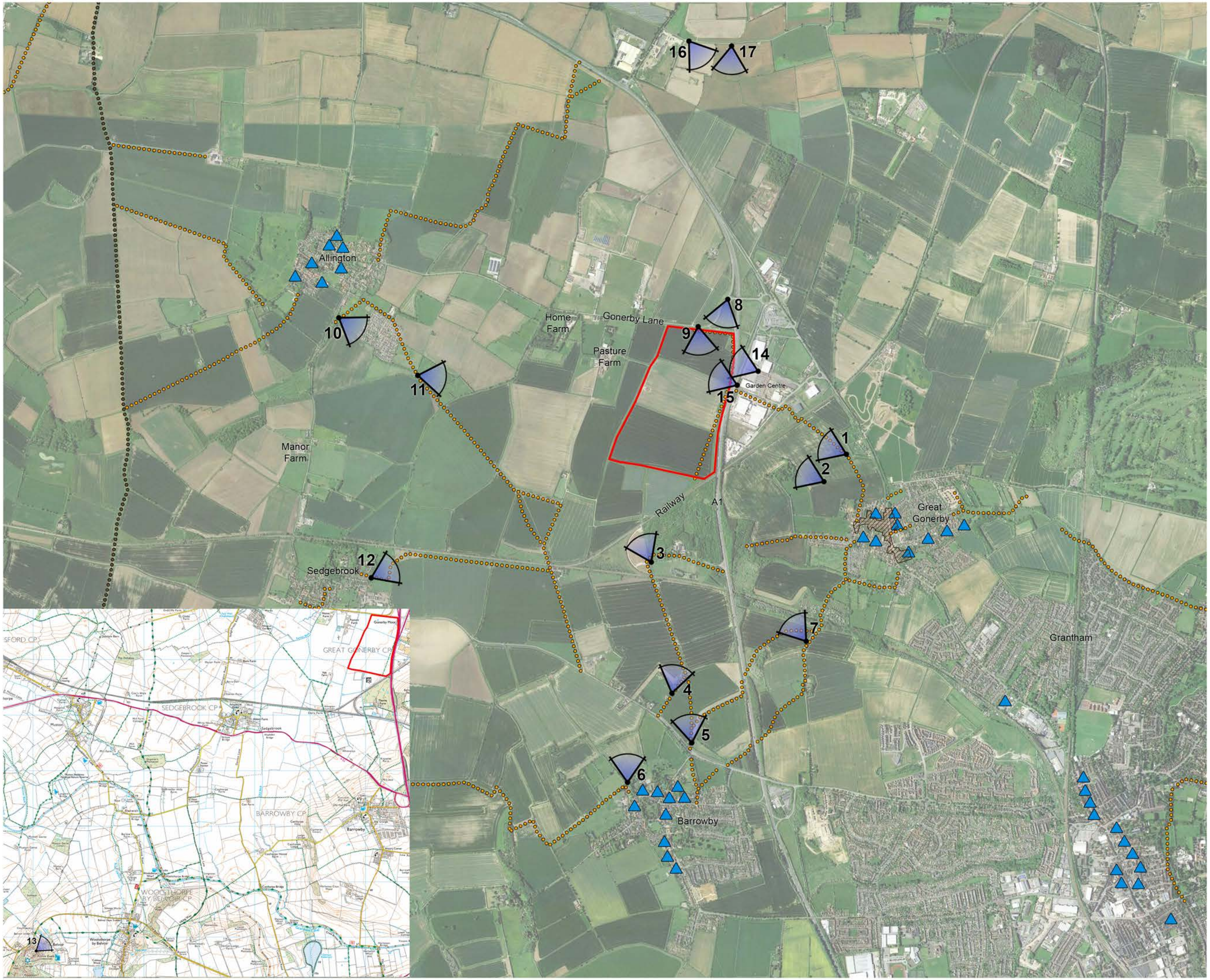
TITLE
Gonerby Moor, Grantham
Site & Setting Plan

CLIENT
Caddick Developments Ltd

SCALE	DATE	DRAWN	CHK'D
1:5,000 @ A3	MAY 2022	AS	CJ
DRAWING NUMBER		REVISION	
7924 / ASP3 / OCP			

Enclosure 2 – Initial Visual Assessment

Aspect Landscape Planning ● Hardwick Business Park ● Noral Way ● Banbury ● OX16 2AF ● Tel: 01295 276066 ● www.aspect-landscape.com



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0m 200m 400m 1km

Key:

- Site Boundary
- Viewpoint Location
- Listed Buildings
- Public Rights of Way
- Viking Way - Long Distance Route
- Conservation Area

REV	DATE	NOTE	DRAWN	CHK'D

REVISIONS

aspect landscape planning

TITLE
Gonerby Moor, Grantham
Viewpoint Location Plan

CLIENT
Caddick Developments Ltd

SCALE	DATE	DRAWN	CHK'D
1:25,000 @ A3	MAY 2022	AS	CJ

DRAWING NUMBER	REVISION
7924 / VLP	

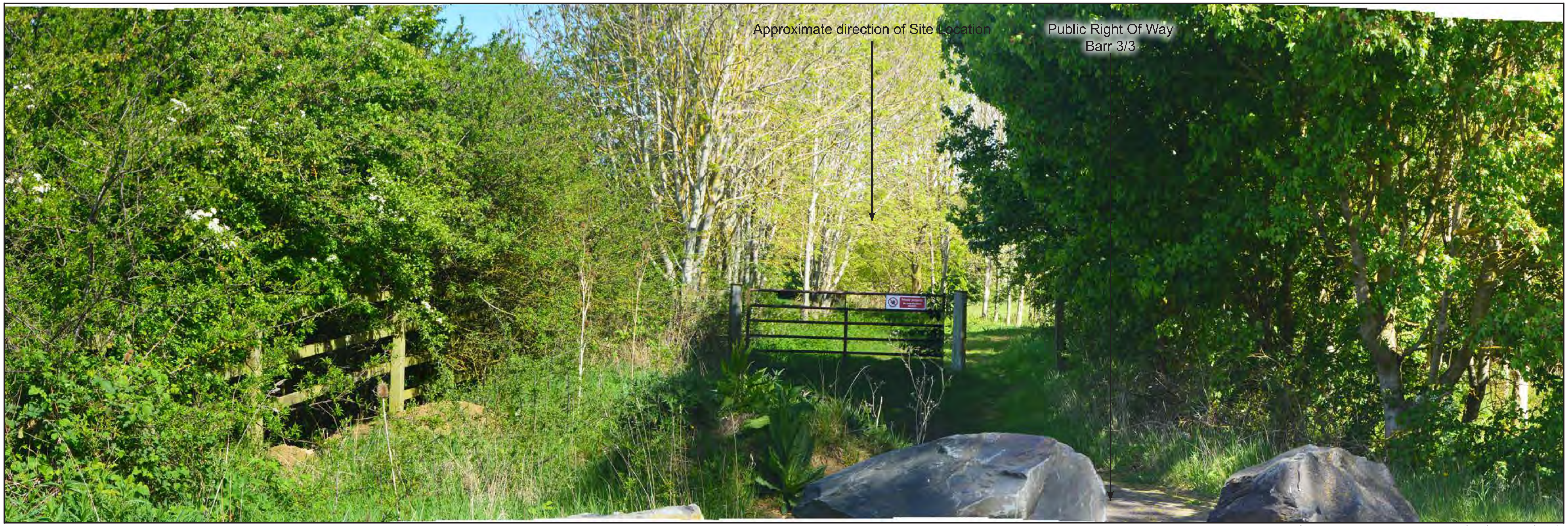
Viewpoint Coordinates: E 489415 N 338870 | Date & time of photograph: 10/05/2022 10:48 | AOD & Viewing height: c. 92m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 1 (Annotated Panorama Image for Context Only)

Viewpoint Coordinates: E 489207 N 338659 | Date & time of photograph: 10/05/2022 11:03 | AOD & Viewing height: c. 104m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 2 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.



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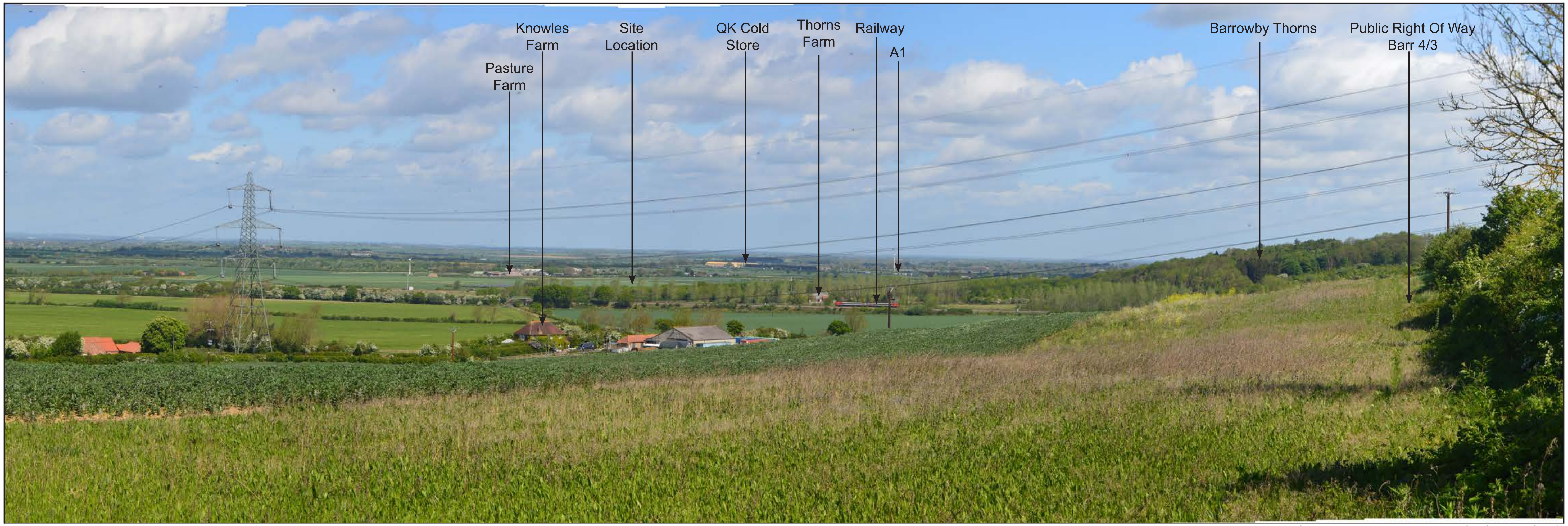
Viewpoint Coordinates: E 488150 N 337180 | Date & time of photograph: 10/05/2022 11:33 | AOD & Viewing height: c. 69m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 4 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.



Viewpoint Coordinates: E 488269 N 336783 Date & time of photograph: 10/05/2022 11:41 AOD & Viewing height: c. 99m AOD 1.6m Weather conditions: Clear, good visibility.

Viewpoint 5 (Annotated Panorama Image for Context Only)

Viewpoint Coordinates: E 487796 N 336509 Date & time of photograph: 10/05/2022 11:52 AOD & Viewing height: c. 104m AOD 1.6m Weather conditions: Clear, good visibility.

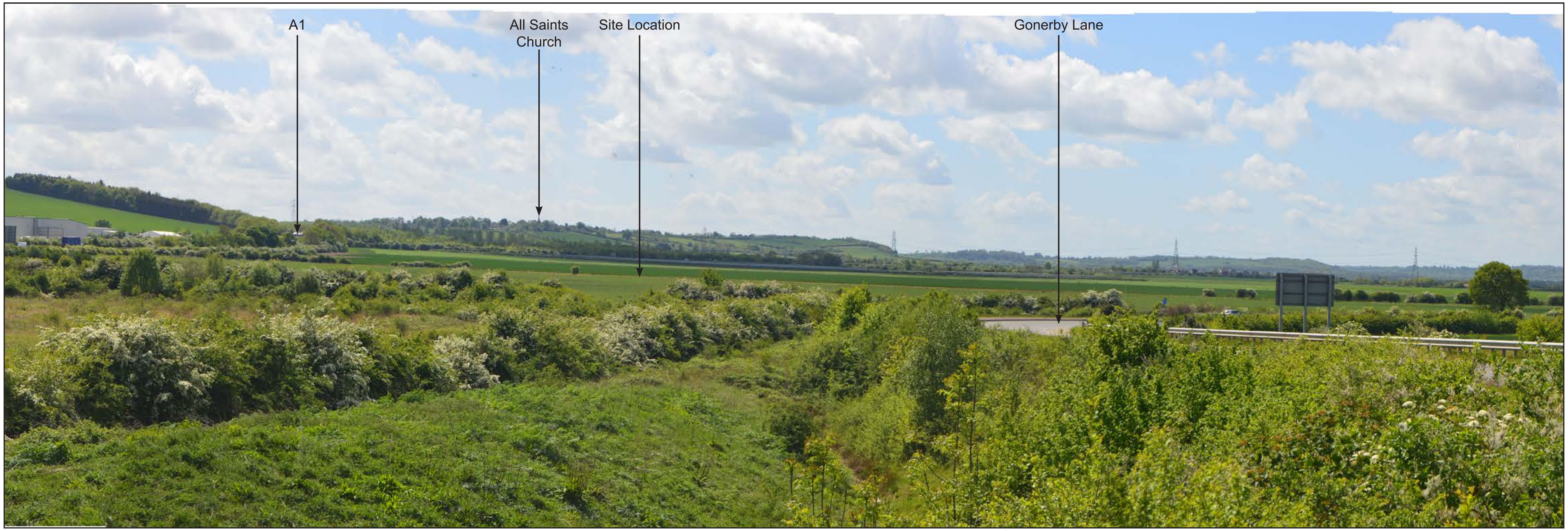
Viewpoint 6 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

Viewpoint Coordinates: E 489095 N 337489 | Date & time of photograph: 10/05/2022 12:32 | AOD & Viewing height: c. 98m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 7 (Annotated Panorama Image for Context Only)



Viewpoint Coordinates: E 488534 N 339985 | Date & time of photograph: 10/05/2022 13:04 | AOD & Viewing height: c. 39m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 8 (Annotated Panorama Image for Context Only)

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Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

Viewpoint Coordinates: E 488325 N 339796 | Date & time of photograph: 10/05/2022 13:10 | AOD & Viewing height: c. 38m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 9 (Annotated Panorama Image for Context Only)

Viewpoint Coordinates: E 485718 N 339858 | Date & time of photograph: 10/05/2022 13:19 | AOD & Viewing height: c. 40m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 10 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

Viewpoint Coordinates: E 486302 N 339450 | Date & time of photograph: 10/05/2022 13:36 | AOD & Viewing height: c. 42m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 11 (Annotated Panorama Image for Context Only)

Viewpoint Coordinates: E 485957 N 338031 | Date & time of photograph: 10/05/2022 14:02 | AOD & Viewing height: c. 43m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 12 (Annotated Panorama Image for Context Only)

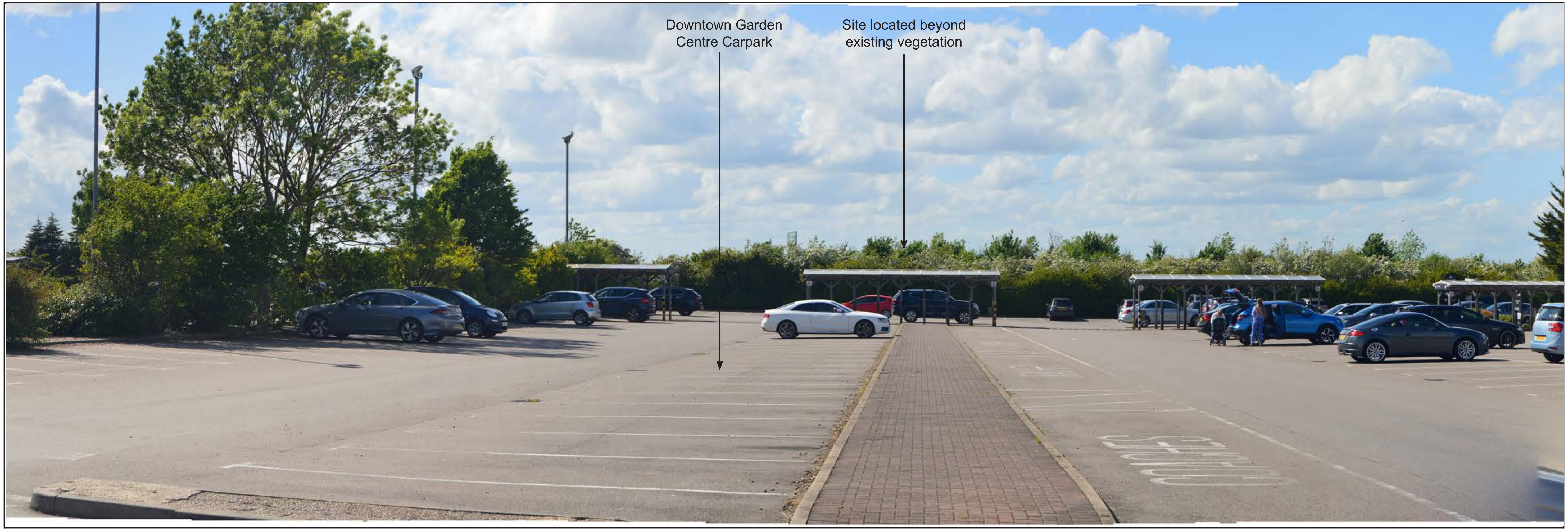
aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

Viewpoint Coordinates: E 482098 N 333771 Date & time of photograph: 10/05/2022 15:30 AOD & Viewing height: c. 121m AOD 1.6m Weather conditions: Clear, good visibility.

Viewpoint 13 (Annotated Panorama Image for Context Only)



Viewpoint Coordinates: E 488769 N 339483 Date & time of photograph: 10/05/2022 16:02 AOD & Viewing height: c. 45m AOD 1.6m Weather conditions: Clear, good visibility.

Viewpoint 14 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

Viewpoint Coordinates: E 488596 N 339360 | Date & time of photograph: 10/05/2022 16:15 | AOD & Viewing height: c. 45m AOD 1.6m | Weather conditions: Clear, good visibility.

Viewpoint 15 (Annotated Panorama Image for Context Only)

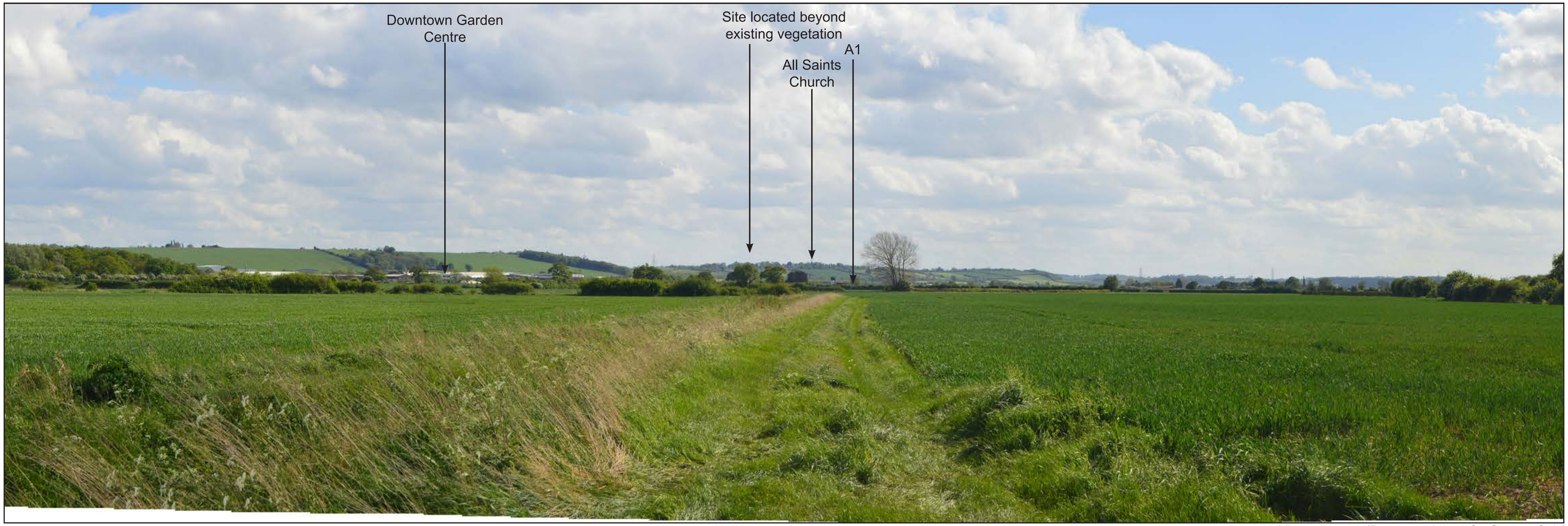
Viewpoint Coordinates: E 488258 N 341877 | Date & time of photograph: 10/05/2022 16:43 | AOD & Viewing height: c. 33m AOD 1.6m | Weather conditions: Clear, good visibility.

Viewpoint 16 (Annotated Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.



Viewpoint Coordinates: E 488559 N 341752 | Date & time of photograph: 10/05/2022 16:45 | AOD & Viewing height: c. 31m AOD 1.6m | Weather conditions: Clear, good visibility. | Viewpoint 17 (Panorama Image for Context Only)

aspect landscape planning

Equipment & Focal Length: Nikon D3200 DSLR 35mm equivalent camera using a 50mm lens
Viewing Distance at A3: 330mm
Horizontal Field of View: 68°
Vertical Field of View: 23°

N.B. IMAGES TO ILLUSTRATE THE EXISTING LANDSCAPE CONTEXT ONLY. Panoramas are created from multiple photographs taken using a digital equivalent of a 35mm camera with 50mm lens in line with best practice and current guidance. Images illustrate a horizontal field of view of 68° and when printed at A3, should be viewed at a distance of 330mm curved through the same radius in order to correctly illustrate the existing landscape context. To ensure considered judgements are accurately assessed, images should not be substituted for visiting the viewpoint.

APPENDIX 4. LETTER FROM SAVILLS FOR SOUTH KESTEVEN REGULATION 18 CONSULTATION

24 April 2024

David Baker-Brook
Caddick Developments

Joanne Neville
Harworth

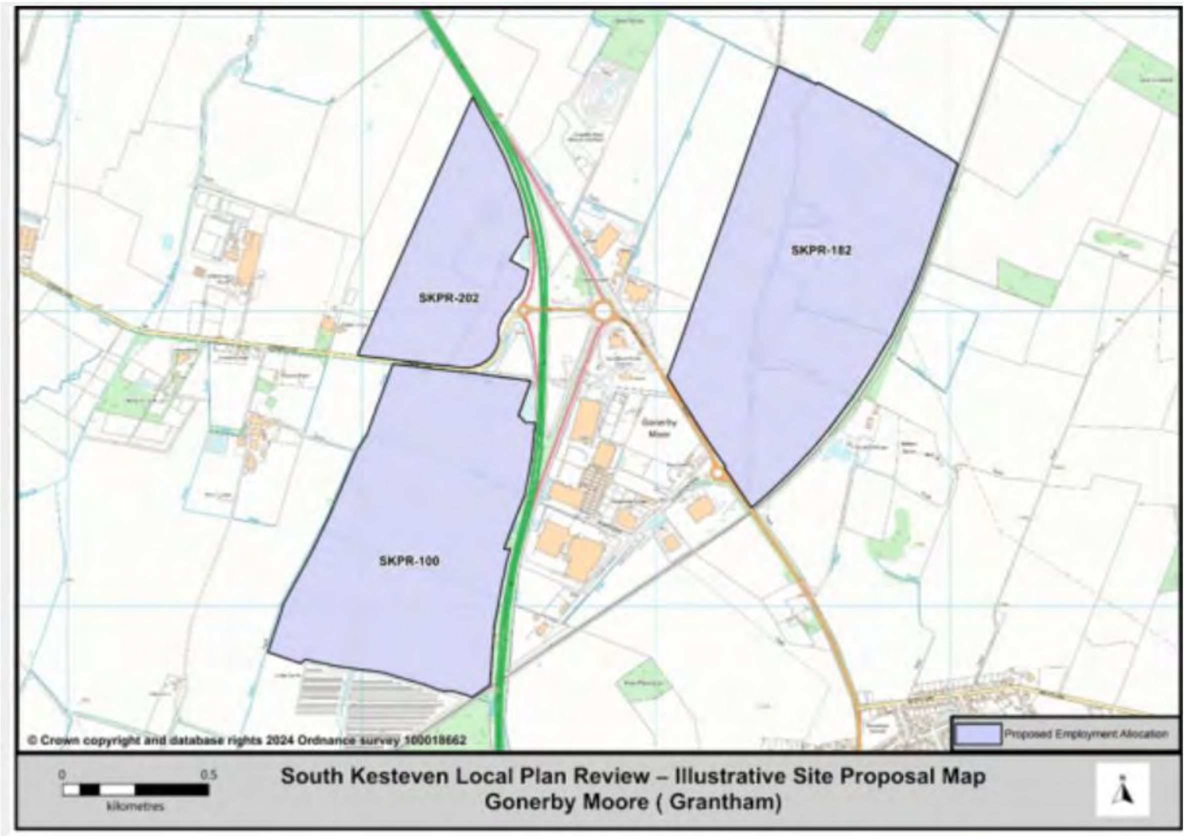
[redacted]

Dear David & Joanne,

Gonerby Moor, South Kesteven

Further to your joint instructions, I am writing to set out a summary of the market case for the allocation of your sites at Gonerby Moor for submission to the South Kesteven Regulation 18 Local Plan Review consultation. This letter should be read in conjunction with the representations prepared by your planning consultants (Boyer).

The sites are both proposed to be allocated for B2/B8 use under draft Policy E2 of the South Kesteven Regulation 18 Local Plan (reference SKPR-202 and SKPR-100 as shown on the plan below – "the Subject Sites").



Site Description & Context

Details of the Subject Sites are as follows:

- SKPR – 202 (Land at Gonerby Lane): controlled by Harworth, this site extends to c. 29 ha and can accommodate c. 123,150 sq. m of floorspace;
- SKPR – 100 (Land South of Gonerby Lane): controlled by Caddick Development and extending to 63.7 ha, this site can accommodate c. 215,380 sq. m of floorspace

The Sites are being brought forward in a coordinated manner, with relevant technical work and masterplanning being undertaken on a joint basis which demonstrates that the sites are both viable and deliverable, being capable of accommodating a range of unit sizes and configurations to meet occupier requirements.

Collectively, the sites provide for a truly strategic scale employment opportunity, immediately adjancent to/accessible from the A1/A52 junction at Gonerby Moor Interchange.

Site Location

The Sites are located immediately adjacent to the A1 junction at Gonerby Moor Interchange to the north of Grantham and offer excellent connectivity north south along the A1 corridor as well as to Nottingham via the A52. The A1 provides links to Peterborough to th south, the A47 (to Leicester), A52 (to Nottingham) and the A14 which is the main east/west road corridor linking the East Coast Ports to the Midlands markets.

The location and connectivity of the Subject Sites will make them very attractive to occupiers seeking a highly accessible location from which to access the wider Midlands markets and customer base.

Market Position: Demand Profile

The A1 is a nationally significant movement corridor linking London to Edinburgh in Scotland and facilitating over 10,000 HGV and LGV movements per day. The A1 corridor has emerged over recent years as a key location for occupiers seeking to serve a regional and/or national catchment.

Demand from occupiers with a national or wider Midlands catchment has traditionally focussed on the core areas within the ‘golden triangle’ and the M1 corridor but, as land supply has become increasingly constrained in these locations, demand for locations along the A1 corridor has increased and it is now an established alternative for a range of occupiers with evidence of very strong demand when high quality sites are available.

Within the Functional Economic Market Area (FEMA), (defined as South Kesteven, Peterborough, Rutland and South Holland within the South Kesteven evidence base), this strategic scale demand has predominantly been focussed on Peterborough to date. This focus of demand has been the result of the availability of well-located (highly accessible) sites which have been delivered by experienced developers and have been of sufficient scale to meet a range of occupier requirements.

Take up at Gateway Peterborough (84 ha) which was delivered by Roxhill/Newlands is evidence of the strong demand being seen from both logistics and manufacturing occupiers when high quality and unconstrained sites are available. Take up averaged c. 55,901 sq. m per annum over the eight year life of the development (2014-2022) increasing to c. 69,700 sq. m per annum (c. 12-13 ha per annum) over the last five years of the development. Examples of occupiers that have taken units at Gateway Peterborough include:

- Amazon (B8 delivery depot) – 146,700 sq. ft (2022)
- Oatly (B2 – food processing) – 385,000 sq. ft (2021)
- McCormick & Co (B2 – food processing) – 636,340 sq. ft (2020)
- AM Fresh (B8) – 240,000 sq. ft (2019);
- Urban Outfitters (B8) – 432,000 sq. ft (2019);

- Lidl Regional Distribution Centre (B8) – 754,000 sq. ft (2017)

Whilst footloose logistics (B8) occupiers have made up the majority of demand, there has also been significant demand from the food manufacturing and processing sector. This demand profile is reflective of the type of occupier demand that would be seen at the Subject Sites.

As will be considered below, there is now very little supply within Peterborough and therefore it is particularly important that South Kesteven ensures a sufficient supply of strategic scale, well-located and deliverable land to meet occupier demand within the FEMA.

The allocation of the Subject Sites will enable South Kesteven to participate in this regional and national market through provision of high quality, deliverable sites of strategic scale, immediately accessible to the A1 corridor, and therefore offering occupiers the ability to serve a significant customer base.

Supply of Strategic Scale Sites

As demonstrated above, occupier requirements are for increasingly large units (across both the manufacturing and logistics sectors). In order to maximise demand and capture footloose occupier requirements, it is necessary for sites to be of sufficient scale to allow flexibility over scale and configuration of buildings, and to ensure continuity of supply over a period of years. Sites of 25 ha plus would generally be the minimum size to be considered as 'strategic' and increasingly sites of 50 ha plus are required in reflection of the larger unit sizes and associated rate of land take up (for example, a site of 25 ha could be taken up by one or two requirements in relatively short timescales).

There are very few strategic scales sites within the FEMA. Existing allocations which would fall within this definition include Grantham Southern Gateway in South Kesteven (plot to the west of the A1) and Redbrick Farm in Peterborough (c. 32 ha net). There are significant constraints around Peterborough which make the promotion of additional large scale land in this location very challenging. Other sites across the FEMA are predominantly of a much smaller scale and suitable for smaller units, aimed at the local market.

It is therefore vitally important to ensure a continued supply of sites which can meet this strategic demand across the FEMA, and specifically in South Kesteven which benefits from accessibility to the A1. The Subject Sites collectively offer an opportunity to make an important contribution to the portfolio of pipeline land within the FEMA and within South Kesteven.

Unmet Need within the FEMA

Using Savills' modelling it is possible to estimate the level of demand across the FEMA. Savills' modelling methodology is NPPG-compliant as it builds upon historic take-up (demand), adjusting past take up trends to account for historic supply shortages. and the resultant loss in occupier take up. We refer to this as 'suppressed demand' which is added to the historic demand trends as a top-up. We also scenario test future e-commerce growth, which is a key growth driver for the sector.

The rational for accounting for suppressed demand is that when sufficient supply isn't available, demand cannot be accommodated. Take-up is often used as a surrogate for demand but that can be misleading, particularly where land supply or availability of buildings is constrained. Take-up is, in effect, the minimum manifestation of demand and supply, but take-up will be constricted in circumstances where demand (in quantitative terms) exceeds supply and (in qualitative terms) where the nature of demand (location, use, scale, quality) is not capable of being met by the actual supply of employment land and buildings available. Limited supply in a strongly performing market means that demand cannot be fully satisfied, typically resulting in strong rental growth.

An allowance for suppressed demand is therefore added to the historic net absorption trend (take up adjusted for out-movers) to account for years when the market was supply constrained, and, projecting this forward provides an estimate of the total demand.

At the national level, the market equilibrium level, where supply and demand are broadly in balance and rents are more stable, is around 8% availability. This benchmark rate is found in several prominent publications such as the GLA's Land for Industry and Transport Supplementary Planning Guidance (SPG) and the London Plan (2021). Availability in South Kesteven has been below the 8% equilibrium between 2014-2022 when we assessed the market indicators, with availability standing at just 2.7% in Q1 2022. Rents have grown well above inflation, demonstrating that occupiers have been competing with one another for available stock, pushing up rents.

Savills ran this model in December 2022 and will be re-running in due course to provide an up to date and accurate estimate of FEMA level demand. Comparing estimated demand using Savills supressed demand model, with supply (of buildings and land with either planning permission or an allocation), **as at December 2022, there was a significant shortfall of land across the FEMA,** considerably in excess of the proposed new dedicated employment allocations in South Kesteven (c. 179 ha).

As noted above, whilst Peterborough has been a focus for demand historically, there is likely to be very limited availability of future land supply in this location (i.e sites which are not already allocated or with planning permission). It is therefore vitally important that South Kesteven is able to respond to this unmet demand at FEMA level and, as proposed, allocates a range of strategic employment sites which can address sub-regional need, maximising the District's location on the A1 corridor.

<u>Conclusions</u>

There is a strong need for significant additional (new) land, over and above previous carried over allocations, within the FEMA and specifically within South Kesteven. This should be of sufficient scale, and sufficiently well-located to be able to meet sub-regional and regional demand and address the critical supply shortage at FEMA level. The Subject Sites are ideally situated to maximise this opportunity, being immediately adjacent to the A1 junction and offering a combined site of significant scale which is in developer control and therefore able to respond flexibly and rapidly to occupier requirements, ensuring delivery of economic benefits, including high quality jobs across the manufacturing and logistics sectors.

Yours sincerely

[redacted]

Siân Rees
Associate Director

Cc: David Baker-Brook, Caddick Developments
Joanne Neville, Harworth

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APPENDIX 5. LEVELLING UP – THE LOGIC OF LOGISTICS (SAVILLS REPORT) (2022)

Levelling Up - The Logic of Logistics

A report demonstrating the wider economic, social and environmental benefits of the industrial & logistics sector

Contents

Foreword

The Covid-19 pandemic has demonstrated that our industrial and logistics facilities are a key part of the nation's critical national infrastructure.

Alongside our supply chains, they support other important and growing sections of a strong economy and the way we live our lives by ensuring we have what we need at the right time. They are as crucial as the roads, rail, airport and port facilities needed to move goods around the country.

The sector also generates significant economic benefits supporting increasing numbers of high-quality jobs across the English regions. A thriving industrial and logistics sector is therefore critical to the government delivering on its ambitions to 'level up' across the UK with over 70% of demand for industrial and logistics space in the North of England and the Midlands.

Enabling the sector to reach its full potential is essential to the government's aspirations to address regional inequalities but our planning system remains a barrier and is restricting growth in the sector by not allocating enough land in appropriate locations. If the industrial and logistics sector is to play its full part in levelling up, it is vital that we create a more agile planning system which is more responsive to the sector's needs.

This latest BPF Industrial Committee report builds on previous research publications advocating for a more responsive planning system to the needs of the industrial and logistics sector. The report also provides a comprehensive overview of the growing economic, social value and environmental credentials of the sector as well as presenting case studies from within the BPF membership to reinforce these qualities.

Gwyn Stubbings
Planning Director, GLP
Chair of the BPF Industrial Committee

Executive Summary

An Economic Powerhouse

I&L facilities are Critical National Infrastructure

Alongside their supply chains, they support the functioning of our economy and the way we live our lives, by ensuring we have what we need. They are as critical as the roads, rail, airport and port facilities needed to move goods around the country

Food Supplies

Fuel Supplies

Vaccines and Medical Supplies

The I&L sector generates significant economic benefits

3.8 million
jobs in I&L in England

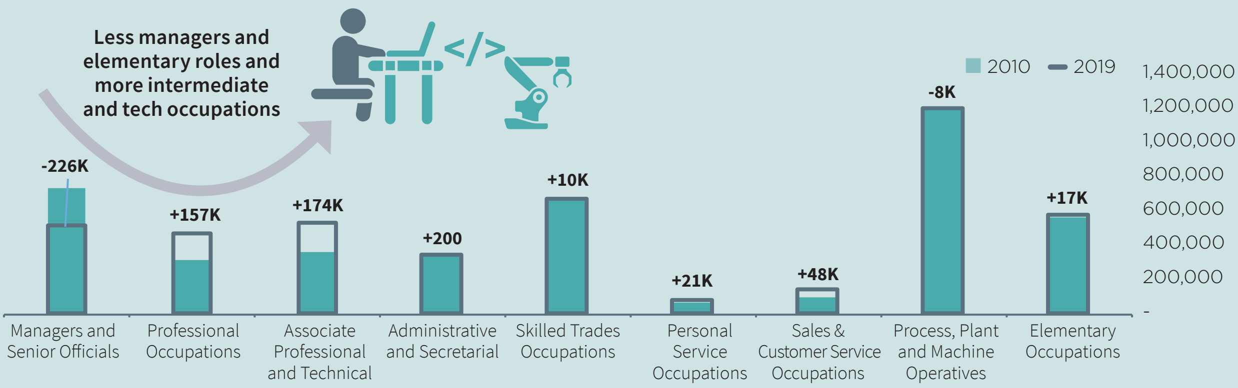
£232 billion
of GVA

29% productivity
increase between 2025 and 2039

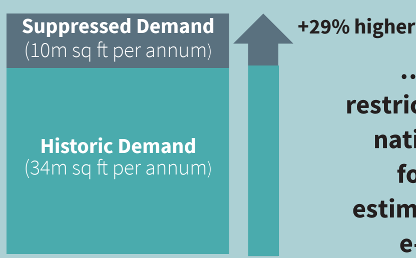
The I&L sector is subject to continuing misconceptions about average pay and skill levels

...the reality is I&L jobs pay more

...and the occupations provided are becoming more diverse



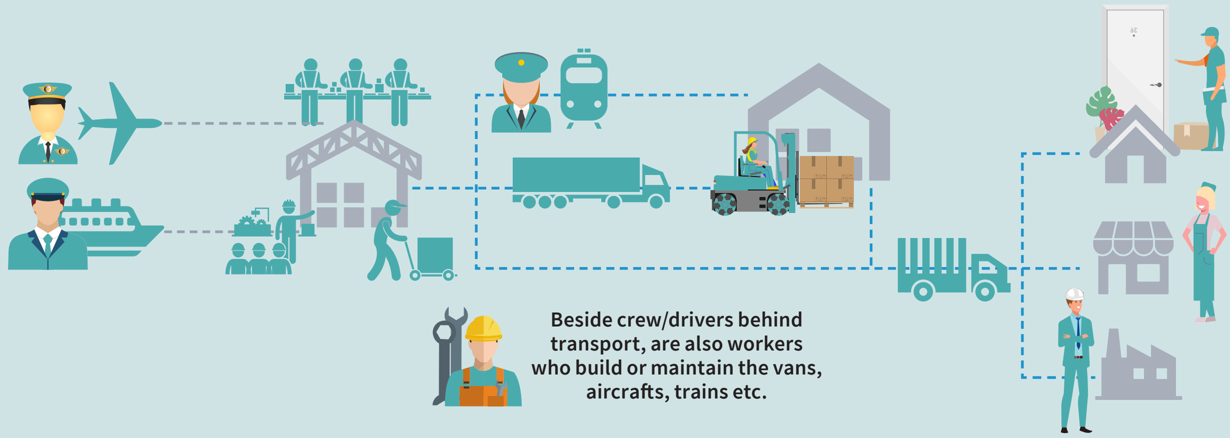
The UK planning system is restricting growth in the I&L sector by not allocating enough land in the right locations



...the historic lack of supply has restricted ('suppressed') demand by 29% nationally which should be provided for in the future. Future demand estimates should also consider housing, e-commerce and freight growth

Growing Social Value Credentials

I&L supply chains are far-reaching and provide significant levels of employment in addition to on-site jobs



Most UK freight comes in via ports and airports → Freight is handled at port / air-side sheds before being distributed → Goods are moved mainly by HGV / LGV or rail to either distribution hubs (sheds) or direct to customers → End customers are either homes or businesses

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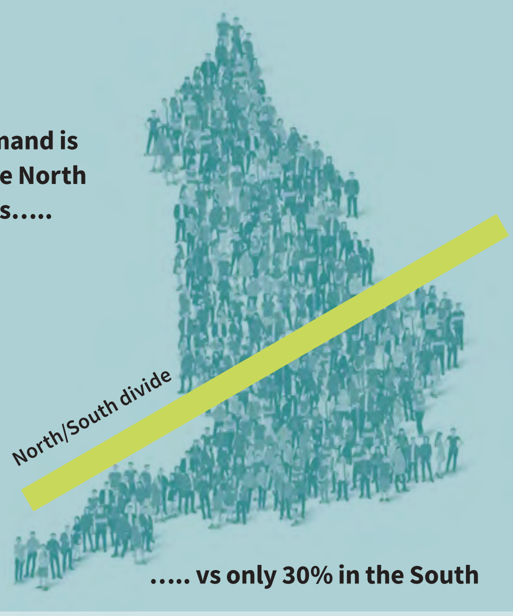
I&L investment is helping to support the Government's 'Levelling Up' Agenda

70% of I&L demand is generated in the North and Midlands.....



..... vs only 30% in the South

Given the I&L sector's strong economic credentials and growth prospects, future I&L jobs can be crucial in bridging the GVA and productivity gap between the North and South

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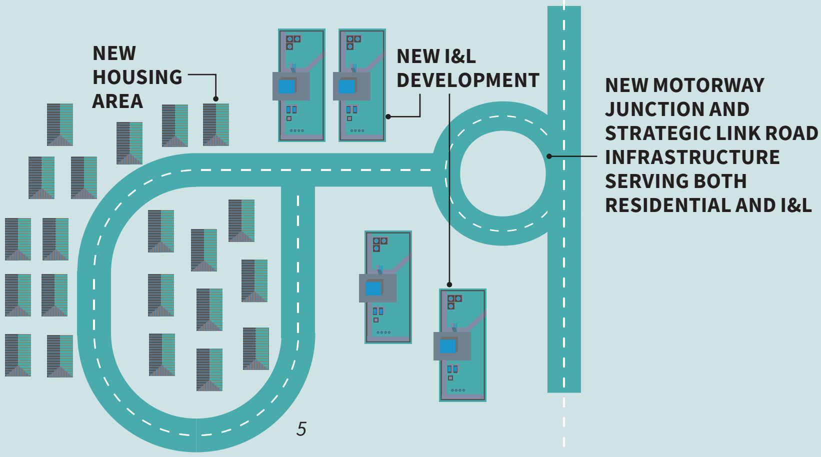
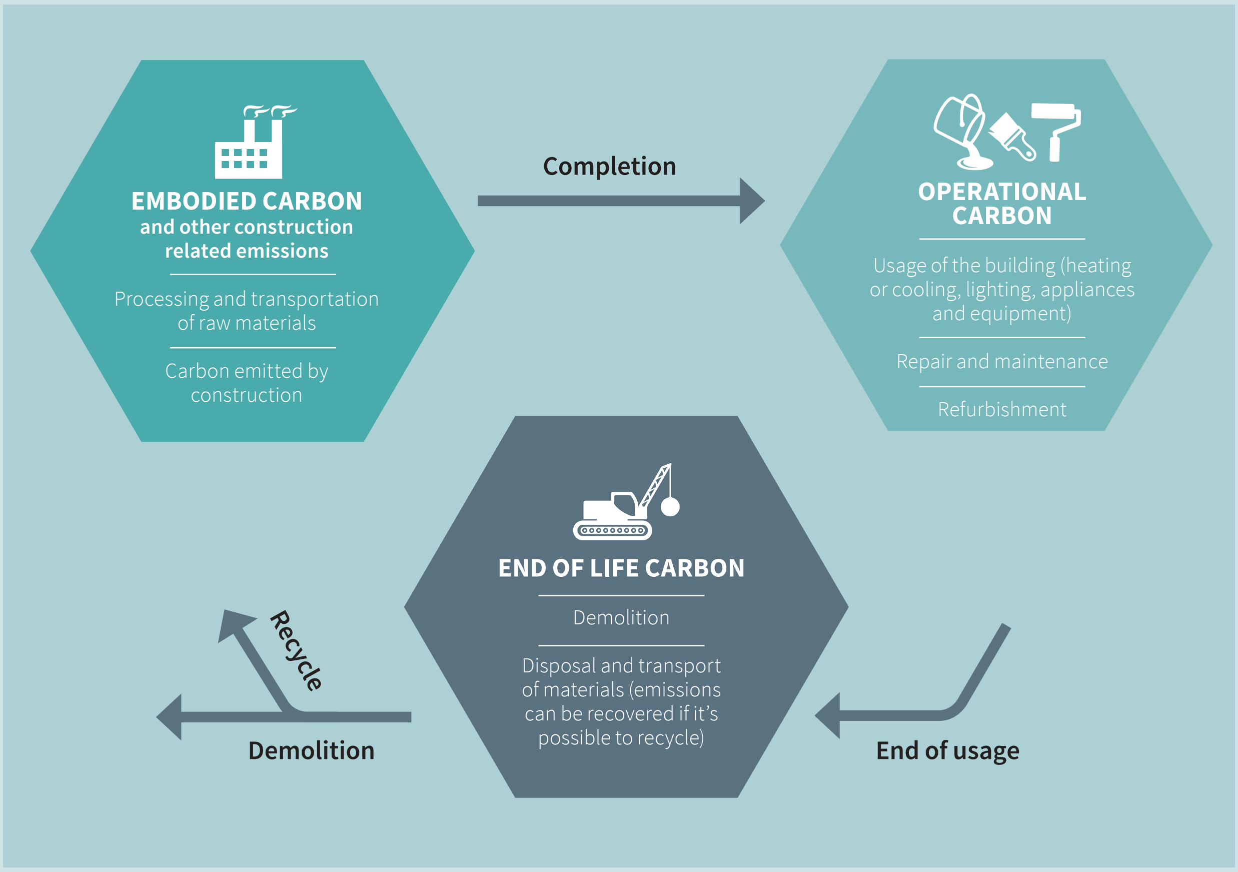
I&L investment can aid the delivery of new housing

I&L development can contribute to the delivery of new homes via the funding of strategic infrastructure such as motorway junction upgrades and link roads



A Green Recovery ‘Boxed’

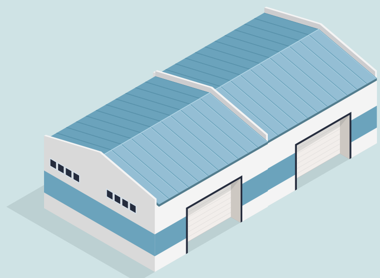
Carbon is present across all three phases of the property life cycle



EMBODIED CARBON
I&L facilities can be built with recycled, low carbon and sustainably sourced materials

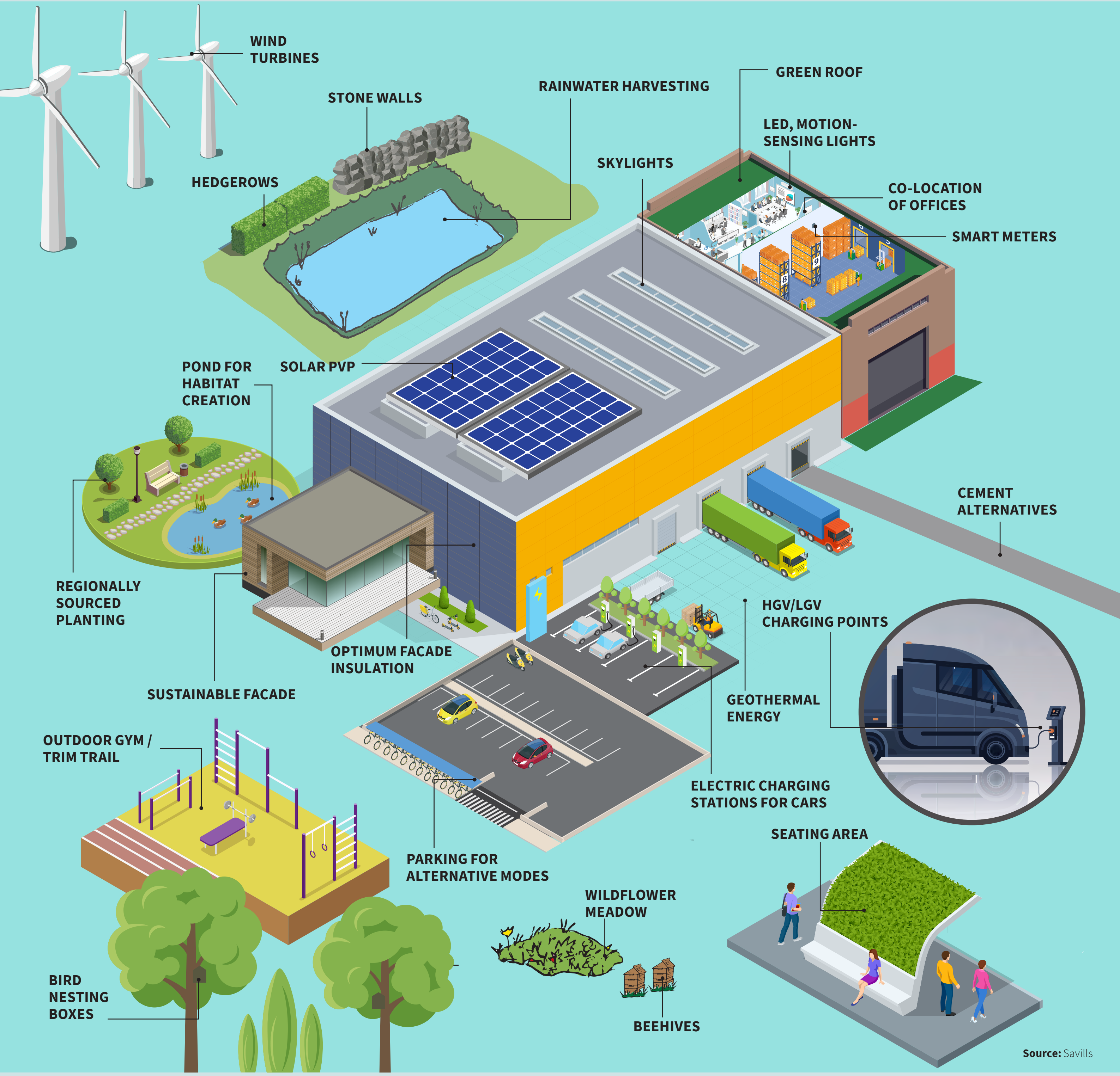
I&L buildings are achieving outstanding results for constructions such as net zero carbon recognition, and top EPC and BREEAM ratings

END OF LIFE CARBON
Modern I&L buildings have the advantage to be lightweight structures which are highly adaptable for a large range of uses



The steel frames used in I&L properties are much more easily recycled than concrete which is more common in other commercial uses

OPERATIONAL CARBON
I&L premises are innovating to reduce carbon



Source: Savills

1. Introduction

The I&L sector is not only an economic powerhouse but also delivers significant social value and is embracing innovative ways to reduce carbon

The aim of this report is to evidence the importance of the industrial and logistics (I&L) sector to the UK, not just in terms of it being an 'Economic Powerhouse' but also in terms of its 'Growing Social Value Credentials' and contribution to 'A Green Recovery Boxed'. It is hoped that by reviewing the sector against economic, social and environmental objectives, this report presents a balanced and evidential account of the sector's future growth potential and the critical role it can play in a post Covid and Brexit UK.

The intended audiences for the report are those integral to the sector's future growth and success including: national government policy makers, local authority planners, elected members, investors and tenants, as well as those keen to learn more about the sector.

The report is structured as follows:

- **An Economic Powerhouse** focuses on the sector's economic attributes, namely how I&L premises facilitate modern lives and therefore should be considered as 'Critical National Infrastructure,' similar to how major roads, ports, airports and rail freight interchanges are. We also discuss the sector's contribution to the national economy and the key growth drivers that are underpinning record-breaking levels of demand. This chapter finishes by discussing a number of flaws in the way future demand and land needs are currently assessed as part of Local Plans and how these flaws can be addressed by using an alternative method developed by Savills and St Modwen;

- **Growing Social Value Credentials** discusses the sectors contribution to local and regional communities, the Government's 'Levelling Up' agenda and the range of jobs and training opportunities the sector creates as part of its wider supply chains. We also discuss how I&L developments are contributing to strategic infrastructure to the benefit of new housing developments and how modern I&L premises are adopting a more human-centric approach to their design; and

- **A Green Recovery 'Boxed'** outlines how the sector is embracing sustainability via a reduction in carbon across all phases of a property's life cycle. We discuss how buildings are achieving net zero in construction; how carbon can be reduced during operations through clever building design solutions that improve energy supply and reduce energy demand; and we finally consider a property's end of life, exploring how I&L premises can be repurposed for other uses.

Reader's Note

When we refer to the industrial and logistics (I&L) sector we mean Light Industrial (formally B1c use class now part of Class E), General Industry (B2 use class) and Storage and Distribution (B8 use class). Effectively the primary use classes that require warehouses or factories (including ancillary offices) and associated yard spaces. These use classes typically cover the diverse range of industrial, manufacturing and logistics companies that operate within England.

2. An Economic Powerhouse

Recent global challenges have proven that the I&L sector's workers, stock of facilities and distribution networks are unquestionably 'critical national infrastructure'

I&L facilities and their supply chains support the functioning of our economy and the way we live our lives. The food we eat, the products and services we purchase, the materials used to build new homes and new infrastructure, even the vaccines that give us protection from Covid are stored, manufactured and distributed from warehouses and factories to 'us' the end customer. Without these facilities and the increasingly efficient supply chains that link them up with suppliers and end customers, the delivery of our purchases would be much slower, more expensive and we would have less choice.

It can be difficult to acknowledge the critical role played by the I&L sector when everything is running smoothly. It is much easier to understand its importance when things don't work quite as well. The six-day blockage of the Suez Canal in March 2021 created a domino effect on global supply chains, which affected not only those sectors relying on container shipping but also the transport sector as fuel vessels were delayed too. The shortage of HGV drivers in autumn 2021 led to fuel shortages in UK petrol stations and forced businesses to close down sites or cut product lines, adding to the backlog of production caused by the Covid pandemic.

These challenges have brought to the fore the importance of supply chain resilience and the need for a sufficient supply of appropriately located I&L premises. For instance, during the recent lockdowns, the I&L sector has been instrumental to ensure the effective delivery of medical stock in hospitals and food supplies on supermarket shelves. As vaccines were made available, the operation of effective distribution networks across transport modes was fundamental to supply vaccination centres while meeting stringent time frames and cold-store requirements. The pandemic has indeed proven that our daily life depends on the I&L sector. Its workers, stock of facilities and distribution networks are unquestionably 'critical national infrastructure.' The sector is also critical to the Government's 'Levelling Up' agenda given it is one of the few large sectors that invests more in the central and northern parts of the country rather than London and the south. We discuss this issue further in the 'Growing Social Value Credentials' chapter.

