

PERSIMMON HOMES ESSEX

**PROPOSED RESIDENTIAL DEVELOPMENT:
DOVERS CORNER, RAINHAM**



**TRANSPORT ASSESSMENT: VOLUME 1
(TEXT, FIGURES & DRAWINGS)**

**REPORT REFERENCE NO. S960-02
PROJECT NO. S960
JUNE 2015**

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(TEXT, FIGURES & DRAWINGS)**

**Ardent Consulting Engineers
Suite 207
One Allie Street
LONDON
E1 8DE
Tel: 020 7680 4088
Fax: 020 7488 3736
enquiries@ardent-ce.co.uk**

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DOCUMENT CONTROL

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
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EXECUTIVE SUMMARY

Persimmon Homes Essex has submitted a planning application for the proposed residential redevelopment of the Dovers Corner Industrial Estate and Boomes Industrial Estate, Rainham, to provide 396 residential dwellings.

The Site is on the fringe of Rainham Village, within walking distance of employment opportunities and local shops and schools. There is a comprehensive network of pedestrian and cycle routes in its proximity, and it is readily accessible by public transport with bus stops and Rainham railway station located within a short walk.

It is proposed to consolidate the existing site access arrangements for vehicles, retaining this from a single point on New Road, with alternative emergency access taken from Lamson Road. The existing site access junction will be modified to serve the new residential use, and the existing accesses on New Road and Bridge Road closed and foot/cycleways reinstated.

The proposed scheme is design-led, with emphasis on providing high quality shared surfaces, assisting in reducing car dominance, keeping traffic speeds within the target of 20mph, and prioritising pedestrian and cycle movement. To further enhance site connectivity, and integrate with neighbouring sites and wider area designations, new pedestrian and cycle routes are provided across and through the site to facilitate convenient access to Rainham Village and the railway station.

The proposed level of car parking provision, within *London Plan* maximum standards, is considered appropriate in the context of the site's village fringe location and public transport accessibility.

Predicted changes in traffic flows on the local highway network in the weekday am and pm peak hours resulting from the proposed redevelopment scheme have been identified, and it has been found that impact on the operation of junctions is minimal, with only marginal increases in queuing forecast.

The application proposals represent an exciting opportunity to deliver a sustainable residential development at this key sub-site in the Rainham West designation. A high quality environment will be provided which will provide significant planning benefits to the local area in accordance with national, regional and local planning policy, and the objectives of the site specific policy.

1.0 INTRODUCTION

- 1.1 Ardent Consulting Engineers (ACE) has been appointed by Persimmon Homes Essex (PHE) (the 'Applicant') to advise on transport and infrastructure aspects of the proposed redevelopment of the Dovers Corner Industrial Estate and Boomes Industrial Estate, Rainham (the 'Site'), in the London Borough of Havering (LBH).

Scope

- 1.2 This Transport Assessment (TA) has been prepared to accompany a full planning application for: *"demolition and phased residential redevelopment of 396 residential dwellings comprising 177 houses (up to 3 storeys) and 219 apartments (up to 5 storeys) (Use Class C3), associated car parking, cycle parking, substation, public open space and pedestrian and cycle infrastructure, de-culverting of the Pooles Sewer, relocation of the existing gas main, alterations to access to New Road, closure of accesses to New Road and Bridge Road, formation of emergency only access to Lamson Road at the Dovers Corner Industrial Estate and Boomes Industrial Estate, New Road, Rainham, Essex, RM13 8QT"*.
- 1.3 The planning application for the proposed development is submitted to LBH as the local planning and highway authority. The application is 'referable' and will be directed to the Mayor of London and the Greater London Authority (GLA), which will seek guidance from Transport for London (TfL) on strategic transport matters.
- 1.4 The proposed development has been subject to extensive pre-application discussions with LBH through a Planning Performance Agreement (PPA). Pre-application discussions have also been held with the GLA and TfL between August 2014 and May 2015.
- 1.5 This TA has been prepared in accordance with TfL's '*Transport Assessment Best Practice Guidance*' and its scope agreed with both

LBH and TfL (see **Appendix A**). It forms part of an Environmental Statement (ES), which accompanies the planning application. The potential environmental impacts resulting from forecast changes in the site's trip attraction/generation are set out in Chapter 15 (Transport & Access) of the ES.

Development Overview

- 1.6 The Site is located within the 'London Riverside Opportunity Area' ('LROA') designated by the *London Plan*, and is a sub-site of the wider Rainham West site, designated by LBH's *Site Specific Allocations Development Plan Document (DPD)* (Site Specific Allocation SSA12).
- 1.7 The proposed development comprises the demolition of all existing industrial units on the site (ref. Drawing PH154-DP-001 (Rev A)) in order to deliver new high quality residential accommodation comprising 396 new dwellings. The scheme incorporates a broad range of residential accommodation including two bed houses and flats, and three and four bed family homes.
- 1.8 The proposed development represents an exciting opportunity to deliver a sustainable residential development at this key site within Rainham West. A high quality permeable environment will be created which will provide significant planning benefits to the local area in accordance with national, regional and local planning policy.
- 1.9 The proposed development constitutes a significantly reduced scale of development on the site to that previously granted detailed planning consent at Appeal in 2011. The previous scheme comprised 729 dwellings and 8,780m² of retail/commercial floor space (app. ref. U0002.08). The planning application was submitted by Weston Homes.

Structure of TA

1.10 Following this introduction, the remainder of this report is structured as follows: -

- **Section 2.0** describes the existing situation;
- **Section 3.0** outlines the proposed redevelopment scheme;
- **Section 4.0** assesses how the development complies with current national, regional and local policy guidance on transport and land use planning;
- **Section 5.0** sets out the forecast trip attraction/generation and assumed modal split of the development;
- **Section 6.0** considers the impact of the additional trips on the local transport network; and
- **Section 7.0** provides a summary and sets out the conclusions.

2.0 EXISTING SITUATION

Site Location

2.1 The application site is located on the north-west fringe of Rainham Village, directly south-west of Dovers Corner roundabout as shown at **Plate 1**.

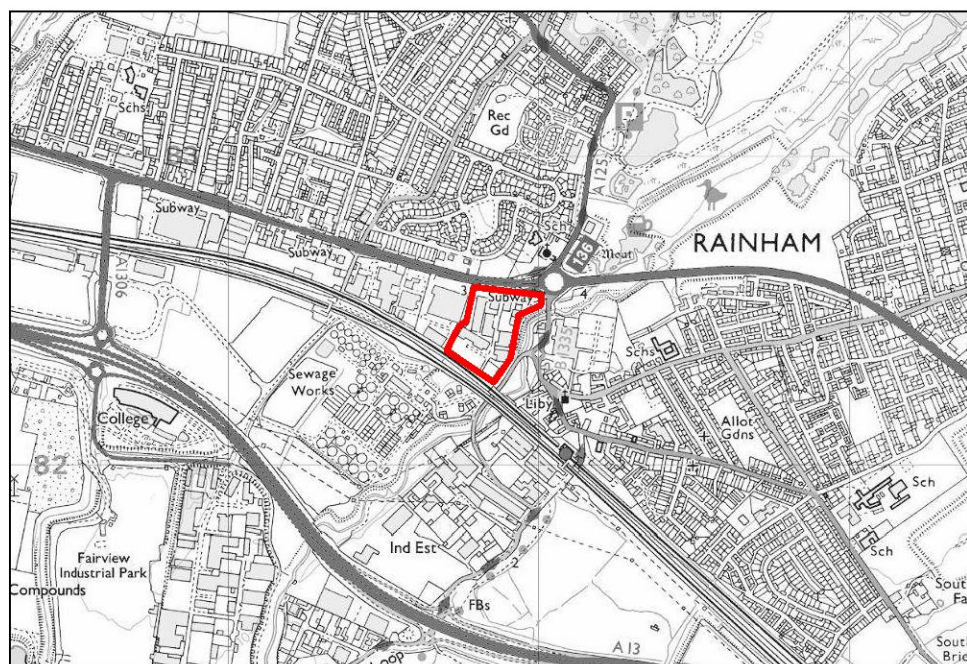


Plate 1: Site Location

2.2 The outer boundary of the site is formed by:

- the A1306 New Road to the north;
- Bridge Road and Lamson Road to the east;
- the Tilbury Loop of the Essex Thameside railway line to the south; and
- Havering College (Rainham Campus) and the new Passive Close housing development to the west.

The Site

- 2.3 An aerial view of the site is shown at **Plate 2**. It currently comprises the Dovers Corner Industrial Estate and Boomes Industrial Estate, covering a total area of some 5.7 hectares with total floor space of approximately 4,000m² under Use Classes B2 and B8.



Plate 2: Aerial View of Site

- 2.4 The Site includes a range of buildings from small workshops to large warehouse units, along with adjacent areas of hardstanding for car parking and heavy goods vehicle (HGV) loading and turning.
- 2.5 The trip attraction of the existing industrial uses on site is reviewed in **Section 5.0** in the context of historic traffic surveys from 2008, contemporary surveys from 2014 and survey data for similar sites available on the TRICS database.

Planning History

- 2.6 Detailed planning consent was granted to Weston Homes via the Appeal process in 2011 for a residential-led, mixed-use scheme on the site comprising 729 dwellings and 8,780m² of retail/commercial floor space (app. ref. U0002.08). The consent was never implemented and is no longer an extant planning consent.
- 2.7 The Weston Homes planning application was supported by a TA prepared by Bettridge Turner & Partners (BTP) (2011).

Access

- 2.8 Vehicular site access is available from two points on the A1306 New Road and one location on Bridge Road (see **Plate 3**), as follows: -
1. Primary access to the industrial estate from New Road;
 2. Secondary access from New Road serving a scrap merchants and builders' merchants; and
 3. Bridge Road access, primarily serving an existing business - Rainham Sheds Ltd.



Plate 3: Site Access

- 2.9 The primary site access from New Road comprises a priority 'T' junction with ghost right turn lane, located around 100m west of Dovers Corner Roundabout (see **Plate 4**). The junction bellmouth is

currently very wide to cater for the frequent turning movements of HGVs, as necessary to serve the existing industrial employment site use.



Plate 4: Primary New Road Access

- 2.10 There is a shared foot/cycleway on the east side of the access junction and a segregated foot/cycleway on the west side. There is no marked transition between these, and the routes do not align, thereby creating a confusing layout for users.
- 2.11 The secondary access is located around 90m west of the primary access on New Road and also comprises a priority 'T' junction with ghost right turn lane (see **Plate 5**).



Plate 5: Secondary New Road Access

- 2.12 The site access from Bridge Road comprises a simple priority junction, located around 40m south of Dovers Corner Roundabout (see **Plate 6**). The access road, at 4m wide, is narrow and cannot accommodate two-way vehicle flow.



Plate 6: Bridge Road Access

Local Highway Network

- 2.13 The local highway network in the vicinity of the site is shown at **Plate 7**.

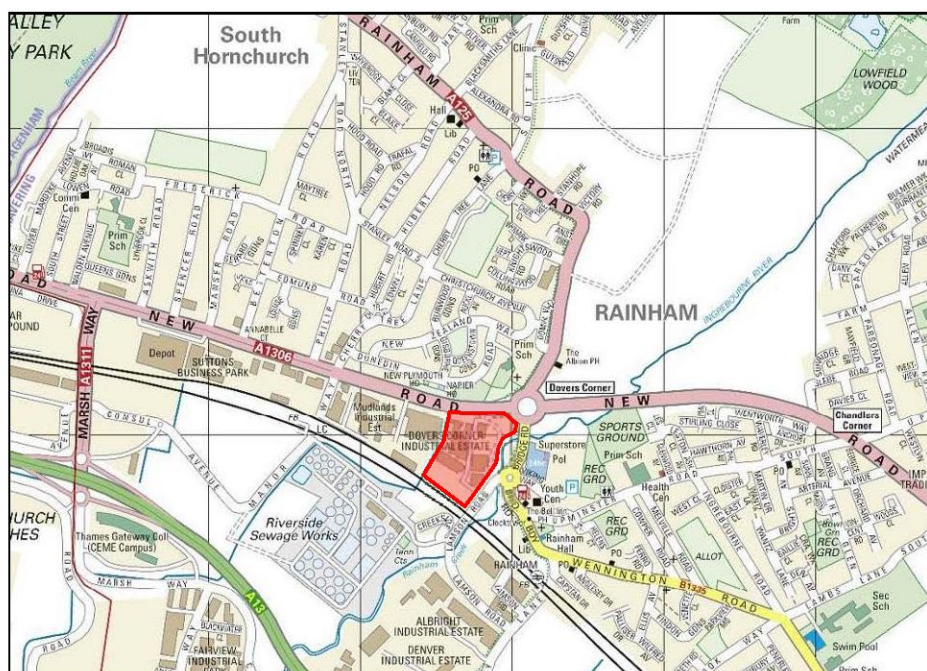


Plate 7: Local Highway Network

A1306 New Road

- 2.14 The A1306 is the historic route of the A13, being redesignated and de-trunked in 1999 on opening of the new dual carriageway A13 which bypasses Rainham to the south.
- 2.15 The A1306 New Road is a single carriageway road, around 8m wide and subject to a 30mph speed limit along the site frontage (see **Plate 8**). It has double yellow lines along its length, prohibiting waiting at any time, and a combination of lit shared and segregated foot/cycleways on both sides.



Plate 8: New Road

- 2.16 New Road connects to the A125 Rainham Road and B1335 Bridge Road at the Dovers Corner roundabout junction, directly north-east of the site. This is a 4-arm roundabout with a 67m inscribed circle diameter (ICD) and 3-lane entries on all approaches. At each entry, left-turning traffic is led to its exit outside of the circulatory carriageway; this movement is un-segregated and still needs to give-way (see **Plate 9** and **drawing. no. S960-11**).

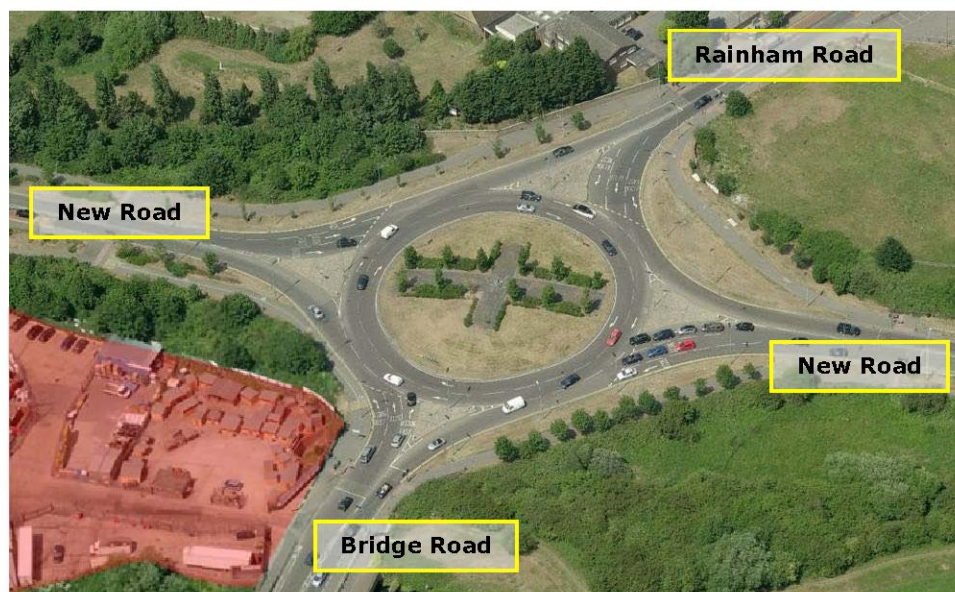


Plate 9: Dovers Corner Roundabout

A125 Rainham Road

2.17 The A125 Rainham Road is a single carriageway road, around 8m wide and subject to a 30mph speed limit (see **Plate 10**). It has a lit footway on its east side and lit shared foot/cycleway on its west side, with the latter terminating opposite Knightswood Road, some 450m north of Dovers Corner roundabout.



Plate 10: Rainham Road

B1335 Bridge Road and Broadway

- 2.18 The B1335 Bridge Road is a single carriageway road, around 9m wide and subject to a 30mph speed limit (see **Plate 11**). It connects to Lamson Road and Viking Way (for the Tesco Extra store) at a standard 4-arm roundabout junction around 180m south of Dovers Corner roundabout.



Plate 11: Bridge Road

- 2.19 Bridge Road has north and southbound cycle lanes along part of its length between the two roundabouts, and also lit shared foot/cycleways on both sides.
- 2.20 The B1335 becomes Broadway south of its roundabout junction with Lamson Road/Viking Way and is subject to a 20mph speed limit as it passes through Rainham Village. It extends south towards Rainham railway station, and has cycle lanes and lit footways along this section.

Lamson Road

- 2.21 Lamson Road is a single carriageway road, around 7.3m wide and subject to a 30mph speed limit (see **Plate 12**). It extends south-west from its roundabout junction with the B1335 and Tesco access and passes under (in cutting) the Essex Thameside Tilbury Loop and

High Speed 1 (HS1) railway bridges. It has a lit segregated foot/cycleway on its west side only.



Plate 12: Lamson Road

Accident Data

2.22 We have obtained accident data for the above described links and junctions for the five year period to 30th November 2014, which is included at **Appendix B**. Accidents at links and junctions within the study area are summarised in **Table 2.1** below.

Table 2.1 Accident Data Summary (5 years to 30th November 2014)

Location	Description	Conditions	Severity
<i>New Road</i>			
128m east of junction with Rainham Road	Rear shunt involving 3 cars travelling EB	Light Dry	Slight
<i>Dovers Corner Roundabout</i>			
New Road west entry	Rear shunt involving 2 cars	Light Wet	Slight
New Road west entry	Rear shunt involving 2 cars	Dark - Lit Dry	Slight
New Road west entry	Rear shunt involving a bus and car	Light Dry	Slight
New Road west entry	Rear shunt involving 2 cars	Dark - Lit Dry	Slight
Rainham Road entry	Rear shunt involving 2 cars	Light Dry	Slight
Rainham Road entry	Rear shunt involving 2 cars	Dark - Lit Wet	Slight

Location	Description	Conditions	Severity
<i>Dovers Corner Roundabout (continued)</i>			
Rainham Road entry	rear shunt involving 2 cars	Light	Dry Slight
New Road E entry	Rear shunt involving 2 cars	Light	Dry Slight
New Road E entry	Rear shunt involving 2 cars	Light	Wet Slight
Bridge Road entry	Rear shunt involving 3 cars	Light	Snow Slight
Bridge Road entry	Car pulled out into the path of a car on circulatory carriageway	Light	Dry Slight
Bridge Road entry	Car pulled out into path of cyclist on circulatory carriageway	Light	Dry Slight
Bridge Road entry	Rear shunt involving 2 cars	Light	Dry Slight
Bridge Road to New Road east	Rear shunt with car striking motorcyclist on circulatory carriageway	Light	Wet Slight
<i>Rainham Road</i>			
70m north east of junction with New Road	Motorcyclists lost control and fell from vehicle	Light	Dry Slight
75m north of junction with New Road	Rear shunt involving 2 cars in slow moving traffic	Light	Snow Slight
65m south west of junction with Dominion Way	Car pulled out and turned right into the path of a motorcyclist causing the rider to lose control	Light	Dry Serious
Junction with Dominion Way	Car turned right out of Dominion Way and struck a motorcyclist overtaking slow moving northbound traffic	Light	Dry Serious
Junction with Dominion Way	Pedestrian stepped out into nearside of southbound car	Light	Dry Slight
<i>Bridge Road</i>			
40m S of J/W New Road	Rear shunt involving 2 cars travelling SB	Light	Wet Slight
77m S of J/W New Road	Wheelchair being pushed across side road was struck by a car turning right into side road	Light	Dry Slight
78m S of J/W New Road	Goods vehicle pulled out into path of NB vehicle	Light	Dry Slight
90m S of J/W New Road	Bus stopped suddenly causing injury to a passenger	Light	Dry Slight
153m S of J/W New Road	Northbound car collided with stationary (parked) vehicle	Light	Dry Slight

Location	Description	Conditions	Severity
Bridge Road (continued)			
62m north of junction with Viking Way	Pedestrian on crossing was struck by a NB car	Light	Dry Slight
33m north of junction with Upminster Road	Northbound car moved across into the opposing lane and collided with oncoming goods vehicle	Light	Dry Slight
53m north west of junction with Broadway	Pedestrian crossed road (not on crossing) and was struck by a northbound car	Light	Dry Slight
Bridge Road/Viking Way Roundabout			
Bridge Road southbound entry	Rear shunt involving a goods vehicle and car	Light	Dry Slight
Bridge Road southbound entry	Rear shunt involving 2 cars	Light	Dry Slight
Bridge Road to Viking Way	Cyclist travelling southbound struck by a car turning left into Viking Way	Light	Dry Slight
Viking Road approach	Pedestrian ran across road behind a stationary car into the path of a car	Dark - Lit	Wet Serious
Viking Road approach	Pedestrian on mobile stepped out into path of a car	Light	Dry Slight
Viking Way			
48m east of junction with Bridge Road	Car turned right out of car park and collided with a westbound motorcycle	Light	Dry Slight
65m east of junction with Bridge Road	Eastbound car turned right into side road and struck a westbound cyclist	Light	Wet Slight
144m east of junction with Bridge Road	Child ran from his mother into path of an eastbound car	Light	Dry Slight
Upminster Road South			
80m east of junction with Broadway	Pedestrian ran out into the side of an eastbound vehicle	Dark - Lit	Dry Slight
28m north of junction with Broadway	Southbound motorcyclist rode over a manhole cover, lost control and hit the front of a shop	Light	Dry Slight
Broadway/Upminster Road South Junction			
Broadway	Pedestrian (not on crossing) walked out from front of stationary bus into the path of a northbound car	Light	Wet Slight

Location	Description	Conditions	Severity	
Broadway/Upminster Road South Junction (continued)				
Broadway to Upminster Road	Rear shunt involving 3 cars	Light	Dry	Slight
Broadway to Upminster Road	Motorcyclist tried to overtake a bus as it attempted to turn right into Upminster Road	Light	Dry	Slight
Broadway				
35m south of Upminster Road	Pedestrian ran across road and into the path of a NB car	Dark - Lit	Dry	Serious
44m north west of J/W Ferry Lane	Bus collided with stationary (parked) car and 2 pedestrians	Light	Wet	Slight
24m north of Wennington Road	Northbound car struck a pedestrian on a zebra crossing	Dark - Lit	Dry	Slight

2.23 Of the 44 accidents in the study area, 40 caused slight injury and 4 were serious. The data does not show any clusters or repeated pattern of collisions, apart from rear shunt accidents at the Dovers Corner roundabout, of which there were 14 over the five year period (i.e. 2.8 a year on average). These accidents are split fairly evenly over the four entries, with no more than one a year on average at each and the majority attributed to driver error; this suggests no particular pattern or problem.

2.24 The actual accident rate at the Dovers Corner roundabout, at an average of 2.8 a year, is better than would be expected for a junction of this type subject to current traffic levels, at 4.2 a year (as calculated using the formulae set out in Tables 4/1 and 5/1 of the COBA – Cost Benefit Analysis – 11 User Manual, Part 2).

Waiting Restrictions

2.25 Many local roads have single and double yellow lines to restrict indiscriminate on-street parking. The single yellow lines typically restrict parking between 8:30am and 6:30pm, Monday to Saturday, while double yellow lines prohibit waiting at any time.

- 2.26 Public pay & display parking is available at the Tesco Extra store for non-store users and at the railway station.
- 2.27 The adjacent new Passive Close residential development operates a privately managed resident permit holder parking scheme.

Wider Highway Network

- 2.28 The A1306 New Road connects to Cherry Tree Lane at a signal controlled junction around 400m west of the site, with this providing an alternative link north to Rainham Road. Around 800m west of this, Marsh Way connects to New Road at another signal controlled junction, south of which it links to the A13 via a grade separated junction.
- 2.29 The A1306 becomes Ripple Road west of the Heathway and connects directly to the A13 via the grade separated 'Goresbrook Interchange' junction, around 2.3km west of Marsh Way.
- 2.30 Access to the A13 is also available via Lamson Road and Ferry Lane, and at the eastern end of the A1306 New Road, both connecting via grade separated junctions.
- 2.31 The A13 runs in an east-west direction to the south of the site. It is classified as a "Red Route" and forms part of the TfL Road Network (TLRN). It connects to east London to the west, with access to the A406 North Circular available via the 'Beckton Roundabout' junction around 7km west of the site. It extends through Thurrock to the east, and connects to the M25 at Junction 30 around 8km east of the site, and then into south Essex and onto Southend-on-Sea.

2011 Census Data

- 2.32 Both car ownership and travel to work data has been derived from the 2011 Census for the local residential population within the South

Hornchurch and Rainham & Wennington wards, details of which are contained in **Appendix C**.

Car Ownership

- 2.33 The data shows a total average car ownership level of 1.19 per household for all housing types in the area surrounding the site, and 23% of local households do not own a car.

Travel to Work

- 2.34 The data shows that 33% of residents in the area surrounding the site travel to work by public transport (24% rail and 9% bus), 5% on foot and 1% by bicycle. 56% drive to work, with 4% car sharing.

Local Amenities and Facilities

- 2.35 The Site is located on the north-west fringe of Rainham Village, which has a variety of shops and services to cater for the day-to-day needs of local residents (see **Figure 1**).
- 2.36 There is a local parade of shops along Upminster Road South, a 350m (5-minute) walk from the site, which includes a newsagents, fast food restaurants, cafés, a dry cleaners and bank among others.
- 2.37 There is a Tesco Extra store opposite the site on the east side of Bridge Road, within a 250m (3-minute) walk, which sells groceries and a range of other goods, and has other facilities including a pharmacy and opticians.
- 2.38 Rainham Library is located on Celtic Farm Road, a 400m (5-minute) walk from the site. East of this, there is a post office on Wennington Road within a 550m (7-minute) walk.
- 2.39 Rainham Health Centre and Raydens Dental Surgery are located in adjacent buildings on Upminster Road South, a 900m (11-minute)

walk from the site. Rainham Medical Centre is located on Frederick Road, a 1.4km (18-minute) walk from the site.

- 2.40 There are four primary schools and a secondary school within a 1.6km (20-min) walk catchment of the site. These are: La Salette Catholic Primary School (a 300m, 4-min, walk); Rainham Village Primary School (a 600m, 8-min, walk); Brady Primary School (a 1.4km, 18-min, walk); Newtons Primary School (a 1.5km, 19-min, walk); and The Chafford School (a 1.2km, 15-min, walk).
- 2.41 Local pre-schools include: Cottage Nursery (a 200m, 3-min, walk), Growing Pains Nursery (a 300m, 4-min, walk) and Rainham Village Nursery (a 600m, 8-min, walk).
- 2.42 For higher education, The Construction Campus of Havering College is located directly west of the site. Its site is subject to an extant planning consent and a further application is currently under consideration by LBH as discussed later.
- 2.43 Ingrebourne Hill Country Park has an entrance on Rainham Road, a 700m (9-minute) walk from the site, for leisure walks and cycling.
- 2.44 There are many areas of employment within a reasonable walk or cycle distance, including the Ferry Lane Industrial Area, Fairview Industrial Estate and Beam Reach Business Park among other industrial/business parks.

Pedestrian Facilities

- 2.45 The provision of pedestrian routes and crossings in proximity to the site is very good, with footways present along both sides of most roads in its vicinity. **Figure 3** shows the network of footways, footpaths and crossings in proximity to the site.

- 2.46 There are lit foot/cycleways on both sides of New Road in the site vicinity; mostly shared east of the primary site access (save for a 70m long segregated section south-west of the roundabout) and segregated west of this. These are separated from the carriageway by a verge along the site frontage.
- 2.47 There is an additional footway alongside the carriageway east of the primary site access that connects to an eastbound bus stop.
- 2.48 There is a toucan crossing on New Road located 50m east of the primary site access (see **Plate 13**), which replaced the former pedestrian subway. This facilitates safe movement from the site to Rainham Road and La Salette Catholic Primary School.



Plate 13: New Road Toucan Crossing

- 2.49 There is another toucan crossing 30m west of the secondary access on New Road, to cater for movement to the westbound bus stop and a foot/cyclepath that extends north to Dunedin Road.
- 2.50 There are also toucan crossings on Rainham Road, New Road (east) and Bridge Road within 50m of each respective entry to Dovers Corner roundabout.

- 2.51 Rainham Road has a lit footway on its east side and lit shared foot/cycleway on its west side, with the latter terminating opposite Knightswood Road, some 450m north of Dovers Corner roundabout.
- 2.52 Bridge Road has lit shared foot/cycleways on both sides. There is another toucan crossing on Bridge Road (see **Plate 14**), located 40m north of the Viking Way/Lamson Road roundabout, which caters for movement to the Tesco Extra store and Rainham Village beyond.



Plate 14: Bridge Road Toucan Crossing

- 2.53 There are uncontrolled crossings with tactile paving and pedestrian islands across each other arm of the Viking Way/Lamson Road roundabout.
- 2.54 Lamson Road has a lit segregated foot/cycleway on its west side only along the site frontage, and passes under the Essex Thameside Tilbury Loop and HS1 railway bridges (see **Plate 15**).



Plate 15: Lamson Road foot/cycleway

- 2.55 There are footways/paths along both Viking Way and the Tesco Extra store. These provide the most direct route between the site and Rainham Village Primary School. A zebra crossing on Viking Way caters for movement towards Upminster Road South for local shops.
- 2.56 Broadway has lit footways along its length providing for movement to Rainham railway station. The public realm around the clock-tower War Memorial has recently been improved, with Upminster Road North converted to one-way westbound operation to allow more pedestrian space around this focal point.
- 2.57 There is a zebra crossing on Broadway, located midway between the War Memorial and railway station. Pedestrian connectivity around the station, in front of the new library, was improved as part of the new Station Interchange that opened in 2012.
- 2.58 The above routes will actively encourage walking as a main mode of travel for residents for local trips and as part of an integrated journey with public transport.
- 2.59 The Site itself currently creates a barrier to more direct movement between New Road (west) and Rainham Village and the railway station, with Bridge Road providing the most direct route presently.

