

Appendix 4

Coffee Transport Assessment



CROUDACE STRATEGIC

STONARDS HILL, EPPING

PROPOSED RESIDENTIAL DEVELOPMENT FOR 150 UNITS

TRANSPORT REPORT

1303/DH

October 2013

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1. INTRODUCTION

- 1.1 COTTEE Transport Planning are instructed by Croudace Strategic Limited to review transport matters associated with the development of land on Stonards Hill, Epping.
- 1.2 The site has been identified by Epping Forest District Council (EFDC) in its Community Choice consultation document as being an option for future residential development – Local Authority reference EPP-B. The site's potential is based on its proximity to key facilities, Epping Town Centre and the physical containment of the land by the route of the former London Underground Central Line.
- 1.3 This submission should be considered alongside the detailed planning representations prepared by Kember Loudon Williams LLP in support of the release of the land for housing as the framework process moves forward towards the publication of the Council's Preferred Options.
- 1.4 The Highway Authority responsible for this area is Essex County Council (ECC) and there have been some initial discussions with officers. ECC are undertaking there own assessments of the various sites and will be advising EFDC in due course.

2. THE SITE AND EXISTING CONDITIONS

Site Location

- 2.1 The site is located to the east of Epping town centre on the north-east side of Stonards Hill. It is currently open land. Along the northern boundary is the residential property of Old Pastures and a Recreation Ground. The former Central Line forms the south-eastern boundary whilst Stonards Hill defines the south-western boundary.
- 2.2 There is a gated access on to Stonards Hill near the boundary with Old Pastures. A site location plan is attached at **Appendix A** whilst a site context plan is attached at **Appendix B**.
- 2.3 The residential development of Theydon Grove is nearby, located opposite the Recreation Ground with access from Stonards Hill.

Local Road Network

- 2.4 Stonards Hill is a local road with no strategic significance in the Highway Authority's hierarchy. It carries local traffic. From the junction with the B1393 Palmers Hill to the north-west of the site it leads in a fairly straight alignment and then continues over the rail line to Coopersale and Fiddlers Hamlet, small settlements to the east of Epping.
- 2.5 The junction with the B1393 is a crossroads junction with a quieter arm of Lindsey Street on the opposite side. The main junction of Lindsey Street is further south. Lindsey Street crosses The Green, which is an open grassed area located on the north side of the B1393 and extending towards the town centre.
- 2.6 Stonards Hill is subject to a 30mph speed limit between the B1393 and immediately west of Theydon Grove. Beyond that point, and passing the site, the speed limit is in accordance with the national speed limit for single carriageway roads of 60mph.
- 2.7 There is street lighting within the 30mph area but not on the section of road passing the site.

Public Transport

- 2.8 There are a number of bus services operating along B1393 with the nearest bus stops are either near Maltings Lane / Tidy's Lane to the north (400 to 450m through the Recreation Ground) or the town centre to the south-west (750m through the Recreation Ground). These bus stop locations are indicated on the site context plan attached at **Appendix B**, whilst a plan showing public transport services is attached at **Appendix C**.
- 2.9 These bus stops are served by the following routes:

Service	Route	Frequency		
		Monday - Friday	Saturday	Sunday
7/7A/7B	Epping – Ongar - Chelmsford	6 / day	1 / day	-
19/20/21	Harlow – Epping - Brentwood	3 / hour	3 / hour	-
213	Epping – Waltham Abbey – Waltham Cross	1 / hour	1 / hour	-

339	Epping Station – North Weald - Ongar	7 / day	-	-
380/381/382	Harlow – Epping – Toot Hill	8 / day	4 / day	-
541	Loughton – Epping - Harlow	1 / hour	1 / hour	7 / day
575	Romford - Epping	8 / day	-	-

2.10 Epping is served by the Central Line underground service. The station is to the south of the town centre and approximately 1.6km distance through local streets from Stonards Hill, which is around 20 minutes on foot and 8 mins by cycle.

2.11 The Central Line connects Epping with the London Underground network with a frequency of around 9 trains per hour operating into London.

Pedestrian and Cycle Access

2.12 There are no existing formal pedestrian routes to the site. However, Stonards Hill has footways on both sides from the B1393 junction to the access to the Recreation Ground. On the south side the footway continues to the last property beyond the junction with Theydon Grove as indicated on the site context plan.

2.13 Pedestrian routes to the north of the site are well established and of a good standard, including:

- Footways on both sides of Stonards Hill leading to Palmers Hill;
- The residential roads of Theydon Grove provide a pedestrian route through to Hennall Street with links onwards to the town centre and Epping Station;
- Wide footways on Palmers Hill / High Street towards the town centre; and
- Existing pedestrian routes across the Recreation Ground connecting entrances at Stonards Hill, Tidy's Lane and St Margarets Hospital.

2.14 There is potential to integrate the site to the town centre and other facilities by using existing routes on the Recreation Ground and this is discussed later in the report. Details of existing pedestrian routes are provided on the site context plan attached at **Appendix B**.

3. PROPOSED DEVELOPMENT AND SCOPE OF THE STUDY

- 3.1 The proposals for the site comprise residential development of up to 150 units. There is no scheme layout at this stage but this threshold will enable more of the established woodland to be retained and protected on site. There will be provision for new cycle and pedestrian routes through the site.
- 3.2 The current exercise involves preparing a preliminary design for an access on Stonards Hill and an assessment of the capacity of the local road network.
- 3.3 In addition, the opportunity for pedestrian, cycle and public transport connections is reviewed.

Traffic Surveys

- 3.4 Traffic surveys have been undertaken on the following junctions:

- Stonards Hill / Palmers Hill / Lindsey Street;
- Stonards Hill / Houblons Hill;
- Coopersale St. / Stewards Green Road; and
- Automatic Traffic Count on Stonards Hill.

These junctions are shown on the Site Location plan at **Appendix A**.

Traffic Flows

- 3.5 The Trip Rate Information and Computer System database (TRICS) 2012 (b) v6.10.1 has been examined to establish the expected vehicle trip rates associated with this development.
- 3.6 The table below shows the trip rates and associated trips for the site based on 150 residential units:

150 Residential Units

	Trip Rate per unit			Vehicles		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Weekday AM Peak Hour	0.155	0.413	0.568	23	62	85
Weekday PM Peak Hour	0.388	0.237	0.625	58	36	94

Details are included at **Appendix D**.

- 3.7 The traffic flow diagrams are included at **Appendix E** and include traffic growth for a five year period i.e. the design year for testing is 2018. The development traffic has been distributed with 70% to and from the north (Palmers Hill) and 30% to and from the south. The distribution is based on professional judgement at this stage and some sensitivity testing may be required at a later stage.

4. VEHICULAR ACCESS

Site Access Junction

- 4.1 The existing field access to the site is located on the boundary with Old Pastures but the current arrangement is inappropriate for the main access to the development.
- 4.2 There are currently two highway design standards in operation. The Design Manual for Roads and Bridges (DMRB) produced by the Department for Transport (DfT) is generally applied on routes in excess of the 30mph speed limit whilst Manual for Streets (MfS) is used where speed limits are below the 30mph limit and with the agreement of the Highway Authority.
- 4.3 The site is located outside the 30mph speed limit at present and if the speed limit was retained in this location it would be necessary to apply the more onerous DMRB standards.
- 4.4 The Automatic Traffic Count recorded vehicle speeds of 43mph in each direction. These speeds require visibility splays of 120m.
- 4.5 In order to achieve the 120m visibility splays, the access would need to be located midway along the site frontage, which would have a more significant impact on vegetation along the site boundary than were the access to be located further north along the site frontage.
- 4.6 It is proposed that the 30mph speed limit is extended past the site and will incorporate some gateway speed reducing features. This would enable the lesser standards in MfS to be used resulting in a lesser visibility (43m) and possibly no requirement for a right turn lane. It would be a matter for discussion with ECC and Epping Forest DC as there are obvious advantages in visual amenity terms by retaining more of the frontage – the preference of Croudace.
- 4.7 A MfS junction arrangement has been shown on the plan at **Appendix F** and this arrangement includes:
- Priority junction arrangement but with no right turn lane;
 - Visibility splays of 2.4x 43m in accordance with 30mph speeds; and
 - The 30mph speed limit is extended beyond the site access.
- 4.8 This arrangement enables the access to be located further west on Stonards Hill closer to the existing residential property and facilities and with a reduced impact on vegetation. At this point there is very little difference in level between Stonards Hill and the site. The MfS standard junction has also been tested and has substantial capacity to accommodate the anticipated flows. The PICADY computer program has been used to analyse the proposed junction and a summary of the results is included at **Appendix G**.

Off-site Junctions

- 4.9 Traffic surveys have been carried out on the Palmers Hill junction to the north and two further junctions on the route south.
- 4.10 Examination of the traffic flows on the southern junctions indicates traffic flows are relatively light during the peak hours and the addition of any further traffic associated with this development will not adversely impact the operation of the junctions.

- 4.11 The busiest junction is to the north at Palmers Hill. Whilst traffic flows on Stonards Hill are relatively light (less than 100 vehicles two-way in the peak hours), the traffic flows along Palmers Hill and the High Street are high (close to 2000 vehicles in the peak hours).
- 4.12 The PICADY computer program has been used to analyse the priority junction of Stonards Hill / Palmers Hill / Lindsey Street / High Street and a summary of the results is included at **Appendix H**.
- 4.13 It can be seen from the summary table of results that the junction operates with RFC values exceeding the design figure of 0.85 using the 2018 PM base traffic flows. The capacity test on the junction indicates that in the base situation without any development the junction is at capacity, primarily because of the very heavy traffic flows along the main road.
- 4.14 The proposed 150 dwelling development will add about 60 vehicles to this junction in the peak hours. The capacity test confirms that the junction becomes significantly over capacity raising the maximum RFC from 0.974 in the 2018 scenario to 1.397 in the 2018 plus proposed development scenario. The vehicles on Stonards Hill will have great difficulty exiting on to the main road. Improvements to the junction will be required to mitigate the impact of the development on the junction.
- 4.15 Potential improvements have been considered at the Palmers Hill / Stonards Hill junction. There is a wide footway and verge on the southern corner of the junction that could be used for adding an extra lane on the exit from Stonards Hill and scope to widen Palmers Hill all within the public highway. A capacity test of this option indicates that this improves the operation of the junction, with maximum RFC values improving such that maximum values drop to similar levels to that observed in the base 2018 scenario (no junction improvements), ie a nil detriment impact. The development traffic represents only a 3.1% increase in traffic at this junction in the morning and evening peak hours. A summary of the results is included at **Appendix I**.
- 4.16 To improve the operation of the junction, an initial scheme plan is included at **Appendix J** indicating a widening of Palmers Hill and Stonards Hill.
- 4.17 The junction capacity analysis undertaken above represents a robust assessment of the Stonards Hill / Palmers Hill / Lindsey Street / High Street priority junction as base traffic flows have had a growth factor applied to assess future year operation. However, a further analysis has been undertaken to test a 2013 base plus the proposed development scenario with the above proposed junction improvements to assess the immediate impact of the junction. The results show that with the junction improvements to Stonards Hill and Palmers Hill, the RFC values fall below the design figure of 0.85. The development traffic represents only a 3.2 and 3.3% increase in traffic at this junction in the morning and evening peak hours respectively. A summary of the results is included at **Appendix K**.
- 4.18 The junction capacity analysis indicates that the proposed improvements to the junction would cater for the proposed 150 unit development with RFC values dropping below the design figure of 0.85 and, furthermore, would improve upon the base situation.
- 4.19 It is interesting to note that there is a proposal by Epping Town Council to close the section of Lindsey Street in front of the war memorial as indicated on the scheme plan. The Town Council has been concerned about the narrowness of the road and the resulting damage to the

green of cars using this section of road. ECC will be considering options for this road but there is currently no timescale for when they will report.