The sector's growth is critical to the UK's future prosperity

The sector is a significant employer of at least 3.8 million people. However the true number of jobs is likely much higher as this only relates to 'manufacturing, transportation and storage'[1] activities. The wider supply chains of I&L businesses

Key stats: I&L sector

3.8 million
jobs in I&L in England

£232 billion
of GVA

29% productivity
increase between 2025 and 2039

14% the share of I&L in the total economy in terms of GVA

Source: ONS, Oxford Economics, Savills [2]

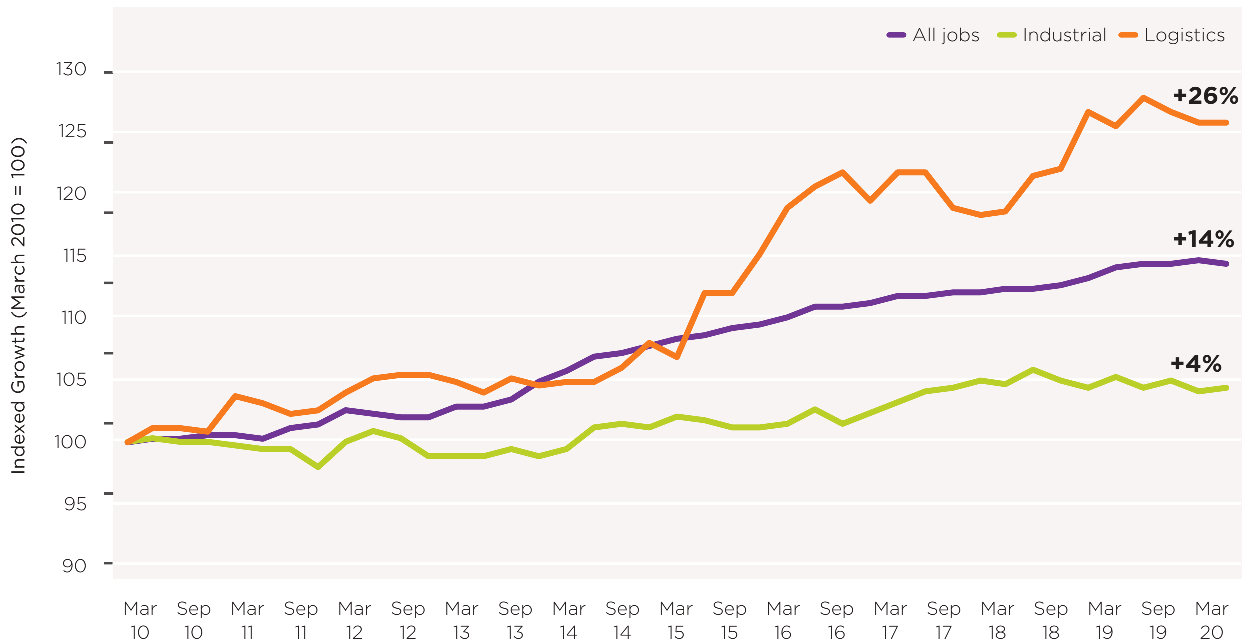
include other types of jobs not covered by this statistical classification. For instance, office based roles and professions such as product design, research & development and engineering are routinely found in I&L companies but fall within the 'professional services' classification.

A prime example of the wider economic impacts of I&L supply chains is Amazon. In addition to the 55,000 staff[3] it employs directly in the UK, the company is reported to have created 175,000 jobs via the 65,000 plus small and medium-sized enterprises (SMEs) who are selling professionally through Amazon[4]. While Amazon's diversity lies primarily in the different products it handles and distributes, I&L companies can differ greatly in terms of their operational characteristics and the activities conducted from their premises.

Not only is the I&L sector large, at 14% of the England economy, it is fast growing too. Over the last 10 years, jobs within the logistics part of the I&L sector have grown by 26% compared to only 14% across the economy as a whole. Its growth profile has been further accelerated by the Covid pandemic and Brexit as we discuss further below.

"Over the last 10 years, jobs within the logistics part of the I&L sector have grown by 26% compared to only 14% across the economy as a whole."

Historic Jobs Growth in England



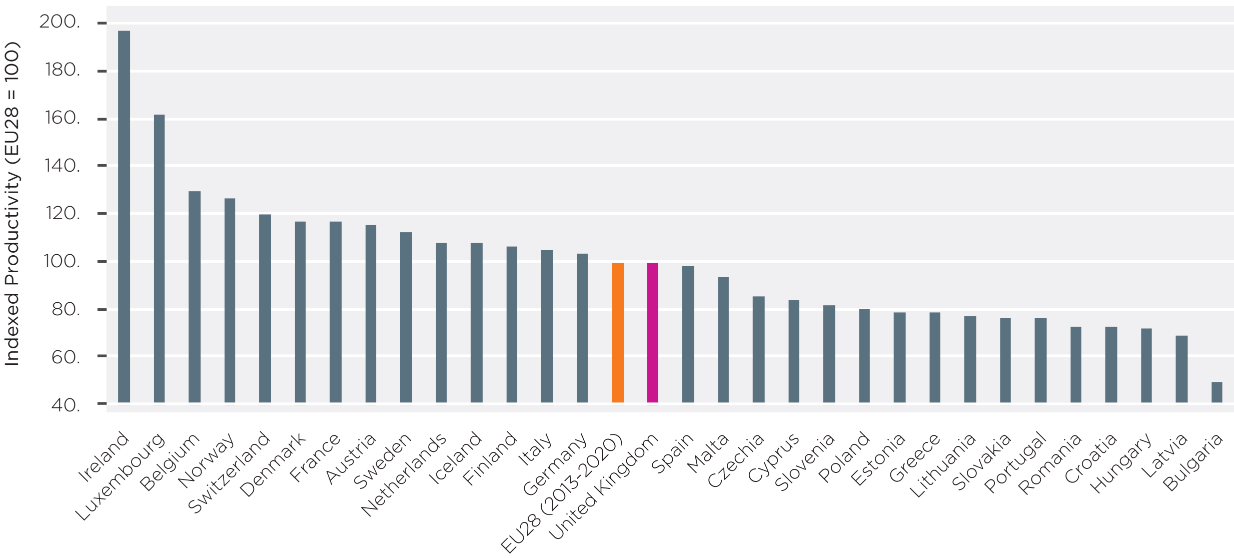
Source: ONS, Workforce Jobs by Industry and Region, Savills

The sector is also highly productive with Gross Value Added (GVA)[5] per job currently at £58,000, some 12% higher than the average of all sectors. Its productivity is also predicted to grow at a faster pace, increasing by 29% between 2025 to 2039 compared to 18% across the UK economy as a whole[6]. These are extremely important statistics given the UK's labour productivity currently lags many of its western European peers as shown in the chart below.

Improving the UK's labour productivity will become increasingly important in a post Brexit world given its important bearing on attracting inward investment, ability to pay higher wages and higher tax revenues for the Government which can be reinvested in critical services and infrastructure.

The vision of the UK becoming a "high-wage, high-skill" economy was central to Prime Minister Boris Johnson's Conservative Party Conference speech on the 6th October 2021. Essential to achieving this vision will be to increase overall labour productivity, which in turn will require further growth in the more productive parts of the economy which undoubtedly include the I&L sector.

Labour productivity per person employed - 2019



Source: Eurostat, Savills

I&L growth is being driven by numerous factors

Not just e-commerce driving growth

While e-commerce grabs most of the headlines for driving growth in the sector, there are several growth drivers at play as illustrated below. Combined, these growth drivers are resulting in unpreceded demand for I&L premises.

Savills January 2022 Big Shed Briefing[7] reported that 55.1 million sqft (gross) of warehouse space had been transacted in 2021, setting a new annual record for take-up and being 86% above the long-term annual average.

I&L Growth Drivers

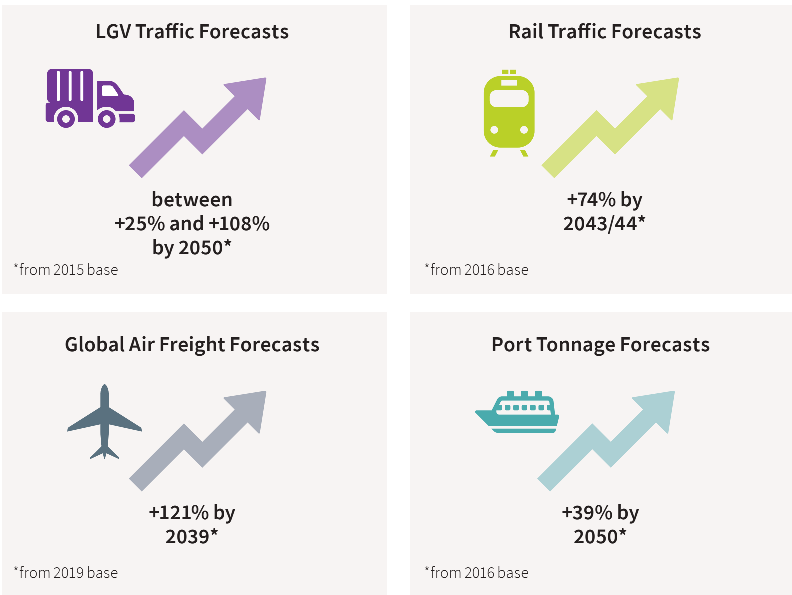
Source: Savills

Growth in UK freight

Freight arriving and leaving the UK needs to be sorted, packaged and distributed via a network of freight handling infrastructure (i.e. ports, airports, rail freight interchanges and motorways) and optimally located I&L premises in order to reach end customers.

Significant growth is forecast across all freight modes, which will increase demand for I&L space in the future. I&L premises should not be seen as separate from the infrastructure which enables goods to be moved around the UK, but should be considered critical national infrastructure itself.

I&L forecasts



Source: DfT, MDS Transmodal for Network Rail, Boeing, DfT, Savills

E-Commerce Growth

E-Commerce growth is being driven by two factors.

Firstly, population growth. The UK Government has announced a housing shortage in response to demand consistently outstripping supply. To address this situation, the Government has set an annual housing target of 300,000 homes per annum in England which it is struggling to achieve with less than 225,000 homes delivered per annum over the last five years[8]. Based on current online retail spending data[9] and average household size[10], 300,000 homes per annum equates to an extra £1.3 billion per annum in online retail spending. Using the 'warehouse to homes ratio' discussed in the BPF's 'What Warehouse Where?' report[11], this level of housing growth could generate a warehouse requirement of 21 million sqft per annum on its own.

Secondly, technological improvements coupled with society's increasing preference to purchase goods and services online. Retail spending is growing faster than the rate of population growth (+71%[12] vs +14%[13] over the last 20 years). More of this retail spending is being conducted online, for instance in 2006 online sales accounted for only 3% increasing to 19% prior to the Covid pandemic in February 2020. The Covid pandemic has accelerated this growth with internet sales currently at 26%[14] and forecast to grow to 37% by 2025[15]. The growth in online shopping has significant implications on future I&L demand given that e-commerce requires over three times the logistics space compared to traditional brick-and-mortar retailers[16].

Faster Deliveries

Consumer expectations for same-day or next-day delivery are reshaping the operating models of logistics companies. For instance, the emergence of Zapp, Getir and Deliveroo who deliver groceries "in minutes" while most of the major retailers such as Boots, Next and many more deliver next day. These trends are expected to increase demand for logistics space as reduced delivery times are expected to benefit online retailers.

The Covid pandemic has accelerated this shift: a survey by Bringg[17] found that since the start of the pandemic 27% of retailers added same-day delivery for online orders as a fulfilment option and 1 in 3 retailers are planning to add same-day delivery options in the next 6 to 12 months.

To enable fast deliveries, stock needs to be held near the end customer before it's picked up for the last mile. This requires warehousing space in regional and local distribution hubs nearby to population centres. Large 3PLs like Amazon can more easily fit this model within their existing operations due to the sheer number of deliveries that they fulfil daily and their huge geographic coverage. For most retailers however this move will require investment in technology and upskilling of staff in addition to more warehousing space. In some cases, it could require setting up their own delivery fleet to improve margins, as already done by some large grocery retailers such as Sainsbury's, Tesco and Asda, to cope with the growing demand for online orders.

Near-shoring / re-shoring

The Covid pandemic and Brexit have created major disruptions for the sector's supply chains in the form of border restrictions, lockdowns and access to labour such as HGV drivers. In order to minimise similar disruptions in the future, many UK companies are moving their operations either back to the UK or closer by. Likewise certain I&L activities may be re-shored to the UK as it becomes more expensive to conduct business in the EU as a result of Brexit. According to a survey carried out in July 2020 by the Institute for Supply Management, 20% of firms are planning to or have already started to near-shore or re-shore. These findings are corroborated by a survey carried out by Savills[18] whereby over 80% of respondents expected the Covid pandemic to either 'greatly increase' or 'somewhat increase' on-shoring. This is likely to lead to higher domestic inventory requirements, further increasing long-term demand for I&L space.

Definitions

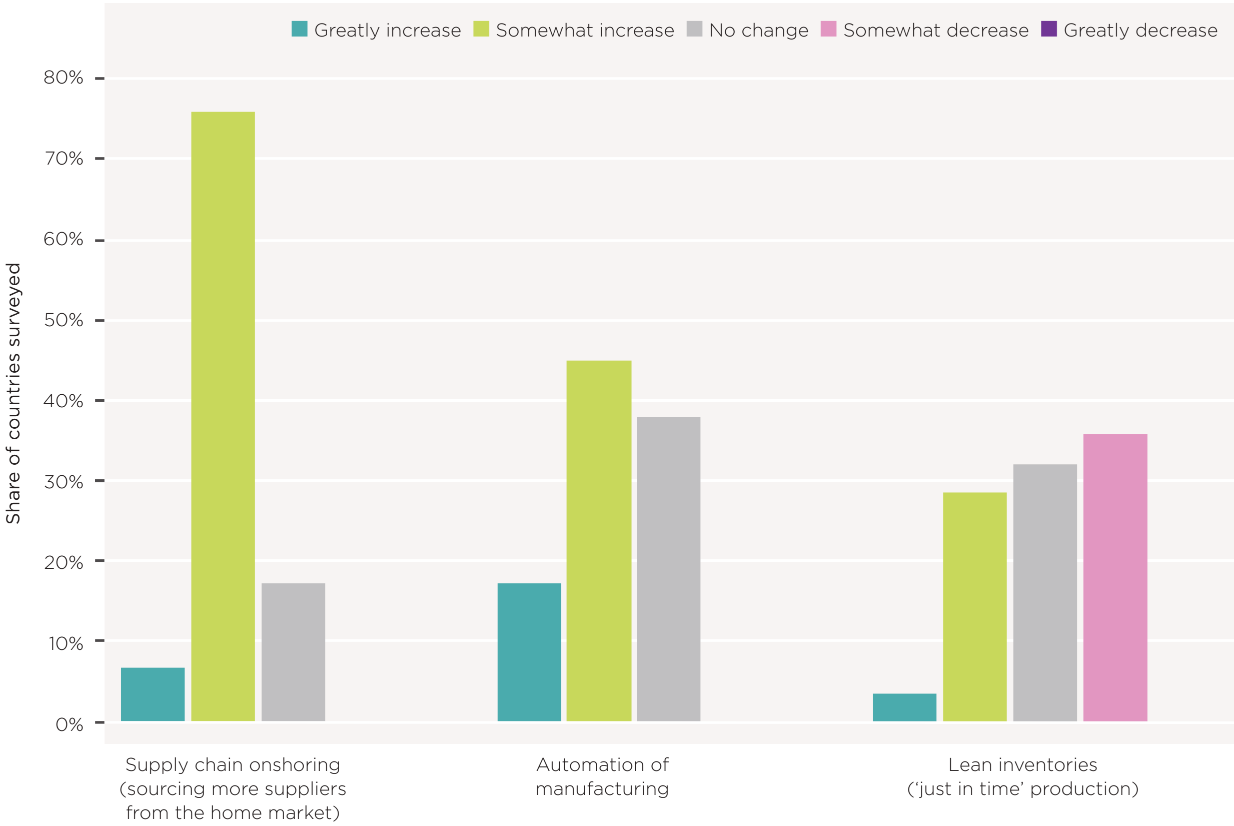
Near-shoring
Transferring a business operation to a nearby country as opposed to a more distant one (i.e. off-shoring)

Re-shoring
Moving a business that had gone overseas back to the country from which it had originally relocated

"To enable fast deliveries, stock needs to be held near the end customer before it's picked up for the last mile. This requires warehousing space in regional and local distribution hubs nearby to population centres"

Certain I&L activities may be on-shored to the UK in response to international supply chain disruptions

Impact of Covid-19 on supply chains and manufacturing after pandemic has passed



Source: Savills Research

Co-locating different business functions

As the operations of modern day I&L companies have evolved via investments in automation and technology, so have the types of occupations found in the sector. Alongside traditional roles such as factory / warehouse managers, forklift operators and delivery drivers are a diverse range of new roles such as software engineers in charge of automated systems, supply chain managers and data analysts.

While these new and more diverse occupations are the result of operational changes in the sector, these changes are impacting the design and composition of modern I&L premises. One such change is the increased prevalence of office space being co-located with warehouse and manufacturing facilities to house these new roles, but also as a means of improving operational efficiency, reducing estate costs and fostering stronger collaboration between different business units (see Bidfood case study). Based on Savills data tracking large units over 100,000 sqft across the UK, the amount of office space found in I&L premises has increased over the last five years.

While the external appearance of premises occupied by a manufacturer may look similar to that occupied by a logistics company, their internal fit out, even a building's environmental performance are increasingly tailored to the specific requirements of individual companies. Modern I&L premises are also found to house gyms, cafes, restaurants, game rooms, and even hairdressers and physiotherapy suites. As a result, the types of activities undertaken, the levels of employment generated, and range of occupations found on site are very much company specific. This diversity evident in the sector is not adequately captured via the current planning use classes or standard job densities applied to I&L developments.

As detailed in our Gymshark case study below their diverse operations are being co-located together meaning its premises do not fit solely within either an office (E(g)(i)), research and development (E(g)(ii)), industrial processes (E(g)(iii)), general industrial (B2) or storage and distribution (B8) use class. Nor do any of its different activities operate as ancillary to one another but rather as separate components of a collective whole.

Case Study: Gymshark

Gymshark is a fast growing clothing company which is now expanding across multiple facilities in Blythe Valley Business Park (Solihull) to create a campus style working environment. The large warehouse chosen for their new innovation hub provided Gymshark with the necessary flexibility to house multiple functions, combining production, storage, design studio, innovation and office space, meeting rooms and breakout areas. The building is designed to bring together these diverse uses and the people covering different roles to promote innovation and integration across a number of functions.

Source: Gymshark

Case Study: Bidfood

Purpose-built for Bidfood, the 117,400 sqft premises in the Slough Trading Estate include 22,000 sqft of head office accommodation arranged across three floors for marketing, commercial, quality control, finance, IT, customer services and telesales personnel. The remaining floorspace includes a customer presentation suite, temperature-controlled warehouse and distribution facility.

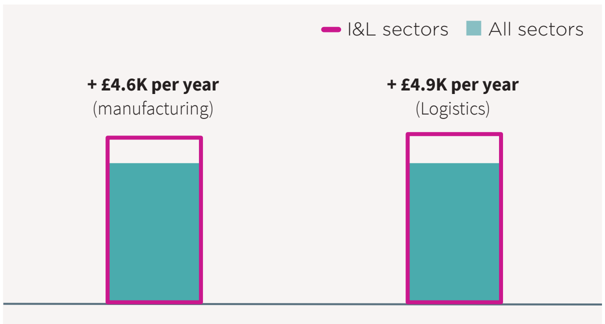
Source: SEGRO

Diverse and better paid occupations

The I&L sector is subject to several misconceptions about average pay levels, skills required, and types of spaces provided. It is not a low-paid[19], low-skilled employer, in fact, the reality is very different.

Firstly, average pay is higher than the UK average. Data from the Office for National Statistics (ONS) show annual wages above average at +£4,600 for Manufacturing and +£4,900 for Logistics.

I&L jobs pay more



Source: ONS (2021) ASHE, UK Gross Annual Pay in 2020

Secondly, while other sectors have contracted during the Covid pandemic the I&L sector has continued to expand. Data on online job ads tracked by ONS via Adzuna indicate that job postings have increased by three times for transport & logistics roles and two and a half times for manufacturing roles since the start of the pandemic[20]. Two notable examples behind these statistics are the John Lewis Partnership and Amazon:

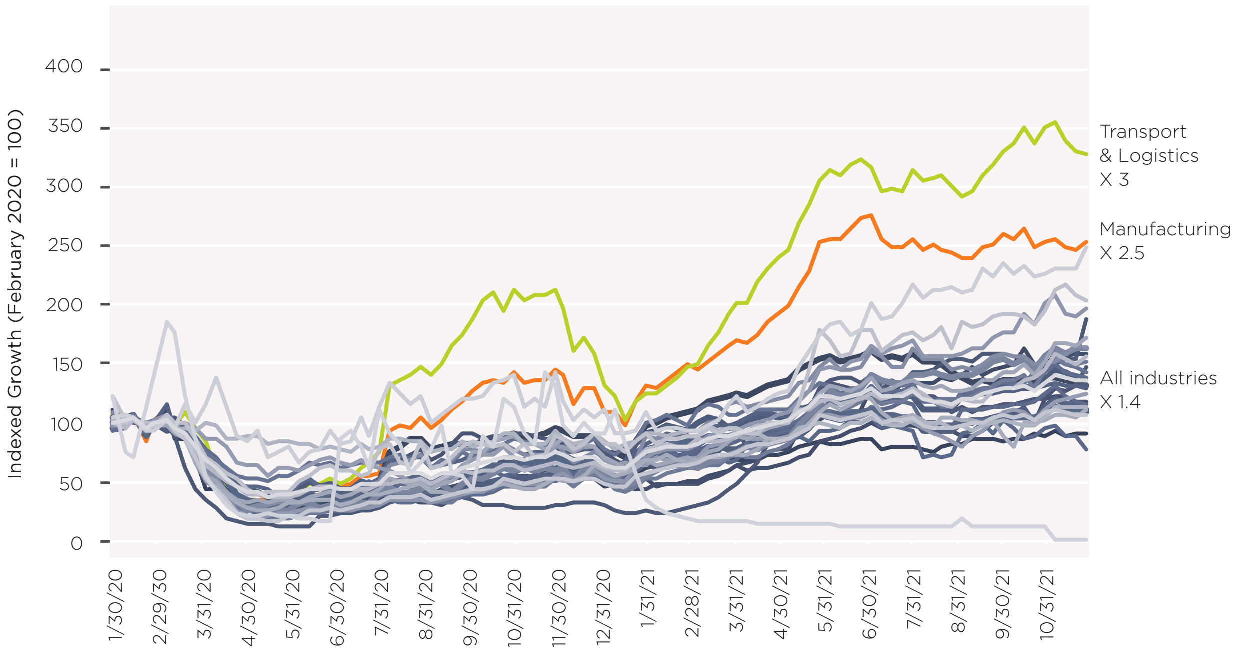
- The John Lewis Partnership is recruiting more than 550 permanent full-time driver and warehouse partner roles across its distribution centres and Waitrose.com and John Lewis.com customer delivery centres[21]; and

- Amazon committed to recruit 20,000 temporary staff for the busy Christmas period across its network of fulfilment centres, sort centres and delivery stations[22]. These are in addition to the 7,000 permanent jobs it announced in September 2021[23].

“The Industrial & Logistics sector is not a low-paid, low-skilled employer, in fact, the reality is very different”

I&L job adverts have increased during the pandemic

Up to 3 x more I&L job adverts

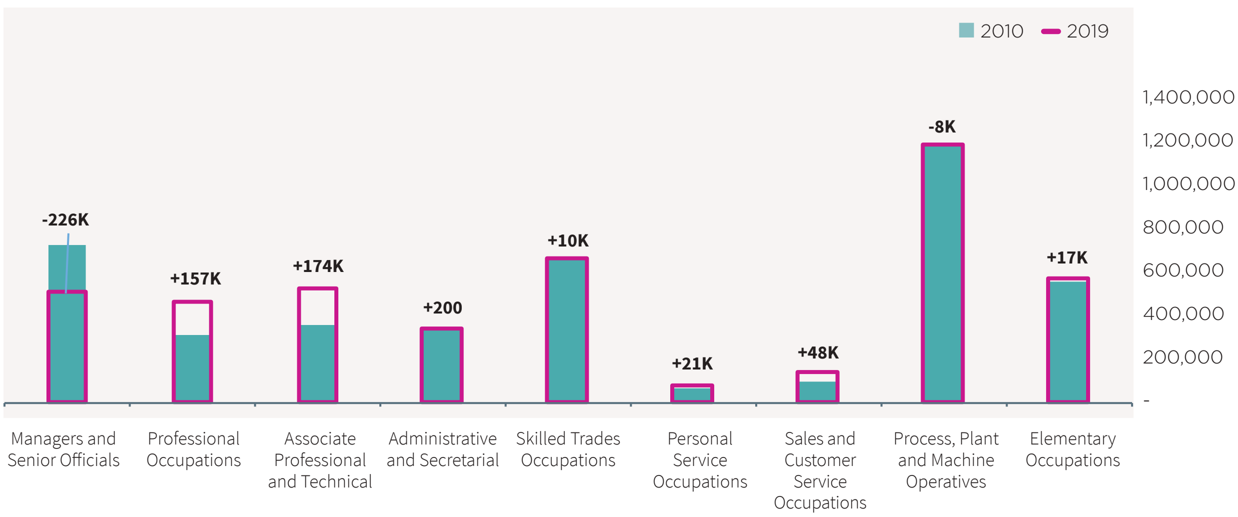


Source: ONS (2021), Online Job Advert Estimates based on Adzuna

Thirdly, I&L jobs have become increasingly diverse over the last decade. At the beginning of the decade the sector had a much more polarised distribution, with a higher share of managers at one end of the spectrum and more plant and machinery operatives and elementary occupations at the other end. Today we see a higher share of Professional and Associate Professional and Technical roles, typically associated with higher-skilled engineering and technological professions.

This is in response to increased automation and robotics in the sector and more advanced supply chain processes. These office-based roles are increasingly co-locating alongside production and logistics uses as it is convenient for these people to be closer to the operations they control and analyse. This increased occupational diversity means the I&L sector can play an important role in re-employing people that have lost jobs in other sectors of the economy as a result of the Covid pandemic.

I&L occupations are becoming more diverse



Source: ONS, APS

Case Study: Overclockers

Overclockers is a modern British logistics and e-commerce success story. Initially founded in 1999 as a web retailer of custom 'overclocked' PCs, Overclockers started life trading from a tiny, 400 square foot warehouse in Stoke-on-Trent. It was, in many respects, a precursor to the personalisation and e-commerce boom that has transformed the way Britain likes to shop today. In 2021, following phenomenal business performance during the pandemic, which saw record demand for high performance computers, gaming hardware, and personalisation in the era of working-from-home, Overclockers now employs 107 staff across three areas and will soon move into a new, 100,000 square foot St. Modwen built warehouse.

Overclockers is a traditional logistics business in the sense that it receives and ships products to and from Europe, and all over the world. However, the extreme technical personalisation service that it offers to customers – Overclockers configures some of the world's most powerful personal computers – means its workforce is highly skilled, with a significant proportion of the team hired as apprentices and trained on the job.

Employing and nurturing a highly skilled, local workforce is not the only service that Overclockers provides to society. Some of its clientele include police forces, who require especially powerful computers to help them solve crimes, Formula One teams, who operate right at the cutting-edge of technology and data, and universities, who have an increasing need for ever-more-powerful computers to help them find solutions for some of the world's most pressing issues, including climate change.

Source: St Modwen

The UK planning system is restricting growth

The strong growth expected in the I&L sector, and the jobs, investment and productivity it will bring, will not materialise unless sufficient land is allocated in the right locations. The planning system is the guardian for allocating land, therefore it is critical the employment evidence which support Local Plans do a more accurate job at assessing future demand.

This issue has been central to the recommendations of other BPF publications, most recently the BPF's Employment Land Manifesto which recommends:

- Introducing a *Presumption in Favour of Logistics Development* within the NPPG when precise criteria are met. This is needed as Local Plans can take years to be adopted and therefore are completely out of kilter with the pace of market changes;

- Ensuring *Local Plans allocate sites in the right locations* to respond to a broad range of market needs;

- Modernising Employment Land Reviews to allow for the utilisation of 'real time' information so that they can be kept up to date; and

- Introducing an *Employment Land Delivery Test* to ensure that a commensurate amount of employment land is brought forward to counterbalance housing and that any employment land lost to other uses is delivered in the right locations. If a local planning authority failed to meet the delivery test, a presumption in favour of sustainable logistics development could be engaged.

The attributes of an optimal I&L location

Source: Savills

Although the National Planning Policy Framework (NPPF) provides a clear and positive policy context to assessing future economic needs, the Planning Practice Guidance that accompanies the NPPF lacks the same clarity. Economic need plays second fiddle to housing need in the guidance, the latter being subject to a standard methodology with a series of unambiguous steps set out to establish the minimum annual housing need for each local authority area.

There is specific reference to the critical role of logistics and the need for market analysis and engagement with stakeholders, but the guidance fails to provide a clear and robust approach to ensuring I&L needs are met. As a consequence, an array of local authority strategies are being adopted resulting, in most cases, too little land being allocated to meet current and future market demand. This is primarily due to these strategies being backwards looking and projecting forward historic trends as a proxy for future demand. As a result, modern day growth drivers are not taken into account, for example: housing growth, online retailing growth, increasing UK freight volumes and the need for larger premises, all of which generate increased demand for I&L land and floorspace. The main NPPG methods for estimating future land needs and their deficiencies are summarised below.

The UK planning system is restricting growth in the I&L sector by not allocating enough land in the right locations

Current NPPG methods are not fit for purpose

Project forward future demand based on either **historic completions** or **historic net absorption** (take up)	Underestimates future need as the **I&L sector** has been **supply constrained for the majority of the last decade**
Consultations with relevant organisations, studies of business trends, and understanding of innovative and changing business models	Not sufficient on its own, most **agents don't take longer term view** which are essential to forecasting employment land need. Transactional focus, not land focus
Demographically derived assessments of current and future local labour supply > usually look at **housing growth** either within LA or wider FEMA	Housing growth at the local level has no relationship to **I&L markets** which have a **more regional** demand profile. A local focus restricts need
Use **3rd party job projections** such as Oxford Economics, Experian, etc. and translate into floorspace requirement	**No transparency** and therefore limited scrutiny. **Do not have a land focus** which is the core requirement to facilitate I&L growth

Source: Savills

The inadequacies of these models and their application is evident in that supply historically has not kept pace with demand. When demand cannot be fully satisfied occupiers vie for limited available space pushing up rents. This is what we have seen over the last decade with 61% rental growth[24], more than double the rate of inflation.

At the national level, the market equilibrium level where supply and demand are broadly in balance and rents are more stable is around 8% availability. This benchmark rate is found in a number of prominent publications such as the GLA's Land for Industry and Transport Supplementary Planning Guidance (SPG). England's I&L market has been below this level for over seven years clearly demonstrating the failure of the current NPPG methods in estimating demand accurately. Put another net absorption is a leading measure of demand, comparing occupied space (move-ins) versus vacated space (move-outs).

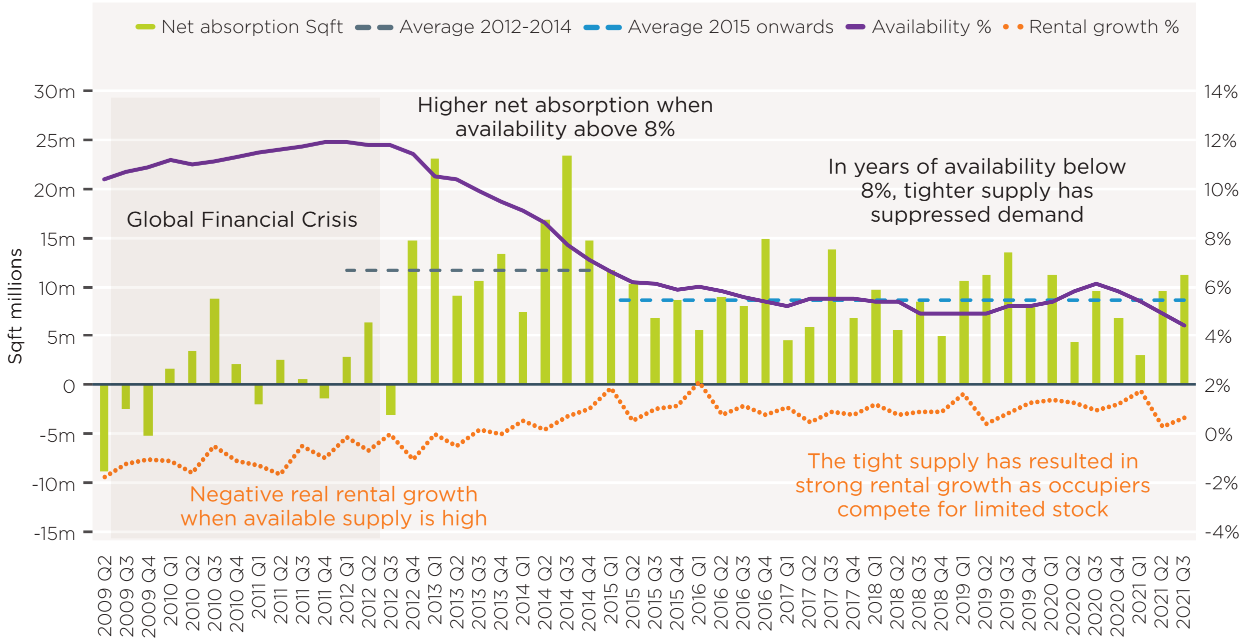
This relationship between supply and demand is clearly shown in the chart below. When available supply was higher at around 10%-12% in 2012-2014 net absorption averaged 47 million sqft per annum (net). This is higher than the average net absorption more recently from 2015-2020 at 34 million sqft (net) despite the UK only having just emerged from the Global Financial Crisis (GFC). The key reason why leasing demand was higher in 2012-2014, despite the impact of the GFC, is that sufficient available supply existed to accommodate demand, even though overall demand was weaker compared to the more recent period post 2015. After 2015, available supply has been well below the equilibrium rate of 8% which has suppressed overall demand as it could not all be accommodated.

A further clear indicator of demand exceeding supply is strong rental growth. As can be seen from the bottom part of the chart real rents[25] have been growing strongly since 2015 when availability dropped below 8%. This is distinct from the period after the GFC (2012-2014) when real rental growth was either negative or zero, indicating there was more than enough supply to meet demand.

Definitions

Net absorption is a leading measure of demand, comparing occupied space (move-ins) versus vacated space (move-outs).

Historic supply constraints have suppressed demand



Source: Savills

To help address the supply / demand imbalance Savills and St Modwen have developed a new methodology built upon the principle of 'suppressed demand' that accounts for demand that has been lost due to supply shortages. The calculation of suppressed demand can then be added to historic demand projections to give a more accurate picture of likely demand into the future.

The high level steps in the Savills / St Modwen employment land estimation model includes:

A. Find a market's equilibrium availability rate: This is around 8% at the national level but can alter slightly from market to market. A market's equilibrium rate is either when rents are broadly stable or when rental growth transitions from being negative or stable to growing strongly year on year.

B. Identify those years when available floorspace was below the equilibrium rate: This involves identifying previous years when availability was below the 8% equilibrium rate.

C. Calculate suppressed demand: Here you calculate how much demand the market should have had in those years of tight supply in order to be at the equilibrium rate. For instance, if the equilibrium rate is 8% but the market had 5% in a given year, the 3% difference needs to be translated into floorspace.

Next, you calculate the average of the ratio between net absorption and available floorspace for every year over the lookback period. This ratio is then applied specifically to the availability uplift that was needed in those years of tight supply to reach the equilibrium rate. This provides a suppressed demand calculation for each year when actual availability was lower than the equilibrium rate. These are then added together to give a total suppressed demand over the lookback period.

D. Add suppressed demand to historic trend: Finally the suppressed demand is added to the historic demand over the lookback period. The annualised figure of this combination can then be projected forward over the Local Plan period to provide a more accurate estimate of future demand.

This methodology when run at the England level estimates future demand will be at least 29% higher than historic levels, equating to a minimum of 44 million sqft per annum (net). A useful cross reference to make here is with the BPF's previous report 'What Warehouse Where?' which estimated each home could generate a need of 69 sqft of warehouse space or 21 million sqft per annum based on the Government's annual housing target of 300,000 homes. While Savills calculations are for both warehousing and industrial demand (i.e. the entire I&L sector), this comparison usefully gives an idea of the significant contribution warehouse needs from new homes will make to overall future I&L demand (of up to 48%).

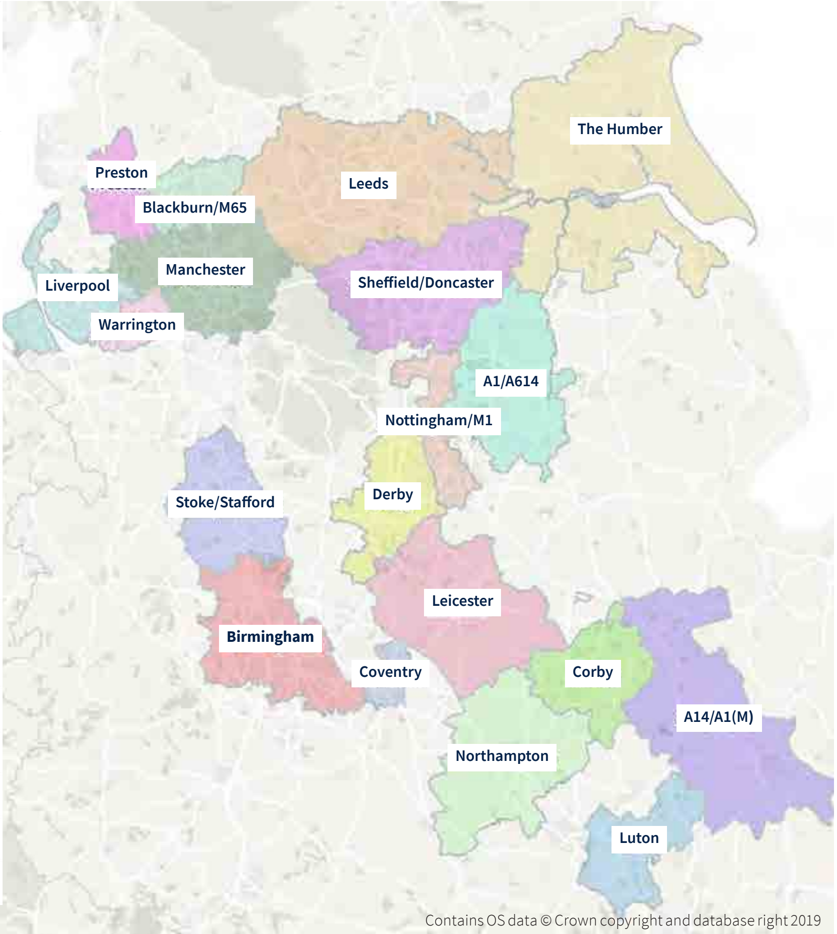
If supply improves in England, future demand p.a. (net) will be at least 29% higher than historic levels

Source: Savills

Savills has tested its suppressed demand model across 19 key I&L markets in England. Many of these markets have historically experienced leasing demand well beyond the supply of available land and floorspace. The percentages on the table indicate how much additional demand (as a minimum) should be planned for in the future within each market above historic levels. While these results are based on wider market areas made up of a collection of local authorities, the model can be run at the national level, the individual local authority level as well as more bespoke market areas.

Markets Tested for Suppressed Demand in England

Market	Supressed demand uplift %
A1/A614	38%
A14/A1(M)	9%
Birmingham/M65	29%
Blackburn/M65	30%
Corby	70%
Coventry	21%
Derby	30%
Leeds	42%
Liverpool	7%
Luton	72%
Manchester	35%
Northampton	20%
Nottingham/M1	28%
Preston	32%
Sheffield/Doncaster	27%
Stoke/Stafford	29%
The Humber	24%
Warrington	6%



Source: Savills 2021

The above suppressed demand figures should be considered minimums as their focus is on correcting past trends by accounting for lost demand due to historic supply constraints. This more accurate historic trend should also be uplifted further to account for current day and future demand drivers, the key ones, as discussed above, being online retailing growth and growth in freight volumes. Savills has developed a method for calculating these factors too (please see below contact details for further information).

For further information on the Savills/St Modwen methodology, please contact either:

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3. Growing Social Value Credentials

I&L development generates direct and indirect jobs and substantial social value in the form of training and apprenticeships

The social value of I&L supply chains

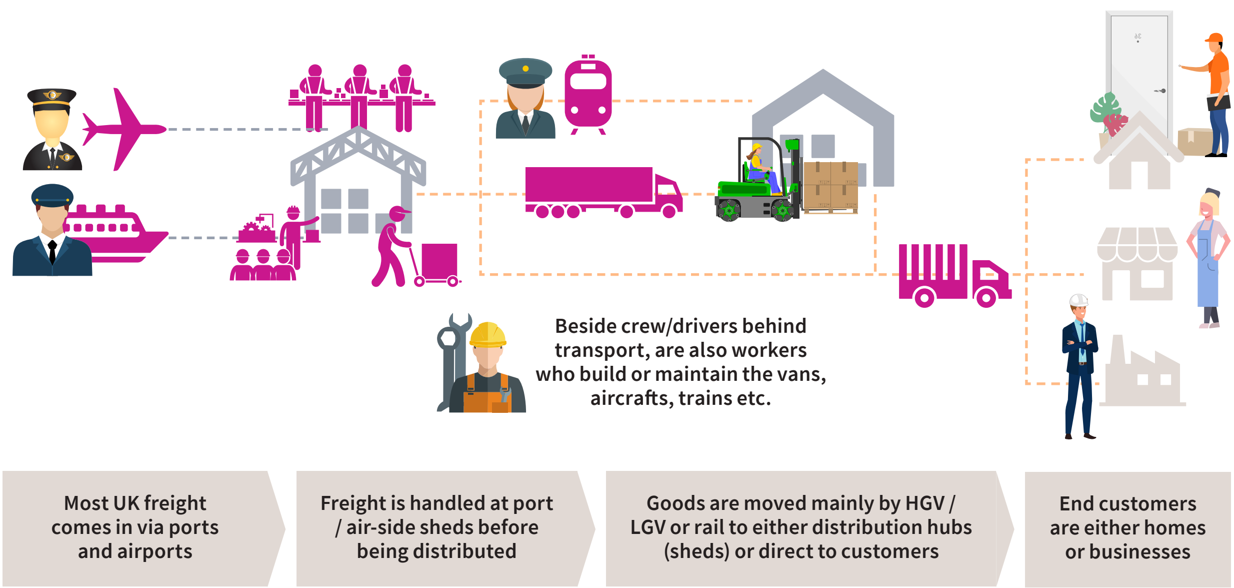
I&L developments generate significant jobs and economic benefits as part of their wider supply chains in addition to on-site employment. In turn, these economic benefits create social value in the form of apprenticeships, training and upskilling opportunities for local people.

I&L jobs range from entry level graduates to highly skilled engineering and management roles. This wider supply chain employment is often overlooked in favour of the higher on-site job densities for retail and office uses. However, in many cases, the office and retail jobs envisaged in Local Plans are not created given these uses are unviable to build in many locations throughout the country.

In terms of wider supply chain employment, production plants and warehouses require goods to be transported and delivered between their suppliers and end use customers. This creates the need for drivers of Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs). LGV licences alone have increased by 83% over the last two decades[26] in response to the rise in online shopping and subsequent expansion of the I&L sector. This increase in HGVs and LGVs creates jobs involved in their manufacture, maintenance and repair.

The growth of the UK's freight industry also creates significant jobs. I&L premises are a critical link in the chain alongside the key freight modes that allow goods to enter, leave and move around the country (i.e. ports, airports, rail freight interchanges and motorways). Like warehouses and factories, these freight handling facilities generate employment to drive the planes, trains and boats, as well as jobs involved in their maintenance and repair. Jobs are also created at ports, airports and rail freight interchanges as part of their operation.

Employment within wider I&L supply chains



Source: Savills

As discussed above, the sector has also increased its share significantly of professional occupations (plus 157k) and associate professional and technical roles (plus 174k) over the last decade. Many of these roles are involved in supply chain management, engineering linked to the sector's increased automation, sales and marketing and even research and development into future advancements such as drone deliveries and autonomous driving vehicles.

The sector also generates significant construction and apprenticeship roles which will increase further as it expands into the future. As discussed earlier, Savills estimates future I&L needs in England to be at least an additional 44 million sqft (net) per annum. This is an uplift of 29% against the historic 10-year trend and accounts for suppressed demand (i.e. demand that has not been accommodated historically due to the lack of available supply). This future demand, if facilitated via the bringing forward of ample land supply, will give rise to a vast construction programme that will support 45,400 jobs per annum. Of these, 400 construction apprenticeships will be created each year, delivering a social value of over £7.8 million per annum[27]. Based on Savills research on local procurement benefits, we expect this construction programme to generate £440 million of social value benefits for local communities[28].

The I&L sector also delivers on average 41,100 apprenticeship starts per annum[29]. This is particularly important given the high levels of youth unemployment in England which currently stands at 14.6%[30]. If the sector is able to expand consistent with Savills estimate of future demand, the number of apprenticeships could grow to 53,000 starts annually; which is equivalent to over half a million apprenticeships over the next 10 years.

Case Study: From unemployed to full-time, permanent employee

Jehan's journey to employment shows her determination to seize the opportunity enabled by I&L development at Hinckley Park and Mercia Park. Below are some excerpts from Jehan's story as told on winvic.co.uk.

"Back in April 2019 I was unemployed and my Jobcentre Plus assessor told me about a jobs fair that was taking place. I spoke to a number of different organisations and businesses there but one offering that really caught my attention was a training course being offered by North Warwickshire and South Leicestershire College, IM Properties, Winvic and a local groundworks subcontractor, which focused on groundworks and health and safety. […]

I was accepted onto the three-week course and in June 2019 I walked into a college classroom as the only female out of 22 attendees – I didn't feel apprehensive about this, but instead, I thought, prove you can do it and see what happens. The first week focused on employability skills, such as interview techniques, the second was all about groundworks – and this was all on-site at Hinckley Park as the earthworks were being undertaken there – and the last was back in the classroom for health and safety training, sitting exams and a job interview with a Winvic groundworks subcontractor on the project."

Upon completion of the course, Jehan obtained her CSCS card, an employability certificate and a City and Guilds Level 1 in Health and Safety. The subcontractor she had the interview with passed on her CV to their network and in November 2020 Jehan was invited to an interview with Winvic's HSEQ Director Ian Goodhead, for a Covid Marshal role at the fit-out project at Hinckley Park. A week later she was already on site to start her new job.

After her Covid Marshal role ended she started to look for other options. "When discussing potential options with Ian Goodhead, a position at IM Properties site, Mercia Park was mentioned to me. I had an interview with my now Project Manager Frank Hayes and HSEQ Manager David Powell, I'm happy to say that I'm now an Assistant Site Manager. I've now undertaken my Fire Marshal, Fire Co-ordinator, First Aid, IPAF, cherry picker, scissor lift and Confined Space Management training and I'm about to undertake my Temporary Works Co-ordinator Training and NEBOSH, which I'm hoping to complete it over six to eight weeks via distance learning.

In one way it's still hard to believe that a three-week training course through attending a jobs fair has really led me to a complete career change, a stable job in an area I was interested in and that it's with a successful and supportive company!"

Source: https://www.winvic.co.uk/news/how-laying-social-value-foundations-constructs-new-careers-meet-jehan-our-latest-assistant-site-manager/

Case Study: GLP Centre of Logistics Education & Research (CLEAR) at Magna Park Lutterworth

The Centre for Logistics, Education and Research (CLEAR) is a research, innovation, education, and training facility that is being developed through a partnership between industry and education in Magna Park, Lutterworth. CLEAR will provide skills training and professional development at all levels across the spectrum of logistics and supply chain roles, creating training pathways of progression for new entrants and established talent alike. The centre will give students the opportunity to learn while they earn via a portfolio of work based, facility based or online learning options. Delivery of training will be by North Warwickshire and South Leicestershire College (NWSLC) and Aston University, working in partnership to ensure that CLEAR offers training pathways of progression. Together they have complementary skills and expertise that allows for the 'one stop shop' delivery of a fully integrated and holistic programme of applied research, education, training and professional development.

Source: https://www.nwslc.ac.uk/, GLP

Case Study: Prologis Education Hub at DIRFT

The Education Hub is a 9,551 sqft centre for logistics training and education that can be used by occupiers at Daventry International Rail Freight Terminal (DIRFT). The building has three distinct areas, a reception and café, three flexible training rooms and three smaller meeting rooms. The Hub is also home to the Prologis Warehousing and Logistics Training Programme (PWLTP), a digital learning and development programme aimed at training those leaving education and re-skilling the unemployed by equipping them with the knowledge needed to pursue a career in logistics.

Source: Stephen + George[31], Prologis

The I&L sector can play a pivotal role as part of the Government's levelling up agenda

The Levelling Up Agenda

Traditionally, there has been a North-South divide in the UK whereby regions in the South[32] perform better across a number of socio-economic indicators compared to regions in the North[33]. The Government has repeatedly tried to address this issue for a long time with initiatives aimed at 'rebalancing' the economy and a Levelling Up White Paper due to be published in the coming months.

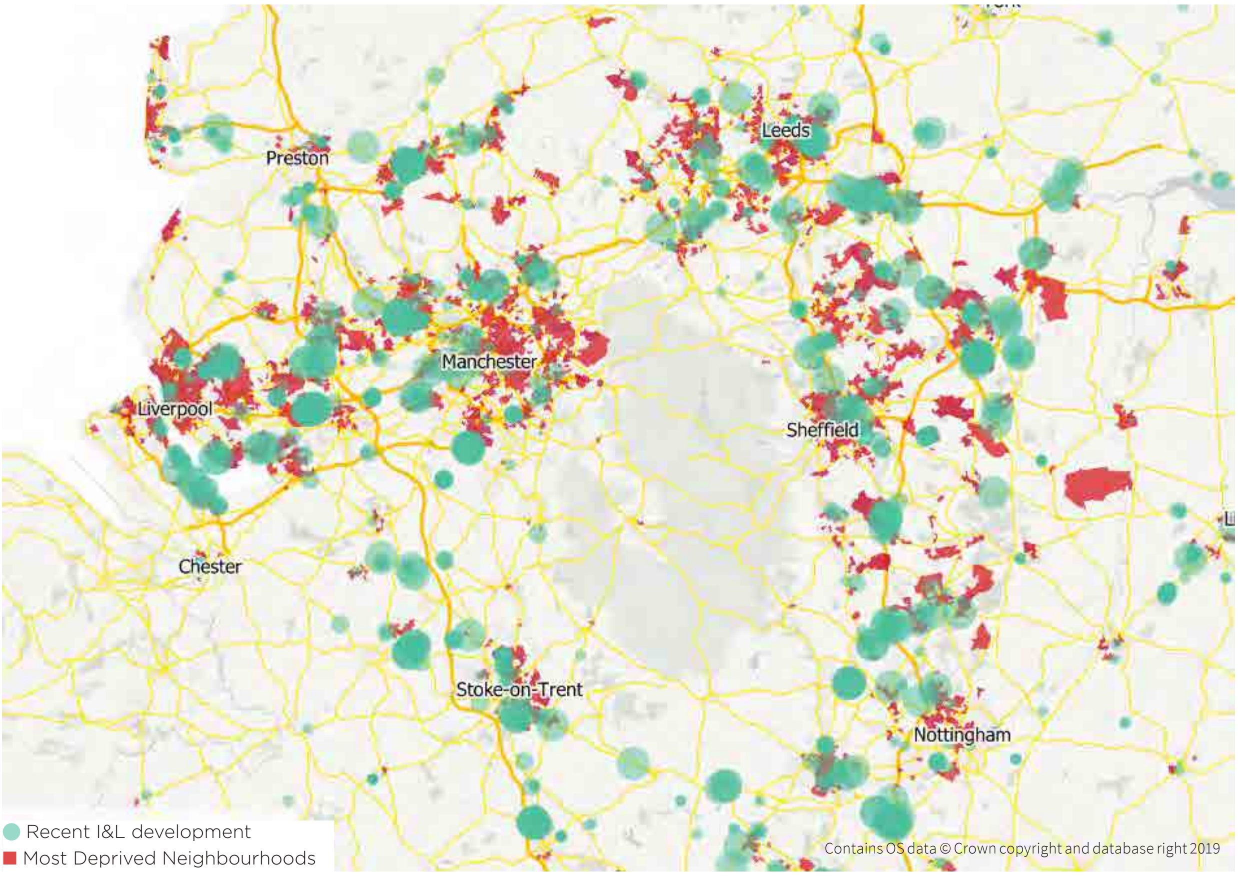
The I&L sector can play a pivotal role as part of the Government's levelling up agenda. In GVA terms, the South accounts for 63% of England's total GVA while the North accounts for only 37%. However, over the last five years I&L demand (net absorption) in the North has accounted for 70% of the country's total demand. Looking at a more granular level, a region such as the East Midlands that accounts for 7% of the country's GVA, has attracted 19% of the country's I&L demand in the last five years.

This strong growth in I&L in the North equates to circa 113 million sqft of net additional floorspace[34] or 117,000 jobs[35] over the last five years. As discussed above the sector provides a diverse range of jobs with higher levels of pay and GVA compared to the 'all sector' average. These jobs will be crucial in bridging the GVA and productivity gap between the North and South.

Another key focus is to provide better job opportunities for deprived communities outside the South East. The chart below shows that the hotspots for I&L investment over the last five years are located nearby to deprived communities demonstrating the important role the sector can play in providing access to local jobs.

The Planning System is starting to recognise the link between I&L jobs and helping address deprivation. For example, in a recent called-in decision[36] for an I&L development in St Helens, the Secretary of State agreed with the Inspector that the jobs brought about by the development "would have a tangible benefit to the local economy and would provide an early opportunity to help address […] deprivation issues".

I&L investment is located nearby deprived areas in the North



Source: Savills 2021

I&L investment can aid the delivery of new housing

Tackling the under-supply of homes has now been at the forefront of the planning system's objectives for many years. Major I&L investments are increasingly becoming integral to the delivery of new homes. Some key advantages of bringing forward I&L development alongside residential include:

- The strong I&L market can achieve healthy uplifts in land value and therefore can usefully contribute to funding strategic infrastructure such as new and improved motorway junctions and link roads. This infrastructure is also critical to enabling new residential development. Many other commercial uses on the other hand are viability challenged and in many cases are unable to make an upfront contribution to wider infrastructure provision.

- Given the strength of occupier demand, the I&L component of Garden Villages and other mixed use developments can be delivered quickly creating local job opportunities for the new incoming residential population. This can support higher levels of self-containment (i.e. local people living and working locally) and higher usage of greener modes of transport (i.e. walking, cycling and public transport) given the reduced distances people are travelling to work. The creation of early jobs is also vital given other commercial uses such as office, retail and leisure uses within town centres typically take longer to come forward as they require a critical mass of housing to be in place to underpin their demand.

Some current examples of I&L investment helping to deliver residential development include:

- Linmere in Houghton Regis (see case study box)

- Hayes Nestle Factory (see case study box)

- Milton Keynes East, which has recently gained outline planning permission and is set to deliver 5,000 homes and 105ha of logistics led employment. The delivery of the employment land at J14 will open the site up and deliver the initial supporting infrastructure.

Case Study: Linmere in Houghton Regis

Linmere in Houghton Regis is a 5,100 unit residential development with an infrastructure cost of approximately £100 million and requiring an upfront payment of £45 million towards the M1/A5 link. The infrastructure payments significantly impacted viability and meant the development could not achieve the level of returns required. However, the Site included 1.23 million sq ft of B8 which was sold to Lidl in a £90 million deal facilitated by Savills. This made the development almost cost neutral and enabled the consortium of owners to progress with servicing and selling the residential units.

Source: Houghton Regis News Desk, http://www.hrnd.co.uk/2013/01/green-field-sites-around-houghton-regis.html

Case Study: Hayes Nestle Factory

Following Nestle's announcement in 2012 to close the former coffee factory, the site is being regenerated to deliver over 1,386 new homes, alongside a 240,000 sq. ft industrial park. The scheme is being brought forward by SEGRO and Barratt London and will create at least 500 permanent jobs and deliver over 3 hectares of public open space, a 1.3 km trim trail and 300 m of canal frontage for the community to enjoy.

Source: SEGRO

More than just warehouses and factories

While the office sector has outwardly embraced health and wellness as part of building design for some time, it has raced up the agenda within the I&L sector recently. I&L developers and occupiers are increasingly adopting the WELL Building Standard which is delivering a more human-centric approach to the design of I&L premises.

The Seven Concepts of the WELL Building Standard

1. Air: Optimise and achieve indoor air quality. Strategies include removal of airborne contaminants, prevention and purification.

2. Water: Optimise water quality while promoting accessibility. Strategies include removal of contaminants through filtration and treatment, and strategic placement.

3. Nourishment: Encourage healthy eating habits by providing occupants with healthier food choices, behavioural cues, and knowledge about nutrient quality.