- 2.60 A qualitative pedestrian route assessment has been undertaken, as requested by TfL, and is contained in **Appendix D**.
- 2.61 We have adopted the walking route audit tool methodology, appended to *Design Guidance: Active Travel (Wales) Act 2013* (December 2014). This method has been used as an alternative to the Pedestrian Environment Review System ('PERS'), as agreed in principle with TfL in scoping discussions. This methodology is discussed as an alternative to 'PERS' in *Designing for Walking*, published by the Chartered Institution of Highways and Transportation (CIHT) in March 2015.
- 2.62 Like 'PERS', this method uses a scoring system, whereby 20 items are examined on each identified route and each given a score for its provision: 0 for poor, 1 for adequate and 2 for good quality. Improvements should generally be considered for any route which scores under 28 out of a possible 40 points.
- 2.63 In summary, 14 local routes were considered in the assessment. All but 3 scored over the 28 point threshold. Those 3 were: Rainham Road (26), Wennington Road (27) and Lamson Road (27). The 'attractiveness' of Rainham Road scored poorly due to traffic volume, causing some severance, and a footway pinch-point. Footways on Wennington Road are in need of some maintenance and tactile paving is not provided at the Anglesey Drive side arm. The 'attractiveness' of Lamson Road also scored poorly, given that this runs through an industrial area and underneath the railway line, and requires some maintenance. This is discussed further in **Section 3.0** in the context of potential improvements.
- 2.64 It is understood that there is an LBH aspiration for further changes to the A1306 corridor to further enhance pedestrian and cycle movement between the Rainham West sites. Details are unknown as to the proposed scheme at the time of writing.

Cycle Facilities

- 2.65 The provision of cycle routes in proximity to the site is excellent, as illustrated at **Figures 2 and 3**.
- 2.66 National Route 13 of the National Cycle Network passes the site on New Road and Bridge Road, and intersects with National Route 136 at Dovers Corner roundabout.
- 2.67 Route 136 is known locally as the Ingrebourne Way, and is a mainly traffic-free route through parkland, extending north to Noak Hill via Upminster, Hornchurch and Harold Hill. Locally, this extends north from Dovers Corner roundabout along the west side of Rainham Road on a lit shared foot/cycleway before entering Ingrebourne Hill Country Park opposite Knightswood Road.
- 2.68 Route 13 runs west from the site to east London, close to the River Thames, and west to Tilbury and then into Essex.
- 2.69 Along New Road, Route 13 comprises a combination of segregated and shared lit foot/cycleways. There are two toucan crossings along the site frontage, one 50m east of the primary site access, and the other 30m west of the secondary access.
- 2.70 There are additional toucan crossings on Rainham Road, New Road (east) and Bridge Road within 50m of each respective entry to Dovers Corner roundabout, and a further one on Bridge Road 40m north of Viking Way.
- 2.71 There are north and southbound cycle lanes along part of Bridge Road, and also lit shared foot/cycleways on both sides. Route 136 extends south along Broadway, with north and southbound cycle lanes present.

- 2.72 Lamson Road has a lit segregated foot/cycleway on its west side only, along the site frontage.
- 2.73 The above routes will actively encourage cycling as a main mode of travel for residents.

Public Transport

Buses

- 2.74 The Site has very good accessibility to buses given its village fringe location. The closest bus stops are located on New Road, with the westbound stop located just east of the primary site access and the eastbound stop directly opposite the secondary access.
- 2.75 Both bus stops have a flag, shelter and litter bin, along with new block paving and kerbs installed in 2014 (see **Plate 16**). These are served by the 165, 287 and 372 bus routes.



Plate 16: New Road Westbound Bus Stop

- 2.76 Another bus service, the 103, is available from stops on Rainham Road, a 250m (3-minute) walk from the site. Only the southbound stop has a shelter; the footway width is insufficient to accommodate on at the northbound stop.

2.77 A further bus service, the 356, is available from stops on Cherry Tree Lane, a 550m (7-min) walk from the site. Only the northbound stop has a shelter in this case; the footway width is insufficient to accommodate on at the southbound stop.

2.78 The routes and frequencies of the above bus services are summarised in **Table 2.2**. The available services provide good connections to towns and railway stations within the Borough and beyond, and out-of-town retail. The bus stop locations are shown at **Figure 2** and route map is included at **Appendix E**.

Table 2.2: Local Bus services

Service and Route	Daytime Frequency (mins)		
	Weekdays	Saturdays	Sundays
103 Collier Row, Romford Station, Rush Green, Becontree Heath, Dagenham East Tube Station, South Hornchurch, Broadway Rainham and Rainham Station	8-11	9-12	20
165 Romford Brewery, Romford Station, Gidea Park, Emerson Park Station, Hornchurch, Elm Park Tube Station, South Hornchurch, Broadway Rainham and Abbey Wood Lane Rainham	11-12	11-12	20
287 Barking Station, Upney, Goresbrook, Dagenham, South Hornchurch, Broadway Rainham and Abbey Wood Lane Rainham	15	15	20
365 Havering Park, Collier Row, Romford Station, Queen's Hospital, Elm Park Station, South Hornchurch, Rainham	11-13	11-13	20
372 Hornchurch, Elm Park Tube Station, South Hornchurch, Broadway Rainham, Aveley, Lakeside Shopping Centre	20	20	30

2.79 The available bus routes and frequencies serve to make this mode of travel a realistic choice for residents, particularly those travelling with the Borough and just beyond.

East London Transit (ELT)

- 2.80 The ELT currently operates as two routes, the EL1 and EL2, which run between Ilford and the Thames View Estate via Barking Town Centre. The EL1 currently extends to and terminates at Barking Riverside and the EL2 continues on to Dagenham Dock station.
- 2.81 TfL proposes that the ELT will in the future run along the A1306, increasing public transport accessibility within the 'LROA' (see **Section 4.0**). It is intended that the ELT will run from Barking to Rainham, then onto Elm Park, Romford, Harold Hill and Collier Row. Timescales for implementation are unknown at the time of writing.

Rail

- 2.82 The nearest railway station is Rainham, located a 500m (6-minute) walk from the site. It is located within London Travel Zone 6 on the Tilbury Loop (between Pitsea and Barking) of the Essex Thameside (formerly London, Tilbury & Southend) main line from Southend to London Fenchurch Street, with services operated by the c2c franchise.
- 2.83 The journey time between Rainham and London Fenchurch Street is around 25 minutes.
- 2.84 During the weekday peak hours there are 4 trains per hour towards London Fenchurch Street and three towards Southend Central. There are two trains per hour on Saturdays in both directions and one an hour on Sundays.
- 2.85 Interchange is available as follows:
- Grays for c2c services to Chafford Hundred (Lakeside Shopping Centre), Ockendon and Upminster;
 - Pitsea or Barking for c2c services to Basildon, Laindon and West Horndon;

- At Barking for London Underground (LU) Hammersmith & City and District Lines, and London Overground to Gospel Oak;
- West Ham for LU Jubilee, Hammersmith & City and District Lines, and the Docklands Light Railway (DLR);
- Limehouse for the DLR; and
- London Fenchurch Street for LU Circle and District Lines.

2.86 Dagenham East is the closest LU station to the site, a 20 minute bus journey on the 103 service that stops on Rainham Road. It is served by the District Line which runs from Upminster, its eastern terminus, through central London to Earl's Court, where it divides into three western branches, to Wimbledon, Richmond or Ealing Broadway.

2.87 The availability of rail services makes this mode of travel a realistic choice for residents commuting into London or south Essex.

2.88 The *Network Rail Anglia Route Study Draft for Consultation* (Nov 2014), sets out the strategic vision for the future of the Anglia route network over the next 30 years. This identifies a proposal for a new station at Beam Park between Dagenham Dock and Rainham on the Tilbury Loop, which would increase public transport accessibility within the 'LROA' (see **Section 4.0**). However, Rainham station would still be closest to the site.

Public Transport Accessibility Level (PTAL)

2.89 The site has a PTAL of "3", which represents a "moderate" level of accessibility, although can be considered good for an outer London Borough. This has been calculated using the standard PTAL methodology adopted by TfL, based on weekday am peak period service frequencies. This includes bus routes serving stops within 640m, and rail services serving stations within 960m.

2.90 Details of the PTAL calculations are attached at **Appendix F**.

2.91 It is generally recognised that PTAL has limited application when determining accessibility, as it does not consider the ability to travel beyond the immediate area of a site. Neither does it account for local accessibility by foot and cycle. Indeed, given the site location within a short walk of shops and local services/amenities, the need to use public transport other than for commuting is not as great as for out of centre locations.

2.92 The Site's PTAL would be expected to increase in the future, with implementation of ELT services along the A1306 New Road.

Summary

2.93 It is clear from the above that the site is accessible by a range of transport modes. Given its location on the fringe of Rainham Village, in close proximity to bus stops and Rainham rail station, and comprehensive pedestrian and cycle routes/facilities, the site is well located to take advantage of sustainable travel opportunities.

Local Committed Development

2.94 There are two local sites with extant planning consents that are not yet built-out, as described in **Table 2.3** below.

Table 2.3: Local Extant Planning Consents

Site	Description
Havering College – Rainham Campus	Planning application ref: P1371.12 – outline consent for the redevelopment of 11,800m ² of D1 floorspace with 200 car parking spaces (approved). Subsequent reserved matters planning application ref: P1473.12 for phase 1 comprising 3,803m ² of D1 floorspace (approved). A further planning application ref: P0196.15 has been submitted for 2,767m ² of D1 floorspace and 106 car parking spaces. If approved, this application would supersede both P1371.12 and P1473.12.
Former Somerfield Depot, New Road	Planning application ref: P1813.11 – Demolition of existing buildings and comprehensive development of the site comprising 170m ² of commercial floorspace and 497 residential units plus an energy centre, car and cycle parking, landscape, public and communal amenity space.

- 2.95 The Havering College Rainham Campus outline planning application was supported by a TA prepared by Gifford, dated May 2009, whilst the Former Somerfield Depot application was supported by a TA prepared by WSP, dated September 2011.
- 2.96 The adjacent new Passive Close development was completed in January 2015 and is now occupied. This is a 51 unit scheme delivered by Climate Energy Homes on behalf of Circle Housing and Old Ford. A Transport Statement (TS), prepared by Templeman Associates in 2012, supported the planning application.

3.0 THE PROPOSED DEVELOPMENT

- 3.1 A full description of the proposed development is contained in the supporting documents accompanying the planning application – in particular the Planning Statement prepared by Icen Projects Limited.
- 3.2 The proposed development comprises demolition of the existing industrial units and its redevelopment to provide 396 residential dwellings (177 houses and 219 apartments).
- 3.3 **Appendix G** contains a Site Layout plan prepared by the scheme architect, JCN Design, and a Landscape Masterplan prepared by the scheme landscape architects, Matt Lee Landscape Architecture. The following description is pertinent to the highways and transport aspects of the proposed redevelopment scheme.
- 3.4 The proposed residential mix is as follows: -

Houses

- 36 x two-bed houses;
- 112 x three-bed houses;
- 29 x four-bed houses; and

Apartments

- 219 x two-bed apartments.

Access

Vehicles

- 3.5 It is proposed to consolidate site access and retain this from a single point on New Road, with alternative access for emergency vehicles taken from Lamson Road.

- 3.6 The existing primary site access junction will be modified to serve the new residential use, with the existing wide junction bellmouth reduced in size through the use of 10m kerb radii where the access road joins New Road, resulting in a shorter crossing distance for pedestrians and cyclists on this side arm. The proposed junction layout is illustrated at **drawing no. S960-007B**.
- 3.7 It is also proposed to improve the current confusing foot/cycleway layout either side of the junction, by realigning the shared route on the east side of the junction and providing a clear transition to the segregated route on its west side.
- 3.8 Junction visibility splays of 4.5m x 90m are provided to the left (west) and right (east) for drivers egressing from the development onto New Road (see **drawing no. S960-007B**). These splays accord with *Design Manual for Roads and Bridges (DMRB)* “desirable minimum” standards for a major road speed limit of 30mph. These are onerous in the context of *Manual for Streets (MfS, DfT, 2007)* and *MfS2: Wider Application of the Principles* (CIHT, 2010) guidance for sub-40mph non-Trunk roads such as New Road, although achievable and so shown.
- 3.9 The other existing accesses on New Road and Bridge Road are to be closed as part of the proposals. This will benefit pedestrians and cyclists as two points of potential conflict with vehicles are removed.
- 3.10 In addition to the above access from New Road, it is proposed to provide alternative emergency access from Lamson Road, also serving as foot/cycle access. This will be 3.7m wide where it connects with Lamson Road, sufficient for a fire tender, and restricted to general vehicular traffic by collapsible bollards.
- 3.11 A Stage 1 Road Safety Audit (RSA) of the proposed improved junction layout was undertaken by M&S Traffic and this is included at **Appendix H**. The Audit identifies potential problems relating to

proximity of the westbound bus stop and sufficiency of the right turn lane width. The Designers Response, also at **Appendix H**, addresses these matters along with other more detailed considerations. Both are existing characteristics of the junction, and no accidents were reported for the five year period to 30th November 2014, with the site operating under its industrial employment use, attracting many HGV movements.

Pedestrians and Cycles

- 3.12 The primary access on New Road will have 2m wide footways on both sides, connecting to those on New Road. Two additional points of pedestrian and cycle access are proposed from New Road: a 3m wide shared foot/cyclepath that connects at the northwest corner of the site to facilitate movement through it to Lamson Road and on to Rainham Village (see below); and a 3m wide shared foot/cyclepath that connects just east of the primary access to enable more direct access to the westbound bus stop and adjacent toucan crossing.

Site Layout

- 3.13 The site layout has been informed by pre-application discussions with LBH, under the PPA, and the GLA (also attended by TfL), and is guided by LBH's *Residential Design Guide Supplementary Planning Document (SPD)* and the *MfS*.
- 3.14 Emphasis has been on reducing car dominance through the provision of shared surfaces, keeping traffic speeds within the target of 20mph on all internal roads, and prioritising pedestrian and cycle movement within and through the site.
- 3.15 All roads within the proposed development site, both those with footways and shared surfaces, will have a carriageway width of at least 5.5m, which enables a refuse or delivery vehicle to pass a car with ease (as demonstrated by the AutoTrack vehicle swept path assessment at **Appendix J**).

- 3.16 It is intended that all roads will be privately maintained under a Management Company (arranged and implemented by PHE) and not offered for adoption to LBH.

Area North of Linear Park

- 3.17 The main spine road, Central Avenue, extends south from the site access as a 5.5m wide single carriageway road with 2m wide footways on both sides. An east-west aligned shared surface road intersects Central Avenue around 70m south of New Road, with the junction formed on a raised table to restrain vehicle speed and enable at-grade pedestrian/cycle crossing movement.
- 3.18 The east-west aligned shared surface roads provide direct access to dwellings and parking courts. These extend east and west from Central Avenue and then curve south to run along the site's eastern and western boundaries towards a linear park.
- 3.19 Midway along its length, Central Avenue intersects the linear park and an east-west aligned foot/cyclepath (see below). This is proposed to be formed as a raised table, again to restrain vehicle speed and enable at-grade crossing movement.

Area South of Linear Park

- 3.20 The eastern north-south aligned shared surface road extends 50m south from the linear park before connecting to an east-west aligned section that in turn connects with Central Avenue around 70m west via a priority 'T' junction. This forms a loop with Central Avenue.
- 3.21 Central Avenue extends south from the shared surface road for a further 40m before forming a priority 'T' junction with an east-west route, Southern Avenue. This is also a 5.5m wide single carriageway road with 2m wide footways on both sides. The road extends east and forms a turning head, from which access to a parking court is taken.

- 3.22 Around 40m west of Central Avenue, Southern Avenue transitions to a shared surface road which extends further west before turning north and running along the western site boundary. This loops back to connect with Central Avenue.
- 3.23 The above described routes provide direct access to parking courts and in-curtilage parking.

Pedestrians and Cycles

- 3.24 A 3m wide shared foot/cyclepath will be provided on an east-west alignment through the heart of the site, through the linear park, to enable a connection between the adjacent Havering College site to the west and Lamson Road to the east, and onto Rainham Village beyond. This provision is required by **Policy SSA 12 – Rainham West** of LBH's *SSADPD* for development south of New Road (see **Section 4.0**).
- 3.25 As identified above, a cycle link will also be provided between New Road at the northwest corner of the site and Lamson Road. This will take the form of a 3m wide foot/cyclepath as it extends southeast from New Road, then a 3m wide foot/cycleway as it runs alongside the shared surface road. The route joins a 'quiet' section of the shared surface road for a 50m section. It then connects with the east-west aligned foot/cyclepath at the eastern end of the linear park, and a 3m wide foot/cycle path connecting to Lamson Road.
- 3.26 In addition, a 3m wide shared foot/cyclepath will connect the foot/cycleway running alongside the shared surface road with the foot/cycleway on New Road, east of the site access. This enables direct access to the westbound bus stop and toucan crossing.
- 3.27 The above routes create a highly permeable layout for pedestrians and cyclists.

Parking

Cars

- 3.28 The proposed level of on-site parking for cars and bicycles is to be provided in accordance with adopted standards (see **Section 4** for full details).
- 3.29 In summary, residential parking will be accommodated in a mixture of parking courts, lay-bys and spaces within the curtilage of houses. A total of 379 residential parking spaces will be provided for the 396 dwellings, an average of 0.96 spaces per dwelling across the site. This includes 22 spaces for disabled users, 10% that are lifetime homes adaptable, and 9 unallocated essential visitor spaces.
- 3.30 By dwelling type, the average allocated provision is 1.13 spaces per house and 0.78 per apartment.
- 3.31 It is proposed to provide controlled parking on-site to eliminate possible indiscriminate on-street parking linked to both the railway station and amenities/facilities in Rainham Village. This approach is consistent with that recently agreed for the Passive Close housing development on the adjacent site.
- 3.32 It is proposed to operate a residents' permit scheme, administered and enforced by the site management company, with those dwellings without in-curtilage parking required to display a valid permit in cars parked within the development.
- 3.33 For visitor parking, books of 10 visitor scratch card parking permits will be available to buy from the management company. The number of books that can be purchased annually can be limited and/or the cost increased incrementally to limit visitor parking to essential use. visitors would be required to display a visitor parking permit scratch card with day of use scratched off.

- 3.34 The estate roads and parking areas will include signage at the site entrance and at regular intervals within the site to advise motorists that unauthorised parking without a valid permit is not permitted.
- 3.35 Charging infrastructure for electric vehicles will be provided in accordance with *London Plan* minimum standards. 20% of spaces will be 'active', with fully wired and connected charge points, and 20% 'passive', with the necessary underlying infrastructure to enable future installation and activation of a charge point.
- 3.36 All 22 wheelchair accessible apartments will be assigned a disabled parking space, conveniently located to the block entrances. This represents 10% provision.

Bicycles

- 3.37 Cycle parking will be provided in accordance with the minimum *London Plan* standards. A total of 790 secure 'long-stay' spaces will be provided, with those for houses within a shed (with garden accessible by gate to the rear or side), and those for apartments located in cycle stores positioned adjacent to each block entrance. 10 secure 'short-stay' visitor spaces will be provided in Sheffield stands disbursed at appropriate locations on-site.

Deliveries and Servicing

- 3.38 In accordance with TfL requirements, a *Delivery and Servicing Plan* has been prepared and is included at **Appendix I**. All deliveries and servicing will take place within the site, avoiding any obstruction to the public highway.
- 3.39 Suitably sized turning heads are provided at the end of cul-de-sacs, that can accommodate the movements of pantechnicons and LBH refuse vehicles. The AutoTrack vehicle swept path assessment shown at **Appendix J** demonstrates that such turning movements can be undertaken with ease.

- 3.40 The residential development will attract relatively few deliveries and servicing movements, generally restricted to removals, delivery of furniture and white goods, on-line grocery shopping, post, and rubbish, recycling and garden waste collection. This means that there is limited potential to co-ordinate servicing aside from already co-ordinated postal deliveries and rubbish, recycling and garden waste collection.

Off-Site Highway Improvements

Pedestrians and Cycles

- 3.41 There is currently a very good level of provision for pedestrians in the vicinity of the site, as reinforced by the qualitative route assessment at **Appendix D**. This provision will be maintained and improved through closure of two vehicle access points that currently interrupt foot/cycleways on New Road and Bridge Road.
- 3.42 The proposed re-configuration of the foot/cycleways either side of the site access to a more legible form, described above, will further enhance provision on New Road.
- 3.43 The qualitative pedestrian route assessment identifies links that have an absence of dropped kerbs and tactile paving on junction side arms. Funding could be provided towards such provision as part of the development proposals. Locations that would benefit include the car wash access at its junction with Bridge Road, and Anglesey Road at its junction with Wennington Road, with the latter route used for resident trips to/from The Chafford School.
- 3.44 The proposed development will also result in a more active frontage on Lamson Road, improving surveillance and the attractiveness of this route, as shown on the Landscape Masterplan at **Appendix G**.
- 3.45 To enable safer pedestrian and cycle movement between the new southern access on Lamson Road and Rainham Village, a new toucan

crossing is proposed on Lamson Road, around 40m west of its roundabout junction with the B1335, as shown on **drawing no. S960-009A**. The proposed crossing will reduce severance on Lamson Road and further enhance this route.

- 3.46 A Stage 1 RSA of the proposed crossing was undertaken by M&S Traffic and this is included at **Appendix H**. The Audit identifies a potential problem relating to sufficiency of pedestrian/vehicle inter-visibility. The Designers Response at **Appendix H** addresses this matter along with other more detailed considerations. The proposed crossing has been located to achieve optimum visibility for drivers, cyclists and pedestrians in both directions
- 3.47 As discussed earlier, there is an LBH aspiration for further changes to the A1306 corridor to further enhance pedestrian and cycle movement between the Rainham West sites. Details are unknown as to the proposed scheme at the time of writing.

Buses

- 3.48 The east and westbound bus stops closest to the site on New Road have a flag, shelter and litter bin, along with new block paving and kerbs installed in 2014. It is therefore anticipated that no further improvements are required to these.
- 3.49 Provision at the southbound bus stop on Rainham Road also appears adequate. The northbound bus stop has no shelter, however, there is insufficient width to provide one on the footway.
- 3.50 *The Site Specific Allocations DPD* suggests under **Policy SSA12 - Rainham West** that the sub-sites south of the A1306, including Dovers Corner, must enable a bus service to be routed through (see **Section 4**). As all parts of the site are located within a 400m (5-minute) walk distance of bus stops on New Road, the provision of a route through the development site is considered unnecessary. This

provision has therefore been omitted from the scheme, as agreed in principle with LBH.

Travel Plan

3.51 In accordance with LBH and TfL requirements, the planning application is also supported by a *Travel Plan* (TP, document ref. no. S920-12) that contains a variety of measures to promote sustainable travel to and from the site.

3.52 As part of the measures contained within the TP, a Travel Pack will be provided and issued to each household on first occupation. This will contain details of local walk and cycle routes and locations of bus stops within walking distance of the site together with timetables for routes serving them and of trains from Rainham station.

Construction Logistics

3.53 In accordance with TfL requirements, a *Construction Logistics Plan* (CLP) has been prepared and is included at **Appendix K**. At this stage the method of construction and the overall programme has not been determined nor has a contractor been appointed. It is therefore not possible to provide a significant amount of detail for the CLP although some principles can be established.

3.54 The Site currently attracts considerable HGV movement given its industrial use and size, and the existing New Road access junction is of sufficient size to accommodate the frequent movement of these vehicles. The Site has extensive areas of hardstanding suitable for a site compound, loading and unloading.

4.0 POLICY CONTEXT

Framework

4.1 Relevant policy guidance on transport and land use planning relating to new development is set out in the following documents: -

- *National Planning Policy Framework (NPPF)* (2012);
- *The National Planning Practice Guidance (NPPG)* (2014);
- *The London Plan (Consolidated with Further Alterations - FALP)* (2015);
- *The London Plan: Housing Supplementary Planning Guidance* (2012);
- *The Mayor's Transport Strategy* (2010);
- *LBH Core Strategy and Development Control Policies (CSDCP)* (2008); and
- *LBH Site Specific Allocations DPD* (2008)

National Planning Policy Framework

4.2 The *NPPF* states, at para 29, that: *Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas.*

4.3 Para 30 goes on to state that: *Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development*

which, where reasonable to do so, facilitates the use of sustainable modes of transport.

4.4 The NPPF identifies at para 32 the need for either a Transport Statement or Transport Assessment to support developments that generate significant amounts of movement. It states that: *Plans and decisions should take account of whether:*

- *the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
- *safe and suitable access to the site can be achieved for all people; and*
- *improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.*

4.5 Para 34 states that: *Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.*

4.6 Para 35 states that: *Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to:*

- *accommodate the efficient delivery of goods and supplies;*
- *give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*

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

4.7 Para 35 states that: *If setting local parking standards for residential and non-residential development, local planning authorities should take into account:*

- *the accessibility of the development;*
- *the type, mix and use of development;*
- *the availability of and opportunities for public transport;*
- *local car ownership levels; and*
- *an overall need to reduce the use of high-emission vehicles.*

The London Plan (consolidated with Further Alterations)

4.8 The *London Plan* provides the overall strategic plan for London and guides decisions on planning applications by the London Boroughs.

4.9 **Policy 6.1 Strategic Approach** states that: *The Mayor will work with all relevant partners to encourage the closer integration of transport and development through the schemes and proposals shown in Table 6.1 and by:*

- *encouraging patterns and nodes of development that reduce the need to travel, especially by car*
- *seeking to improve the capacity and accessibility of public transport, walking and cycling, particularly in areas of greatest demand*
- *supporting development that generates high levels of trips at locations with high public transport accessibility and/or capacity*

4.10 **Policy 6.3 Assessing Effects of Development on Transport Capacity** states that:

A Development proposals should ensure that impacts on transport capacity and the transport network, at both a corridor and local level, are fully assessed. Development should not adversely affect safety on the transport network.

B Where existing transport capacity is insufficient to allow for the travel generated by proposed developments, and no firm plans exist for an increase in capacity to cater for this, boroughs should ensure that development proposals are phased until it is known these requirements can be met, otherwise they may be refused. The cumulative impacts of development on transport requirements must be taken into account.

C Transport assessments will be required in accordance with TfL's Transport Assessment Best Practice Guidance for major planning applications. Workplace and/or residential travel plans should be provided for planning applications exceeding the thresholds in, and produced in accordance with, the relevant TfL guidance. Construction logistics plans and delivery and servicing plans should be secured in line with the London Freight Plan and should be co-ordinated with travel plans.

4.11 **Policy 6.9 Cycling** states that developments should:

- provide secure, integrated, convenient and accessible cycle parking facilities in line with the minimum standards set out in Table 6.3 and the guidance set out in the London Cycle Design Standards (or subsequent revisions)*
- contribute positively to an integrated cycling network for London by providing infrastructure that is safe, comfortable, attractive, coherent, direct and adaptable and in line with the guidance set out in the London Cycle Design Standards (or subsequent revisions)*

- *provide links to existing and planned cycle infrastructure projects including Cycle Superhighways, Quietways, the Central London Grid and the 'mini-Hollands'*
- *facilitate the Mayor's cycle hire scheme through provision of land and/or planning obligations where relevant, to ensure the provision of sufficient capacity.*

4.12 **Policy 6.10 Walking** states that: *Development proposals should ensure high quality pedestrian environments and emphasise the quality of the pedestrian and street space by referring to Transport for London's Pedestrian Design Guidance.*

4.13 **Policy 6.13 Parking** states that: *The Mayor wishes to see an appropriate balance being struck between promoting new development and preventing excessive car parking provision that can undermine cycling, walking and public transport use.*

The maximum standards set out in Table 6.2 in the Parking Addendum to this chapter should be the basis for considering planning applications.

In addition, developments must:

- *ensure that 1 in 5 spaces (both active and passive) provide an electrical charging point to encourage the uptake of electric vehicles*
- *provide parking for disabled people in line with Table 6.2*
- *meet the minimum cycle parking standards set out in Table 6.3*

4.14 Para 6.42 states that: *Parking policy, whether in terms of levels of provision or regulation of on- or off-street parking, can have significant effects in influencing transport choices and addressing congestion. It can also affect patterns of development and play an important part in the economic success and liveability of places, particularly town centres. It goes on to state that: TAs and travel plans for major*

developments should give details of proposed measures to improve non-car based access, reduce parking and mitigate adverse transport impacts. They will be a key factor in helping boroughs assess development proposals and resultant levels of car parking.

- 4.15 Para 6.43 states that: *PTALs are used by TfL to produce a consistent London wide public transport access mapping facility to help boroughs with locational planning and assessment of appropriate parking provision by measuring broad public transport accessibility levels. There is evidence that car use reduces as access to public transport (as measured by PTALs) increases. Given the need to avoid over-provision, car parking should reduce as public transport accessibility increases. TfL may refine how PTALs operate and will consult on any proposed changes to the methodology.*
- 4.16 Para 6A.3A of the Parking Addendum states that: *The Mayor conducted a review of residential car parking standards in conjunction with Transport for London and with the advice of the Outer London Commission. This considered the scope for greater flexibility in different parts of London having regard to patterns of car ownership and use, levels of public transport accessibility, the need for integrated approaches to on-and off-street parking, efficiency in land use and overall impact on the environment and the transport network.*
- 4.17 Table 6.2 of the *FALP* sets out maximum residential car parking standards of up to 1 space per dwelling for those with one or two bedrooms, increasing to up to 1.5 per dwelling with three bedrooms, and up to 2 per dwelling with four bedrooms. The related matrix that indicates appropriate parking provision by site location, housing density and PTAL rating is shown at **Plate 17**.