4.20 There is a considerable safety benefit in closing the road, which could be part of the improvement scheme associated with this development

4.21 The increased capacity at this junction will provide further benefit to traffic flow along Palmers Hill.

5. PARKING

Off-site parking

- 5.1 Stonards Hill has some restrictions to on-street parking and some locations where on-street parking is permitted.
- 5.2 It is considered that these parking restrictions are reviewed as part of the development to minimise parking on-street during the day to ensure free flow of traffic to the Palmers Hill junction.

On-site parking

- 5.3 ECC's parking standards are outlined at Section 4 of the Parking Standards Design and Good Practice document – September 2009. The minimum parking standards for residential developments are summarised as follows:

Car Parking

- 1 bedroom – 1 space per dwelling*
 - 2+ bedroom – 2 spaces per dwelling*
- * - Excluding garage if less than 7m x 3m internal dimension.
- Visitor / Unallocated – 0.25 spaces per dwelling (unallocated) rounded up to the nearest whole number

Cycle Parking

- 1 bedroom – 1 secure covered space per dwelling
 - 2+ bedroom – None if garage or secure area is provided within the curtilage of the dwelling.
- * - Excluding garage is less than 7m a 3m internal dimension.
- Visitor / Unallocated –If no garage or secure area is provided within curtilage of dwelling then 1 covered and secure space per dwelling in a communal area for residents plus 1 spacer per 8 dwellings for visitors.

- 5.4 The proposed number of parking spaces to be incorporated within the development will accord with standards and will need to be discussed and agreed with ECC at planning stage.

6. PUBLIC TRANSPORT, PEDESTRIAN AND CYCLE ACCESS

Pedestrian and Cycle Access

6.1 The existing pedestrian connections are described earlier in the report. This section describes the potential improvements to integrate the site with the town centre and other local facilities.

6.2 The site is well placed for pedestrian and cycle access to local destinations as follows:

- The town centre is to the west and is within 745m of the site (approximately 10 mins walk time and 4 mins cycle time);
- The Town Hall is across The Green and is 670m from the site (approximately 9 mins walk time and 3.5 mins cycle time);
- St Margarets Hospital, providing local health services and a major employer, is within 450m of the site (approximately 6 mins walk time and 2.5 mins cycle time);
- Epping underground station is within 1.6 km of the site through adjacent roads (approximately 20 mins walk time and 8 mins cycle time); and
- The nearest primary and secondary schools are a distance of 1.28km (approximately 16 mins walk time and 6.5 mins cycle time) and 1.87km (approximately 24mins walk time and 9.5 mins cycle time) respectively.

6.3 A plan illustrating the walking and cycling distances to local facilities is attached at **Appendix L**.

6.4 All of these destinations are within the Preferred Maximum walking distances as set out in "Providing for Journeys on Foot" CHIT, 2000. The site is therefore in a very sustainable location within walking distance of numerous facilities.

6.5 The links across the Recreation Ground can be constructed as shared pedestrian / cycle routes, which will also encourage cycling from the site.

Public Transport

6.6 The nearest bus corridor is along Palmers Hill / High Street with bus stops near Tidy's Lane. The walk distance from the site boundary to the bus stops, assuming use of the Recreation Ground is between 400m and 450m.

6.7 The bus corridor has 7 regular bus services offering a significant choice of destination.

6.8 As part of a transport contribution, the development could fund improvements such as new stops on Palmers Hill to encourage travel by bus.

6.9 A Travel Plan will be prepared to encourage sustainable travel associated with the site. This is part of a standard requirement by ECC to ensure there is focus on sustainable travel options.

7. POLICY

The National Planning Policy Framework - March 2012 (NPPF)

7.1 National Transport Policy is now contained in the National Planning Policy Framework (March 2012) and supersedes Planning Policy Guidance Note 13 and Planning Policy Statement 4: Planning for Sustainable Economic Growth.

7.2 In paragraph 17 of section 1 the document sets out twelve principles that planning should follow. Bullet point 11 states that planning should:

“actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable;”

7.3 Section 4 deals with Promoting Sustainable Transport. Paragraph 30 states;

“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.”

The site is well located for access by sustainable transport modes. The scheme will provide direct links with Epping Town Centre and local shopping facilities and to local education and medical facilities in the surrounding area. In addition, financial contributions will be made to improve pedestrian, cycle and public transport links.

7.4 Paragraph 32 refers to the need for Transport Assessments:

“All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:

- **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.”**

A Transport Assessment will be prepared at planning application stage but this report demonstrates how sustainable transport modes are encouraged, how safe access is achieved for all modes and how improvements limit the impact of the development.

7.5 Paragraph 35 requires consideration to be given to delivery of goods, sustainable travel modes, safe layouts, provision for low-emission vehicles and the needs of people with disabilities;

“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;
- incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- consider the needs of people with disabilities by all modes of transport.”

The site will be developed to incorporate all these factors.

7.6 Paragraph 37 refers to the need for a balance of land uses within an area;

“Planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities”

7.7 As described earlier the development is well located for local facilities and sustainable travel by public transport, bicycle and walking.

7.8 The public transport, pedestrian and cycle improvements proposed as part of the development will ensure a high quality access by these modes is available and means that the development accords with the transport and accessibility related policies.

Epping Forest District Council – Combined Local Plan (1998) & Local Plan Alterations (2006)

7.9 Policy ST1 – Location of Development states:

“New development will be located in places that encourage walking, cycling and the use of public transport (including the provision of additional services and infrastructure). The Council expects new development to satisfy the following criteria:

- (i) major trip generating uses will be located in the principal centres and be in accordance with the retail hierarchy listed in policy TC1;**
- (ii) facilities used on a day-to-day basis will be located in non key frontage of principal centres or smaller, district and local centres;**
- (iii) housing will principally be located in existing urban areas, and make the best use of land which is, or could be, highly accessible to public transport or close to services and employment opportunities.**

In rural areas, for development which has transport implications, preference will be given to locations with access to regular public transport services and containing basic shops and other facilities. Proposals that are not in accordance with this policy and where their location is considered to be unsustainable will be refused.

Legal agreements may be used to secure the provision of new or additional public transport services and facilities.”

7.10 Policy ST2 – Accessibility of Development states:

“New development must be designed to provide safe, pleasant and convenient access for pedestrians and cyclists, including where appropriate, integrated transport choices and practical links with adjoining public rights of way and cycleway networks. Major developments must be well served by public transport and, if necessary, make provision for enhanced services and infrastructure”

7.11 These policies emphasise the need for the site to be well located for access to local facilities using sustainable travel modes.

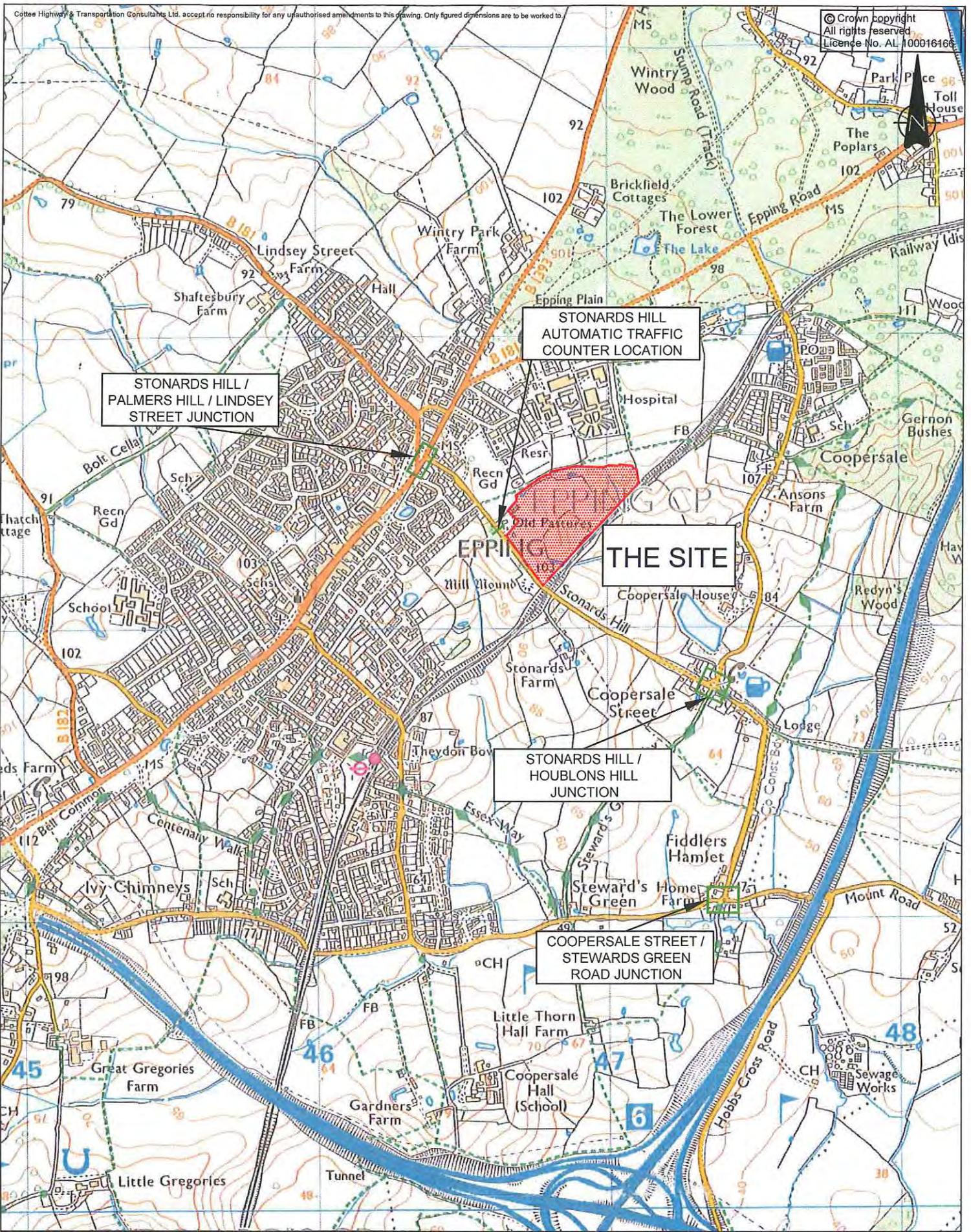
7.12 This particular site is located close to local facilities and will be designed to meet these policy requirements.