4. Light: Minimise disruption to the body's circadian rhythm. Requirements for window performance and design, light output and lighting controls, and task-appropriate illumination levels are included to improve energy, mood and productivity.

5. Fitness: Utilise building design technologies and knowledge-based strategies to encourage physical activity. Requirements are designed to provide numerous opportunities for activity and exertion, enabling occupants to accommodate fitness regimens within their daily schedule.

6. Comfort: Create an indoor environment that is distraction-free, productive and soothing. Solutions include design standards and recommendations, thermal and acoustic controllability, and policy implementation covering acoustic and thermal parameters that are known sources of discomfort.

7. Mind: Support mental and emotional health, providing the occupant with regular feedback and knowledge about their environment through design elements, relaxation spaces and state-of-the-art technology.

The attractiveness of a work location is largely determined by the presence of green space around it

This includes building design issues such as south facing offices, making best use of attractive views, natural lighting, improved ventilation, drinking water stations, creating break out and relaxation spaces for staff and in some instances the inclusion of health and childcare facilities.

External to the building there is an increasing emphasis on making better use of outdoor amenity areas such as natural spaces for increased biodiversity, sitting and relaxing, or for sports facilities such as running tracks and football courts for exercise. These trends are consistent with the results of Savills What Workers Want survey which found that, generally speaking, the attractiveness of a work location is largely determined by the presence of green space near or around it.

These human-centric design approaches help to attract staff and keep them happy, which in turn drives productivity. As discussed, the sector's growth has meant that some workers who previously worked in other sectors such as office and retail, now work within I&L and demand these types of facilities. While the sector has increasingly become automated it is still very much being driven by people[37].

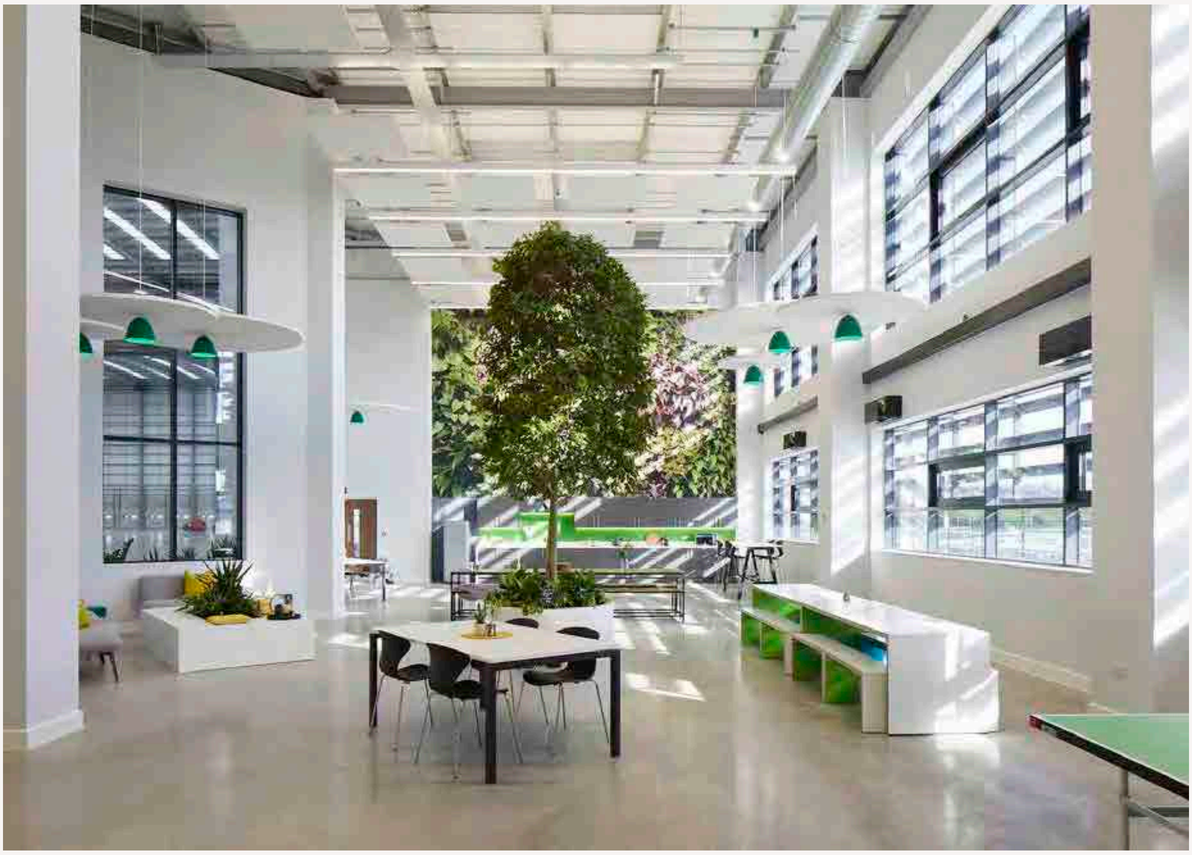
Case Study: Baytree, Dagenham Essex

The scheme is to include a variety of sustainable building features leading to WELL accreditation including external gym equipment, solar photovoltaics linked to battery storage, electric vehicle charging stations, air source heat pumps, enhanced use of recycled and recyclable materials, prefabricated building elements, low energy LED lighting and a super airtight, insulated building envelope, all of which will be constructed within an enhanced landscape environment.

Source: https://www.baytree.com/wp-content/uploads/2017/03/17-03-01-Baytree-commences-first-phase-development-at-its-East-London-....pdf
https://www.chetwoods.com/projects/baytree/

Case Study: DC535 at Prologis DIRFT

DC535 has a living tree as the centrepiece in a light, bright atrium area designed to help employees relax and connect with nature. DC535 also has an employee gym which makes use of natural light, and has a number of green spaces around the building to promote employee wellbeing.



Source: https://prologis.co.uk/wp-content/uploads/2021/01/200226_Prologis_DIRFT_0335.jpg

4. A Green Recovery 'Boxed'

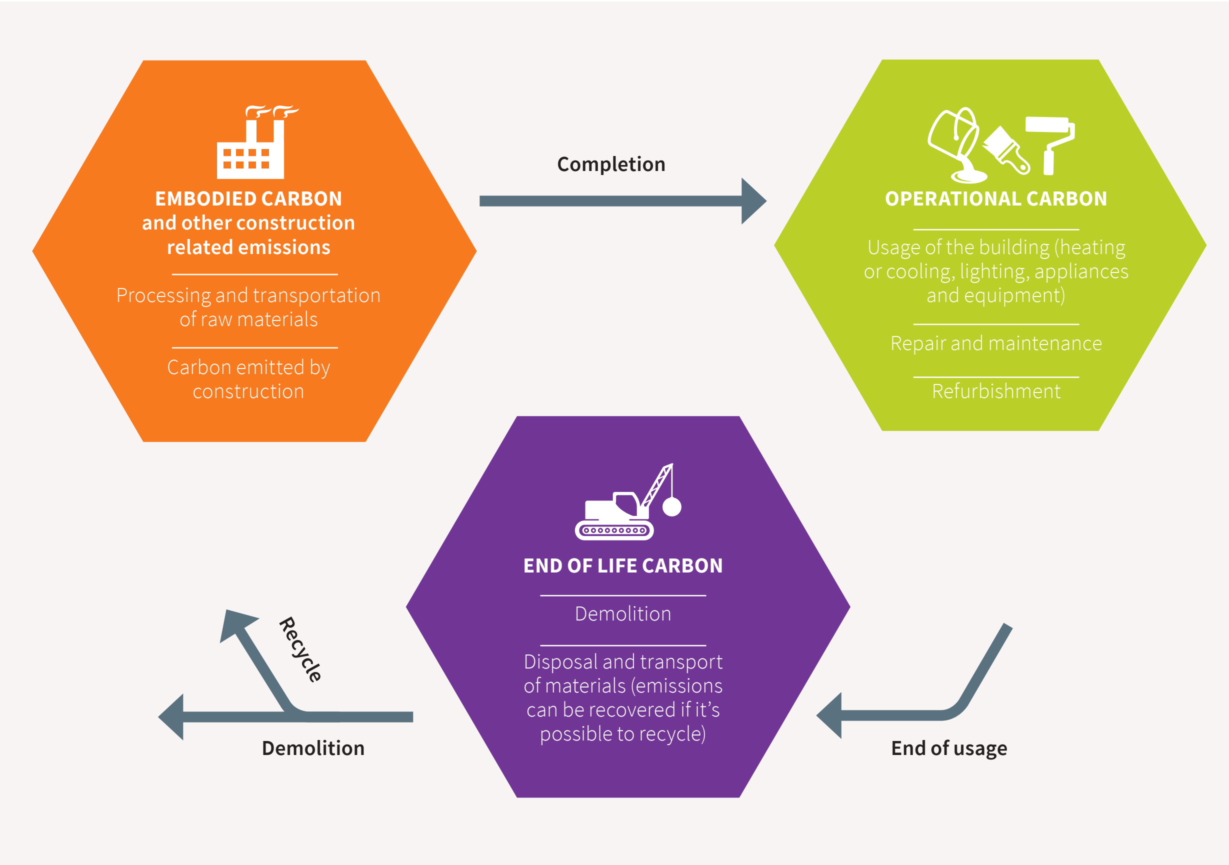
To reduce carbon emissions, interventions have to be made in the construction, operation and demolition of buildings. This is leading to innovations across all phases of an I&L property's life cycle

The Green Evolution of I&L Premises

In 2019, the UK Government and the devolved administrations committed to bring all greenhouse gas emissions to net zero by 2050, in line with recommendations made by the Committee on Climate Change. However, the Government has subsequently clarified this includes shipping and aviation emissions, which means that the rest of the economy needs to decarbonise much sooner, effectively by the very early 2030s. Reaching net zero greenhouse gas emissions requires extensive changes across the economy, and real estate has a key role to play. Every building has embodied, operational and end of life carbon emissions and the built environment contributes 40% of the UK's carbon footprint.

This drive to lower emissions is pushing companies to take a close look at the real estate they occupy to make sure it is in line with Government carbon reduction policies. This is driving a range of innovative solutions that improve the environmental performance of I&L buildings. A Savills survey of logistics occupiers found that 'green/sustainability features' have climbed from 11th to the 6th most important warehouse feature[38].

The Sources of Carbon Across the Cycle of Property



Source: Savills

Embodied Carbon

It is accepted that in today's world, net zero carbon in construction cannot be achieved without an element of carbon offset, but initiatives are under way to further reduce the embodied carbon in construction, including:

- Design for long life, re-use and flexibility
- Using recycled materials or materials that contain a high level of recycled content
- More elegant, efficient design
- Modern methods of construction, off-site manufacture and design for less material and less waste
- Cement alternatives in concrete
- Alternative methods of concrete production
- Increased use of low carbon products, such as cross laminated timber, in lieu of high carbon materials such as steelwork
- Sourcing materials responsibly and as local as possible, with particular consideration to steel
- Using local workforce
- Liaising with contractors and suppliers to reduce their embodied carbon
- Engineering solutions to reduce imported hardcore to site

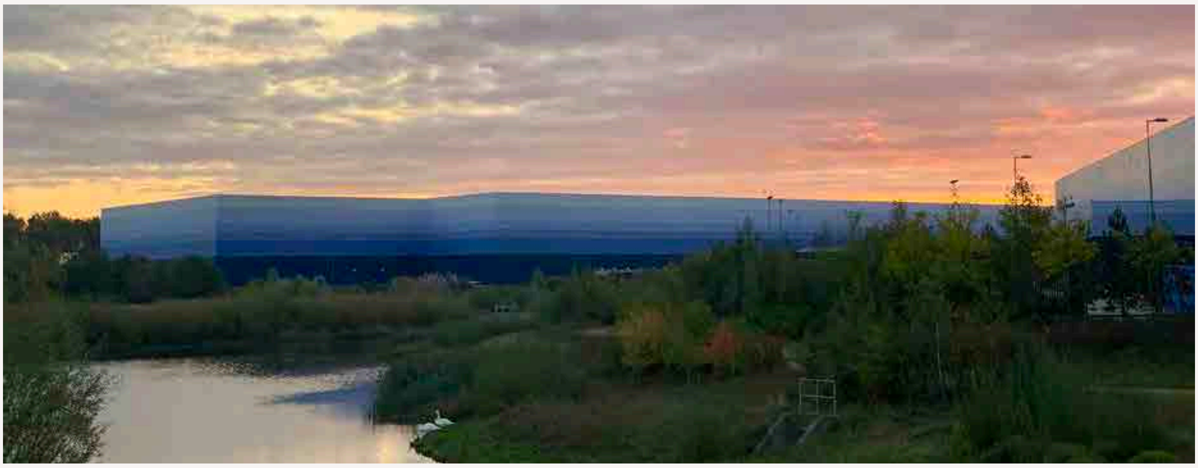
The embodied carbon footprint of some typically carbon-intensive materials and components can be reduced by using low-carbon building materials. Using cement replacement in concrete and recycled materials in new warehouse construction delivers significant environmental benefits, including minimising transportation-related greenhouse gas emissions and diverting a large percentage of construction waste from landfill. For example, GLP use GGBS (Ground Granulated Blast-Furnace Slag) in concrete as a cement replacement which reduces the embodied carbon of the concrete as GGBS is a by-product from the steel industry[39].

Case Study: GLP Magnitude 314, Magna Park

Magnitude 314 is 29,200 sqm warehouse with 1,500 m2 of office area located at GLP's flagship logistics park Magna Park Milton Keynes. The development has been officially verified as the world's first Net Zero carbon for construction in line with the UKGBC Net Zero Carbon Buildings Framework Definition. The building was designed to WELL principles and has achieved both a BREEAM Excellent and EPC A rating. Overall, the design has resulted in a 25.8% reduction in embodied carbon compared to a standard logistics building.

Key members of the building supply chain including material manufacturers and component suppliers were asked to provide a complete breakdown and assessment of the products being supplied including details of their origin, embodied carbon value and whether the product can be reused or recycled. Chetwoods, Thrive and Circular Ecology, along with other leaders in their fields were engaged to help the design team and wider supply chain collaborate and reduce as much embodied carbon as possible.

The building was designed to be flexibly adapted by future occupiers. The roof structural capacity allowed for future installation of Solar PV, once an occupier was in place and their energy load was calculated. Magnitude 314 is now occupied by Royal Mail. The delivery of Magnitude 314 also performed high in social value terms, resulting in over 39% of added social value against a contract value of £12 million. This was well above the expectation of 10-15% of social value delivery for similar construction projects.



Source: GLP

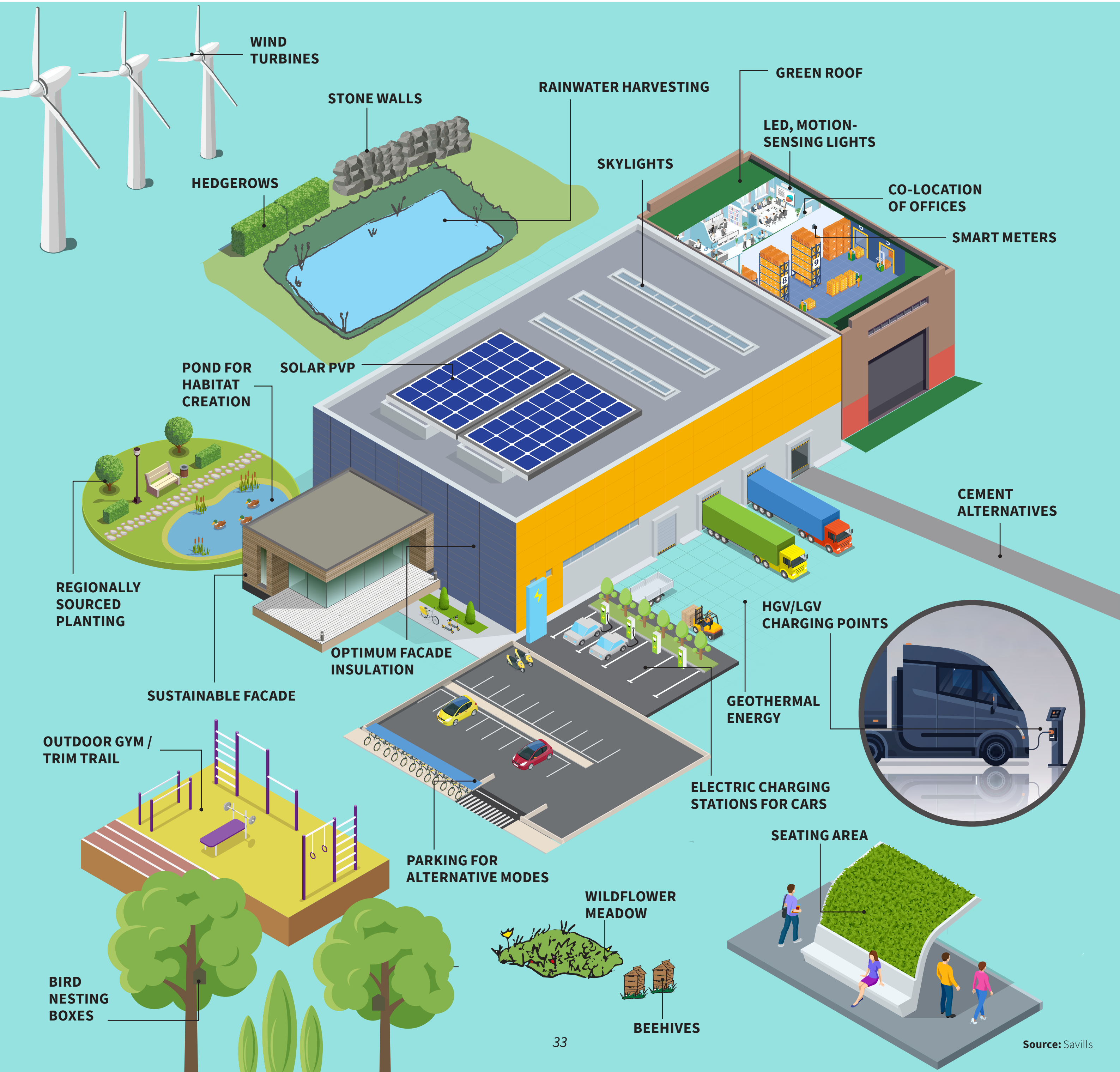
Operations

Energy efficiency during operations can be achieved by addressing both energy demand and energy supply. The former is about reducing the inherent energy demand a building requires to operate, while the latter is about decarbonising the development's energy supply via the use of renewable sources.

The energy demand of large I&L sites has generally been increasing in recent years, driven by growth in certain occupier types such as data centres and cold storage, both of which have heavy cooling demands. This trend is expected to continue over the next decade as we see the increased use of automation and the electrification of transport.

The image below outlines a number of solutions that improve the environmental performance of an I&L building during its operational phase.

The Green Evolution of I&L units



Source: Savills

Lighting is typically one of the largest contributors to a warehouse's energy demand

Reducing Energy Demand

The UK Green Building Council (UKGBC) states that reductions in energy demand and consumption should be prioritised over all other measures prior to implementing on-site renewable energy sources[40]. I&L operators are achieving this in a number of ways.

Lighting is typically one of the largest contributors to a warehouse's energy demand. Below are some popular solutions:

a. Skylights and clerestory windows lower electricity use and associated greenhouse gas emissions and improve indoor environmental quality for warehouse personnel. Skylights avoid light pollution.

b. LED can lower a building's total energy consumption, as well as reduce heat generation. A transition to LED technology can cut consumption between 60-80% compared to other lighting types[41]. LED bulbs also last much longer than all other forms of lighting, which means replacing lighting far less often, resulting in significant cost savings.

c. Sensors, such as motion-sensing lights, as well as sub-meters on machinery, appliances and other equipment. Motion sensors which switch energy-efficient LED lighting on and off as workers move through the space result in a 53% energy reduction from conventional LEDs. For example, all Panattoni buildings include 15% roof lights, and their intelligent lighting systems result in a reduction in electricity consumption by up to 70%[42].

High-reflectance roof membranes such as white thermoplastic polyolefin (TPO) roofing can reduce the building's energy consumption by reflecting more sunlight, with solar gain during the day and loss of heat at night. Benefits include lower indoor temperatures and greater comfort for occupiers, reduced heating, ventilation, and air conditioning (HVAC) costs, and reduced cost of roof maintenance and replacement.

Compounds and chemicals with non-petroleum bases such as low-emitting sealants, adhesives and carpet systems, also help to conserve non-renewable resources and improve indoor air quality for a healthier working environment.

Parking for alternative modes of transportation, for example, bicycles, e-scooters and e-bikes, EV, hybrid and carpool vehicles, encourages lifestyle choices that reduce carbon emissions and promote health and wellbeing.

Smart meters allow occupiers to track and reduce energy consumption.

Improving Energy Supply

Using renewable energy sources and becoming self-sustainable is increasingly a target for I&L occupiers as it decreases operational costs as well as environmental impacts.

The flat roofs of large I&L buildings are ideal candidates to house solar photovoltaic panels (PV). According to Savills' research and depending on the internal systems, new warehouse development can be nearly energy independent if at least 40% of the roof space is used for PV installation. New development can be designed so that solar PV can achieve a much higher roof coverage. For example Parker Steel's storage facility at Shoreham Port was retro-fitted with around 95% of the roof surface covered by solar PV.

Power resilience is already raised by some occupiers as a growing concern but the full extent of this risk is generally not well understood within the sector. Many organisations overlook the fact that power may not be available at an affordable price without new contract structures or on-site generation. We expect power availability to become a more pressing subject as constraints start to crop up across occupiers' portfolios with the adoption of new technologies that are hungry for electricity, and the roll out of electric vehicles, electric heating and wider decarbonisation.

Distribution Network Operators' (DNOs') strategies tend to respond well to national policy objectives, but lack alignment with local government plans. This can result in a disconnect between where local authorities are planning growth and where DNOs are investing, which can lead to site allocations lacking sufficient energy capacity. This is one area where much more work is needed to align the power grid with opportunities to decarbonise. To this end, engagement in Local Plan making would be welcomed.

While constraints in energy availability can deter development and slow the growth of the I&L sector, they are also pushing developers and occupiers to come up with innovative sustainable solutions to reduce their reliance on the power grid, especially when availability is constrained at peak times. A solution is to decentralise a site's energy supply by building in a private network. This is likely to mean equipping sites with battery storage and on-site energy generation like solar, wind or hydrogen, so that they can more effectively manage on-site demand.

Below are some of the popular solutions:

Solar PVP can be installed on roofs and provide significant energy capacity. For example, DPD's Hub 5 in Hinckley, Leicestershire, has a Solar PV system comprising over 6,000 panels providing an output of 2.4 MW. The power generated by the system enables the hub offices to operate off grid during daytime working hours. Barriers to installation of solar PV will need to be addressed in order to meet net zero targets.

- **Borehole thermal energy storage** stores heat underground during warm months and pumps it back into the building during winter months to meet heating demands.

- **Electric air source heat pumps** also offer a solution to drive down the environmental impacts of buildings. They use electricity to move ambient heat energy into or out of a building's interior, enabling Heating, Ventilation, and Air Conditioning (HVAC) systems to operate without burning fossil fuels.

- In some circumstances, **water source heat pumps** might be attractive where a large water body is nearby and the infrastructure can be installed in the water body without ecological harm.

- **Hydrogen fuel cells** generate power without carbon emissions – the only emission being water vapour – and can be applied to a broad spectrum of transport vehicles including trucks used for distribution and automated forklifts used to shift goods around within I&L facilities. This technology provides improved energy density and allows for significantly longer driving times compared to electric vehicles.

- **Wind farms** offer a source of green energy typically generated off-site. Occupiers can supply their site with this form of renewable energy by choosing energy providers that source electricity from wind farms.

Case Study: DPD, Symmetry Park, Bicester

The 60,000 sq ft hub at Symmetry Park, Bicester is Tritax Symmetry, and DPD's, first 'net zero carbon in construction' building, as regulated by the UK Green Building Council (UKGBC).

Locally sourced A and A+ rated construction materials were used wherever possible, with associated low embodied carbon impact. Timber was also sourced from certified and renewable Forestry Stewardship Council (FSC) approved sources. Low energy and zero carbon design principles were incorporated into the scheme from the start. Reduction in energy demand is achieved using efficient fabric and shading design to reduce heating and cooling demand, and natural daylighting to reduce artificial lighting demand.

The unit also implemented smart energy/building management systems to provide automatic monitoring and targeting of all sub-meters to promote energy management and deliver lower consumption. This measure alone reduced the inherent energy demand of the building by approximately 12%, and the carbon dioxide emissions by approximately 40%. The building design incorporates air source heat pumps for heating and cooling, 5,500 sq ft of solar panels (25% of useable roof area), while the design and building materials used help deliver an 82% improvement in airtightness. The remaining useable roof area is designed to take further solar panels as required by any increase in consumption from DPD in the future, most likely through additional EV charging points. The site also boasts 30 electric vehicle (EV) charging points with ducts provided to the service yard and car park for future installation of further car, van and HGV charging points.

The landscape strategy prepared for the development added to the existing ecological resource through the creation of new habitats interconnected with the existing retained habitats. This included the creation of new seasonal wet areas to enhance the local amphibian population, and to provide an aquatic habitat resource on the Site which was previously not present.

Overall, there was a reduction of 500 tonnes of carbon in the construction process, with the remaining carbon being offset through the use of an accredited tree planting scheme in Northamptonshire with over 1,000 trees being planted. In addition, a wind project in India was sponsored, helping develop renewable energy provision in the country.

Source: Tritax Symmetry

Water Management

Solutions to reduce the use of fresh water include:

- motion-activated faucets,
- rainwater harvesting,
- grey water recycling,
- low-flow toilets,
- waterless urinals,
- captured rainwater for irrigation.

Towards Greener Distribution Networks

The sector's drive to decarbonise doesn't stop at its facilities. The largest contributing sector to the UK's carbon emissions at 27% is transport[43]. Even though HGVs and vans account for a smaller share of emissions than cars and taxis, they are still linked to over a third of all road transport emissions. This means that the I&L sector can make a significant contribution to the reduction of the UK's carbon emissions by decarbonising its distribution networks.

Policies such as zero and low emission zones, and the recent Government's pledge to phase out the sale of petrol and diesel HGVs by 2040 are strong drivers for the sector's decarbonisation. Based on Savills research we expect that the commercial sector will transition faster to more sustainable transport than private households. This is due to the increasing costs of running commercial vehicles as a result of policy changes discussed above, which will favour the switch from conventional fuel to EVs or alternative fuels such as compressed natural gas.

Compressed natural gas, although a fossil fuel, is considered a low carbon alternative to diesel and is seen as a stepping stone towards hydrogen. This is because of similarities in the type of engines used and the way the gas is handled.

For example, in 2020 John Lewis Partnership announced that it will convert its 600 HGV fleet to biomethane by 2028. CO2 savings from each truck are estimated to exceed 100 tonnes per year. These gas trucks have also the benefit of being quieter, which is especially important for urban deliveries.

The market for HGV EVs is still in its infancy, given the challenges arising from their large size and the considerable distances they travel. However, EVs can be more easily deployed for last mile deliveries, given their smaller load and the shorter distance travelled. They also contribute to make urban areas healthier, improving air quality and reducing noise pollution.

I&L occupiers are driving this change by increasing the adoption of EVs and natural gas powered fleets.

dpd

DPD is building the largest all-electric delivery fleet in the UK, with over 700 electric vehicles operating throughout England, Scotland and Wales. In July 2021 Oxford has become DPD's first all-electric city, meaning that all parcels delivered by DPD in the city are carried by EVs. This move is part of DPD's wider initiative that will see them go fully electric in 25 cities by 2025, backed by a £111 million investment in EVs. The initiative will deliver 42,000 tonnes of carbon dioxide savings for the UK[44].

amazon

Amazon has committed to reaching net zero carbon by 2040 and has announced that it is on a path to powering its global operations with 100% renewable energy by 2025. The company has over 500 e-vans operating in the UK and has installed more than 800 electric charging stations across its UK sites, with hundreds more to follow.

ups

UPS is investing in 10,000 electric vans to be rolled out across the UK, Europe and the US between 2020 and 2024[45].

DHL

DHL Express has pledged to make any purchase of new courier vehicles electric in order to achieve a 100% electric UK-wide fleet by 2030. The company has also been experimenting across different transport modes. In 2020 it launched its waterborne delivery service on the river Thames in London and is currently exploring the use of fully electric cargo planes for regional deliveries.

Hermes

Hermes' parent company Otto Group has committed to become carbon neutral by 2030. Hermes is making a move to EVs to deal with parcel pick up and deliveries from the Hermes ParcelShop service. It is also increasing its fleet of compressed natural gas fuelled vehicles, becoming the largest fleet of this kind in the UK parcel sector.

Enhancing Biodiversity

I&L developments are increasingly delivering landscape improvements that enhance the biodiversity of an area. The delivery of 'pocket parks' is becoming more and more popular. These are green spaces that can be found within or adjacent to an I&L development that provide outside relaxation space for workers and can also benefit the wider local community. For example, SEGRO's pocket park on the Slough Trading Estate has bee hives, hard standing for street food and solar smart benches which provide free WiFi and USB and wireless charging. At Prologis Park in Hemel Hempstead, a pocket park has been created by rejuvenating a neglected area of land and turning it into a green community space, complete with footpaths, landscaping and benches which can be used by the adjoining nursery and residents[46].

A development delivers biodiversity net gain (BNG) if it contributes to an overall increase in biodiversity value measured using Defra's biodiversity metric. The Environmental Act sets total BNG requirements at 10% above the pre-development level. BNG can be achieved by delivering habitat creation and/or enhancement on-site, off-site or by purchasing credits. Savills' involvement in a number of I&L schemes has shown that:

- There is a shortage of specialist ecological expertise to advise both developers and local planning authorities;

- There is a need to assess biodiversity earlier in the process than has traditionally been the case;

- All land that is developed, even for landscaping, is considered to be a BNG loss and no account is taken of other benefits, such as land remediation;

- It will be necessary to assess whether additional land should be acquired to support BNG strategies, as on-site delivery of BNG is cheaper than off-site solutions or payments; and

- LPAs will need to develop systems for allowing purchase of credits and to identify suitable BNG land.

The I&L sector needs to adapt to the environmental "damage cost" approach. Some local planning authorities are already requiring 20% BNG and Government has been trialling metrics for assessing air quality impacts and will extend this approach to include other natural capital impacts, such as nitrate neutrality, water and waste.

The sector should participate in Government consultations on how these metrics will impact I&L. Development of greenfield sites in particular will become more complex and costly unless it is possible to commit through the planning process to environmental net gains in both building design and operation.

Case Study: Example of Developer's Sustainability Commitments – St. Modwen

Net carbon reduction

What it is

To help achieve the global goal to stop average temperatures rising more than 2 degrees, the UN wants everyone – from individuals to global corporations and governments – to decrease the damage to our planet.

Why it's important

The building and construction industry accounts for around 40% (UN) of the world's carbon emissions. Government, local authorities, partners and customers have expectations and targets which must be met or exceeded but a global step-change is needed.

How can we help

- Target ongoing carbon reduction at a business unit and group level
- Embrace design principles that deliver long-term, low-carbon and low-carbon enabled buildings
- Integrate carbon reduction into business policies.

Overarching ambition

Be operationally net zero carbon by 2025 and fully net zero carbon by 2040.

Biodiversity & sustainable environments

What it is

Population growth and social trends mean humans are impacting our natural environment in unprecedented ways. From the destroying of distant rainforests to dying out UK insect breeds and the way we all handle waste, change is high on the agenda.

Why it's important

Our company changes the landscapes of both brown- and greenfield sites so we are directly impacting nature and the land around us. We want to embrace making a virtue of a progressive approach to our natural environment.

How can we help

- Boost biodiversity at our schemes
- Make positive use of the community spaces we create to improve biodiversity
- Only use materials from sustainably managed sources
- Reduce waste by maximising product and material use throughout lifecycles.

Overarching ambition

Be ready by the end of 2020 to achieve a net biodiversity gain of at least 10% associated with all development activity.

Health & Wellbeing

What it is

Good physical and mental health is something everyone strives towards in the pursuit of a happy life. A healthy body and mind allow us to enjoy our surroundings, feel good about ourselves and achieve more.

Why it's important

We want to play our part in helping to support a healthier, happier and engaged workforce because it drives sustainable performance. We also have the potential to impact our customers and communities – through places and products – to boost their wellbeing and enrich their lives.

How can we help

- Support wellbeing programmes within our workplace
- Address the wellbeing of communities in all development plans
- Consider and plan for the wellbeing of contractors and partners.

Overarching ambition

Be bold in our pursuit of wellbeing to boost the happiness, health and satisfaction of our people. Make a meaningful, positive impact on the health and wellbeing of the communities we operate in and the places we deliver.

Responsible operating practices and partnerships

What it is

Having the right operating practices ensures that our responsible approach to business is reflected in the way we carry out our business. It also means working with and influencing our supply chain and partners to ensure quality, mutually beneficial outcomes.

Why it's important

We are many times larger than ourselves through the activities we carry out and the supply chain we use. This gives us the chance to positively affect working practices, from payment terms and job creation to education and our impact on the natural environment.

How can we help

- Safety first for ourselves, our partners and our customers
- Establish and maintain a framework for supply chain alignment, ensuring we work with partners to collectively meet our responsible business goals
- Build and maintain positive partnerships and effective stakeholder engagement and communications
- Build and maintain a culture.

Overarching ambition

We can only fulfil our approach to responsible business by working with our supply chain. During 2020, launch a charter to our partners to inspire, set goals and underpin responsible ways of working.

Case Study: SEGRO's Beehives

SEGRO has made beehives a common feature of many of their developments, with over 150 hives across their portfolio. Each hive holds as many as 50,000 bees during the peak harvesting season, and these bees visit over two million plants within a two-mile radius, assisting with the pollination of local plants and crops.

Source: www.segro.com

End of Life

Demolition and rebuilding are carbon intensive activities. Transport and disposal of the old materials produces emissions and wastes the embodied carbon that went into the construction of a property in the first place. Giving a new use to an existing building typically arises as a response to changing economic conditions, so that declining sectors can make space for emerging ones.

Modern I&L buildings have the advantage to be lightweight structures which are highly adaptable for a large range of uses. Since they are built for production or storage purposes, they are not typically visited by the general public and their lighting and interior design requirements are much simpler.

The lack of solid walls means that internal spaces can be easily reconfigured and readapted to host a diverse range of light industrial, manufacturing and logistics companies with limited capital costs. They can also be repurposed to provide lab space, leisure facilities, data centres and even health facilities. Temporary hospitals were an essential component of the Government strategy to counter the Covid pandemic. Examples include Exeter's Nightingale Hospital built on a former Homebase site in Sowton Industrial Estate and Sunderland Nightingale Hospital built as a conversion of a former industrial building.

A well designed I&L building should also be easy to deconstruct at end of life, making materials available for reuse or recycling. Steel frames used in I&L properties are much more easily recycled than concrete which is more common in other commercial uses. When delivering a new building, the cataloguing of its materials and components make it easier to pinpoint and identify items of value that can be captured for potential reuse at the building's end of life.

5. Final Recommendations

This report has evidenced the need for an improved method to estimate future I&L land demand. It is clear that demand within the sector has been much higher than supply for most of the last decade which has resulted in extremely low availability and exponential rental growth as occupiers compete for limited available stock. In order for the sector to grow to its full potential and generate the jobs and investment the national economy needs, the planning system has to better estimate future land demand. It is recommended that the Savills and St. Modwen 'suppressed demand' methodology is incorporated within the NPPG to help inform Local Plans.

The evidence within this report also supports a number of previous BPF recommendations outlined in its Employment Land Manifesto (July 21)[47] as discussed below.

1

Recommendation 1 of the Employment Land Manifesto

Introduce a Presumption in Favour of Logistics Development within the NPPG when precise criteria are met, such as:

- **Easy access and proximity to the strategic highway network.**
- **Ability to provide effective access by non-private car to suit shift working patterns.**
- **Located away from residential development/where there is no unacceptable impact on residential amenity to allow for uninterrupted 24 hour working.**
- **Capable of accommodating large scale buildings in terms of both footprint and height.**
- **Sites which suit the future occupier's needs.**

The Local Plan process is too slow to respond to significant market changing events, such as the COVID 19-induced acceleration in the growth of e-commerce. As evidenced in the 'An Economic Powerhouse' chapter, the planning system has failed to provide a sufficient level of I&L land to meet demand. This has resulted in the national I&L market becoming supply-constrained for the last seven years, as signalled by availability dropping below the equilibrium threshold of 8%, and high rental growth at twice the rate of inflation.

2

Recommendation 2 of the Employment Land Manifesto

Ensuring Local Plans allocate logistics sites in the right locations to respond to a broad range of market needs.

The optimal location for I&L occupiers allows them to be close to their suppliers as well as their end customers. For this reason, access to the strategic road network is critical, as it reduces transportation time, costs, and carbon emissions. The strategic road network also allows a site to expand their catchment of intermodal freight facilities, which are critical nodes within logistics networks. An optimal logistics site is also in easy reach of a workforce with a range of skills, and is close to worker amenities. It also requires good availability of utilities, services, and broadband. A dialogue between Distribution Network Operators (DNOs) and Planning Authorities should be encouraged to ensure power is supplied in locations where I&L development is being planned. Employment allocations should be in locations that allow I&L operators to work 24/7 without impediments.

3

Recommendation 3 of the Employment Land Manifesto

Ensuring the industrial and logistics sector is recognised for its focus on ESG: making a valuable contribution to the Government's Green Industrial Revolution and generating social value.

As discussed in the 'Growing Social Value Credentials' chapter, the I&L sector supports large and diverse supply chains which generate significant economic and social value benefits. As the sector continues to expand so will the number of apprenticeships and training opportunities it supports. The sector is also heavily invested in the central and northern parts of the country and therefore is playing a critical role as part of the Government's 'Levelling-Up' agenda.

As evidenced in the 'Green Recovery 'Boxed'' chapter, I&L buildings are delivering on ESG objectives across all stages of a property's life cycle. Reduction in embodied carbon is being achieved in numerous ways, such as via the use of recycled materials, cement alternatives in concrete, and reliance on local labour force. During the operational phase, energy efficiency can be achieved by addressing both energy demand and energy supply. The former is about reducing the inherent energy demand a building requires to operate, which can be achieved in numerous ways (for example, improving lighting, or installing smart sensors and sub-meters; while the latter is about decarbonising a development's energy supply via the use of renewable sources such PV, wind, etc.). Finally, with regards to the end of life phase, modern I&L buildings have an advantage of being lightweight structures which can be adapted for other uses. They can also be easily repurposed or materials can be catalogued to allow for potential reuse in the future.

7

Recommendation 7 of the Employment Land Manifesto

Introducing an Employment Land Delivery Test to ensure that a commensurate amount of employment land is brought forward to counterbalance housing and that any employment land lost to other uses is delivered in the right locations. If a local planning authority failed to meet the delivery test, a presumption in favour of sustainable logistics development could be engaged.

I&L facilities and their supply chains support the functioning of our economy and the way we live our lives. One of the biggest transformations to our lifestyles in the past 15 years has been the rise of e-commerce. In 2006 online shopping was at 3%, while today this share has grown to 26% and is expected to increase even further. The growth in online shopping has significant implications on future I&L demand given that e-commerce requires over three times the logistics space compared to traditional brick-and-mortar retailers. Population growth is a key driver of this rise in e-commerce as more people mean increased online speeding. Based on Savills future I&L demand estimation, Government housing targets and I&L space requirements per housing unit, we know that about half of future I&L demand will be linked to housing growth. This means that Government should not plan for housing growth without also planning for I&L growth.

Acknowledgements

Commissioning Team

BPF

The British Property Federation (BPF) represents the real estate sector, an industry which contributed more than £116bn to the economy in 2020 and supported more than 2.4 million jobs.

We promote the interests of those with a stake in the UK built environment and our membership comprises a broad range of owners, managers and developers of real estate as well as those who support them. Their investments help drive UK economic success, provide essential infrastructure and create great places where people can live, work and relax.

UKWA
The Voice of The Logistics Industry

UKWA Limited is the United Kingdom Warehousing Association, a trade association with approximately 900 Members. We represent a sector that is worth £20 billion to the UK economy, has grown by 32% in the past six years, and employs over half a million workers. The Voice of the Warehousing & Logistics Industry, UKWA engages with policymakers, the media and other high-profile stakeholders, to represent the views of our Members. We promote and share best practice and our mission is to help Members operate safely, ethically and profitably, while safeguarding industry standards. UKWA Members benefit from a wide range of valuable services from professional business advice and strategic support to networking opportunities and discounted offers from partnering specialists and associates.

GLP

GLP is a leading long term global investment manager and business builder in logistics, data infrastructure, renewable energy and related technologies.

Our combined investing and operating expertise allow us to create value for our customers and investors. In the UK, we have over 33 years' experience in developing best in class logistics units and more than £2.3 billion in assets under management in 42 properties in our operating portfolio with key schemes such as Magna Park Milton Keynes, Magna Park Lutterworth, G-Park Biggleswade and G-Park Doncaster.

Across the United Kingdom, our operating portfolio consists of just under 12 million sq ft in key strategic logistic locations which are leased to blue chip customers such as John Lewis, Royal Mail, Amazon, DHL and Bleckmann Logistics.

We are committed to a broad range of environmental, social and governance (ESG) commitments that elevate our business,

protect the interest of our shareholders and investors, support our employees and customers and enhance our local communities. To learn more about our UK operations, please go to eu.glp.com

ST.MODWEN LOGISTICS

St. Modwen is a property developer focused on logistics, housebuilding and master developing sites. The St. Modwen Logistics business unit develops and manages urban and big box warehouses on key logistics corridors and conurbations. Our Parks serve the needs of customers to expand their businesses, employ local people and support economic growth. Our customers include global logistics and e-commerce organisations as well as significant national and regional enterprises. The Parks showcase the St. Modwen Swan Standard – a set of industry-leading sustainable development guidelines with a focus on responsible building practices.

St. Modwen is committed to ESG, our Responsible Business approach includes a set of ambitious goals in six strategic areas where we can make a sustained difference to society, our stakeholders and the environment: biodiversity and sustainable environments; net carbon reduction; diversity and inclusion; education and future skills; health and wellbeing; and responsible operational practices and partnerships. This includes our aim to be operationally net zero carbon by 2025, and fully net zero carbon by 2040.

TRITAX SYMMETRY
A TRITAX BIG BOX COMPANY

Tritax Symmetry is Tritax Big Box REIT's dedicated logistics developer, specialising in delivering best-in-class greener buildings and an unrivalled choice of locations and scale. With offices in London, Northampton and Manchester, Tritax Symmetry has a land portfolio of 4,150 acres, capable of accommodating 40 million sq ft of logistics space.

The company is dedicated to targeting carbon neutrality on the construction of all new buildings. Its commitment to best-in-class sustainable construction methods will give customers the operational advantages they demand. Further information on Tritax Symmetry is available at www.tritaxsymmmetry.com

Tritax Big Box REIT plc is the only listed vehicle dedicated to investing in very large logistics warehouse assets ("Big Boxes") in the UK and is committed to delivering attractive and sustainable returns for shareholders.

Founded in 1987, IM Properties has established itself as one of the UK's largest privately-owned property companies with an enviable track record of delivery across all sectors of commercial real estate.

Originating from the IM Group, the company has developed over 10 million sq ft of commercial real estate becoming renowned in the industry for the consistent delivery of strategically located, award-winning schemes.

Located in the Midlands, the business is focused on a sustainable future in all sectors in which it invests, develops and manages, including offices, logistics/industrial and residential. Our strategic framework centred on People, Planet and Place is pivotal to our future ambitions for responsible development and innovative growth, to ensure both long-term social and economic value to the communities within which we operate, underpinned by strong environmental credentials.

With a customer-focused approach to development, IM Properties is a market leader in quality building design, place-making and sustainable construction, developing schemes for a wide range of clients, including blue-chip customers from across the globe; all delivered with local market knowledge and expertise.

We are an agile organisation that is committed to securing high quality, long-term investments through a fair approach to business. Our management team uniquely combines the skill set and creativity of a property company with the financial resource of a fund which, over its lifetime, has delivered a diverse and high prized portfolio of institutional standard.

Based in Rugby, Newlands Developments is a specialist industrial and logistics developer with a long history of success and sound professional ethos built up over the last 20 years. It's well-known senior management team, who have worked together for many years, have a solid track record and is responsible for delivering over 50 million sq ft of development.

Newlands expertise is centred around taking large, often complex schemes through the planning process and then using an in-house team of professionals and capital to implement infrastructure contracts, often in excess of £100 million. Newlands are bringing forward numerous sites across the country with a concentration of sites in the East Midlands.

SEGRO is a UK Real Estate Investment Trust (REIT), listed on the London Stock Exchange and Euronext Paris, and is a leading owner, manager and developer of modern warehouses and industrial property. It owns or manages 8.8 million square metres of space (95 million sq ft) valued at £15.3 billion serving customers from a wide range of industry sectors. Its properties are located in and around major cities and at key transportation hubs in the UK and in seven other European countries.

For over 100 years SEGRO has been creating the space that enables extraordinary things to happen. From modern big box warehouses, used primarily for regional, national and international distribution, to urban warehousing and light industrial property located close to major population centres and business districts, it provides high-quality assets that allow its customers to thrive. SEGRO's customers include major businesses such as DHL, Amazon, Mars, Royal Mail, British Airways, Brompton Bike, Ocado, Tesco, Netflix, DPD and Equinix that operate in a range of sectors from parcel delivery to ecommerce, retail to TV and film and manufacturing to date centres.

A commitment to be a force for societal and environmental good is integral to SEGRO's purpose and strategy. Its Responsible SEGRO framework focuses on three long-term priorities where the company believes it can make the greatest impact: Championing Low-Carbon Growth, Investing in Local Communities and Environments and Nurturing Talent.

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Footnotes

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[22]https://www.reuters.com/business/amazon-uk-hire-20000-temporary-workers-festive-season-2021-09-28/

[23]https://www.dailymail.co.uk/news/article-8693211/Amazon-announces-create-7-000-jobs-warehouses-sites-UK.html

[24]CoStar Q2 2021 vs Q2 2011- England

[25]i.e. rents after accounting for inflation

[26]DfT, Table VEH0101, Q2 2021 vs Q4 2020 – GB

[27]Based on Social Value Portal (2020), National TOMs 2020; DfE (2019), 2018/19 academic year; DfE (2020), Apprenticeships Evaluation 2018-19: Employers

[28]Average proportion of procurement at local authority level

[29]DfE (2020), Apprenticeship starts with enterprise characteristics, 2012-13 to 2019-20 for Manufacturing and Transportation & Storage

[30]ONS (2021), APS, Unemployment rate for the aged 16 to 24 in England

[31]https://www.stephengeorge.co.uk/wp-content/uploads/2021/09/Prologis-RFI-DIRFT-Phase-III-Academy-Hub-1-scaled.jpg

[32]London, South East, East of England and South West

[33]North West, West Midlands, East Midlands, Yorkshire and the Humber

[34]CoStar (2021) – net deliveries in the North since 2016

[35]Based on standard job densities from the HCA Employment Density Guide, 3rd Edition, November 2015

[36]APP/H4315/V/20/3265899

[37]Savills' Podcast (2021), Why the industrial & logistics sector is thinking about 'wellness'

[38]Savills' Research Article (2021), Does demand for green buildings lead to a premium?

[39]GLP Europe ESG Report 2020 https://eu.glp.com/wp-content/uploads/2021/05/GLP-Europe_ESG-Report-2020.pdf

[40]UK Green Building Council (UKGBC) Net Zero Carbon Buildings: A Framework Definition https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2019/04/05150856/Net-Zero-Carbon-Buildings-A-framework-definition.pdf

[41]Prologis 2020 Sustainability Report https://www.prologis.com/sites/corporate/files/documents/2021/06/2020-sustainability-report.pdf

[42]Panattoni Built in Sustainability https://panattoni.co.uk/sustainability/built-in-sustainability/

[43]DfT, Transport and Environment Statistics 2021 Annual report

[44]DPD Switches Entire Oxford Fleet to Electric https://www.parcelandpostaltechnologyinternational.com/news/delivery/dpd-switches-entire-oxford-fleet-to-electric.html

[45]UPS Delivery Vans Get Electric Makeover by Arrival https://www.dezeen.com/2020/02/03/ups-vans-arrival-electric-vehicles/

[46]BF acquires a 74,314 sq.ft at Prologis Park for IWG https://brasierfreeth.com/prologisparkiwg/

[47]BPF (July 2021), BPF Employment Land Manifesto

[redacted]

APPENDIX 6. LAND SOUTH OF GONERBY LANE, GONERBY MOOR – VISION DOCUMENT

VISION DOCUMENT:
EMPLOYMENT DEVELOPMENT OPPORTUNITY

LAND SOUTH OF GONERBY LANE, GONERBY MOOR

CaddickGroup.

The Caddick Group is an industry leading developer and contractor with a proven track of specialising in the acquisition, development, construction and management of major projects across the UK.

Our strength lies in the quality of projects we deliver, huge wealth of experience and track record. The Group has a development pipeline with a GDV in excess of £4 billion and a workforce of over 400 people across the UK.

Our developments range from large scale industrial and office projects right the way through to major mixed use urban regeneration, city centre and out of town retail schemes. We have the financial strength and expertise to drive forward acquisitions, new partnerships and investment, resulting in the delivery of high-quality projects nationally in all sectors of the property industry.

Our expertise in taking a site from acquisition through to delivery and operation, means we would progress the site at Gonerby Moor with the full intention of realising development at the earliest possible opportunity.

1. EXECUTIVE SUMMARY

This Vision Document has been prepared by Barton Willmore, now Stantec, and Boyer Planning on behalf of Caddick Group to illustrate why land at Gonerby Moor, Grantham provides a suitable location to deliver a high-quality employment development.

Caddick recognise the suitability of this **66ha** Site to deliver a high-quality employment development to accommodate up to **2.7 million sqft** of high value storage and distribution units (B8) and general industrial uses (B2).

The Site is strategically positioned with unrivaled access immediately adjacent to the A1 corridor, and near to an existing mixed-use economic hub at Gonerby Moor. Its development will help to meet local employment needs, whilst attracting inward investment and establishing Grantham as a Regional Centre.

There is an overwhelming and demonstrable need for the employment uses proposed, at a local, regional and national level. As a result of consistently high and increasing levels of occupier demand, there is a severe undersupply of premises both nationally and regionally for industrial and logistics.

Last year, the supply of premises fell at the fastest pace ever recorded, which has resulted in a chronic undersupply. This has served to stifle economic growth, which will only become more acute should the supply of employment land, and in particular strategic employment land, continue to be limited.

The proposed employment development respond directly to this need and will make a significant and material contribution to the supply of strategic employment land in the region, capitalising upon the strong strategic connectivity of the Site.

This document includes a Concept Masterplan which demonstrates how the Site can accommodate up to 2.7m sq ft of employment development across a range of unit sizes, including a single unit of up to 1m sqft.

The Concept Masterplan has been informed by the following technical assessments:

- Highways (Fore Consulting)
- Landscape (Aspect Landscape)
- Drainage (BWB)
- Heritage (BWB)
- Ground Conditions (BWB)
- Ecology (BWB)

The proposed development is deliverable and agreements between the owners and Caddick mean the Site can be brought forward at the earliest opportunity to respond to market demand.

Caddick are keen to work with the Council to bring the Site forward for development in order to realise the significant benefits outlined in this document as soon as possible.

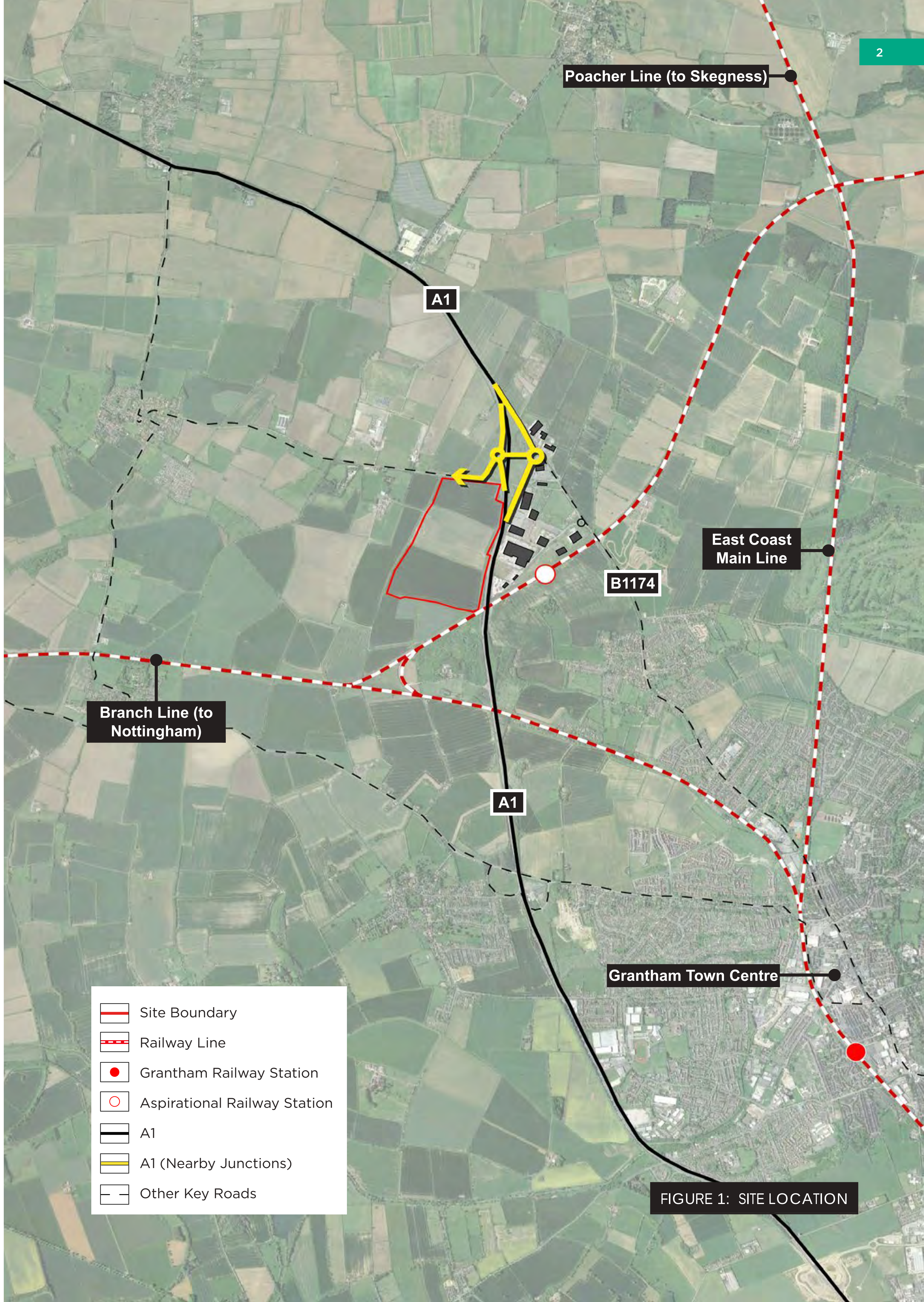


FIGURE 1: SITE LOCATION

CaddickLand.

2. OUR VISION

Our vision is to establish a strategically important modern employment development accommodating high value storage and distribution units (B8) and general industrial uses (B2), set within a network of green infrastructure.

The development will take advantage of the Site's central location and unrivaled access to the A1, complementing existing nearby uses and reinforcing Gonerby Moor as an important strategic economic destination which can provide far-reaching benefits to the District.

The development will help deliver ambitions to grow the economy in Grantham by attracting new business to the town and generating very significant new job opportunities and inward investment.

Modern Employment Hub

- Deliver a high-quality employment to support the local, regional and national market.
- Provide a range of employment buildings at a range of sizes including very large floor plate buildings to accommodate the needs of modern occupiers.