	PTAL 0 to 1		PTAL 2 to 4		PTAL 5 to 6	
Suburban	150–200 hr/ha	Parking provision	150–250 hr/ha	Parking provision	200–350 hr/ha	Parking provision
3.8–4.6 hr/unit	35–55 u/ha	Up to 2 spaces per unit	35–65 u/ha	Up to 1.5 spaces per unit	45–90 u/ha	Up to one space per unit
3.1–3.7 hr/unit	40–65 u/ha		40–80 u/ha		55–115 u/ha	
2.7–3.0 hr/unit	50–75 u/ha		50–95 u/ha		70–130 u/ha	
Urban	150–250 hr/ha		200–450 hr/ha		200–700 hr/ha	
3.8–4.6 hr/unit	35–65 u/ha	Up to 1.5 spaces per unit	45–120 u/ha	Up to 1.5 spaces per unit	45–185 u/ha	Up to one space per unit
3.1–3.7 hr/unit	40–80 u/ha		55–145 u/ha		55–225 u/ha	
2.7–3.0 hr/unit	50–95 u/ha		70–170 u/ha		70–260 u/ha	
Central	150–300 hr/ha		300–650 hr/ha		650–1100 hr/ha	
3.8–4.6 hr/unit	35–80 u/ha	Up to 1.5 spaces per unit	65–170 u/ha	Up to one space per unit	140–290 u/ha	Up to one space per unit
3.1–3.7 hr/unit	40–100 u/ha		80–210 u/ha		175–355 u/ha	
2.7–3.0 hr/unit	50–110 u/ha		100–240 u/ha		215–405 u/ha	

Plate 17: FALP Residential Density/Parking Matrix

4.18 Table 6.3 sets out minimum cycle parking standards of one per studio or 1-bed dwelling, and two for each other dwelling, plus one additional space per 40 units for visitors.

4.19 With reference to the *FALP*, Map 2.4, the Site falls within the boundary of The London Riverside Opportunity Area (LROA). **Policy 2.13 Opportunity Areas and Intensification Areas** states that: *Development proposals within opportunity areas and intensification areas should:*

realize scope for intensification associated with existing or proposed improvements in public transport accessibility, such as Crossrail, making better use of existing infrastructure and promote inclusive access including cycling and walking

support wider regeneration (including in particular improvements to environmental quality) and integrate development proposals to the surrounding areas especially areas for regeneration

4.20 On 11th May 2015 the Mayor of London published for six weeks public consultation two sets of *Minor Alterations to the London Plan (MALP)*, on Housing Standards and Parking Standards. The proposed minor alterations to Parking Standards have been brought about by Central Government's view that more car spaces should be provided alongside new homes in areas of low public transport accessibility.

- 4.21 The Consultation Draft *MALP* states at para 6.42i that: *In developing their residential parking standards in the context of London Plan policy, outer London boroughs should take account of residents' dependency on the car in areas with low public transport accessibility (generally PTALs 0-1). Where appropriate in these locations Boroughs should consider revised standards (which could include minima) and permitting higher levels of provision there than is indicated in Table 6.2.* It goes on to state at para 6.42j that: *In outer London a more flexible approach for applications may also be acceptable in some limited parts of areas within PTAL 2, in locations where the orientation or levels of public transport mean that a development is particularly dependent on car travel.*
- 4.22 The site has a PTAL rating of 3 "moderate", and therefore the proposed minor alterations to Parking Standards (for PTALs 0-2) set out in the Consultation Draft *MALP* would not affect standards applicable to the proposed development.

The London Plan: Housing Supplementary Planning Guidance

- 4.23 Para 1.3.49 states that: *on any site, car parking can take up a considerable amount of land nominally available for housing. Some of this provision may be essential (e.g. for servicing and parking for disabled people), but the amount of space set aside for cars can often be consolidated or minimised through good design.*
- 4.24 **Standard 1.1.2** states that: *Development proposals should demonstrate:*
- a How the scheme complements the local network of public spaces, including how it integrates with existing streets and paths.*
 - b How public spaces and pedestrian routes are designed to be overlooked and safe, and blank elevations onto the public realm at ground floor have been avoided.*

- c *For larger developments, how any new public spaces including streets and paths are designed on the basis of an understanding of the planned role and character of these spaces within the local movement network, and how new spaces relate to the local vision and strategy for the area.*

4.25 **Standard 3.3.1 (and Policy 6.13)** states that: *All developments should conform to LP policy on car parking provision... In areas of good public transport accessibility and/or town centres the aim should be to provide no more than one space per dwelling. Elsewhere parking provision should be broadly as follows, depending on location as indicated in Annex 2.3:*

- a 4+ bedroom dwellings: 1.5 – 2 spaces per dwelling
- b 3 bedroom dwellings: 1 – 1.5 spaces per dwelling
- c 1 - 2 bedroom dwellings: Less than 1 per dwelling

4.26 The above standard has however been superseded by those in the FALP (see para 4.17 of this TA).

4.27 **Standard 3.3.2** states that: *Each designated wheelchair accessible dwelling should have a car parking space 2400mm wide with a clear access way to one side of 1200mm.*

4.28 **Standard 3.3.3** states that: *Careful consideration should be given to the siting and organisation of car parking within an overall design for open space so that car parking does not negatively affect the use and appearance of open spaces.*

4.29 **Standard 3.3.4** states that: *Where a dwelling has car parking within its plot, at least one parking space should be capable of enlargement to attain 3300mm width. Where parking is provided in communal bays, at least one space with a width of 3300mm should be provided per block entrance or access core in addition to spaces designated for wheelchair user dwellings.*

4.30 **Standard 3.4.1** states that: *All developments should provide dedicated storage space for cycles at the following level:*

- i. 1 per 1-2 bedroom dwelling; or*
- ii. 2 per 3+ bedroom dwelling.*

4.31 The above standard has however been superseded by those in the FALP (see para 4.18 of this TA).

4.32 **Standard 3.4.2** states that: *Individual or communal cycle storage outside the home should be secure, sheltered and adequately lit, with convenient access to the street.*

The Mayor's Transport Strategy

4.33 The *Mayor's Transport Strategy* envisages: *London's transport system excelling among that of global cities, providing access to opportunities for all people and enterprises while achieving the highest environmental standards and leading the world in its move towards tackling the urban transport challenges of the 21st century.*

4.34 The document outlines six goals for achieving this overarching vision: -

- Support economic development and population growth;*
- Enhance the quality of life of Londoners;*
- Improve the safety and security of Londoners;*
- Improve transport opportunities for all Londoners;*
- Reduce transport's contribution to climate change and improve its resilience; and*
- Support the delivery of the London 2012 Olympic and Paralympic Games and its legacy.*

4.35 **Policy 5** states that: *the Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and*

other stakeholders, will seek to ensure efficient and effective access for people and goods within central London through providing improved central London connectivity and appropriate capacity. This will include improving access to major public transport interchanges for pedestrian, cyclists and by public transport.

4.36 **Policy 8** indicates that: *the Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London Boroughs and other stakeholders, will support a range of transport improvements within metropolitan town centres for people and freight that help improve connectivity and promote the vitality and viability of town centres, and that provide enhanced travel facilities for pedestrians and cyclists.*

4.37 **Policy 9** states that: *the Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London Boroughs and other stakeholders, will use the local and strategic development control processes to seek to ensure that:*

- All high trip generating developments are located in areas of high public transport accessibility, connectivity and capacity (either currently or where new transport schemes are committed);*
- The design and layout of development sites maximise access on foot, cycle and to public transport facilities, for example, via safe walking and cycling routes and provision of secure cycle parking; and*
- Access for deliveries and servicing maximise the opportunities for sustainable freight distribution where possible.*

4.38 **Policy 11** states that: *the Mayor, though TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to reduce the need to travel,*

encourage the use of more sustainable, less congesting modes of transport (public transport, cycling, walking and the Blue Ribbon Network), set appropriate parking standards, and through investment in infrastructure, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate, aim to increase public transport, walking and cycling mode share.

- 4.39 **Policy 17** states that: *the Mayor, through TfL, and working with the DfT and other government agencies, the London Boroughs, health authorities and other stakeholders, will promote healthy travel options such as walking and cycling.*

LBH Core Strategy and Development Control Policies

- 4.40 The LBH Core Strategy and Development Control Policies DPD is the key spatial planning document for LBH, setting out the spatial vision for the Borough over a 12 year plan period.

- 4.41 **Core Policy CP9 – Reducing the Need to Travel** states that: *the need to travel will be reduced by:-*

- *co-locating major trip generating retail, services, cultural, office, and community uses in places with good public transport accessibility*
- *ensuring that new development reinforces the town centre hierarchy*
- *relating residential densities to current and future public transport access levels and the character of existing development*
- *ensuring that there is a range of local employment opportunities, that local people are suitably skilled to compete for these, and maximising the employment of local people in new development*

- *improving opportunities for informal recreation in the Havering countryside*

4.42 **Core Policy CP10 – Sustainable Transport** states that: *A choice of sustainable transport modes, where travel is necessary, will be promoted by:-*

- *achieving integration and convenient interchange between different transport modes*
- *requiring the submission of a travel plan and transport assessment for proposals with material transport implications ensuring that new development does not overload the capacity of the public transport and strategic road networks*
- *welcoming facilities which support the use of green fuels for public transport*
- *where appropriate relating maximum car parking standards to public transport accessibility*
- *ensuring that new developments in their design and layout prioritise the needs of pedestrians and cyclists and minimise the distance to local public transport nodes*
- *ensuring new development does not have an adverse impact on the road hierarchy*

4.43 **Development Control Policy DC2 – Housing Mix and Density** states that: *Residential developments will only be permitted with less than one car parking space per unit where on-street car parking can be controlled through a Controlled Parking Zone.*

4.44 **Development Control Policy DC32 – The Road Network** states that: *New development which has an adverse impact on the functioning of the road hierarchy will not be allowed.*

4.45 **Development Control Policy DC33 – Car Parking** states that: *car parking provision within new developments should not exceed*

the maxima set out in Annex 5 which are based on those provided in the London Plan. They should also provide Motor-cycle Parking and Disabled Parking to the standards provided in Annex 5.

In applying these standards developers need to satisfy the following criteria in addition to those set out in Annex 5:

- for private off-street car parking achieve secure by design standard (or equivalent methodology)*
- demonstrate with regard to existing, or planned Controlled Parking Zones, and the need for additional parking controls that there is no adverse impact on the amenity of residents and the interests of the users of adjacent facilities*
- for development with material transport implications require a submission of a Transport Assessment with the planning application in line with the guidance in PPG13 [now withdrawn]*

4.46 The standards set out in Annex 5 differ to those in the *FALP*.

4.47 **Development Control Policy DC34 - Walking** states that: *In the design and location of access and circulation arrangements within, and between, development and local pedestrian destinations, developers will be required to:*

- take account of the needs of pedestrians*
- address 'desire lines' to local shops, services and schools, including safer routes to school, and public transport nodes, lighting, rest facilities, safety and security, and barriers to local movement.*
- In appropriate circumstances, contributions will be sought towards initiatives either planned, or underway, to promote walking in the borough as included in Havering's Local Implementation Plan, and the strategic walking routes set out in the Transport for London Walking Plan including the*

Greenways. This includes the implementation of a continuous Thames Path across the borough which increases access to the Thames frontage.

- Where relevant, contributions may also be sought towards increasing pedestrian accessibility between the development and important local facilities including shops and services and local public transport nodes, for example crossings, drop kerbs, tactile paving, lighting and so on.*
- This would include contributions toward improving the pedestrian environment at transport interchanges including stations and bus stops.*

4.48 Development Control Policy DC35 – Cycling states that: *The design and layout of developments will be required to take account of the needs of cyclists by:*

- encouraging safe and secure cycle parking and changing and shower facilities to be provided appropriate to the nature and scale and location of the development*
- encouraging the design and location of access and circulation arrangement of the development to take account of the needs of cyclists*
- in major new development encouraging cycle priority measures which link with existing routes and networks*
- where appropriate seeking contributions towards off-site improvements to the cycle network and cycle facilities including facilities at key public transport nodes and destinations and contributions towards the London Cycle Network Plus and Thames Chase Forest Circle.*
- Applicants will be required to provide cycle parking to the standards provided in Annex 6 from Transport for London.*

4.49 The standards set out in Annex 6 differ to those in the FALP.

- 4.50 **Development Control Policy DC36 – Servicing** states that:
Planning permission for new industrial, housing, shopping and commercial developments will only be granted where adequate servicing arrangements are provided. As far as possible these will be required within the curtilage of the development and be designed and laid out so that vehicles can leave in forward gear.

LBH Site Specific Allocations DPD

- 4.51 The site is designated within **Policy SSA12 – Rainham West**, in which Dovers Corner is identified as one of six sub-sites south of the A1306. For these sites, the policy states that: -

- *Pedestrian and cycling linkages must be provided east-west through the heart of the site, and the road layout must enable a bus service to be routed through it.*
- *At the eastern end of the site development must: Provide convenient access for pedestrians and cyclists to Rainham Town Centre, Rainham Station and Ingrebourne Creek.*

- 4.52 The reasoned justification attached to the policy states, at Para 1.9, that: *The ELT is proposed to run along the A1306 and improve the current low levels of public transport provision in this area. Therefore the policy seeks to ensure that a high standard of public transport is introduced to the area, such as ELT would provide, as a pre-requisite to enable residential development at the densities and car parking standards proposed. This requirement does not apply to Dovers Corner which is already within walking distance of Rainham Station and the bus services which serve Rainham Village. It is also important to ensure that the new development is organised around the needs of pedestrians and cyclists and also facilitates the penetration of bus services. Particular attention should be paid to ensuring safe and convenient links to Rainham Station to the East...*

- 4.53 As identified earlier, all parts of the site are located within a 400m (5-minute) walk distance of bus stops and the provision of a route through the development itself is unjustified.

Compliance

- 4.54 The site is located on the fringe of Rainham Village, within walking distance of employment opportunities and local services such as shops, schools and community and leisure facilities. It benefits from a comprehensive network of pedestrian and cycle routes in its proximity, and is readily accessible by public transport with bus stops and Rainham railway station located within a short walk, resulting in a site PTAL rating of "3".
- 4.55 To further enhance site connectivity and integrate with neighbouring sites and the wider area, an east-west aligned foot/cyclepath will be provided within a linear park at the heart of the site, and a route created through it from New Road to Lamson Road. Along with a potential a new toucan crossing on Lamson Road, this will enable convenient access on foot or by bike to Rainham village and the railway station.
- 4.56 The site location is highly suited for residential development in-line with current national, regional and local planning policy guidance, and the proposed enhanced connectivity responds to the need to integrate with the wider 'LROA' and Rainham West designations.
- 4.57 Site accessibility will be heightened further with the improvements identified as part of wider area designations.

Access

- 4.58 The proposed access arrangements have been designed in line with best practice guidance and have been subject to a Stage 1 RSA. The turning movement swept paths of all vehicles likely to access the site are accommodated within the design.

- 4.59 All deliveries and servicing will take place within the site, avoiding any obstruction to the public highway (see *Delivery and Servicing Plan* at **Appendix I**).

Parking

- 4.60 The current adopted LBH parking standards are those included in Annex 5 of the *Core Strategy and Development Control Policies DPD*, which refer to density matrix DC2 for residential provision.
- 4.61 For sites within a PTAL zone of 3 – 4, the density matrix suggests an average car parking provision of 1 – 1.5 spaces per unit for a mix of terrace houses and flats with a 50 – 80 unit per hectare density, and less than 1 space per unit for mostly flats with a 80 – 150 unit per hectare density.
- 4.62 The *FALP* standards permit a maximum of up to 1 space per dwelling for those with one or two bedrooms, increasing to 1.5 spaces for each with three bedrooms and 2 for four bedroom dwellings.
- 4.63 Suitable provision in the *FALP* varies by location, habitable rooms per unit, units per hectare and PTAL rating (see **Plate 17**, earlier). For a development site such as this, in an urban location, 3.1 – 3.7 habitable rooms per unit and 55 – 145 units per hectare, with a PTAL rating of 2 to 4, the matrix suggests an average overall provision of around 1 space per unit.
- 4.64 A total of 379 residential car parking spaces will be provided for the 396 dwellings, at an average of 0.96 spaces per dwelling across the site. By housing type, the average allocated provision is 1.13 spaces per house and 0.78 per apartment. This provision accords with the applicable parking standards described above, and is considered appropriate in the context of the site's village fringe location, close to shops and other services/amenities, and the availability of public

transport within walking distance. Car-free living at this site is a realistic prospective for some future residents.

4.65 Charging infrastructure for electric vehicles will be provided in accordance with *London Plan* minimum standards, as described in **Section 3.0**.

4.66 All wheelchair accessible apartments (10%) will be assigned a disabled parking space, conveniently located close to the block entrances in accordance with requirements set out in the *London Plan: Housing SPG*.

4.67 Car parking will be controlled through a CPZ, in accordance with LBH Core Strategy and Development Control Policies DPD **Policy DC2**, and as described in **Section 3.0**.

4.68 Parking space dimensions are listed in the applicable standards as being 4.8m x 2.4m, increasing to 4.8m x 3.6m for disabled spaces. These bay dimensions have been used in the scheme layout.

4.69 790 secure cycle parking spaces are provided in accordance with the minimum *London Plan* standards, with dedicated secure cycle stores for the apartments. An additional 10 secure 'short-stay' visitor spaces will also be provided.

Summary

4.70 In view of the above, it is clear that the principle of the proposed residential development on this site is fully compliant with current policy guidance on transport and land use planning at national, regional and local levels.

5.0 TRIP ATTRACTION/GENERATION AND ASSIGNMENT

- 5.1 The existing industrial employment uses on the site currently attract a number of trips in the weekday am and pm peak hours and throughout the day. The existing and potential historic (fully occupied) trip attraction of the existing site use is considered in this section alongside the forecast trip generation of the proposed residential scheme.

Existing Site Use

- 5.2 The weekday am and pm peak period trip attraction of the existing industrial estate was surveyed in January 2008 to inform the BTP TA submitted as part of the previous Weston Homes planning application for the site. The observed weekday am and pm peak hour vehicle trip attraction at that time is shown at **Table 5.1**.

Table 5.1: January 2008 site trips (source: Weston Homes TA)

Period and mode	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (08:00-09:00)			
All Vehicles	59	24	83
OGVs	11	10	21
Weekday pm peak hour (17:00-18:00)			
All Vehicles	21	68	89
OGVs	3	5	8

- 5.3 It is unknown how much of the industrial estate was operational at the time of the above survey. Many units and areas of hardstanding on-site are currently not in use and if this was also the case in January 2008, then the trip attraction shown in **Table 5.1** would understate the potential trip attraction of a fully-occupied site.

- 5.4 Contemporary traffic surveys were undertaken in November 2014, comprising turning counts at each of the three existing accesses (see **Appendix L**). The total observed vehicle trip attraction in the weekday network am and pm peak hours is shown at **Table 5.2**.

Table 5.2: November 2014 site trips

Period and mode	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (07:30-08:30)			
All Vehicles	46	34	80
OGVs	8	9	17
Weekday pm peak hour (16:30-17:30)			
All Vehicles	47	73	120
OGVs	4	2	6

- 5.5 It is evident from comparing the observed January 2008 and November 2014 weekday peak hour site trip attraction (**Tables 5.1 and 5.2** above) that there has been little change in the am peak hour, however the trip attraction in the pm peak hour has increased by around 30 movements.
- 5.6 As mentioned above, many units and areas of hardstanding on-site are currently not in use and, therefore, the site's potential trip attraction could be higher still.
- 5.7 In view of the above, as a comparison, we have therefore derived the trip attraction that could be expected to be typically associated with an industrial estate of this size (site area of 5.7 hectares) by deriving trip rates from the *Industrial Estate* sub-category in the TRICS database. We have included sites in England, and selected only compatible suburban, edge of town and neighbourhood centre locations, giving data for 14 sites/days. Full TRICS output data is included at **Appendix M**. The resultant weekday peak hour vehicle trip attraction is summarised in **Table 5.3**.

Table 5.3: Potential site trips (source: TRICS)

Period and mode	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (08:00-09:00)			
All Vehicles	82	42	124
OGVs	4	6	10
Weekday pm peak hour (17:00-18:00)			
All Vehicles	21	70	91
OGVs	3	2	5

5.8 A comparison of **Tables 5.2** and **5.3** shows that the level of peak hour trip attraction is similar, although existing businesses on-site actually attract more trips than the potential attraction derived from TRICS sites during the pm peak hour, with the reverse being the case for the am peak hour. This is clearly dependent on the operational needs of specific businesses.

5.9 For the purpose of the assessment work presented in **Section 6.0**, we have taken the contemporary (Nov 2014) site trip attraction as the 'extant' case for site trips, and included this in the Base Case.

Former Consented Scheme

5.10 As identified earlier, planning consent was previously granted to Weston Homes for a residential-led mixed-use scheme comprising 729 dwellings and 8,780m² of retail/commercial floor space. The BTP TA assessed the forecast trip generation/attraction of the development using trip rates attained from sites available on the TRAVL database, the data from which has since migrated to TRICS.

5.11 The weekday peak hour vehicle trip rates (per dwelling) BTP obtained from TRAVL were as follows: -

- am – 0.080 in, 0.240 out, 0.320 two-way
- pm – 0.190 in, 0.110 out, 0.300 two-way

- 5.12 However LBH subsequently requested that BTP adopt a two-way weekday peak hour vehicle trip rate of 0.500 for use in its analysis.
- 5.13 The forecast weekday peak hour vehicle trip generation/attraction of the consented scheme, as identified in the BTP TA, is shown at **Table 5.4**.

Table 5.4: Former Consented Scheme trips (source: BTP TA)

Period and mode	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (08:00-09:00)			
All Vehicles	189	308	497
OGVs	0	0	0
Weekday pm peak hour (17:00-18:00)			
All Vehicles	270	216	486
OGVs	0	0	0

Proposed Development Scheme

- 5.14 The proposed development comprises 396 dwellings, comprising a mix of 177 houses and 219 apartments.
- 5.15 We have obtained trip rate data from the TRICS database for the *Mixed Private/Affordable Housing* category for each mode of travel for the weekday am and pm peak hours, which follows the approach agreed for the 2011 WSP TA in support of a residential-led mixed-use scheme at the Former Somerfields Depot site on New Road. We have included sites in Greater London and the South East, and selected only edge of town and suburban area locations that have comparable public transport provision, giving data for 6 sites/days.
- 5.16 **Table 5.5** sets out the adopted mean trip rates and the resultant weekday peak hour trip generation by main mode of travel of the proposed residential development on the site. Full TRICS output data is included at **Appendix M**.

Table 5.5: Weekday peak hour trip rates (source: TRICS)

Period and mode	Trip Rates (per dwelling)			Trips (396 dwellings)		
	<i>In</i>	<i>Out</i>	<i>2-way</i>	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (08:00-09:00)						
All Vehicles	0.097	0.279	0.376	38	110	149
OGVs	0.002	0.000	0.002	1	0	1
Cyclists	0.007	0.027	0.034	3	11	13
Vehicle occupants	0.110	0.378	0.488	44	150	193
Pedestrians	0.079	0.171	0.250	31	68	99
Bus	0.015	0.057	0.072	6	23	29
Rail	0.000	0.035	0.035	0	14	14
Total people	0.211	0.667	0.878	84	264	348
Weekday pm peak hour (17:00-18:00)						
All Vehicles	0.249	0.125	0.374	99	50	148
OGVs	0.000	0.000	0.000	0	0	0
Cyclists	0.022	0.017	0.039	9	7	15
Vehicle occupants	0.331	0.162	0.493	131	64	195
Pedestrians	0.090	0.069	0.159	36	27	63
Bus	0.028	0.008	0.036	11	3	14
Rail	0.010	0.000	0.010	4	0	4
Total people	0.482	0.256	0.738	191	101	292

5.17 As a sensitivity test, we have also derived trips by mode and journey purpose in each weekday peak period for the Havering (00AR1) zone from the National Trip Ends Model (NTEM) v6.2 (July 2011) and applied this to the weekday peak hour person trips derived from TRICS set out in **Table 5.5**. This gives the trips by mode set out in **Table 5.6**.

Table 5.6: Predicted peak hour residential trips by main mode of travel (source: TRICS/NTEM v6.2)

Period and mode	Trip generation (395 dwellings)		
	<i>In</i>	<i>Out</i>	<i>2-way</i>
Weekday am peak hour (08:00-09:00)			
Person trips	84	264	348
Walk trips	20	61	81
Cycle trips	1	4	5
Car driver trips	35	99	134
Car passenger trips	16	45	62
Bus trips	9	24	33
Rail trips	2	30	33
Weekday pm peak hour (17:00-18:00)			
Person trips	191	101	292
Walk trips	40	22	62
Cycle trips	3	1	4
Car driver trips	86	49	135
Car passenger trips	32	19	51
Bus trips	13	8	21
Rail trips	17	2	19

Note: Modal split from NTEM v6.2 data for Havering (main) zone

- 5.18 Comparing **Tables 5.5 and 5.6** shows that the predicted weekday peak hour vehicle trip generation of the development is similar using both methods, with the TRICS data producing a 'worst case'. In view we have adopted the slightly higher vehicle trip generation derived from TRICS data (**Table 5.5**) in our assessment of development traffic impact.
- 5.19 However, we consider that the TRICS/NTEM method produces a more realistic forecast of development trips using public transport.
- 5.20 The above approach was agreed with LBH during pre-application scoping discussions. The scheme does not now propose affordable housing.

- 5.21 We have therefore compared the trip generation derived from rates obtained from the TRICS *Mixed Private/Affordable Housing* category (shown in **Table 5.5**) with that using an alternative approach based on rates obtained from the *Private Houses* and *Private Flats* sub-categories and applied those to the proposed mix. The alternative approach results in marginally fewer vehicle movements in each peak hour, assumed to be a result of the proposed development having a higher proportion of flats than the surveyed TRICS *Mixed Private/ Affordable Housing* sites, as flats generally generate fewer trips than houses. The approach agreed with LBH is therefore robust.

Change

- 5.22 **Table 5.7** sets out predicted changes in weekday peak hour vehicle trips, derived by subtracting those in **Tables 5.2** (2011 site trips), **5.3** (Potential site trips) and **5.4** (Former Consented Scheme trips) from those in **Table 5.5** (Forecast development trips).

Table 5.7: Comparison of predicted total vehicle trip generation of existing, former consented and proposed uses of the site

Period	In	Out	Two-way
Weekday am peak hour			
Proposed Development	38	110	149
2014 Site Trips	46 (-8)	34 (+76)	80 (+69)
Potential Site Trips (TRICS)	82 (-44)	42 (+68)	124 (+25)
Former Consented Scheme Trips	189 (-151)	308 (-198)	497 (-348)
Weekday pm peak hour			
Proposed Development	99	50	148
2014 Site Trips	47 (+52)	73 (-23)	120 (+28)
Potential Site Trips (TRICS)	21 (+78)	70 (-20)	91 (+57)
Former Consented Scheme Trips	270 (-171)	216 (-166)	486 (-338)

- 5.23 **Table 5.6** shows that the proposed redevelopment of the site is expected to result in a net increase of up to around 69/28 two-way movements in the weekday am/pm peak hours based on a comparison with surveyed 2014 site trips. A reduced net increase could be expected when compared with the forecast trips attracted by a fully occupied site (derived from TRICS).
- 5.24 The proposed redevelopment scheme would result in a significant net reduction of around 340 two-way movements in the weekday peak hours when compared with the forecast trips associated with the unimplemented consented Weston Homes scheme.

6.0 TRAFFIC IMPACT & CAPACITY ANALYSIS

Methodology

- 6.1 In order to assess the impact of the predicted traffic generated by the proposed redevelopment of the site, it is necessary to consider the operation of the local highway network under both the Base and Development Cases and undertake a comparison of the performance in each scenario. Both Base and Development Cases must consider the future assessment year and include the traffic associated with consented developments in the area and include an allowance for the growth of existing “background” traffic.
- 6.2 The impact of development traffic has been assessed in the weekday am and pm peak hours for an assessment year of 2020 (i.e. five years after submission of the application in accordance with the 2007 DfT/DCLG TA Guidance, as agreed with LBH), allowing for projected background growth.
- 6.3 DfT/DCLG Guidance suggests that assessment should be undertaken where the net increase in two-way traffic flows is expected to exceed +30 movements per hour. The expected net increase falls below this threshold in the weekday am peak hour when compared with the potential trip attraction of a fully occupied site (using TRICS), and the pm peak hour when compared with existing (2014) site trips. Notwithstanding this, the impact of development traffic has been assessed as agreed with LBH.

Existing conditions

- 6.4 Observed 2014 weekday am and pm peak hour traffic flows are shown at **Flow Diagrams 1 and 2** respectively. These were derived from classified turning count surveys undertaken between the hours of 07:00-10:00 and 16:00-19:00 on Thursday 6th November 2014 (i.e. midweek during school term time so a “typical” weekday) at

the site access junctions with New Road and Bridge Road, and the Dovers Corner roundabout. The survey results are included at **Appendix L**.

- 6.5 The survey results show the am and pm peak hours (defined as those in which the total flow through the junction was greatest) to occur between 07:30 and 08:30, and 16:30 and 17:30 respectively.
- 6.6 Existing site traffic has been isolated from the observed flows, assuming that movement in/out of each site access assigns through Dovers Corner roundabout in accordance with observed turning proportions. The existing site traffic flows in the weekday am and pm peak hours are shown at **Flow Diagrams 3 and 4** respectively.
- 6.7 The site traffic shown at **Flow Diagrams 3 and 4** is conservative as the site has potential to attract a higher level of trips than it does at present since not fully occupied (see **Tables 5.1 – 5.3**, above).