8. SUMMARY AND CONCLUSIONS

- 8.1 This Transport Report considers the transport impact and sustainable location of a proposed residential development of 150 units on land adjoining Stonards Hill, Epping.
- 8.2 Traffic surveys have been commissioned to assess the impact on the local road network.
- 8.3 An access solution to the site can be achieved and a design is included in the report based on Manual for Streets standards. The proposal will be discussed with the authorities.
- 8.4 Analysis of the local road network has identified the Stonards Hill / Palmers Hill junction is at capacity. Potential improvements to the junction include widening Stonards Hill to provide a two lane approach, closing off the minor arm of Lindsey Street on the opposite side of the junction and a minor widening of Palmers Hill. These improvements mitigate the impact of the development on the junction.
- 8.5 Epping Town Council is currently seeking closure of Lindsey Street to enhance the setting of the war memorial. This development could assist in bringing that scheme forward.
- 8.6 The site will make pedestrian/cycle connections through the adjacent Council Recreation Ground to ensure these networks can be connected to the existing built-up areas. The proposed improvement will ensure the site is well located for walking and cycling to the town centre, hospital, schools and other important destinations in Epping and therefore is very sustainable.
- 8.7 There are around 14 scheduled bus services operating in the vicinity of the site providing at least 5 buses per hour from Monday to Friday. The site is about the maximum 400m walk distance to the nearest bus stop but the development will make contributions to improve sustainable travel modes.
- 8.8 A Travel Plan will be introduced to promote the sustainable travel options available to residents of the development.
- 8.9 The development proposals have been examined in the light of national and local policies and the development is well located to ensure it conforms to policy.
- 8.10 It is therefore considered that as the site is well located for access to the town centre and other local facilities by sustainable travel modes it should be included in the selection of sites for housing in Epping.

APPENDIX A

SITE LOCATION PLAN



Drawn	DAVID HOWSON	Checked	GJK
Scale	NTS	Date	MAR 2013
Drawing No.	1303/2A		
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Project

**CROUDACE STRATEGIC
STONARDS HILL, EPPING**

SITE LOCATION PLAN

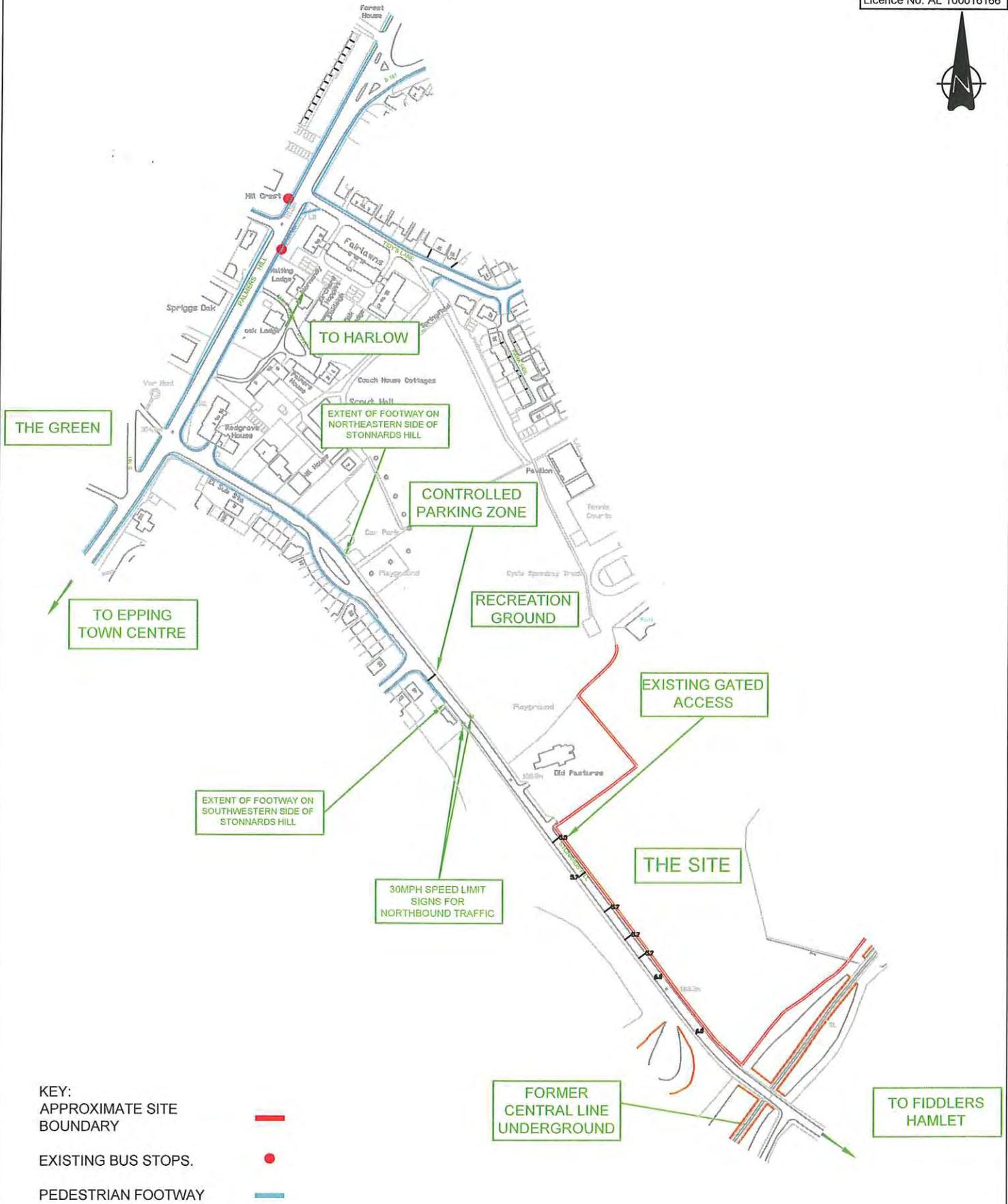
COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

APPENDIX B

SITE CONTEXT PLAN



KEY:
 APPROXIMATE SITE BOUNDARY ———
 EXISTING BUS STOPS. ●
 PEDESTRIAN FOOTWAY ———

Drawn	DAVID HOWSON	Checked	GJK
Scale	NTS	Date	AUG 2013
Drawing No.	1303/3B		
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Project
**CROUDACE STRATEGIC
 STONARDS HILL, EPPING**
 SITE CONTEXT PLAN

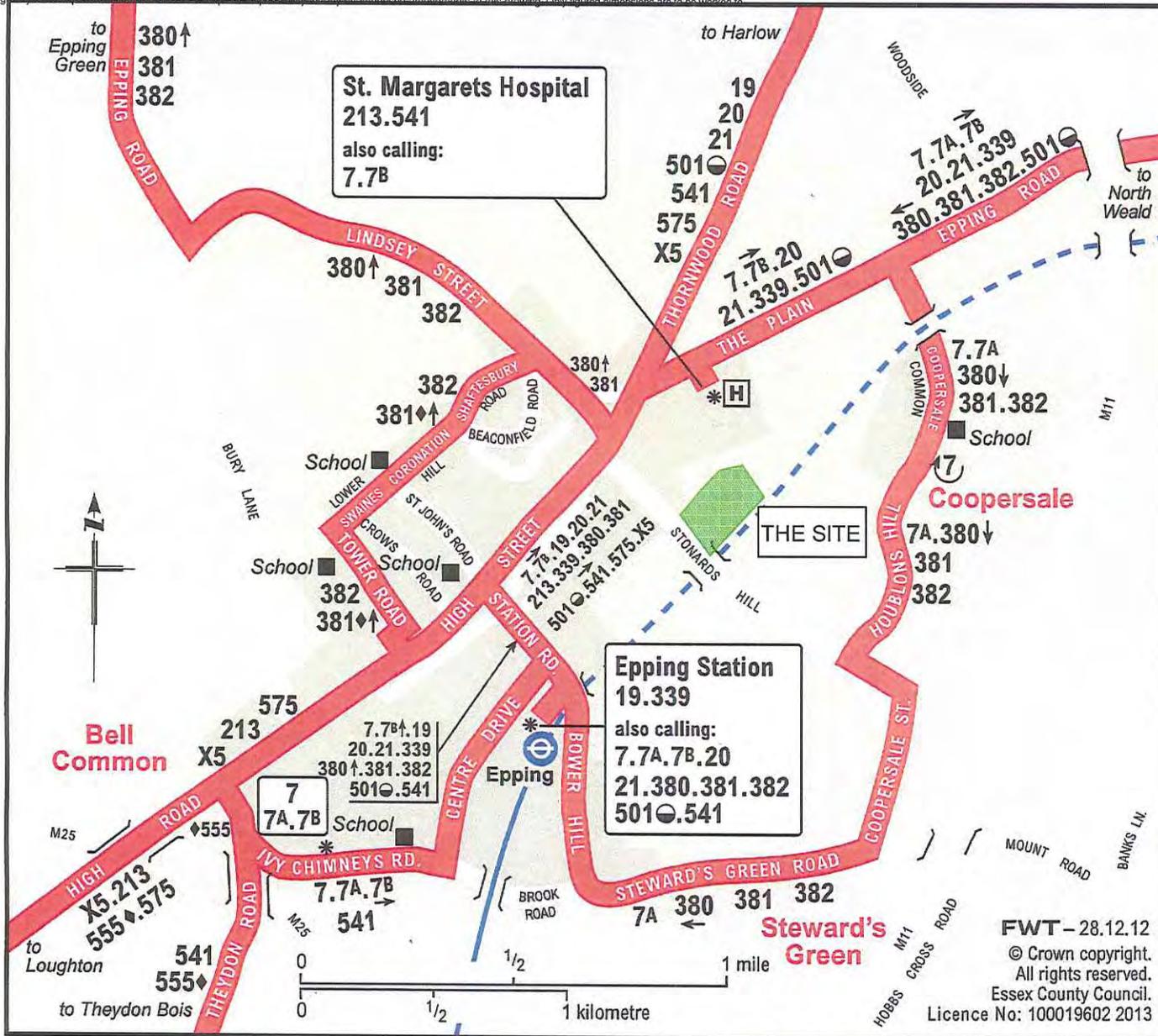
COTTEE Transport Planning

Fir Lodge
 Threshelfords Business Park
 Feering
 Essex
 CO5 9SE

Tel : 01376 573400
 Fax : 01376 573480
 email : info@cottee-tp.co.uk
 www.cotteetransportplanning.co.uk

APPENDIX C

PUBLIC TRANSPORT INFORMATION



BUS SERVICE FREQUENCY

Service	Mon-Fri	Sat	Sun
7	4/day	1/day*	-
7A	1/day	-	-
7B	1/day	-	-
19	1/hr	1/hr	-
20	2/hr	1/hr	-
21	-	1/hr	-
213	1/hr	1/hr	-
339	7/day	-	-
380	1/day	-	-
381	6/day	4/day	-
382	1/day	-	-
501	-	-	7/day
541	1/hr	1/hr	7/day
575	8/day	-	-
X5	-	4/day	-

*night service

UNDERGROUND SERVICE FREQUENCY

Service	Mon-Fri	Sat	Sun
Circle Line	9/hr	9/hr	9/hr

FWT - 28.12.12
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Scale NTS	Date OCT 2013
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Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
PUBLIC TRANSPORT SERVICES**

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE
Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

APPENDIX D

RESIDENTIAL TRICS DATA

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED
 VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	BD	BEDFORDSHIRE	1 days
	EX	ESSEX	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	2 days
	NT	NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	WO	WORCESTERSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
	LC	LANCASHIRE	1 days
	MS	MERSEYSIDE	1 days
09	NORTH		
	TV	TEES VALLEY	1 days