Accessible Location

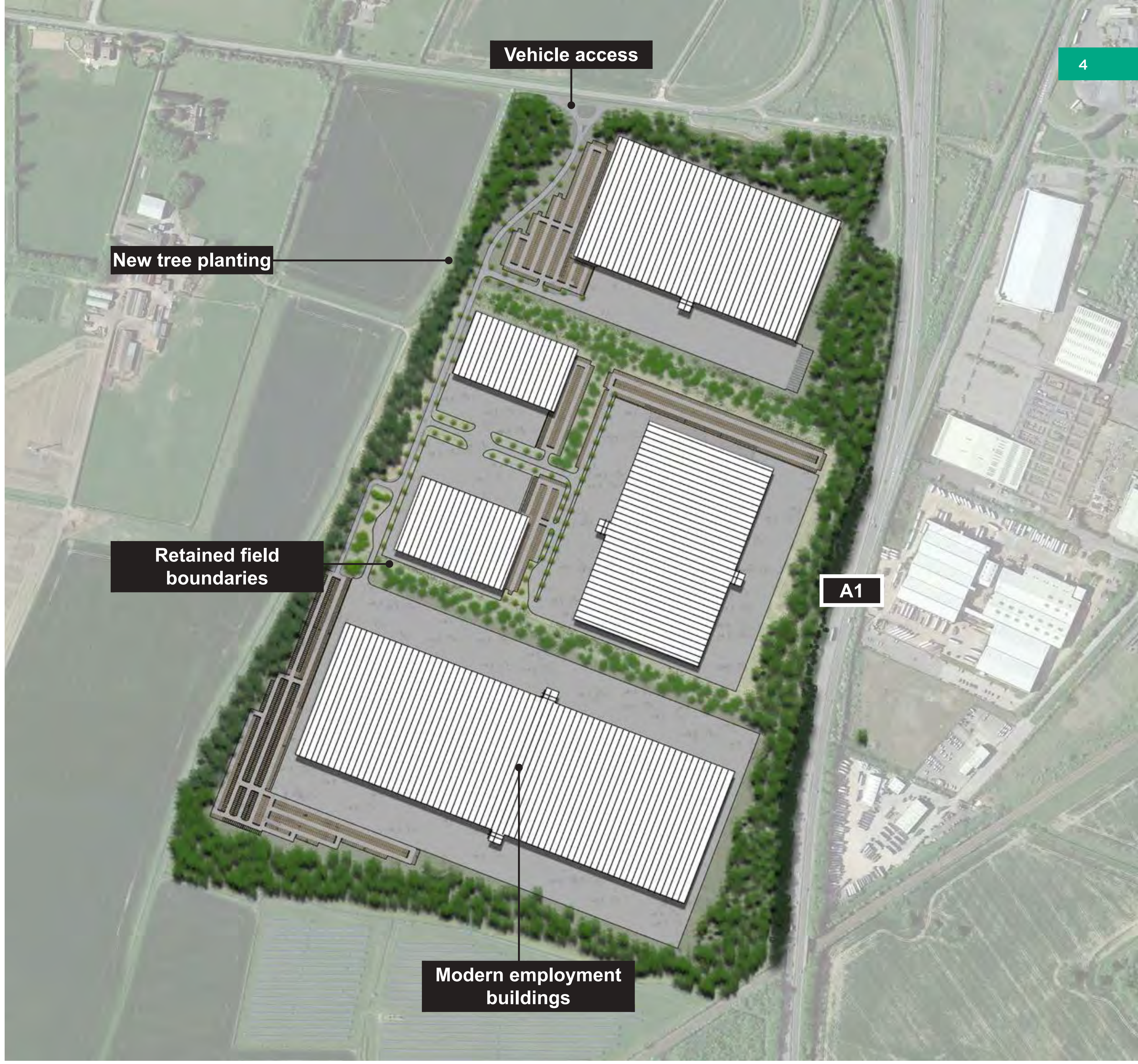
- Central location with direct access to the A1 corridor makes the Site accessible to a significant proportion of the UK.
- Good access to public transport, with nearby bus services connecting to Grantham Town Centre in c.20min.

Local Jobs

- Accelerate economic development and drive growth locally.
- Attract new investment and help the community flourish, creating more employment opportunities.
- Deliver a variety of employment opportunities from apprenticeships and entry level work to high tech and managerial roles.

Green Infrastructure

- Provide a strong landscape framework and deliver wildlife corridors which will result in an overall ecological enhancement.
- Landscape boundary treatments, comprising of new and existing planting will be incorporated.
- Opportunity to provide a network of SuDS that can also provide biodiversity gains.



3. THE STRATEGIC OPPORTUNITY

The Site is strategically well-placed to positively contribute towards South Kesteven District Council's ambition to establish Grantham as a leading regional centre.

3.1. NATIONAL SIGNIFICANCE

The Site occupies a strategic location on the A1 corridor, with excellent north-south and east-west linkages, being directly adjacent to the junction of the A1 and A52. This will allow occupiers to serve the Midlands, East of England markets and beyond with a significant proportion of the UK accessible within a 2-hour HGV drive time.

The central accessible location and excellent connectivity to key transport freight nodes, including East Midlands Gateway, East Midlands Airport and Doncaster – Sheffield Airports, as well as the East Coast Ports, Immingham and Hull, will all support strong occupier demand for the Site.

1. **Road:** Grantham is positioned adjacent to the A1 corridor, which provides continuous road connectivity between London and Edinburgh, with a significant proportion of the UK accessible within a 2-hour HGV drive time.

2. **Sea:** The Site has excellent access to the ports of Immingham and Hull which are of national significance.

3. **Air:** Grantham is located within close proximity to key freight airports, including East Midlands and Doncaster-Sheffield.

4. **Rail Infrastructure:** The key rail freight nodes of East Midlands Gateway and iPort Doncaster are easily accessible to the Site.

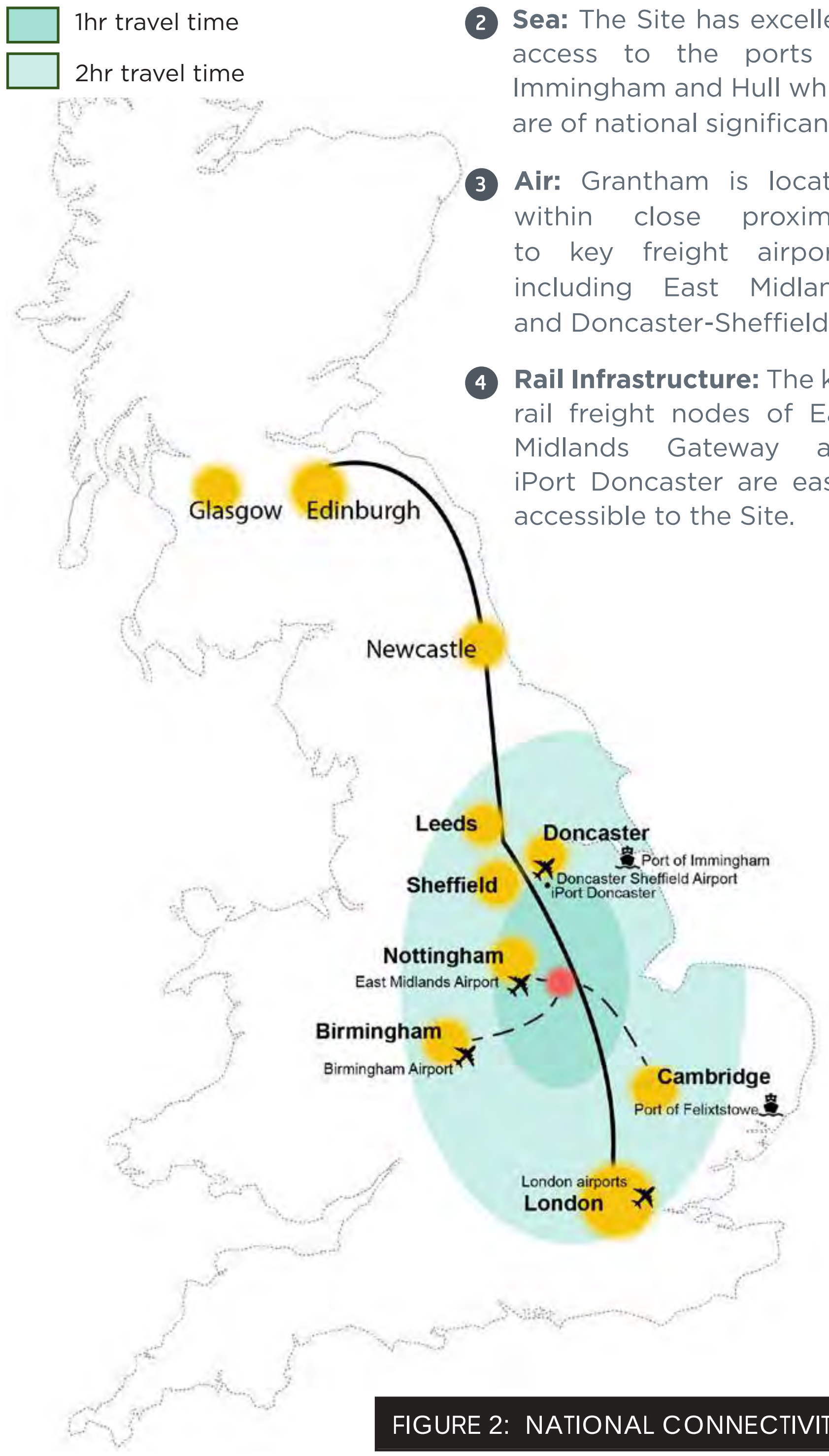


FIGURE 2: NATIONAL CONNECTIVITY

3.2. REGIONAL SIGNIFICANCE

The Site is a deliverable proposal which has the necessary scale and locational credentials to cater for a wide range of occupier requirements, meeting a strategic, as well as local need and will deliver significant economic benefits for South Kesteven, including a range of high-quality employment opportunities.

1. **Regional Centre:** The Council identifies growth and investment aimed at establishing Grantham as a Regional Centre.

2. **Greater Lincolnshire Local Enterprise Partnership (LEP):** Grantham is identified as the key town to support business growth in the county.

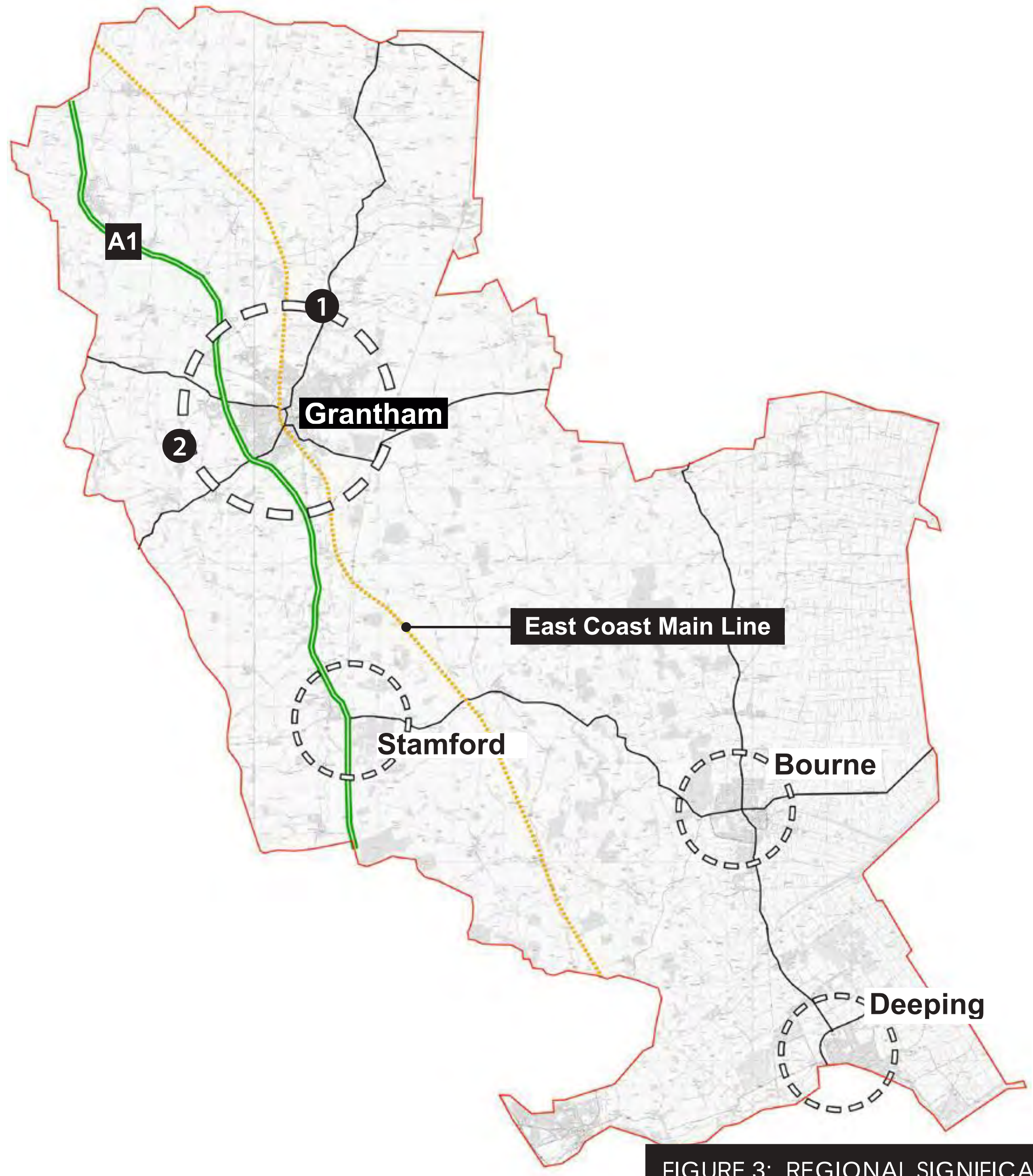


FIGURE 3: REGIONAL SIGNIFICANCE

4. THE LOCAL CONTEXT

The Site will establish Gonerby Moor Junction as an important economic hub of regional and national significance, and complement existing retail, employment and energy developments.

4.1. GONERBY MOOR

Existing Nearby Facilities:
In addition to benefiting from direct access to the A1, the Site is located close to a range of existing commercial and retail facilities, including food outlets, a petrol station, hotel, retail outlets, garden centre and hire car facilities.

Approved Retail Outlet:
Outline planning permission has been granted for the erection of a Designer Outlet Centre comprising of A1(retail units), A3 (restaurants and cafes) and storage.

4.2. GRANTHAM

Grantham Town Centre:
The Site lies c.4km from Grantham Town Centre, a c.10min drive or a c.22min cycle.

Within the centre there are a variety of amenities, including a wide range of shops, services, and public transport opportunities.

Residential Growth and the Southern Relief Road:
The Local Plan directs significant residential development to Grantham, providing a strong local labour supply and a need for job creation to keep pace.

Grantham's proposed and planned residential growth is shown on the plan opposite.

Existing employment:
The majority of existing employment sites or allocations are located to the south of Grantham and fragmented across a number of smaller sites. They are unable to deliver the scale of development required to encourage the necessary investment in the area and are also unable to accommodate the large floor plate buildings that the market is increasingly demanding.

4.3. CONNECTIVITY

Bus Connectivity:
The closest bus stop is located c.600m from the Site, next to the Downtown Superstore.

Services from this stop connect to the town centre, within 20mins. The route goes to Grantham Train Station, past the Grantham Meres Leisure Centre and Grantham Football Club.

This development would be a logical additional stop to the existing bus routes, with buses presently passing along Gonerby Lane.

Train Connectivity:
Grantham Train Station is c.5km south east from the Site and provides sustainable access to surrounding towns and cities, including:

- Nottingham c.35min
- Leicester c. 1.2hrs
- London c.1.5hrs
- Newcastle c. 2hrs

Pedestrian and Cycle Connectivity:
A pedestrian footpath is present on Gonerby Lane, continuing to the A1/Gonerby Lane/B1174 roundabout and providing a pedestrian link to the service station, incorporating a fast-food restaurant, café and convenience store. Immediately to the south of the service station is the Downton Superstore and garden centre. The footpath benefits from street lighting at the roundabouts, improving pedestrian safety on this route.

Grantham is within cycling distance for employees traveling to the Site, along with surrounding villages of Allington, Sedgebrook, Muston, Foston and Marston.

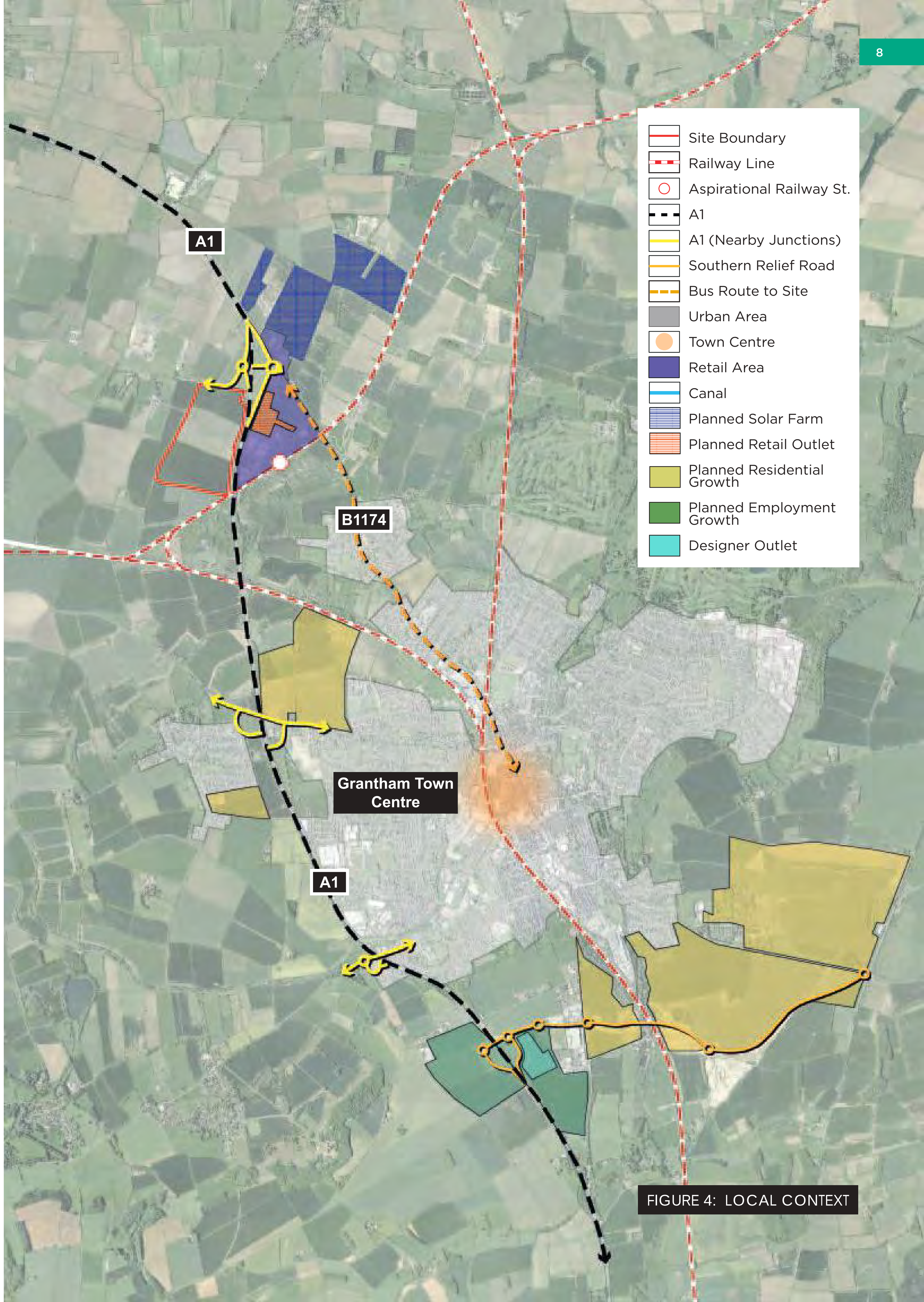
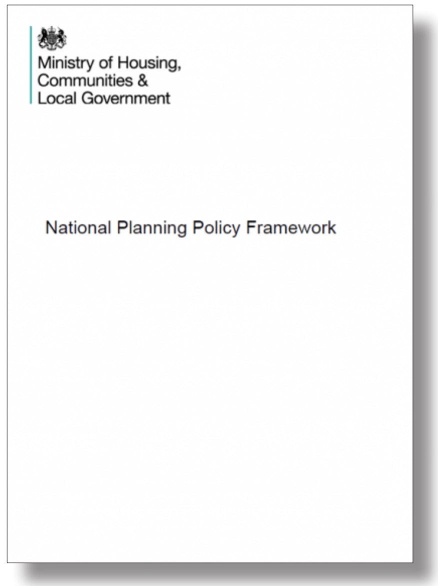


FIGURE 4: LOCAL CONTEXT

5. PLANNING POLICY CONTEXT

This section provides a summary of the pertinent local and national planning policy against which the proposed development would be subject to.

The development plan for South Kesteven District Council is the adopted Local Plan 2011-2036 (adopted 2020), whilst national policy refers to the National Planning Policy Framework (revised 2021).

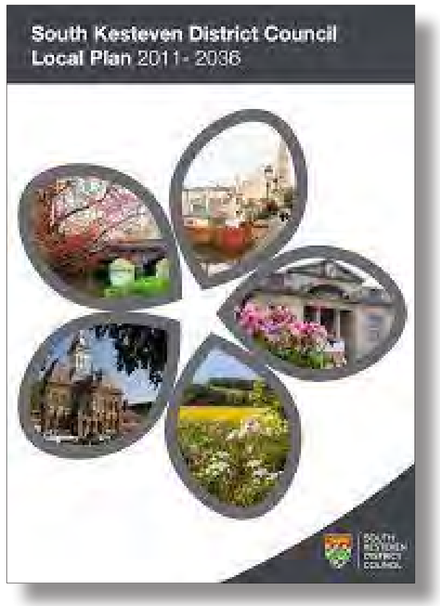


5.2. NATIONAL PLANNING POLICY FRAMEWORK (2021)

In accordance with paragraph 8 of the NPPF, the Site would help achieve the objectives of sustainable development. The proposals would contribute to the economic role of sustainable development in building a strong, responsive and competitive economy in South Kesteven and Grantham as a regional centre. The proposals would assist by ensuring sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity.

In accordance with paragraph 81 of the NPPF, the proposals take into account local business needs and the wider opportunities for development and provide opportunities for businesses to invest, adapt and expand, while supporting economic growth and productivity within the local area. The NPPF requires that significant weight be placed on the need to support economic growth and productivity.

Paragraph 83 states that planning policies and decisions should recognise and address the specific locational requirements of different sectors. This includes making provision for clusters or networks of knowledge and data-driven, creative or high technology industries; and for storage and distribution operations at a variety of scales and in suitably accessible locations.



5.1. SOUTH KESTEVEN DISTRICT COUNCIL – LOCAL PLAN 2011-2036 (ADOPTED 2020)

Policy E4 – Protection of Existing Employment Sites:
Policy E4 is relevant to the proposals as the site would form a further logical extension of existing employment land at Gonerby Moor. This would increase the provision of much needed employment land for logistics purposes to help deliver economic growth in Grantham and support regional and national economic objectives. Technical assessments show the site can be brought forward in line with the requirements of Policy E4 and should therefore be supported.

The proposed development directly responds to and meets the principles outlined Paragraph 2.66, with particular reference to both the District and Grantham capitalising upon the A1 and fully exploiting the significant opportunities that are available.

This site can therefore support the strategic requirements of the Local Plan, delivering true sustainable growth for the betterment of Grantham and the District more widely

5.3. THE EMPLOYMENT LAND STUDY (2015)

The Employment Land Study (2015) identifies a need for between 46.7ha to 79.1ha of industrial land in the district from 2015 to 2036.

It has assessed land around Gonerby Moor as a location for new employment development, identifying it as suitable for new B8 uses and large footprint employment uses which would benefit from close access to the strategic highway network.

6. THE MARKET AND ECONOMIC BENEFITS

There is an overwhelming and demonstrable need for the proposed uses, both at a regional and national scale, which the proposed development will directly address and respond to.

6.1. THE OPPORTUNITY

The proposed development has the necessary scale and locational credentials to cater for a wide range of occupier requirements. **This will deliver significant economic benefits for South Kesteven**, including a range of high-quality employment opportunities.

6.2. INDUSTRIAL & LOGISTICS SECTORS: TRENDS

The industrial and logistics sectors are inextricably linked, with the supply and transportation of parts and goods around the world and the UK essential to the operation of almost every other sector (and directly to us the consumer).

Overall, there has been (and continues to be) a significant increase in the level of occupier demand driven by a number of factors (increasing levels of on-line retailing, overall growth in freight, housing growth, stockpiling and the trend for near-shoring and re-shoring as occupiers seek to protect supply chains) which together are supporting record breaking levels of take up and unprecedented falls in supply. Both manufacturers and logistics occupiers are also now seeking larger buildings and correspondingly larger plots of land, to support bespoke and increasingly efficient facilities and sites are therefore being taken up at a much faster rate than previously anticipated.

Excellent accessibility and connectivity have become increasingly important to occupiers within both sectors as businesses seek to maximise efficiencies and drive down fuel costs. This translates in the UK to locations directly accessible to the strategic road network, with excellent linkages to labour force and markets, as well as existing supply chain companies and skills base in the case of manufacturers.

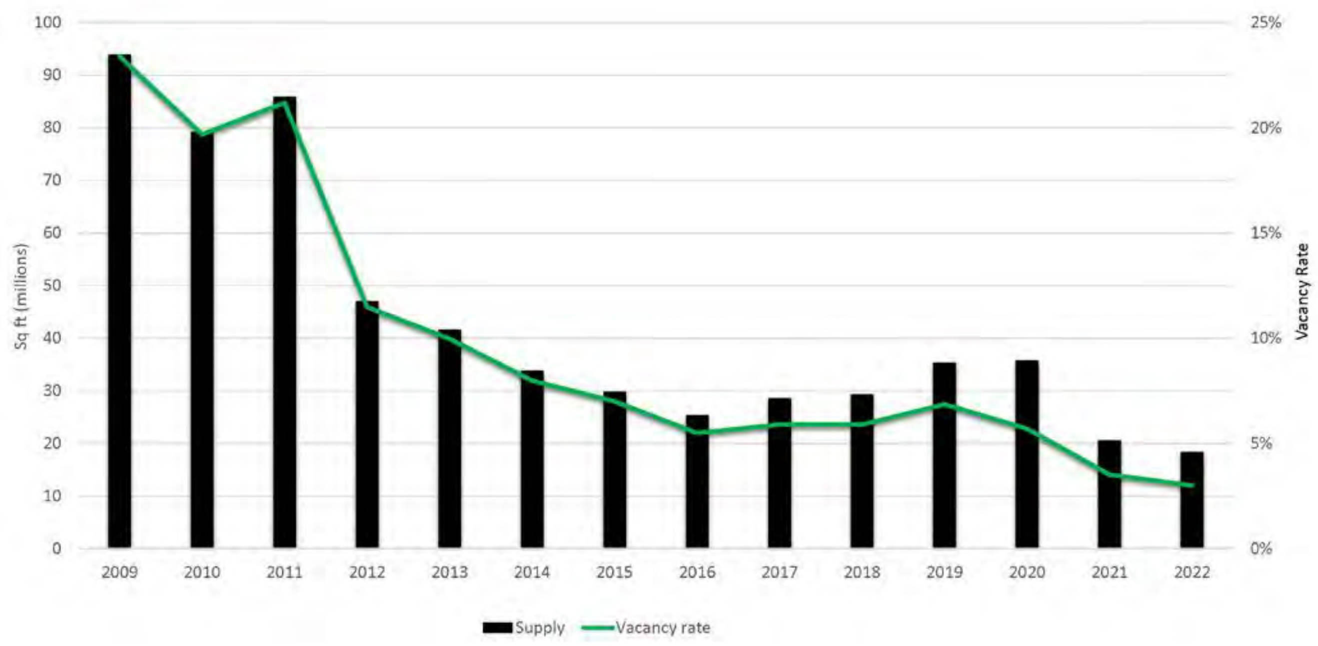


FIGURE 5: NATIONWIDE SUPPLY AND VACANCY

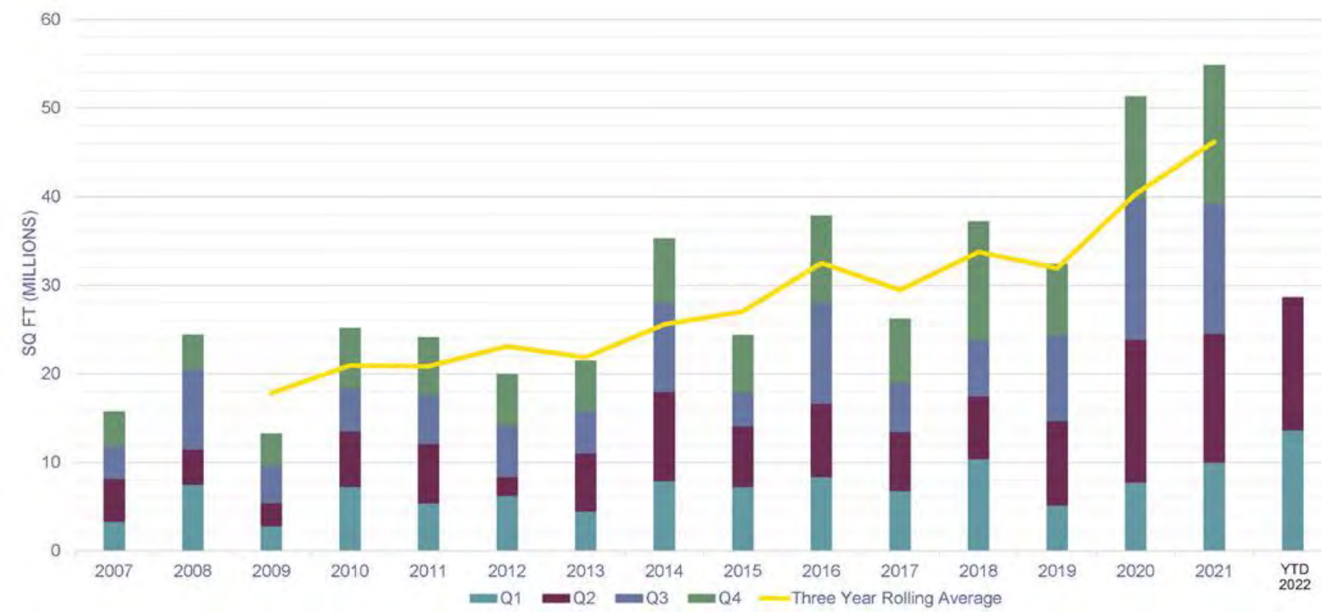


FIGURE 6: UNITED KINGDOM TAKE-UP

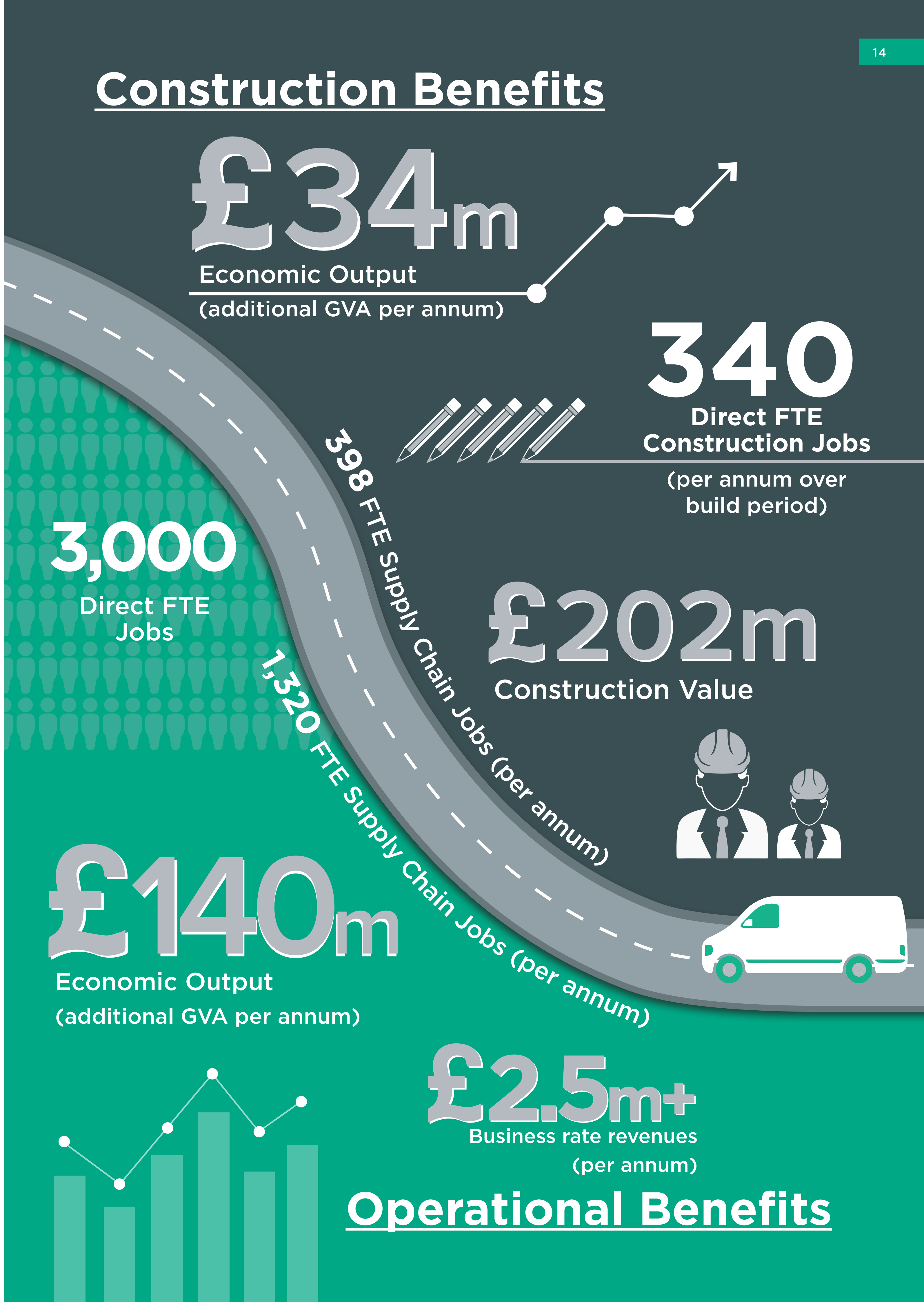
6.3. MARKET INDICATORS

There has been **record breaking take-up** nationwide over H1 2022. Data from Savills Research shows that year-to-date take-up has totalled 28.87 million sq. ft. across 100 transactions, some way ahead of the 24.50 million sq. ft. achieved in H1 in 2021, which was also a record-breaking year. As a result of consistently high and increasing levels of occupier demand, there is a **severe undersupply** of premises both nationally and regionally. Last year, the supply of premises fell at the fastest pace ever recorded. A similar picture has been seen regionally. In the East Midlands, year-to-date take-up has reached 4.95 million sq. ft. across 12 transactions, this is 96% up on the long-term H1 average.

These market dynamics have resulted in significant rental growth and vacancy rates considerably lower than the level required for market equilibrium (currently 3.01% nationally and 1.40% in the East Midlands, compared to an equilibrium rate of c. 8.00%). This will prevent the proper functioning of the market and **hinder economic growth**. The supply of immediately available land to meet occupier requirements (via 'build to suit' opportunities) is therefore vital and indeed over half of take up so far this year has been of build to suit opportunities, the highest level ever recorded, reflecting the critical lack of stock.

However, both nationally and regionally, there is an ongoing and **increasingly severe shortage of employment land** (particularly of strategic scale) which can meet a range of occupier requirements and offer continuity of supply, thereby maximising investment and economic benefits.

The A1 Corridor is an **important emerging market**, increasingly being considered by occupiers as an alternative to more traditional locations like the M1 Corridor, against the context of growing supply shortages elsewhere and an acknowledgment that locations along the A1 are well-placed to serve the Midlands markets. Pent up demand, together with the Green Belt constraints which will impact on the timescales and opportunities for delivery of further employment land along the M1 corridor, point toward this trend continuing.



7. LANDSCAPE CONTEXT

This section summarises the Landscape Visual Assessment of the Site prepared by Aspect Landscape Planning. It provides an overview of any likely landscape constraints and opportunities and concludes that the proposal can be successfully integrated into the landscape.

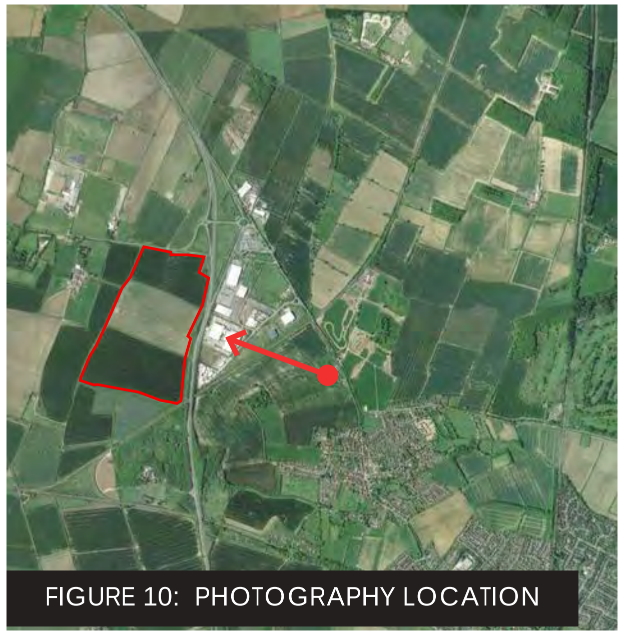


FIGURE 10: PHOTOGRAPHY LOCATION

7.1. VISUAL APPRAISAL

Aspect Landscape Planning have undertaken an Initial Landscape & Visual Technical Note (LVTN) to understand the landscape capacity of the Site to accommodate development. For further information (including all photography), reference should be given to the LVTN which will be submitted separately.

Overall, it is considered that there is sufficient intervening vegetation and topography to visually screen the Site from view in the vast majority of situations. Mitigation measures such as improvements to boundary planting and planting through the development and along the A1 corridor will help to integrate any development and connect the landscape with the escarpment vegetation near Great Gonerby.

Visual Appraisal Summary

The Site boasts an excellent and logical strategic location adjacent to the A1, with the existing retail and commercial uses on the opposite side of the A1 to the east enabling the proposal to integrate with the surrounding context. Additional contributing factors to the existing developed context include the solar farm and rail line to the south, and the Grantham North service station and B1174, which would legibly assimilate with the proposed development of the Site, thereby limiting any potential perceived negative visual impact from the wider locality.

The South Kesteven Landscape Character Assessment (2017) suggests that development is kept away from sensitive settlements and located closer to existing human influences, such as the A1 and power lines. The Site is heavily influenced by the A1 and adjacent existing urbanising influences, thereby according with the aspirations of the Landscape Character Assessment.

The Site benefits from being situated adjacent to the Grantham Scarps and Valleys character area and the escarpment of Great Gonerby. This is advantageous as the landscape holds a structure which would serve to contain the proposal within the urbanized locality and protect wider areas from potentially perceived visual intrusion. Additionally, there are opportunities for enhancements, which include the extension of tree planting along the eastern and southern boundaries of the Site to reinforce the features of the character area.

In summary the proposed development can be accommodated on this Site without detriment to localised or wider visual amenity and the integrity of the receiving landscaper character can be respected and protected. This positively reinforces the suitability of the location and spatial context for a strategic employment development in landscape terms.

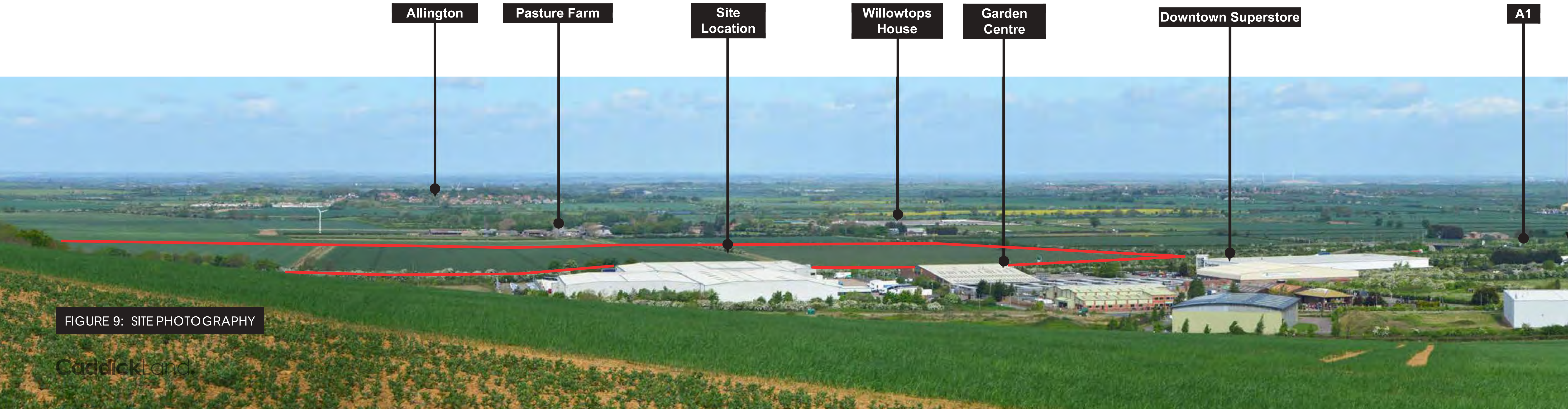


FIGURE 9: SITE PHOTOGRAPHY

8. SITE ASSESSMENT

This section describes the Site and provides a summary of the initial observations and the findings of preliminary technical assessments. The Site has been assessed by a team of experienced masterplanners (Barton Willmore, now Stantec), planners (Boyer), landscape architects (Aspect) and environmental consultants (BWB).

8.1. SITE DESCRIPTION

The Site is rectilinear in shape with three distinct grassed fields and a tree planted landscape buffer alongside the A1.

8.2. SITE ACCESS

Fore Consulting have undertaken a Transport and Access Appraisal (TAA), including a design for a new roundabout junction which can be found within the **Appendix.**

The TAA states that vehicle access into the Site can be taken at the northern boundary, with a new 3-arm roundabout off Gonerby Lane. The proposed access would be designed to accord with DMRB guidance.

The trips generated by the proposal are not anticipated to represent a significant impact on the operation of the local or strategic highway network.

The TAA has concluded that opportunities are available to travel to the Site by modes other then single occupancy car trips, including public transport, walking and cycling.

Existing bus routes run to Gonerby Moor services (route 14) and along Gonerby Lane (route 24). We would work with network operators to secure a limited extension to the former and provide an additional stop on Site. Opportunities for improving service frequency would also be explored where necessary.

8.3. PUBLIC RIGHTS OF WAY

There is one Public Right of Way (PRoW), classed as a bridleway, which runs along the eastern Site boundary (GtGo/1/2). This route is not obvious from Gonerby Lane and looks to be underused. Similarly, the GtGo/2/6 on the east of the A1 is heavily overgrown and unpopular.

To the west of the Site, a PRoW (Alli/4/5) leads to Allington. This route is used to connect with Barrowby.

The proposed development would ensure the retention of public rights of way as part of the masterplan proposals. The existing public rights of way would be enhanced as part of the development proposals which would encourage greater use of local rights of way to improve pedestrian connectivity for access and leisure purposes.

8.4. GROUND CONDITIONS

As part of their Environmental Appraisal, BWB have undertaken a desk-based assessment of the ground conditions of the Site.

The Site has remained undeveloped throughout mapped history, with the exception of a former building once located to the south-east of the Site and the electricity substation found at the northern boundary.

The assessment provides that shallow spread (strip or pad) foundations bearing onto the weathered bedrock are likely to be suitable. As such, the foundational requirements for the proposal are considered to be optimal, enhancing the deliverability of the scheme and location for future operators.

It was noted that soakaways are unlikely to be suitable at the Site as the majority of soils are typically cohesive with low permeability.

Detailed ground investigations will be undertaken in due course to confirm ground conditions, the ground gas regime and allow for in-situ and laboratory testing to inform foundation design.

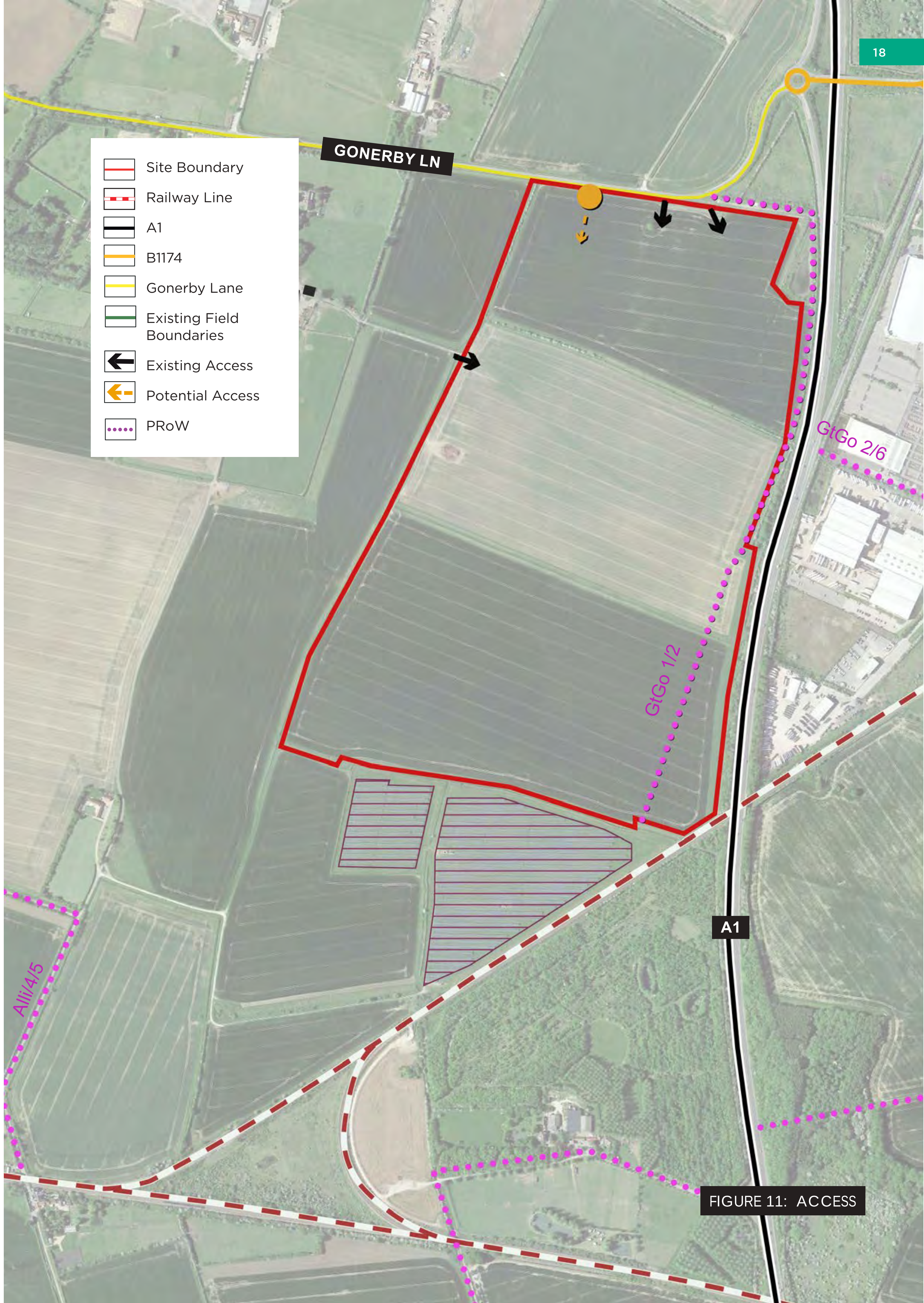


FIGURE 11: ACCESS

8.5. LANDSCAPE FEATURES

Due to the Site being of agricultural land use, the vegetation is lacking within the centre but there are some features along the boundary.

The boundaries are partially edged by hedgerow, predominantly found along the eastern edge, along the A1. There are trees also along this edge to provide screening to the road.

There are hedgerows within the Site which have been used to separate the agricultural fields and one existing tree remains in field 1.

A new hedgerow along the southern edge of the Site has been planted to create some screening towards the solar farm which is along most of the boundary.

Along the north-east boundary of the Site is a partial scrub with seeded hedgerow species, bramble and taller grasses.

To the west of the Site is the Foston Beck, a chalk stream, which has a series of open field ditches which connect to it.

The Site slopes from 50 AOD to 35 AOD from the south-east to the north-west of the Site.

8.6. ECOLOGY

As part of their Environmental Appraisal, BWB have undertaken an Preliminary Ecological Appraisal (PEA) of the Site.

There are no internationally designated sites located within 10km and the Site provides low value for biodiversity due to its historical and current intensive arable farmland use, thereby being largely free of any potential habitat features. Hedgerows that surround and bisect the Site would be retained as far as possible and if limited loss was to prove unavoidable, additional hedgerow planting would be implemented.

It is acknowledged that there is some potential for Great Crested Newt habitat in the wider area, however this can be mitigated for appropriately as part of any development proposals.

There are no overriding constraints from an ecological perspective that would prevent development and given the low present ecological value of the Site, a landscape led species rich planting scheme would enhance the habitats on Site and ensure a biodiversity net gain.

8.7. FLOOD RISK AND DRAINAGE

BWB have assessed the drainage potential of the Site, both in regard to surface water and foul drainage.

Surface Water

The Site and immediate surrounding area is at a low probability of flooding, located entirely within Flood Zone 1.

A network of drainage ditches run adjacent to and bisect the Site, and are suitable to receive surface water flows.

Subject to infiltration testing, water may be discharged to ground, these existing ditches, or a combination of both.

Through the utilization of Sustainable Drainage Systems (SuDS), the development will ensure that surface water run off does not exceed current green field rates.

Foul Drainage

The drainage assessment has identified multiple sewers for foul drainage which the Site could utilise. Conversations are ongoing with Anglian Water to identify the most appropriate point of connection.

It is considered that a development of the Site would be adequately served for foul drainage.

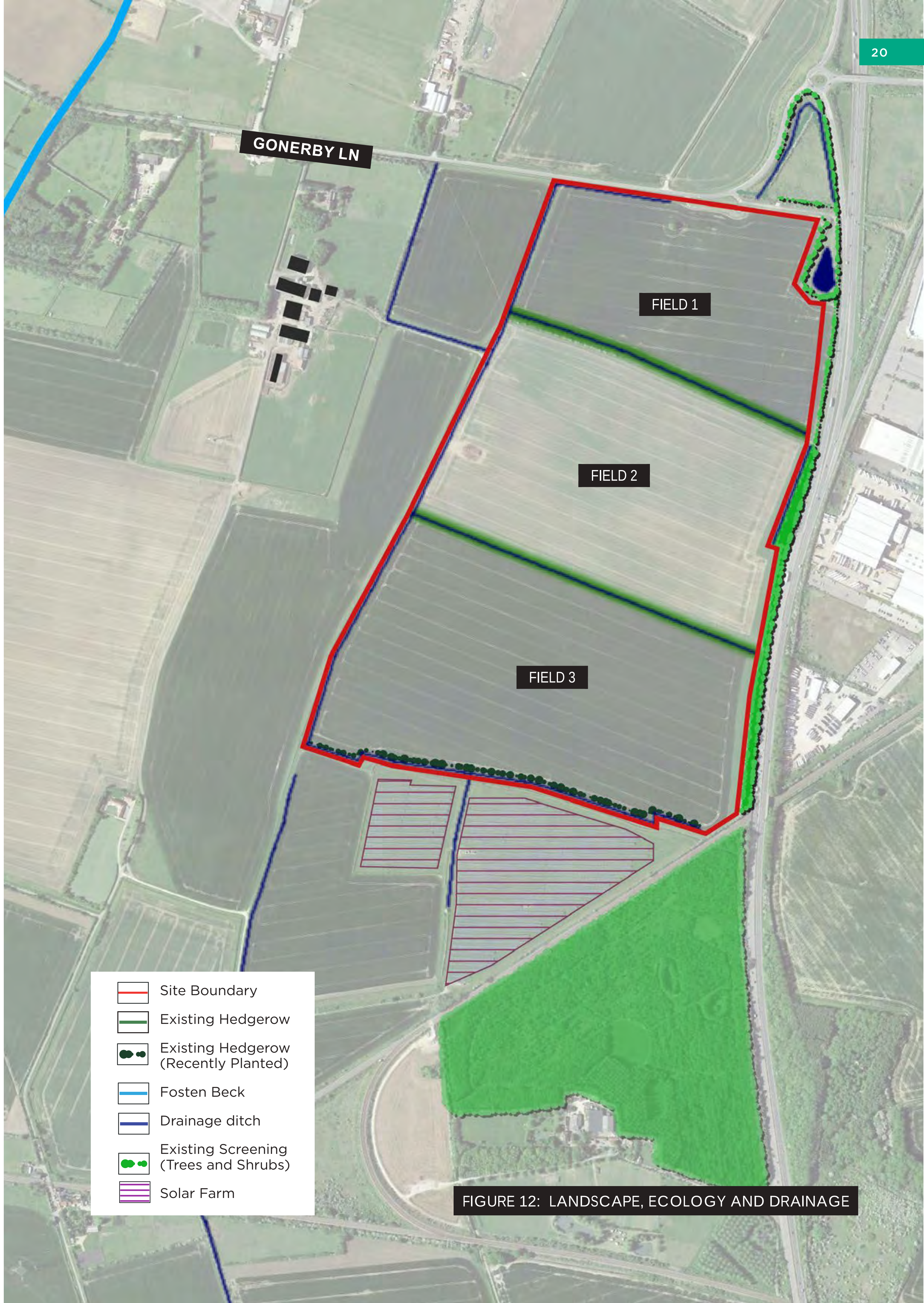


FIGURE 12: LANDSCAPE, ECOLOGY AND DRAINAGE

8.8. ARCHAEOLOGY AND HERITAGE

BWB have assessed the potential for archaeological deposits and assets within the site and its immediate surroundings to determine possible impact on historic landscape and designated assets.

The Appraisal has found that there are no designated nor non-designated heritage assets within the Site.

The Site blends in with the existing urbanised influences which are located to the east of the A1. The Site would therefore be read clearly as forming a part of the adjacent development, were it visible from the south-west, protecting views from Belvoir Castle from any perceived visual impact. Nonetheless, mitigation measures such as tree screening and massing considerations will further reduce and limit any potential visual intrusion upon Belvoir Castle (Grade I) and its associated parks and gardens (Grade II*).

It is considered that the proposed development could be accommodated positively without substantial harm to the setting of any heritage assets.

8.9. UTILITIES & INFRASTRUCTURE

There are no known utilities within the Site. All supporting infrastructure such as gas, electricity, broadband and water are within the vicinity of the Site and accessible.

Overall, there are no utilities or infrastructure constraints that would prevent the development of the Site.

8.10. AIR QUALITY

BWB have undertaken a desktop review of the site and surrounding area in order to identify any emission sources which may influence local air quality and assess the suitability of the Site for the proposed development.

The desktop review has considered that it is likely that pollutant concentrations within the Site will be below the relevant current air quality objectives.

There is the potential for development-generated traffic to influence pollutant concentrations and a detailed air quality assessment will therefore be provided with any future planning application.

8.11. NOISE

As part of their Environmental Appraisal, BWB have undertaken a high-level desktop review of potential noise impacts in order to inform masterplanning and assess the overall site suitability for the proposed use. The review has considered noise impacts both during the operational phase as well as the construction phase.

There are a very limited number of noise sensitive receptors within the vicinity of the site, with the closest being over 200m to the west. Utilisation of standard mitigation measures in the design of the scheme will therefore mean noise is unlikely to be a constraint to the scheme. This is especially true given the existing noise sources generated by the A1, existing nearby commercial/ industrial premises and the railway line.