Future year conditions

Background traffic

- 6.8 We have applied projected background traffic growth for Principal Urban Roads, derived from projected increases in annual vehicle mileage in London from the National Transport Model (NTM) 2013. These have been modified by the use of local factors for the increase in car driver trips in the Havering (main) zone derived from the National Trip Ends Model (NTEM) dataset v6.2 (July 2011).
- 6.9 We have derived growth factors to project from the 2014 surveyed flows to the future assessment year of 2020. The resultant growth factors are: -
- Weekday am peak period: 1.085 (+8.5%); and
 - Weekday pm peak period: 1.085 (+8.5%).

- 6.10 We have applied these growth factors to the observed traffic, with existing site traffic discounted, to give the predicted background flows for 2020 which are shown at **Flow Diagrams 5 and 6**.

Committed Development

- 6.11 LBH has requested that our assessment take into account the forecast trip attraction of committed development (with planning consent) at the Havering College of Further and Higher Education Rainham Campus and the Former Somerfield Depot sites.
- 6.12 LBH has also requested that the potential redevelopment of the Land Between Railway and Broadway (SSA13) be accounted for in the assessment, although not consented and no application submitted.
- 6.13 At the time of the turning count surveys, in November 2014, the adjacent Passive Close development was not completed. We have therefore also accounted for this in the assessment.

Havering College of Further and Higher Education Rainham Campus (application ref: P1371.12)

- 6.14 We have obtained the TA prepared by Gifford, dated May 2009. The traffic associated with the redevelopment scheme (11,800m² of D1 floorspace with 200 car parking spaces) in the weekday am and pm peak hours is shown at **Flow Diagrams 7 and 8** respectively.
- 6.15 Traffic has been assigned to New Road in accordance with the assumed distribution in the Gifford TA, and through Dovers Corner roundabout in accordance with observed turning proportions.

Former Somerfield Depot (application ref: P1813.11)

- 6.16 We have obtained the TA prepared by WSP, dated September 2011. The traffic associated with the redevelopment scheme (170m² of

commercial floorspace and 497 residential units plus energy centre, car and cycle parking) in the weekday am and pm peak hours is shown at **Flow Diagrams 9 and 10** respectively.

- 6.17 Traffic has been assigned to New Road in accordance with the assumed distribution in the WSP TA. We have assumed that traffic assessing the A125 Rainham Road would do so via Cherry Tree Lane rather than via Dovers Corner roundabout; otherwise, movement through the roundabout has been assigned as per observed turning proportions.

Land Between Railway and Broadway (Site Specific Allocation - SSA13)

- 6.18 It is understood that this site could be redeveloped to provide up to around 65 new dwellings. We have applied the same weekday peak hour trip rates as adopted for the application scheme, and assigned the resultant traffic in broad accordance with 2011 Census Travel to Work origin-destination (O-D) data for the local resident population who drive to/from work (see below, under Development Case Traffic Distribution/Assignment for details). The forecast traffic associated with the redevelopment scheme in the weekday am and pm peak hours is shown at **Flow Diagrams 11 and 12** respectively.

Passive Close, New Road, Havering

- 6.19 We have obtained the TS prepared by Templeman Associates in 2012. **Flow Diagrams 13 and 14** show the traffic associated with the residential scheme in the weekday am and pm peak hours respectively, with traffic again assigned in broad accordance with 2011 Census Travel to Work O-D data.

Total Committed Development

- 6.20 **Flow Diagrams 15 and 16** show the total predicted committed development traffic flows in the weekday am and pm peak hours respectively.
- 6.21 In respect of the derivation of projected background growth, it is important to note that NTEM includes an allowance for development allocations identified in the adopted Local Development Plan. Neither the proposed development nor these committed developments have been discounted in the derivation of NTEM rates. Therefore, there is an element of double counting, with the growth factor allowing for at least part of these development sites already, and so the method adopted is robust.

Base Case

- 6.22 Adding the existing site traffic (**Flow Diagrams 3 and 4**) to the predicted 2020 Background traffic (**Flow Diagrams 5 and 6**) and the total committed development traffic (**Flow Diagrams 15 and 16**) gives the 2020 Base Case flows, shown in **Flow Diagrams 17 and 18**.

Development Case

- 6.23 We have distributed the forecast development trips to the local highway network in broad accordance with 2011 Census Travel to Work O-D data for the local residential populations of the Havering 028 and 030 Middle Layer Super Output Areas (note: 2011 O-D data not currently available at ward level) who drive to/from work (see **Appendix C**).
- 6.24 “TomTom” website routefinder was used to verify the assignment of trips onto the local highway network; this identifies the expected quickest route during the peak periods, taking into account the

levels of congestion normally experienced at these times. This results in the following distribution:

New Road (west):	30%
Rainham Road:	35%
New Road (east):	23%
Bridge Road:	11%

- 6.25 Applying the forecast distribution to the predicted traffic associated with the proposed residential development, set out in **Table 5.5**, gives the traffic shown in **Flow Diagrams 19 and 20**.
- 6.26 The Development Case flows, shown in **Flow Diagrams 21 and 22**, have been derived by adding the predicted development traffic (**Flow Diagrams 19 and 20**) to the predicted 2020 Background traffic (**Flow Diagrams 5 and 6**) and committed development traffic (**Flow Diagrams 15 and 16**).

Change in traffic flows

- 6.27 An increase of +10% in peak hour traffic is generally regarded as material in terms of the impact on highway capacity and represents the typical day-to-day variation in flows. Such an increase has historically been taken as the threshold for determining whether or not the impact of development traffic on highway capacity should be assessed, reduced to +5% in areas already subject to, or expected to be subject to, congestion.

Increase in flows on links

- 6.28 We have derived the capacity of each link in the study area using guidance set out in *TA 79/99 Traffic Capacity of Urban Roads*, as described below.

- 6.29 In the vicinity of the site, New Road is a good standard single carriageway road with an average width of 8m, subject to a 30mph speed limit with restricted on-street parking, bus stops and some at-grade pedestrian crossings, and so can be defined as a "UAP2" road according to *TA 79/99*. Interpolating between standard road widths included at Table 2 of *TA 79/99* shows that an 8m wide single carriageway of this type would be expected to have a capacity of 1,500 vehicles per hour in the peak direction of flow, assuming a 60:40 directional split. This gives a two-way link capacity of 2,500 vehicles.
- 6.30 Rainham Road is a variable standard single carriageway road with an average width of 8m, subject to a 30mph speed limit with frontage access, bus stops and at-grade pedestrian crossings, and so can be defined as a "UAP3" road according to *TA 79/99*. Interpolating between standard road widths included at Table 2 of *TA 79/99* shows that an 8m wide single carriageway of this type would be expected to have a capacity of 1,395 vehicles per hour in the peak direction of flow, assuming a 60:40 directional split. This gives a two-way link capacity of 2,325 vehicles.
- 6.31 New Road, east of Dovers Corner roundabout, is a high standard single carriageway road with an average width of 8.5m, subject to a 40mph speed limit with restricted on-street parking and bus stops in lay-bys, and so can be defined as a "UAP1" road according to *TA 79/99*. Interpolating between standard road widths included at Table 2 of *TA 79/99* shows that an 8.5m wide single carriageway of this type would be expected to have a capacity of 1,780 vehicles per hour in the peak direction of flow, assuming a 60:40 directional split. This gives a two-way link capacity of 2,967 vehicles.
- 6.32 Bridge Road is a good standard single carriageway road with an average width of 9m, subject to a 30mph speed limit with restricted on-street parking, and some at-grade pedestrian crossings, and so can be defined as a "UAP2" road according to *TA 79/99*. Table 2 of

TA 79/99 shows that an 9m wide single carriageway of this type would be expected to have a capacity of 1,550 vehicles per hour in the peak direction of flow, assuming a 60:40 directional split. This gives a two-way link capacity of 2,583 vehicles.

6.33 **Table 6.1** sets out the predicted absolute and percentage increase in two-way link flows on the local highway network within the study area in the weekday am and pm peak hours in the 2020 assessment year. For each link we have also identified its capacity derived from Table 2 of TA 79/99.

Table 6.1: Predicted change in on links within study area, Assessment Year (2020)

Link	Capacity (two-way flow, vehs/hour)	Weekday AM peak hour			Weekday PM peak hour		
		Base	Dev't	Change	Base	Dev't	Change
New Road (west of access)	2,500	1,381	1,400	+19	1,212	1,203	-9
	(8.0m UAP2)	55%	56%	+1.4%	48%	48%	-0.7%
New Road (between access and rbt)	2,500	1,397	1,460	+63	1,224	1,263	+39
	(8.0m UAP2)	56%	58%	+4.5%	49%	51%	+3.2%
Rainham Road	2,325	2,131	2,180	+49	2,196	2,241	+45
	(8.0m UAP3)	92%	94%	+2.3%	94%	96%	+2.0%
New Road (east)	2,967	2,053	2,068	+15	1,907	1,914	+7
	(8.5m UAP1)	69%	70%	+0.7%	64%	65%	+0.4%
Bridge Road	2,583	1,842	1,837	-5	1,986	1,963	-23
	(9.0m UAP2)	71%	71%	-0.3%	77%	76%	-1.2%

6.34 **Table 6.1** shows that all links within the study area are expected to operate within capacity with the predicted Base and Development Case flows in the weekday peak hours. It also shows that the predicted increase in flows on all links is well below both the +10% typical day-to-day variation and the lower +5% threshold adopted historically. The Base Case is understated as this includes the existing (2014) site flows rather than the potential fully occupied site trip attraction, and so increases in flows would be even less if the latter were included in the Base.

- 6.35 The predicted increase is greatest in the weekday am peak hour on New Road, between the site access and Dovers Corner roundabout, at +4.5%. A small decrease in traffic is expected on Bridge Road due in part to the closure of site access from this link and forecast changes in assignment due to the site's proposed change of use.

Increase in flows through junctions

- 6.36 **Table 6.2** sets out the total predicted flows through junctions on the local highway network in the weekday am and pm peak hours in the 2020 Assessment Year in the Base and Development Cases, and the resultant change.

Table 6.2: Predicted change in flows through junctions within study area, Assessment Year (2020)

Junction	Weekday am peak hour				Weekday pm peak hour			
	Base	Dev't	Change		Base	Dev't	Change	
Site Access/New Road	1,419	1,504	+85	+6.0%	1,270	1,307	+37	+2.9%
Dovers Corner roundabout	3,711	3,772	+61	+1.6%	3,657	3,689	+32	+0.9%

- 6.37 **Table 6.2** shows that the predicted increase in traffic during the weekday peak hours due to the development in the 2020 assessment year is well below the +10% typical day-to-day variation at both the site access junction with New Road and Dovers Corner Roundabout. It is above the 30 movements set out in the DfT/DCLG Guidance though. Notwithstanding this, we have assessed the impact of the predicted increase in traffic on the operation of these junctions as agreed with LBH.

Junction capacity analysis

Principles

- 6.38 The results of the capacity analysis of each junction in the weekday am and pm peak hours in the future assessment year of 2020 are

summarised in the tables below. This has been undertaken using the appropriate industry-standard software (PICADY for the priority T-junction and ARCADY for the roundabout), using the *ODTab* option to model a 90-minute period (the peak hour itself plus 15 minutes either side) with a synthesised flow profile. This assumes a peak within the peak period and so is robust. The junction models have been developed using Ordnance Survey mapping, supplemented by on-site observations.

- 6.39 The tables give, for each flow scenario, the maximum Ratio of Flow to Capacity (RFC) value predicted in association with each give way manoeuvre during each modelled period, together with the maximum average queue (in vehicles) and the average overall delay incurred by every vehicle passing through the junction. An RFC value of 0.85 is usually taken as indicating that the manoeuvre is operating at practical capacity, while a value of 1.0 indicates that it is operating at theoretical capacity. Once a manoeuvre is operating at an RFC above 0.85 it becomes very sensitive to any increase in traffic.

Site Access/New Road Priority 'T' Junction

- 6.40 **Table 6.3** summarises the results of the PICADY capacity analysis of the proposed modified site access junction with the predicted 2020 Development Case flows in the weekday peak hours. Full program outputs are provided at **Appendix N**.

Table 6.3: Summary of results of PICADY capacity analysis of proposed Site Access/New Road priority junction

Manoeuvre	2020 Weekday am peak hour				2020 Weekday pm peak hour			
	Base Case		Dev't Case		Base Case		Dev't Case	
	RFC	Q	RFC	Q	RFC	Q	RFC	Q
Site Access: left out	-	-	0.111	0.1	-	-	0.035	0.0
Site Access: right out	-	-	0.426	0.7	-	-	0.145	0.2
New Road: ahead and right turn	-	-	0.032	0.6	-	-	0.069	0.1
Overall junction delay (min/veh)	-		0.02		-		0.01	

6.41 **Table 6.3** shows that the proposed junction arrangement is forecast to operate well within capacity with the predicted 2020 Development Case flows.

Dovers Corner Roundabout

6.42 The junction model has been verified by analysing the performance of the roundabout using the Direct flow profile option in ARCADY with observed traffic flows and comparing the predicted queues with those surveyed. These were found to be similar on all arms.

6.43 **Table 6.4** summarises the results of the ARCADY capacity analysis of the Dovers Corner roundabout junction with the predicted 2020 Base and Development Case flows in the weekday peak hours. Full program outputs are provided at **Appendix O**.

Table 6.4: Summary of results of ARCADY capacity analysis of existing Dovers Corner roundabout junction

Arm	2020 Weekday am peak hour				2020 Weekday pm peak hour			
	Base Case		Development Case		Base Case		Development Case	
	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)	RFC	Queue (vehs)
Rainham Road	0.556	1.4	0.596	1.5	0.648	1.8	0.662	1.9
New Road (east)	0.745	3.0	0.757	3.1	0.567	1.3	0.576	1.3
Bridge Road	0.847	5.2	0.845	5.1	0.756	3.0	0.763	3.2
New Road (west)	0.394	0.6	0.437	0.8	0.514	1.1	0.510	1.0
Overall junction delay (min/veh)	0.10		0.10		0.08		0.08	

6.44 **Table 6.4** shows that the Dovers Corner roundabout is forecast to operate within capacity with the predicted 2020 Base and Development Case flows. The assessment results show that development impact at the junction is immaterial, and would not be perceptible.

7.0 SUMMARY & CONCLUSIONS

- 7.1 Persimmon Homes Essex has submitted a planning application for the residential redevelopment of the Dovers Corner Industrial Estate and Boomes Industrial Estate, Rainham, to provide 396 residential dwellings.
- 7.2 The Site is located on the fringe of Rainham Village, within walking distance of employment opportunities and local services such as shops, schools and community and leisure facilities. It benefits from a comprehensive network of pedestrian and cycle routes in its proximity, and is readily accessible by public transport with bus stops and Rainham railway station located within a short walk.
- 7.3 It is proposed to consolidate vehicular site access and retain this from a single point on New Road, with alternative emergency access taken from Lamson Road. The existing site access junction will be modified as appropriate to serve the new residential use, and the layout of foot/cycleways improved either side to provide a clear transition between shared and segregated routes. The other existing accesses on New Road and Bridge Road are to be closed, with foot/cycleways reinstated.
- 7.4 The internal site layout has been designed with consideration given to both LBH's *Residential Design Guide Supplementary Planning Document (SPD)* and the *Manual for Streets*. Emphasis has been on providing high quality shared surfaces, which will assist in reducing car dominance, keeping traffic speeds within the target of 20mph on all internal roads and prioritising pedestrian and cycle movement.
- 7.5 All roads within the development site, both those with footways and shared surfaces, will have carriageway at least 5.5m wide, enabling a refuse or delivery vehicle to pass a car with ease.
- 7.6 The layout is highly permeable for pedestrians and cyclists and integrates with neighbouring sites and wider area designations. An

east-west aligned foot/cyclepath is provided through a linear park at the heart of the site, and a route is created through the site from New Road to Lamson Road, enabling convenient access on foot or by bike to Rainham village and the railway station. Consideration is being given to the provision of a new toucan crossing on Lamson Road to further enhance site connectivity.

7.7 The proposed level of car parking provision, within maximum standards, is considered appropriate in the context of the site's village fringe location, close to shops and other services/amenities, and the availability of public transport within walking distance. Cycle parking is to be provided in accordance with adopted standards.

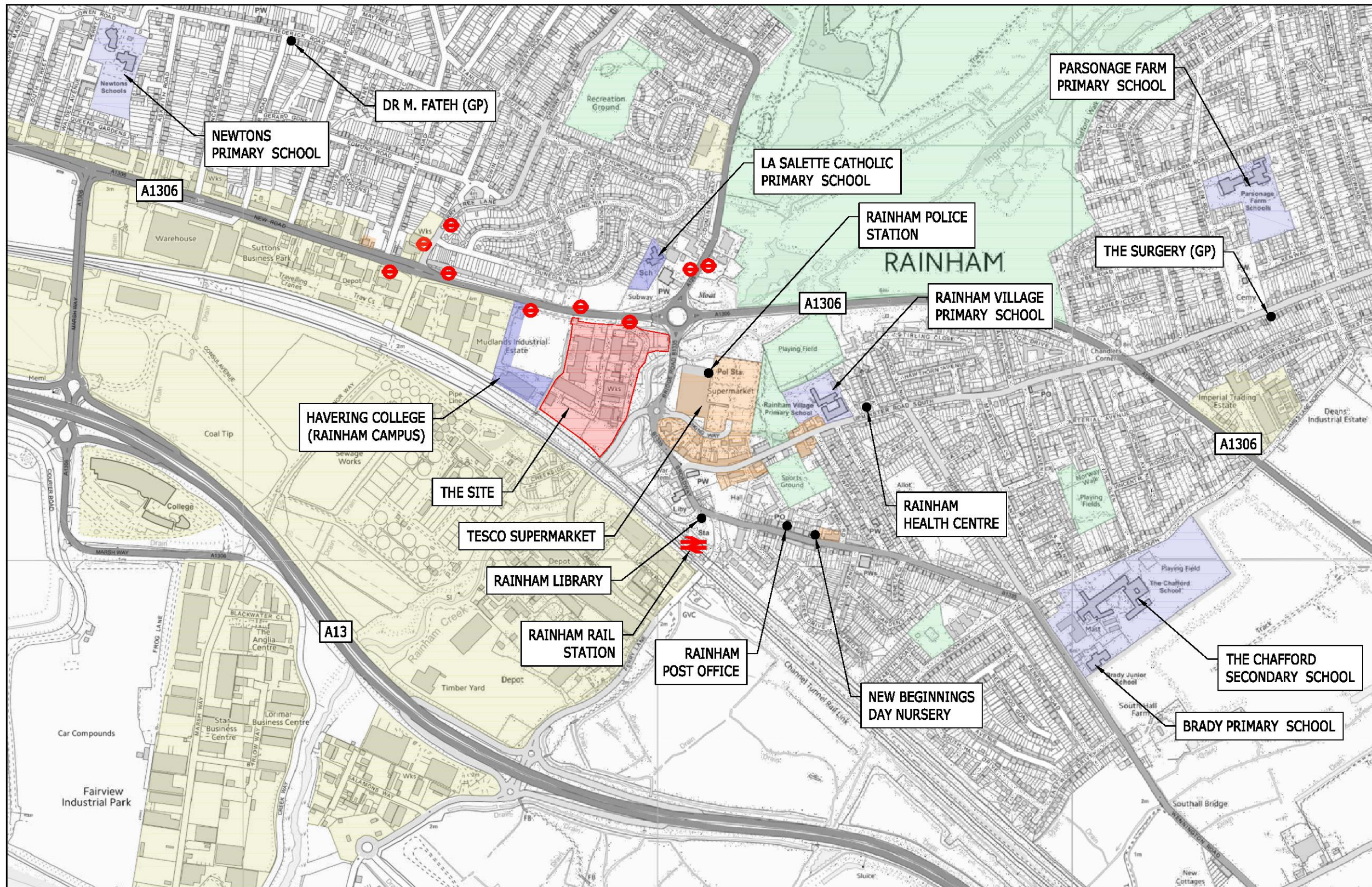
7.8 In accordance with LBH and TfL requirements, a Travel Plan has been prepared that contains a variety of measures to promote sustainable travel to and from the site. This includes the provision of a Travel Pack to each household on first occupation, which will contain details of local walk and cycle routes and locations of bus stops within walking distance of the site together with timetables for routes serving them and of trains from Rainham station.

7.9 The proposed development is expected to result in a net increase of up to around 69 two-way movements in the weekday am peak hour and 28 in the pm peak hour based compared with the existing site use. It is forecast to result in a significant net reduction of around 340 two-way movements in the weekday peak hours when compared with the forecast trips attracted by the former consented scheme.

7.10 The impact of the predicted net trip generation/attraction resulting from the proposed redevelopment of the site has been considered on links and junctions in the agreed study area. The assessment considered both the Base and Development Cases in the 2020 assessment year.

- 7.11 It has been found that all links would continue to operate within their theoretical capacities in the 2020 assessment year in the Development Case.
- 7.12 The predicted changes in traffic during the weekday peak hours due to the development in the 2020 assessment year is well below the +10% typical day-to-day variation at both the site access junction with New Road and Dovers Corner Roundabout. Notwithstanding this, we have assessed the impact of the predicted changes in traffic on the operation of these junctions, and this is shown to be minimal, with marginal increases in queuing forecast. The redevelopment scheme will therefore have a negligible impact on the local highway network.
- 7.13 Having fully considered highways/transport matters, we consider that planning permission for the proposed development at the Site should be granted.

Figures



KEY

LOCAL SHOPS

EDUCATION

LOCAL BUS STOPS

LEISURE

EMPLOYMENT



ARDENT CONSULTING ENGINEERS

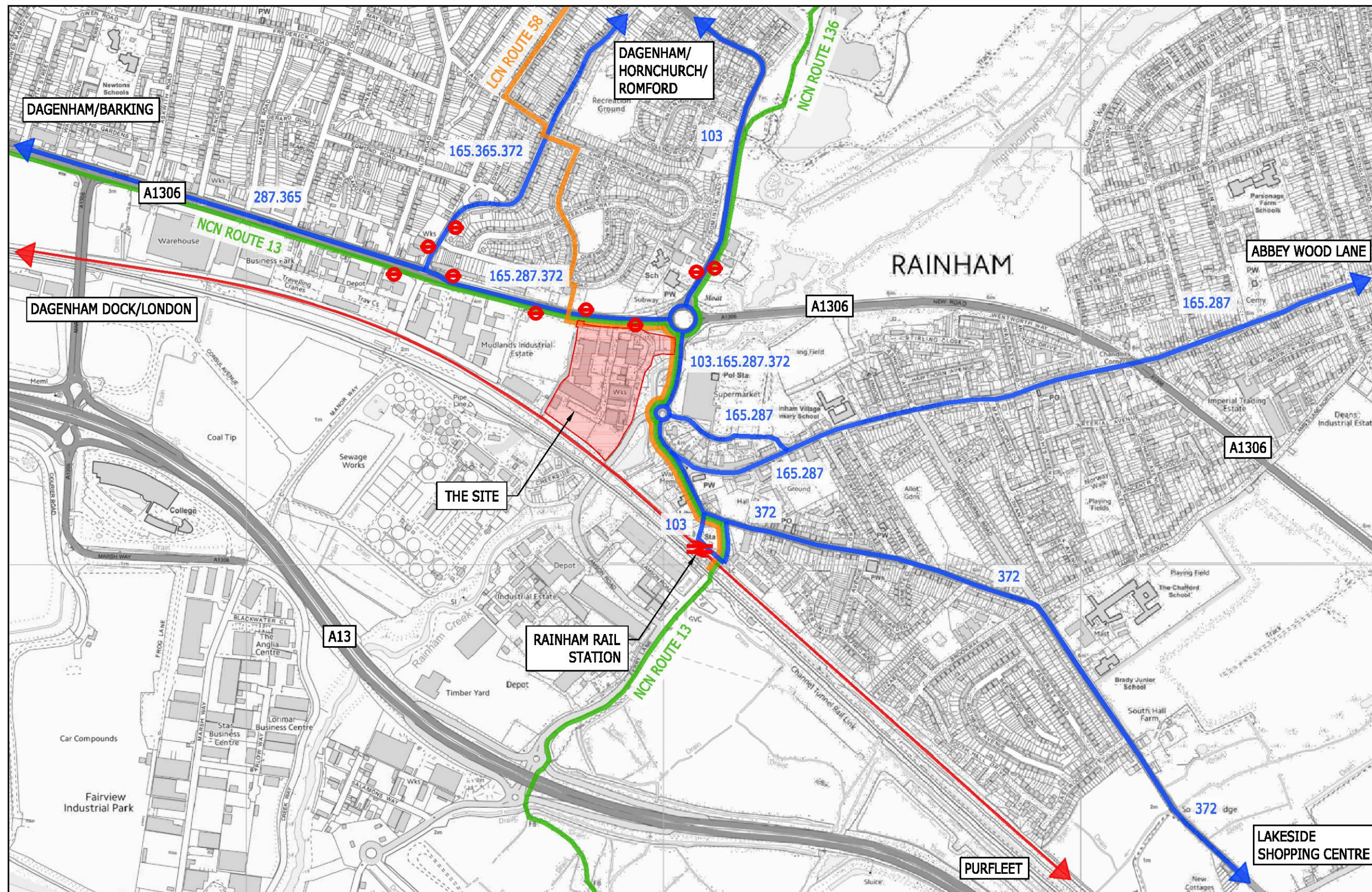
Suite 207, One Alie Street, London, E1 8DE
t 020 7680 4088 f 020 7488 3736
w www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE:
**DOVERS CORNER,
RAINHAM**

DRAWING TITLE:
**LOCAL FACILITIES
PLAN**

CLIENT:
**PERSIMMON HOMES
ESSEX**

REV.	AMENDMENTS	DRN	CHK	APP	DATE
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DRAWN:	CHECKED:	APPROVED:			
DV	SAF	ML			
DRAWING NO.	FIGURE 1				REV:
					-



KEY

- BUS ROUTE
- LOCAL BUS STOPS
- NCN CYCLE ROUTE
- LCN CYCLE ROUTE 58



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Suite 207, One Alie Street, London, E1 8DE
t 020 7680 4088 f 020 7488 3736
www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE:
**DOVERS CORNER,
RAINHAM**

DRAWING TITLE:
**PUBLIC TRANSPORT
PLAN**

CLIENT:
**PERSIMMON HOMES
ESSEX**

REV. AMENDMENTS

DRN CHK APP DATE

SCALE:
1:10,000 @ A3

DATE:
MARCH 2015

JOB NO:
S960

DRAWN:
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CHECKED:
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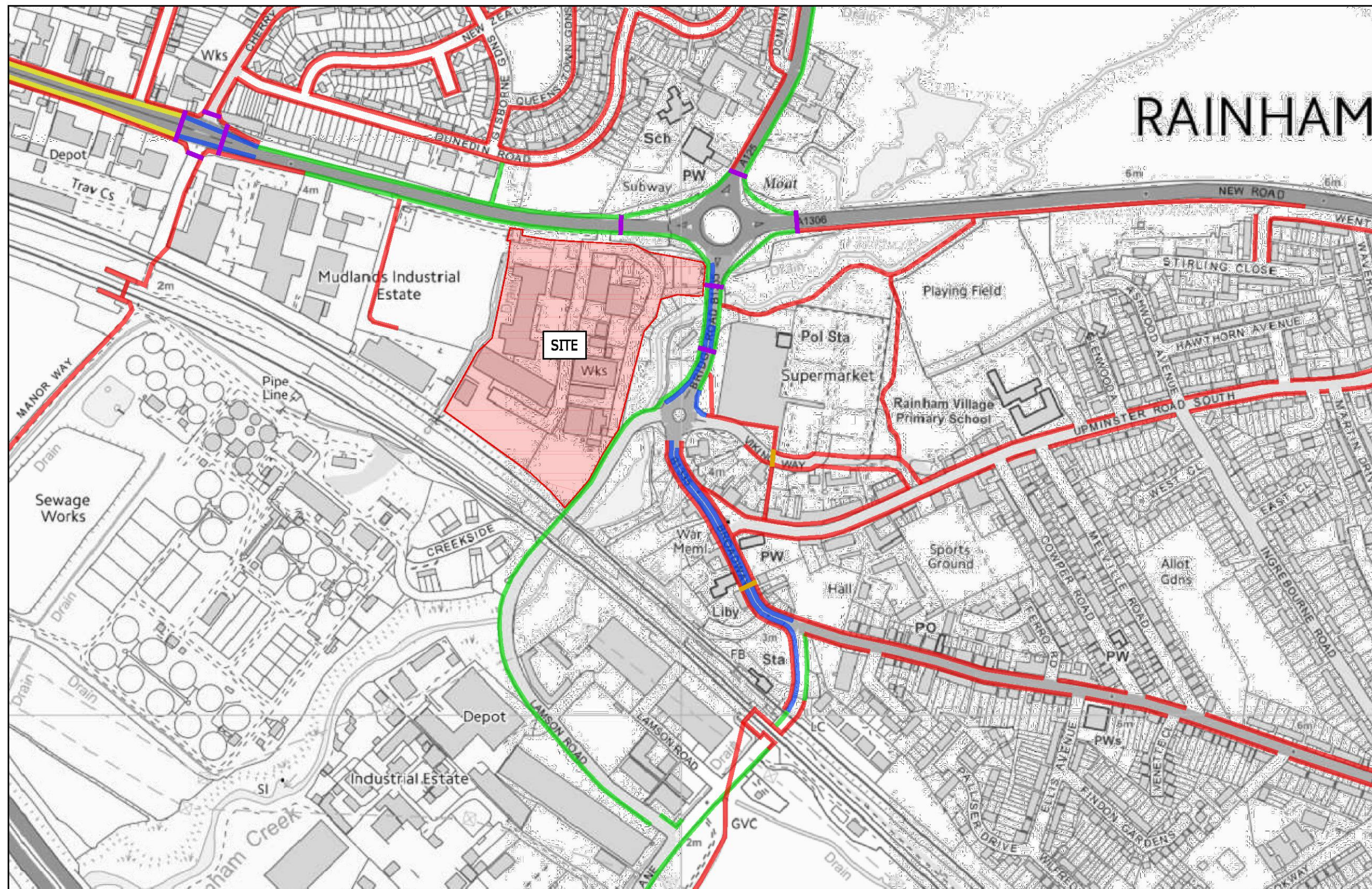
APPROVED:
ML

DRAWING NO.