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

Filtering Stage 2 selection:

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

Parameter: Number of dwellings
 Actual Range: 101 to 372 (units:)
 Range Selected by User: 100 to 400 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/04 to 22/09/12

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

Selected survey days:

Monday	2 days
Tuesday	4 days
Wednesday	1 days
Thursday	8 days
Friday	2 days

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

Selected survey types:

Manual count	17 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	7
Edge of Town	8
Neighbourhood Centre (PPS6 Local Centre)	1

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

Selected Location Sub Categories:

Residential Zone	12
Out of Town	1
No Sub Category	4

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

Filtering Stage 3 selection:

Use Class:

C3	17 days
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This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	2 days
10,001 to 15,000	1 days
15,001 to 20,000	8 days
20,001 to 25,000	3 days
25,001 to 50,000	2 days

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

Population within 5 miles:

5,001 to 25,000	1 days
50,001 to 75,000	1 days
75,001 to 100,000	4 days
100,001 to 125,000	4 days
125,001 to 250,000	7 days

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

Car ownership within 5 miles:

0.6 to 1.0	6 days
1.1 to 1.5	11 days

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

Travel Plan:

No	17 days
----	---------

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

LIST OF SITES relevant to selection parameters

- | | | |
|---|---|---------------------|
| 1 | BD-03-A-01 SEMI DETACHED, LUTON
NEW BEDFORD ROAD | BEDFORDSHIRE |
| | LUTON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 131
Survey date: THURSDAY 08/07/04 | Survey Type: MANUAL |
| 2 | CA-03-A-02 MIXED HOUSES, PETERBOROUGH
THORPE ROAD | CAMBRIDGESHIRE |
| | PETERBOROUGH
Edge of Town Centre
Residential Zone
Total Number of dwellings: 363
Survey date: THURSDAY 13/05/04 | Survey Type: MANUAL |
| 3 | CH-03-A-02 HOUSES/FLATS, CREWE
SYDNEY ROAD | CHESHIRE |
| | CREWE
Edge of Town
Residential Zone
Total Number of dwellings: 174
Survey date: TUESDAY 14/10/08 | Survey Type: MANUAL |
| 4 | CH-03-A-06 SEMI -DET./BUNGALOWS, CREWE
CREWE ROAD | CHESHIRE |
| | CREWE
Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 129
Survey date: TUESDAY 14/10/08 | Survey Type: MANUAL |
| 5 | EX-03-A-01 SEMI -DET., STANFORD-LE-HOPE
MILTON ROAD
CORRINGHAM
STANFORD-LE-HOPE | ESSEX |
| | Edge of Town
Residential Zone
Total Number of dwellings: 237
Survey date: TUESDAY 13/05/08 | Survey Type: MANUAL |
| 6 | LC-03-A-29 DETACHED/SEMI D., BLACKBURN
REVIDGE ROAD
FOUR LANE ENDS
BLACKBURN | LANCASHIRE |
| | Edge of Town
Residential Zone
Total Number of dwellings: 185
Survey date: THURSDAY 10/06/04 | Survey Type: MANUAL |
| 7 | LN-03-A-01 MIXED HOUSES, LINCOLN
BRANT ROAD
BRACEBRIDGE
LINCOLN | LINCOLNSHIRE |
| | Edge of Town
Residential Zone
Total Number of dwellings: 150
Survey date: TUESDAY 15/05/07 | Survey Type: MANUAL |

LIST OF SITES relevant to selection parameters (Cont.)

8	LN-03-A-02	MIXED HOUSES, LINCOLN HYKEHAM ROAD	LINCOLNSHIRE
		LINCOLN Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 186 Survey date: MONDAY 14/05/07	Survey Type: MANUAL
9	MS-03-A-01	TERRACED, RUNCORN PALACE FIELDS AVENUE	MERSEYSIDE
		RUNCORN Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total Number of dwellings: 372 Survey date: THURSDAY 06/10/05	Survey Type: MANUAL
10	NT-03-A-03	SEMI DETACHED, KIRKBY-IN-ASHFD B6018 SUTTON ROAD	NOTTINGHAMSHIRE
		KIRKBY-IN-ASHFIELD Edge of Town Residential Zone Total Number of dwellings: 166 Survey date: WEDNESDAY 28/06/06	Survey Type: MANUAL
11	NY-03-A-06	BUNGALOWS/SEMI DET., BBDGE HORSEFAIR	NORTH YORKSHIRE
		BOROUGHBRIDGE Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 115 Survey date: FRIDAY 14/10/11	Survey Type: MANUAL
12	SF-03-A-02	SEMI DET./TERRACED, IPSWICH STOKE PARK DRIVE MAIDENHALL IPSWICH	SUFFOLK
		Edge of Town Residential Zone Total Number of dwellings: 230 Survey date: THURSDAY 24/05/07	Survey Type: MANUAL
13	SF-03-A-03	MIXED HOUSES, BURY ST EDMDS BARTON HILL FORNHAM ST MARTIN BURY ST EDMUNDS	SUFFOLK
		Edge of Town Out of Town Total Number of dwellings: 101 Survey date: MONDAY 15/05/06	Survey Type: MANUAL
14	SH-03-A-04	TERRACED, SHREWSBURY ST MICHAEL'S STREET	SHROPSHIRE
		SHREWSBURY Suburban Area (PPS6 Out of Centre) No Sub Category Total Number of dwellings: 108 Survey date: THURSDAY 11/06/09	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

15	TV-03-A-01 POWLETT ROAD	MIXED HOUSES/FLATS, HARTLEPL	TEES VALLEY
	HARTLEPOOL Suburban Area (PPS6 Out of Centre) No Sub Category Total Number of dwellings: 225 Survey date: THURSDAY 14/04/05		
	Survey Type: MANUAL		
16	WO-03-A-03 BLAKEBROOK BLAKEBROOK KIDDERMINSTER	DETACHED, KIDDERMINSTER	WORCESTERSHIRE
	Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of dwellings: 138 Survey date: FRIDAY 05/05/06		
	Survey Type: MANUAL		
17	WO-03-A-06 ST GODWALDS ROAD ASTON FIELDS BROMSGROVE	DET./TERRACED, BROMSGROVE	WORCESTERSHIRE
	Edge of Town No Sub Category Total Number of dwellings: 232 Survey date: THURSDAY 30/06/05		
	Survey Type: MANUAL		

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	17	191	0.074	17	191	0.262	17	191	0.336
08:00 - 09:00	17	191	0.155	17	191	0.413	17	191	0.568
09:00 - 10:00	17	191	0.168	17	191	0.203	17	191	0.371
10:00 - 11:00	17	191	0.148	17	191	0.186	17	191	0.334
11:00 - 12:00	17	191	0.182	17	191	0.175	17	191	0.357
12:00 - 13:00	17	191	0.197	17	191	0.187	17	191	0.384
13:00 - 14:00	17	191	0.181	17	191	0.170	17	191	0.351
14:00 - 15:00	17	191	0.190	17	191	0.194	17	191	0.384
15:00 - 16:00	17	191	0.284	17	191	0.207	17	191	0.491
16:00 - 17:00	17	191	0.316	17	191	0.197	17	191	0.513
17:00 - 18:00	17	191	0.388	17	191	0.237	17	191	0.625
18:00 - 19:00	17	191	0.276	17	191	0.232	17	191	0.508
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.559			2.663			5.222

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

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

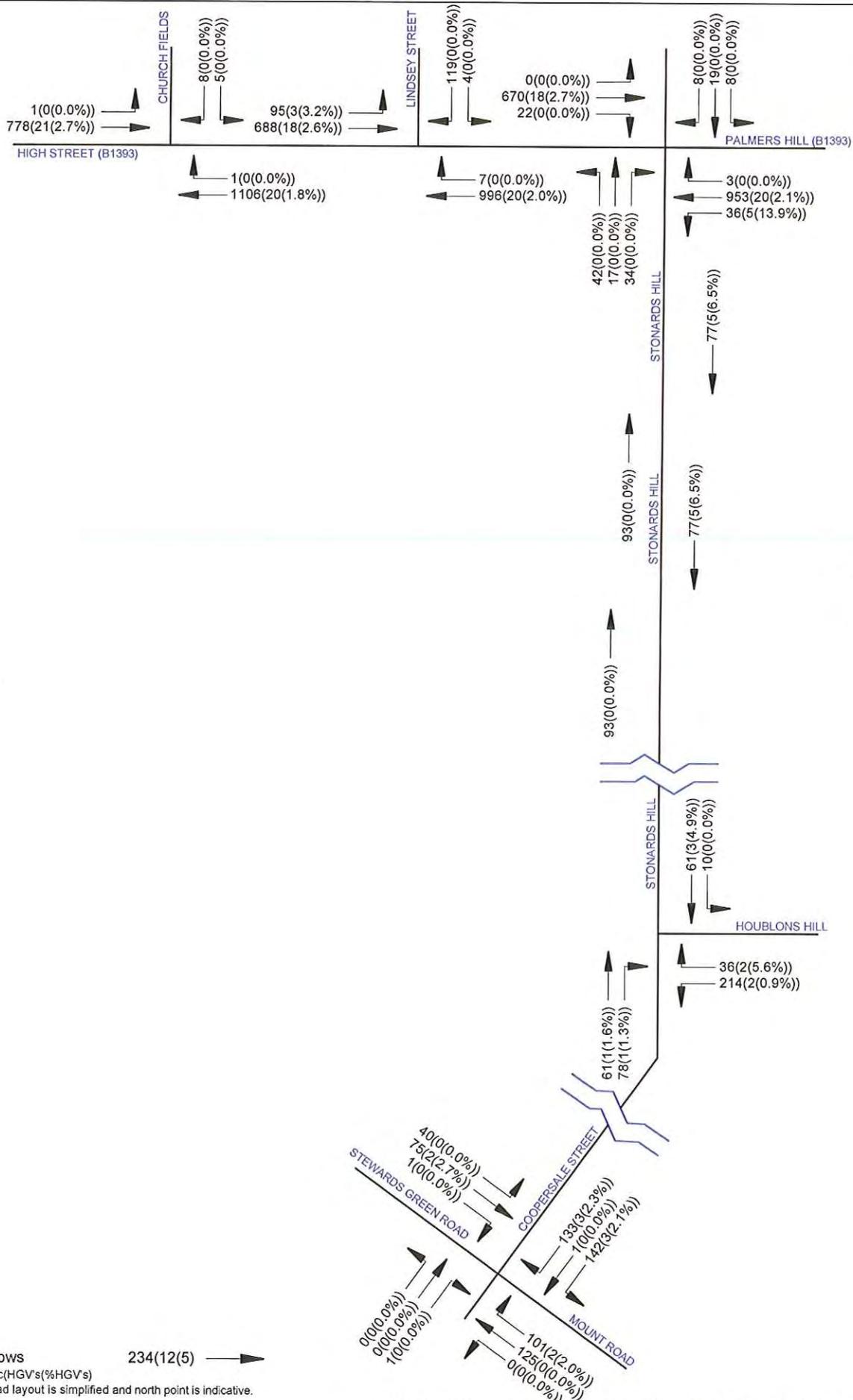
Parameter summary

Trip rate parameter range selected: 101 - 372 (units:)
 Survey date date range: 01/01/04 - 22/09/12
 Number of weekdays (Monday-Friday): 17
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 0

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

APPENDIX E

TRAFFIC FLOW DIAGRAMS



THE SITE

KEY:
 Traffic flows 234(12.5) →
 Total Traffic(HGV's(%HGV's))
 NOTE: Road layout is simplified and north point is indicative.

Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

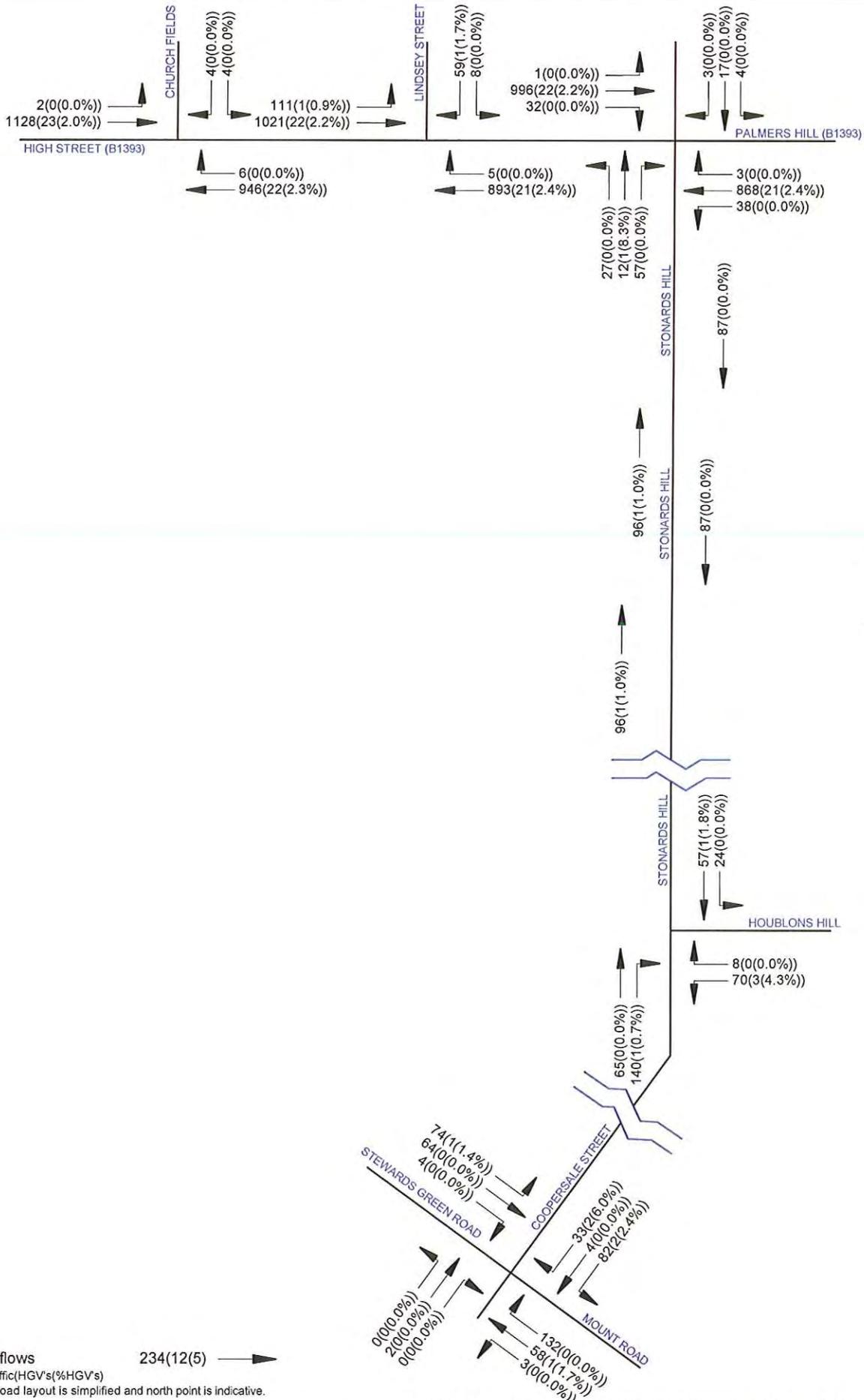
Drawn DAVID HOWSON	Checked GJK
Scale NTS	Date OCT 2013
Drawing No. 1303/A3	
Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.	

Project
**CROUDACE STRATEGIC
 STONARDS HILL, EPPING**
 2013 BASE TRAFFIC FLOWS
 WEEKDAY AM PEAK HOUR (0800-0900)

COTTEE Transport Planning

Fir Lodge
 Threshelfords Business Park
 Feering
 Essex
 CO5 9SE

Tel : 01376 573400
 Fax : 01376 573480
 email : info@cottee-tp.co.uk
 www.cotteetransportplanning.co.uk



THE SITE

KEY:
Traffic flows 234(12(5)) →
Total Traffic(HGV's(%HGV's))
NOTE: Road layout is simplified and north point is indicative.

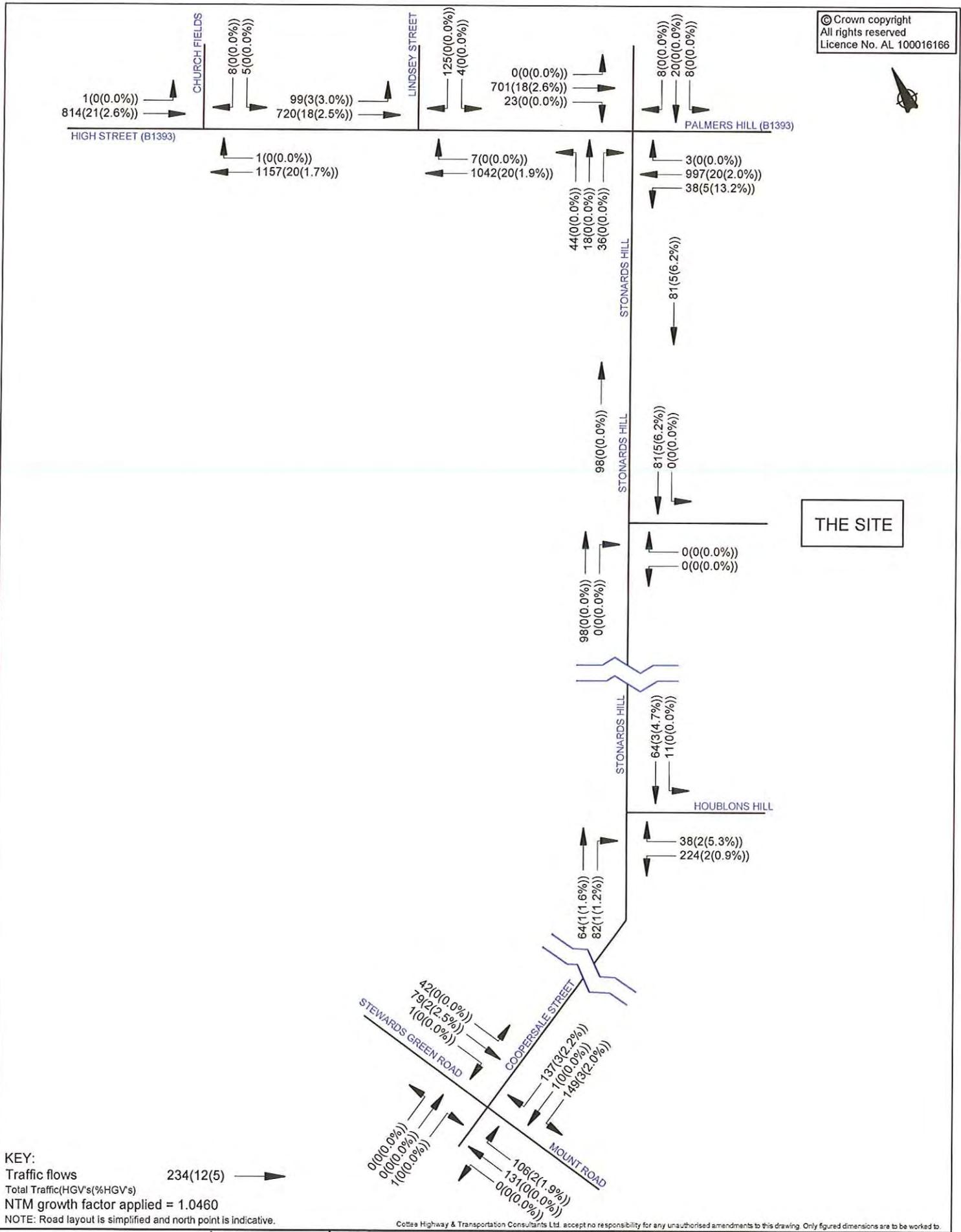
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Drawn DAVID HOWSON	Checked GJK
Scale NTS	Date OCT 2013
Drawing No. 1303/B3	
Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.	

Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
2013 BASE TRAFFIC FLOWS
WEEKDAY PM PEAK HOUR (1700-1800)**

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE
Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk



THE SITE

KEY:
 Traffic flows $234(12(5)) \rightarrow$
 Total Traffic(HGV's(%HGV's))
 NTM growth factor applied = 1.0460
 NOTE: Road layout is simplified and north point is indicative.

Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

Drawn	DAVID HOWSON	Checked	GJK
Scale	NTS	Date	OCT 2013
Drawing No.	1303/C3		
<small>Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.</small>			