9. THE EMERGING PROPOSAL

The Site is considered capable of delivering up to 2.7m sqft of high-quality employment space, including singe buildings of over 1m sqft.

The Site can accommodate employment development to cater for a wide range of occupier requirements, delivering significant economic benefits.

The proposed development will comprise a high-quality, landscape-led approach which will ensure the character and visual qualities of the Site and surrounding landscape are considered.

The proposed development will incorporate the following design principles:

1. **Vehicle Access:** Provided via a new roundabout on Gonerby Lane, connecting the proposed development directly to the A1 Corridor.

2. **Employment Buildings:** Varying sizes of employment buildings can be provided, including large floor plate buildings over 1m sqft to meet the needs of modern occupiers.

3. **Development Scale and Massing:** Building heights will be sensitively determined to ensure there is no unacceptable impact on sensitive views towards the Site.

4. **Cladding:** The proposed buildings will comprise cladding that reflects the hues and shades within the surrounding natural vegetation.

5. **Active Travel:** The proposed development will include pedestrian and cycle connectivity, incorporating the retained public footpath into an area of enhanced landscape.

6. **Landscaped Boundaries:** Retained and enhanced landscape features along the Site boundaries will help assimilate the proposed development into its landscape setting.

7. **Sustainable Urban Drainage System (SuDS):** The Site can provide a network of SuDS, including attenuation basins, swales and existing drainage ditches.

8. **Biodiversity Net Gain:** The proposed development will deliver biodiversity net gains, through the retention and enhancement of existing landscape features, alongside the provision of new planting and landscape corridors incorporating retained hedgerows on the Site.

9. **Landscape Buffer (A1 Corridor):** Existing trees and structural planting along the A1 will be retained to soften views of the new buildings.

FIGURE 13: CONCEPT MASTERPLAN

9.1. BUILDING EXAMPLES

The proposed employment buildings will comprise high-quality modern materials, incorporating the layout principles shown below, subject to the end users operation requirements.

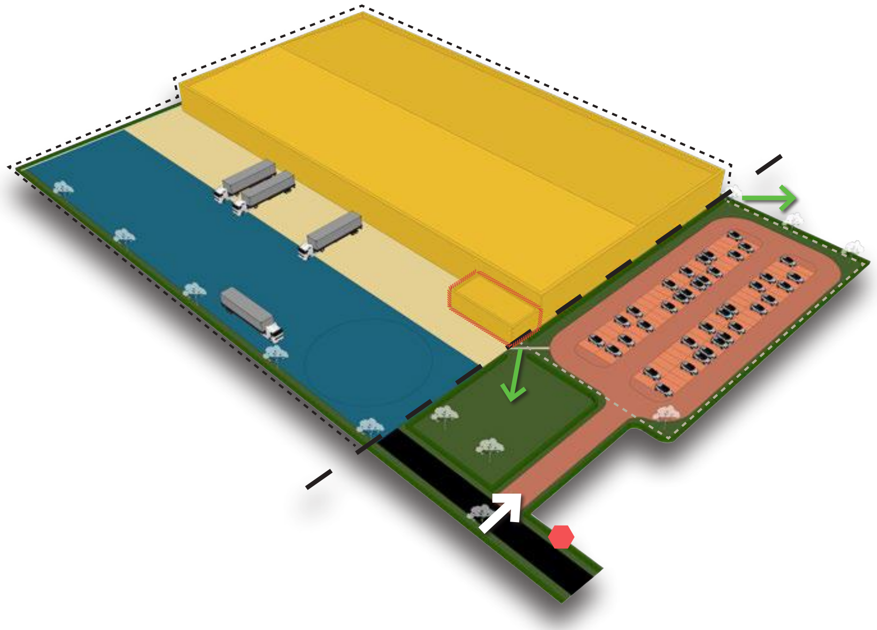


FIGURE 15: SINGLE SIDED DOCK

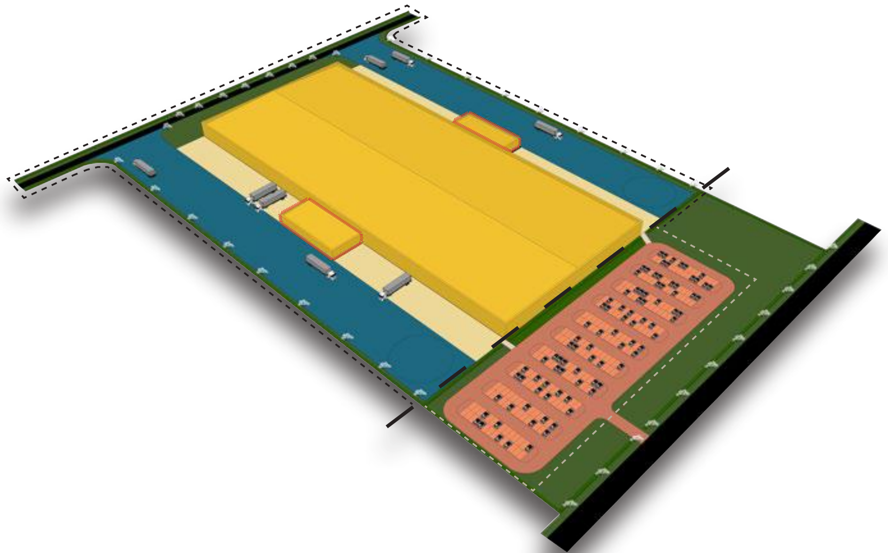


FIGURE 14: DOUBLE SIDED DOCK

- Consistent building line
- Landscaped spine road.
- Secure boundary (operational area)
- Semi-secure boundary (car park)
- Service yard (rear of building to screen views)
- Staff parking (Incl. planting)
- Landscape & tree planting.
- Employment buildings (with architectural enhanced office space fronting the spine road)

10. CONCLUSION

Our expertise in taking a site from acquisition through to delivery and operation, means we would progress the site at Gonerby Moor with the full intention of realising development at the earliest possible opportunity.

This document has presented an initial assessment of the Site, its context, and its development potential. In doing so, it has been demonstrated that there are sound planning and design reasons for the Site to be brought forward for employment development.

The Site has the potential to accommodate a modern employment hub of regional significance that will encourage the retention and development of local skills in a highly accessible location along the A1 and adjacent to an existing employment hub.

The Site is easily accessible from Grantham and has good accessibility to the A1. A good bus service runs within walking distance of the Site, which has potential for further local improvements, while opportunities also exist to access the Site via walking and cycling.

The proposed employment uses complement the requirements as outlined within the Local Plan and will help meet the needs of the employers to suit the local market.

There is an overwhelming and chronically undersupplied need for such uses both nationally and regionally, and it has been acknowledged in adopted planning policy that the substantial potential for such uses in South Kesteven has not been met. As such, the proposed development would make a significant and material contribution towards helping the District capitalise upon this potential, whilst offering considerable employment opportunities to serve the population of Grantham and the surrounding villages.

The Site assessment process has found that the Site is relatively constraint free, suitable for employment purposes and deliverable. It can be brought forward in a way that is sensitive to the local context, incorporating a comprehensive landscaping scheme, while securing a net gain in biodiversity.

10.1. NEXT STEPS

The Site is considered deliverable immediately and Caddick is committed to progressing the emerging Concept Masterplan towards a high-quality employment development that responds to the local economic need.

We look forward to working with the Council to progress the proposals for the Site and welcome any feedback.

11. APPENDIX

CaddickLand.

11.1. SITE ACCESS - GENERAL ARRANGEMENT

DO NOT SCALE

N O T E S

DESIGN NOTES

1. ALL DESIGN AND WORKS TO COMPLY WITH CURRENT VERSION OF THE FOLLOWING DOCUMENTS:
   - DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB);
   - SPECIFICATION FOR HIGHWAY WORKS (SHW);
   - MANUAL FOR STREETS (MFS); AND
   - LINCOLNSHIRE COUNTY COUNCIL (LCC) DESIGN GUIDE AND SPECIFICATION.
2. EXISTING FENCES, VERGES/SHUBBERY, FOOTWAY, AND OTHER PHYSICAL FEATURES TO BE REMOVED WITHIN THE AREA OF WORKS.
3. ALL KERBS TO BE HB2.
4. ALL IRONWORK WITHIN EXTENT OF WORKS TO BE LOWERED / RAISED AS REQUIRED.
5. ALL PROPOSED ROAD MARKINGS TO BE IN ACCORDANCE WITH THE FOLLOWING:
   - TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS (TSRGD);AND
   - TRAFFIC SIGNS MANUALS CHAPTER 5 - ROAD MARKINGS.
6. GONERBY LANE PROPOSED DESIGN SPEED: 30mph
7. EARTHWORKS SLOPES TO BE MAXIMUM 1:3.

KEY

- CARRIAGEWAY
- FOOT/CYCLEWAY
- TACTILE PAVING (UNCONTROLLED CROSSING)
- BLOCK PAVING
- GRASS VERGE

REV	DESCRIPTION	DATE	BY

Client:
CADDICK DEVELOPMENTS

Project
LAND AT GONERBY MOOR
GRANTHAM

Drawing Title
GENERAL ARRANGEMENT

PRELIMINARY

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Drawn by	Checked by	Issue Date	Scale	Format
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Job Number	Drawing Number	Revision
5136	100-P-001	-

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Desk Top Publishing and Graphic Design by Barton Willmore

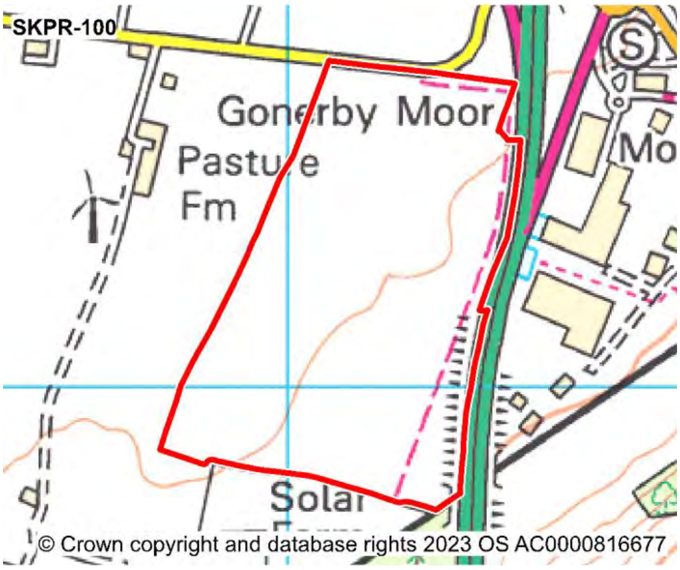
This artwork was printed on paper using fibre sourced from sustainable plantation wood from suppliers who practice sustainable management of forests in line with strict international standards. Pulp used in its manufacture is also Elemental Chlorine Free (ECF).

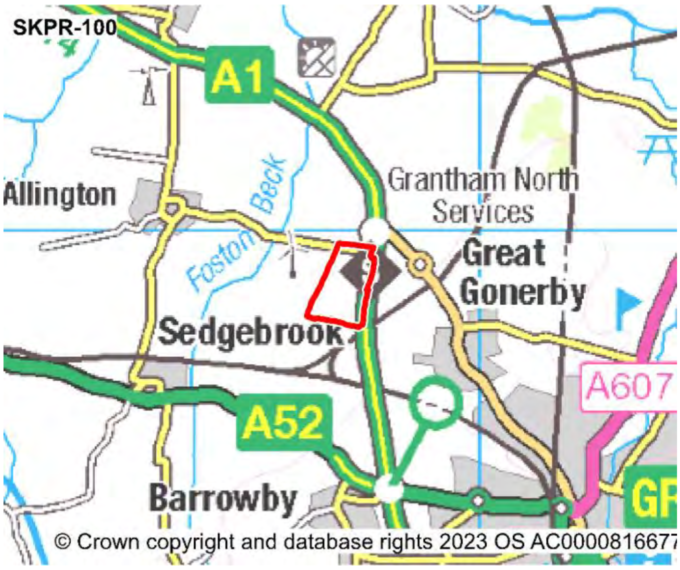
Document Status	-
Revision	-
Author	SM
Checked by	SW
Authorised by	-
Issue Date	08/2022

APPENDIX 7. SKPR-100 DRAFT SITE ASSESSMENT

Ref: **SKPR-100** Parish: Grantham Proposed Use: Employment Preferred Site: **Yes**

Location: Land South of Gonerby Lane, West of the A1, Gonerby Moor, Gra Land Type: Greenfield Site Size: 63.7





Major Contraints

Constraint	Assessment
Settlement Hierarchy	Grantham
Site Deliverability Timetable	Short Term (0-5 years)
Located / Overlap with a Flood Zone	No
% of Overlap with Flood Zone 2	N/A
% of Overlap with Flood Zone 3	N/A
Statutory consultee comment on Flood Risk (Environment Agency)	No comment from Environment Agency
Surface Water Flood Risk	Yes
Proximity to closest Designated Site (SAC, SPA, SSSI)	0km - 5km
Statutory consultee comment on Designated Site (SAC, SPA, SSSI)	The following sites are in proximity to a SSSI and any applications would need to provide sufficient information to provide evidence that the proposal would not damage or destroy the interest features for which the SSSI has been notified
Impact on the Strategic Highway Network	Major
Statutory comments on Highway Network (Highways England)	High priority as it is located abutting the SRN and the trips are greater than 100. Likely to have cumulative impact with SKPR 202 and 185
Impact on the Local Highway Network	Major
Impact on the Local Road Network	Major
Statutory comments on Highway Network (Lincolnshire County Council)	This site could take access from Gonerby Lane, which would need upgrading to the A1 junctions. However, due to its remote lcoation from Grantham Town Centre and its immediate access to the A1, it is likely to be predominantly reliant on the private car for travel. Active travel and sustainable modes would be unlikely to mitigate the impact of traffic which is likely to be severe on the adjoining highway network.
Does the site have suitable access	Part
Site Affected by Minerals and Waste Policy	No

Minerals and Waste Policy Code	N/A
Statutory consultee comment on Minerals and Waste	No comment from Lincolnshire County Council

Other Constraints

Proximity to Local Wildlife Sites	1.75km+
Proximity to Local or Regional Geological Sites	0.1km+
Statuary consultee comment on Local Wildlife Site (Greater Lincolnshire Nature Partnership)	No comment from Greater Lincolnshire Nature Partnership
Proximity to Shops	0.5 - 2km
Proximity to public transport	0.25 - 1km
Proximity to medical services	1.5 - 5km
Proximity to Primary School	1 - 3.5km
Proximity to Secondary School	2 - 8km
Proximity to Employment Site	3 - 10km
Proximity to Conservation Area	1km+
Listed Building (includes Grade 2* Grade 2 and Grade 1)	1km+
Proximity to Schedule Ancient Monuments	1.5km+
Proximity to Registered Park or Garden	4km+
Proximity to Ancient Woodland	3km+
TPO tree on Site	No
Distance from Public Right of Way	0.2 - 0.4km
Distance from Local Nature Reserve (LNR)	10+ km
Overlap with Agricultural Grade 1	No
Percentage of Overlap with Agricultural Grade 1	N/A
Overlap with Agricultural Grade 2	No
Percentage of Overlap with Agricultural Grade 2	N/A
Overlap with Agricultural Grade 3	Yes
Percentage of Overlap with Agricultural Grade 3	100%
Contaminated Land on Site	No
Air Quality Management Area	3-10km
Biodiversity Ecological network - High Quality	No
Biodiversity Ecological network - Opportunity for management	No
Biodiversity Ecological network - Opportunity for creation	No
Green Infrastructure Opportunities – High Quality Green Infrastructure	No
Green Infrastructure Opportunities – Opportunities to Manage Green Infrastructure	Yes

Main Findings

Employment Land Study 2023 recommends that the site is allocated for employment generating uses. The Employment Land Study 2023 concludes that the site benefits from direct access to the strategic road network and could facilitate intense HGV movements. The current low intensity of use on this site presents opportunity for future development and intensification, which can significantly increase the provision of employment land in this location.

APPENDIX 8. EMAIL CORRESPONDENCE WITH NATIONAL HIGHWAYS AND LINCOLNSHIRE COUNTY COUNCIL

Olivia Price

From: Ian Field [redacted]
Sent: 26 January 2024 10:19
To: David Hobday
Subject: RE: Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

Hi Dave,
I write in reply to your enquiry regarding this site and your initial Transport Appraisal. In general, the assessment is acceptable but I have the following comments:

- The 4 arm site access roundabout shown on Drawing ADC3032-DR-002-P2 is preferred form of access for the development. In Appendix A, priority junctions are shown as access points for the northern site and this would need further evidence as to their suitability.
- The pedestrian and cycle improvements shown on Drawing ADC3032-DR-002-P2 are necessary, also the widening of the carriageway to 7.3m to the roundabout.
- The distribution proposed seems reasonable. We would want to limit any traffic impact through the villages of Allington and Sedgebrook, the distribution results in nearly 50 additional vehicles in the peak hour along this route which should be compared to base flows. It may be a high percentage increase, and it would be helpful if consideration could be given to ways to reduce this impact.
- A McDonalds fast food and drive-thru has been consented on Allington Lane East and the junction with the B1174 is to be upgraded to a roundabout. The flows from this committed development should be included in any assessment.
- The junction of Newark Hill / Belton Lane will need including in an assessment.
- Parking provision should be considered in the appraisal. Whilst LCC does not have parking standards, the amount of parking proposed should be justified by comparison to other sites (used for trip rates in TRICS). The provision should correlate with the trip rates used, and ideally parking provision should be limited as far as possible.

Please let me know if you have any queries.
Regards
Ian

Ian Field CEng, BEng(Hons), MCIHT, ACGI
Growth Manager (Special Projects)

Lincolnshire County Council
County Offices, Newland, Lincoln LN1 1YL

Phone: [redacted]

Teams: Chat with me
Website: www.lincolnshire.gov.uk

Lincolnshire County Council
Working for a better future

From: David Hobday [redacted]
Sent: Thursday, January 11, 2024 12:04 PM
To: Sarah Heslam [redacted]
Subject: Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

You don't often get email from [redacted] Learn why this is important

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Hi Sarah,

Apologies if you're the wrong person within HDC to approach with this, please feel free to forward on to the correct person in your team if that's the case.

We have been commissioned by Harworth Group and Caddick Group to support their representations to the Regulation 18 Local Plan for their sites located adjacent to the A1/Gonerby Moor junction in Lincolnshire. The proposals are for a large employment development which would be accessed via a new roundabout onto Gonerby Lane to the west of the A1 junction.

We have prepared an initial Transport Appraisal (**ADC3032-RP-B-v3**, attached) which looks at the key localised impacts of the development, on both LCC's and NH's infrastructure along with presenting an access strategy and review of the local sustainable transport provision in the area.

We would appreciate LCC's feedback on this initial analysis. We would assume that SKDC will consult with LCCseparately once the Reg 18 draft consultation is fully underway, but hopefully the attached report will provide some more detailed analysis from a highways perspective in advance of that.

The timescales on SKDC's website indicate that the Reg 18 consultation is imminent, and the later Reg 19 will take place in the summer, however you have a particular timescale you are working to that would be really useful to understand? Of course we are happy to answer any questions you or your team may have regarding the report.

Many thanks

Dave

David Hobday
Senior Engineer – ADC Infrastructure limited.
[redacted]

Olivia Price

From: Catherine Townend [redacted]
Sent: 29 January 2024 09:45
To: David Hobday
Subject: National Highway response - Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

Good morning Dave,

Thank you for your below email in relation to pre-application consultation in support of a Regulation 18 Local Plan allocation submission for land adjacent to the A1 at Gonerby Moor, Lincolnshire.

Our consultants AECOM have reviewed your submitted transport appraisal note and more information is required as set out below:

Trip Generation and Distribution

We welcome the applicant using the TRICS database to identify the trip rates for each possible land use proposed at the development site. We recommend trip rates are derived using the latest available version of TRICS (v7.10.4) and that surveys carried out on Monday, Friday and weekends are omitted from the TRICS site selection.

The proposed area for B8 warehouse use in both the Harworth Group's land and Caddick Group's land exceeds the maximum gross floor area surveyed in TRICS. We recommend the applicant obtains trip rates (total, light vehicles and HGVs) from other sites with similar characteristics (e.g. land use, size, proximity to the SRN) for comparison with the trip rates available in TRICS to ensure that the traffic generation predicted is accurate for assessing the potential impact from the development on the adjacent SRN.

We also note that an arbitrary split between B8 Storage and Distribution and B2 General Industrial Uses is defined as 75% and 25% respectively. We suggest the applicant updates the traffic assessment with a more accountable split when available.

Furthermore, committed developments within the surrounding area should also be included in the vehicle trip assessment. Details of these developments should be confirmed with the Local Planning Authority.

We are content with the use of the national census data at MSOA level to derive the traffic distribution for the light vehicles.

In relation to the approach of adopting a 50% north and 50% south distribution of HGVs as proposed in the appraisal report, we recommend the applicant reviews the observed directional split of HGVs in order to justify the proposed methodology or to update the proposed directional splits as appropriate.

Junction Assessments

TEMPro Growth Factor - National Highways are content with the use of TEMPro Version 8.1 and the use of South Kesteven 002 MSOA for the background traffic growth. However, it is recommended that 'Trunk Road' is used for the TEMPro forecasts instead of 'All Roads' due to the vicinity of the site to the Strategic Road Network and the higher traffic growth it forecasts. We feel this would provide a more robust assessment.

Committed Development - All committed development traffic has been assigned as "cars". This has therefore meant that the heavy vehicle percentages have reduced accordingly. The applicant should provide all committed development traffic in cars / Light Vehicles and heavy vehicles for our review.

Further clarification is required to understand how the peak periods of 08:15 – 09:15 and 16:30 – 17:30 have been selected for the assessment. National Highways requires the highest combined peak period to be selected from background traffic plus development traffic.

Traffic Merge Assessment Flows – The slip road merge assessments have been reviewed. It appears that due to the location of the DfT traffic count sites, additional calculations were undertaken to identify the Upstream Mainline flows for the assessments. National Highways requires further clarity on how this has been calculated. We recommend the applicant submits the calculation spreadsheets for our review.

Traffic Modelling Geometry Measurements – Following independent measurements being undertaken, a few geometry measurements require a further review:

Western Dumbell Roundabout

- The entry width of the Gonerby Lane approach needs revising with an approximate width of 3.96 metres being identified.
- The entry radius on the A1 off-slip requires amendment with an approximate radius of 11.4 metres being identified.

National Highways also recommends that an annotated drawing of the geometry measurements for the roundabouts are provided to support the measurements used within the modelling.

I trust the above comments are helpful in progressing the representation of this site for the Regulation 18 Site Allocation process for the South Kesteven Local Plan. Should you have any questions please get in touch.

Kind regards

Catherine Townend
Spatial Planner
Operations Directorate (Midlands) – *Nottinghamshire, Derbyshire, Lincolnshire & Rutland*
[redacted]

[redacted] days are Monday to Thursday

From: David Hobday [redacted]
Sent: Thursday, January 11, 2024 11:46 AM
To: Catherine Townend [redacted]
Cc: Tim Cooke [redacted]
Subject: Gonerby Moor Employment Site. Transport Appraisal for SKDC Local Plan representations.

Hi Catherine/Steve

Further to our email below, please find attached our Transport Appraisal report **ADC3032-RP-B-v3** for the two proposed employment sites near the Gonerby Moor interchange north of Grantham.

If you have any questions, or require clarification on anything contained within the report, don't hesitate to contact us.

Many thanks

Dave

David Hobday
Senior Engineer – ADC Infrastructure limited.
[redacted]

[redacted]
Sent: Wednesday, November 1, 2023 4:49 PM
To: [redacted]
Subject: Gonerby Moor

Hi Catherine

Hope you're well.

We have been commissioned by Harworth Group and Caddick Group to support their representations to the Regulation 18 Local Plan for their sites located adjacent to the A1/Gonerby Moor junction in Lincolnshire. The proposals are for a large employment development which would be accessed via a new roundabout onto Gonerby Lane to the west of the A1 junction.

As part of the representations, we are undertaking a traffic analysis and capacity assessment exercise to understand the potential traffic impact of the proposals on the operation of the two A1/Gonerby Moor roundabouts and the slip roads onto/off of the A1. To inform this work we have commissioned new traffic counts to be undertaken in November, and the survey company is currently in the process of obtaining the required permissions for the surveys. Our aim is to submit the results of our assessments to National Highways for comment at the end of November. We just wanted to make you aware of these proposals and to ask whether there is anything that you are aware of that we should take into account in our work?

Kind regards

Tim Cooke
Technical Director – ADC Infrastructure Limited
[redacted]

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APPENDIX 9. PRELIMINARY ECOLOGICAL APPRAISAL (PEA) (BWB CONSULTING)

A CAF GROUP COMPANY

Gonerby Moor, Grantham

Caddick Developments Ltd

Environmental Appraisal

June 2022

Contents

Document ID:	Environmental Appraisal
BWB Reference:	2207932

Revision	Date of Issue	Status	Author	Checked	Approved
1	June 2022	Draft	OS	KC	KC

Notice

1. Introduction

This environmental appraisal has been prepared by BWB Consulting Limited (BWB) on behalf of Caddick Developments Limited (the 'Client'). It set outs an appraisal for proposed B8 warehouse units with an associated access road, service yards, car parking and limited soft landscaping at land north west of Gonerby Lane, Gonerby Moor, Grantham ('the Site') as shown in Figure 1.1.

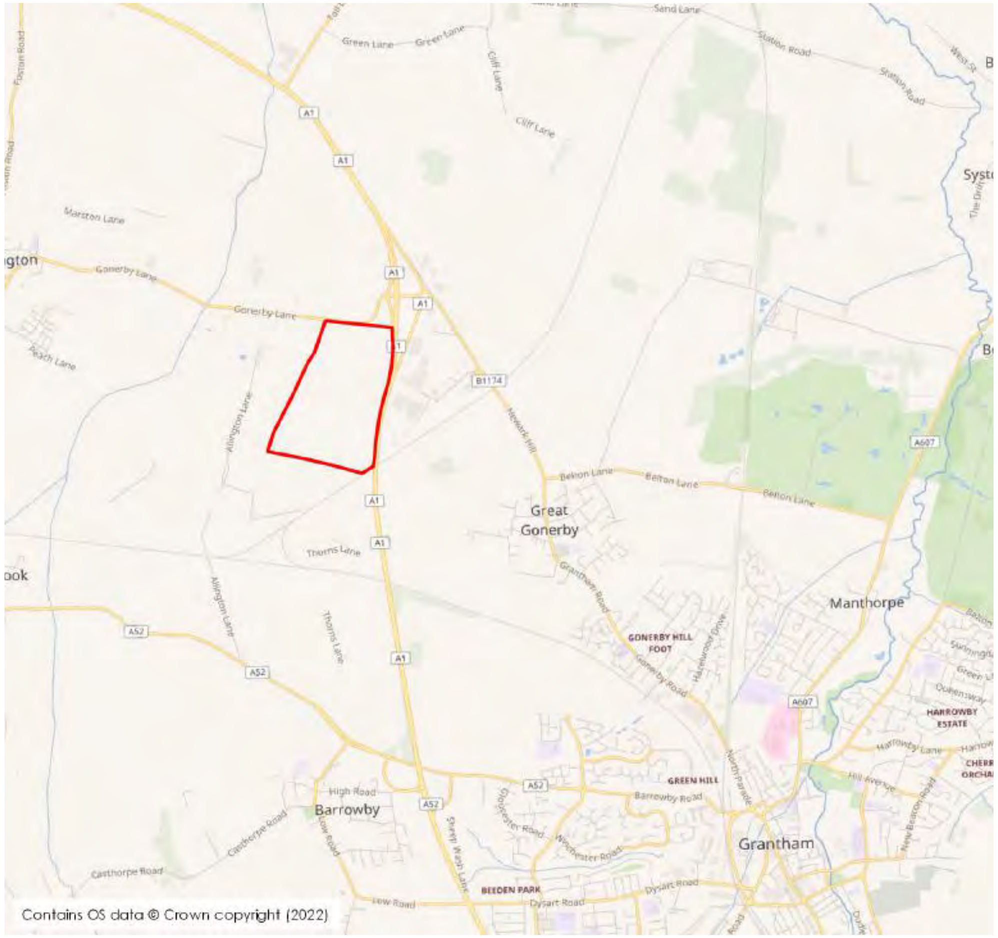

Figure 1.1: Site Location

The appraisal has been prepared in order to inform the Client of the potential risks, constraints and opportunities associated with the parcel of land being proposed for development.

The appraisal has been prepared in line with relevant technical standards, guidelines and best practice. It is based primarily on readily available desk top information, and has been informed by relevant field surveys conducted between May and July 2022.

This report provides a high level review of the following topics:

- Ground Conditions;
- Air Quality;
- Noise;
- Ecology; and
- Cultural Heritage.

The Proposed Development is anticipated to comprise warehouse units with associated infrastructure and landscaping.

2. Site Location and Description

Site Location

The Site lies approximately 1.4km north west of the village of Great Gonerby in Grantham and lies immediately west of the A1 dual carriageway. The Site location is presented in Figure 2.1. It is centred at National Grid Reference 488210, 339289 and covers an area of approximately 66 ha. The Site is within the administrative boundaries of South Kesteven District Council (SKDC) and Lincolnshire County Council (LCC).

Figure 2.1: Site Location

Site Description

The Site currently comprises three agricultural fields, with dense vegetation and semi mature trees along the field boundaries. A balancing pond is located in the north east of the Site. There is a public footpath that starts at the centre of the northern boundary following the Site periphery to the east and along the eastern boundary. It is noted that at the midway point it bisects the south east corner.

The Site is located just off the Gonerby Moor Interchange. It is bound by Gonerby Lane to the north with agricultural land beyond. The A1 dual carriageway was built in 1961 and forms the eastern boundary of the Site with existing commercial premises beyond. To the south of the Site lies a solar farm and the Bottesford to Ancaster railway line. To the west of the Site lies agricultural land, associated farm buildings and residential dwellings.

Figure 2.2 provides an aerial image of the Site and the surrounding environment.

Figure 2.2: Aerial Photography of the Site

Site Walkover

A site walkover was completed on 17/05/2022 by a representative of BWB. At the time of the walkover, the Site comprised agricultural fields utilised for crops (Image 3.1). Dense vegetation and semi mature trees were noted along hedgerows (field boundaries) with a single mature tree located in the northern field.

Image 3.1: The Agricultural Fields and Hedgerow Boundary

A balancing pond was noted in the north-eastern corner of the Site. Drainage ditches were located between the field boundaries. Water was noted flowing from the east to west in the ditch between the northern and central fields. These features can be seen in Image 3.2 and Image 3.3.

An electricity substation was located centrally along the northern boundary of the Site. A public footpath was noted along the eastern boundary with a footbridge located between the northern and the central field.

Image 3.2: Balancing Pond in the North-East of the Site

Image 3.3: Drainage Ditch along a Field Boundary

3. Ground Solutions

Site Setting and History

The Site has remained undeveloped throughout mapped history with the exception of a former building once located in the south-east, the balancing pond in the north-east and the electricity substation along the northern boundary. The surrounding areas are largely agricultural. Land to the east and south-east have undergone development associated with the railway, the A1 dual carriageway, the A1 Trunk Road, the A1 Service Area and commercial developments.

Geology

Ground conditions are expected to comprise Topsoil overlying bedrock geology comprising Charmouth Mudstone Formation, Charmouth Mudstone Formation – Ironstone Nodular, Brandon Sandstone Bed and Loveden Gryphaea Bed Mudstone. No superficial deposits are mapped on-site. Three inferred fault lines are mapped on-site.

Hydrogeology

The Environment Agency (EA) classifies the Charmouth Mudstone Formation as a Secondary Undifferentiated Aquifer, the Brandon Sandstone Bed as a Secondary A Aquifer and the Loveden Gryphaea Bed as an Unproductive Aquifer. The Site is not indicated to be within, or within close proximity to, an EA groundwater Source Protection Zones.

Hydrology

A balancing pond is located in the north-eastern corner of the Site. Drainage ditches are located along each field boundary (Image 3.2 and Image 3.3).

Ground Gas and Radon

The south-east corner of the Site and an area immediately to the west are located within areas where between 3% and 5% of properties are affected by Radon gas.

Limited Made Ground is expected to be present along roads, in the area of the former small building in the southeast and surrounding the electricity substation and balancing pond to the north and north east respectively. Localised Made Ground deposits on-site represent a potential source of hazardous ground gas.

Coal Mining and Mineral Extraction

The Site is not located in a Coal Mining Reporting Area, as classified by the Coal Authority.

UXO

The Site is located within an area of low UXO risk.

Geotechnical Review

Based on the Proposed Development, shallow spread (strip or pad) foundations bearing onto the weathered bedrock are considered likely to be suitable.

Soakaways are unlikely to be suitable at the Site as the majority of soils are typically cohesive with low permeability.

Environmental Review

The Proposed Development is considered to pose a low risk to human health. It is considered that the main drivers for the risk to human health are the potential sources of ground gas from potential Made Ground/infilled ground on-site.

The risk posed to controlled waters is predominantly considered to be low due to the limited potential sources of contamination identified at the Site.

Recommendations

A ground investigation should be undertaken at the Site to confirm ground conditions, assess the ground gas regime and allow for in-situ and laboratory testing to inform foundation design.

Basic Radon protection measures are required as part of the Proposed Development in the south-east corner of the Site and an area immediately to the west.

4. Air Quality

Introduction

A desktop review of the Site and surrounding area was undertaken in order to identify any emission sources which may influence local air quality and assess the suitability of the Site for the proposed industrial use. In addition, a review of local air quality monitoring data and management regimes was undertaken to consider potential works required to accompany a planning application.

Legislation, Planning Policy and Guidance

National Legislation and Planning Policy

The following national legislation and planning policy documents were considered in this constraints review:

- The UK Air Quality Strategy;
- The National Planning Policy Framework (NPPF); and
- The Planning Practice Guidance (PPG).

Local and Regional Planning Policy

The following local and regional planning policy documents were considered in this air quality constraints review:

- South Kesteven District Council Local Plan 2011- 2036 (2020).

Review of Existing Site Setting

Existing Pollutant Sources

The existing pollutant sources in the vicinity of the Site is outlined within Table 4.1.

Table 4.1: Existing Pollutant Sources

Source	Comment
Road Traffic	The principal source of air pollution in the vicinity of the Site is considered to be road traffic emissions. The A1 dual carriageway is located immediately east of the Site. Emissions from vehicles utilising this road are considered to have the greatest potential to influence air quality within the Site and in the local area.
Rail	The Bottesford to Ancaster railway line runs to the south of the Site. This railway line is not identified within Defra guidance as a heavy diesel usage line. Therefore, it is considered unlikely that emissions from railway sources will significantly influence air quality within the Site or the surrounding area.
Industrial	No significant industrial sources were identified in the vicinity of the Site and therefore, it is unlikely that emissions from industrial sources will significantly impact air quality within the Site.
Odour Sources	A review of local operations identified one potentially odour-generating operation; an unnamed poultry farm, located approximately 1.3km north west of the Site. Taking into consideration the distance between the Site and the poultry farm, and the prevailing south westerly wind direction, it is considered unlikely that odours associated with the poultry farm would be detected at the Site at a level or frequency that would influence amenity for future users. It was therefore considered that the operations at the poultry farm would not significantly influence the suitability of the site for the proposed commercial use.
Dust	A review of local operations identified no dust-generating operations in the vicinity of the Site. It is therefore considered unlikely that dust from external sources would significantly influence the suitability of the Site for the proposed commercial use.

Existing Baseline Air Quality Conditions

Local Air Quality Management

The Site is not located within an Air Quality Management Area (AQMA). The closest AQMA is the South Kesteven AQMA Number 6 which is located approximately 3.8km southeast of the Site in Grantham (Figure 4.1). The AQMA covers the junction of Manthorpe Road, Wharf Road, High Street and London Road and was declared by SKDC for the potential exceedance of the annual mean nitrogen dioxide (NO_2) objective.

Figure 4.1: Air Quality Management Areas within Proximity to the Site.

Local Air Quality Monitoring

<u>Nitrogen Dioxide (NO_2)</u>

SKDC undertakes air quality monitoring within its administrative area. The closest monitoring location to the Site (SK24) is located 1.4km east of the Site on Belton Lane.

Bias adjusted annual mean NO_2 monitoring results, for the monitoring locations in the vicinity of the Site, are detailed in Table 4.2. 2020 monitoring data was available for review at the time of assessment however, air quality monitoring undertaken in 2020 is not considered representative of normal conditions. This is due to the influence of COVID-19 lockdown restrictions on road traffic levels. In accordance with the Institute of Air Quality Management Position Statement, 2019 monitoring data should be treated as the last year of 'normal' monitoring data until such time that the impact of lockdown restrictions on pollutant concentrations is more fully understood.

The monitored annual mean NO_2 concentrations recorded between 2015 and 2020 for the four closest monitoring locations to the Site all recorded concentrations below the current annual mean NO_2 objective of 40µg.m^{-3}. Monitored concentrations at the monitoring locations detailed in Table 4.2 fluctuated over the past five years but an overall downward trend is evident. Monitoring location SK16/17 is considered most representative of the conditions at the Site as it is the closest monitoring location to the A1, which is considered to be the primary source of emissions in the vicinity of the Site.

5. Noise

Introduction

A high-level desktop review has been undertaken to inform masterplanning and assess the overall site suitability for the proposed uses from a noise perspective.

Any noise generating uses will need to be considered at any nearby existing sensitive receptors. A review of aerial imagery shows isolated existing sensitive receptors surrounding the Site. These are:

- Isolated dwellings to the north of Gonerby Lane;
- Isolated dwellings to the west of the Site off Gonerby Lane;
- Isolated dwelling to the south-west off Allington Lane; and
- Thorns Farm Leisure Bed and Breakfast accommodation to the south of the Site beyond the rail line.

Existing Baseline

The following noise sources have been identified in the local area:

- Road traffic on the A1 and the surrounding road network;
- Noise associated with the commercial/industrial/logistics premises to the east; and
- Rail movements on the rail line to the south.

Potential Impacts from the Development

Construction Phase

The noise and vibration levels generated during the construction phase may cause an adverse impact at nearby sensitive receptors. However, this is likely to be a short-term, localised impact, and can be controlled through a suitably worded Construction Environmental Management Plan (CEMP).

Operational Phase

As the Site is adjacent to the A1 and a rail line, it is likely that the existing background noise levels will be high. However, for receptors located further away from the A1 the background noise levels will be lower. Therefore, given the intermittent nature of industrial noise, it is recommended that careful consideration is given to the Site layout to ensure that noise sources are located on the screened side of the buildings.

Mitigation and Design Considerations

Consideration should be given to the layout of the Site, which could include, but is not limited to, the following design approaches:

- Placing the service yard on the screened side of the Proposed Development;
- Locating the access road away from existing receptors;
- Installing an acoustic barrier along the perimeter of the development site; and
- Enhancing the make-up of the building façade to minimise break-out noise.

Summary

With careful consideration to the design of the Site, it is considered that noise is unlikely to be a significant constraint to the Proposed Development, especially given the existing noise sources such as the A1, existing commercial/industrial premises and the rail line.

It is considered that a noise assessment including a baseline noise survey will be required to accompany a planning application for the Proposed Development.

4. Air Quality

Site ID	Grid Reference	Site Type	Distance from and direction to Site Boundary	Monitored Annual Average Concentration					
				2015	2016	2017	2018	2019	2020
SK24	489870, 338683	Roadside	1.4km east	18.8	19.6	23.4	21.2	21.2	15.2
SK23	489720, 338204	Roadside	1.37m south east	18.2	20.7	21.1	18.7	18.7	14.3
SK18	489956, 336574	Roadside	2.6km south east	16.2	18.2	21.2	15.3	15.3	12.2
SK16/17	489263, 335353	Roadside	3.5km south	34.6	31.6	36.0	27.3	27.3	19.7

Table 4.2: SKDC NO_2 Monitoring Data in 2015 – 2020

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

No PM_{10} or $PM_{2.5}$ monitoring is undertaken in the administrative area of SKDC.

Local Planning Application Review

A review of air quality assessments for neighbouring planning applications was undertaken to consider the findings of recent air quality assessments relative to the Site. An air quality assessment was prepared for a proposed commercial development located approximately 60m east of the Site (Planning Reference: S17/2155) in 2017. The air quality assessment concluded that pollutant concentrations in the vicinity of the Site were below the relevant air quality objectives at existing sensitive receptors locations. The assessment did identify elevated NO_2 concentrations within the South Kesteven AQMA Number 6 in Grantham. It is therefore advised that the impact of the Proposed Development on this AQMA should be considered in any air quality assessment prepared for the Site to accompany any planning application.

Recommendations

Following a desktop review of the Site and surrounding area and a review of local air quality monitoring data and management regimes, it is considered likely that pollutant concentrations within the Site will be below the relevant current air quality objectives. Air quality is therefore not considered a significant consideration in the design of the Site.

Taking into consideration the scale of the Proposed Development, there is the potential for development-generated traffic to influence pollutant concentrations. It is therefore anticipated that SKDC will require a detailed air quality assessment to be submitted with any planning application to determine the impact of the Proposed Development on local air quality, and identify any measures required to minimise emissions.

6. Ecology

Introduction

A Preliminary Ecological Appraisal of the Site was undertaken on the 7th June 2022.

The appraisal is based on findings of the survey and a desk based review of the following:

- Magic Maps (accessed June 2022); and
- Ordnance Survey digital mapping.

This review is based upon the findings at the time of the survey and desk based assessment. There is potential for the baseline to change as the planning stage progresses.

Results and Recommendations

Internationally Designated Sites

No internationally designated Sites located within 10km.

Nationally Designated Sites

The Allington Meadow SSSI is located 870m west of the Site. The Site is located within one of the Impact Risk Zones for the SSSI. Under the citation it states the following; '*Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more*'.

As the development meets this threshold, early engagement with the LPA and Natural England is recommended.

Amphibians-Great Crested Newt (GCN)

The Site supports extensive optimal habitat for amphibians at the peripheries including wet ditches, hedgerows and grassland with a heightened sward.

Numerous ponds and ditches were identified within 500m, these will require eDNA survey between March and June in advance of any planning application (Figure 6.1). If GCN are found a licence may be needed to legitimise the Proposed Development.

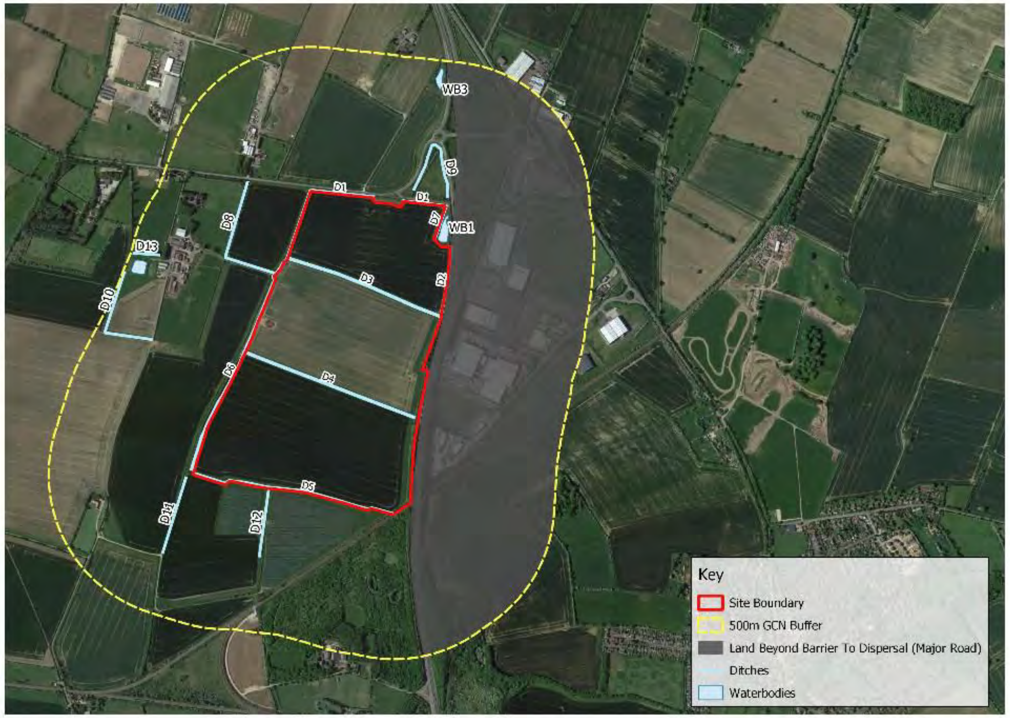

Figure 6.1: Great Crested Newt Survey Buffer (500m)

6. Ecology

Habitats

Hedgerows are a priority habitat surrounding / dissecting the Site and should be retained or reinstated if lost as part of a Biodiversity Net Gain (BNG) strategy, with native, species-rich hedges preferred.

A belt of grassland which is particularly wildflower rich, as can be seen in Image 6.1) was located along the eastern side of the arable fields (likely under a stewardship scheme).

Image 6.1: Wildflower Area On-site

This was a notable feature and should be subject to grassland NVC to determine its status as potential priority habitat (TN2 in Figure 6.2). If considered priority habitat it is likely this feature will be sought for retention by SKDC. Retention is recommended however, if loss is proposed, development will need to demonstrate compliance with principles set out within the mitigation hierarchy as referenced in the NPPF. If compensation is preferred, adequate replacement habitat will need to be delivered as part of any development of the Site, ensuring a BNG is secured.

A belt of woodland along the eastern Site boundary was identified. Whilst this was likely off-site it was considered a notable floristic feature and should be retained and protected during development.

Additionally, wet ditches were considered notable features; mostly for their potential to support fauna.

Biodiversity Net Gain

The loss of notable / potential priority grassland, priority hedges and ditches is likely to have a significant impact on the BNG score for the Site. It is therefore considered extremely important that the landscaping proposed seek to maximise potential of the Site. As such, early engagement is recommended with a professional ecologist on the BNG Assessment to inform landscape design.

For this Site landscaping should include native wildflower meadow, native species rich hedgerows, native mixed scrub and native trees (ideally specimens which grow to ‘large’ standards are preferred in terms of BNG and maximising scoring potential).

6. Ecology

Bats (Roosting)

T1 in Figure 6.2 is a large mature oak tree with a fractured limb with moderate bat roosting potential (Image 6.2). If this tree is to be lost, a suite of two emergence surveys is recommended between May and August. If a roost is found a final third survey will be required to characterise the roost and a mitigation licence from Natural England may be necessary to legitimise development.

Image 6.2: A Single Mature Oak Tree in the Northern Field

If impacts are proposed to the off-site woodland to the east, a daytime bat survey will be required to inform the need for further emergence surveys. Such surveys can take place at any time of the year.

TN1 in Figure 6.2 denotes an off-site pole with bat boxes mounted. This is unlikely to be directly impacted but lighting should seek to avoid this feature.

Bats (Foraging)

The Site is considered to be well suited to foraging bats and development is likely to result in fragmentation of some of the existing linear features with those that dissect the Site, such as hedgerows and wet ditches, being lost. As such a suite of activity surveys and static monitoring is recommended monthly between April and October.

A lighting strategy sympathetic to nocturnal fauna should be devised for the Site ensuring no more than 0.5 Lux light spill onto peripheral and off-site features occurs as a result of development lighting.

Birds

The Site supports a range of habitats suited to farmland bird species. Three skylark (Bird of Conservation Concern red list species; highest priority for conservation) were seen flying over the Site and emerging from the arable fields. As such a suite of monthly breeding bird surveys is recommended between March and June. Where skylark are confirmed as breeding, ‘nesting plots’ in undisturbed parts of the Site may need to be created for this species and managed appropriately as part of the long-term landscaping strategy.

Invasive Species

No invasive species were identified during the survey.

Reptiles

Optimal terrestrial habitat was identified for this species, particularly at the peripheries and in association with the ditches and hedgerows which dissect the Site.

As vegetation clearance and development could result in injury and killing risk, a suite of surveys is recommended. This comprises seven surveys between April and May or in September.

Riparian Mammals

The potential presence of water vole and to a lesser extent otter in the wet densely vegetated ditches on-site cannot be entirely ruled out at this stage. As direct impacts are proposed to a number of these, a suite of two surveys for these species is recommended between April and September.

Where this species are confirmed as present, Natural England Mitigation licences may be required to legitimise the development.

Badger

A likely main badger sett (5 holes) has been identified adjacent to the eastern boundary of the Site (Image 6.3). For the specific location of the badger sett see TN3 in Figure 6.2. The sett is well worn, had badger hair at the entrances and is likely to be active. The sett was located 10-15m from the Site boundary (located at approximate GRID REF: SK884390) within a parcel of woodland.

Development should avoid impacts within 30m of this feature to reduce risk of wildlife offences. If this is not possible further monitoring may be necessary and a badger development licence may be required from Natural England to legitimise the development.

Badger Setts can only be closed between July and November. Where main setts are to be lost a replacement must be created first and use by badger proven before the existing sett can be closed.

Image 6.3: Off-site Badger Sett

White-clawed Crayfish

This species is unlikely to be present owing to the dominance of silt in the channel, shallow water and presumed poor water quality (typical of agricultural ditches). As such, white-clawed crayfish present no constraint to development of the Site.

6. Ecology


D1
H1
D1
H7
T1
D7
H3
H5
D3
D2
H4
TN2
D6
D4
TN2
TN3
H2
TN2
H6 D5
TN1
© Copyright BWB Consulting Ltd
0 100 200 m
Notes
1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
Key
Site Boundary
HEDGEROWS
Native Hedgerow
Native Hedgerow with trees
RIVERS
Ditches
HABITATS
Scattered Tree
Modified grassland
Arable Crop
Other neutral grassland
Target Note (TN)
Target Notes:
TN1: Bat Boxes on Pole
TN2: Wildflower Meadow (Potential Stewardship scheme)
TN3: Badger Sett Adjacent to Site (5 Holes) Located SK884390
Trees With Bat Roosting Potential:
T1: Oak Tree-Moderate Bat Roosting Potential
Issues & Revisions
Birmingham | 0121 233 3322
Leeds | 0113 233 8000
London | 0207 407 3879
Manchester | 0161 233 4260
Nottingham | 0115 924 1100
www.bwbconsulting.com
Client
Caddick Developments Ltd
Project Title
Gonerby Moor
Drawing Title
Figure 6.2: Habitat Map
Drawn JMcL Reviewed CG
BWB Ref 220732 Date 16.06.22 Scale@A3 1:4300
Drawing Status
Final
N
Project - Originator - Zone - Level - Type - Role - Number
GMG-BWB-ZZ-XX-DR-LE-0001
Status S2
Rev P01

7. Cultural Heritage

Introduction

This appraisal included an assessment of the potential for archaeological deposits and assets within and/or within the immediate vicinity of the Site in order to:

- Determine any potential impacts on recorded historic landscapes; and
- Assess the impact on designated assets, including scheduled monuments, listed buildings/ structures, Conservation Areas, Registered Historic Park and Gardens, World Heritage Sites and Registered Battlefields.

The Appraisal has drawn upon the advice provided by the NPPF, best practice standards and guidelines, and Historic England's Historic Environment Good Practice Advice in Planning (2015).

Scope of Works

An assessment of the significance of potential recorded heritage assets within 1 km of the Site has been undertaken. Specifically, the assessment has included:

- A review of the Site in relation to the current legislative framework and other standards and guidelines;
- Inclusion and review of the Historic Environment Record (HER) data for the Site and its vicinity;
- Identification and consideration of heritage assets on and within the vicinity of the Site;
- A search of relevant documentary and cartographic sources for the Site and its surroundings;
- Identification and assessment of the known and potential archaeological resource;
- Recommendations where appropriate; and
- Identification of any constraints.

Sources

The following sources have been reviewed to inform the appraisal:

- Information from Client;
- Ordnance Survey information;
- Lincolnshire Historic Environment Record;; and
- Multi-government Agency Mapping.

7. Cultural Heritage

From the information reviewed there are a number of non-designated heritage assets within the 1 km study area as summarised in Table 7.1 below and shown on Figure 7.1.

Table 7.1: Designated / Non-Designated Constraints

Asset Type		Is the feature present within or within 1km of the Site? Yes	No	Unknown
Scheduled monuments or archaeological areas	Within Site		X	
	Within 0.5km of the Site		X	
	Within 1km of the Site		X	
Listed buildings / Structures	Listed buildings within Site		X	
	Listed buildings/ structures 0.5km from the Site		X	
	Listed buildings / structures 1km from the Site		X	
Conservation Area	Within conservation area		X	
	Within 0.5km of conservation area		X	
	Within 1km of conservation area		X	
World Heritage Sites	Within World Heritage Site		X	
	Within World Heritage Site management plan area (sphere of influence)		X	
Local government archaeological priority zone	Within local government archaeological priority zone		X	
	Within 0.5km of local government archaeological priority zone		X	
Register of Parks and Gardens of Historic Interest in England	Within Registered Park and Garden of Historic Interest		X	
	Within 0.5km Registered Park and Garden of Historic Interest		X	
	Within locally registered Gardens and Designed Landscapes		X	
	Within 0.5km of locally registered Gardens and Designed Landscapes		X	
	Within 1km of locally registered Gardens and Designed Landscapes		X	
Registered Landscapes of Historic Interest	Within Registered Landscape of Historic Interest		X	
Battlefields Trust UK Fields of Conflict database	Within battlefield		X	
	Within 0.5km of battlefield		X	
	Within 1km of battlefield		X	
Historic Environments Records	Within Site	X		
	Within 0.25km of Site	X		
	Within 0.5km of Site	X		
	Within 1km of Site	X		

7. Cultural Heritage

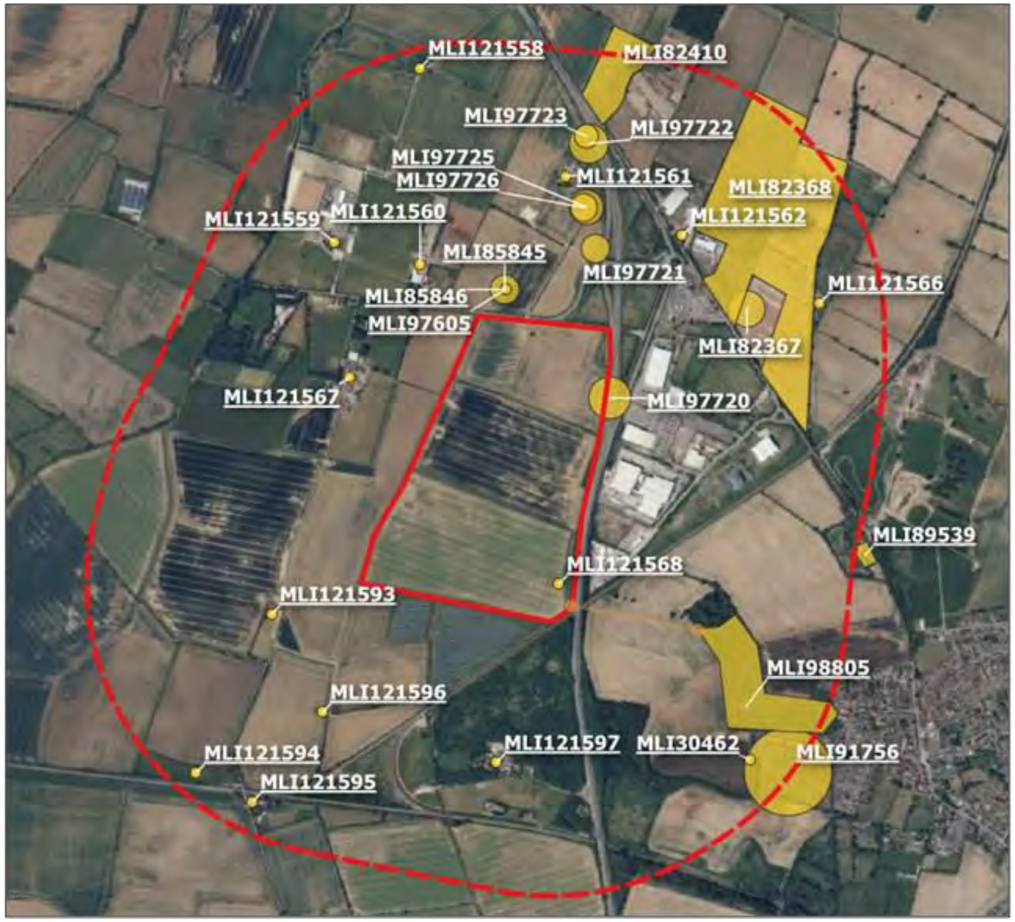

Figure 7.1: Location of Non-designated Heritage Assets

The location of an unnamed farmstead is recorded in the south-eastern corner of the Site (MLI121568). Historic mapping shows that this was constructed during the 19th century and demolished at some point during the 20th century. Several other farm buildings and farmsteads, both extant and demolished, are recorded within the study area.

Ditches of unknown date were revealed in the north-eastern part of the Site during trial trenching in 2004 (MLI97720, ELI10276). Animal bone and ceramic building material were found within these.

Other features identified during trial trenching in fields to the north of the Site included Iron Age ditches and gullies (MLI97725), ditches containing Roman pottery (MLI97722), Iron Age and Roman pottery (MLI85846, MLI85845), a Neolithic or Bronze Age flint thumbnail scraper (MLI97605) and an undated field boundary (MLI97721). Further undated pits and ditches (MLI97723, MLI97726) were also recorded.

A Romano British pit was revealed during a watching brief approximately 450m to the east of the Site (MLI82367). Over 300 pottery sherds dating to the early-to-mid-3rd century were recovered from the fill along with fired clay and animal bones, suggesting that it may have been used as a rubbish pit.

Evidence of medieval cultivation survives across much of the surrounding landscape in the form of ridge and furrow earthworks, including c. 390m to the Site's northeast (MLI82368), c. 750m to its north (MLI82410) and c. 470m to its east (MLI98805).

Details of the non-designated heritage assets recorded within the study area on the Lincolnshire HER are provided in Table 7.2 below.

Table 7.2: Non-designated Heritage Assets within the 1 km Study Area

HER No.	Description	Asset Type
MLI30462	Undated building remains near Belvoir Gardens, Great Gonerby	Building
MLI82367	Romano British pit, near College Farm Great Gonerby	Pit
MLI82368	Ridge and furrow, near College Farm, Great Gonerby.	Ridge and Furrow
MLI82410	Medieval earthwork ridge and furrow, north of College Farm	Ridge and Furrow
MLI85845	Large quantity of Roman pottery found west of Gonerby Moor Junction	Artefact Scatter
MLI85846	Iron Age pottery sherd found west of Gonerby Moor Junction, Great Gonerby	Findspot
MLI89539	Brickworks to the north of Great Gonerby	Brickworks
MLI91756	Post medieval quarry pits near Belvoir Gardens, Great Gonerby	Quarry
MLI97605	Worked flint found west of Gonerby Moor Junction, Great Gonerby	Findspot
MLI97720	Undated ditches, Great Gonerby	Ditch
MLI97721	Undated field boundary, Great Gonerby	Field Boundary
MLI97722	Roman activity, Great Gonerby	Ditch, Pit
MLI97723	Undated pit and ditch, Great Gonerby	Ditch, Pit
MLI97725	Iron Age ditches and gullies, Great Gonerby	Ditch, Gully
MLI97726	Undated pit and possible ditch, Great Gonerby	Ditch, Pit
MLI98805	Ridge and furrow in Great Gonerby	Ridge and Furrow
MLI121558	Unnamed farmstead, Great Gonerby	Farmstead
MLI121559	Willowtops House (Willowtops Farm), Great Gonerby	Farmstead
MLI121560	Unnamed farmstead (Glebe Farm), Great Gonerby	Farmstead
MLI121561	Unnamed farmstead, Great Gonerby	Farmstead
MLI121562	College Farm, Great Gonerby	Farmstead
MLI121566	Mickling Farm, Great Gonerby	Farmstead
MLI121567	Pasture Farm, Great Gonerby	Farmstead
MLI121568	Unnamed farmstead, Great Gonerby	Farmstead
MLI121593	Unnamed farmstead (Vale Farm), Barrowby	Farmstead
MLI121594	Unnamed farmstead, Barrowby	Farmstead
MLI121595	Dairy Farm, Barrowby	Farmstead
MLI121596	Unnamed farmstead, Barrowby	Farmstead
MLI121597	Thorns Farm (Barrowby Thorns Farm), Barrowby	Farmstead

7. Cultural Heritage

There are a number of listed buildings which lie a short distance beyond the 1 km study area (see Figure 7.2), including the Grade I Church of St Sebastian (1062882) and other Grade II listed buildings within the Great Gonerby Conservation Area, which are situated approximately 1.1 km to the south east of the Site. Due to the topography of the landscape, none of the listed buildings within this conservation area share inter-visibility with the Site (see Image 7.1)

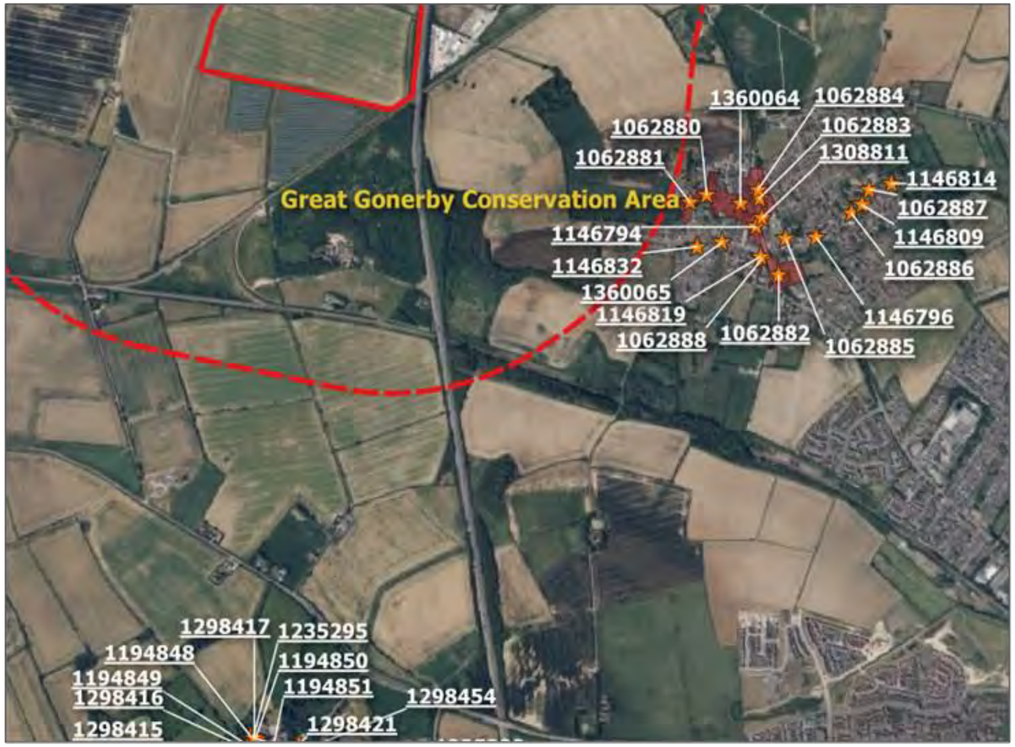

Figure 7.2: Location of Listed Buildings

Image 7.1 View towards Great Gonerby Conservation Area

Due to its elevated position topographically, the Grade I listed Church of All Saints (1194848), which is situated in Barrowby approximately 2.3 km to the south of the Site, shares distant inter-visibility with the Site. However, the setting of this asset is restricted by the densely packed trees and hedgerows within and surrounding its churchyard and, at ground level, the Site is not visible from this asset.

7. Cultural Heritage

Three Registered Historic Parks & Gardens lie within the wider landscape (see Figure 7.3). These are the late 17th century Grade I gardens of Belton House (1000460) which lie c. 4 km to the Site's east; the mid-19th century Grade II* park and gardens at Harlaxton Manor (1000982), which lie c. 5 km to its south, and the Grade II* park and gardens at Belvoir Castle (1000957), which lie c. 6 km to its southwest.

Figure 7.3: Location of Registered Historic Parks & Gardens

Due to distancing and topography, the Site shares no inter-visibility with the former two designated landscapes and it does not form part of their setting.

The Site does share distant inter-visibility with the Grade I listed Belvoir Castle (1360870) and its Grade II* park and gardens (see Image 7.2 and Image 7.3). Originally the site of a Norman castle, Belvoir Castle was rebuilt in the 16th century, again in the 17th century and remodelled by James Wyatt in the early 19th century. The building's main elevation faces the northeast, directly towards the Site, and long-distance panoramic views across the Lincolnshire countryside are afforded as a result of the Castle's elevated position.

Image 7.2: View towards Belvoir Castle

Image 7.3: View from Belvoir Castle towards the Site

The designed landscape at Belvoir Castle is mostly early 19th century, although it incorporates late 17th century elements. The Park and gardens were largely laid out to a 1780 plan of the pre-eminent landscape architect Lancelot 'Capability' Brown, and the designed view to the northeast contributes strongly to their significance. The name Belvoir dates back to Norman times and translates to 'beautiful view'. The current pronunciation dates back to the same period, where Saxon speaking locals could not pronounce the Norman French term.

Assessment

This Heritage Appraisal has determined that the Proposed Development sits within a complex historic landscape stemming from its early use in the Iron Age and Romano British periods to the gentrified medieval and post-medieval landscapes to the east, south and southwest.

The scheme will impact on the undated ditch features in the east of the Site and on any other previously unrecorded archaeological assets within the Site. However, this impact can be mitigated through an appropriate scheme of archaeological works which will allow for preservation by record or planning of the development to allow preservation in-situ.

The Site lies within the extended rural setting of both Belvoir Castle and its associated parks and gardens. Although the Proposed Development would, to an extent, likely blend in with and form a visual extension to the existing warehouse buildings beyond the A1 to the east (visible in Image 7.3), its scale and central position in views from the Castle mean that it will have an impact upon the significance, within setting, of the Castle and its park and gardens. However, appropriate tree screening and massing can help to alleviate this impact.

Due to topography, distance, treelines and built form, no other designated assets have inter-visibility with the Site. No other impacts are therefore predicted to arise.

Recommendations

It is recommended that the following works are undertaken to accompany the planning proposal:

- Archaeology Assessment to further ascertain the level of archaeological risk. This would assess archaeological and historical records, aerial photographs and the results of previous interventions in the area; and
- Heritage Statement to fully assess the impact on designated heritage assets, including Belvoir Castle and its Registered Historic Park and Gardens.

APPENDIX 10. FLOOD RISK AND DRAINAGE SCOPING STUDY (BWB CONSULTING)

ENVIRONMENT

Caddick Developments Ltd
Gonerby Moor
Grantham
Flood Risk and Drainage Scoping Study

www.bwbconsulting.com

BWB

ENVIRONMENT

Caddick Developments Ltd
Gonerby Moor
Grantham
Flood Risk and Drainage Scoping Study

[redacted]

July 2022

BWB

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APPENDICES

1. INTRODUCTION

1.1 This Flood Risk and Drainage Scoping Study (FRDSS) summarises a desktop study into the possible flood risk and drainage constraints at a potential development on land at Gonerby Moor, Grantham. A conceptual surface water drainage strategy has been provided which summarises a preliminary commentary of constraints and opportunities and the management of surface and foul water from the development. It has been prepared on behalf of Caddick Developments Ltd to advise on the development potential of the site from a flood risk and drainage perspective.

1.2 At this time, it is proposed that the site is developed to accommodate a series of commercial units. An initial proposed layout plan is included as Appendix 1.

1.3 The report is based on readily available information including a site walkover and consultation responses received from the Internal Drainage Board (IDB), Lead Local Flood Authority (LLFA) and Highways England.

Sources of Data

i. OS Explorer Series mapping
ii. Environment Agency (EA) 1m Spatial Resolution Light Detection and Ranging (LiDAR) Data
iii. Third Witham IDB Consultation
iv. South Kesteven District Council Level 1 Strategic Flood Risk Assessment
v. South Kesteven District Council Level 2 Strategic Flood Risk Assessment
vi. Lincolnshire County Council Preliminary Flood Risk Assessment
vii. Site visit undertaken by BWB Consulting Ltd on the 22nd June 2022
viii. Web Based Soil Mapping
ix. Anglian Water Sewer Records
x. Anglian Water Pre- Development Enquiry
xi. British Geological Survey Drift & Geology Maps

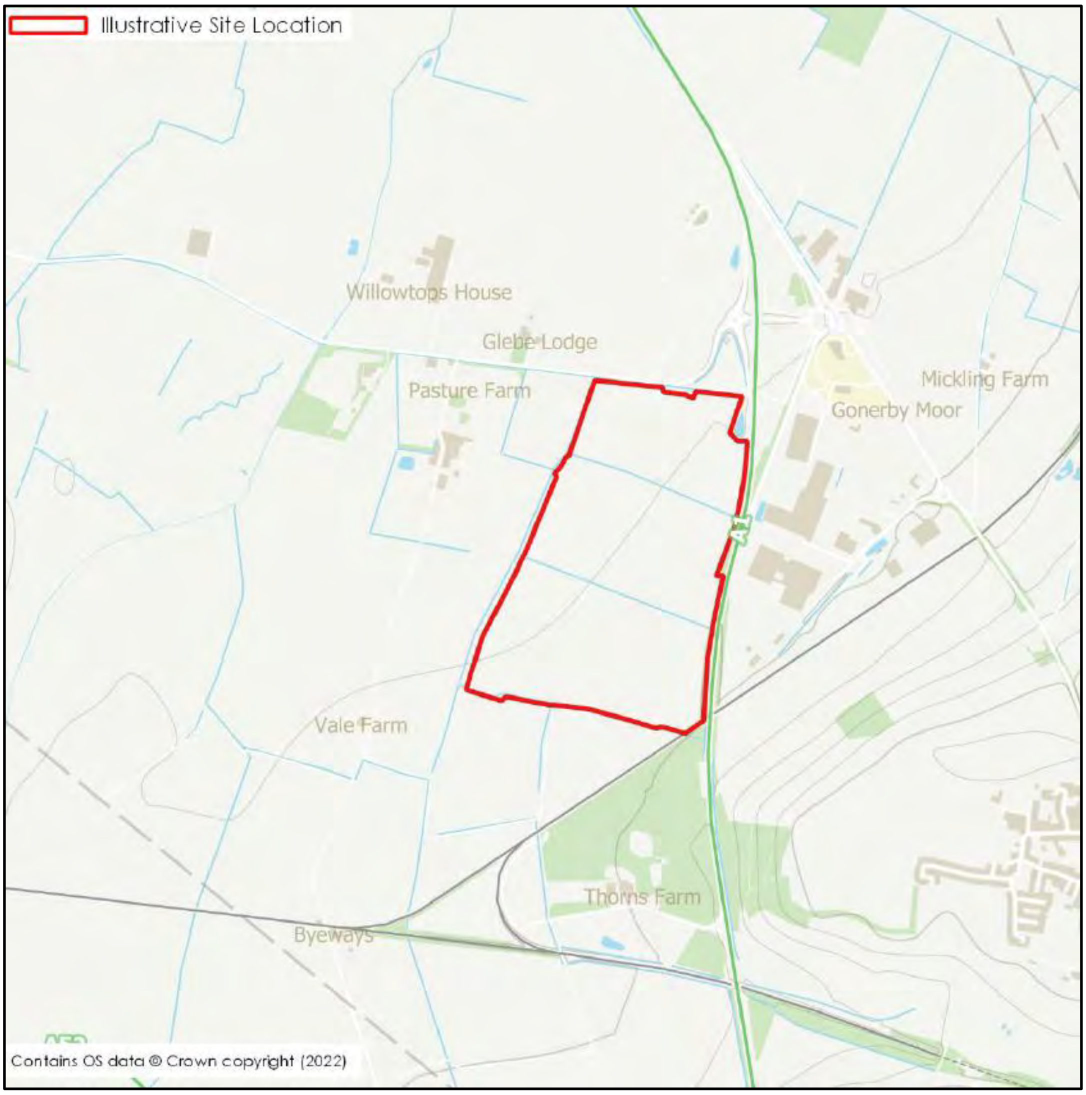
Site Details

1.4 The site is located immediately west of the A1 at Gonerby Moor, approximately 4.5km north-west of Grantham. The landscape is dominated by agriculture with hedgerows, trees, roads and drainage ditches dissecting the landscape. The site is approximately 66ha and comprises three arable fields bounded by hedgerows and drainage ditches.

1.5 Surface water runoff from the current site is expected to drain via the surrounding drainage ditches before eventually discharging into the Foston Beck, located approximately 870m west of the site's western boundary. The Foston Beck is designated as an EA Main River.

1.6 Located adjacent to the north-eastern corner of the site is an attenuation pond, understood to form part of the drainage network associated with the A1.

1.7 The site location is illustrated within



1.8 Figure 1.1 with details provided within

1.9 Table 1.1.

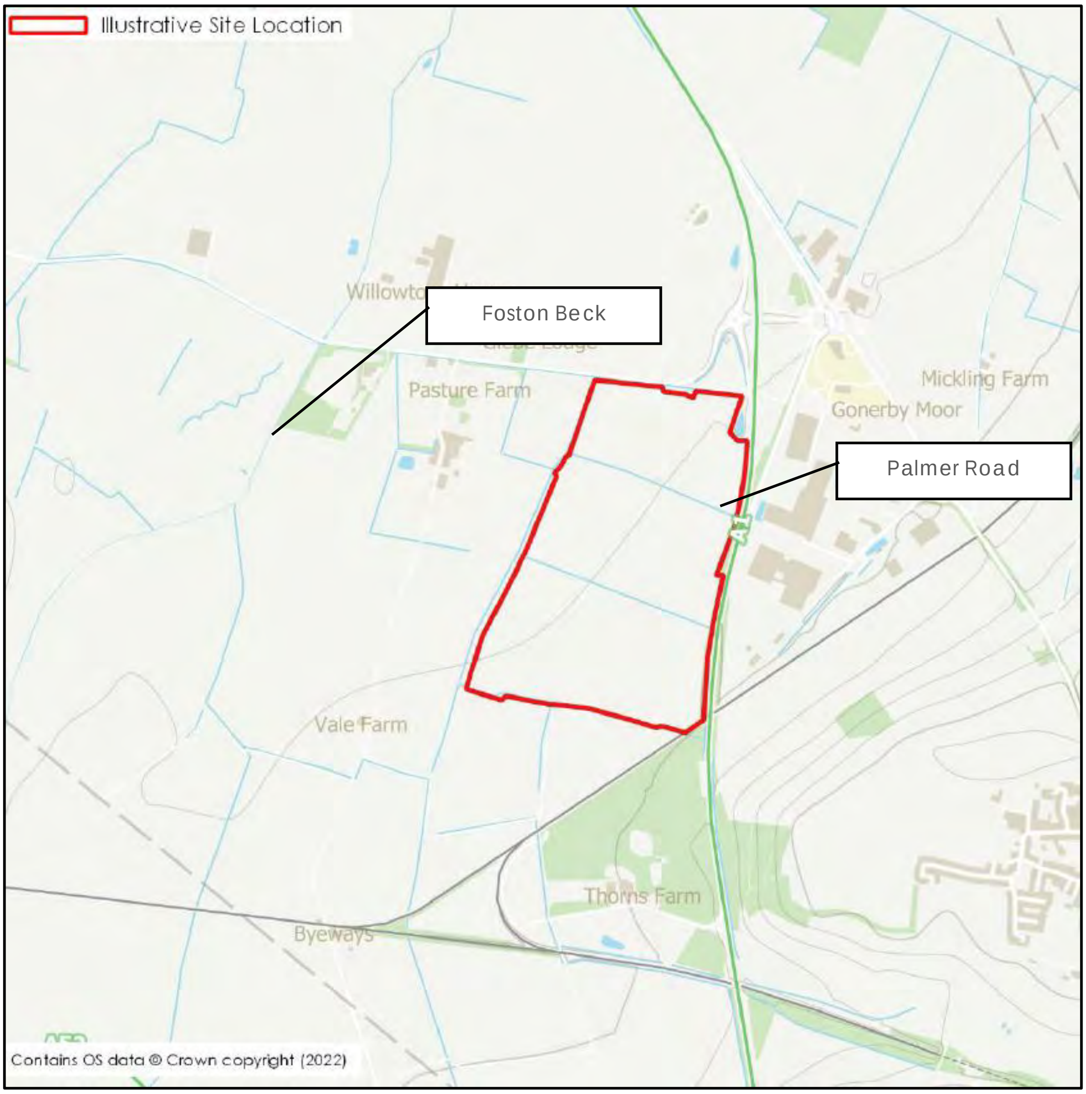


Figure 1.1: Site Location

Table 1.1: Site Summary

Site Name	Gonerby Moor
Location	Grantham, Lincolnshire
NGR (approx.)	SK 88260 39260
Study Site Area (ha)	66 (approximately)
Development Type	Industrial
Flood Zone Classification	Flood Zone 1
NPPF Vulnerability	Less Vulnerable
Environment Agency Region	Anglian
Lead Local Flood Authority	Lincolnshire County Council
Sewage Undertaker	Anglian Water
Local Planning Authority	South Kesteven District Council

1.10 A review of LiDAR data identifies the site to slope from east to west, with levels shown to range between 52m Above Ordnance Datum (AOD) in the east to 37m AOD in the west. Contour data of the site and surrounding area is included as Figure 1.2.

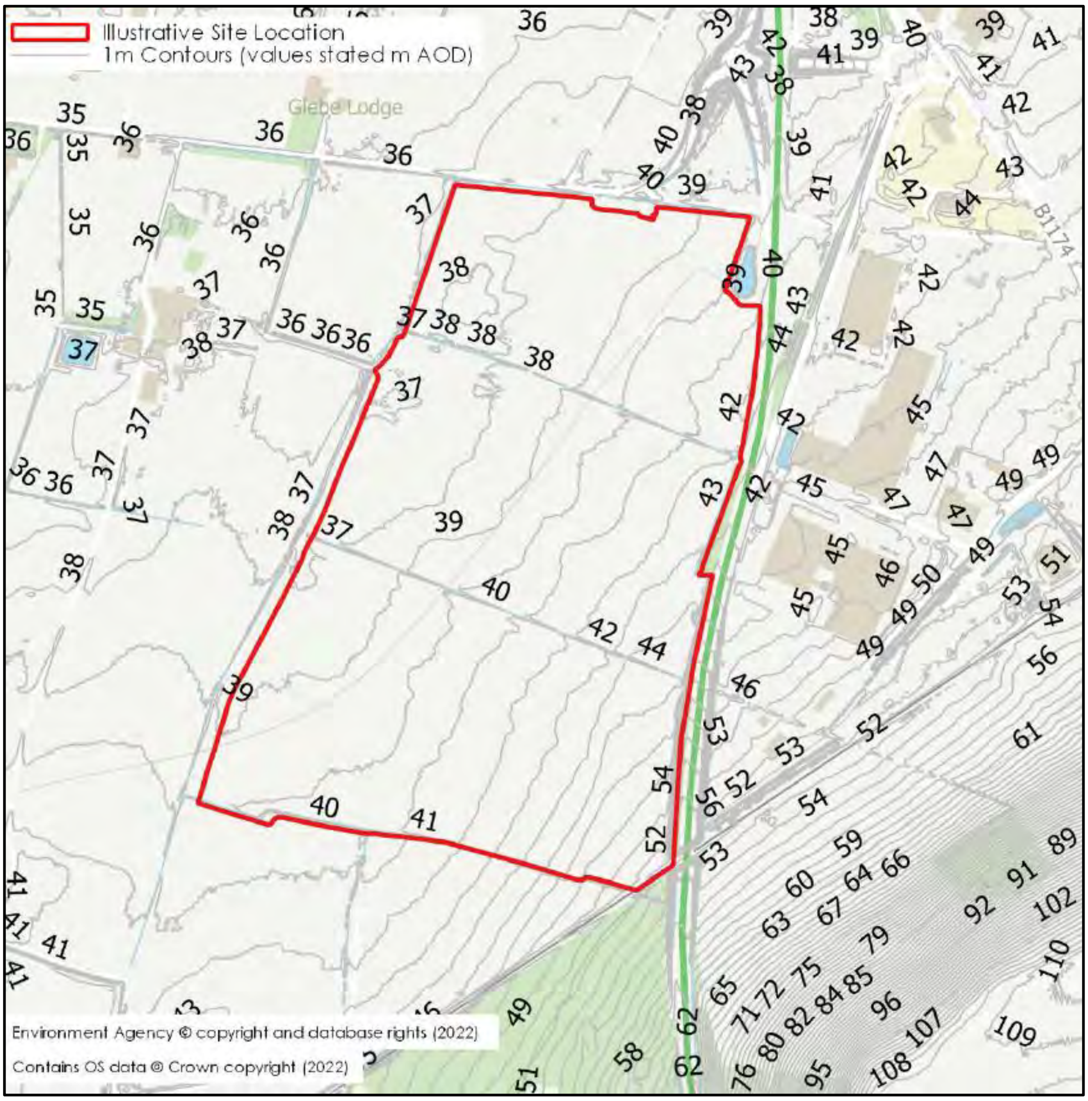


Figure 1.2: Site Contour Data as Extracted from LiDAR

<u>Site Visit Observations</u>

1.11 A site visit was carried out by BWB Consulting on the 22nd June 2022 in order to further understand the hydrological characteristics of the site and connectivity of the drainage ditches in the surrounding area.

1.12 All the ditches were generally quite vegetated and approximately 2-3m deep. A typical drainage channel is shown below in Figure 1.3, along with the attenuation basin associated with the A1 in Figure 1.4.

Figure 1.1: Typical drainage channel passing through the site

Figure 1.2: View from northern extent of basin looking north

2. FLOOD RISK REVIEW

Flood Risk Guidance

Strategic Flood Risk Assessment

2.1 A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

2.2 The South Kesteven District Council Level 1 SFRA[1] has been reviewed in the production of this FRDSS. The SFRA does not provide information specific to the site location in the form of fluvial, surface water and groundwater flood risk mapping, other than as part of the general mapping produced to accompany the SFRA.

2.3 The mapping identifies the Foston Beck along with the associated Flood Zones. The drainage ditches passing through the site are also shown on the mapping but there are no flood extents shown to be associated with them. This is considered to be due to the catchment size being less than 3km^2 and therefore has not been incorporated within a wider model. This not necessarily mean that there is not a flood risk associated with the drains.

2.4 The South Kesteven District Council Level 2 SFRA[2] was produced to facilitate the application of Sequential and Exception Tests to screen allocated development sites. The proposed application site is not referenced within the Level 1 SFRA. Information from the Level 1 SFRA will be referenced within this report where applicable.

Preliminary Flood Risk Assessment

2.5 A Preliminary Flood Risk Assessment (PFRA) is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the LLFA's.

The Lincolnshire County Council PFRA[3] considers flooding from surface water runoff, groundwater, ordinary watercourses and canals.

2.6 The PFRA for Lincolnshire was updated in 2017 using all relevant flood risk data current at the time. However, there were no significant changes required to the PFRA.

Local Flood Risk Management Strategy

2.7 A Local Flood Risk Management Strategy (LFRMS) is prepared by the LLFA to help understand and manage flood risk at a local level.

[1] South Kesteven District Council lLevel 1 Strategic Flood Risk Assessment (AECOM, June 2017)
[2] South Kesteven Level 2 Strategic Flood Risk Assessment (AECOM, July 2017)
[3] Lincolnshire County Council Preliminary Flood Risk Assessment (LCC, June 2011)

2.8 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.

2.9 The Joint Lincolnshire Flood Risk Management Strategy 2019 -2050[4] has been produced by Lincolnshire County Council (LCC) in line with the Flood Risk and Management Partnership. The partnership includes the 4 district authorities that sit within Lincolnshire, one of which is South Kesteven. The report also covers the surface water details that would ordinarily be included as part of a Surface Water Management Plan,

Fluvial Flood Risk

2.10 A representation of flood risk posed from fluvial sources can be shown using the EA's Flood Map for Planning, an excerpt of which has been included as Figure 2.1. The site is shown to be wholly located within Flood Zone 1. The nearest Flood Zones are associated with the Foston Beck.

2.11 With particular reference to planning and development, the Flood Map for Planning identifies Flood Zones in accordance with Table 1 of the Planning Practice Guidance. Further details on the Flood Zone classifications are outlined below:

- Flood Zone 1 (Low Probability) is defined as land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability).
- Flood Zone 2 (Medium Probability) is defined as land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
- Flood Zone 3a (High Probability) is defined as land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by "Flood Zone 3" on the Flood Map for Planning.
- Flood Zone 3b (The Functional Floodplain) is defined as land where water has to flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.

[4] Joint Lincolnshire Flood Risk Management Strategy (LCC, 2019)

Figure 2.1: Environment Agency Flood Map for Planning

2.12 A series drainage ditches are shown to flow through the site, all of which drain from east to west and form part of the 3rd Witham IDB area. Further details are included with the IDB catchment Plan included within Appendix 2. Five drainage ditches runs are present; one on each of the northern, southern and western boundaries and two in the centre of the site. The drainage channels are tributaries of the Foston Beck.

2.13 Il is understood through correspondence with Highways England (Appendix 3), and confirmed on the site visit, that the northern central ditch receives flows from the east via a culvert beneath the A1.

2.14 A review of LiDAR levels suggests that the drainage ditch flowing along the site's western boundary drains from south to north.

2.15 The northern boundary drainage ditch that runs alongside Gonerby Lane, known as the Allington Roadside Drain, is identified as falling from east to west and is likely to connect into the Foston Beck via a more direct route.

2.16 The ditches passing through the site and within the immediate area are shown within Figure 2.2

Figure 2.2: IDB Drain Locations

2.17 The Allington Roadside Drain has been identified as being the outfall for the National Highways basin.

2.18 It is noted within the IDB response that a Section 19 Flood Investigation report has been undertaken by LCC for a property on Gonerby Lane however, further information could not be found within the online records. Further review and consultation with the IDB/LCC is recommended. The nearest Section 19 investigation is shown on Sedgebrook Road, approximately 2km to the west of the site.

2.19 Located on the eastern edge of the site, at the bottom of the bank associated with the A1, are a series of ditches that direct flows towards the drainage ditches crossing through the site. A series of small headwalls are shown on the National Highways plans to discharge the flows into the drainage ditches. The position of the headwalls is a potential masterplan constraint, although it is likely they sit within National Highways land.

2.20 As described above, there are several existing drainage ditches within the site with onward connectivity to the Foston Beck and a drainage function beyond the site boundary. As the ditches are not included within the Flood Map for Planning, the fluvial risk they pose to the site is not currently known and further investigation and masterplanning considerations are required. This is discussed further in Section 4.

Pluvial Flood Risk

2.21 Mapping of surface water flood risk, prepared by the EA, can been used to determine the risk of surface water flooding at the site, an excerpt of which is included within Figure 2.2. A limitation of the mapping is that it does not represent connectivity e.g. culverts and as such can lead to an exaggeration of the extent of surface water flooding.

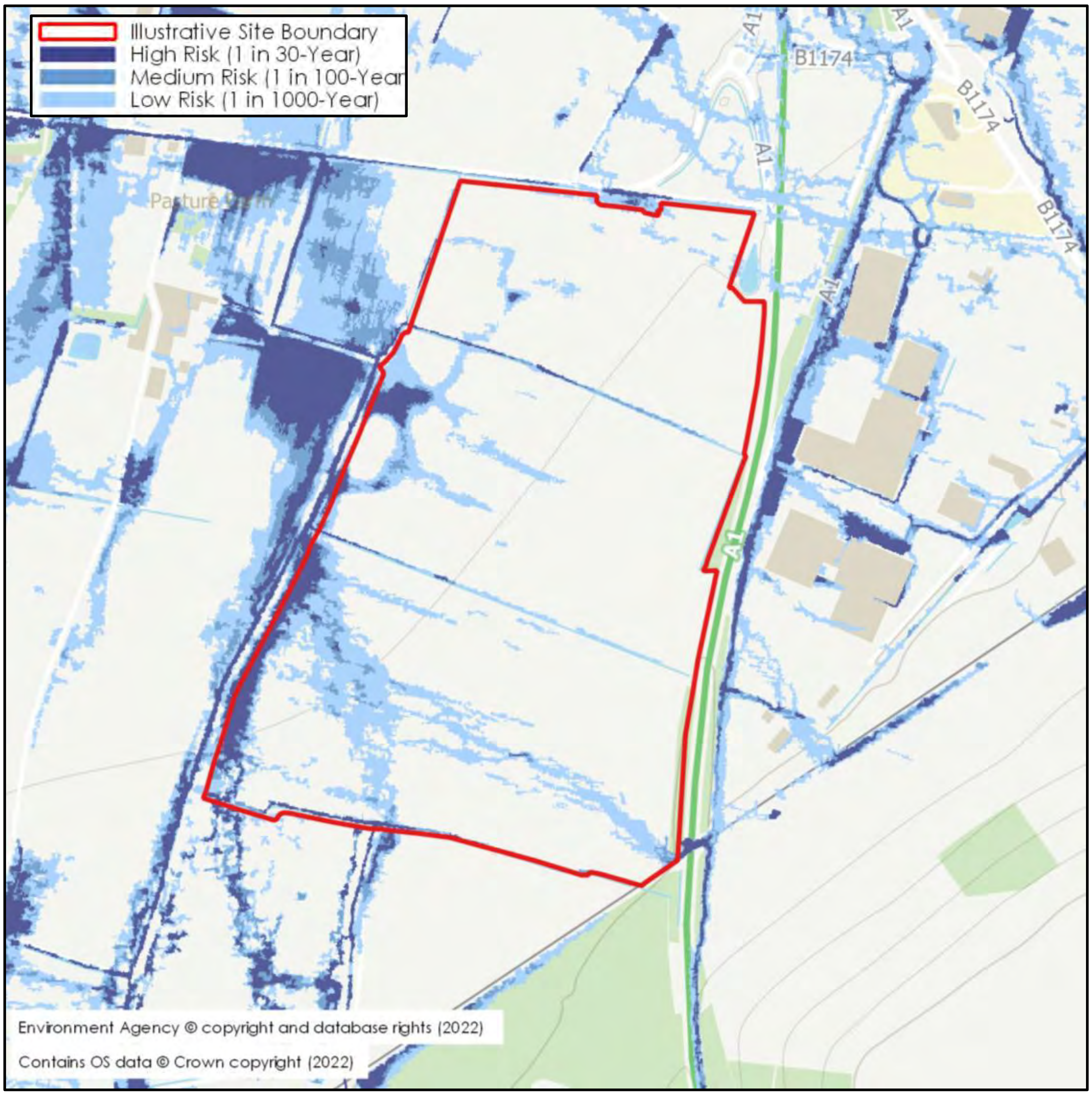


Figure 2.3: Environment Agency Surface Water Susceptibility Mapping

2.22 The surface water mapping identifies a number of surface water flow routes, some of which relate to the IDB drainage ditches discussed within the fluvial section.

2.23 In addition to the known ditches, there are several low-high risk overland flow routes identified, most notably within the southern portion of the site. Surface water runoff flows south-east to north-west and correlates with the general topography of the site. The spatial resolution of the data does not clearly define the flow routes although it is expected that the flows are being directed along shallow valley lines. A topographical survey of the site is required to further assess the risk this may pose to the proposed development. Although at this time is likely that a direct rainfall runoff model will be required to understand the flows and potential implications further.

2.24 Further details on the work required to understand pluvial flood risk is outlined within Section 4.

Groundwater Flood Risk

2.25 British Geological Survey (BGS) mapping shows the underlying geology for the majority of the site to comprise of Charmouth Mudstone Formation (Mudstone with Limestone Nodules) with bands of Brandon Sandstone Bed and Loveden Gryphaea Bed (Mudstone, Shelly) shown to be present within the site. BGS record no superficial deposits within the site.

2.26 The geology is such that there is the potential for groundwater at shallow depths within the areas of the permeable geology such as the Sandstone.

2.27 BGS borehole logs from previous excavations undertaken close to the site's eastern boundary (reference: SK83NE169 and SK83NE177) identify a geology comprised of Clay with no groundwater having been struck. No borehole logs available within the area are shown to comprise of Sandstone.

2.28 The underlying Aquifer within the Charnmouth Mudstone Formation is designated as Secondary Undifferentiated. This is an aquifer where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. The bands of Brandon Sandstone Bed and Loveden Gryphaea Bed are designated as Secondary A Aquifers which are defined as permeable layers that can support local water supplies, and may form an important source of base flow to rivers

2.29 The Level 1 SFRA identifies the site to have a less than 25% susceptibility to groundwater flooding, based upon the 1km^2 spatial resolution mapping.

2.30 Flooding from the groundwater source, at this time, is not considered to hinder development although site specific ground investigation is required to confirm this assumption.

Flood Risk Posed by Canals

2.31 The site is located approximately 5km to the north of the Grantham Canal, the distance and intervening topography is such that flooding from a canal source is not likely to impact the site.

Flood Risk Posed by Breach/Failure from Reservoirs and Large Water Bodies

2.32 Reservoir breach mapping produced by the EA, as shown in Figure 2.3, identifies the site to be located outside of both the 'Wet Day' and 'Dry Day' scenarios.

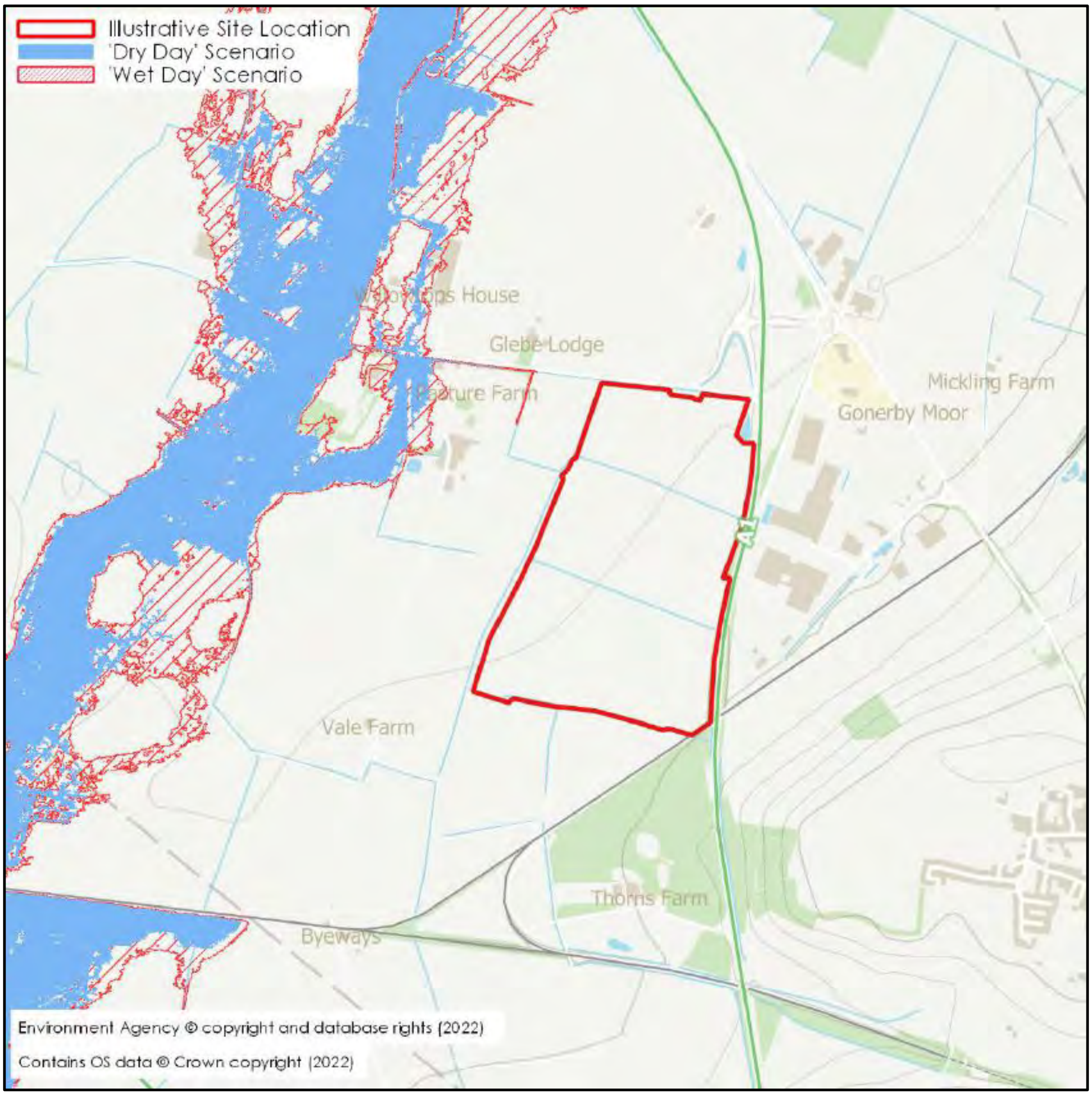


Figure 2.4: Environment Agency Reservoir Breach Mapping

2.33 The A1 attenuation basin, located immediately north-east of the site boundary, is fed from two inlets and outfalls to the Alington Roadside Drain. The attenuation basin will have been designed and constructed to the appropriate standards with ongoing maintenance in place to ensure that surface water is managed correctly, and therefore does not pose a significant risk to development of the site.

Flood Risk Posed by Sewers

2.34 The rural nature of the site is such that there are no public sewers shown to cross the site. Anglian Water sewer records, included as Appendix 4, identifies a foul and a surface water sewer to be located approximately 100m to the east of the site, within Palmer Road.

2.35 The foul sewer is 150mm diameter and flows in an easterly direction, with the head of the run at the eastern end of Palmer Road. Details relating to the depth of the sewer are unknown but in the event of the foul sewer exceeding its capacity it is expected that any flooding would remain to the east of the A1 and not enter the site.

2.36 The surface water sewer is part of the upstream catchment of the northern central ditch. The sewer is currently unadopted and has a diameter of 900mm. On the site visit the upstream headwall alongside the A1 was not visible.

2.37 The surface water sewer during an extreme event has the potential to exceed its capacity. In such an event, some flows may enter the site via the culvert. There are no details relating to the depth to invert of this asset.

3. DRAINAGE REVIEW

Sustainable Drainage Guidance

3.1 Local and national policy requires the use of SuDS within new developments, which would necessitate consideration of infiltration potential for the ground, provision of attenuation storage and treatment of surface water runoff.

Lincolnshire Development Roads and Sustainable Drainage Design Approach[5] (2021)

3.2 The Lincolnshire County Council drainage guidance[6] provides an overview of the approach to be taken when proposing SuDS within new developments. the document sets out the requirements for both full and outline planning as well as early concept work.

3.3 In particular it highlights the need for all sites to restrict to greenfield rates and to ensure that attenuation is provided to account for up to and including the 1 in 100 year plus climate change event. In the case of this proposed development and in line with the May 2022 climate change guidance, a 40% allowance is considered appropriate.

3.4 The document also provides details relating to the design parameters for a range of SuDS features.

Drainage Hierarchy

3.5 National policy and local guidance identify that surface water runoff should be disposed of as high up the following hierarchy as possible:

i. Infiltration into the Ground
ii. Discharge to a Watercourse
iii. Discharge to a Surface Water Sewer or Highway Drainage
iv. Discharge to a Combined Sewer

3.6 The underlying geology would suggest that infiltration is not viable for the entire site, although BRE365 soakaway testing should be carried out at the appropriate juncture to confirm this is the case.

3.7 If the BRE365 testing shows soakaways to be viable then in line with the drainage hierarchy then the use of infiltration techniques should be used as the primary form of surface water management.

[5] Highway and Lead Local Flood Authority- Lincolnshire Development Roads and Sustainable Drainage Design Approach, 2021

3.8 Assuming infiltration is not viable for the development, the next available outfall would be to the surrounding drainage ditches, in line with the drainage hierarchy. IDB correspondence has confirmed the need to discharge at existing greenfield rates.

Surface Water Management

Existing Runoff Rate

3.9 An assessment of the equivalent greenfield surface water runoff rates per hectare has been undertaken. The greenfield (QBAR) runoff rate has been calculated at 3.7l/s/ha, using the ICP SuDS methodology within MicroDrainage, which is included as Appendix 5 and summarised in Table 3.1.

Table 3.1: Existing Greenfield Runoff Rates per Hectare

Return Period (Yr.)	Runoff Rate (l/s/ha)
1	3.2
QBAR	3.7
30	8.8
100	13.1

Surface Water Drainage Concept

3.10 Although a layout plan is available (Appendix 1), it is considered that from a drainage perspective the position of the single basin is not at the lowest point within the site and is not large enough to accommodate all the required volume. A series of developable areas each with their own attenuation have therefore been proposed at this early stage.

3.11 For the purposes of the surface water drainage strategy, the site has been divided into 3 catchments based upon the position of the ditches crossing the site.

3.12 There is the potential, following a further review of site levels and consultation with the IDB/LLFA, to divert the ditches. However, this would require further investigation.

3.13 It is estimated that 90% of the developable area will be impermeable, with no requirement to account for urban creep due to the commercial/industrial nature of the proposals.

3.14 Further consultation would be required with the IDB at the appropriate juncture to confirm the exact points of discharge and associated outfall details. At this time it is expected that based on the approach of 3 catchments at least 3 outfalls would be required, each outfall requiring Land Drainage Consent.

3.15 If following further review of the suite level sit is found that a connection(s) to the drainage ditch within land ownership cannot easily be achieved, then there is the potential that connection through 3rd party land may be required.

3.16 Catchment details are provided within Table 3.2. The catchment-based approach will treat and attenuate surface water runoff as close to its source as possible.

Table 3.2: Summary of Proposed Sub-Catchments

Sub-Catchments	Developable Area (ha)	Impermeable Area (90%) (ha)	Prorated Greenfield Runoff rate (l/s)
1	10.3	9.3	38.1
2	14.5	13.0	53.7
3	17.3	15.6	64.0

3.17 A simulation has been run using the 'Source Control' module in Micro Drainage to identify the necessary storage provision for each catchment. The basins have been sized to accommodate the 1 in 100-year event with a 40% allowance for climate change. The greenfield (QBAR) runoff rate of 3.7l/s/ha has been pro-rated by the developable area of each sub-catchment (as detailed within Table 3.2) to calculate the required storage volume (as summarised in Table 3.3). Calculations have been provided within Appendix 6.

Table 3.3: Summary of Outline Storage Requirements

Sub Catchment	Rainfall Method	Critical Storm	Maximum Storage (m^3)
1	FEH	1440 min Winter	9,500
	FSR	960 min Winter	6,670
2	FEH	1440 min Winter	13,600
	FSR	1440 min Winter	9,500
3	FEH	1440 min Winter	18,420
	FSR	1440 min Winter	12,940
Total	FEH	-	41,520
	FSR	-	29,110

3.18 It is therefore expected that a storage requirement in the region of 41,520m^3 would be required to be accommodated within the development in order to appropriately manage surface water flows.

3.19 A concept drainage plan, identifying the low lying north-western corner of each catchment as being the most suitable location for above ground attenuation, is included as Appendix 6. For the purpose of this high-level assessment, the basins have been designed to have a depth of 1.2m and include a 300mm freeboard in the 1 in 100-year + 40% climate change event.

3.20 Further review of site levels once in receipt of the topographical survey will confirm the depths of the diches and in turn inform the depth of the attenuation.

3.21 The development type is such that below ground attenuation by means of geo-cellular storage within parking and service yard areas could be proposed, with a connection to the above ground storage at the downstream extent of the network. Where possible however it is recommended that above ground is the primary focus for providing the required surface water attenuation volumes.

3.22 Water quality should be considered within the proposed drainage strategy to capture any potential pollutants in the runoff from the development. The detention basins will provide the primary stage of treatment; however, to supply a minimum two-stage treatment train, further features such as conveyance swales, bioretention areas and pervious pavements should be incorporated into the development and included within the detailed design. Where possible, detention basins should be enhanced with low flow channels, variable depths and forebays.

3.23 In the service yards and heavily trafficked areas it is expected that oil/petrol interceptors will be required in order to remove hydrocarbons within the surface water, ahead of flows entering the main attenuation.

3.24 As part of any future planning application, the conceptual drainage design should be developed into a more detailed drainage strategy. This should be created alongside the masterplan, to ensure that a suitable area is designated for SuDS in line with local and national guidance, whilst considering the four pillars of SuDS design (amenity, biodiversity, water quality and water quantity).

Foul Water Management

3.25 It is proposed to drain foul and surface water from the development separately.

3.26 A Pre-development Enquiry response from Anglian Water, included as Appendix 7, has identified that the development is expected to generate flows that will require a connection to a foul sewer with a diameter of 300mm or larger. The nearest foul sewer that has been identified as being suitable is a 610mm diameter sewer, located approximately 3.4km to the north of the site. Making a connection point such a significant distance from the site would be costly to deliver.

3.27 However, there is the potential following further review of the proposed flows from the development that a 225mm diameter connection could be made to the sewer within Palmer Road (manhole reference 8200). This would require the sewer to pass beneath the A1 and would be subject to confirmation from Anglian Water.

3.28 Based upon a peak flow rate of 1.1 l/s per ha of proposed building are (as per the DCG) the likely foul water flows generated from the development are in the region of 28 l/s. Such a rate would be expected to be accommodated within a 225mm sewer, assuming that it is currently not at full capacity. Further consultation is to be had with Anglian Water to understand the foul flows they expect the development to generate.

3.29 A pumped solution will be required, regardless of the final point of connection. It is recommended that any pumping station should be positioned within the low point of the development to receive flow via gravity and should be isolated from areas of surface water flooding. The pumping station should have vehicular access to allow for inspection and maintenance.

3.30 Prior to a connection to the existing sewer network being made, a S106 agreement with Anglian Water will be required.

4. RECOMMENDATIONS AND FURTHER WORKS

Flood Risk

4.1 A Flood Risk Assessment (FRA) will be required to accompany a future planning application for the site.

Further Investigation of Baseline Conditions

4.2 The pluvial flow route shown to be present within the southern portion of the site, not associated with the drainage ditches, will require further review, once a topographical survey becomes available, in order to define its route, magnitude and in turn the likely mitigation measures. At this time is expected that an element of hydraulic modelling associated with the drainage diches, along with a direct rainfall runoff model relating to the pluvial source, will be required.

4.3 There is the potential that the hydraulic modelling exercise could concentrate on the areas proposed as vehicular crossing points, rather than the full site. This is to be confirmed following further review of site levels.

4.4 Further details regarding the culvert passing beneath the A1 should be obtained in order to understand further potential implications to site with regard to flows within the drainage ditches. This may require a CCTV drainage survey to be undertaken.

4.5 A topographical survey undertaken to OS Ordnance Datum will be necessary to inform the FRA along with a series of watercourse cross sections strategically located to inform the modelling.

Masterplan Considerations

4.6 The IDB require a 9m easement from the top of bank either side of the drainage ditches, within which no built development or planting can take place in order to provide suitable access to the ditches for maintenance/inspection. The proposed layout plan shows an easement associated with the drains, however, confirmation of the precise location and extent of the easement should be undertaken once a topographical survey is available. The topographical survey should accurately include all top of banks.

4.7 An overland flow route associated with the 1 in 1000-year event has been identified by EA surface water flood risk mapping within the site boundary. Further investigation of the contributing catchment of this flow route will need to be undertaken as part of further works, namely involving the development of a direct rainfall runoff model.

4.8 At this stage it is recommended that allowances are made within the masterplan to ensure that this is not impeded. Such actions may include but are not limited to providing a green corridor through the development and/or locating conveyance structures within it to capture and divert flows if required.

4.9 There is the potential following further investigation/consultation that the ditches could be diverted in order to provide further masterplan options.

Surface Water

4.10 A Sustainable Drainage Statement (SDS) will be required to support a planning application on this site. This will be inclusive of a Drainage Strategy which will detail how surface and foul flows from the development will be required.

Further Investigation of Baseline Conditions

4.11 Infiltration testing should be undertaken in accordance with BRE 365 methodologies to confirm whether infiltration is viable at this location. If viable, future site investigations should include measurements of groundwater to ensure there is a 1m minimum clearance between the base of any SuDS features and peak groundwater levels.

4.12 The drainage ditches within the site will need to be appropriately maintained to ensure that surface water from the downstream development can be conveyed and access is achievable.

4.13 Consultation with LCC is recommended, once an initial drainage strategy has been completed in order to get their comments and understand further any specific requirements they have.

Policy Considerations

4.14 A S106 agreement is required in order to connect to the public foul sewer. A Section 104 application would need to be submitted if the foul water assets within the site are intended to be put forward for adoption by Anglian Water. The proposals would need to meet the requirements set out in the Design and Construction Guidance.

4.15 Prior written consent of the IDB and/or LLFA is required for any proposed temporary or permanent works or structures within any watercourses, under the terms of the Land Drainage Act 1991.

4.16 Land Drainage Consent applications will also be required to be submitted post planning for each of the surface water outfalls being proposed.

Masterplan Considerations

4.17 A topographical survey undertaken OS Ordnance Datum will be necessary to inform the Drainage Strategy.

4.18 Any foul pumping stations will be required to have a 15m cordon sanitaire between the wet well and the nearest development. The pumping station should have vehicular access, appropriate for a tanker and to allow for inspection and maintenance.

4.19 There is the potential that there will be a need to cross the drains, in order to make connections to the pumping stations. This could potentially be above or below the drain. Further review of levels would be required to provide further details on this.

4.20 Further review of expected foul flows generated from the development will allow further understanding on likely point of connection and in turn potential implications. Correspondence with Anglian Water to agree connection in point(s) in principle, is also recommended as part of this element of work.

4.21 The development is expected to generate a peak flow in the region of 15 l/s, further consultation with Anglian Water is required to establish the peak flow they expect to be generated from the development. This in turn will allow for further discussion around point of connection.

4.22 The final site layout should include sufficient space for SuDS to ensure there is enough room for attenuation features receiving surface flows from the development. There is the potential for a proportion of attenuation to be provided below ground, with further SuDS, such as swales, permeable paving and tree pits being considered as the masterplan progresses.

4.23 A 5m easement is to be provided around all above ground SuDS features to allow for maintenance.

5. SUMMARY AND CONCLUSIONS

5.1 This scoping study has identified pluvial and fluvial sources from the surrounding IDB drainage ditches pose the most likely flood risk to the site. It has also been identified that there are inflows to the drain from the east along with the A1 drainage system. Further details around the capacity of the drains and in particular the culvert conveying flows beneath the A1, are recommended to be undertaken ahead of any future planning application.

5.2 An initial concept of surface and foul water management for future development has been undertaken, to establish the likely volumes required to be accommodated within the development.

5.3 Furthermore, a set of recommendations for further works have been provided which are summarised below:

i. To support a future planning application, an FRA and SDS will be required.

ii. Subject to development aspirations, it may be necessary to undertake a hydraulic modelling study of the UOW to further characterise the flood risk posed by the UOW.

iii. A direct rainfall runoff model is expected to be required to further understand the areas shown to be impacted by pluvial runoff.

iv. A series of pump stations are expected to be required to manage foul water flows generated from the development, with further consultation with Anglian water required to inform the point(s) of connection.

v. A topographical survey will be required to inform the FRA, Drainage Strategy and any necessary hydraulic modelling, should it be deemed necessary following a review of the topographical survey.

vi. A site investigation should be undertaken which includes soakaway testing in accordance with BRE 365 Digest, as well as measurements of groundwater to quantify the flood risk it poses. This may also influence the design of SuDS features, depending on whether a minimum clearance between the base of SuDS and peak groundwater levels can be achieved.

vii. Detention basins are to be designed to accommodate the 1 in 100-year event with a 40% allowance for climate change. A minimum of 300mm freeboard should be provided, with basin slopes not being steeper than 1 in 4.

viii. The use of a range of SuDS features such as swales permeable paving and tree pits should be explored as the masterplan progresses, with the potential for a proportion of the required storage to be below ground.

ix. The final layout will need to take into consideration the flood risk posed by the 1 in 1000-year overland flow route present on the site, which is yet to be confirmed. The existing layout currently shows development within this route which has the potential to impede flows.

x. The masterplan will also need to take into account any easements from watercourses and SuDS features. As per the IDB response, this is 9m from the top of bank of watercourse. A 5m easement from any SuDS features to the nearest watercourse is expected to be required.