FIGURE 2

REV:

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KEY:

— FOOTWAY/CYCLEWAY
— FOOTWAY/PATH
— CYCLE LANE

— BUS LANE
— PELICAN/TOUCAN CROSSING
— ZEBRA CROSSING



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Suite 207, One Alie Street, London, E1 8DE
t 020 7680 4088 f 020 7488 3736
w www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE:

DOVERS CORNER,
RAINHAM

DRAWING TITLE:

FOOT/CYCLE
PLAN

CLIENT:

PERSIMMON HOMES
ESSEX

REV. AMENDMENTS

DRN CHK APP DATE

SCALE:

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DATE:

MARCH 2015

JOB NO:

S960

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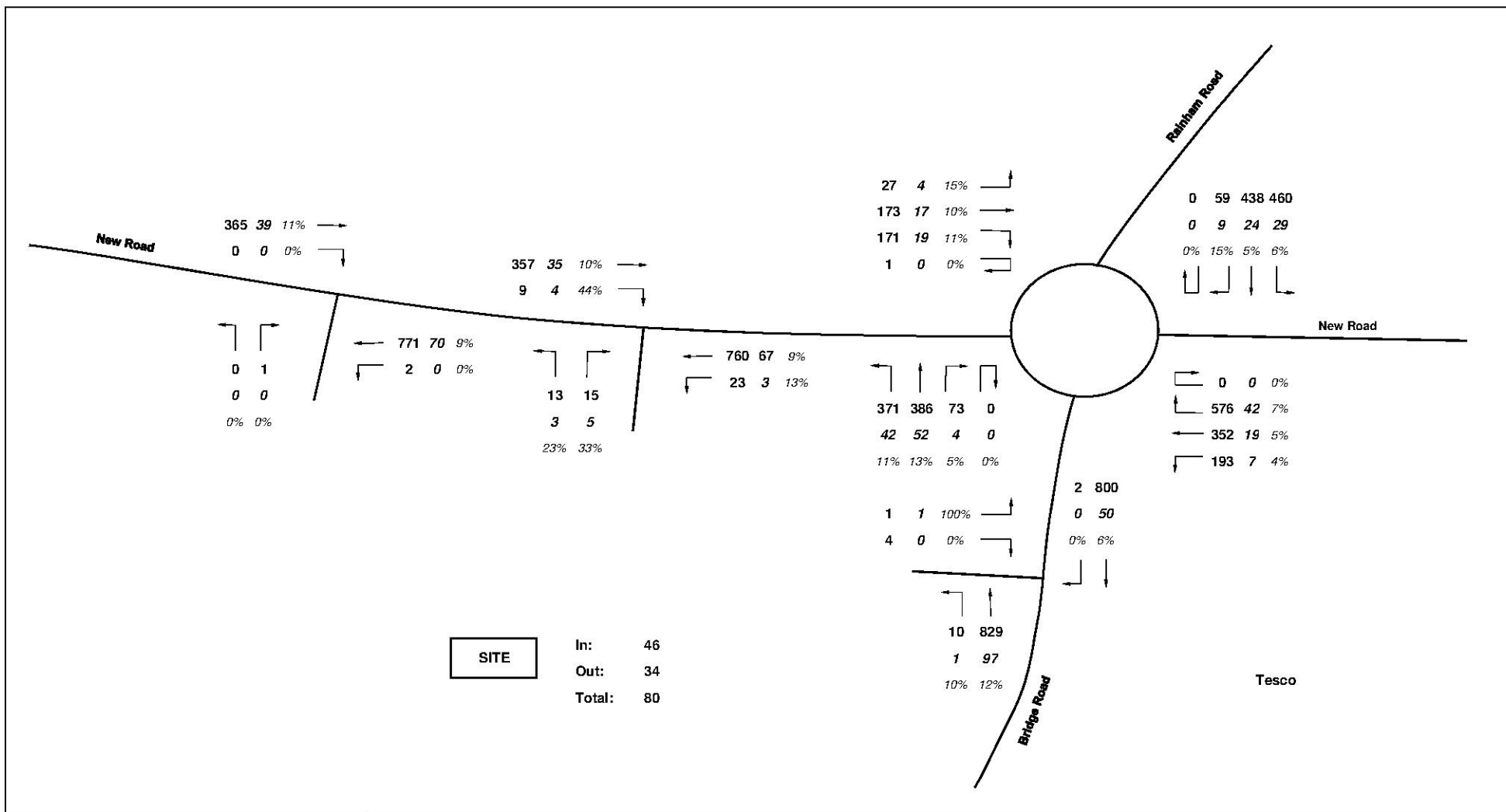
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FIGURE 3

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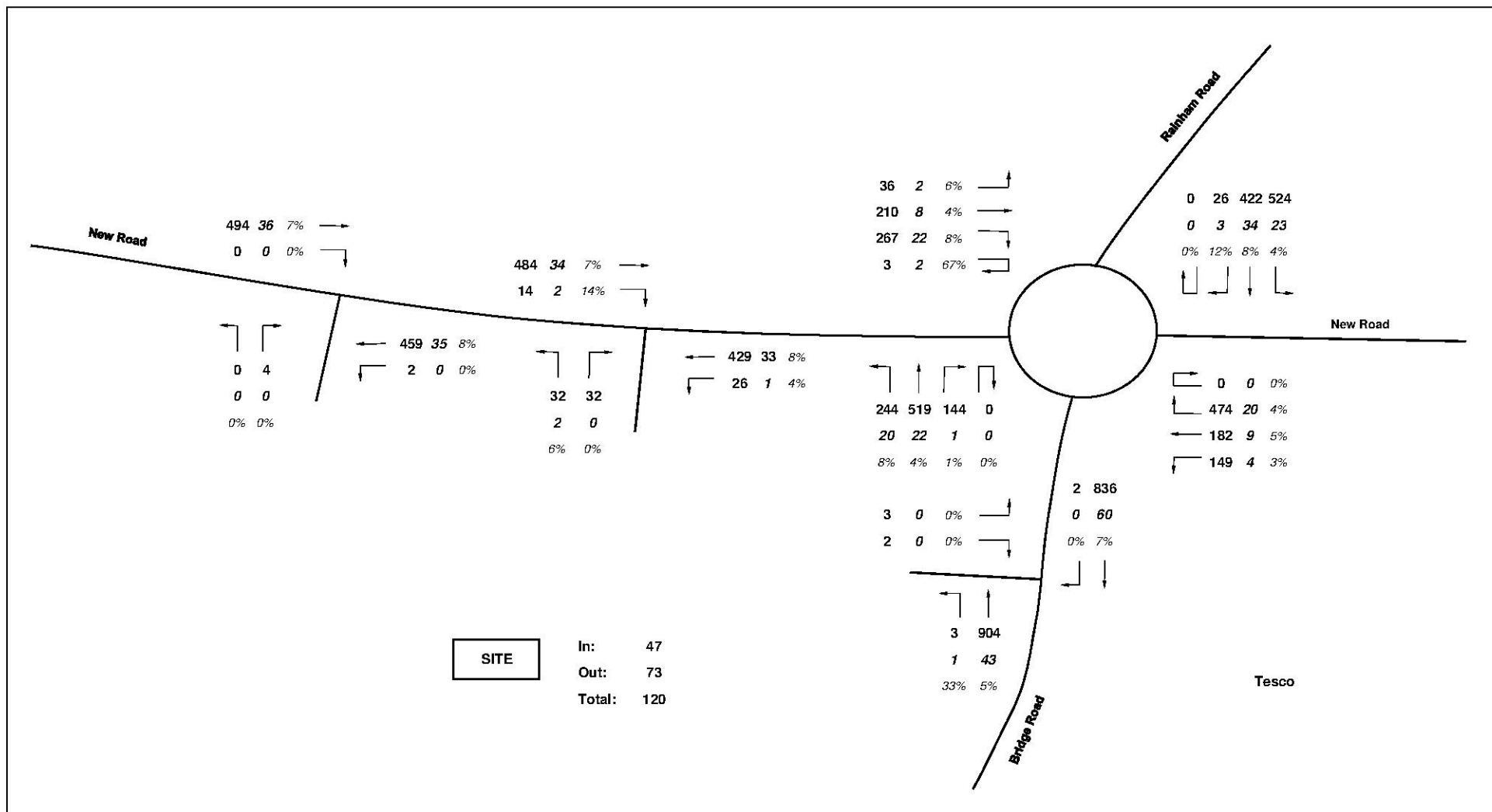
Flow Diagrams



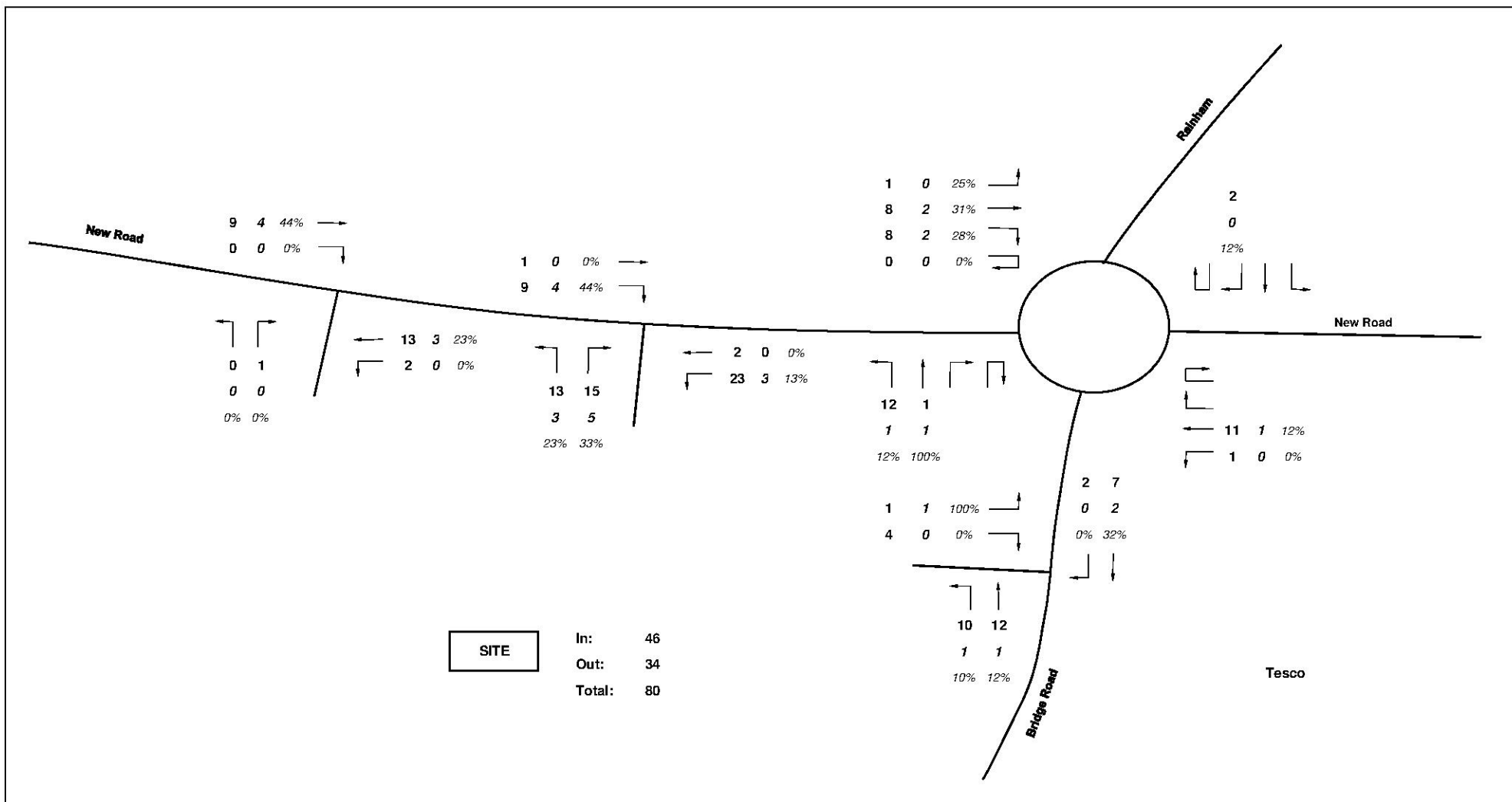
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CONSULTING ENGINEERS

Suite 207
One Alie Street
London E1 8DEB
Tel: 020 7680 4088 Fax: 020 7488 3736
Email: enquiries@ardent-ce.co.uk

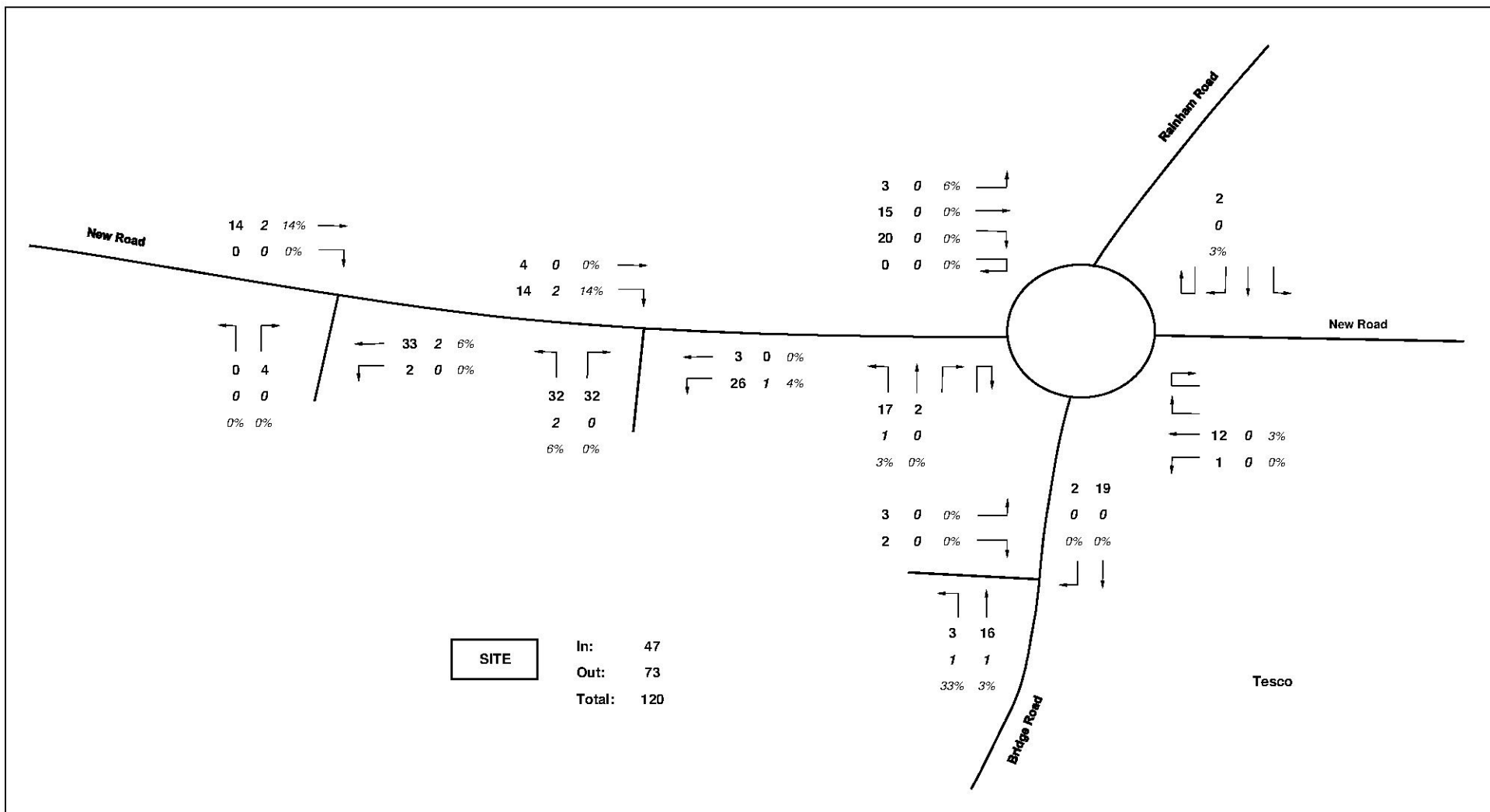
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Project	Dovers Corner, Rainham		
Date	Apr-15	Job No	S960
Diagram No	S960-01		
Title	Observed flows: 2014 weekday am peak hour (07:30 - 08:30)		



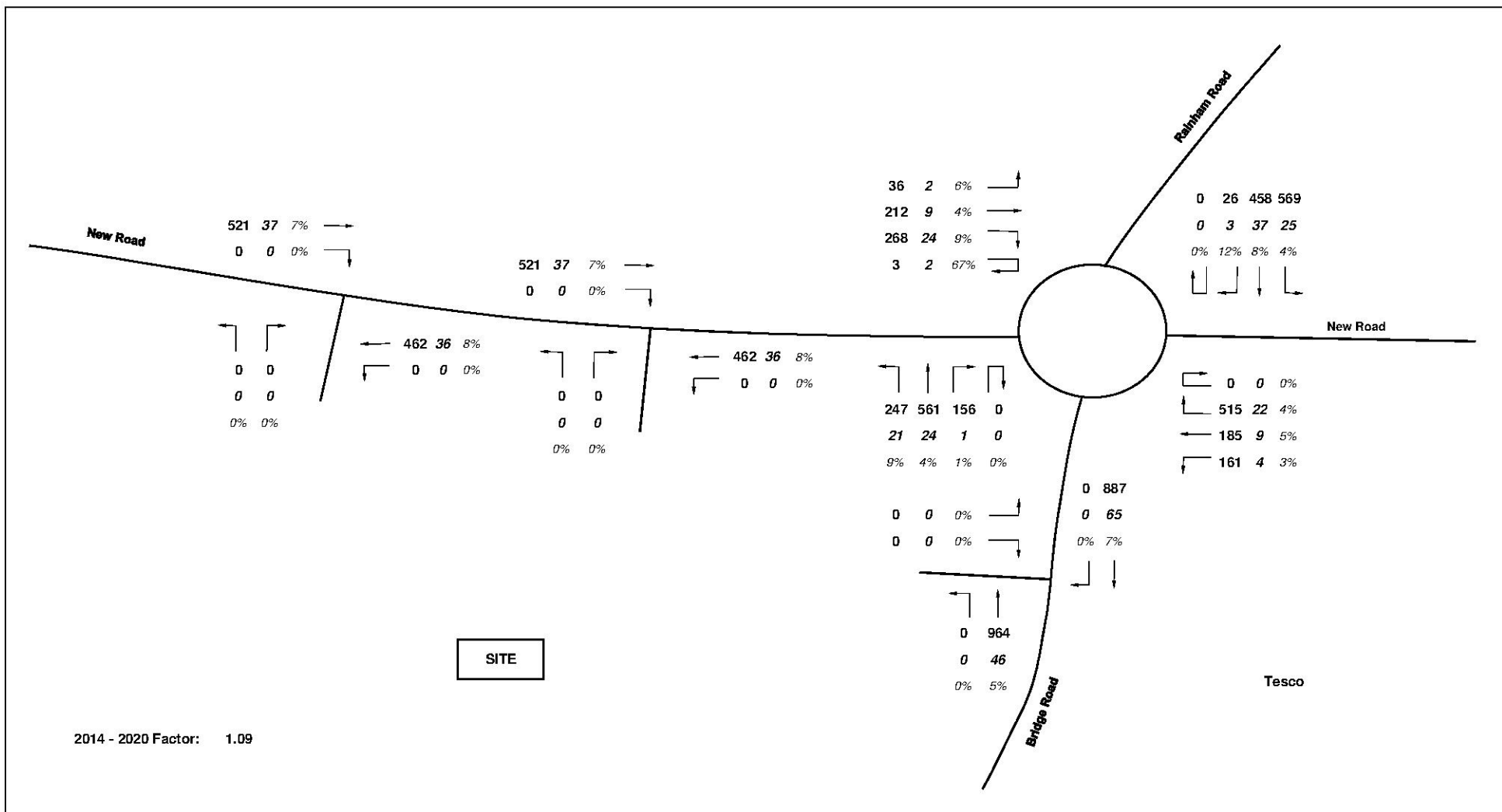
ARDENT CONSULTING ENGINEERS	Client Persimmon Homes		
	Project Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date Apr-15	Job No S960	Diagram No S960-02
	Title Observed flows: 2014 weekday pm peak hour (16:30 - 17:30)		



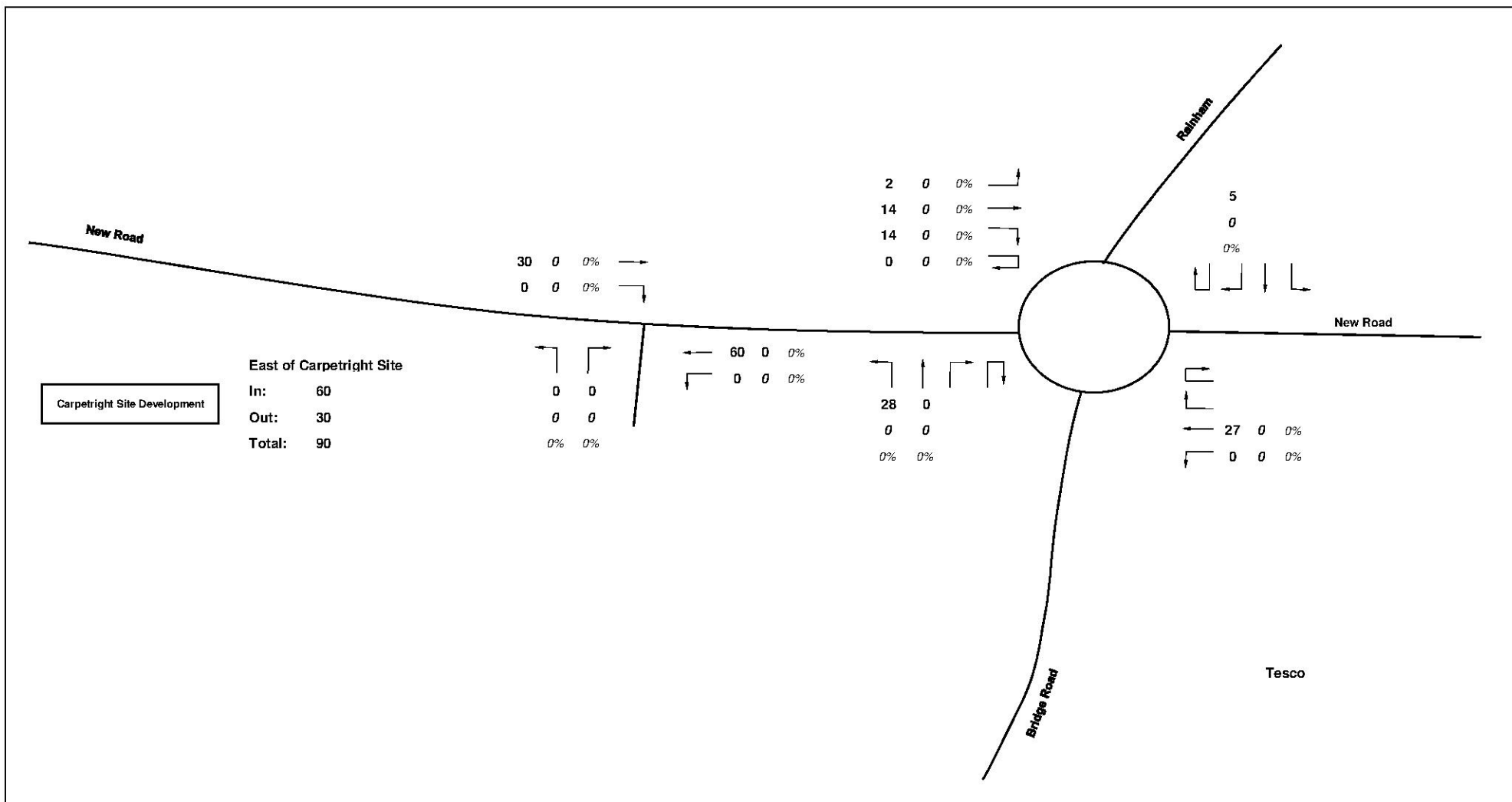
ARDENT CONSULTING ENGINEERS	Client Persimmon Homes			
	Project Dovers Corner, Rainham			
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date Apr-15	Job No S960	Diagram No S960-03	
	Title			
	Existing site flows: 2014 weekday am peak hour (07:30 - 08:30)			



ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-04
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	Existing site flows: 2014 weekday pm peak hour (16:30 - 17:30)					



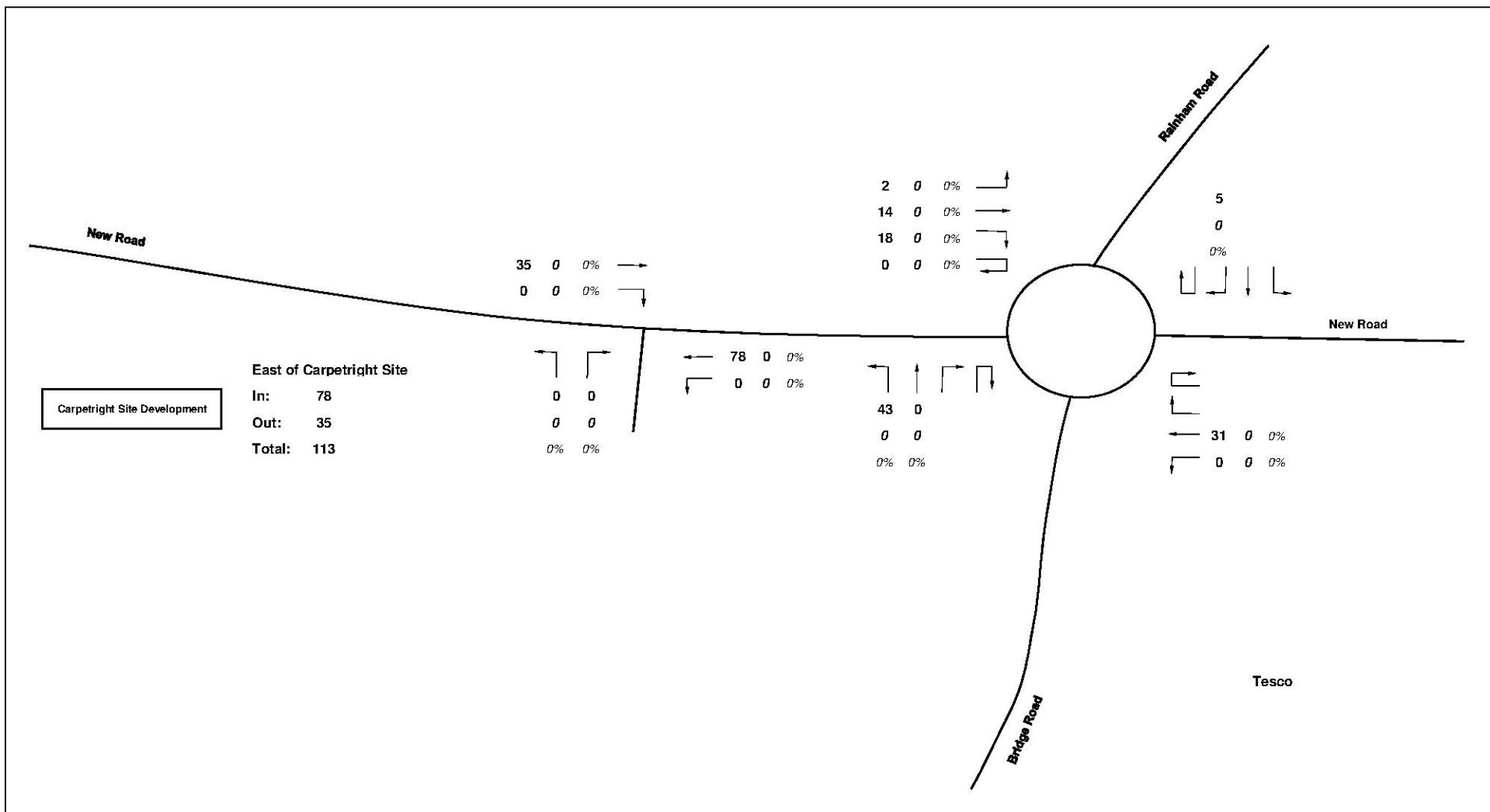
ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Allie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-06
	Title					
	Background flows: 2020 weekday pm peak hour (16:30 - 17:30)					