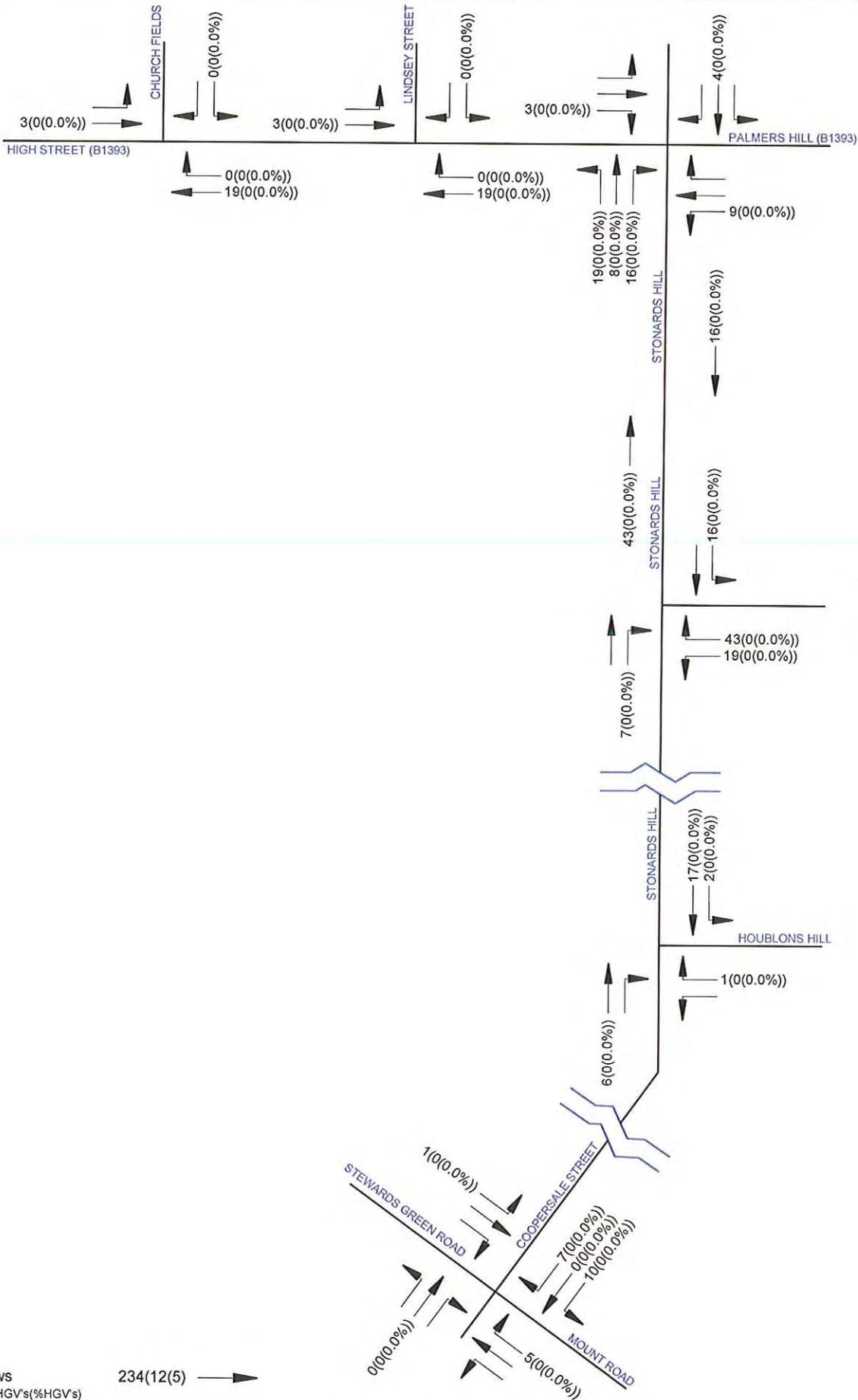
Project

**CROUDACE STRATEGIC
STONARDS HILL, EPPING
2018 BASE TRAFFIC FLOWS
WEEKDAY AM PEAK HOUR (0800-0900)**

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk



KEY:
Traffic flows 234(12(5)) →
Total Traffic(HGV's(%HGV's))
NOTE: Road layout is simplified and north point is indicative.

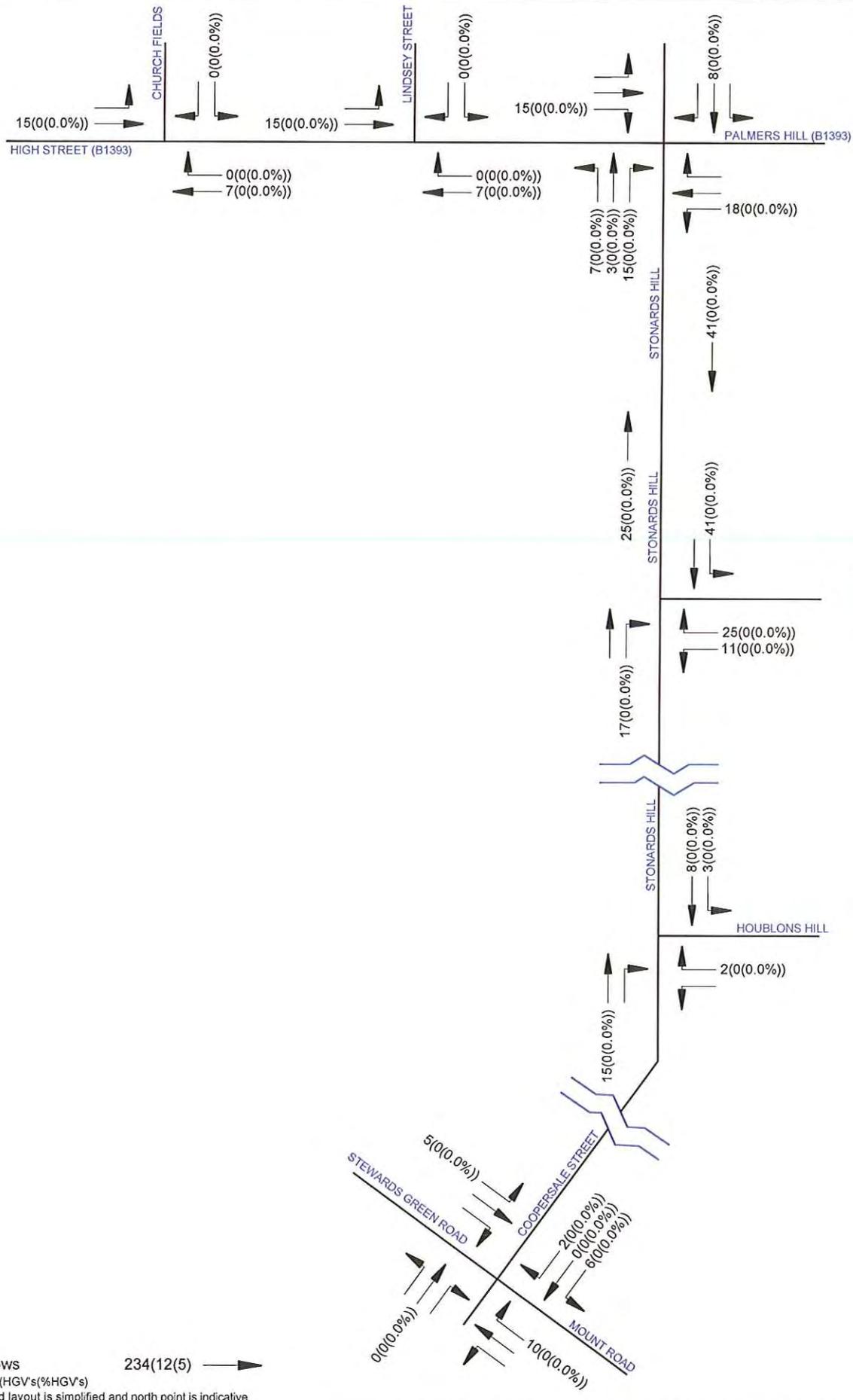
Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

Drawn	DAVID HOWSON	Checked	GJK
Scale	NTS	Date	OCT 2013
Drawing No.	1303/E3		
<small>Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.</small>			

Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
DEVELOPMENT TRAFFIC FLOWS
WEEKDAY AM PEAK HOUR (0800-0900)**

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE
Tel : 01376 573400
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KEY:
Traffic flows 234(12(5)) →
Total Traffic(HGV's(%HGV's)
NOTE: Road layout is simplified and north point is indicative.

Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

Drawn	DAVID HOWSON	Checked	GJK
Scale	NTS	Date	OCT 2013
Drawing No.	1303/F3		
<small>Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.</small>			