APPENDICES

Appendix 1: Proposed layout

NORTH

Notes:

This drawing is the sole copyright of KPP Architects Ltd and reproduction in any form is forbidden unless permission is obtained in writing.

Do not scale from this drawing. Any descrepancies on site should be brought to the attention of KPP Architects Ltd.

Work and materials must comply with the current building regulations and codes of practice and be read in conjunction with building specifications and other sub-contractors information. All materials are to be installed in strict accordance with the recommendations of the manufacturers.

SUBJECT TO SURVEY

TOTAL BUILDING AREA 2,773,000Sq.Ft.
SITE AREA 162.6 ACRES

Rev	Description	By	Chkd	Date
-	-	-	-	-

Client

CADDICK DEVELOPMENTS

Project Title

GONERBY MOOR
GRANTHAM

Drawing Title

MASTERPLAN 1

KPP ARCHITECTS
Lodge House
12 Town Street
Horsforth, Leeds LS184RJ
T : +44 (0) 113 2390460
E : architects@kpp-leeds.co.uk
W : www.kpp-leeds.co.uk

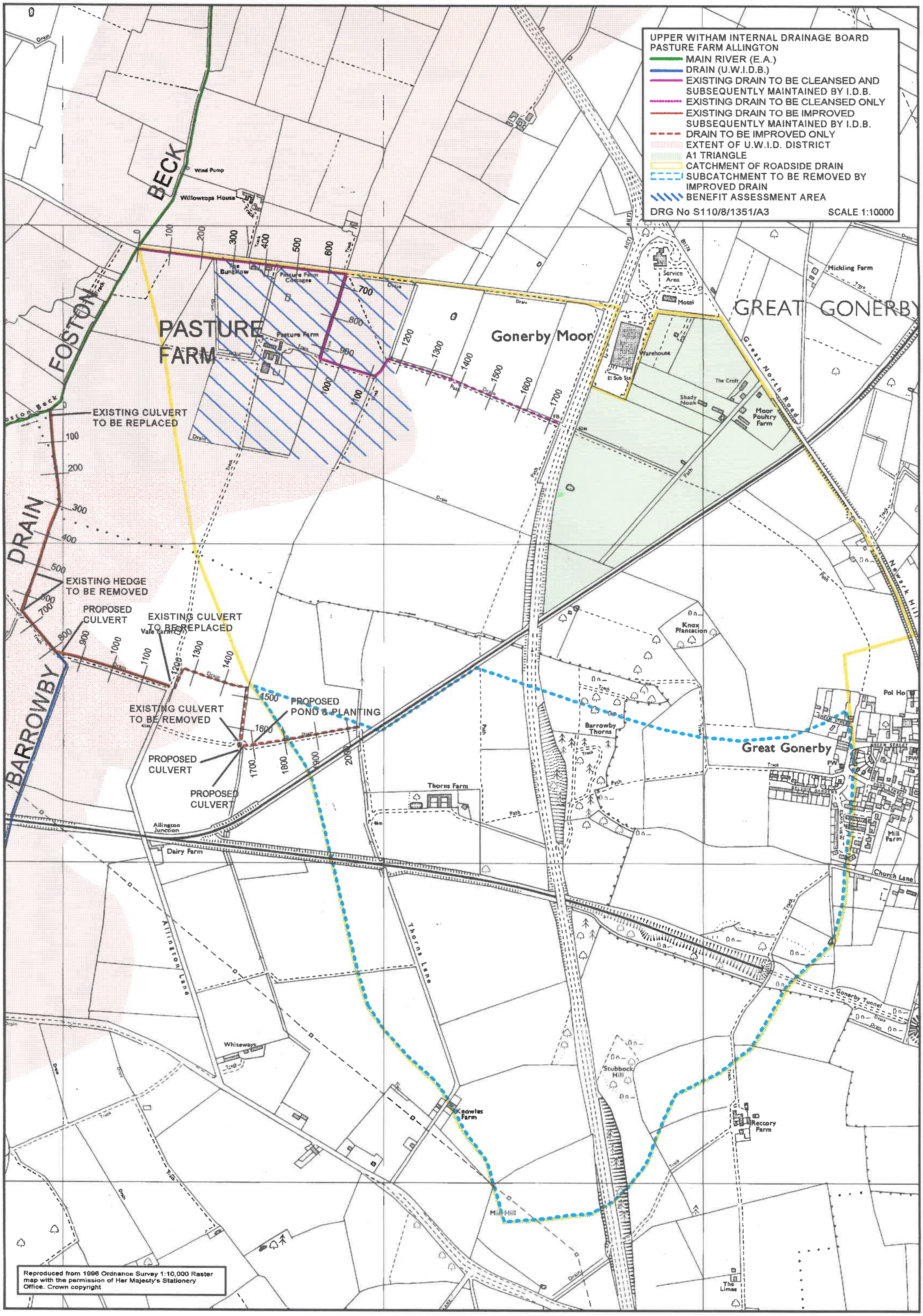
Scale	Size	Date	Drawn	Checked
1:2500	A1	APRIL'21	JB	JW

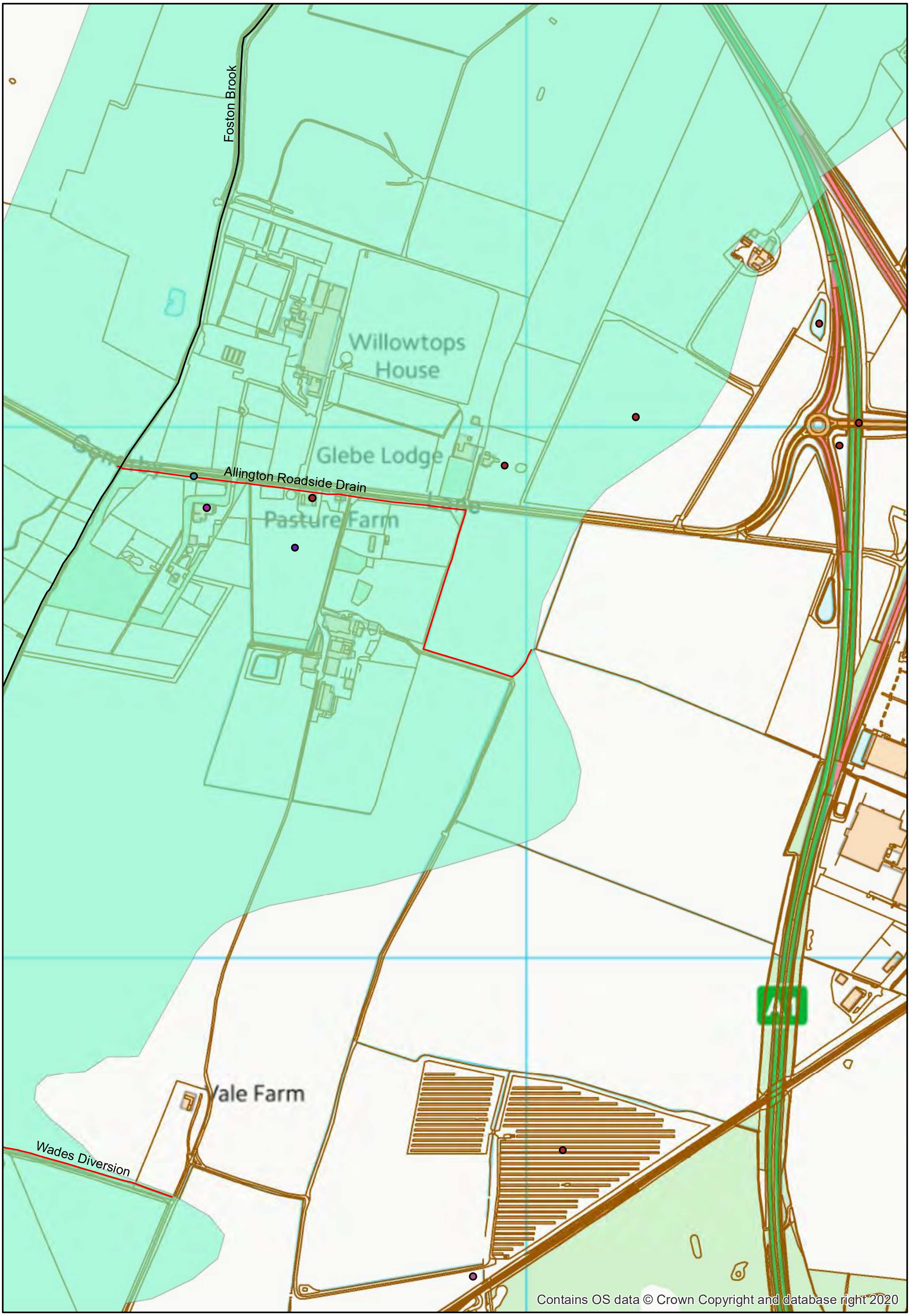
Status
SCHEME

KPP Job No	Rev
CAD'GEN	**A**

Number
1001

Appendix 2: IDB Correspondence


UPPER WITHAM INTERNAL DRAINAGE BOARD
PASTURE FARM ALLINGTON
MAIN RIVER (E.A.)
DRAIN (U.W.I.D.B.)
EXISTING DRAIN TO BE CLEANSED AND SUBSEQUENTLY MAINTAINED BY I.D.B.
EXISTING DRAIN TO BE CLEANSED ONLY
EXISTING DRAIN TO BE IMPROVED SUBSEQUENTLY MAINTAINED BY I.D.B.
DRAIN TO BE IMPROVED ONLY
EXTENT OF U.W.I.D. DISTRICT
A1 TRIANGLE
CATCHMENT OF ROADSIDE DRAIN
SUBCATCHMENT TO BE REMOVED BY IMPROVED DRAIN
BENEFIT ASSESSMENT AREA
DRG No S110/8/1351/A3
SCALE 1:10000
FOSTON BECK
PASTURE FARM
BARROWBY DRAIN
EXISTING CULVERT TO BE REPLACED
EXISTING HEDGE TO BE REMOVED
PROPOSED CULVERT
EXISTING CULVERT TO BE REPLACED
EXISTING CULVERT TO BE REMOVED
PROPOSED POND & PLANTING
PROPOSED CULVERT
PROPOSED CULVERT
GREAT GONERBY
Gonerby Moor
Great Gonerby
Great North Road
Newark Hill
Allington Lane
Thorns Lane
Church Lane
Gonerby Tunnel
Wind Pump
Willowtops House
Pasture Farm Cottages
Pasture Farm
Service Area
Motel
Warehouse
Mickling Farm
The Croft
Shady Nook
Moor Poultry Farm
Knox Plantation
Barrowby Thorns
Thorns Farm
Allington Junction
Dairy Farm
Whiteways
Knowles Farm
Stubbock Hill
Rectory Farm
Mill Hill
Mill Farm
The Limes
Reproduced from 1996 Ordnance Survey 1:10,000 Raster map with the permission of Her Majesty's Stationery Office. Crown copyright


Foston Brook
Willowtops House
Glebe Lodge
Allington Roadside Drain
Pasture Farm
A1
Vale Farm
Wades Diversion
Contains OS data © Crown Copyright and database right 2020

Keith Alger

From: Guy Hird [redacted]
Sent: 27 June 2022 07:43
To: Matthew Bailey
Cc: Keith Alger
Subject: RE: 220732_Gonerby Moor, Grantham - Flood Risk and Drainage Enquiry
Attachments: UWIDB map.pdf; scheme plan.pdf

From: Guy Hird [redacted]
Sent: 14 June 2022 16:57
To: Matthew Bailey [redacted]
Subject: FW: 220732_Gonerby Moor, Grantham - Flood Risk and Drainage Enquiry

This email originated from outside of our organisation. Please exercise caution with content, links and attachments.

UD-6089-2022-PLN

Matthew

220732_Gonerby Moor, Grantham - Flood Risk and Drainage Enquiry

The location has a small part within the Upper Witham IDB area and the Board maintained Allington Roadside Drain (29704) extends to the limit of the district adjacent to the site. See attached map.

You are correct most of the discharge would be to Allington Roadside Drain, but you will as part of your site investigation have to determine if there is a catchment spilt and some goes to the south via riparian watercourses go into Wades Diversion.

In 1998 Pasture Farm flooded and following an investigation by the Board a scheme was carried out on the drainage in the area, with addition watercourses scheduled by the Board. During events Allington Roadside Drain is subject to high flows and water level, it is also affected by levels within the EA main river Foston Beck. Note there is a gauging station downstream of Gonerby Lane. I am aware a Section 19 investigation has been carried out for house flooding, Gonerby Lane, Allington in 2020. The Board has no modelled data of the system.

Surface water discharge from the site is required to be limited to the greenfield rate.

You should also be aware that the surface water from most of the Downtown development runs through the site via a culvert under the A1 it is essential that this watercourse is maintained to an appropriate standard and access to allow this is made available.

Under the terms of the Board's Byelaws, the prior written consent of the Board is required for any proposed temporary or permanent works or structures in, under, over or within the byelaw 9m distance of the top of the bank of a Board maintained watercourse.

Under the terms of the Land Drainage Act. 1991 the prior written consent of the Board is required for any proposed temporary or permanent works or structures within any watercourse including infilling or a diversion.

For the area outside the Board's area under the provisions of the Flood and Water Management Act 2010, and the Land Drainage Act. 1991, the prior written consent of the Lead Local Flood Authority (Lincolnshire County Council) is required for any proposed works or structures in any watercourse outside those designated main rivers and Internal Drainage Districts. At this location this Board acts as Agents for the Lead Local Flood Authority and as such any works, permanent or temporary, in any ditch, dyke or other such watercourse will require consent from the Board.

Regards

Guy Hird
Head of Technical & Engineering Services

Four independent statutory Land Drainage and Flood Risk Management Authorities working in partnership.

www.witham3idb.gov.uk

From: Matthew Bailey [redacted]
Sent: 27 May 2022 15:58
To: Enquiries [redacted]
Subject: 220732_Gonerby Moor, Grantham - Flood Risk and Drainage Enquiry

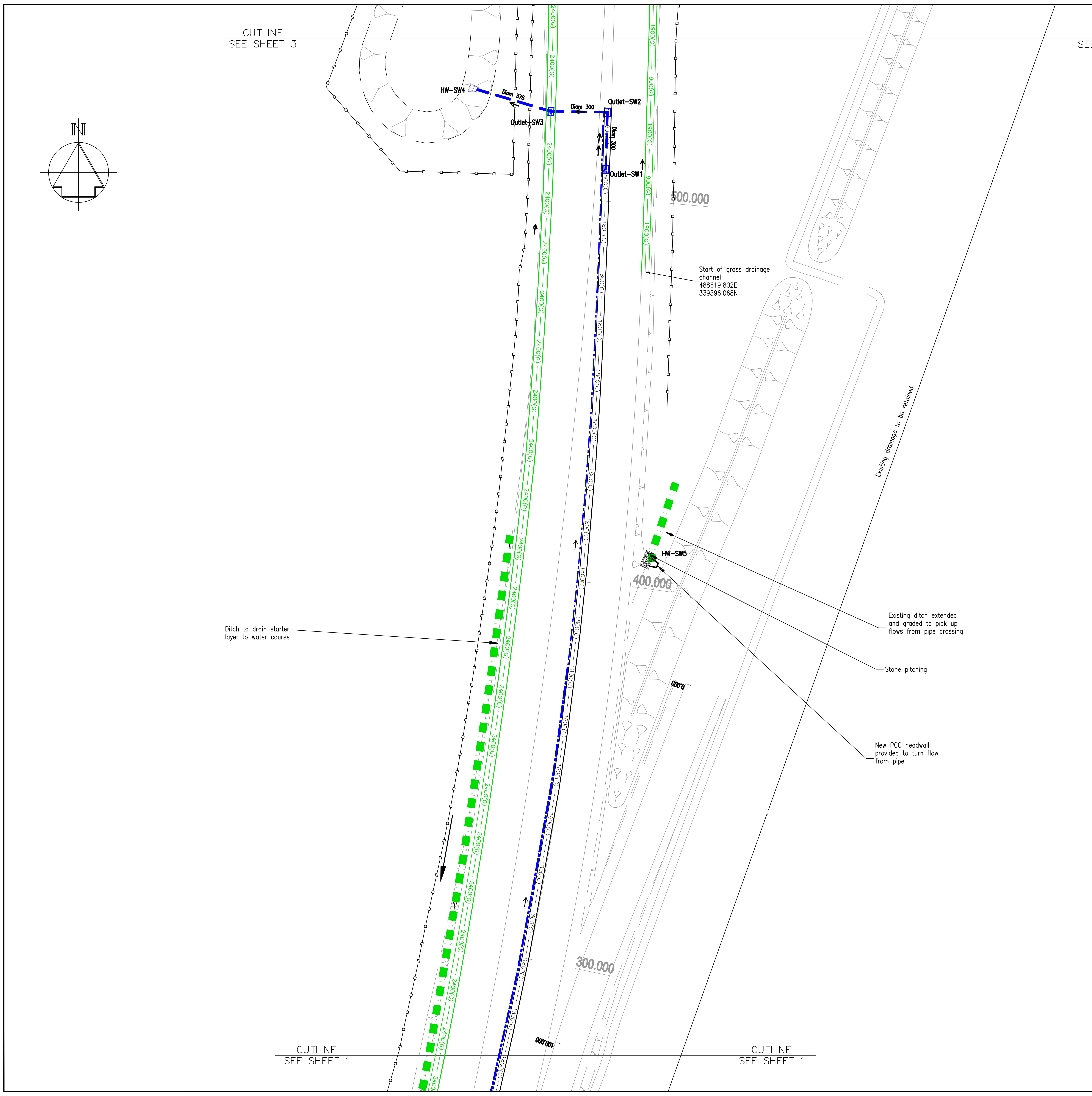
Hi,
We are undertaking a flood risk and drainage assessment at a site located at Gonerby Moor, Grantham (please see attached site location plan).
We are anticipating that our surface water drainage strategy will be discharging into an IDB drain (or drain immediately upstream from the designated IDB area). We would like to request any relevant data that the Upper Witham IDB may have for the area.
Please can you advise on any known issues or historical flooding incidents from the IDB drains in the vicinity of the site and advise on any requirements that the IDB for us to progress a surface water draining connection into an IDB drain within the Upper Witham IDB area.
Also, please can you advise on any easements or offsets that you require from our development and your drains.
Any information that you could provide would be appreciated.
Thanks,

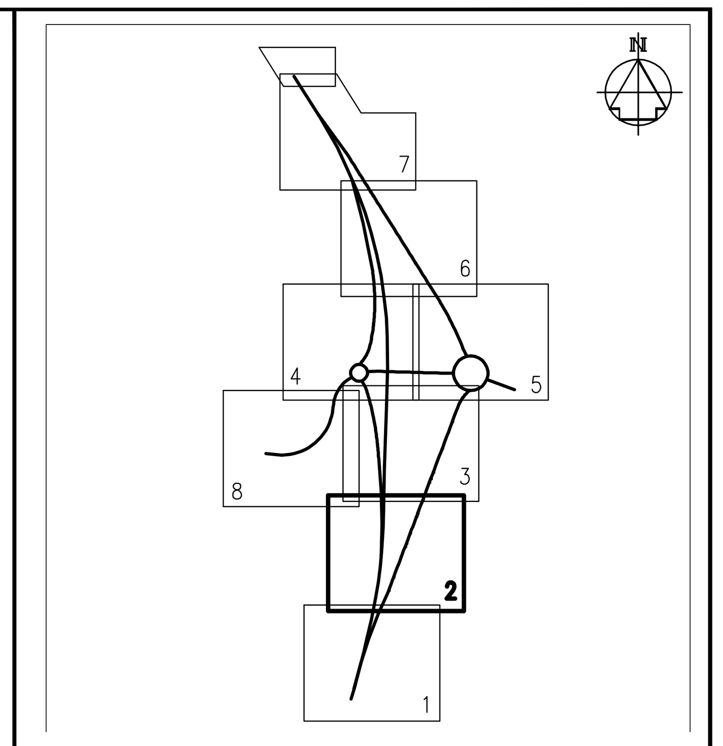
Matthew Bailey
Engineer | Environmental Engineering | BWB Consulting Limited
[redacted]

Registered in England and Wales

[redacted]

Appendix 3: National Highways Plans





NOTES

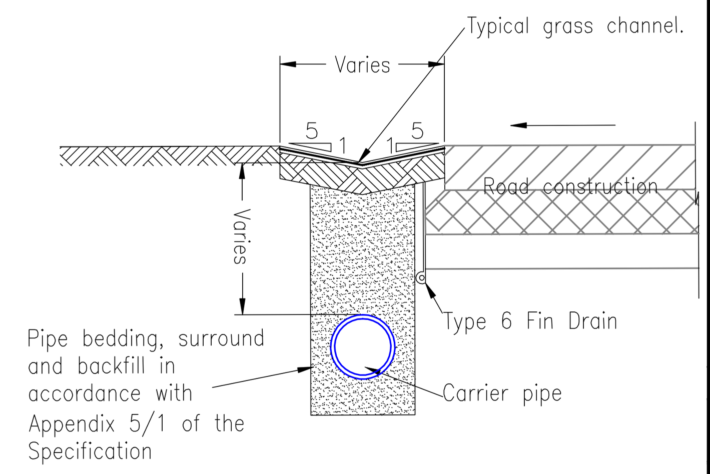
1. Do not scale this drawing.
2. All levels shown in m AOD.
3. Invert levels and pipe sizes calculated using windes.
4. For details of ditches refer to Standard Details
5. Eastern roundabout is to be resurfaced, and the existing drainage system retained.
6. Carrier drains and catchpits shown above grass channels for clarity.
7. All ditches to be 1m clear of toe of embankments.

KEY

- 1300(G) — 1300mm Grass Triangular Channel
- 1900(G) — 1900mm Grass Trapezoidal Channel
- 2400(G) — 2400mm Grass Trapezoidal Channel
- 1800(C) — 1800mm Concrete Trapezoidal Channel
- Precast concrete channel blocks or in situ concrete channel

Refer to Drainage Detail drawing 5041368/511 for channel details.

- B — Channel formed within surfacing
- CP-N1-S2 Diam 225 — Carrier Drain with Catchpit, Catchpit Reference, Pipe Diameter and Flow Direction
- Type 5 Fin Drain. See SWH HCD F18 & F19
- Outlet-Sxx — Concrete Channel, Outlet and Reference - Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
- Outlet-Sxx — Grass Channel, Outlet and Reference - Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
- Interceptor — Interceptor (Description shown adjacent on drawing)
- Kerb drain
- Bridge Deck Drain - Transition unit will be required between kerb drain and bridge deck drain. A special unit will be required to accomodate bridge expansion joints, refer to drawing 5041368/512.
- Proposed Drainage Ditch
- Existing Drainage Ditch
- Linear Drainage Channel
- Kerb Drain Rodding Access
- Kerb Drain Gully Outlet and connection
- GL — Linear Drainage Gully
- HWx — Headwall and Reference (JKH Series 300,600 & 1000)
- HW — Small headwall (JKH Type 'K')
- Filter Drain



Typical Section Through
Carrier Drain / Grass Channel
N.T.S.

Rev	Description	By	Date	Chk'd	Auth
A	AS-BUILTS RECORD DWG.	TFS	7/08	DJG	AK

Client: HIGHWAYS AGENCY

Project: A1 PETERBOROUGH TO BLYTH GONERBY MOOR JUNCTION

Title: DRAINAGE & DUCTS SHEET 2 OF 8

Original Scale	Drawn	Checked	Authorised
1:500 @A1	BS Date 28/07/06	AT Date 02/07/07	IS Date 03/07/07

INTERSERVE Ref : MA87072

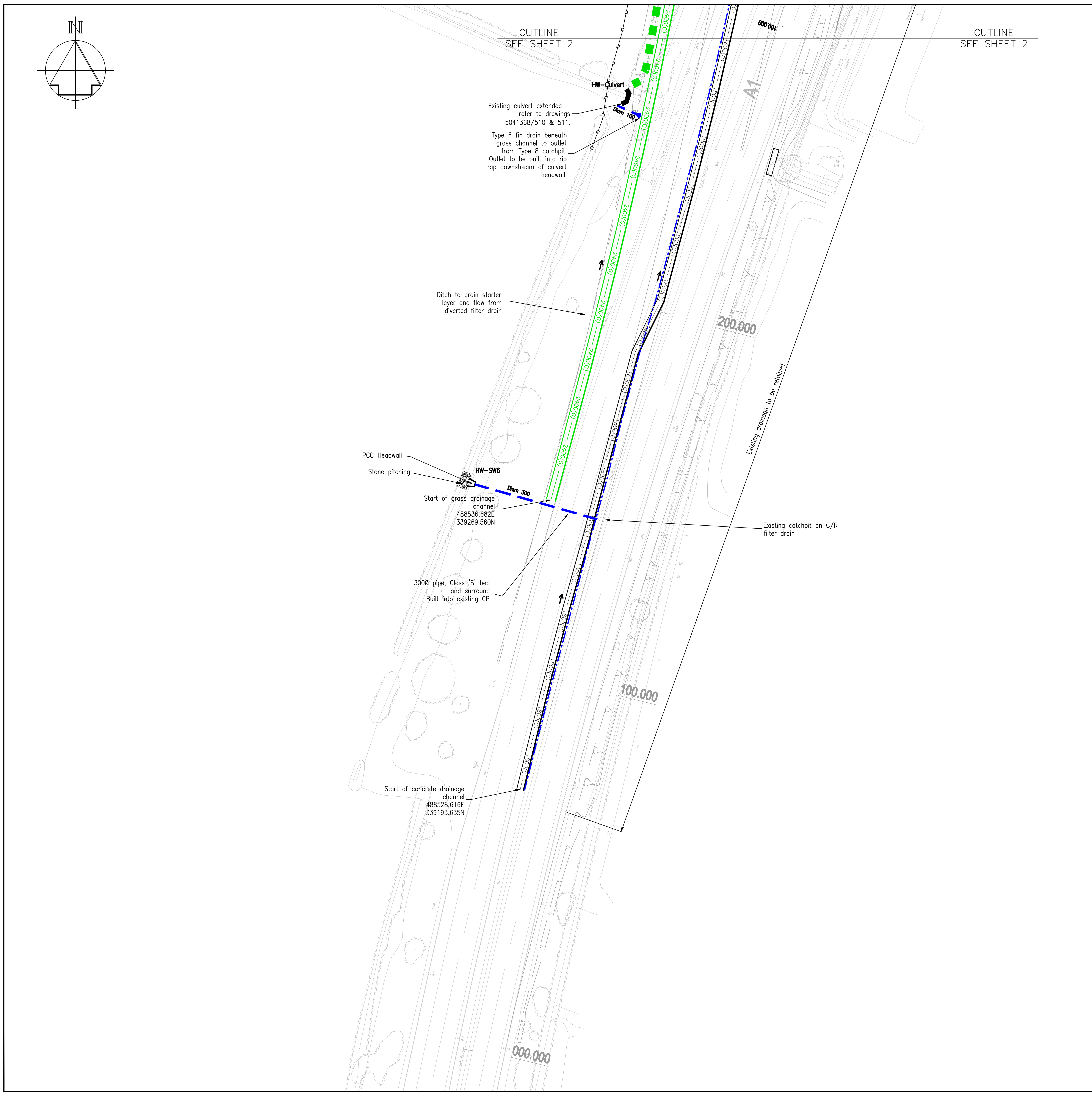
Status	Drawing Number	Rev
AB	5041368/502	A

Status	Drawing Number	Rev
AB	5041368/502	A

DO NOT SCALE

File P:\GBBMA\HandT\TSol\CQ\Projects\5048774-A1 P2B Site Supervision 2B-STUA2133\20_CAD\2001_Drgs\Gonerby Moor\0500_Drainage and Ducts\5041368_502_A.dwg
Date Jul 21, 2009 - 11:07am

A1



KEY

- 1300mm Grass Triangular Channel
- 1900mm Grass Trapezoidal Channel
- 2400mm Grass Trapezoidal Channel
- 1800mm Concrete Trapezoidal Channel
- Precast concrete channel blocks or in situ concrete channel

Refer to Drainage Detail drawing 5041368/511 for channel details.

- Channel formed within surfacing
- CP-N1-S2 Diam 225 — Carrier Drain with Catchpit, Catchpit Reference, Pipe Diameter and Flow Direction
- Type 5 Fin Drain. See SWH HCD F18 & F19
- Outlet-Sxx — Concrete Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
- Outlet-Sxx — Grass Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
- Interceptor — Interceptor (Description shown adjacent on drawing)
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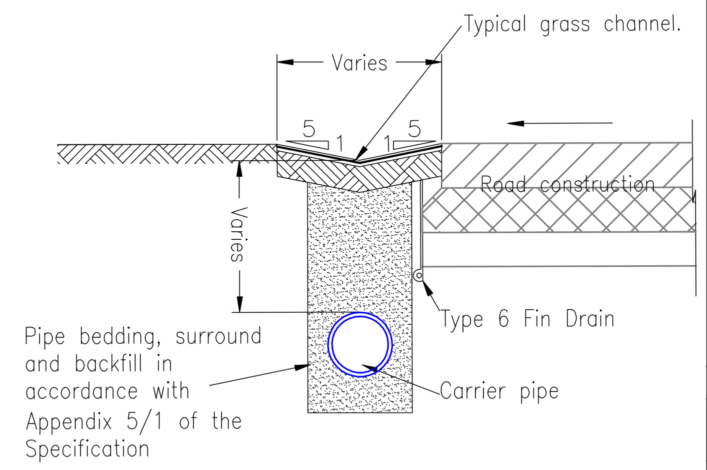
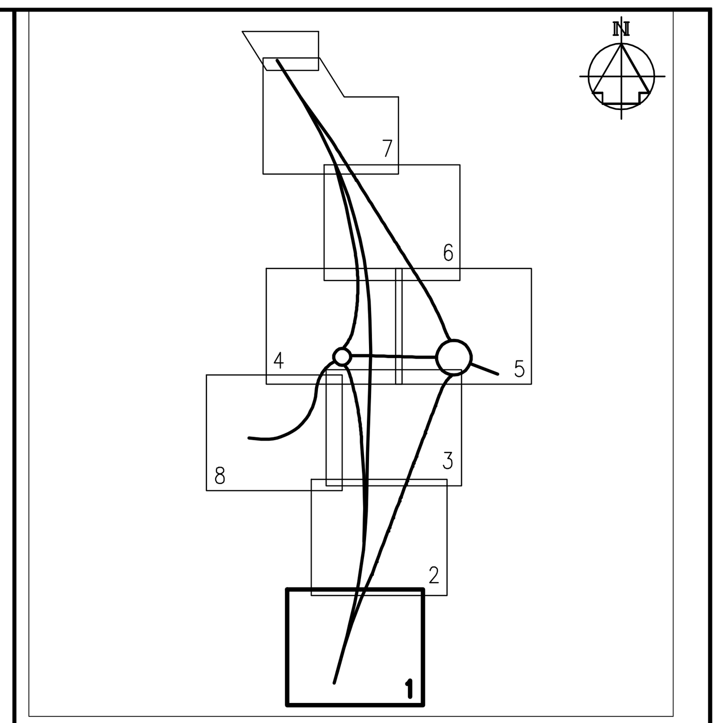
- Bridge Deck Drain – Transition unit will be required between kerb drain and bridge deck drain. A special unit will be required to accomodate bridge expansion joints, refer to drawing 5041368/512.
- Proposed Drainage Ditch
- Existing Drainage Ditch
- Linear Drainage Channel
- Kerb Drain Rodding Access
- Kerb Drain Gully Outlet and connection
- GL Linear Drainage Gully
- HWx — Headwall and Reference (JKH Series 300,600 & 1000)
- HW — Small headwall (JKH Type 'K')
- Filter Drain



Typical Section Through Carrier Drain / Grass Channel
N.T.S.



NOTES

1. Do not scale this drawing.
2. All levels shown in m AOD.
3. Invert levels and pipe sizes calculated using windes.
4. For details of ditches refer to Standard Details
5. Eastern roundabout is to be resurfaced, and the existing drainage system retained.
6. Carrier drains and catchpits shown above grass channels for clarity.
7. All ditches to be 1m clear of toe of embankments.

Rev	Description	By	Date	Chk'd	Auth
A	AS-BUILTS RECORD DWG.	TFS	7/08	DJG	AK

Client: HIGHWAYS AGENCY

Project: A1 PETERBOROUGH TO BLYTH GONERBY MOOR JUNCTION

Title: DRAINAGE & DUCTS SHEET 1 OF 8

Original Scale	Drawn	Checked	Authorised
1:500 @A1	BS Date 28/07/06	AT Date 02/07/07	IS Date 03/07/07

INTERSERVE Ref : MA87072

Status	Drawing Number	Rev
AB	5041368/501	A

Status AB Drawing Number 5041368/501 Rev A

DO NOT SCALE

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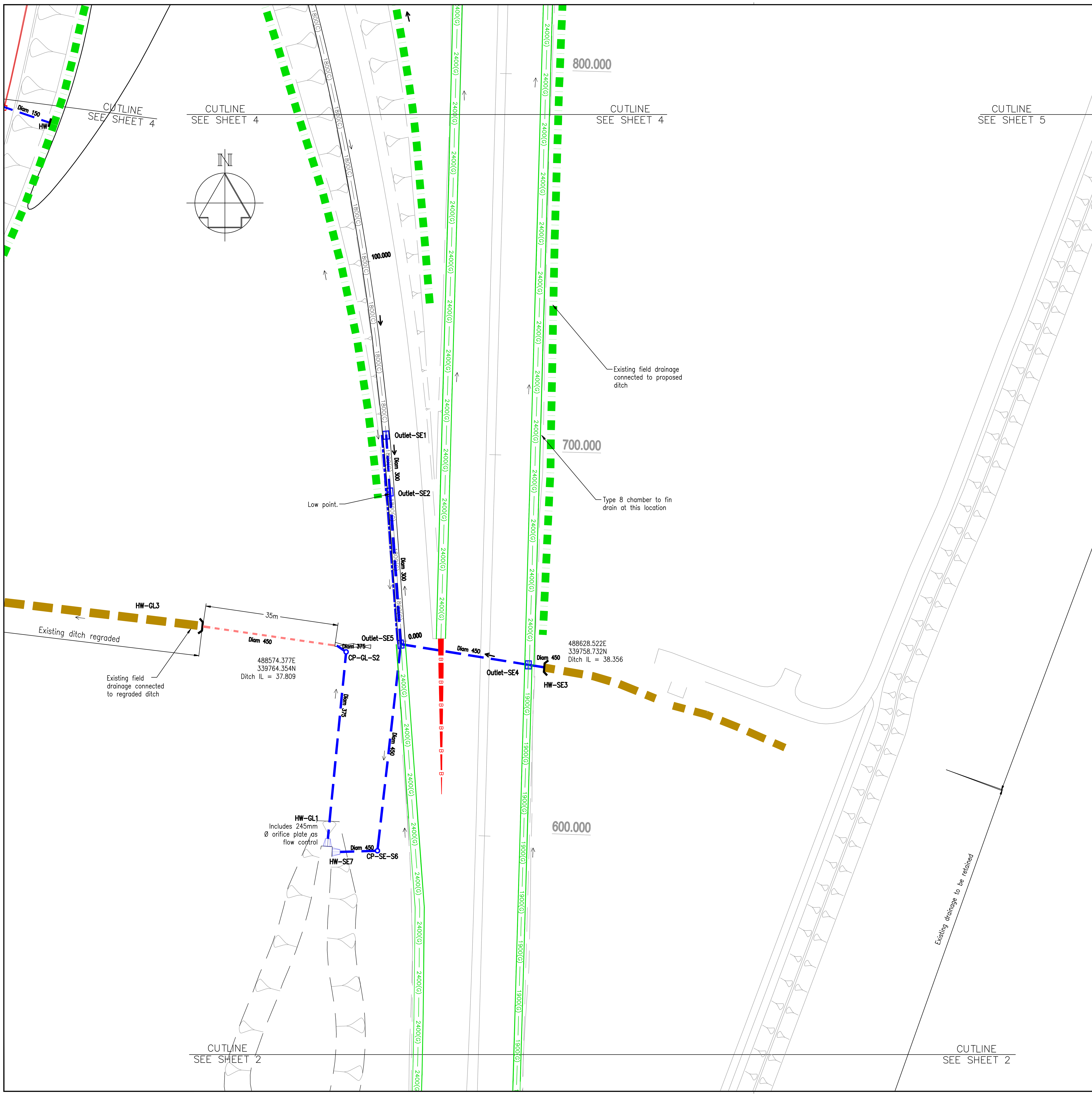
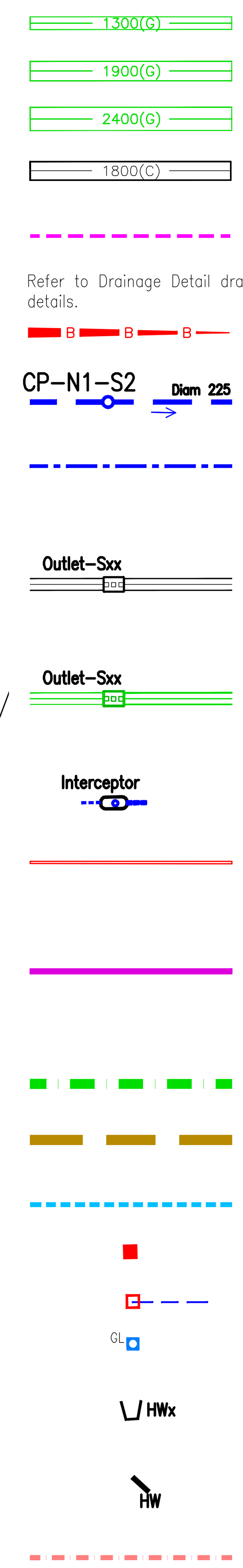


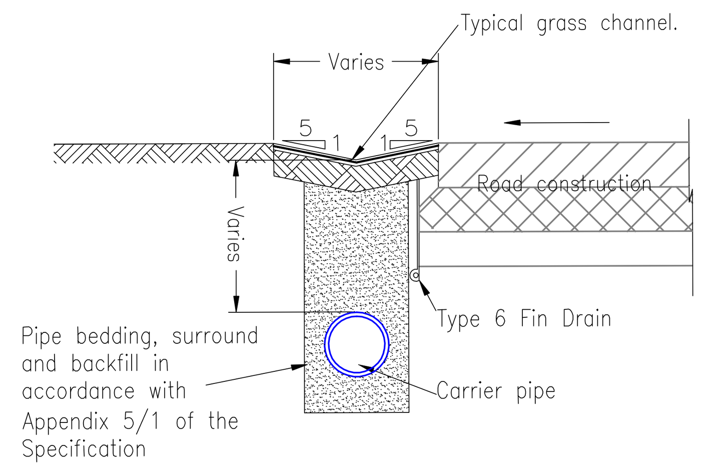


KEY

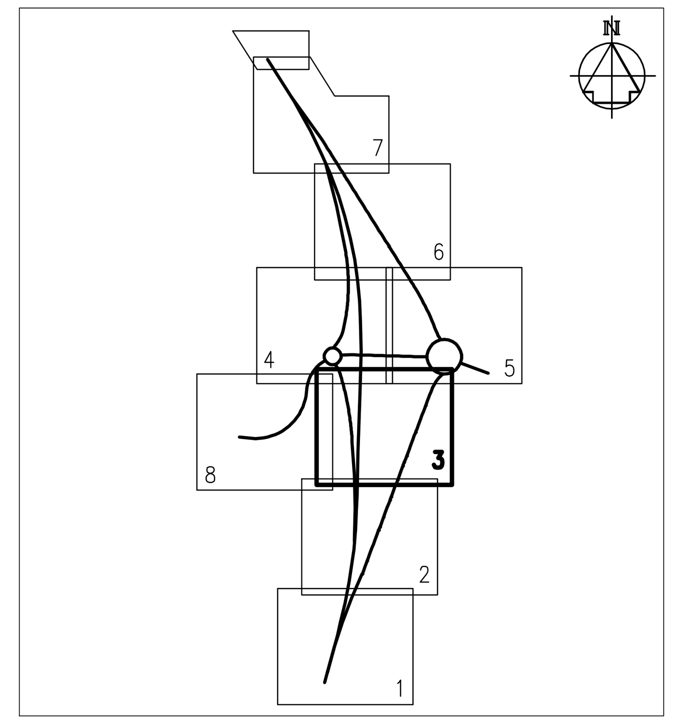
1300(G)	1300mm Grass Triangular Channel
1900(G)	1900mm Grass Trapezoidal Channel
2400(G)	2400mm Grass Trapezoidal Channel
1800(C)	1800mm Concrete Trapezoidal Channel
	Precast concrete channel blocks or in situ concrete channel

Refer to Drainage Detail drawing 5041368/511 for channel details.

B B B	Channel formed within surfacing
CP-N1-S2 Diam 225	Carrier Drain with Catchpit, Catchpit Reference, Pipe Diameter and Flow Direction
	Type 5 Fin Drain. See SWH HCD F18 & F19
Outlet-Sxx	Concrete Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
Outlet-Sxx	Grass Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
Interceptor	Interceptor (Description shown adjacent on drawing)
	Kerb drain
	Bridge Deck Drain – Transition unit will be required between kerb drain and bridge deck drain. A special unit will be required to accommodate bridge expansion joints, refer to drawing 5041368/512.
	Proposed Drainage Ditch
	Existing Drainage Ditch
	Linear Drainage Channel
	Kerb Drain Rodding Access
	Kerb Drain Gully Outlet and connection
GL	Linear Drainage Gully
HWx	Headwall and Reference (JKH Series 300,600 & 1000)
HW	Small headwall (JKH Type 'K')
	Filter Drain



Typical Section Through
Carrier Drain / Grass Channel
N.T.S.



NOTES

1. Do not scale this drawing.
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6. Carrier drains and catchpits shown above grass channels for clarity.
7. All ditches to be 1m clear of toe of embankments.

Rev	Description	By	Date	Chk'd	Auth
A	AS-BUILTS RECORD DWG.	TFS	7/08	DJG	AK

Client
HIGHWAYS AGENCY

Project
A1 PETERBOROUGH TO BLYTH
GONERBY MOOR JUNCTION

Title
DRAINAGE & DUCTS
SHEET 3 OF 8

Original Scale	Drawn	Checked	Authorised
1:500 @A1	BS Date 28/07/06	AT Date 09/10/06	IS Date 09/10/06

INTERSERVE Ref : MA87072

Status	Drawing Number	Rev
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DO NOT SCALE

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Date Jul 21, 2009 - 11:15am

A1

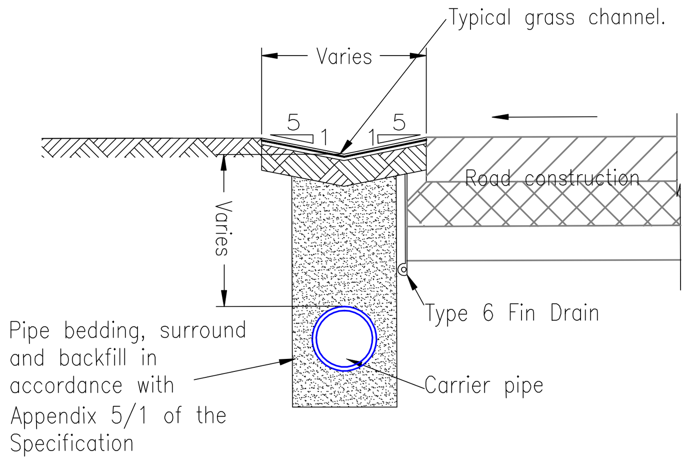
N

KEY

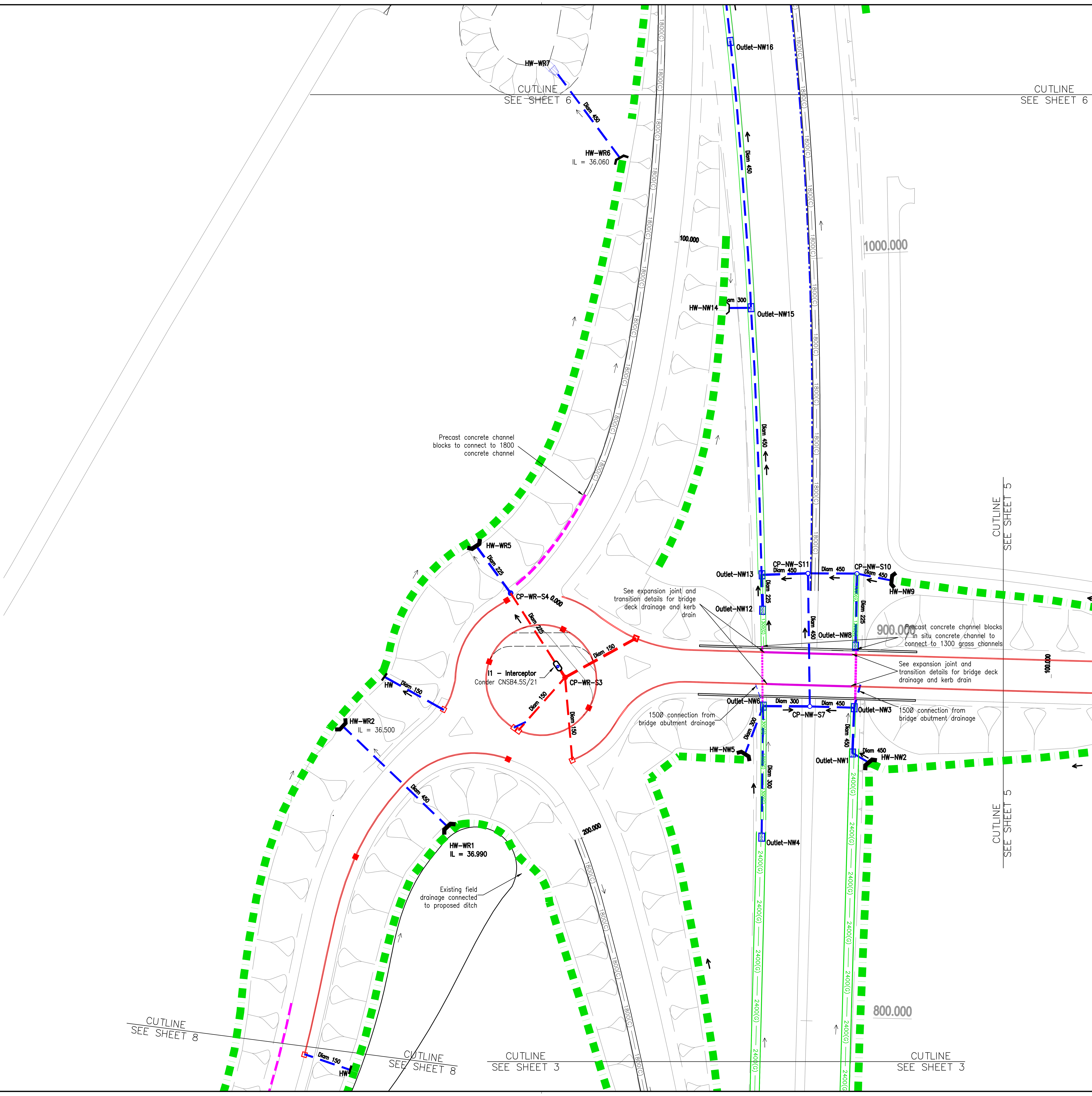
1300(G)	1300mm Grass Triangular Channel
1900(G)	1900mm Grass Trapezoidal Channel
2400(G)	2400mm Grass Trapezoidal Channel
1800(C)	1800mm Concrete Trapezoidal Channel
	Precast concrete channel blocks or in situ concrete channel

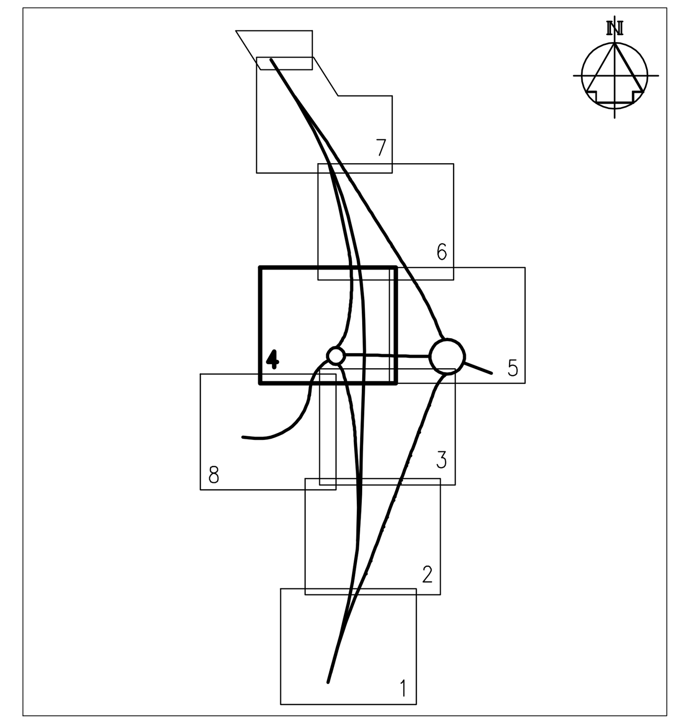
Refer to Drainage Detail drawing 5041368/511 for channel details.

B — B — B	Channel formed within surfacing
CP–N1–S2 Diam 225	Carrier Drain with Catchpit, Catchpit Reference, Pipe Diameter and Flow Direction
	Type 5 Fin Drain. See SWH HCD F18 & F19
Outlet–Sxx	Concrete Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
Outlet–Sxx	Grass Channel, Outlet and Reference – Refer to Drainage Detail drawing 5041368/511 for outlet details and Appendix 5/1 for outlet schedule.
Interceptor	Interceptor (Description shown adjacent on drawing)
	Kerb drain
	Bridge Deck Drain – Transition unit will be required between kerb drain and bridge deck drain. A special unit will be required to accomodate bridge expansion joints, refer to drawing 5041368/512.
	Proposed Drainage Ditch
	Existing Drainage Ditch
	Linear Drainage Channel
	Kerb Drain Rodding Access
	Kerb Drain Gully Outlet and connection
GL	Linear Drainage Gully
HWx	Headwall and Reference (JKH Series 300,600 & 1000)
HW	Small headwall (JKH Type 'K')
	Filter Drain



Typical Section Through Carrier Drain / Grass Channel
N.T.S.





NOTES

1. Do not scale this drawing.
2. All levels shown in m AOD.
3. Invert levels and pipe sizes calculated using windes.
4. For details of ditches refer to Standard Details
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Rev	Description	By	Date	Chk'd	Auth
A	AS-BUILTS RECORD DWG.	TFS	7/08	DJG	AK

Client: HIGHWAYS AGENCY

Project: A1 PETERBOROUGH TO BLYTH GONERBY MOOR JUNCTION

Title: DRAINAGE & DUCTS SHEET 4 OF 8

Original Scale	Drawn	Checked	Authorised
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INTERSERVE Ref : MA87072

Status	Drawing Number	Rev
AB	5041368/504	A

Status AB · Drawing Number 5041368/504 · Rev A

DO NOT SCALE

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Date Jul. 21, 2009 - 11:16am

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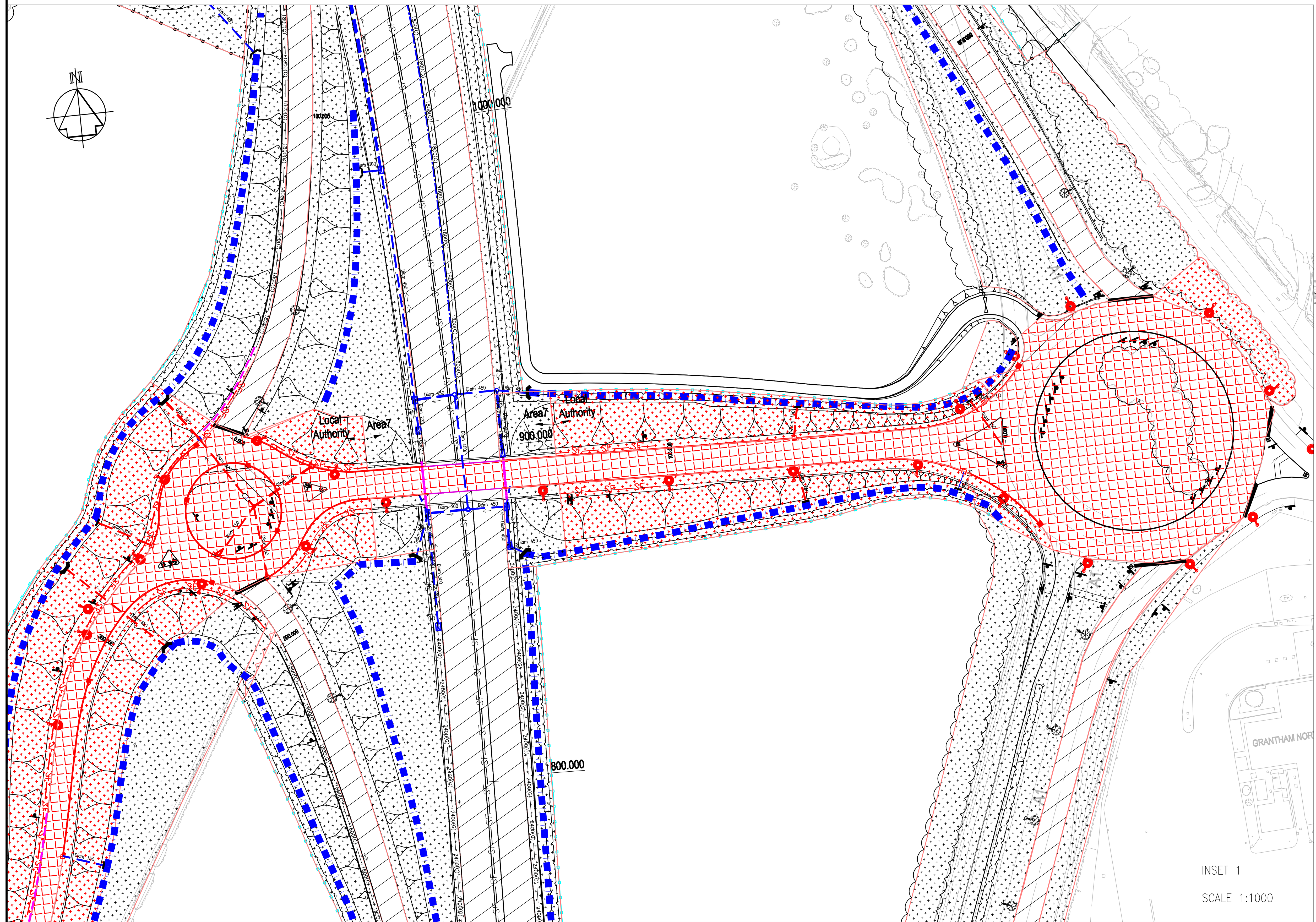

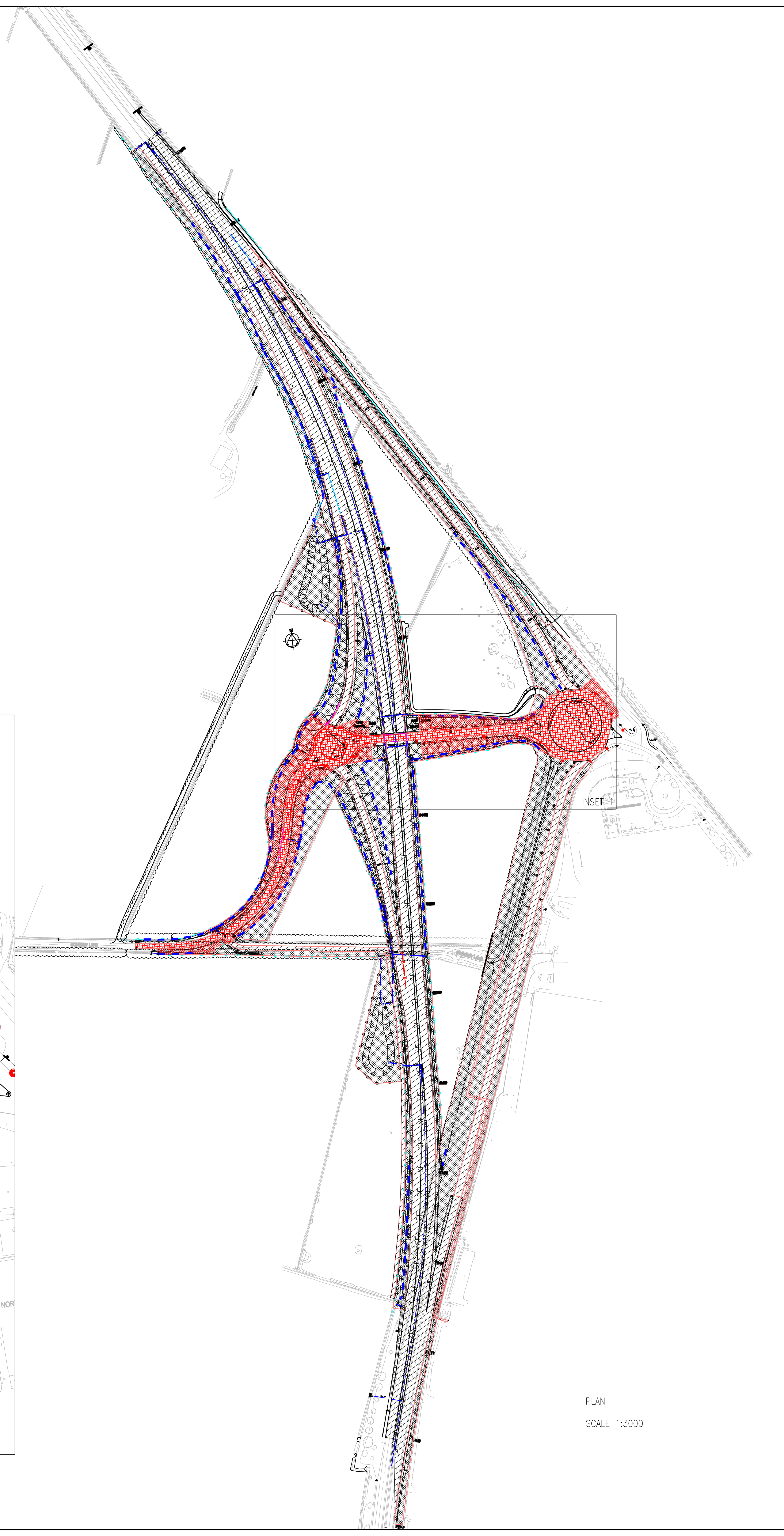

KEY

- TRUNK ROAD
- AREA MAINTAINED BY HIGHWAYS AGENCY
- LOCAL AUTHORITY ROADS
- AREA MAINTAINED BY LOCAL AUTHORITY
- HEDGE - REPRESENTS HIGHWAYS BOUNDARY
- FENCE TO BE MAINTAINED BY THIRD PARTY
- SAFETY FENCE TO BE MAINTAINED BY LOCAL AUTHORITY
- SAFETY FENCE TO BE MAINTAINED BY HIGHWAYS AGENCY
- LOCAL AUTHORITY STREET LIGHTING
- HIGHWAYS AGENCY STREET LIGHTING
- TRAFFIC SIGN
- 1800MM CONCRETE TRAPEZOIDAL CHANNEL
- LOCAL AUTHORITY CARRIER DRAIN WITH CATCHPIT
- AREA 7 CARRIER DRAIN WITH CATCHPIT
- CONCRETE CHANNEL, OUTLET AND REFERENCE
- INTERCEPTOR
- AREA 7 KERB DRAIN
- LOCAL AUTHORITY KERB DRAIN
- KERB DRAIN RODDING ACCESS
- KERB DRAIN GULLY OUTLET AND CONNECTION
- AREA 7 DITCH
- LOCAL AUTHORITY DITCH
- ROAD GULLY
- HEADWALL AND REFERENCE

Rev	Description	By	Date	Chk'd	Auth

Rev	Purpose of issue	Date	Auth
C	FOR APPROVAL	09.09	WR
B	GENERAL AMENDMENTS	07.09	WR
A	ORIGINAL DRAWING	08.08	WR

Client

HIGHWAYS AGENCY

Project

A1 PETERBOROUGH TO BLYTH
GRADE SEPARATED JUNCTIONS

Title

GONERBY MOOR JUNCTION INTERFACE PLAN

Original Scale	Drawn	Checked	Authorised
AS SHOWN	PYB Date 22/08/08	SS Date 22/08/08	WR Date 22/08/08

ATKINS Ref :	INTERSERVE Ref :
5041368	MA87072

Status	Drawing Number	Rev
AB	SK/5041368/008	C

Status AB
Drawing Number SK/5041368/008
Rev C

DO NOT SCALE

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Date Sep 15, 2009 - 12:27pm

A1

Appendix 4: Anglian Water Sewer Records

Date: 31/05/22

Scale: 1:1250

Map Centre: 488220,339474

Data updated: 30/04/22

Our Ref: 867891 - 1

Wastewater Plan A0

Foul Sewer
Surface Sewer
Combined Sewer
Final Effluent
Rising Main*
Private Sewer*
Decommissioned Sewer*

Outfall*
Inlet*
Manhole*

Sewage Treatment Works
Public Pumping Station
Decommissioned Pumping Station

*(Colour denotes effluent type)

jurgita.v@bwbconsulting.com

220732 - Gonerby Moo

love every drop anglianwater

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
6300	488635	339348	F	-	-	-
7300	488743	339306	F	-	-	-
8200	488801	339283	F	-	-	-
8201	488836	339268	F	-	-	-
8202	488870	339253	F	-	-	-
8300	488844	339389	F	-	-	-
9200	488916	339234	F	-	-	-
6350	488615	339360	S	-	-	-
7250	488799	339288	S	-	-	-
7350	488732	339314	S	-	-	-
8250	488842	339270	S	-	-	-
8251	488874	339255	S	-	-	-
9250	488920	339235	S	-	-	-

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix 5: Greenfield Runoff Calculations

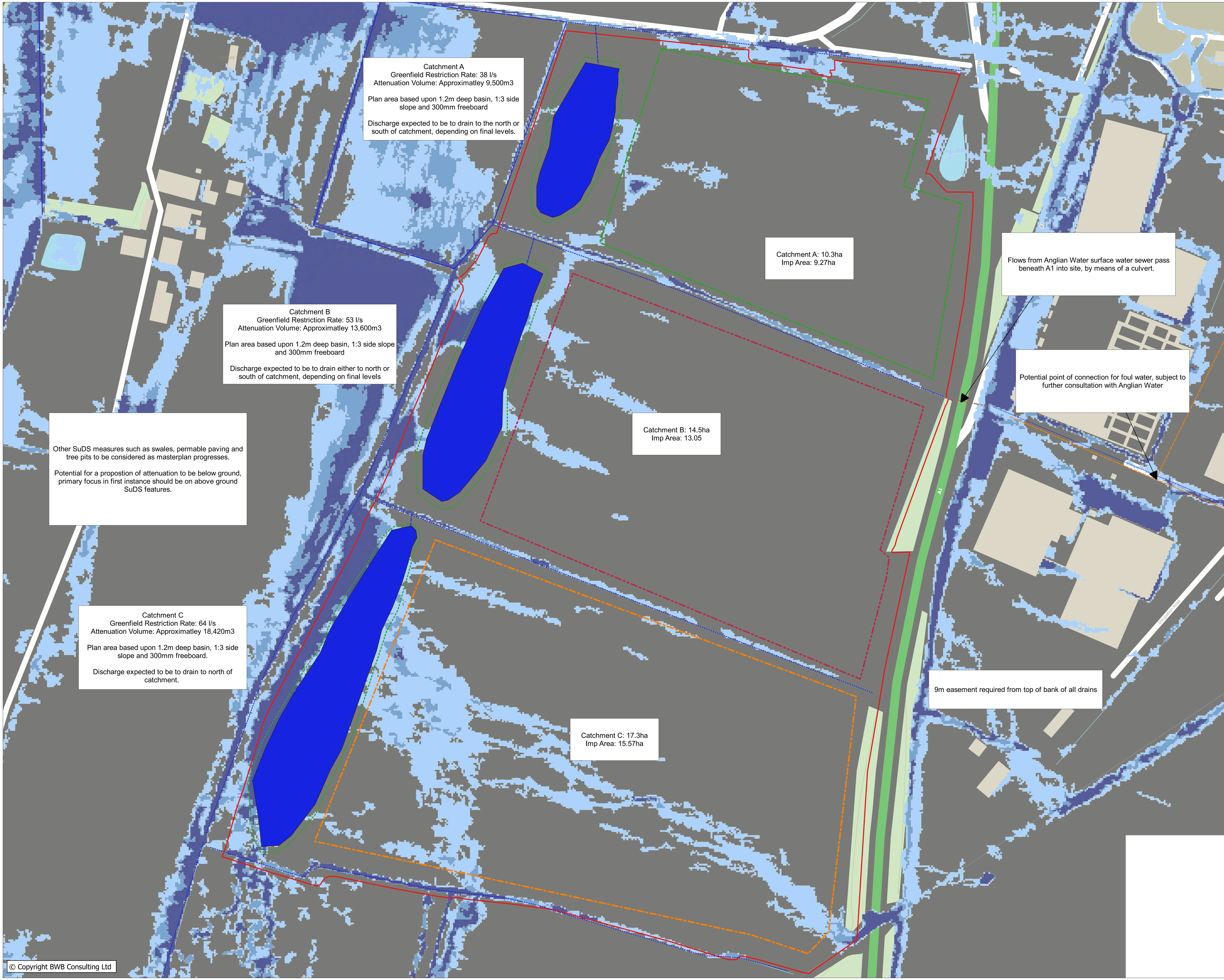
ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	600	Region Number	Region 5

Results	**l/s**
QBAR Rural	3.7
QBAR Urban	3.7
Q2 years	3.3
Q1 year	3.2
Q30 years	8.8
Q100 years	13.1

Appendix 6: MicroDrainage Calculations and Concept Drainage Plan



Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.

2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4. Any discrepancies noted on site are to be reported to the engineer immediately.

5. Plan produced for concept of drainage only, NOT for Planning or Construction.

6. Contour data extracted from 1m spatial resolution LiDAR data.

7. Attenuation sized to accomodate up to and including the 1 in 100 year+ 40% climate change event. 90% of the development area for each catchment assumed to be impermeable.

8. Sewer locations approximate, as taken from sewer records. Full draiange survey required to confirm position, size and depths.

Key

- Catchment A
- Catchment B
- Catchment C
- Attenuation
- 5m SuDS Maintenace Easement
- Anglian Water FW Sewer
- Anglian Water SW Sewer
- Culvert
- Riparian Drain
- IDB Drain
- 1m Contours (m AOD)
- 1 in 30 Year Pluvial Flows
- 1 in 100 Year Pluvial Flows
- 1 in 1000 Year Pluvial Flows

Rev	Date	Details of issue / revision	Drw	Rev
P01	20.07.22	Preliminary Issue	KA	GL

Issues & Revisions

■ Birmingham | 0121 233 3322
□ Leeds | 0113 233 8000
□ London | 0207 407 2879
□ Manchester | 0161 233 4260
□ Nottingham | 0115 924 1100
www.bwbconsulting.com

Client
CADDICK DEVELOPMENTS LTD

Project Title
GONERBY MOOR, GRANTHAM

Drawing Title
CONCEPT DRAINAGE PLAN

Drawn:	**K. Alger**	Reviewed:	**G. Littlewood**
BWB Ref:	**220732**	Date:	**21.07.22**
Scale@A1:	**1:2000**		

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
GMG-BWB-ZZ-XX-DR-YE-0001	**S2**	**P01**

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.081	0.281	37.1	2655.5	O K
30 min Summer	36.166	0.366	38.0	3477.5	O K
60 min Summer	36.253	0.453	38.1	4319.9	O K
120 min Summer	36.338	0.538	38.1	5154.0	O K
180 min Summer	36.398	0.598	38.1	5746.7	O K
240 min Summer	36.444	0.644	38.1	6207.7	O K
360 min Summer	36.512	0.712	38.1	6883.6	O K
480 min Summer	36.559	0.759	38.1	7361.3	O K
600 min Summer	36.593	0.793	38.1	7701.6	O K
720 min Summer	36.617	0.817	38.1	7943.4	O K
960 min Summer	36.645	0.845	38.1	8225.6	O K
1440 min Summer	36.656	0.856	38.1	8342.8	O K
2160 min Summer	36.632	0.832	38.1	8093.7	O K
2880 min Summer	36.601	0.801	38.1	7781.1	O K
4320 min Summer	36.529	0.729	38.1	7060.4	O K
5760 min Summer	36.461	0.661	38.1	6377.1	O K
7200 min Summer	36.400	0.600	38.1	5765.8	O K
8640 min Summer	36.346	0.546	38.1	5228.7	O K
10080 min Summer	36.298	0.498	38.1	4757.3	O K
15 min Winter	36.114	0.314	37.6	2975.8	O K
30 min Winter	36.210	0.410	38.1	3900.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	155.102	0.0	1759.5	38
30 min Summer	101.911	0.0	2372.5	53
60 min Summer	63.674	0.0	3741.6	82
120 min Summer	38.425	0.0	4513.0	140
180 min Summer	28.862	0.0	5036.4	200
240 min Summer	23.610	0.0	5410.9	258
360 min Summer	17.769	0.0	5841.6	376
480 min Summer	14.488	0.0	5945.8	496
600 min Summer	12.326	0.0	5848.1	614
720 min Summer	10.774	0.0	5734.4	732
960 min Summer	8.660	0.0	5528.2	968
1440 min Summer	6.280	0.0	5167.0	1442
2160 min Summer	4.485	0.0	10139.4	1852
2880 min Summer	3.508	0.0	10228.6	2224
4320 min Summer	2.459	0.0	9665.3	2960
5760 min Summer	1.909	0.0	12445.0	3744
7200 min Summer	1.569	0.0	12754.3	4536
8640 min Summer	1.339	0.0	12999.0	5280
10080 min Summer	1.173	0.0	13147.4	6056
15 min Winter	155.102	0.0	2005.5	38
30 min Winter	101.911	0.0	2642.8	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.307	0.507	38.1	4849.0	O K
120 min Winter	36.403	0.603	38.1	5792.2	O K
180 min Winter	36.470	0.670	38.1	6464.9	O K
240 min Winter	36.523	0.723	38.1	6991.0	O K
360 min Winter	36.599	0.799	38.1	7767.8	O K
480 min Winter	36.653	0.853	38.1	8308.2	O K
600 min Winter	36.690	0.890	38.1	8692.0	O K
720 min Winter	36.717	0.917	38.1	8969.9	Flood Risk
960 min Winter	36.750	0.950	38.1	9307.0	Flood Risk
1440 min Winter	36.768	0.968	38.1	9491.0	Flood Risk
2160 min Winter	36.743	0.943	38.1	9233.5	Flood Risk
2880 min Winter	36.701	0.901	38.1	8803.8	Flood Risk
4320 min Winter	36.616	0.816	38.1	7930.5	O K
5760 min Winter	36.520	0.720	38.1	6968.5	O K
7200 min Winter	36.429	0.629	38.1	6051.4	O K
8640 min Winter	36.348	0.548	38.1	5249.9	O K
10080 min Winter	36.278	0.478	38.1	4560.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	63.674	0.0	4200.7	80
120 min Winter	38.425	0.0	5022.6	138
180 min Winter	28.862	0.0	5544.5	196
240 min Winter	23.610	0.0	5867.0	254
360 min Winter	17.769	0.0	6041.0	370
480 min Winter	14.488	0.0	5933.0	486
600 min Winter	12.326	0.0	5830.3	602
720 min Winter	10.774	0.0	5740.7	718
960 min Winter	8.660	0.0	5586.8	948
1440 min Winter	6.280	0.0	5321.8	1400
2160 min Winter	4.485	0.0	11031.8	2040
2880 min Winter	3.508	0.0	10842.9	2320
4320 min Winter	2.459	0.0	9814.1	3220
5760 min Winter	1.909	0.0	13941.2	4104
7200 min Winter	1.569	0.0	14290.8	4904
8640 min Winter	1.339	0.0	14580.8	5696
10080 min Winter	1.173	0.0	14776.3	6376

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 488105 339234 SK 88105 39234
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 9.270

Time From:	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**
0	4	1.545	8	12	1.545	16	20	1.545
4	8	1.545	12	16	1.545	20	24	1.545

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	9300.0	1.200	10571.4

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0262-3810-1000-3810
Design Head (m)	1.000
Design Flow (l/s)	38.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	262
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	38.1
Flush-Flo™	0.408	38.1
Kick-Flo®	0.762	33.5
Mean Flow over Head Range	-	31.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.4	1.200	41.6	3.000	64.7	7.000	97.8
0.200	27.0	1.400	44.8	3.500	69.8	7.500	101.1
0.300	37.4	1.600	47.8	4.000	74.4	8.000	104.4
0.400	38.1	1.800	50.6	4.500	78.8	8.500	107.5
0.500	37.8	2.000	53.2	5.000	83.0	9.000	110.5
0.600	36.9	2.200	55.7	5.500	86.9	9.500	113.5
0.800	34.2	2.400	58.1	6.000	90.7		
1.000	38.1	2.600	60.4	6.500	94.3		

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.040	0.240	34.0	2262.3	O K
30 min Summer	36.113	0.313	37.5	2957.4	O K
60 min Summer	36.187	0.387	38.0	3678.0	O K
120 min Summer	36.261	0.461	38.1	4396.0	O K
180 min Summer	36.301	0.501	38.1	4792.2	O K
240 min Summer	36.327	0.527	38.1	5047.9	O K
360 min Summer	36.359	0.559	38.1	5360.2	O K
480 min Summer	36.379	0.579	38.1	5560.6	O K
600 min Summer	36.392	0.592	38.1	5688.0	O K
720 min Summer	36.400	0.600	38.1	5767.5	O K
960 min Summer	36.407	0.607	38.1	5832.9	O K
1440 min Summer	36.403	0.603	38.1	5797.0	O K
2160 min Summer	36.391	0.591	38.1	5677.7	O K
2880 min Summer	36.374	0.574	38.1	5511.9	O K
4320 min Summer	36.333	0.533	38.1	5106.0	O K
5760 min Summer	36.290	0.490	38.1	4676.8	O K
7200 min Summer	36.247	0.447	38.1	4263.9	O K
8640 min Summer	36.209	0.409	38.1	3885.8	O K
10080 min Summer	36.174	0.374	38.0	3547.6	O K
15 min Winter	36.068	0.268	36.8	2533.3	O K
30 min Winter	36.150	0.350	37.9	3317.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	132.106	0.0	1443.7	38
30 min Summer	86.802	0.0	1999.7	52
60 min Summer	54.368	0.0	3166.3	82
120 min Summer	32.929	0.0	3866.4	140
180 min Summer	24.243	0.0	4265.7	198
240 min Summer	19.399	0.0	4535.1	256
360 min Summer	14.081	0.0	4888.2	374
480 min Summer	11.225	0.0	5128.7	492
600 min Summer	9.408	0.0	5292.1	610
720 min Summer	8.140	0.0	5400.0	726
960 min Summer	6.474	0.0	5489.8	962
1440 min Summer	4.680	0.0	5300.0	1232
2160 min Summer	3.378	0.0	7857.2	1592
2880 min Summer	2.678	0.0	8219.9	1988
4320 min Summer	1.927	0.0	8564.2	2784
5760 min Summer	1.525	0.0	9928.7	3584
7200 min Summer	1.271	0.0	10309.7	4344
8640 min Summer	1.095	0.0	10590.7	5112
10080 min Summer	0.965	0.0	10757.7	5848
15 min Winter	132.106	0.0	1662.5	38
30 min Winter	86.802	0.0	2260.7	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.234	0.434	38.1	4129.3	O K
120 min Winter	36.317	0.517	38.1	4942.1	O K
180 min Winter	36.362	0.562	38.1	5393.6	O K
240 min Winter	36.392	0.592	38.1	5687.9	O K
360 min Winter	36.429	0.629	38.1	6053.9	O K
480 min Winter	36.453	0.653	38.1	6295.4	O K
600 min Winter	36.469	0.669	38.1	6455.6	O K
720 min Winter	36.480	0.680	38.1	6562.8	O K
960 min Winter	36.491	0.691	38.1	6673.9	O K
1440 min Winter	36.490	0.690	38.1	6663.2	O K
2160 min Winter	36.466	0.666	38.1	6426.1	O K
2880 min Winter	36.440	0.640	38.1	6167.7	O K
4320 min Winter	36.376	0.576	38.1	5532.1	O K
5760 min Winter	36.309	0.509	38.1	4865.6	O K
7200 min Winter	36.245	0.445	38.1	4238.5	O K
8640 min Winter	36.188	0.388	38.0	3684.1	O K
10080 min Winter	36.139	0.339	37.8	3214.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	54.368	0.0	3571.4	80
120 min Winter	32.929	0.0	4335.5	138
180 min Winter	24.243	0.0	4762.2	196
240 min Winter	19.399	0.0	5042.6	252
360 min Winter	14.081	0.0	5392.0	368
480 min Winter	11.225	0.0	5605.3	484
600 min Winter	9.408	0.0	5722.0	598
720 min Winter	8.140	0.0	5766.8	714
960 min Winter	6.474	0.0	5696.6	940
1440 min Winter	4.680	0.0	5354.6	1376
2160 min Winter	3.378	0.0	8770.1	1724
2880 min Winter	2.678	0.0	9148.7	2172
4320 min Winter	1.927	0.0	9427.5	3044
5760 min Winter	1.525	0.0	11137.1	3872
7200 min Winter	1.271	0.0	11573.0	4680
8640 min Winter	1.095	0.0	11899.7	5376
10080 min Winter	0.965	0.0	12105.6	6064

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 9.270

Time From:	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**
0	4	1.545	8	12	1.545	16	20	1.545
4	8	1.545	12	16	1.545	20	24	1.545

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	9300.0	1.200	10571.4

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0262-3810-1000-3810
Design Head (m)	1.000
Design Flow (l/s)	38.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	262
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	38.1
Flush-Flo™	0.408	38.1
Kick-Flo®	0.762	33.5
Mean Flow over Head Range	-	31.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.4	1.200	41.6	3.000	64.7	7.000	97.8
0.200	27.0	1.400	44.8	3.500	69.8	7.500	101.1
0.300	37.4	1.600	47.8	4.000	74.4	8.000	104.4
0.400	38.1	1.800	50.6	4.500	78.8	8.500	107.5
0.500	37.8	2.000	53.2	5.000	83.0	9.000	110.5
0.600	36.9	2.200	55.7	5.500	86.9	9.500	113.5
0.800	34.2	2.400	58.1	6.000	90.7		
1.000	38.1	2.600	60.4	6.500	94.3		

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.050	0.250	42.6	3753.3	O K
30 min Summer	36.127	0.327	51.6	4908.0	O K
60 min Summer	36.206	0.406	52.6	6094.9	O K
120 min Summer	36.285	0.485	52.9	7273.0	O K
180 min Summer	36.341	0.541	52.9	8111.7	O K
240 min Summer	36.384	0.584	52.9	8764.5	O K
360 min Summer	36.448	0.648	52.9	9720.4	O K
480 min Summer	36.493	0.693	52.9	10390.9	O K
600 min Summer	36.525	0.725	52.9	10870.6	O K
720 min Summer	36.548	0.748	52.9	11220.3	O K
960 min Summer	36.576	0.776	52.9	11646.6	O K
1440 min Summer	36.591	0.791	52.9	11867.9	O K
2160 min Summer	36.571	0.771	52.9	11569.9	O K
2880 min Summer	36.545	0.745	52.9	11176.7	O K
4320 min Summer	36.487	0.687	52.9	10304.5	O K
5760 min Summer	36.431	0.631	52.9	9467.3	O K
7200 min Summer	36.379	0.579	52.9	8691.9	O K
8640 min Summer	36.333	0.533	52.9	8000.8	O K
10080 min Summer	36.293	0.493	52.9	7388.1	O K
15 min Winter	36.080	0.280	48.6	4202.3	O K
30 min Winter	36.167	0.367	52.2	5502.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	155.102	0.0	2044.8	38
30 min Summer	101.911	0.0	2882.3	53
60 min Summer	63.674	0.0	4847.9	82
120 min Summer	38.425	0.0	5901.1	140
180 min Summer	28.862	0.0	6621.4	200
240 min Summer	23.610	0.0	7149.1	258
360 min Summer	17.769	0.0	7821.3	376
480 min Summer	14.488	0.0	8146.2	494
600 min Summer	12.326	0.0	8225.1	612
720 min Summer	10.774	0.0	8143.2	732
960 min Summer	8.660	0.0	7873.2	968
1440 min Summer	6.280	0.0	7319.2	1442
2160 min Summer	4.485	0.0	13808.8	1832
2880 min Summer	3.508	0.0	13976.0	2168
4320 min Summer	2.459	0.0	13320.6	2940
5760 min Summer	1.909	0.0	17258.0	3712
7200 min Summer	1.569	0.0	17655.7	4488
8640 min Summer	1.339	0.0	17945.7	5280
10080 min Summer	1.173	0.0	18077.4	6056
15 min Winter	155.102	0.0	2372.5	38
30 min Winter	101.911	0.0	3269.9	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.256	0.456	52.9	6838.4	O K
120 min Winter	36.345	0.545	52.9	8170.6	O K
180 min Winter	36.408	0.608	52.9	9121.1	O K
240 min Winter	36.458	0.658	52.9	9862.9	O K
360 min Winter	36.530	0.730	52.9	10956.3	O K
480 min Winter	36.582	0.782	52.9	11731.7	O K
600 min Winter	36.620	0.820	52.9	12295.2	O K
720 min Winter	36.648	0.848	52.9	12714.3	O K
960 min Winter	36.683	0.883	52.9	13250.5	O K
1440 min Winter	36.708	0.908	52.9	13623.9	Flood Risk
2160 min Winter	36.690	0.890	52.9	13355.5	O K
2880 min Winter	36.647	0.847	52.9	12708.7	O K
4320 min Winter	36.566	0.766	52.9	11485.3	O K
5760 min Winter	36.484	0.684	52.9	10264.0	O K
7200 min Winter	36.408	0.608	52.9	9120.5	O K
8640 min Winter	36.340	0.540	52.9	8095.4	O K
10080 min Winter	36.280	0.480	52.9	7201.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	63.674	0.0	5475.9	80
120 min Winter	38.425	0.0	6605.1	138
180 min Winter	28.862	0.0	7344.5	196
240 min Winter	23.610	0.0	7848.4	254
360 min Winter	17.769	0.0	8364.2	370
480 min Winter	14.488	0.0	8425.3	486
600 min Winter	12.326	0.0	8288.0	602
720 min Winter	10.774	0.0	8130.2	720
960 min Winter	8.660	0.0	7809.4	952
1440 min Winter	6.280	0.0	7241.6	1408
2160 min Winter	4.485	0.0	14967.0	2064
2880 min Winter	3.508	0.0	14856.9	2380
4320 min Winter	2.459	0.0	13748.4	3208
5760 min Winter	1.909	0.0	19346.2	4056
7200 min Winter	1.569	0.0	19794.3	4904
8640 min Winter	1.339	0.0	20144.8	5640
10080 min Winter	1.173	0.0	20335.7	6448

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 488105 339234 SK 88105 39234
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 13.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	2.175	8	12	2.175	16	20	2.175
4	8	2.175	12	16	2.175	20	24	2.175

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	15000.0	1.200	15000.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0299-5300-1200-5300
Design Head (m)	1.200
Design Flow (l/s)	53.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	299
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	52.9
Flush-Flo™	0.475	52.9
Kick-Flo®	0.905	46.2
Mean Flow over Head Range	-	43.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.2	1.200	52.9	3.000	82.5	7.000	124.6
0.200	30.8	1.400	57.0	3.500	88.9	7.500	128.9
0.300	50.9	1.600	60.8	4.000	94.8	8.000	133.0
0.400	52.6	1.800	64.4	4.500	100.4	8.500	137.0
0.500	52.9	2.000	67.7	5.000	105.7	9.000	140.9
0.600	52.3	2.200	70.9	5.500	110.8	9.500	144.7
0.800	49.7	2.400	74.0	6.000	115.6		
1.000	48.5	2.600	76.9	6.500	120.2		

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.013	0.213	34.0	3199.8	O K
30 min Summer	36.079	0.279	48.3	4179.6	O K
60 min Summer	36.146	0.346	51.9	5193.8	O K
120 min Summer	36.214	0.414	52.7	6209.5	O K
180 min Summer	36.252	0.452	52.9	6772.9	O K
240 min Summer	36.276	0.476	52.9	7138.8	O K
360 min Summer	36.306	0.506	52.9	7590.8	O K
480 min Summer	36.326	0.526	52.9	7885.0	O K
600 min Summer	36.338	0.538	52.9	8076.0	O K
720 min Summer	36.347	0.547	52.9	8199.6	O K
960 min Summer	36.354	0.554	52.9	8314.2	O K
1440 min Summer	36.355	0.555	52.9	8318.1	O K
2160 min Summer	36.349	0.549	52.9	8229.2	O K
2880 min Summer	36.338	0.538	52.9	8066.2	O K
4320 min Summer	36.308	0.508	52.9	7613.7	O K
5760 min Summer	36.274	0.474	52.9	7102.7	O K
7200 min Summer	36.240	0.440	52.8	6593.6	O K
8640 min Summer	36.208	0.408	52.7	6116.8	O K
10080 min Summer	36.179	0.379	52.4	5682.2	O K
15 min Winter	36.039	0.239	40.1	3581.9	O K
30 min Winter	36.112	0.312	51.2	4682.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	132.106	0.0	1643.6	38
30 min Summer	86.802	0.0	2363.9	53
60 min Summer	54.368	0.0	4061.5	82
120 min Summer	32.929	0.0	5015.1	140
180 min Summer	24.243	0.0	5558.3	198
240 min Summer	19.399	0.0	5924.3	256
360 min Summer	14.081	0.0	6405.4	374
480 min Summer	11.225	0.0	6736.3	492
600 min Summer	9.408	0.0	6966.7	608
720 min Summer	8.140	0.0	7126.9	726
960 min Summer	6.474	0.0	7294.5	962
1440 min Summer	4.680	0.0	7193.2	1224
2160 min Summer	3.378	0.0	10641.7	1584
2880 min Summer	2.678	0.0	11096.4	1980
4320 min Summer	1.927	0.0	11450.5	2784
5760 min Summer	1.525	0.0	13746.9	3584
7200 min Summer	1.271	0.0	14248.4	4344
8640 min Summer	1.095	0.0	14597.0	5112
10080 min Summer	0.965	0.0	14766.6	5856
15 min Winter	132.106	0.0	1919.4	38
30 min Winter	86.802	0.0	2725.3	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.189	0.389	52.5	5827.7	O K
120 min Winter	36.265	0.465	52.9	6977.6	O K
180 min Winter	36.308	0.508	52.9	7619.1	O K
240 min Winter	36.336	0.536	52.9	8039.7	O K
360 min Winter	36.371	0.571	52.9	8566.4	O K
480 min Winter	36.394	0.594	52.9	8916.6	O K
600 min Winter	36.410	0.610	52.9	9151.8	O K
720 min Winter	36.421	0.621	52.9	9311.5	O K
960 min Winter	36.432	0.632	52.9	9485.7	O K
1440 min Winter	36.434	0.634	52.9	9509.3	O K
2160 min Winter	36.418	0.618	52.9	9270.6	O K
2880 min Winter	36.399	0.599	52.9	8986.0	O K
4320 min Winter	36.349	0.549	52.9	8235.9	O K
5760 min Winter	36.295	0.495	52.9	7420.7	O K
7200 min Winter	36.243	0.443	52.8	6637.8	O K
8640 min Winter	36.195	0.395	52.6	5930.0	O K
10080 min Winter	36.155	0.355	52.1	5317.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	54.368	0.0	4615.1	80
120 min Winter	32.929	0.0	5657.2	138
180 min Winter	24.243	0.0	6240.5	196
240 min Winter	19.399	0.0	6626.2	252
360 min Winter	14.081	0.0	7116.1	368
480 min Winter	11.225	0.0	7432.4	482
600 min Winter	9.408	0.0	7631.0	598
720 min Winter	8.140	0.0	7745.2	712
960 min Winter	6.474	0.0	7788.1	940
1440 min Winter	4.680	0.0	7415.4	1372
2160 min Winter	3.378	0.0	11898.3	1708
2880 min Winter	2.678	0.0	12370.0	2164
4320 min Winter	1.927	0.0	12635.0	3044
5760 min Winter	1.525	0.0	15437.1	3880
7200 min Winter	1.271	0.0	16014.8	4688
8640 min Winter	1.095	0.0	16425.1	5440
10080 min Winter	0.965	0.0	16644.2	6152

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 13.050

Time From:	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**
0	4	2.175	8	12	2.175	16	20	2.175
4	8	2.175	12	16	2.175	20	24	2.175

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	**Area (m²)**	**Depth (m)**	**Area (m²)**
0.000	15000.0	1.200	15000.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0299-5300-1200-5300
Design Head (m)	1.200
Design Flow (l/s)	53.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	299
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	1.200	52.9
Flush-Flo™	0.475	52.9
Kick-Flo®	0.905	46.2
Mean Flow over Head Range	-	43.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	9.2	1.200	52.9	3.000	82.5	7.000	124.6
0.200	30.8	1.400	57.0	3.500	88.9	7.500	128.9
0.300	50.9	1.600	60.8	4.000	94.8	8.000	133.0
0.400	52.6	1.800	64.4	4.500	100.4	8.500	137.0
0.500	52.9	2.000	67.7	5.000	105.7	9.000	140.9
0.600	52.3	2.200	70.9	5.500	110.8	9.500	144.7
0.800	49.7	2.400	74.0	6.000	115.6		
1.000	48.5	2.600	76.9	6.500	120.2		

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.064	0.264	50.2	4981.8	O K
30 min Summer	36.144	0.344	62.0	6516.9	O K
60 min Summer	36.226	0.426	63.4	8097.1	O K
120 min Summer	36.307	0.507	63.7	9672.2	O K
180 min Summer	36.365	0.565	63.7	10798.2	O K
240 min Summer	36.410	0.610	63.7	11677.5	O K
360 min Summer	36.476	0.676	63.7	12973.8	O K
480 min Summer	36.522	0.722	63.7	13892.7	O K
600 min Summer	36.556	0.756	63.7	14559.1	O K
720 min Summer	36.581	0.781	63.7	15053.3	O K
960 min Summer	36.613	0.813	63.7	15680.3	O K
1440 min Summer	36.634	0.834	63.7	16099.8	O K
2160 min Summer	36.618	0.818	63.7	15783.2	O K
2880 min Summer	36.593	0.793	63.7	15293.6	O K
4320 min Summer	36.539	0.739	63.7	14213.5	O K
5760 min Summer	36.486	0.686	63.7	13179.9	O K
7200 min Summer	36.437	0.637	63.7	12216.2	O K
8640 min Summer	36.393	0.593	63.7	11341.1	O K
10080 min Summer	36.353	0.553	63.7	10556.9	O K
15 min Winter	36.095	0.295	57.5	5577.8	O K
30 min Winter	36.185	0.385	62.8	7305.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	155.102	0.0	2540.7	38
30 min Summer	101.911	0.0	3593.3	53
60 min Summer	63.674	0.0	6208.3	82
120 min Summer	38.425	0.0	7540.8	140
180 min Summer	28.862	0.0	8428.8	200
240 min Summer	23.610	0.0	9055.0	258
360 min Summer	17.769	0.0	9781.7	376
480 min Summer	14.488	0.0	10031.3	496
600 min Summer	12.326	0.0	9971.2	614
720 min Summer	10.774	0.0	9808.7	732
960 min Summer	8.660	0.0	9453.4	970
1440 min Summer	6.280	0.0	8759.8	1444
2160 min Summer	4.485	0.0	17555.8	1948
2880 min Summer	3.508	0.0	17482.3	2276
4320 min Summer	2.459	0.0	16066.1	2996
5760 min Summer	1.909	0.0	22690.8	3800
7200 min Summer	1.569	0.0	23182.5	4560
8640 min Summer	1.339	0.0	23539.4	5368
10080 min Summer	1.173	0.0	23674.9	6152
15 min Winter	155.102	0.0	2952.8	38
30 min Winter	101.911	0.0	4074.0	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.277	0.477	63.7	9082.9	O K
120 min Winter	36.368	0.568	63.7	10862.6	O K
180 min Winter	36.433	0.633	63.7	12137.0	O K
240 min Winter	36.484	0.684	63.7	13135.0	O K
360 min Winter	36.559	0.759	63.7	14614.6	O K
480 min Winter	36.612	0.812	63.7	15673.3	O K
600 min Winter	36.651	0.851	63.7	16451.7	O K
720 min Winter	36.681	0.881	63.7	17038.9	O K
960 min Winter	36.719	0.919	63.7	17813.1	Flood Risk
1440 min Winter	36.749	0.949	63.7	18415.7	Flood Risk
2160 min Winter	36.741	0.941	63.7	18243.8	Flood Risk
2880 min Winter	36.706	0.906	63.7	17544.3	Flood Risk
4320 min Winter	36.627	0.827	63.7	15963.3	O K
5760 min Winter	36.552	0.752	63.7	14470.2	O K
7200 min Winter	36.479	0.679	63.7	13045.0	O K
8640 min Winter	36.413	0.613	63.7	11744.4	O K
10080 min Winter	36.354	0.554	63.7	10584.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	63.674	0.0	7008.0	82
120 min Winter	38.425	0.0	8414.3	138
180 min Winter	28.862	0.0	9292.8	196
240 min Winter	23.610	0.0	9844.1	254
360 min Winter	17.769	0.0	10264.5	370
480 min Winter	14.488	0.0	10154.8	488
600 min Winter	12.326	0.0	9957.4	604
720 min Winter	10.774	0.0	9745.0	720
960 min Winter	8.660	0.0	9328.2	954
1440 min Winter	6.280	0.0	8651.7	1412
2160 min Winter	4.485	0.0	18529.6	2076
2880 min Winter	3.508	0.0	17879.6	2692
4320 min Winter	2.459	0.0	16431.8	3284
5760 min Winter	1.909	0.0	25413.7	4152
7200 min Winter	1.569	0.0	25960.5	4984
8640 min Winter	1.339	0.0	26365.8	5800
10080 min Winter	1.173	0.0	26573.9	6560

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 488105 339234 SK 88105 39234
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 17.300

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	2.880	8	12	2.880	16	20	2.890
4	8	2.880	12	16	2.880	20	24	2.890

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	**Area (m²)**	**Depth (m)**	**Area (m²)**
0.000	18700.0	1.200	20485.8

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0324-6400-1200-6400
Design Head (m)	1.200
Design Flow (l/s)	64.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	324
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	1.200	64.0
Flush-Flo™	0.502	63.7
Kick-Flo®	0.916	56.2
Mean Flow over Head Range	-	51.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	9.7	1.200	64.0	3.000	99.8	7.000	151.0
0.200	33.1	1.400	69.0	3.500	107.6	7.500	156.1
0.300	58.6	1.600	73.6	4.000	114.9	8.000	161.2
0.400	63.1	1.800	77.9	4.500	121.6	8.500	166.0
0.500	63.7	2.000	82.0	5.000	128.1	9.000	170.7
0.600	63.3	2.200	85.9	5.500	134.2	9.500	175.3
0.800	60.3	2.400	89.6	6.000	140.0		
1.000	58.6	2.600	93.1	6.500	145.6		

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	36.025	0.225	40.0	4246.7	O K
30 min Summer	36.093	0.293	57.1	5550.6	O K
60 min Summer	36.164	0.364	62.5	6901.7	O K
120 min Summer	36.234	0.434	63.5	8261.1	O K
180 min Summer	36.274	0.474	63.7	9021.1	O K
240 min Summer	36.299	0.499	63.7	9519.8	O K
360 min Summer	36.332	0.532	63.7	10146.0	O K
480 min Summer	36.353	0.553	63.7	10563.6	O K
600 min Summer	36.367	0.567	63.7	10844.9	O K
720 min Summer	36.377	0.577	63.7	11036.6	O K
960 min Summer	36.388	0.588	63.7	11244.9	O K
1440 min Summer	36.390	0.590	63.7	11293.6	O K
2160 min Summer	36.386	0.586	63.7	11211.1	O K
2880 min Summer	36.377	0.577	63.7	11039.6	O K
4320 min Summer	36.351	0.551	63.7	10526.9	O K
5760 min Summer	36.320	0.520	63.7	9921.0	O K
7200 min Summer	36.288	0.488	63.7	9294.2	O K
8640 min Summer	36.257	0.457	63.6	8691.3	O K
10080 min Summer	36.227	0.427	63.4	8125.2	O K
15 min Winter	36.052	0.252	47.2	4754.1	O K
30 min Winter	36.128	0.328	61.6	6217.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	132.106	0.0	2036.6	38
30 min Summer	86.802	0.0	2941.6	53
60 min Summer	54.368	0.0	5198.0	82
120 min Summer	32.929	0.0	6419.5	140
180 min Summer	24.243	0.0	7106.0	198
240 min Summer	19.399	0.0	7562.3	258
360 min Summer	14.081	0.0	8147.8	374
480 min Summer	11.225	0.0	8535.2	492
600 min Summer	9.408	0.0	8789.4	610
720 min Summer	8.140	0.0	8949.7	728
960 min Summer	6.474	0.0	9066.0	964
1440 min Summer	4.680	0.0	8735.8	1292
2160 min Summer	3.378	0.0	13793.4	1644
2880 min Summer	2.678	0.0	14312.0	2028
4320 min Summer	1.927	0.0	14531.3	2832
5760 min Summer	1.525	0.0	18092.8	3640
7200 min Summer	1.271	0.0	18742.9	4408
8640 min Summer	1.095	0.0	19184.6	5192
10080 min Summer	0.965	0.0	19380.5	5952
15 min Winter	132.106	0.0	2383.0	38
30 min Winter	86.802	0.0	3396.5	52

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	36.208	0.408	63.2	7741.9	O K
120 min Winter	36.287	0.487	63.7	9280.0	O K
180 min Winter	36.331	0.531	63.7	10144.3	O K
240 min Winter	36.361	0.561	63.7	10715.1	O K
360 min Winter	36.398	0.598	63.7	11441.5	O K
480 min Winter	36.423	0.623	63.7	11934.2	O K
600 min Winter	36.440	0.640	63.7	12274.5	O K
720 min Winter	36.453	0.653	63.7	12514.9	O K
960 min Winter	36.467	0.667	63.7	12802.4	O K
1440 min Winter	36.474	0.674	63.7	12940.9	O K
2160 min Winter	36.460	0.660	63.7	12669.3	O K
2880 min Winter	36.445	0.645	63.7	12367.3	O K
4320 min Winter	36.401	0.601	63.7	11510.5	O K
5760 min Winter	36.351	0.551	63.7	10528.5	O K
7200 min Winter	36.301	0.501	63.7	9551.0	O K
8640 min Winter	36.254	0.454	63.6	8635.1	O K
10080 min Winter	36.211	0.411	63.2	7810.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	54.368	0.0	5910.0	80
120 min Winter	32.929	0.0	7234.0	138
180 min Winter	24.243	0.0	7960.0	196
240 min Winter	19.399	0.0	8429.2	254
360 min Winter	14.081	0.0	9001.0	368
480 min Winter	11.225	0.0	9341.7	484
600 min Winter	9.408	0.0	9525.1	600
720 min Winter	8.140	0.0	9597.3	714
960 min Winter	6.474	0.0	9503.7	942
1440 min Winter	4.680	0.0	8928.9	1384
2160 min Winter	3.378	0.0	15368.7	1772
2880 min Winter	2.678	0.0	15864.5	2204
4320 min Winter	1.927	0.0	15820.6	3108
5760 min Winter	1.525	0.0	20313.4	3944
7200 min Winter	1.271	0.0	21059.3	4768
8640 min Winter	1.095	0.0	21584.6	5544
10080 min Winter	0.965	0.0	21845.2	6264

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 17.300

Time From:	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**	**Time From:**	**(mins) To:**	**Area (ha)**
0	4	2.880	8	12	2.880	16	20	2.890
4	8	2.880	12	16	2.880	20	24	2.890

Model Details

Storage is Online Cover Level (m) 37.000

Tank or Pond Structure

Invert Level (m) 35.800

Depth (m)	**Area (m²)**	**Depth (m)**	**Area (m²)**
0.000	18700.0	1.200	20485.8

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0324-6400-1200-6400
Design Head (m)	1.200
Design Flow (l/s)	64.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	324
Invert Level (m)	35.800
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	1.200	64.0
Flush-Flo™	0.502	63.7
Kick-Flo®	0.916	56.2
Mean Flow over Head Range	-	51.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**	**Depth (m)**	**Flow (l/s)**
0.100	9.7	1.200	64.0	3.000	99.8	7.000	151.0
0.200	33.1	1.400	69.0	3.500	107.6	7.500	156.1
0.300	58.6	1.600	73.6	4.000	114.9	8.000	161.2
0.400	63.1	1.800	77.9	4.500	121.6	8.500	166.0
0.500	63.7	2.000	82.0	5.000	128.1	9.000	170.7
0.600	63.3	2.200	85.9	5.500	134.2	9.500	175.3
0.800	60.3	2.400	89.6	6.000	140.0		
1.000	58.6	2.600	93.1	6.500	145.6		

Appendix 7: Anglian Water Pre-development Enquiry Response

Pre-Planning Assessment Report

Land to west of A1, Gonerby Moor, Grantham

InFlow Reference: PPE-0148633

Assessment Type: Used Water

Report published: 01/07/2022

Thank you for submitting a pre-planning enquiry.

This has been produced for BWB Consulting.

Your reference number is **PPE-0148633**.

This report can be submitted as a drainage strategy for the development should it seek planning permission.

If you have any questions upon receipt of this report, you can submit a further question via InFlow. Alternatively, please contact the Planning & Capacity team on **07929 786 955** or email planningliaison@anglianwater.co.uk

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Section 1 - Proposed development

The response within this report has been based on the following information which was submitted as part of your application:

List of planned developments	
Type of development	**No. Of units**
Storage or distribution	6

The anticipated residential build rate is:

Year	Y1
Build rate	6

Development type: Greenfield

Planning application status: Unknown

Site grid reference number: SK8813639254

The comments contained within this report relate to the public water mains and sewers indicated on our records.

Your attention is drawn to the disclaimer in the useful information section of this report.

Section 2 - Assets affected

Our records indicate that there are no public water mains/public sewers or other assets owned by Anglian Water within the boundary of your development site. However, it is highly recommended that you carry out a thorough investigation of your proposed working area to establish whether any unmapped public or private sewers and lateral drains are in existence.

Due to the private sewer transfer in October 2011 many newly adopted public used water assets and their history are not indicated on our records. You also need to be aware that your development site may contain private water mains, drains or other assets not shown on our records. These are private assets and not the responsibility of Anglian Water but that of the landowner.

Section 3 - Water recycling services

In examining the used water system we assess the ability for your site to connect to the public sewerage network without causing a detriment to the operation of the system. We also assess the receiving water recycling centre and determine whether the water recycling centre can cope with the increased flow and effluent quality arising from your development.

Water recycling centre

The foul drainage from the proposed development is in the catchment of Marston (Lincs) Water Recycling Centre, which currently has capacity to treat the flows from your development site. Anglian Water cannot reserve capacity and the available capacity at the water recycling centre can be reduced at any time due to growth, environmental and regulation driven changes.

Used water network

Anglian Water has undertaken a high level assessment using calculations from Minimum Asset Standards to determine the expected size of sewer that is needed to drain the site using the Design and Construction Guidance (DCG) which has determined that the size of sewer required to drain the development site is 300mm. This means the point of connection at this time would need to be to a 300mm public foul sewer. The nearest points of connection which meet this criteria are; 1) there is a 610mm public foul sewer right outside Marston Water Recycling Centre approximately 3420m to the north, or 2) to the south-east 4333m, there is a 1250mm foul sewer located at NGR SK9204837461. We appreciate Anglian Water have used a set of assumptions of the foul flows to determine the connection point. Once you are at the detailed design stage and have a clearer view of the expected foul flows from the development please get in touch. If the flows are lower than we have anticipated, the site may be able to be drained via a 225mm sewer. A connection could potentially then be made to the 225mm public foul sewer located on Palmer Road at manhole 8200 (NGR SK8880039283). Katie Clark, our Pre-Development Senior Engineer for this area and will be responsible for evaluating the foul water drainage strategy once you have it at detailed design stage. We'd grateful if you could advise Katie of your availability, at the appropriate time, for a meeting via a conference call. For your reference, Katie can be contacted at 07811 038383 or kClark2@anglianwater.co.uk

It is assumed that the developer will provide the necessary infrastructure to convey flows from the site to the network. Consequently, this report does not include any costs for the conveyance of flows.

Surface water disposal

"ou indicated on the Pre-Planning Application form that a connection to the public surface water sewer network is not required. A new surface water sewer can be used as a mechanism to discharge surface water to a watercourse or as part of a Suds scheme where appropriate. Subject to the sewer being designed in accordance with the current version of Sewers For Adoption, the sewer can be put forward for adoption by Anglian Water under Section 104 of the Water Industry Act 1991. If the outfall is to a watercourse, the applicant will be required to obtain consent to discharge via the appropriate body. Therefore a capacity assessment has not been made on the public surface water network. However, should this situation change and you wish to have a surface water connection assessment on the local network, then we will provide this free of charge if requested within 12 months of this report and you are able to provide the relevant evidence that your original strategy was unviable.

As you may be aware, Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in our SuDs adoption manual. This can be found on our website. We will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:

1. Effective upstream source control,
2. Effective exceedance design, and
3. Effective maintenance schedule demonstrating than the assets can be maintained both now and in the future with adequate access.

If you wish to look at the adoption of any SuDs then an expression of interest form can be found on our website

As the proposed method of surface water disposal is not relevant to Anglian Water; we suggest that you contact the relevant Local Authority, Lead Local Flood Authority, the Environment Agency or the Internal Drainage Board, as appropriate.

Trade Effluent

We note that you do not have any trade effluent requirements. Should this be required in the future you will need our written formal consent. This is in accordance with Section 118 of the Water Industry Act (1991).

Used Water Budget Costs

Your development site will be required to pay an Infrastructure charge for each new property connecting to the public water and sewerage network that benefits from Full planning permission. The infrastructure charge replaces the zonal charge as previously identified.

You will be required to pay an infrastructure charge upon connection for each new plot on your development site. The infrastructure charge are types of charges set out in Section 146(2) of the Water Industry Act 1991.

The charge should be paid by anyone who wishes to build or develop a property and is payable upon request of connection.

• The Infrastructure Charge is based on the cost of any reinforcement and upgrades to our existing network ("Network Reinforcements"), whether designed to address strategic or local capacity issues. For more information on our Infrastructure Charge, please see the 'Useful Information' section of this report.

Infrastructure charges are raised on a standard basis of one charge per new connection (one for water and one for sewerage).

The Water Recyling Infrastructure charge for your dwellings is:

Infrastructure charge	Number of units	Total
£ 490	0	£0.00

Please note that you should also budget for infrastructure charges on non-household premises where applicable and these will be calculated according to the number and type of water fittings in the premises. This is called the "relevant multiplier" method of calculating the charge and the relevant multiplier will be applied to the figures set out in our 2022-23 Developer Charging Arrangements to arrive at the amount payable. Details of the relevant multiplier for each fitting can be found on our website.

Section 4 - Useful information

Water Industry Act – Key used water sections

Section 98:

This provides you with the right to requisition a new public sewer. The new public sewer can be constructed by Anglian Water on your behalf. Alternatively, you can construct the sewer yourself under section 30 of the Anglian Water Authority Act 1977.

Section 102:

This provides you with the right to have an existing sewerage asset vested by us. It is your responsibility to bring the infrastructure to an adoptable condition ahead of the asset being vested.

Section 104:

This provides you with the right to have a design technically vetted and an agreement reached that will see us adopt your assets following their satisfactory construction and connection to the public sewer.

Section 106:

This provides you with the right to have your constructed sewer connected to the public sewer.

Section 185

This provides you with the right to have a public sewerage asset diverted.

Details on how to make a formal application for a new sewer, new connection or diversion are available on our website or via our Development Services team on **0345 60 66 087**.

Sustainable drainage systems

Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not resilient to climate change in the long term. .

Our preferred method of surface water disposal is through the use of Sustainable Drainage Systems or SuDS.

SuDS are a range of techniques that aim to mimic the way surface water drains in natural systems within urban areas. For more information on SuDS, please visit our website

We recommend that you contact the Local Authority and Lead Local Flood Authority (LLFA) for your site to discuss your application.

Private sewer transfers

Sewers and lateral drains connected to the public sewer on the 1 July 2011 transferred into Water Company ownership on the 1 October 2011. This follows the implementation of the Floods and Water Management Act (FWMA). This included sewers and lateral drains that were subject to an existing Section 104 Adoption Agreement and those that were not. There were exemptions and the main non-transferable assets were as follows:

Surface water sewers and lateral drains that do not discharge to the public sewer, e.g. those that discharged to a watercourse.

Foul sewers and lateral drains that discharged to a privately owned sewage treatment/collection facility.

Pumping stations and rising mains will transfer between 1 October 2011 and 1 October 2016.

The implementation of Section 42 of the FWMA will ensure that future private sewers will not be created. It is anticipated that all new sewer applications will need to have an approved section 104 application ahead of a section 106 connection.

It is anticipated that all new sewer applications will need to have an approved Section104 application ahead of a Section 106 connection

Encroachment

Anglian Water operates a risk based approach to development encroaching close to our used water infrastructure. We assess the issue of encroachment if you are planning to build within 400 metres of a water recycling centre or, within 15 metres to 100 metres of a pumping station. We have more information available on our website

Locating our assets

Maps detailing the location of our water and used water infrastructure including both underground assets and above ground assets such as pumping stations and recycling centres are available from digdat

All requests from members of the public or non-statutory bodies for maps showing the location of our assets will be subject to an appropriate administrative charge.

We have more information on our website

Charging arrangements

Our charging arrangements and summary for this year’s water and used water connection and infrastructure charges can be found on our website

Section 5 - Disclaimer

The information provided in this report is based on data currently held by Anglian Water Services Limited ('Anglian Water') or provided by a third party. Accordingly, the information in this report is provided with no guarantee of accuracy, timeliness, completeness and is without indemnity or warranty of any kind (express or implied).

This report should not be considered in isolation and does not nullify the need for the enquirer to make additional appropriate searches, inspections and enquiries. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework ('NPPF') and any infrastructure needs identified in this report must be considered in the context of current, adopted and/or emerging local plans. Where local plans are absent, silent or have expired these needs should be considered against the definition of sustainability holistically as set out in the NPPF.

Whilst the information in this report is based on the presumption that proposed development obtains planning permission, nothing in this report confirms that planning permission will be granted or that Anglian Water will be bound to carry out the works/proposals contained within this report.

No liability whatsoever, including liability for negligence is accepted by Anglian Water or its partners, employees or agents, for any error or omission, or for the results obtained from the use of this report and/or its content.

Furthermore, in no event will any of those parties be liable to the applicant or any third party for any decision made or action taken as a result of reliance on this report.

This report is valid from the date issued and the enquirer is advised to resubmit their request for an up to date report should there be a delay in submitting any subsequent application for water supply/sewer connection(s). Our pre-planning reports are valid for 12 months, however please note Anglian Water cannot reserve capacity and available capacity in our network can be reduced at any time due to increased requirements from existing businesses and houses as well as from new housing and new commercial developments.

A CAF GROUP COMPANY

www.bwbconsulting.com

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