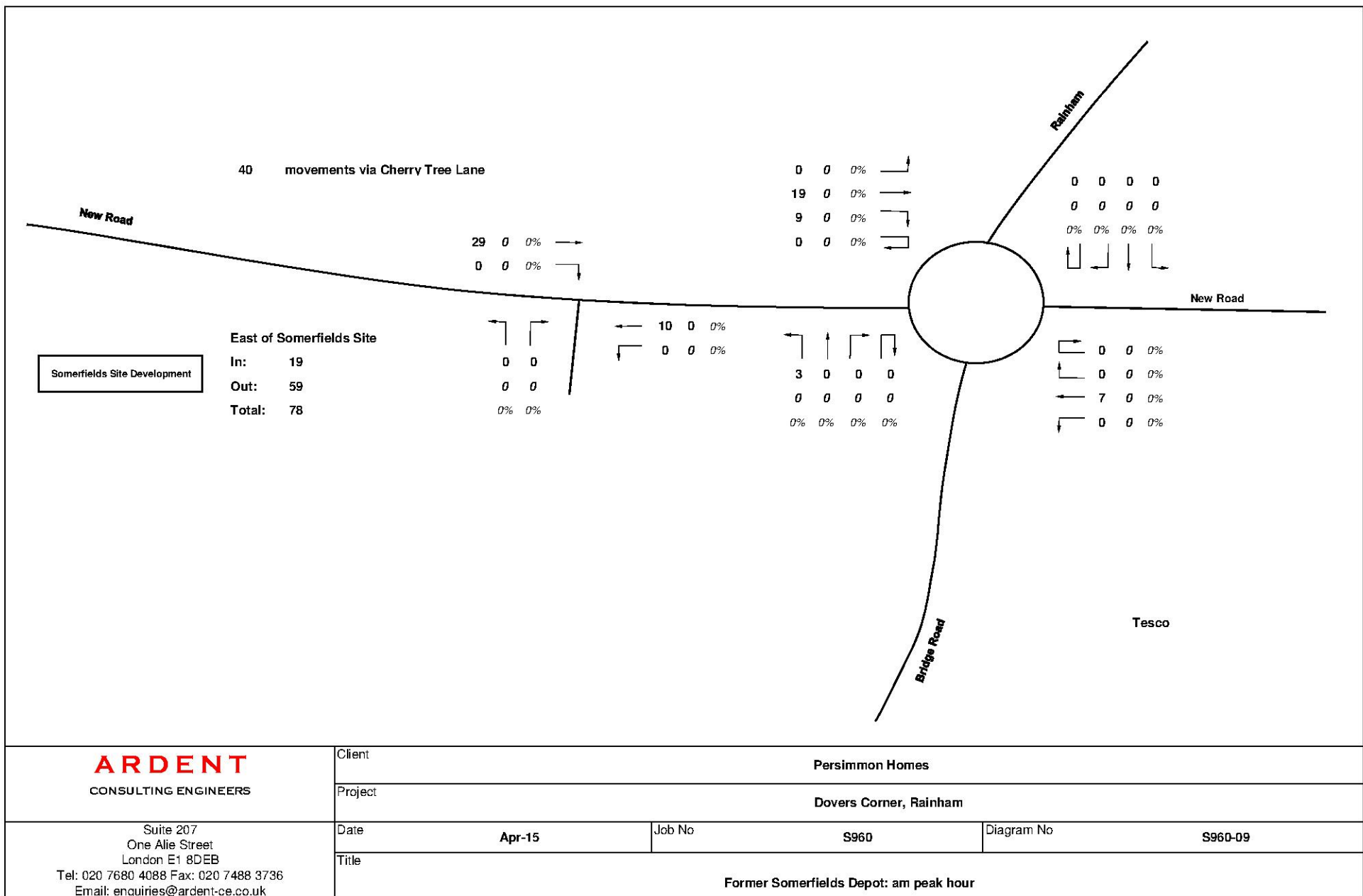
ARDENT
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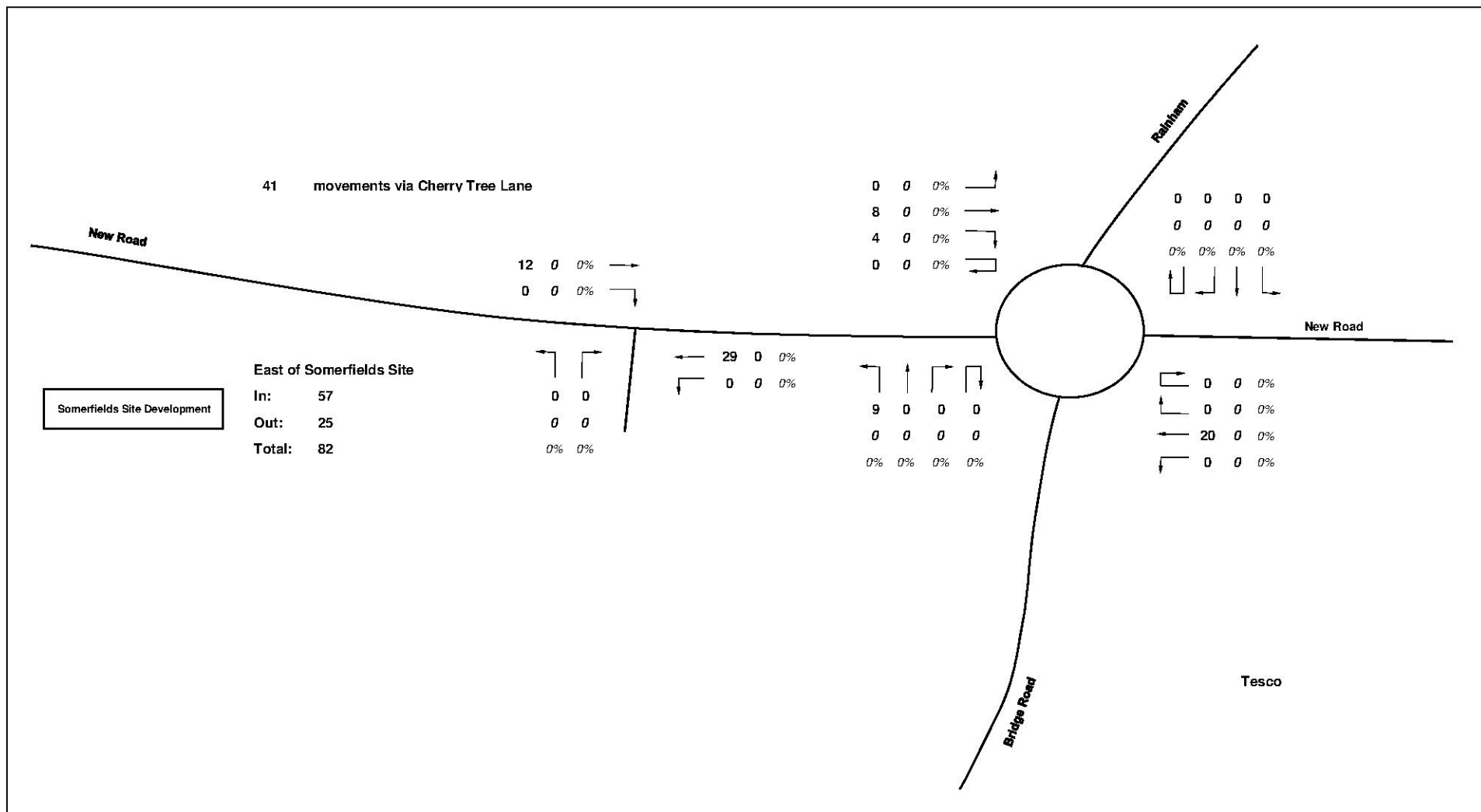
Suite 207
One Alie Street
London E1 8DEB
Tel: 020 7680 4088 Fax: 020 7488 3736
Email: enquiries@ardent-ce.co.uk

Client	Persimmon Homes		
Project	Dovers Corner, Rainham		
Date	Apr-15	Job No	S960
Diagram No	S960-07		
Title	Havering College: am peak hour		



ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-08
	Title					
	Havering College: pm peak hour					





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Email: enquiries@ardent-ce.co.uk

Client

Persimmon Homes

Project

Dovers Corner, Rainham

Date

Apr-15

Job No

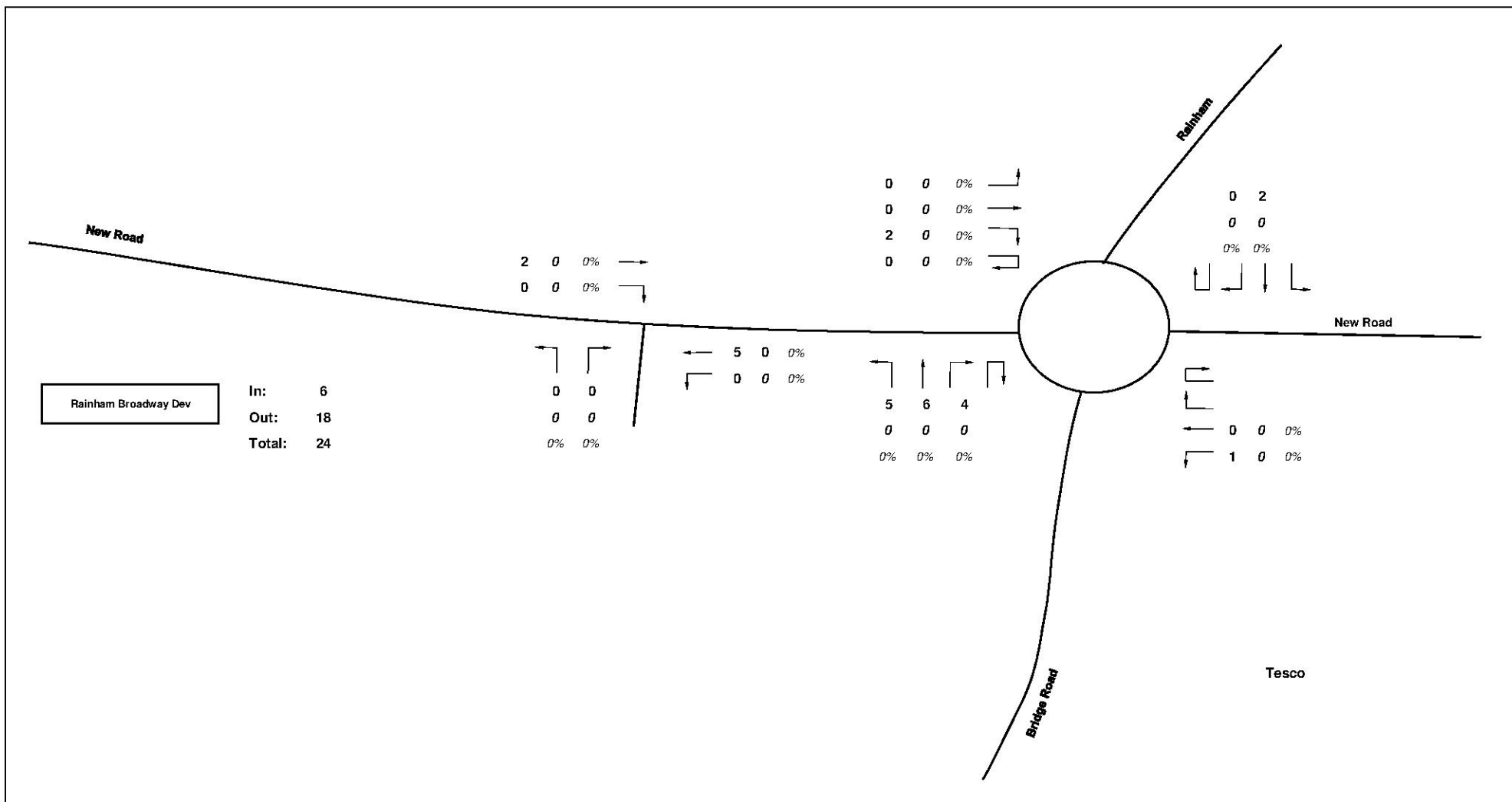
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Diagram No

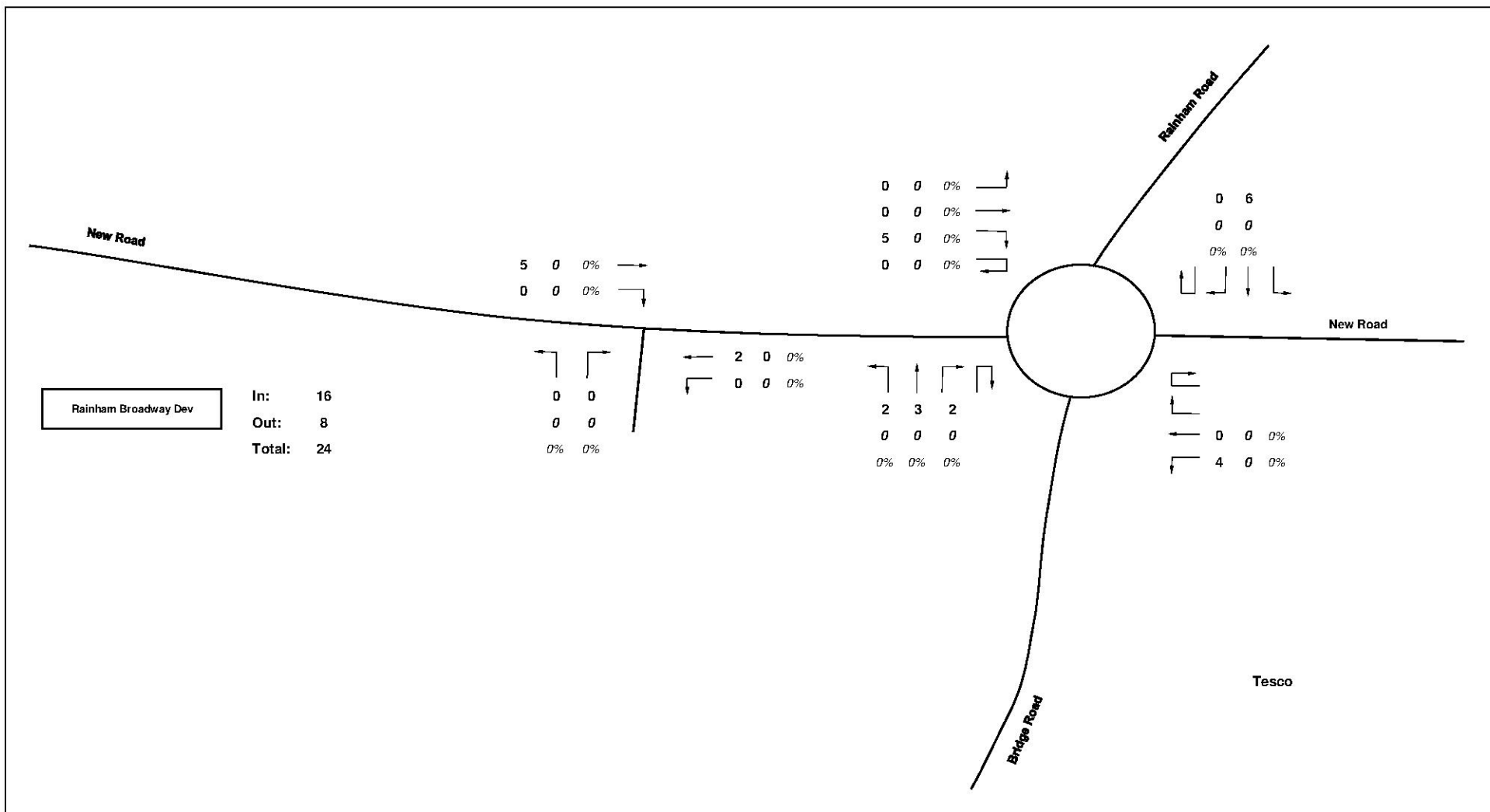
S960-10

Title

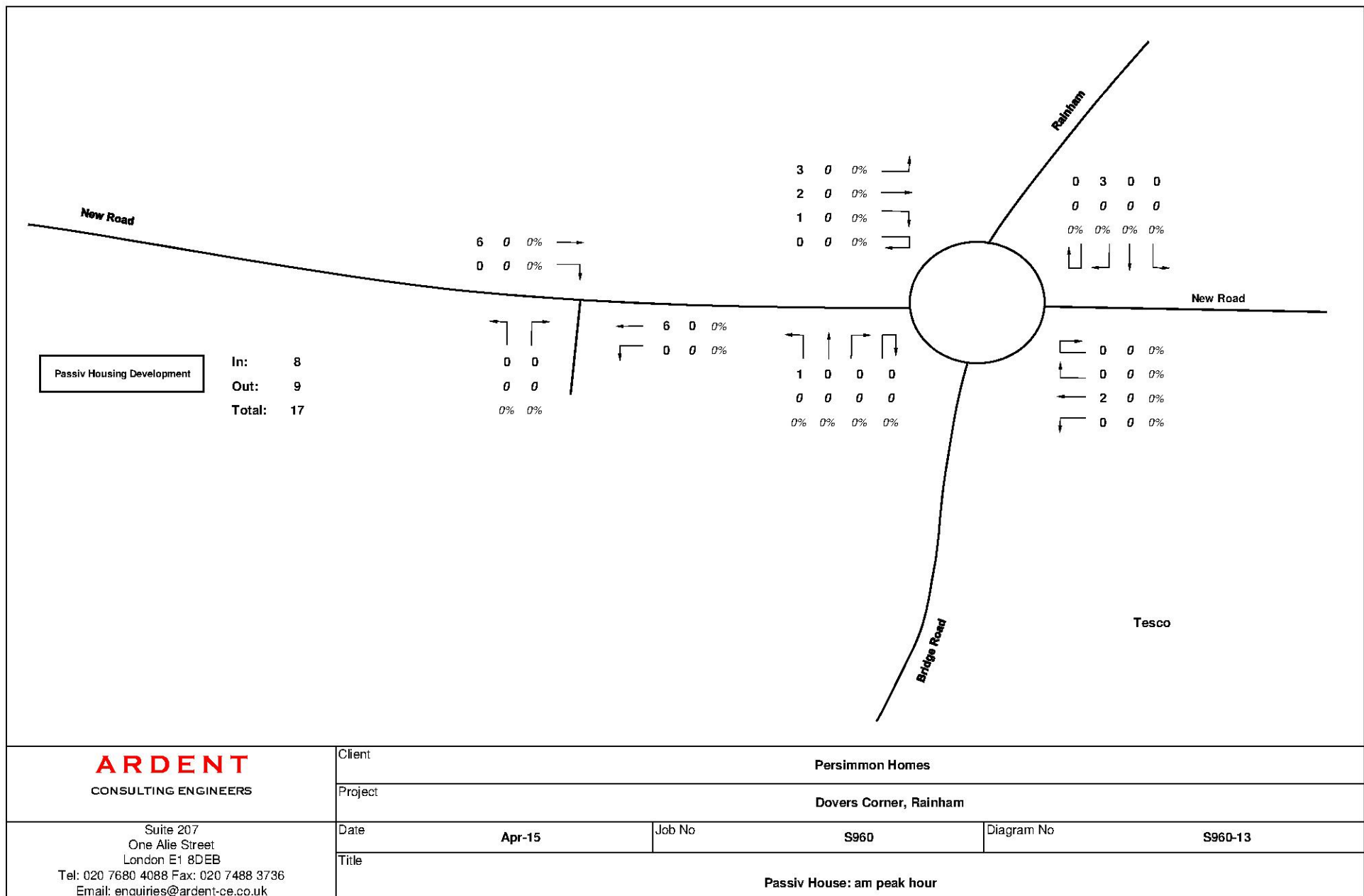
Former Somerfields Depot: pm peak hour

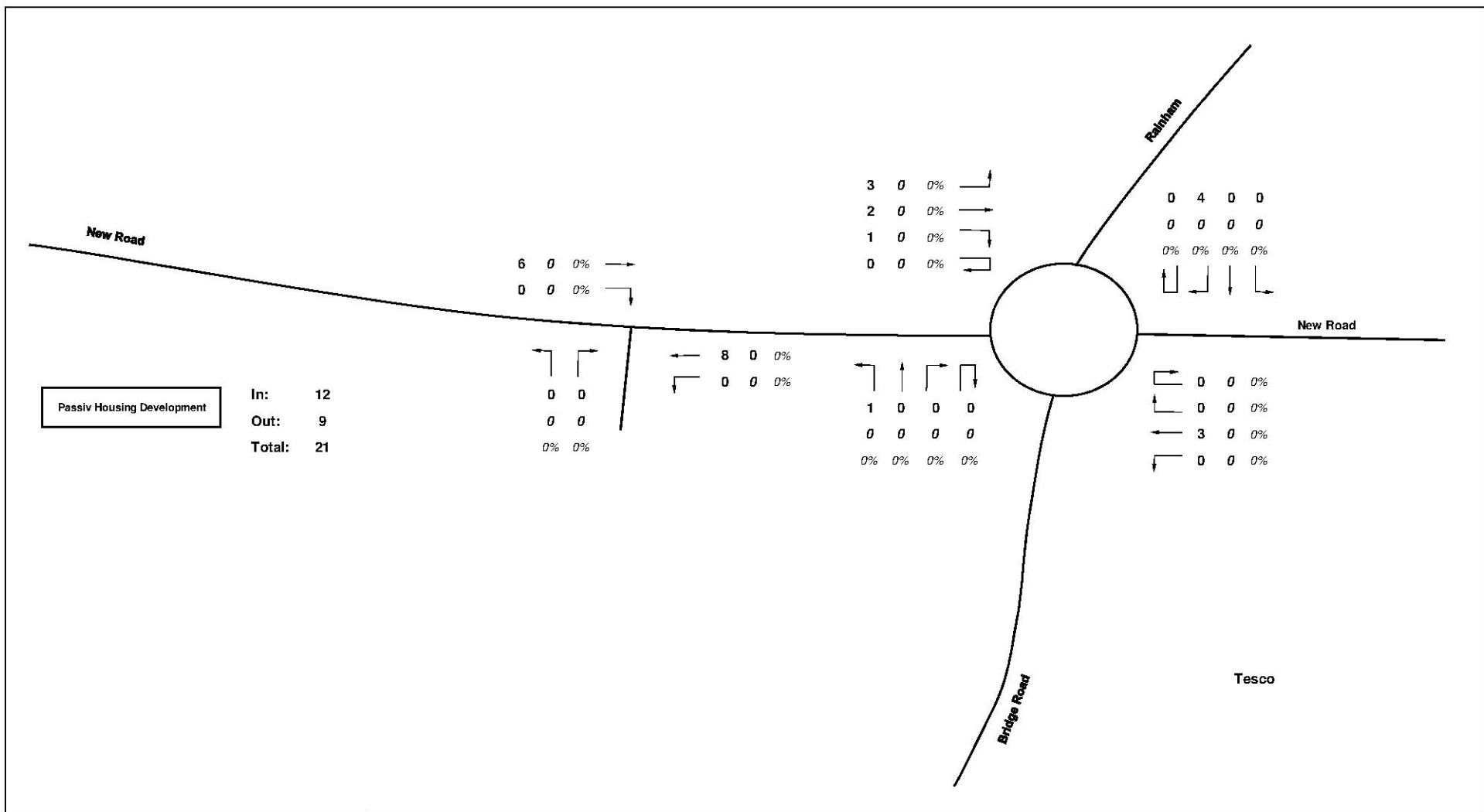


ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-11
	Title					
	Broadway: am peak hour					

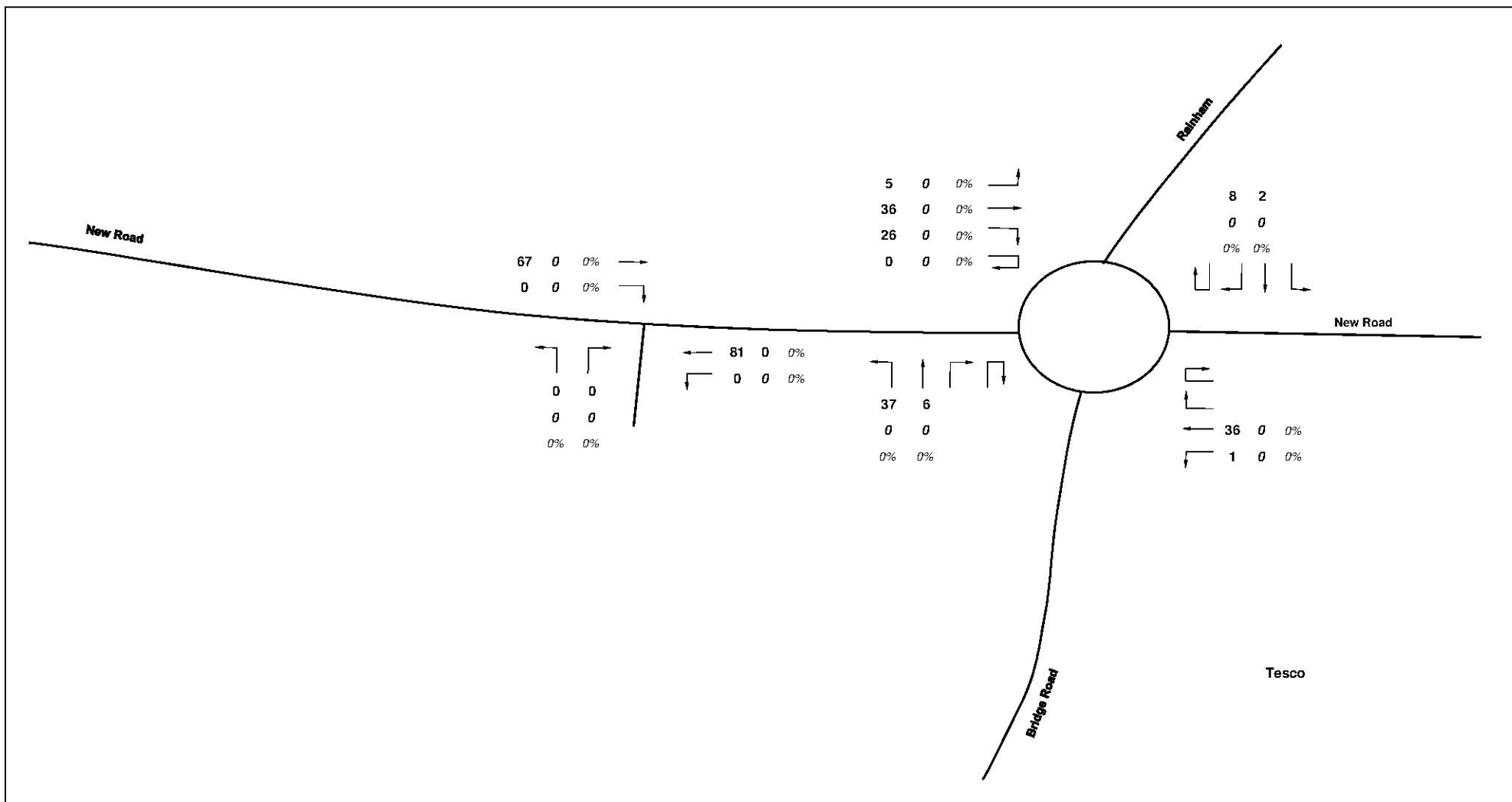


ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-12
	Title					
	Broadway: pm peak hour					

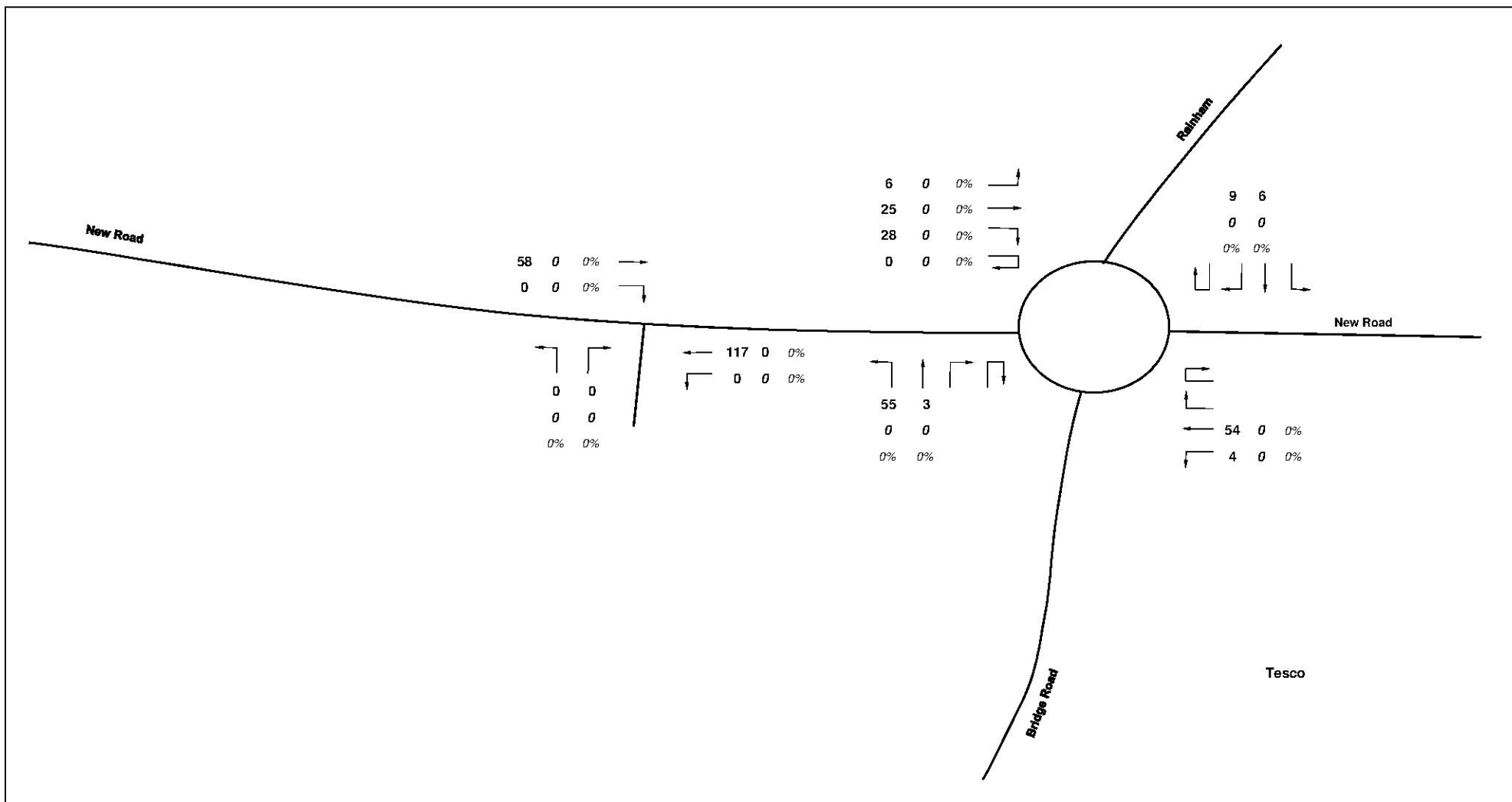




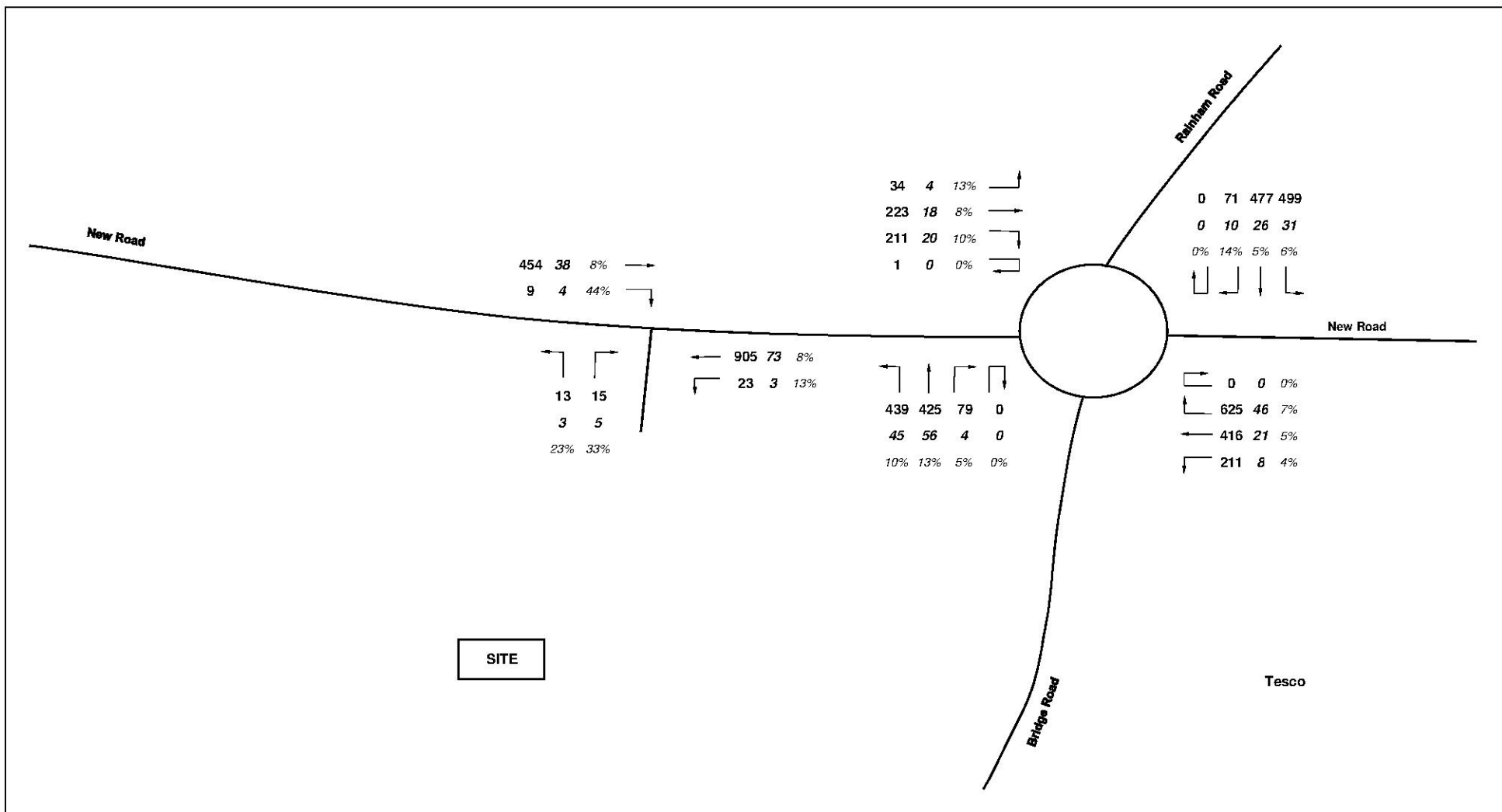
ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes	
	Project			Dovers Corner, Rainham	
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No
	Title	Passiv House: pm peak hour			



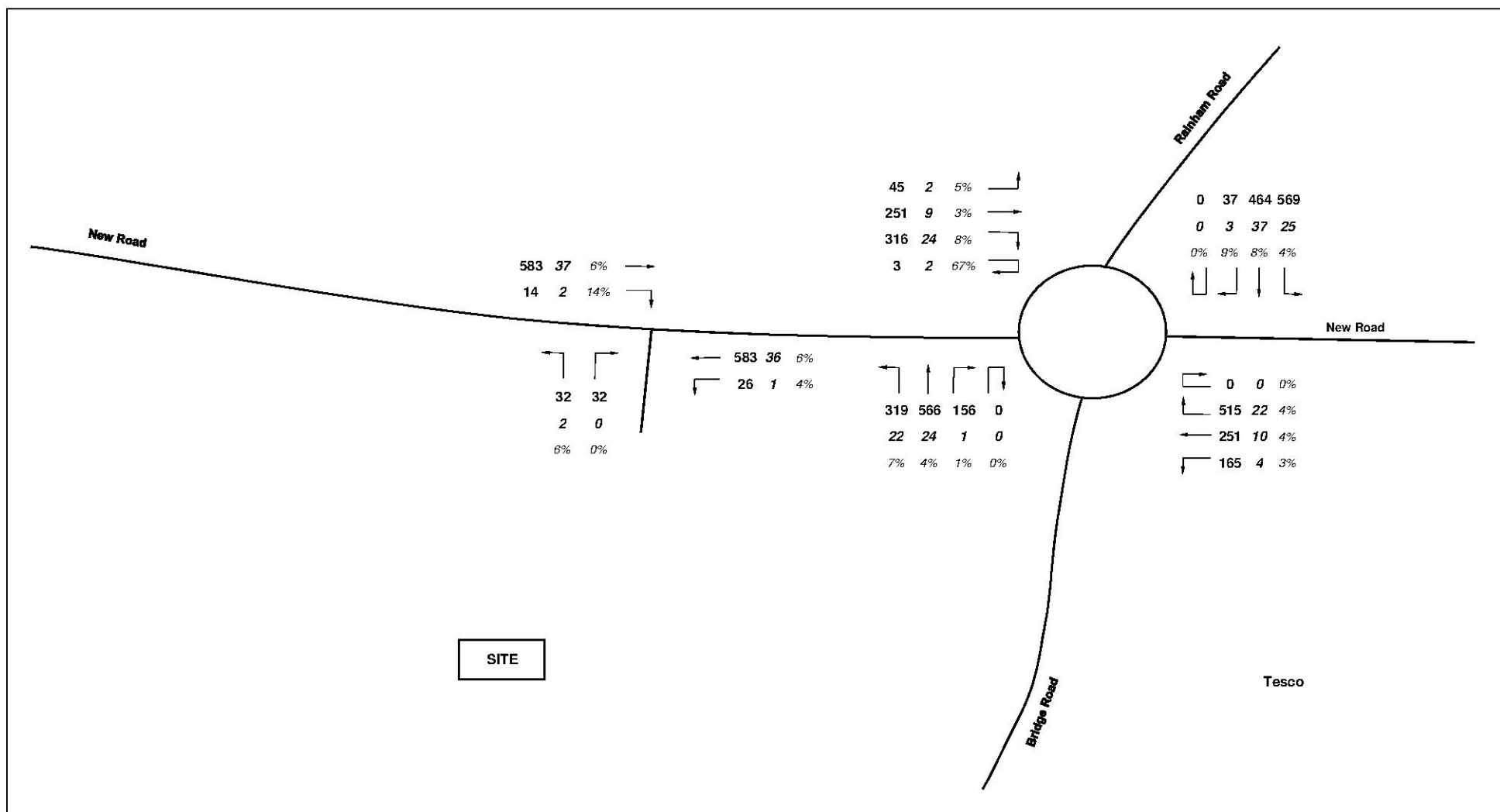
ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-15
	Title					
	Total Committed Development: weekday am peak hour					



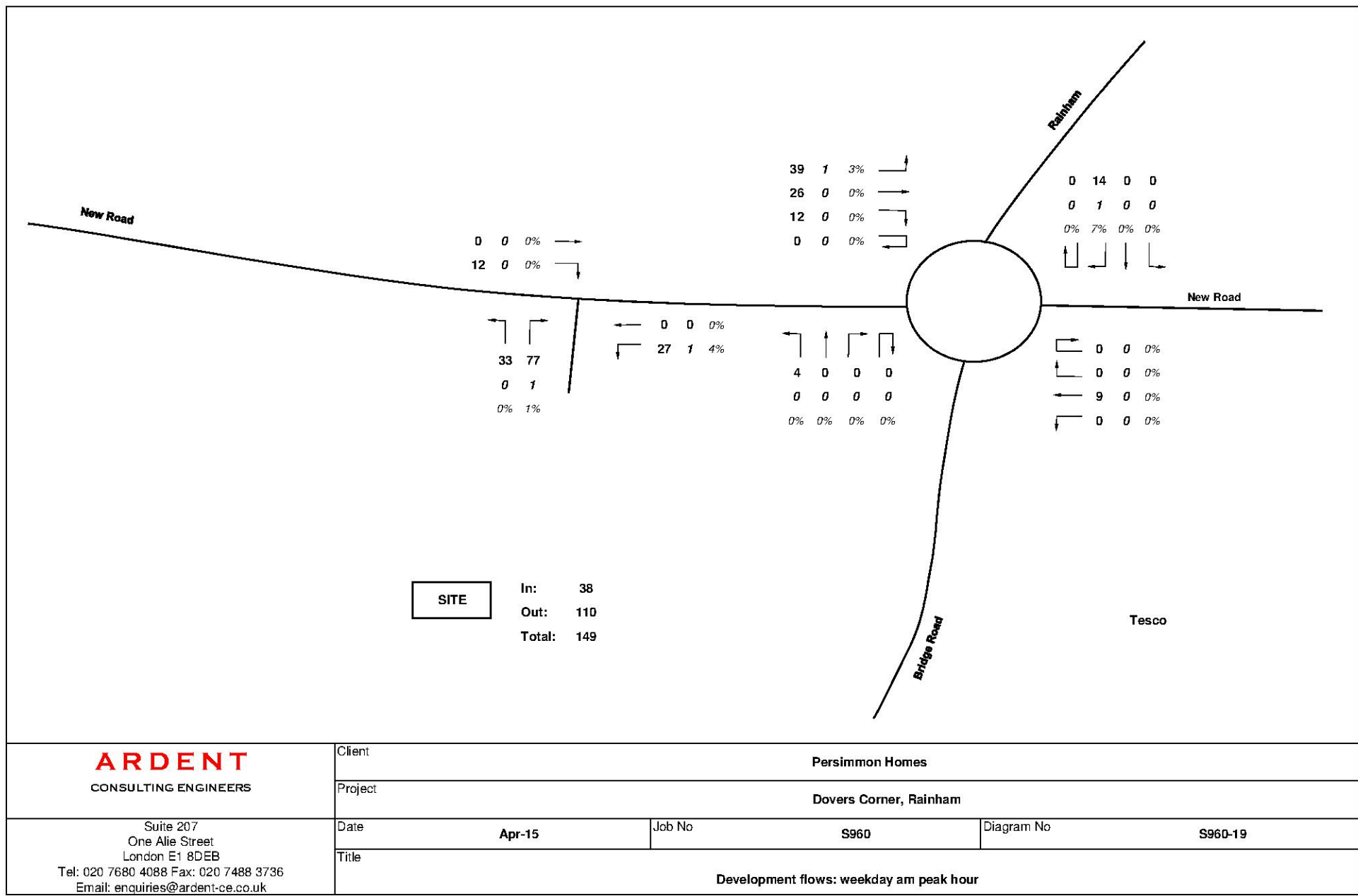
ARDENT CONSULTING ENGINEERS	Client				Persimmon Homes							
	Project				Dovers Corner, Rainham							
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date		Apr-15		Job No		S960		Diagram No		S960-16	
	Title											
	Total Committed Development: weekday pm peak hour											



ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-17
	Title					
Base Case flows: 2020 weekday am peak hour (07:30 - 08:30)						



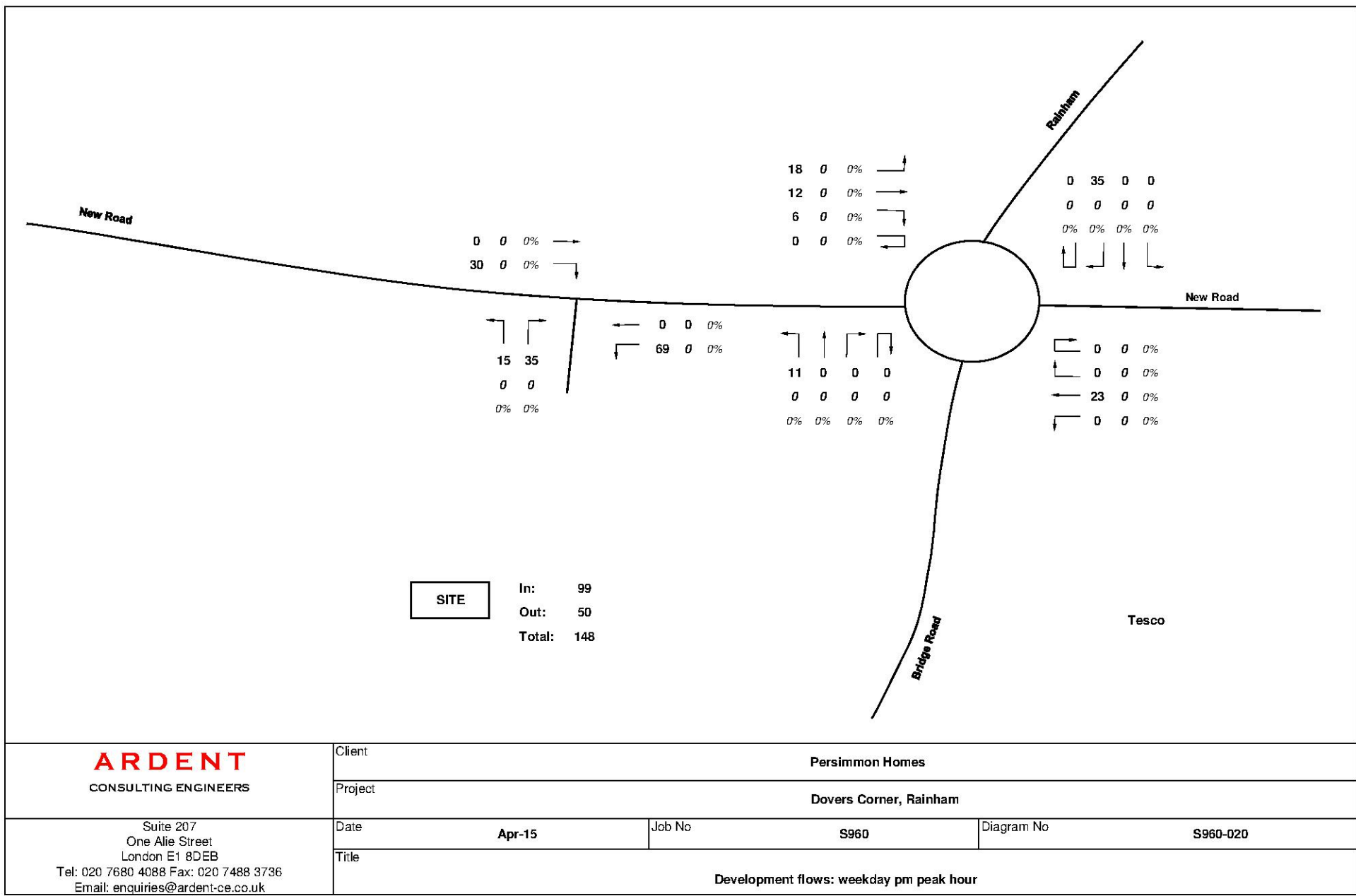
ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-18
	Title					
Base Case flows: 2020 weekday am peak hour (16:30 - 17:30)						



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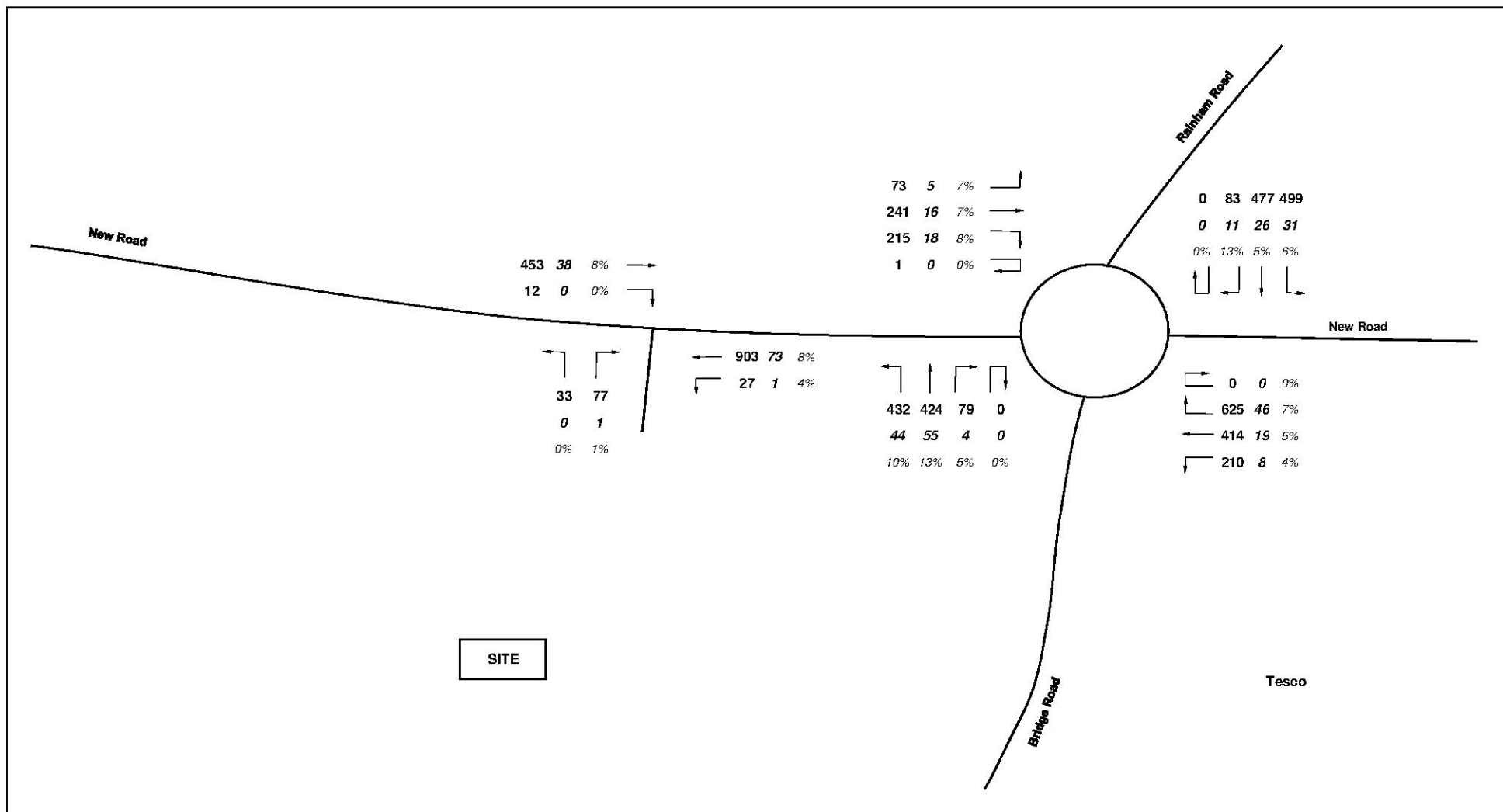
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Date	Apr-15	Job No	S960
		Diagram No	S960-19
Title			
Development flows: weekday am peak hour			



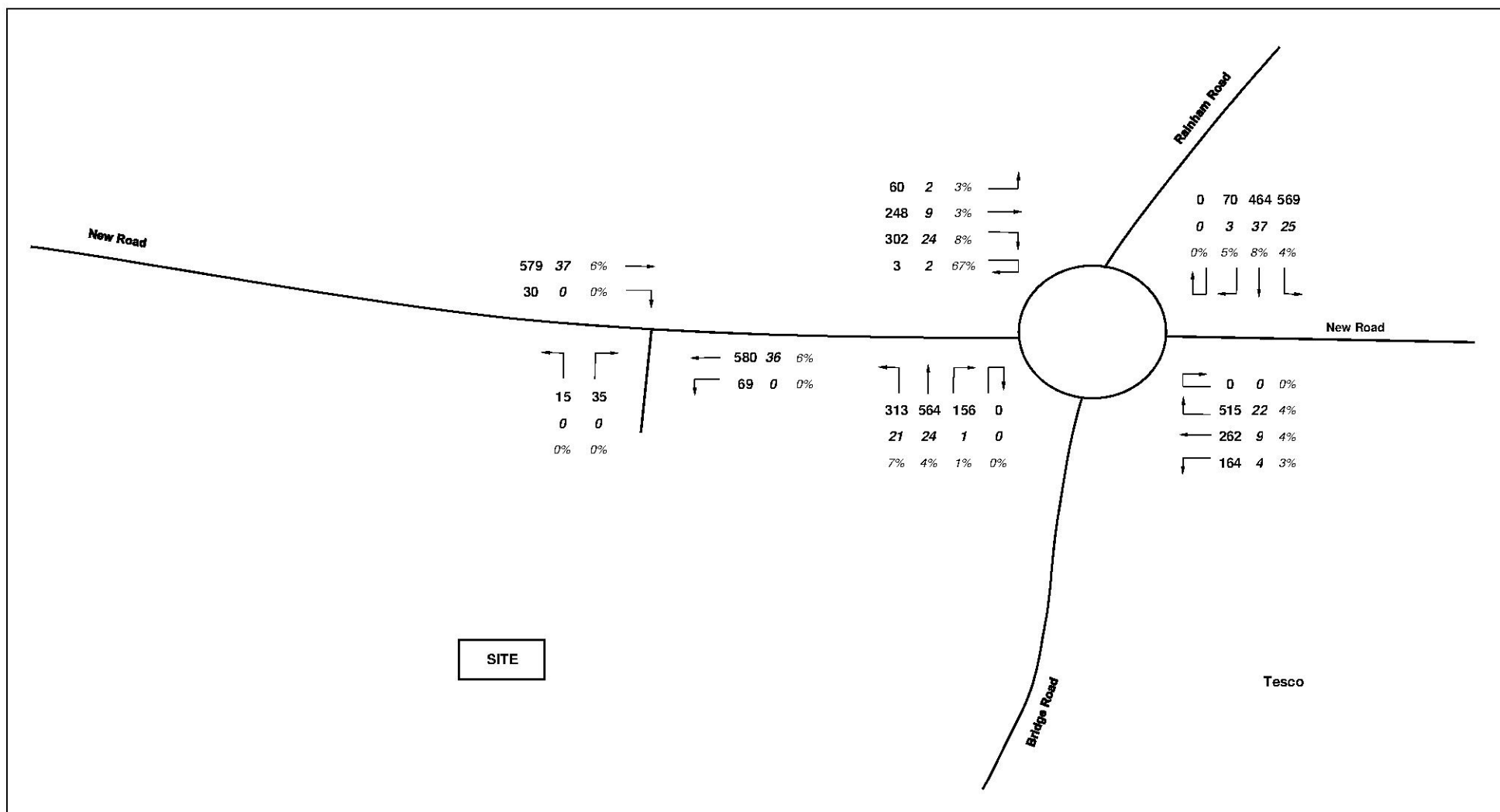
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Email: enquiries@ardent-ce.co.uk

Client		Persimmon Homes	
Project		Dovers Corner, Rainham	
Date	Apr-15	Job No	S960
		Diagram No	S960-020
Title			
Development flows: weekday pm peak hour			

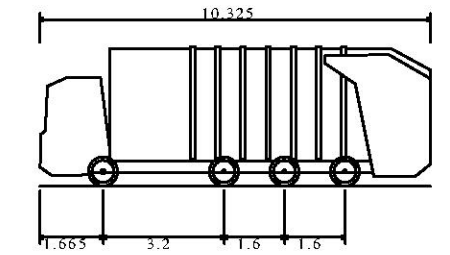
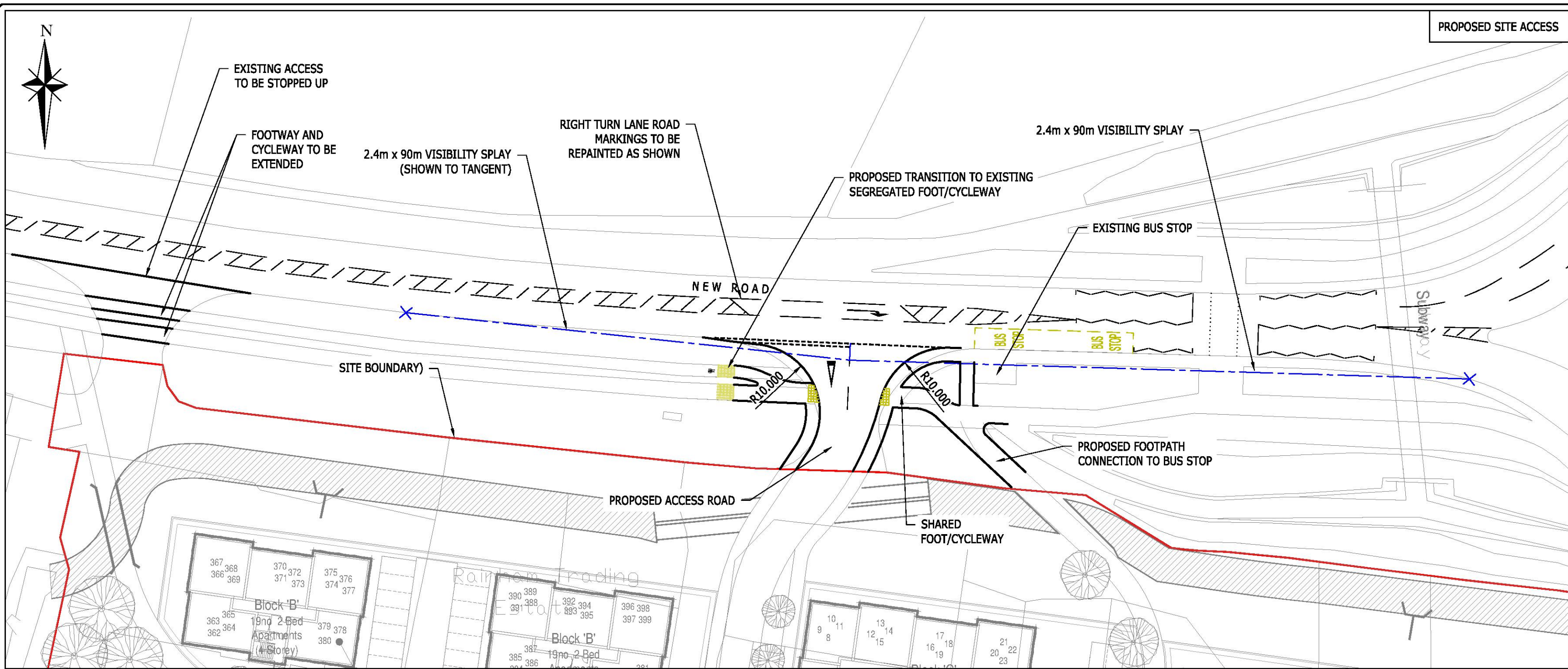


ARDENT CONSULTING ENGINEERS	Client			Persimmon Homes		
	Project			Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date	Apr-15	Job No	S960	Diagram No	S960-21
	Title					
Development Case flows: 2020 weekday am peak hour (07:30 - 08:30)						

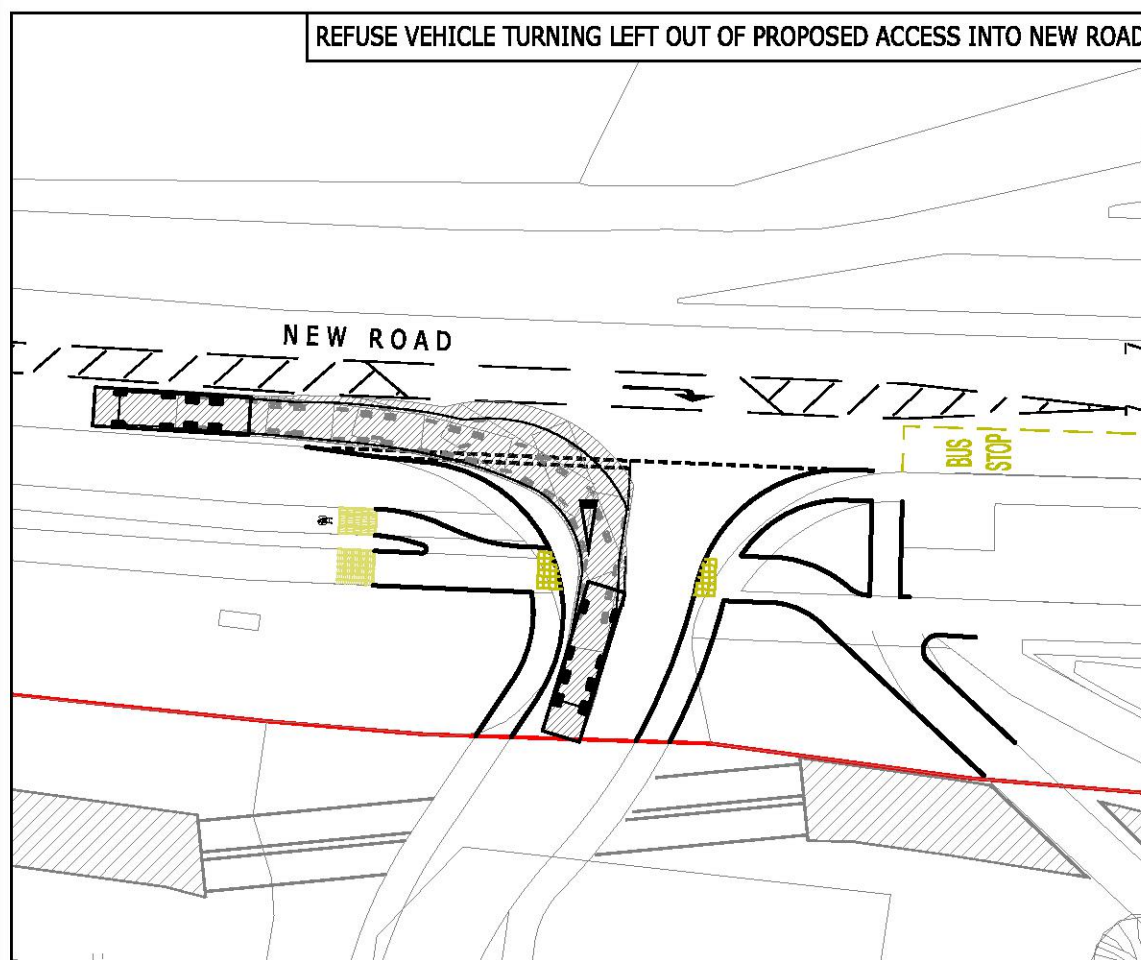


ARDENT CONSULTING ENGINEERS	Client Persimmon Homes		
	Project Dovers Corner, Rainham		
Suite 207 One Alie Street London E1 8DEB Tel: 020 7680 4088 Fax: 020 7488 3736 Email: enquiries@ardent-ce.co.uk	Date Apr-15	Job No S960	Diagram No S960-22
	Title Development Case flows: 2020 weekday am peak hour (16:30 - 17:30)		

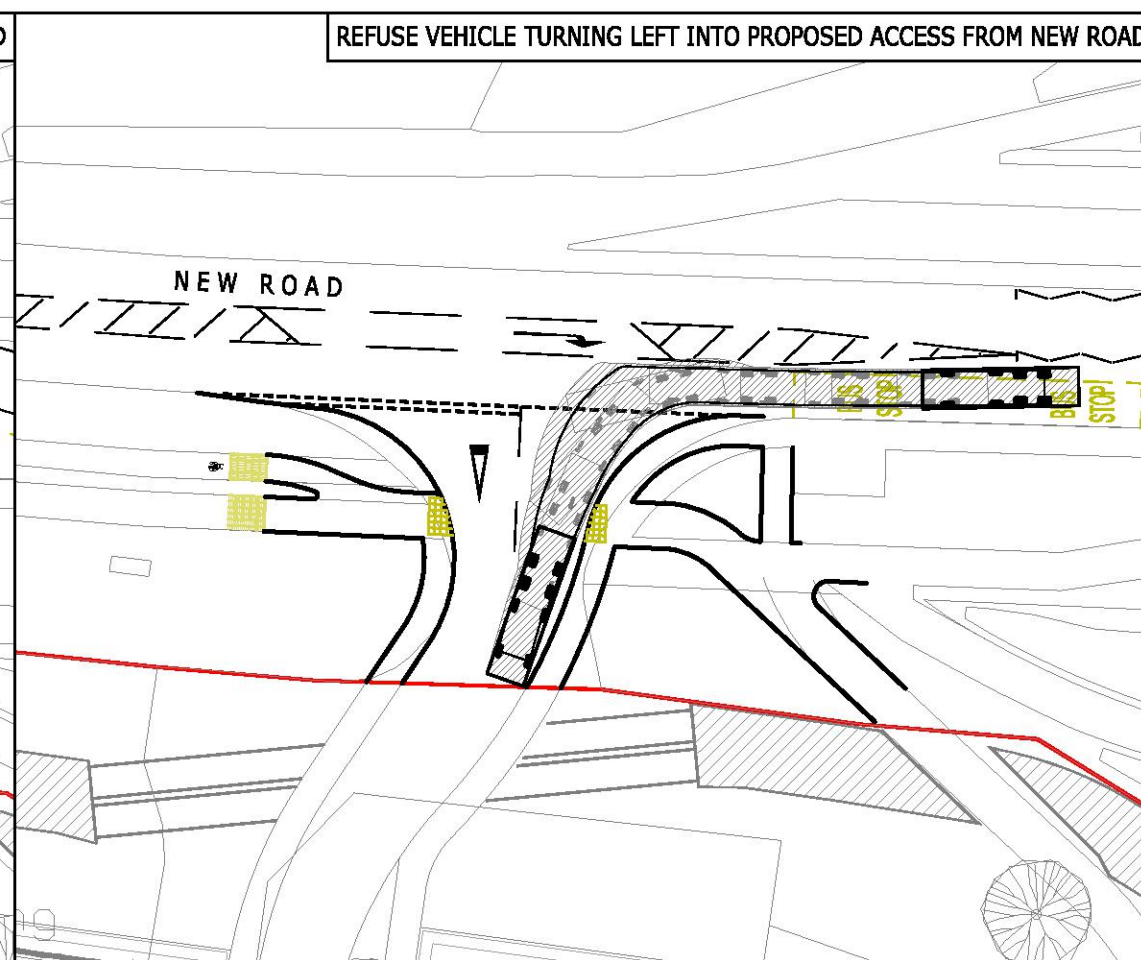
Drawings



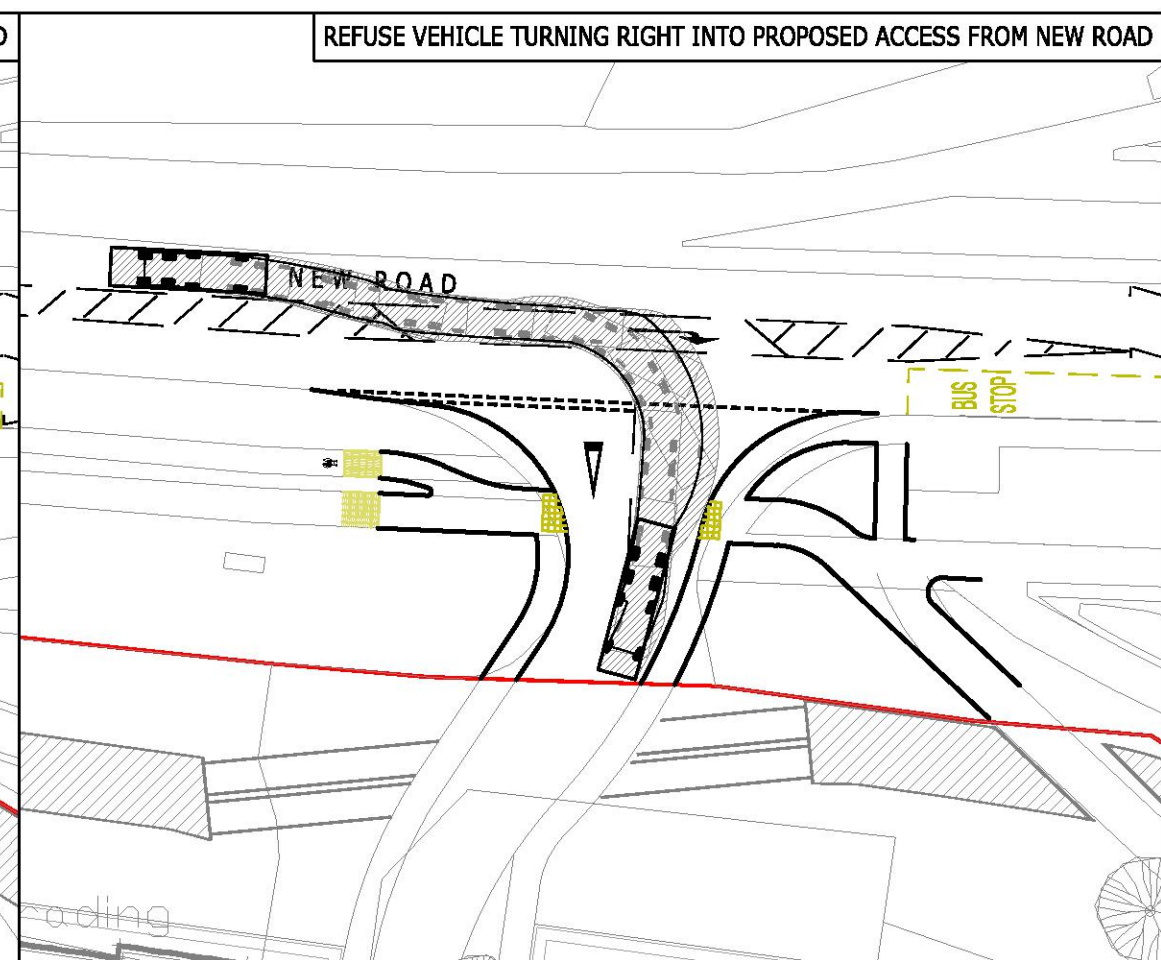
Dennis Eagle Olympus 8x4MS Refuse Vehicle
Overall Length 10.325m
Overall Width 2.550m
Overall Body Height 3.690m
Min Body Ground Clearance 0.251m
Track Width 2.200m
Lock to Lock Time 4.00s
Wall to Wall Turning Radius 11.200m



REFUSE VEHICLE TURNING LEFT OUT OF PROPOSED ACCESS INTO NEW ROAD



REFUSE VEHICLE TURNING LEFT INTO PROPOSED ACCESS FROM NEW ROAD



REFUSE VEHICLE TURNING RIGHT INTO PROPOSED ACCESS FROM NEW ROAD

NOTES:

B	AMENDED FOLLOWING STAGE 1 SAFETY AUDIT COMMENTS	DV	SAF	ML	21.05.15
A	AMENDED FOOT/CYCLEWAY TO TIE INTO EXISTING	DV	SAF	ML	13.05.15
REV	AMENDMENTS	DRN	CHK	APP	DATE

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Suite 207
One Alie Street
London
E1 8DE

t 020 7680 4088
f 020 7488 3736

www.ardent-ce.co.uk
enquiries@ardent-ce.co.uk

worksafe consultant
www.ardent-ce.co.uk
SSPP

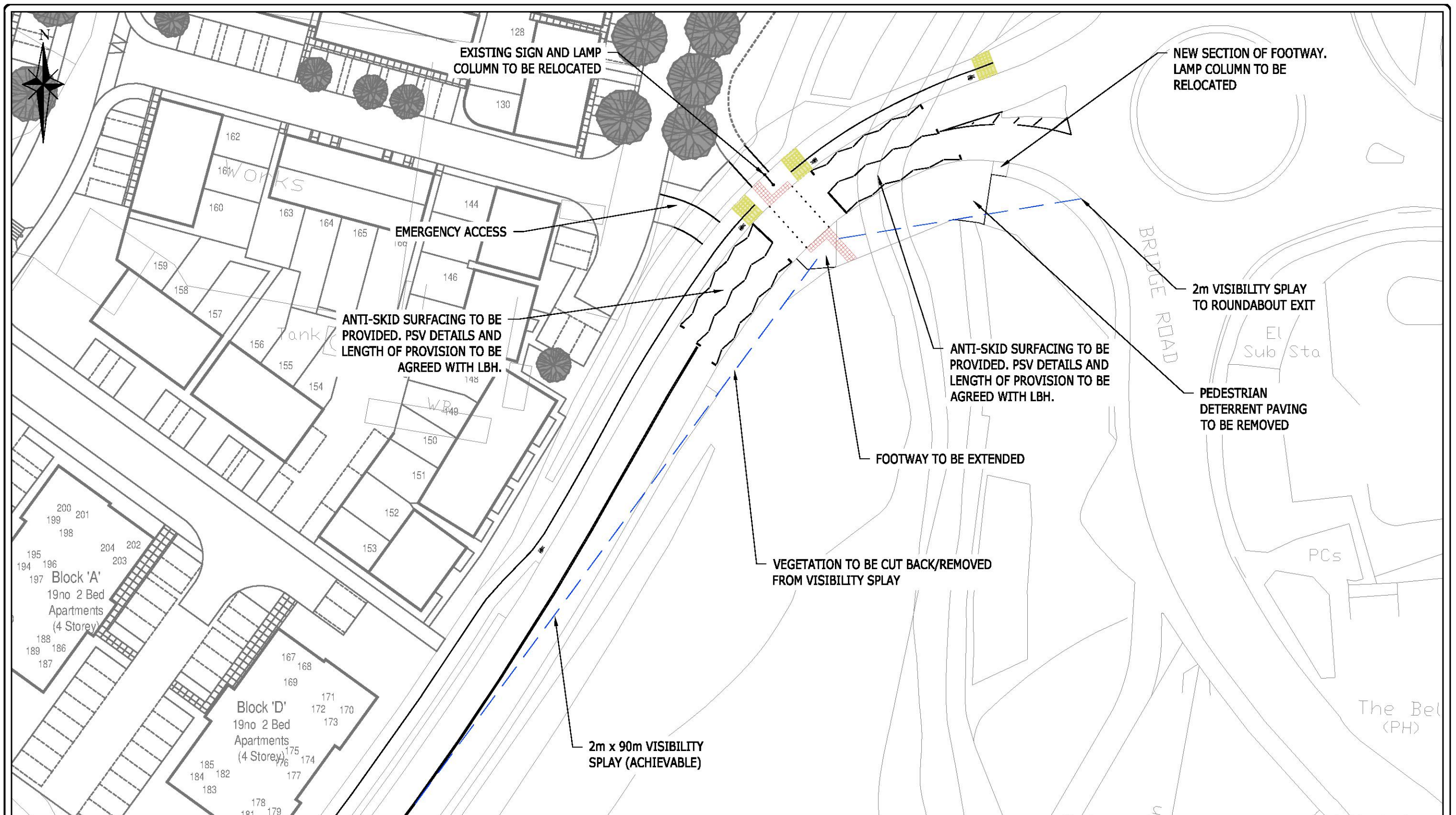
150 9001
BUREAU VERITAS
Certification

CLIENT: **PERSIMMON HOMES ESSEX**

PROJECT TITLE: **DOVERS CORNER RAINHAM**

DRAWING TITLE: **PROPOSED SITE ACCESS**

SCALE: 1:500 @ A2	DATE: APRIL 2015	DESIGNED: DV
DRAWN: DV	CHECKED: SAF	APPROVED: ML
DRAWING NO. S960-007	REV: B	



A AMENDED FOLLOWING STAGE 1 SAFETY AUDIT COMMENTS

DV SAF ML 21.05.15

REV. AMENDMENTS

DRN CHK APP DATE

ARDENT CONSULTING ENGINEERS

Suite 207, One Alie Street, London, E1 8DE
t 020 7680 4088 f 020 7488 3736
w www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE:
**DOVERS CORNER
RAINHAM**

DRAWING TITLE:
**PROPOSED TOUCAN
CROSSING**

CLIENT:
**PERSIMMON HOMES
ESSEX**

SCALE:
1:500 @ A3

DATE:
MAY 2015

DESIGNED:
DV

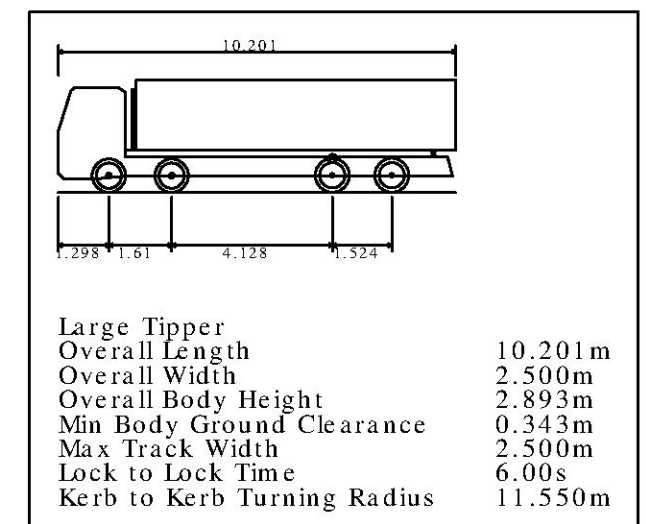
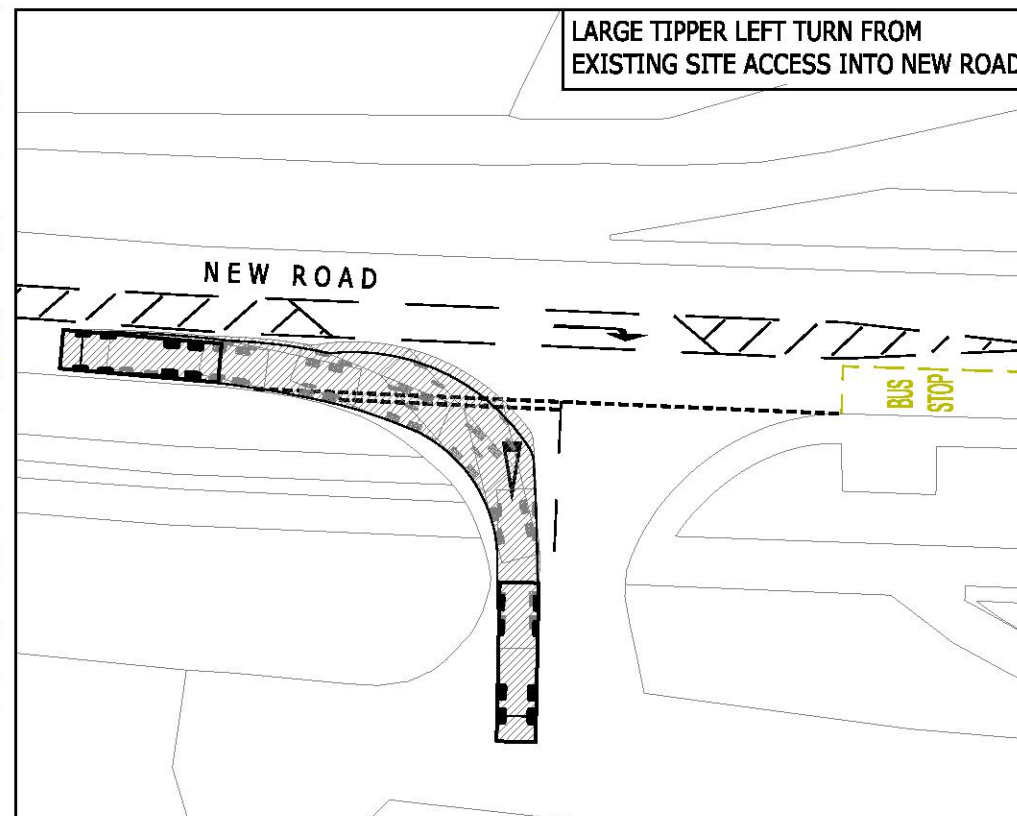
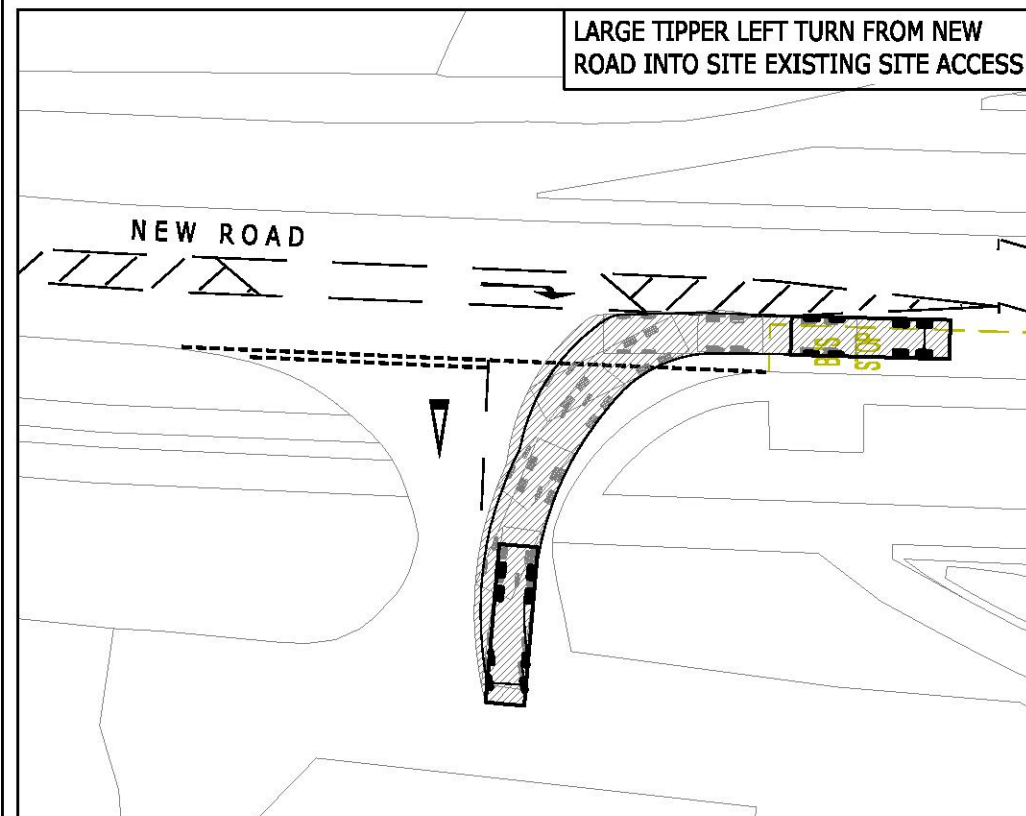
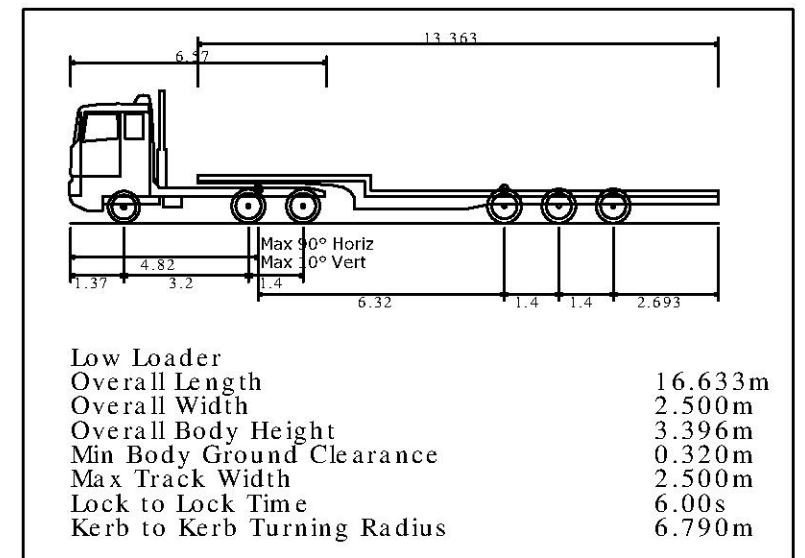
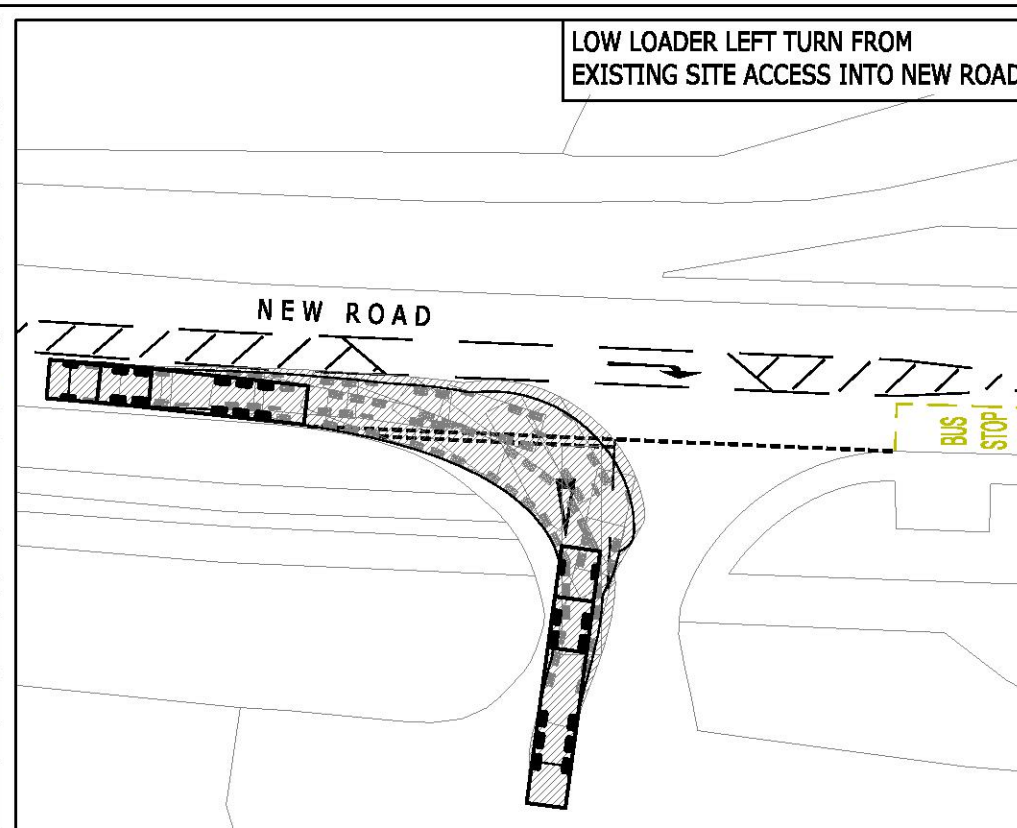
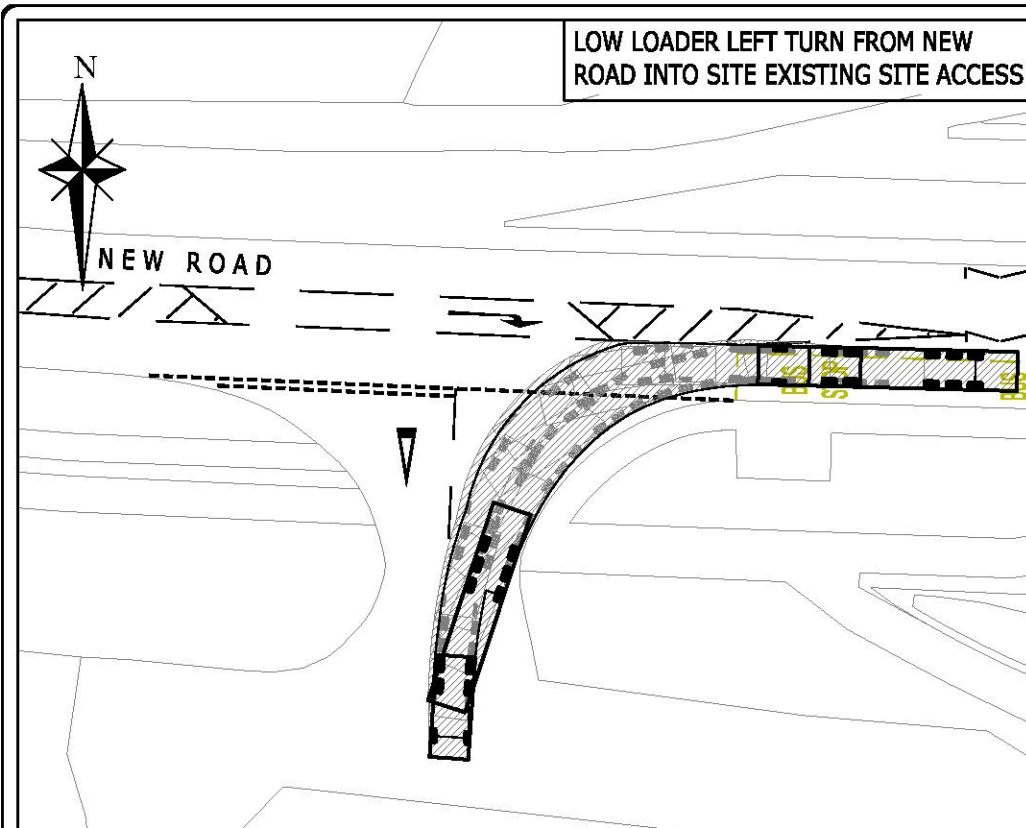
DRAWN:
DV

CHECKED:
RMA

APPROVED:
SAF

DRAWING NO.
S960-009

REV:
A



REV.	AMENDMENTS	DRN	CHK	APP	DATE

ARDENT CONSULTING ENGINEERS

Suite 207, One Alie Street, London, E1 8DE
t 020 7680 4088 f 020 7488 3736
w www.ardent-ce.co.uk e enquiries@ardent-ce.co.uk

PROJECT TITLE: **DOVERS CORNER RAINHAM**

DRAWING TITLE: **EXISTING SITE ACCESS - CONSTRUCTION VEHICLES SWEEP PATH ANALYSIS**

CLIENT: **PERSIMMON HOMES ESSEX**

SCALE: **1:500 @ A3** DATE: **JUNE 2015** DESIGNED: **DV**

DRAWN: **DV** CHECKED: **SAF** APPROVED: **ML**

DRAWING NO. **S960-011** REV: **-**