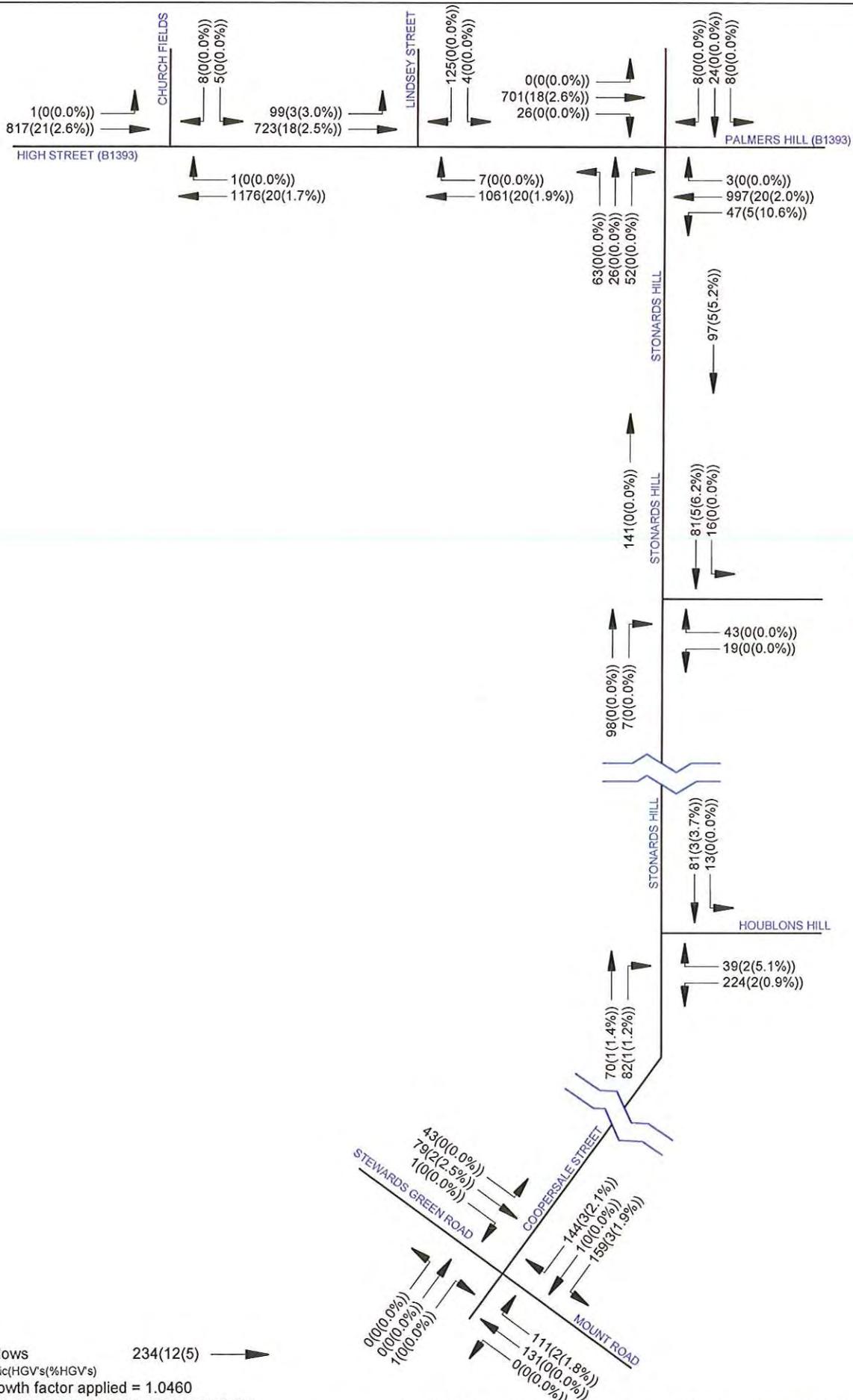
Project

**CROUDACE STRATEGIC
STONARDS HILL, EPPING
DEVELOPMENT TRAFFIC FLOWS
WEEKDAY PM PEAK HOUR (1700-1800)**

COTTEE Transport Planning

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Threshelfords Business Park
Feering
Essex
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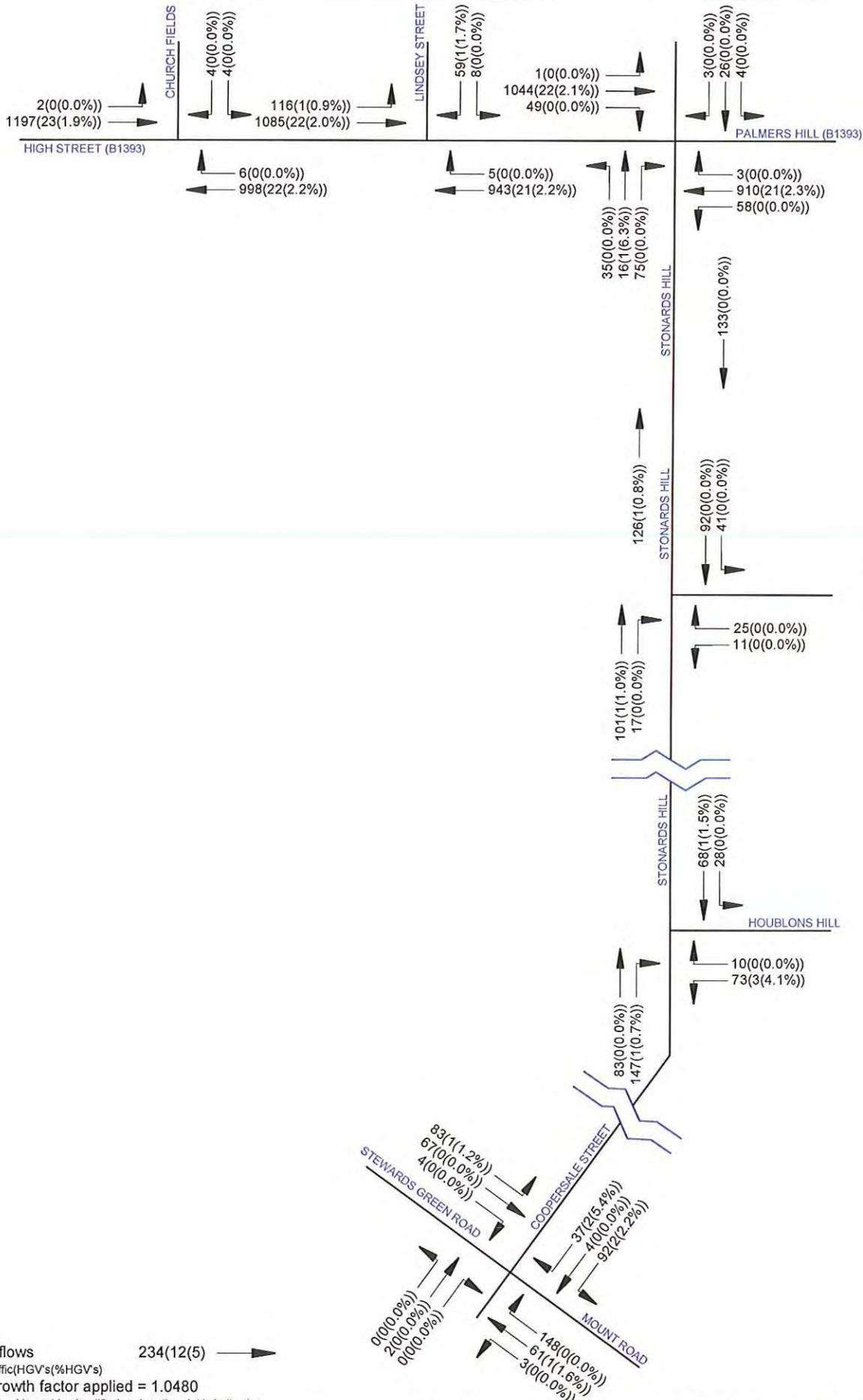
KEY:
Traffic flows 234(12.5%) →
Total Traffic(HGV's(%HGV's))
NTM growth factor applied = 1.0460
NOTE: Road layout is simplified and north point is indicative.

Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

Drawn DAVID HOWSON	Checked GJK
Scale NTS	Date OCT 2013
Drawing No. 1303/G3	
Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.	

Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
2018 BASE + DEVELOPMENT
TRAFFIC FLOWS
WEEKDAY AM PEAK HOUR (0800-0900)**

COTTEE Transport Planning
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Threshelfords Business Park
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Essex
CO5 9SE
Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk



THE SITE

KEY:
Traffic flows 234(12.5) →
Total Traffic(HGV's(%HGV's)
NTM growth factor applied = 1.0480
NOTE: Road layout is simplified and north point is indicative.

Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.

Drawn DAVID HOWSON	Checked GJK
Scale NTS	Date OCT 2013
Drawing No. 1303/H3	
Cottee Highway & Transportation Consultants Ltd. accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions are to be worked to.	

Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
2018 BASE + DEVELOPMENT
TRAFFIC FLOWS
WEEKDAY PM PEAK HOUR (1700-1800)**

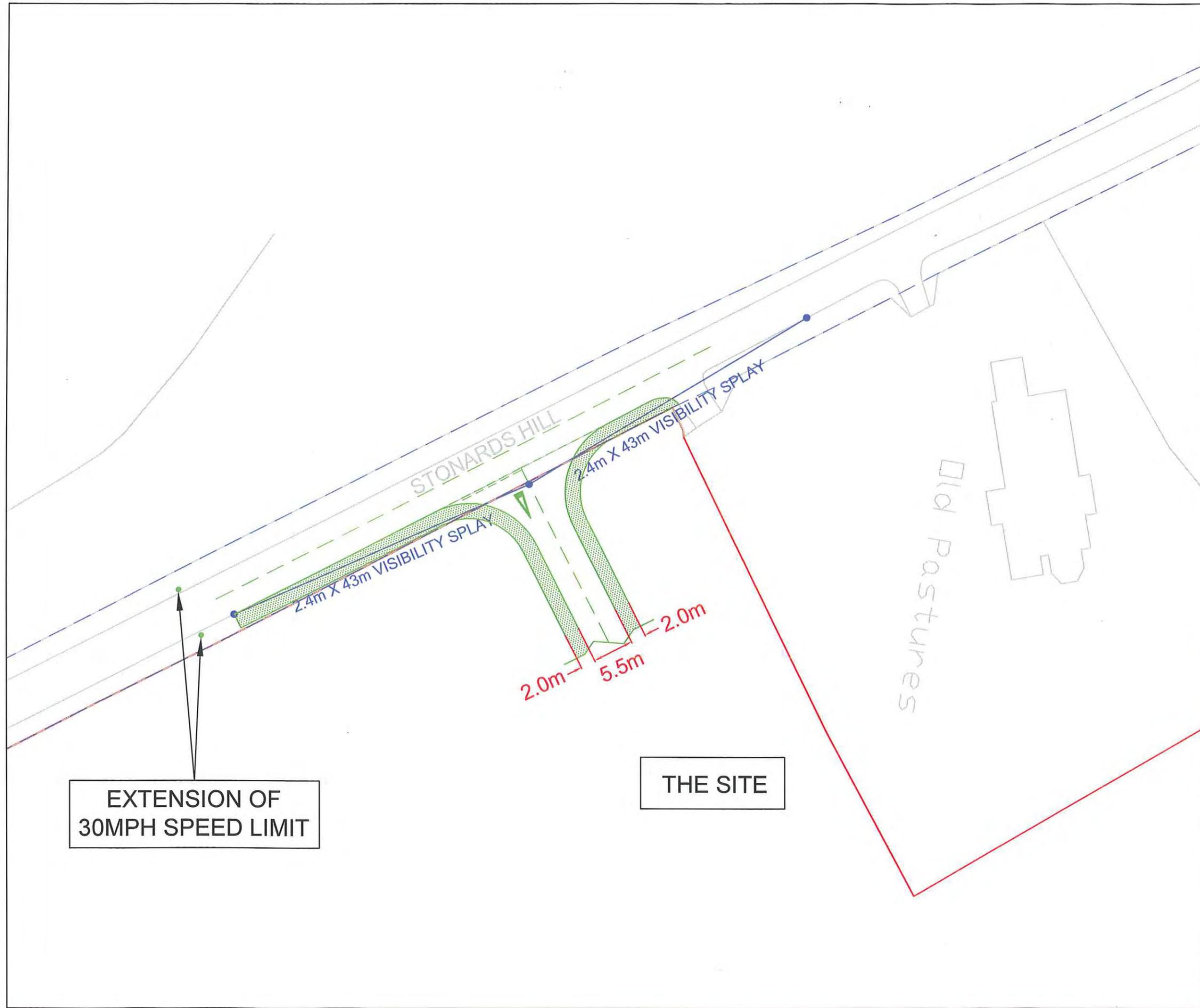
COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

APPENDIX F

MANUAL FOR STREETS ACCESS PROPOSAL



- KEY**
- PROPOSED LAYOUT
 - PROPOSED FOOTWAY
 - DIMENSIONS
 - INDICATIVE SITE BOUNDARY
 - HIGHWAY BOUNDARY

- NOTES:**
1. All vegetation, hedging and trees will need to be removed within the visibility envelope.
 2. Layout subject to topographical survey, detail design and approval of the Highway Authority.

PRELIMINARY

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

Client
CROUDACE STRATEGIC

Project
STONARDS HILL, EPPING

Title
PROPOSED ACCESS ARRANGEMENT

Drawn **DEH** Checked **MMT**

Scale **1:500 @ A3** Date **OCT 2013**

Drawing No. **1303/11**

APPENDIX G

PICADY ANALYSIS – MfS ACCESS

STONARDS HILL, EPPING

STONARDS HILL / PROPOSED MfS ACCESS – PICADY

	B-C		B-A		C-B	
	RFC	Q	RFC	Q	RFC	Q
2018 Base Traffic Flows AM Peak hour 0700 – 0800	0.000	0	0.000	0	0.000	0
2018 Base Traffic Flows PM Peak hour 1700 – 1800	0.000	0	0.000	0	0.000	0
2018 Base + Proposed Development Traffic Flows AM Peak hour 0700 – 0800	0.029	0	0.088	0	0.012	0
2018 Base + Proposed Development Traffic Flows PM Peak hour 1700 – 1800	0.017	0	0.052	0	0.029	0

NOTES:

- A - Stonards Hill (North)
- B - Proposed access
- C - Stonards Hill (South)
- RFC - Ratio of flow to Capacity
- Q - Number of Vehicles

APPENDIX H

PICADY ANALYSIS – PALMERS HILL JUNCTION EXISTING LAYOUT

STONARDS HILL, EPPING

(EXISTING LAYOUT)

HIGH STREET (B1393) / LINDSEY STREET / PALMERS HILL (B1393) / STONARDS HILL – PICADY

	B-CD		B-AD		A-D		D-ABC		C-B	
	RFC	Q								
2018 Base Traffic Flows AM Peak hour 0800 – 0900	0.288	0	0.416	1	0.007	0	0.244	0	0.070	0
2018 Base Traffic Flows PM Peak hour 1700 – 1800	0.960	4	0.974	5	0.010	0	0.383	1	0.096	0
2018 Base + Proposed Development Traffic Flows AM Peak hour 0800 – 0900	0.580	1	0.661	2	0.007	0	0.284	0	0.079	0
2018 Base + Proposed Development Traffic Flows PM Peak hour 1700 – 1800	1.397	*	1.391	*	0.010	0	0.593	1	0.140	0

NOTES:

- A - Palmers Hill (B1393)
- B - Stonards Hill
- C - High Street (B1393)
- D - Lindsey Street (link road) – closed to traffic in this analysis
- RFC - Ratio of flow to Capacity
- Q - Number of Vehicles
- * - Q values become unreliable when RFC values exceed 1

APPENDIX I

PICADY ANALYSIS – PALMERS HILL JUNCTION PROPOSED LAYOUT

STONARDS HILL, EPPING

(WIDENING TO STONARDS HILL, CLOSURE OF LINDSEY STREET LINK ROAD AND WIDENING SOUTHERN SIDE OF B1393)

HIGH STREET (B1393) / LINDSEY STREET / PALMERS HILL (B1393) / STONARDS HILL – PICADY

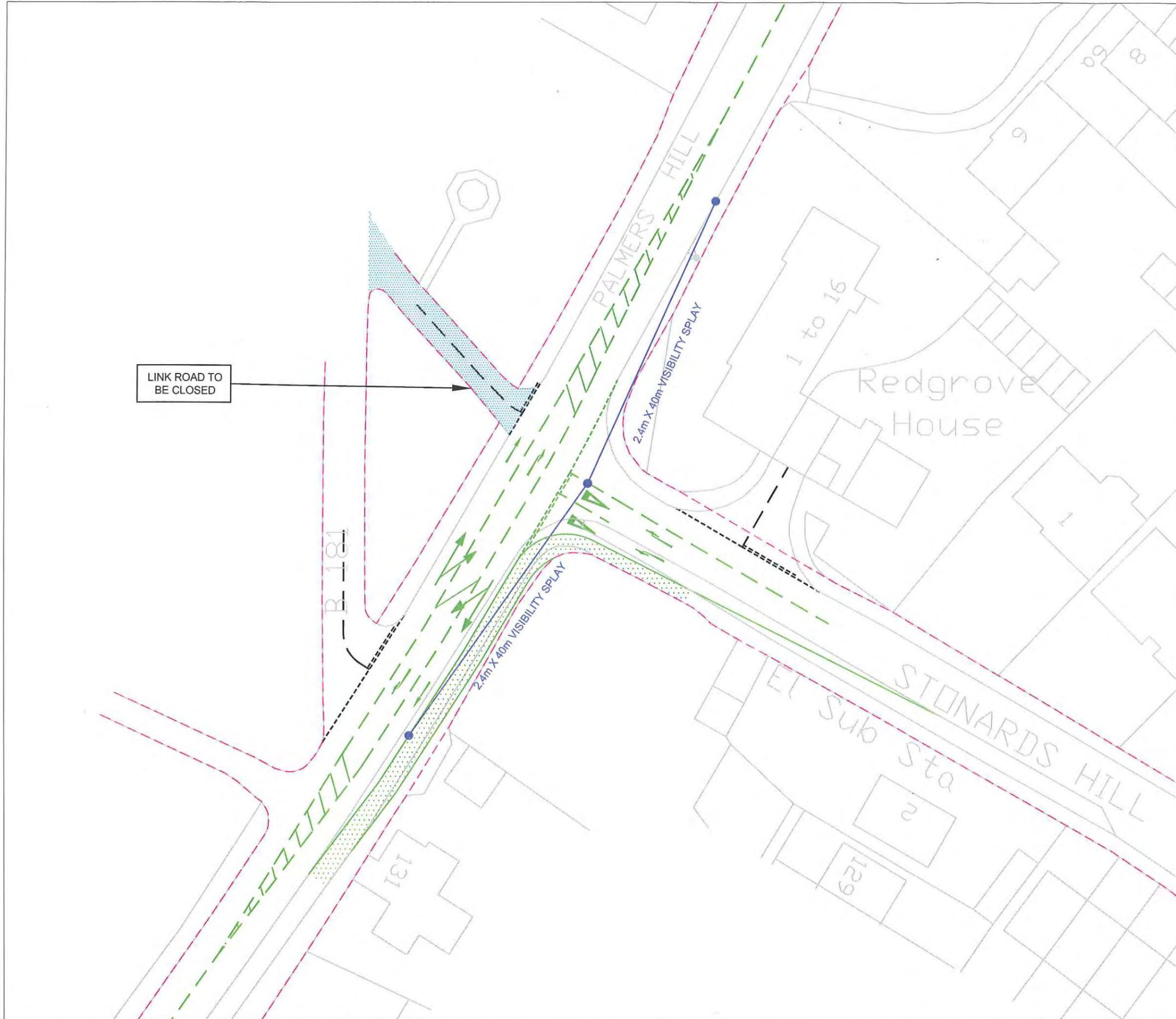
	B-CD		B-AD		A-D		D-ABC		C-B	
	RFC	Q								
2018 Base Traffic Flows AM Peak hour 0800 – 0900	0.142	0	0.346	1	0.000	0	0.000	0	0.062	0
2018 Base Traffic Flows PM Peak hour 1700 – 1800	0.159	0	0.770	3	0.000	0	0.000	0	0.085	0
2018 Base + Proposed Development Traffic Flows AM Peak hour 0800 – 0900	0.217	0	0.508	1	0.000	0	0.000	0	0.070	0
2018 Base + Proposed Development Traffic Flows PM Peak hour 1700 – 1800	1.084	*	1.071	*	0.000	0	0.000	0	0.124	0

NOTES:

- A - Palmers Hill (B1393)
- B - Stonards Hill
- C - High Street (B1393)
- D - Lindsey Street (link road) – closed to traffic in this analysis
- RFC - Ratio of flow to Capacity
- Q - Number of Vehicles
- * - Q values become unreliable when RFC values exceed 1

APPENDIX J

STONARDS HILL / PALMERS HILL / HIGH STREET JUNCTION IMPROVEMENTS



- KEY**
- PROPOSED LAYOUT
 - PROPOSED FOOTWAY
 - HIGHWAY BOUNDARY

PRELIMINARY

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

Client
CROUDACE STRATEGIC

Project
STONARDS HILL, EPPING

Title
**B1393 PALMERS HILL / STONARDS HILL
POSSIBLE JUNCTION ARRANGEMENT**

Drawn **DAVID HOWSON** Checked **GJK**

Scale **1:500 @ A3** Date **AUG 2013**

Drawing No. **1303/10**

APPENDIX K

PICADY ANALYSIS – PALMERS HILL JUNCTION PROPOSED LAYOUT (2013 + DEVELOPMENT SCENARIO)

STONARDS HILL, EPPING

(WIDENING TO STONARDS HILL, CLOSURE OF LINDSEY STREET LINK ROAD AND WIDENING SOUTHERN SIDE OF B1393)

HIGH STREET (B1393) / LINDSEY STREET / PALMERS HILL (B1393) / STONARDS HILL – PICADY

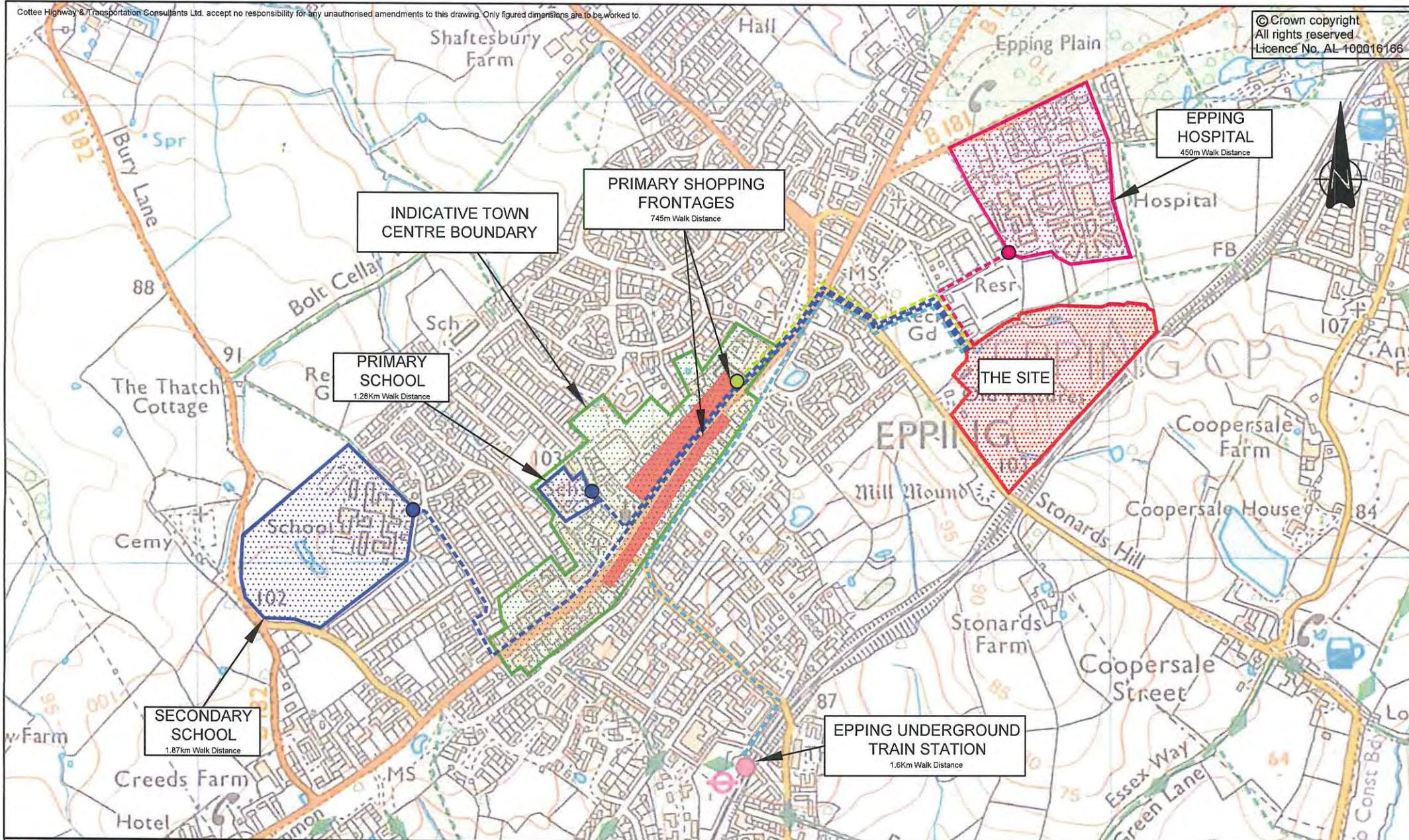
	B-CD		B-AD		A-D		D-ABC		C-B	
	RFC	Q								
2013 Base + Proposed Development Traffic Flows AM Peak hour 0800 – 0900	0.196	0	0.426	1	0.000	0	0.000	0	0.065	0
2013 Base + Proposed Development Traffic Flows PM Peak hour 1700 – 1800	0.215	0	0.801	3	0.000	0	0.000	0	0.116	0

NOTES:

- A - Palmers Hill (B1393)
- B - Stonards Hill
- C - High Street (B1393)
- D - Lindsey Street (link road) – closed to traffic in this analysis
- RFC - Ratio of flow to Capacity
- Q - Number of Vehicles
- * - Q values become unreliable when RFC values exceed 1

APPENDIX L

PEDESTRIAN / CYCLE CONNECTIONS



Drawn DEH	Checked GJK
Scale NTS	Date JUNE 2013
Drawing No. 1303/8	

Project
**CROUDACE STRATEGIC
STONARDS HILL, EPPING
PEDESTRIAN / CYCLE
CONNECTIONS**

COTTEE Transport Planning

Fir Lodge
Threshelfords Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk