

## APPENDIX A

## DRAWINGS







## NOTES

	Rcv	Date	Nature of Revision
.	01/05/2014	FIRST ISSUE	



**CORMAC SOLUTIONS**

SCORNER  
CORNWALL TR16 5EH  
www.cornwall.gov.uk/cornnac 01872 333313

Year	Number of cases
1990	10
1991	15
1992	20
1993	25
1994	30
1995	35
1996	40
1997	45
1998	50
1999	55
2000	60
2001	65
2002	70
2003	75
2004	80
2005	85
2006	90
2007	95
2008	100
2009	105
2010	110
2011	115
2012	120
2013	125
2014	130
2015	135
2016	140
2017	145
2018	150
2019	155
2020	160
2021	165
2022	170
2023	175
2024	180
2025	185
2026	190
2027	195
2028	200
2029	205
2030	210

2

### the Peninsular

### Peninsulat Traffic Management

DRAWING TITLE

### Antony Junction Profile Option 1 and 2

PROJECT MANAGER CS

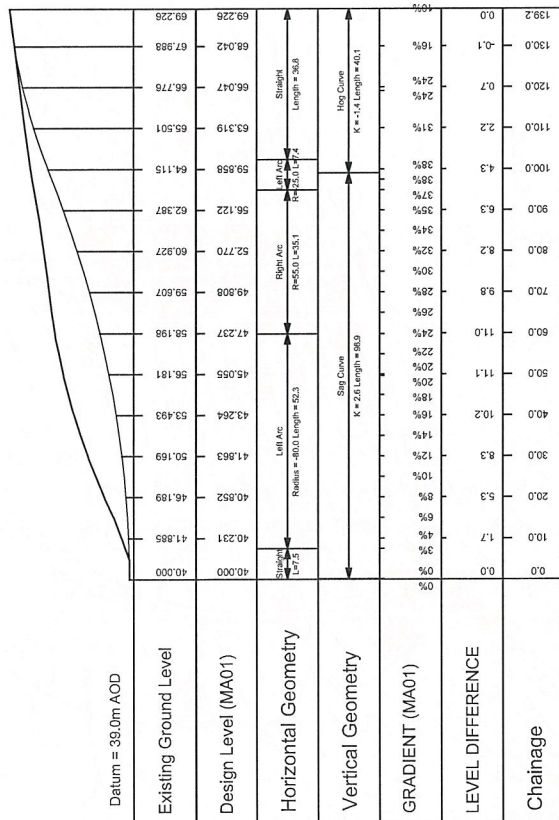
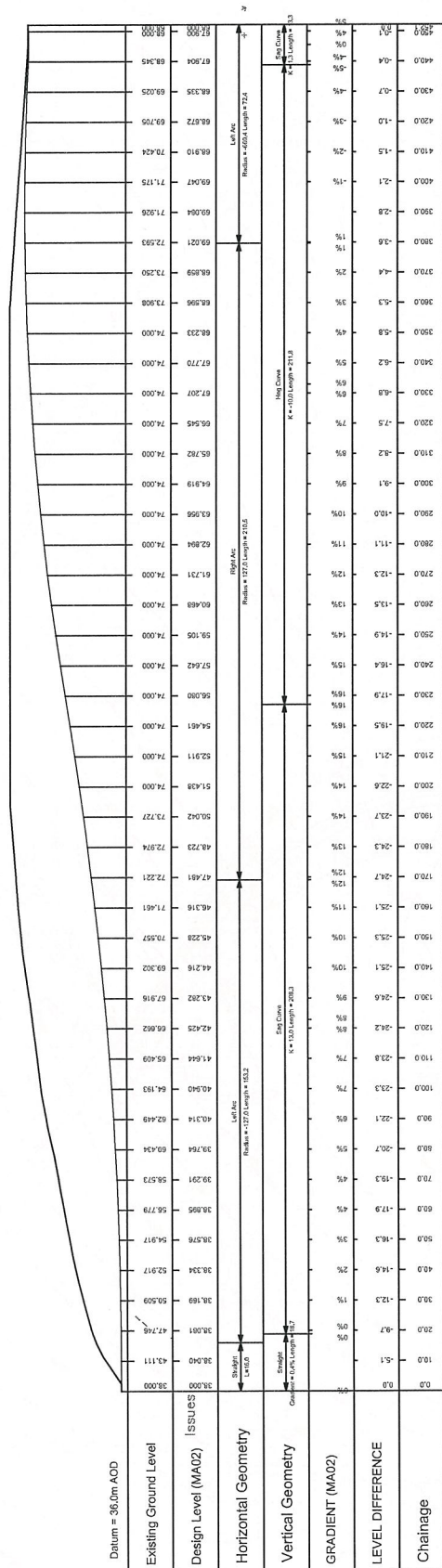
DATE	10/10/2010
------	------------

1.0250

---

DRAWING NO.

DRAWING NO.



© Crown copyright and database rights 2014 Ordnance Survey 100049047.



© This drawing is Copyright. It should not be relied on or used in circumstances other than those for which it was originally prepared. It is the responsibility of the user to ensure that this drawing is used in accordance with the terms of the licence for its use. The user acknowledges that the Council is not responsible for any loss or damage, whether in whole or in part, arising from the use of this drawing by any party other than the person(s) to whom it was commissioned.

NOTES

REV	DATE	REVISION
1	01/03/2014	PREP ISSUE
2		NATURE OF REVISION
3		REVISION
4		
5		
6		
7		
8		
9		
10		



**CORMAC SOLUTIONS**  
ROADWORKS  
CORNWALL LTD 1511 594  
www.cormac.gov.uk/home  
01872 323133

LOCATION  
Rame Peninsula  
PROJECT  
Rame Peninsula Traffic Management

DRAWING TITLE  
Rame Peninsula Layout  
Proposed Circular System

PROJECT MANAGER	CS
DRAWN BY	TEH
CHECKED BY	APPROVED CS
SCALE	N.T.S

DRAWING NO  
E0000055\_04  
REVISION  
-



**LEGEND:**

Quiet Lanes

Circular System for HGV's / Coaches

© Crown copyright and database rights 2014. Ordnance Survey 100049047.













REV	DATE	NATURE OF REVISION	REVISIONS
-	01/05/2014	FIRST ISSUE	



**CORMAC SOLUTIONS**  
RADNOR ROAD  
SCORRIER  
CORNWALL TR16 5EH  
www.cornwall.gov.uk/cormac  
01672 323313

Rame Peninsular

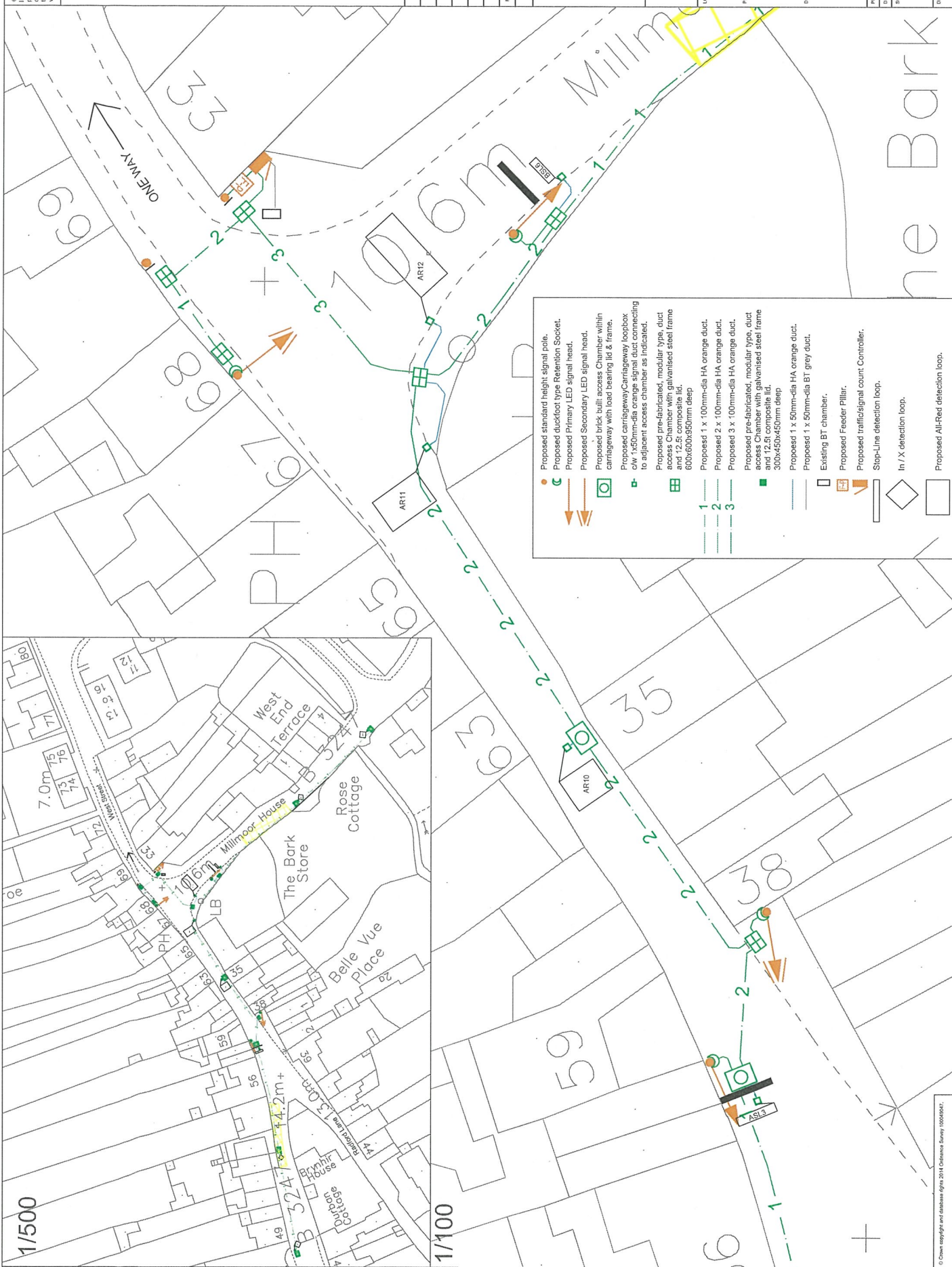
PROJECT  
Rame Peninsular Traffic Management

# RAWING TITLE

PROJECT MANAGER		C5
DRAWN BY: AW	CHECKED: SL	APPROVED: SL

SCALE  
As Shown

SCALE @ A1	
DRAWING NO	EDG0205 F 8
REVISION	





© This drawing is Copyright. It should not be relied on or used in any way without the prior written consent of the author. The author is not responsible for any errors or omissions. Cornwall Council accepts no responsibility for any errors or omissions. The author is not responsible for any errors or omissions. The author is not responsible for any errors or omissions.

SCALE

REV	DATE	NATURE OF REVISION
1	01/05/2014	FIRST ISSUE
2		
3		
4		
5		
6		
7		
8		
9		
10		



**CORMAC SOLUTIONS**  
RAJINDER ROAD  
TRURO  
CORNWALL TR9 7EN  
01872 333153  
www.cormac.co.uk

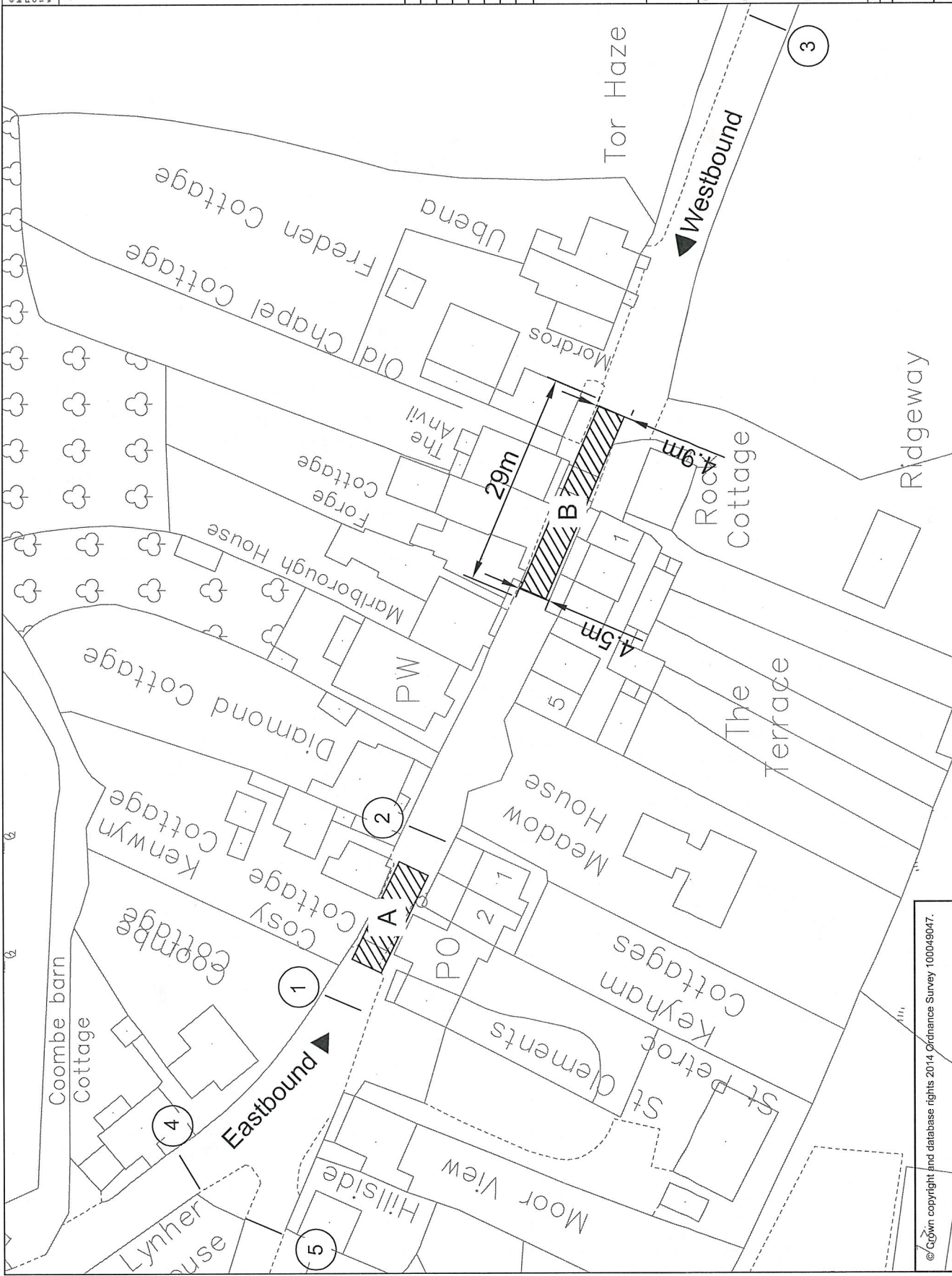
LOCATION  
Rame Peninsula

PROJECT  
Rame Peninsula Traffic Management

DRAWING TITLE  
Crashhole Traffic Lights

PROJECT MANAGER	CS
DRAWN BY	AW
CHECKED	SL
APPROVED	SL
SCALE	NTS

DRAWING NO	EDG0205_00
SCALE	1:1
REVISION	



© Crown copyright and database rights 2014 Ordnance Survey 100049047.

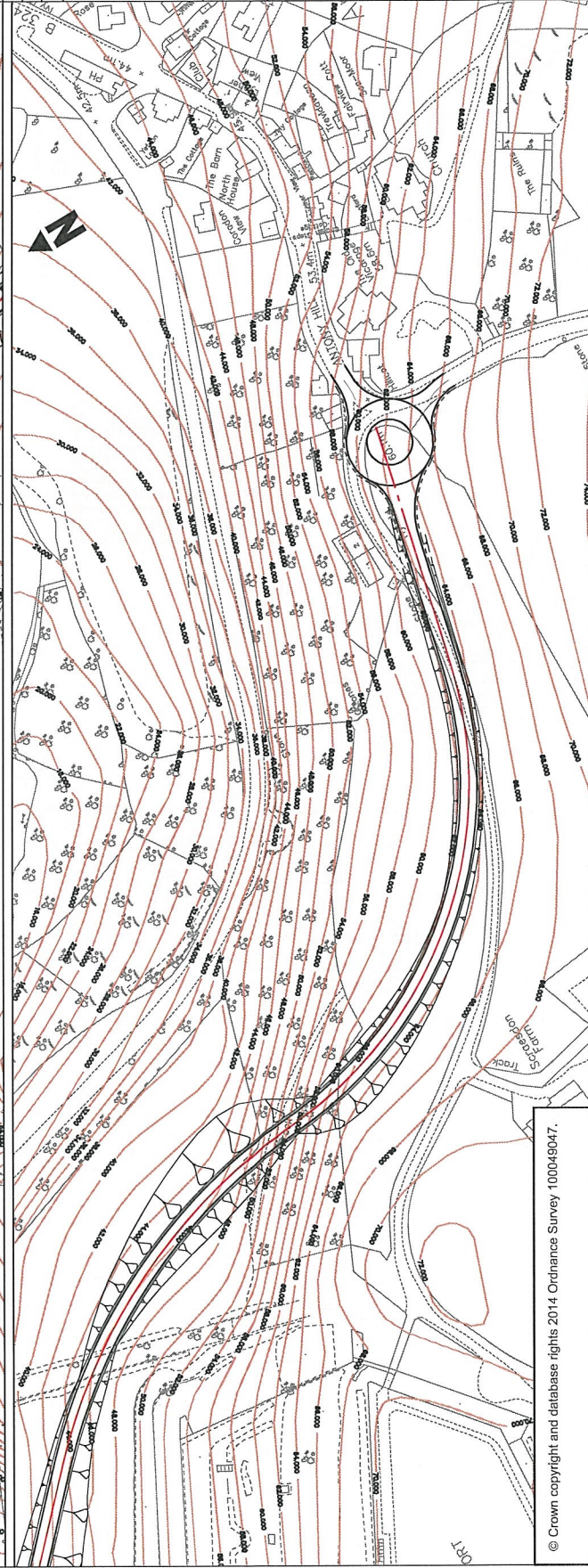
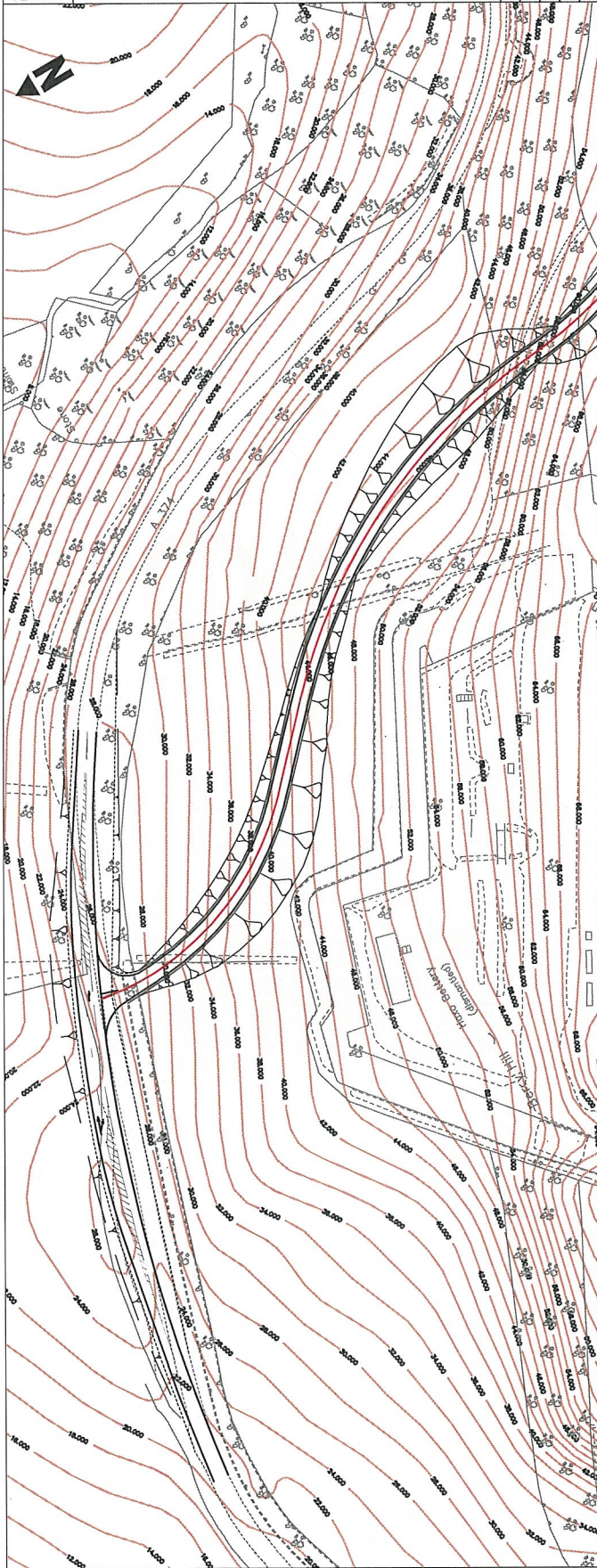






© This drawing is Copyright. It should not be relied on or used in any way for any purpose other than that for which it was prepared and for which Cornwall Council was originally commissioned. Cornwall Council accepts no responsibility for any loss or damage caused by its use or for any errors or omissions. Cornwall Council shall not be liable for any loss or damage caused by its use or for any errors or omissions.

1000049047



**CORMAC SOLUTIONS**

RAJANOR ROAD  
BODMIN  
CORNWALL PL24 1JH

www.cormac-solutions.co.uk

01872 233113

LOCATION

Rame Peninsula

PROJECT

Rame Peninsula Traffic Management

DRAWING TITLE

Antony Junction Plan

New Junction

Option 3

PROJECT MANAGER

CS

CHECKER

RFJ

APPROVED

CS

DRAWN BY

CS

SCALE

1:2000

SCALE @ A3

REVISION

ED0505\_F\_12

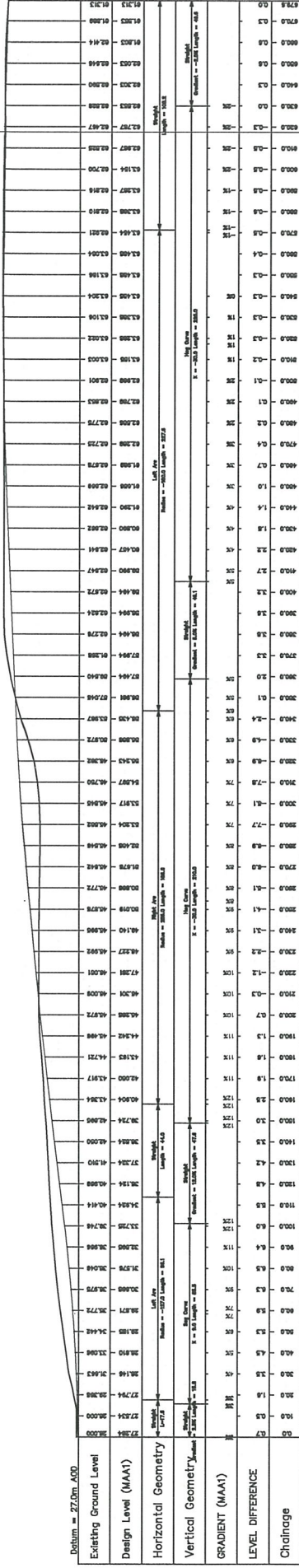
DRAWING NO

© Crown copyright and database rights 2014 Ordnance Survey 100049047.



© This drawing is Copyright. It should not be relied on or used in circumstances other than those for which it was originally prepared and it is the responsibility of the user to ensure that this drawing is used for the purpose for which it was prepared and for this drawing to any party other than the person(s) by whom it was commissioned.

NOTES



REV	DATE	NATURE OF REVISION
1	01/06/2014	FIRST ISSUE
TECHNIQUES		



CORMAC SOLUTIONS

RUGG ROAD  
CORNWALL TR15 5EH  
www.cormac.co.uk  
01922 233113

LOCATION

Rame Peninsula

PROJECT

Rame Peninsula Traffic Management

DRAWING TITLE

Antony Junction Profile  
New Junction  
Option 3

PROJECT MANAGER

CS

CHECKED

APPROVED

CS

SCALE

1:2000

SCALES @ A3

REVISION

EDWARDS\_13

© This drawing is Copyright. It should not be relied on or used in any way without the prior written consent of the author. The author is not responsible for any errors or omissions in this drawing. Cornwall Council accepts no responsibility for any errors or omissions in this drawing. It was commissioned.

NOTES

REV	DATE	NATURE OF REVISION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		



**CORMAC SOLUTIONS**  
RAUNER ROAD  
CORNWALL TR18 2EH  
01872 33313

PROJECT  
Rame Peninsula

PROJECT  
Rame Peninsula Traffic Management

DRAWING TITLE

Anthony Junction  
Junction Improvement Widening of Existing  
Primary Junction Option 4

PROJECT MANAGER

DRAWN BY: CC

CHECKED: CC

APPROVED: CS

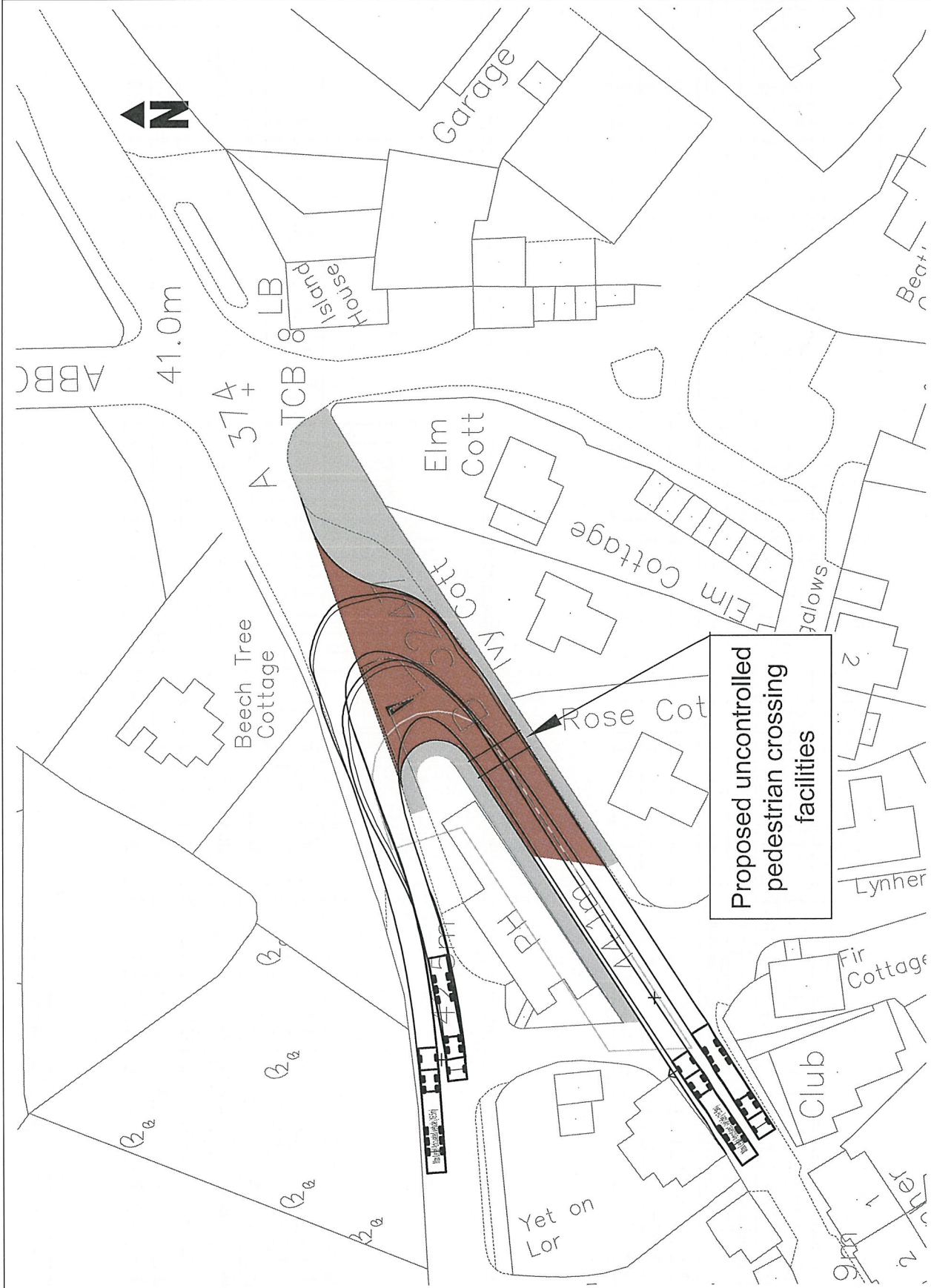
SCALE

1:500 @ A3

DRAWING NO

EDG025F614

© Crown copyright and database rights 2014 Ordnance Survey 100049047.



## NOTES

[illegible]

CORMAC SOLUTIONS

RADNOR ROAD  
SCORNIER  
CORNWALL TR16 5EH

continued from p. 10

01825 333333

100

Rame Peninsular

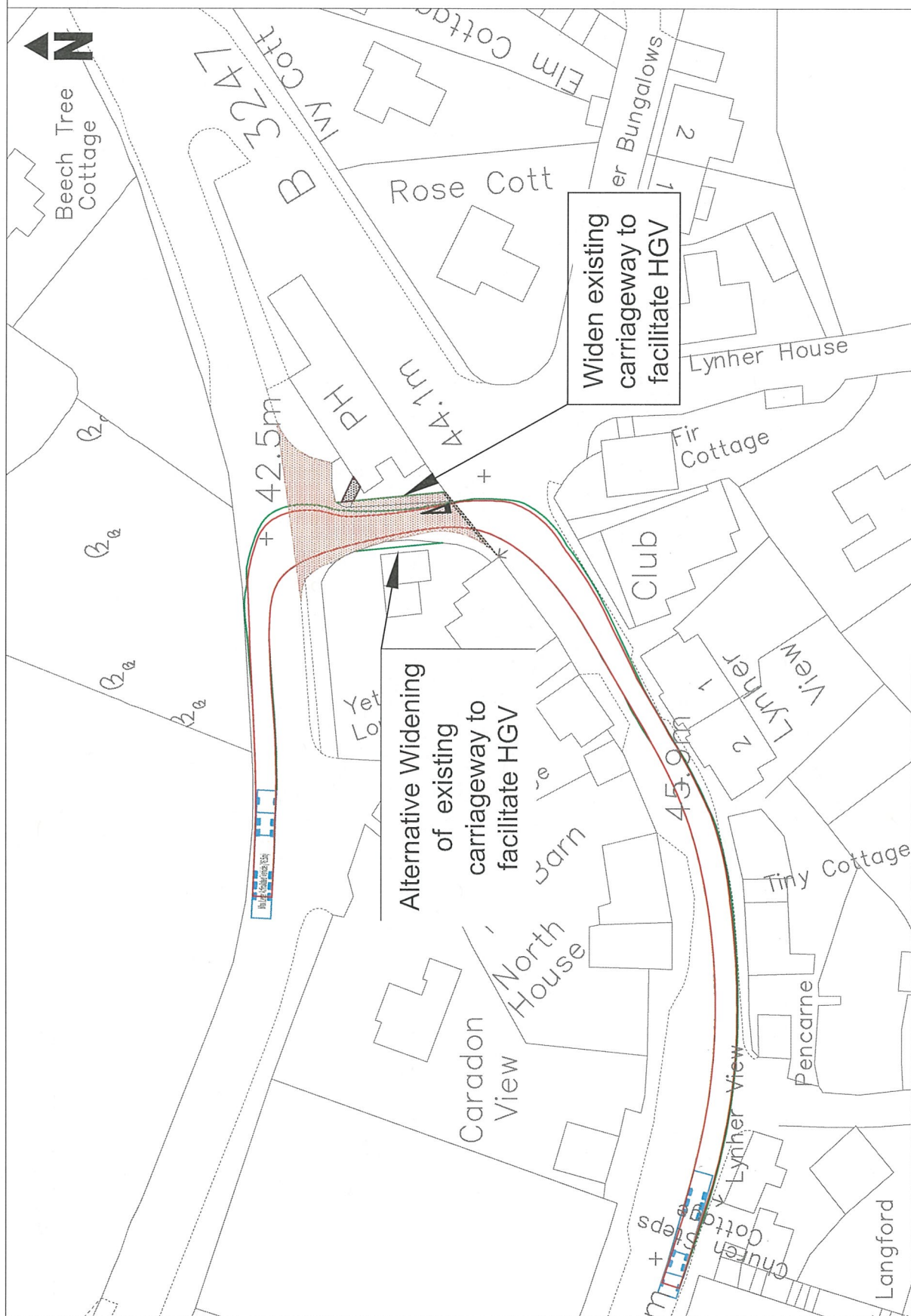
Source

Rame Peninsular Traffic anagement

© 2000 Blackwell Science Ltd

Anthony Junction  
Proposed Right Turn Facility  
Option 5

PROJECT MANAGER	CHECKED: CC	APPROVED: CS
DRAWING NO EDG02056F015		
SCALE 1:500 @ A3		
DRAWING NO EDG02056F015		
REVISION *		
SCALE @ A3		



© Crown copyright and database rights 2014 Ordnance Survey 100049047.



## NOTES

REV	DATE	NATURE OF REVISION	REVISIONS
*	01/05/2014	FIRST ISSUE	



**CORMAC SOLUTIONS**

**RADNOR ROAD  
SCORRER  
CORNWALL TR16 5EH**  
[www.cornwall.gov.uk/downloads](http://www.cornwall.gov.uk/downloads) 01872 323313

LOCATION	Rame Peninsular

PROJECT

## Rame Peninsular Traffic Management

DRAWING TITLE

Anthony Junction  
Proposed Segregated Right Turn Facility  
Option 6

PROJECT MANAGER	CS
-----------------	----

DRAWN BY: CC	CHECKED: RFJ	APPROVED: CS
--------------	--------------	--------------

SCALE @ A3	REVISION
DRAWING NO	-
EDG0205/F016	



© Crown copyright and database rights 2014 Ordnance Survey 100049047.

© This drawing is Copyright. It should not be relied on or used in circumstances other than those for which it was originally prepared. Cornwall Council accepts no responsibility for this drawing to any party other than the person(s) by whom it was commissioned.

#### NOTES

Master key	
	Proposed sign
	Proposed post
	Existing sign
	Existing post
	Existing white line
	Existing kerb
	Existing dropped kerb

REV	DATE	NATURE OF REVISION
1	04/05/2014	FIRST ISSUE
REVISIONS		



#### CORMAC SOLUTIONS

RAISING AND  
SIGNING  
CORNWALL TR16 5EH  
www.cornwall.gov.uk/cormac  
01872 32313

LOCATION  
RAME PENINSULA

PROJECT  
VOLUNTARY ONE-WAY FOR  
COACHES AND HGVs

DRAWING TITLE

#### PROPOSED SIGN LOCATIONS

PROJECT MANAGER	C. Sainsbury
DRAWN BY	N. Preece
CHECKED	REFJ
APPROVED	CC
SCALE	N.T.S

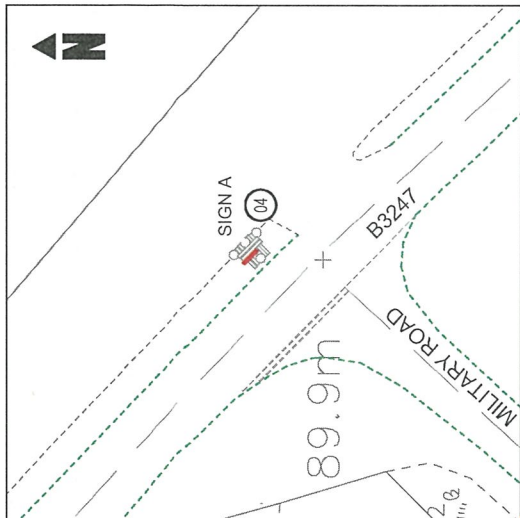
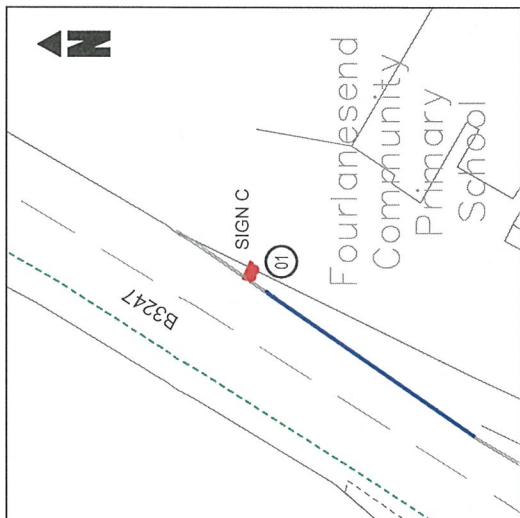
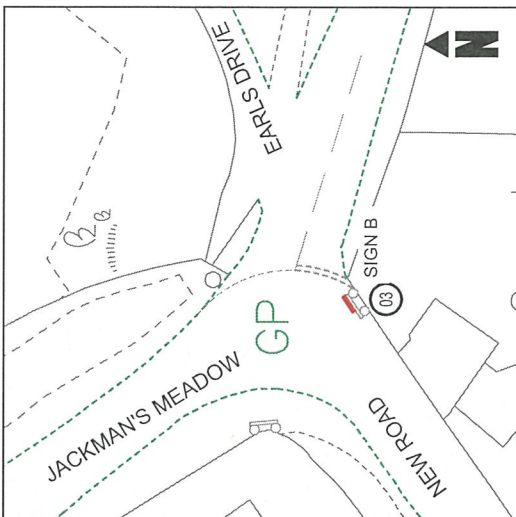
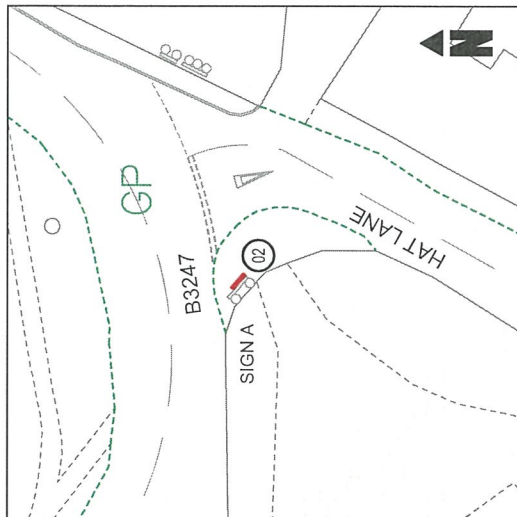
DRAWING NO	ED00005_F_17
SCALE	@ A1
REVISION	



SIGN B



SIGN C



SIGN LOCATION PLAN  
(VOLUNTARY ONE-WAY SYSTEM  
INDICATED)



© This drawing is Copyright. It should not be relied on or used in any way for any purpose other than that for which it was prepared and for which Cornwall Council was originally commissioned. Cornwall Council accepts no responsibility for any loss or damage, whether direct or indirect, arising from any use of this drawing other than that for which it was commissioned.

11/200

REV	DATE	NATURE OF REVISION
1	01/05/2014	FIRST ISSUE
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		



**CORMAC SOLUTIONS**

PLANNING  
CORNWALL TRIS 2011  
01473 333113

LOCATION

Rame Peninsula

PROJECT

Rame Peninsula Traffic Management

DRAWING TITLE

Antony Junction Roundabout Option 7

PROJECT MANAGER

CS

CHECKED

APPROVED

CS

SCALE

1:1250

SCALE @ A3

REVISION

EDG005\_F\_18

© Crown copyright and database rights 2014 Ordnance Survey 100049047.

11/200

11/200

11/200

11/200

11/200

11/200

11/200

11/200

11/200

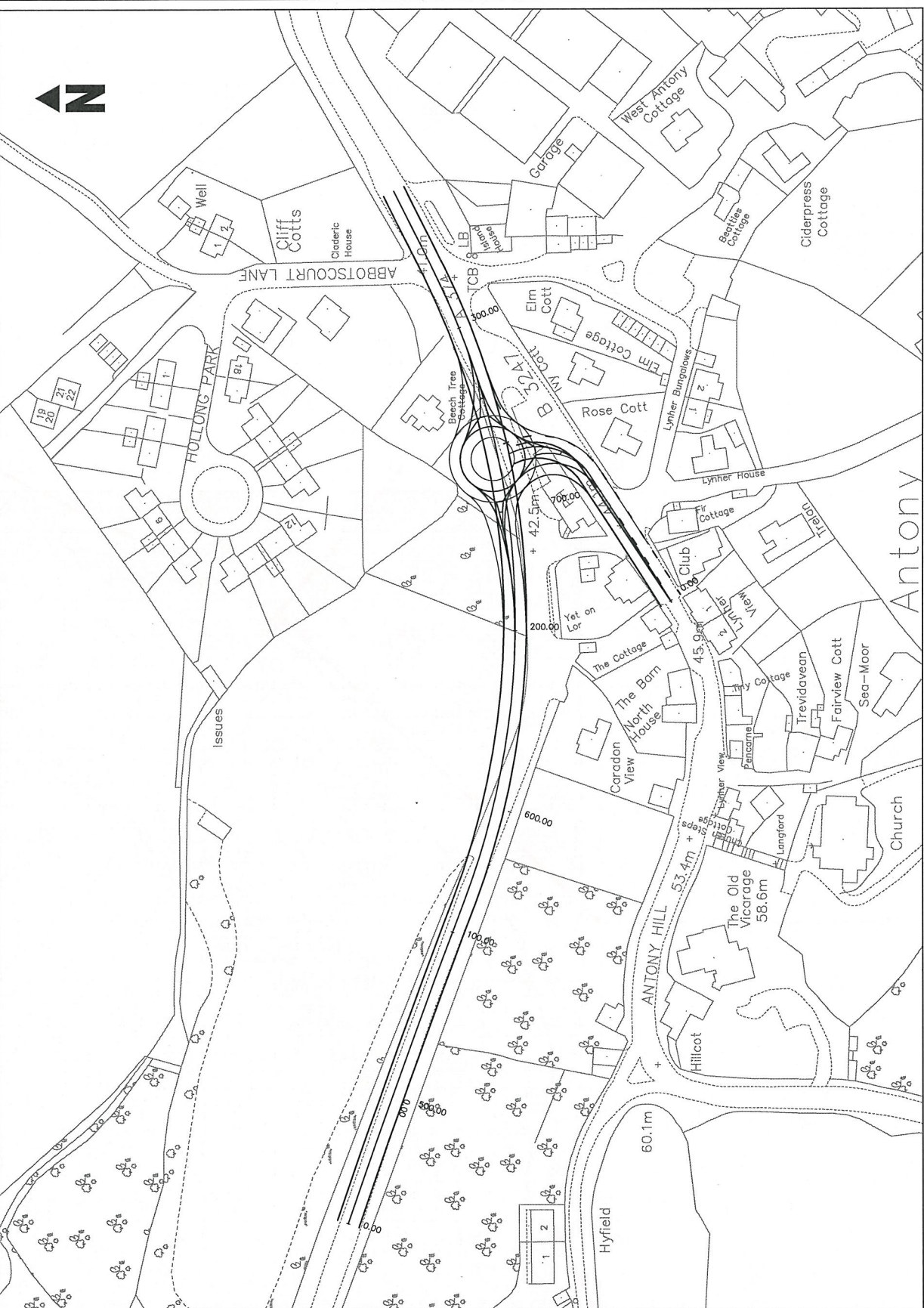
11/200

11/200

11/200

11/200

11/200







© This drawing is Copyright. It should not be relied on or used in circumstances other than those for which it was originally prepared and for which Cornwall Council was originally prepared. No liability is accepted by Cornwall Council for this drawing to any party other than the person(s) by whom it was commissioned.

12345

REV	DATE	NATURE OF REVISION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



**CORMAC SOLUTIONS**  
RADFORD ROAD  
BODMIN  
CORNWALL PL20 1PH  
www.cormac.gov.uk/home  
01872 332313

**LOCATION**  
Rame Peninsular

**PROJECT**  
Rame Peninsular Traffic Management

**DRAWING TITLE**  
AutoTrack West Signal

PROJECT MANAGER	AS
DRAWN BY	DR
CHECKED	APPROVED
SCALE	NTS

DRAWING NO  
ED02095\_L\_20

SCALE @ A1  
REVISION

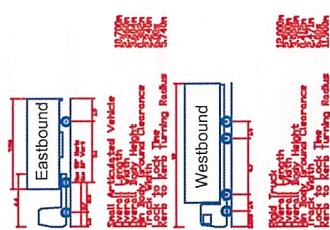








NOTES

[illegible]

**CORMAC SOLUTIONS**

RADNOR ROAD  
SCORRIER  
CORNWALL TR16 5EH

CONTINUED FROM PAGE 13

CONTINUED FROM PAGE 13

RAME PENINSULA

RAME PENINSULA

PROJECT

Rame Peninsula Traffic Management

DRAWING TITLE

### Millbrook Autotrack Runs

AND WAY MANAGED      A Publisher

PROJECT MANAGER	C. GENTILE
1. 2011-2012	2011-2012
2. 2013-2014	2013-2014
3. 2015-2016	2015-2016
4. 2017-2018	2017-2018
5. 2019-2020	2019-2020
6. 2021-2022	2021-2022
7. 2023-2024	2023-2024
8. 2025-2026	2025-2026
9. 2027-2028	2027-2028
10. 2029-2030	2029-2030
11. 2031-2032	2031-2032
12. 2033-2034	2033-2034
13. 2035-2036	2035-2036
14. 2037-2038	2037-2038
15. 2039-2040	2039-2040
16. 2041-2042	2041-2042
17. 2043-2044	2043-2044
18. 2045-2046	2045-2046
19. 2047-2048	2047-2048
20. 2049-2050	2049-2050
21. 2051-2052	2051-2052
22. 2053-2054	2053-2054
23. 2055-2056	2055-2056
24. 2057-2058	2057-2058
25. 2059-2060	2059-2060
26. 2061-2062	2061-2062
27. 2063-2064	2063-2064
28. 2065-2066	2065-2066
29. 2067-2068	2067-2068
30. 2069-2070	2069-2070
31. 2071-2072	2071-2072
32. 2073-2074	2073-2074
33. 2075-2076	2075-2076
34. 2077-2078	2077-2078
35. 2079-2080	2079-2080
36. 2081-2082	2081-2082
37. 2083-2084	2083-2084
38. 2085-2086	2085-2086
39. 2087-2088	2087-2088
40. 2089-2090	2089-2090
41. 2091-2092	2091-2092
42. 2093-2094	2093-2094
43. 2095-2096	2095-2096
44. 2097-2098	2097-2098
45. 2099-2100	2099-2100
46. 2101-2102	2101-2102
47. 2103-2104	2103-2104
48. 2105-2106	2105-2106
49. 2107-2108	2107-2108
50. 2109-2110	2109-2110
51. 2111-2112	2111-2112
52. 2113-2114	2113-2114
53. 2115-2116	2115-2116
54. 2117-2118	2117-2118
55. 2119-2120	2119-2120
56. 2121-2122	2121-2122
57. 2123-2124	2123-2124
58. 2125-2126	2125-2126
59. 2127-2128	2127-2128
60. 2129-2130	2129-2130
61. 2131-2132	2131-2132
62. 2133-2134	2133-2134
63. 2135-2136	2135-2136
64. 2137-2138	2137-2138
65. 2139-2140	2139-2140
66. 2141-2142	2141-2142
67. 2143-2144	2143-2144
68. 2145-2146	2145-2146
69. 2147-2148	2147-2148
70. 2149-2150	2149-2150
71. 2151-2152	2151-2152
72. 2153-2154	2153-2154
73. 2155-2156	2155-2156
74. 2157-2158	2157-2158
75. 2159-2160	2159-2160
76. 2161-2162	2161-2162
77. 2163-2164	2163-2164
78. 2165-2166	2165-2166
79. 2167-2168	2167-2168
80. 2169-2170	2169-2170
81. 2171-2172	2171-2172
82. 2173-2174	2173-2174
83. 2175-2176	2175-2176
84. 2177-2178	2177-2178
85. 2179-2180	2179-2180
86. 2181-2182	2181-2182
87. 2183-2184	2183-2184
88. 2185-2186	2185-2186
89. 2187-2188	2187-2188
90. 2189-2190	2189-2190
91. 2191-2192	2191-2192
92. 2193-2194	2193-2194
93. 2195-2196	2195-2196
94. 2197-2198	2197-2198
95. 2199-2200	2199-2200
96. 2201-2202	2201-2202
97. 2203-2204	2203-2204
98. 2205-2206	2205-2206
99. 2207-2208	2207-2208

DRAWN BY: RFJ	CHECKED: RFJ	APPROVED: CO
---------------	--------------	--------------

SCALE  
1 2 3 4 5

NLS

SCALE 1

Chapter	City
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

DRAWING NO. EDC0205 E 23  
REVISION

**EZ-10000**

Dodbrook



## APPENDIX B

### G0205/F2 Millbrook Traffic Sign Assessment

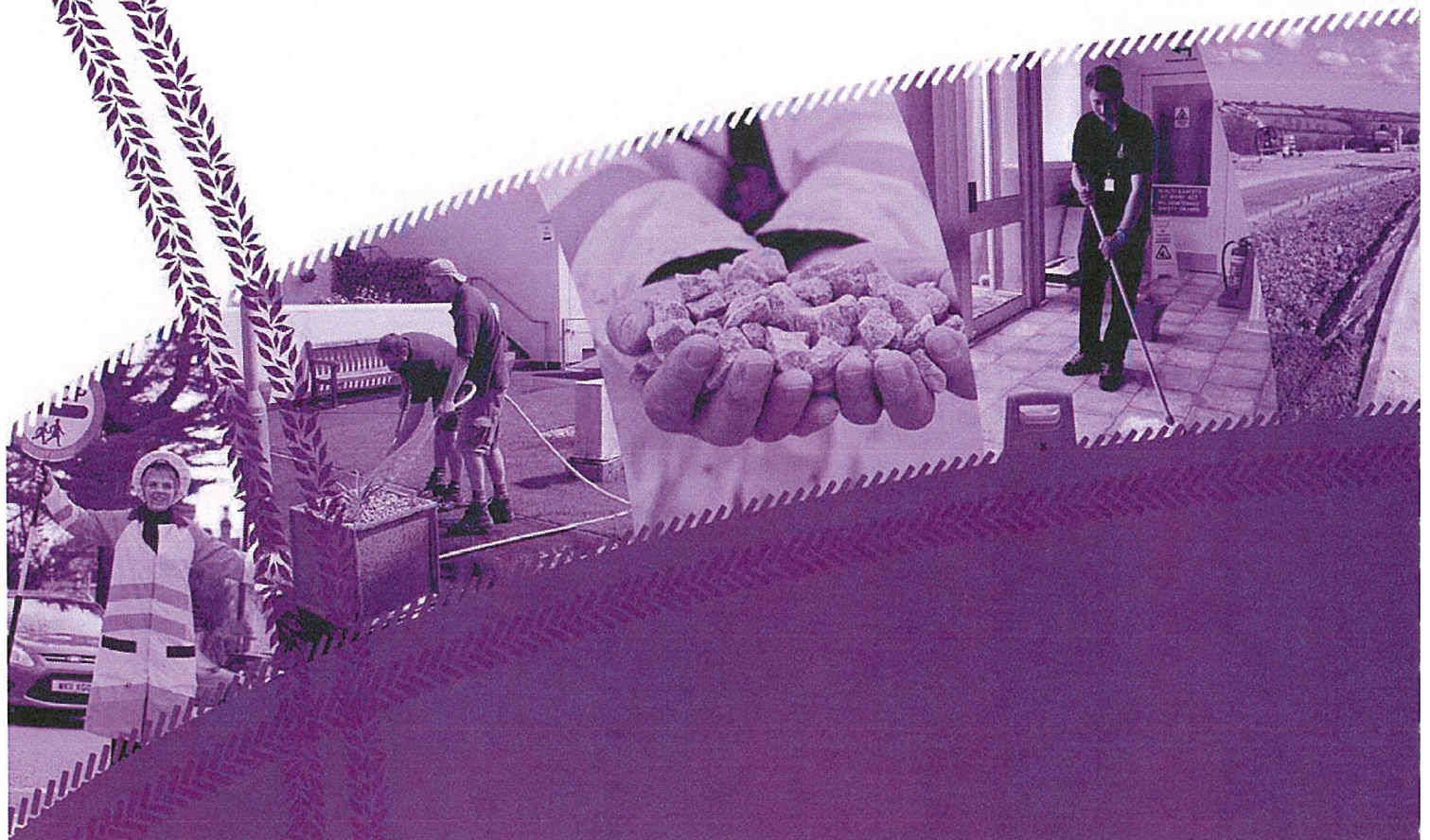




## Millbrook Traffic Signal Assessment

EDG0205-F2  
Revision No. 01  
Date: 23/07/2014

CORMAC Consultancy  
CORMAC Western Region,  
Radnor Road, Scorrier, Redruth, Cornwall, TR16 5EH.







# Millbrook Traffic Signal Assessment

Issue & Revision Record						
Revision	Date	Originator	Checked	Authorised	Purpose of Issue	Nature of Change
01	13/12/13	AS	AC	AJA	Final	Original



Prepared by  
**Engineering Design Group**

If you would like this report in another format, please contact

## **CORMAC Solutions Ltd**

Head Office  
Castle Canyke Road  
Bodmin  
Cornwall  
PL31 1DZ

**Tel: 01872 323 313**

**Email: [customerrelations@cormacltd.co.uk](mailto:customerrelations@cormacltd.co.uk)**  
**[www.cornwall.gov.uk/cormac](http://www.cornwall.gov.uk/cormac)**

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Cormac Solutions Ltd being obtained. Cormac Solutions Ltd accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person using or relying on the document for such other purposes agrees, and will by such use or reliance be taken to confirm his agreement to indemnify Cormac Solutions Ltd for all loss or damage resulting therefrom. Cormac Solutions Ltd accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned.

## **CORMAC Solutions Ltd**

Head Office, Castle Canyke Road, Bodmin, Cornwall, PL31 1DZ

## **EXECUTIVE SUMMARY**

This report examines the workability of two traffic signal options proposed for Millbrook in South East Cornwall. This involves a two stage and a three stage design. Existing constraints on the network are outlined. This includes geometry and the composition of existing traffic flows. The presence of larger vehicles is identified as an issue particularly in relation to observations made on site.

For the purposes of assessment historic traffic data is reviewed and a base model is developed to cover both neutral and summer periods at Millbrook. The model results show little cause for concern in relation to proposed traffic signals when the averaged queuing results are considered from the model. However a variety of caveats are identified in relation to the proposed signals that would influence the workability of the signals in reality. These include careful consideration of the ability of proposed signals to cope with larger vehicles, impact on driver behaviour and pollution generation.

## **CONTENTS**

- 1 INTRODUCTION**
  - 1.1 Overview**
  - 1.2 Report Structure**
- 2 CURRENT ISSUES**
  - 2.1 Study Area**
- 3 DO – SOMETHING SCENARIOS**
  - 3.2 Traffic Signal Option**
  - 3.3 Voluntary One – Way Option**
- 4 ANALYSIS OF OPTIONS**
  - 4.1 Test Data**
  - 4.2 Test Periods**
  - 4.3 Saturation Flows**
- 5 MODEL RESULTS**
- 6 CONCLUSION**
  - 6.2 Recommendations and Further Work**

# **1 INTRODUCTION**

## **1.1 Overview**

1.1.1 This report examines the possibility of installing traffic signals in Millbrook. The need for this report was identified as part of a larger exercise examining traffic management across the Rame Peninsula in South East Cornwall.

1.1.2 The workability of two proposed traffic signal options are examined. The evaluation of these options is a recommendation of the Rame Peninsula Traffic Management Report.

## **1.2 Report Structure**

1.2.1 Following this introductory section, this report is set out in the following sections:

- Section 2 – Current Issues;
- Section 3 – Do – Something Scenarios;
- Section 4 – Method of Analysis;
- Section 5 – Model Results;
- Section 6 – Conclusions and Recommendations.



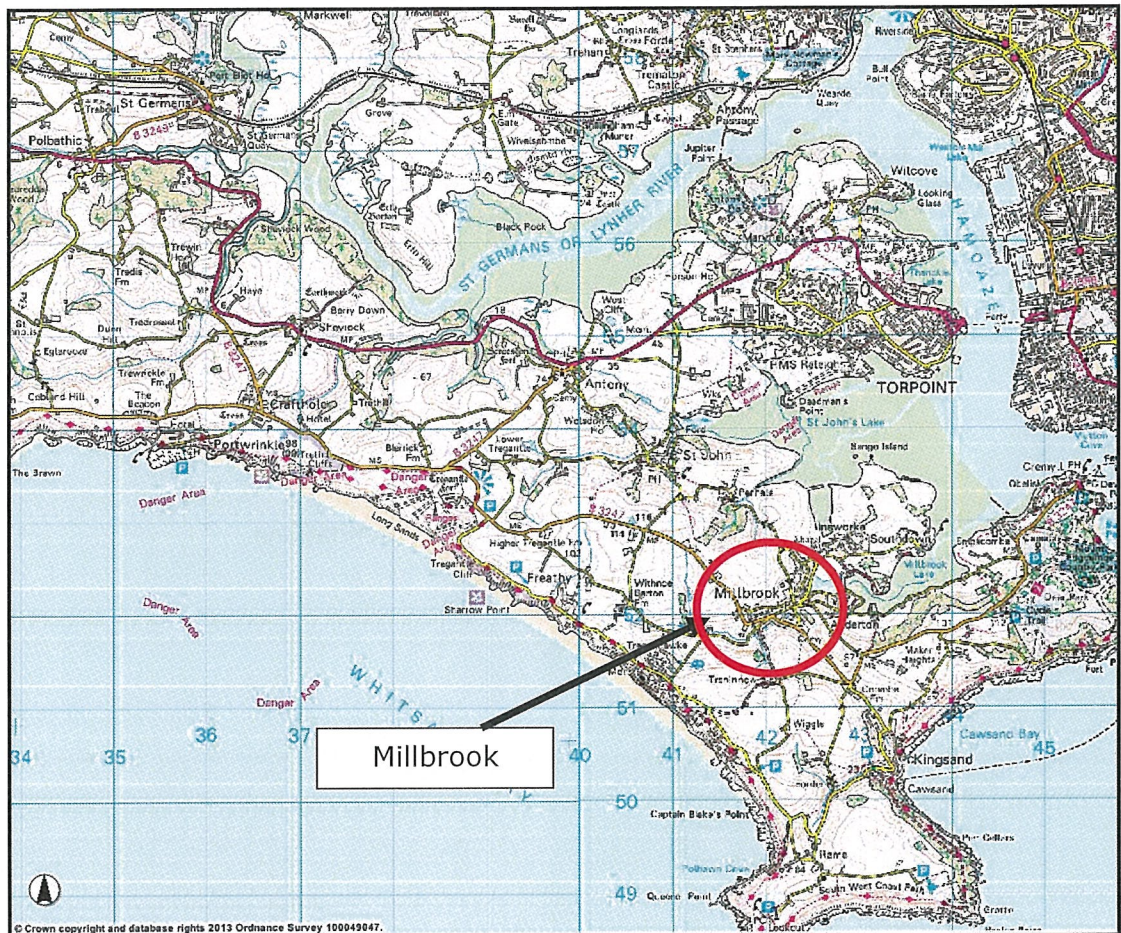
## 2

## CURRENT ISSUES

### 2.1 Study Area

2.1.1 Millbrook is a small settlement located centrally within the Rame Peninsula. The principle route to and from Millbrook is the B3247.

2.1.2 Figure 2.1 shows the study area within the Rame Peninsula



**Figure 2.1 Study Area**

2.1.3 In terms of layout the B3247 becomes windy and has a carriageway width of less than 5.5m within Millbrook. This route is difficult for HGV's and has several pinch points with properties accessing directly onto the road. At the bottom of the B3247 Hounster Hill approach to Millbrook a section of single lane road exists which ends in an acute right bend that blocks forward visibility in both directions. This is shown in **Appendix 1** Photos A4, A6, A7 and A8.

2.1.4 Driving out of the village there are further pinch points. **Appendix 1** contains site photographs which identify constraints on the network in Millbrook.

#### 2.1.5

The most acute restriction is a narrow 50m section which operates on a 'first come first served basis' and relies on driver courtesy. In the past white lining and coloured surfacing have been provided through the section to improve pedestrian safety and provide a virtual footway. A priority working system was previously trialled but was removed when it was found to have worsened the situation causing increased driver frustration. This was caused in part by skewing the willingness of drivers on the approaches to courtesy reverse, for example drivers with priority were refusing to reverse even though it involved a relatively short distance when they possibly may have been more willing to before the priority working was installed.

### **3 DO – SOMETHING SCENARIOS**

3.1.1 Two options have been suggested to address congestion on Hounster Hill on the approach in to Millbrook. These are:

- Traffic signals and possible changes to one way system and use of car park; and
- Voluntary One Way System for HGV's and Buses

#### **3.2 Traffic Signal Option**

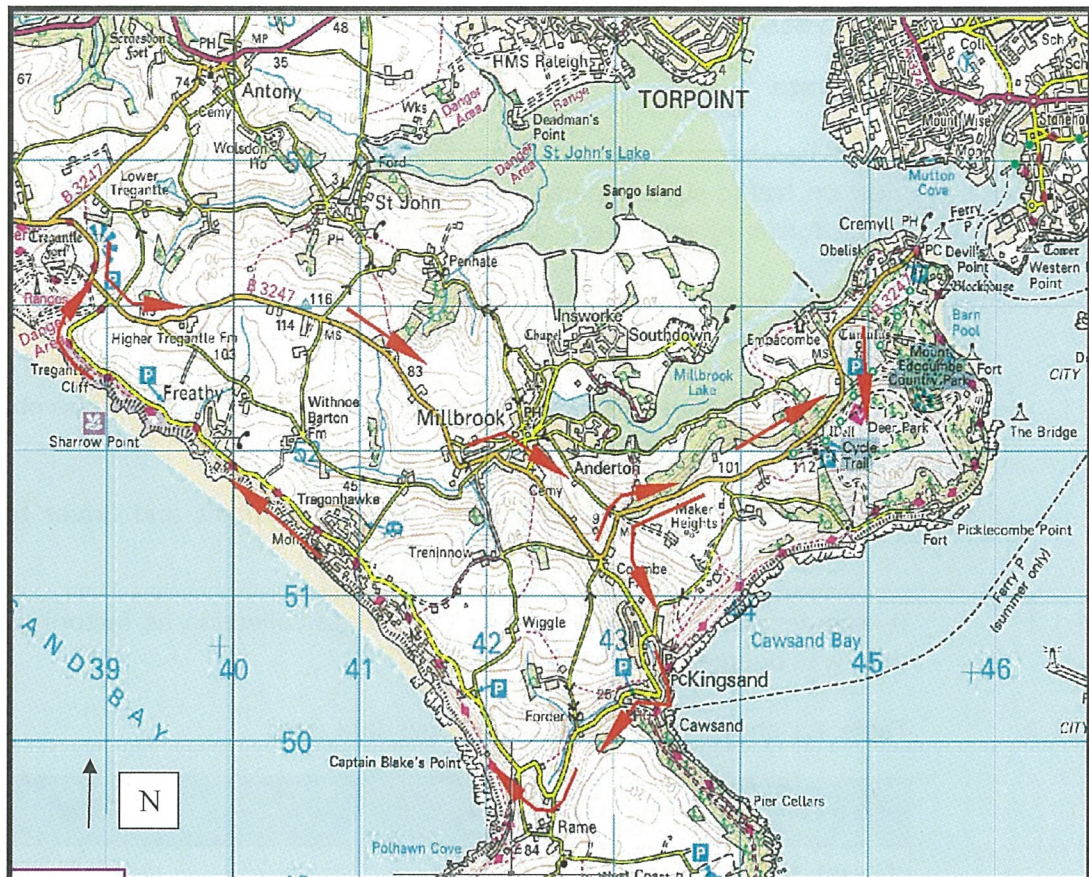
3.2.1 **Appendix 2** shows the proposal for a 2 way traffic signal system with a reversal of the one way system on West Street. **Appendix 3** shows the proposal for a 3 way traffic signal system; this is similar to existing directional traffic movement.

3.2.2 This report has been produced to provide a view regarding the workability of these specific scenarios.

#### **3.3 Voluntary One – Way Option**

3.3.1 The Rame Peninsular Traffic Management Report (authored by the Strategic Projects Team of the CORMAC Engineering Design Group) states that an alternative scheme that would potentially help address the issues of traffic problems in Millbrook would be a voluntary one-way system for HGV / Buses shown in **Figure 3.3**.





**Figure 3.3 Possible One Way HGV / Bus Route**

## 4 ANALYSIS OF OPTIONS

### 4.1 Test Data

A test has been requested covering an initial scenario only in order to provide a view on traffic signal operation in terms of congestion and delay and workability. Three forms of data were felt to be most appropriate for use in completing this test:-

- Historic Quantitative traffic flow data;
- Quantitative saturation flow data and queue lengths to be observed on site if possible; and
- Qualitative data relating to vehicle movement and driver behaviour from site visits.

4.1.1 It was decided to not proceed with raw data collection as factoring up of existing data was deemed to be acceptable.

4.1.2 Table 4.1 shows the historic traffic flow data used

Count	Date	Location
Count A	11/10/2001	<i>B3247 Tregantle Fort Junction</i>
Count B	30/08/2001	
Count C	18/04/2007	
Count D	22/08/2007	<i>West Street Millbrook</i>
Count E	10/06/2013	
Count F	22/08/2013	
Count G	7/10/1996	
Count H	21/06/2004	

**Table 4.1 Historic Data**

4.1.3 To form a base model it was necessary to establish 2014 neutral traffic flows. This was developed by applying traffic growth prediction factors to the 2006 West Street turning count. It was also necessary to develop a test of the model applicable to the higher levels of traffic experienced in the Summer holiday period.

4.1.4 Summer Test Model flows were developed by comparing data from June and August at the B3247 Tregantle Fort Junction. The percentage difference between these two counts is shown in Table 4.2

Hour Beginning	% Increase
07:00	-5
08:00	-11
09:00	19
10:00	41
11:00	70
12:00	53
13:00	72
14:00	50
15:00	43
16:00	59
17:00	53
18:00	68

**Table 4.2** Summer Increase Factor at B3247 Tregantle Fort Junction by hour

4.1.5 From Table 4.2 it can be seen that the influence of summer traffic is significant and therefore the need to test a summer scenario is justified.

## 4.2 Test Periods

4.2.1 The test model involved two periods

- Neutral Period Scenario
- Summer Factor Scenario

4.2.2 Testing covered the 3 stage traffic signal option only as the 2 stage operation with reversed flow on West Street would by its nature be more efficient. This is because less inter-green time would be lost through not having to start vehicles across three traffic movements.

4.2.3 LINSIG V3 was selected as the most appropriate package for testing the proposed signals. LINSIG requires classified vehicle flows to be broken down and reconstructed into Passenger Car Unit (PCU) flows however for the tests in this report PCU factors were not applied. This is because a proportionally large amount of work is required to create PCU flows which would be not have significant influence on the results in certain outcome situations like this.

4.2.4 Only the PM peak model was run as the movements on all approaches were higher in the 1600 peak than any other period including lunch and am peaks.

## 4.3 Saturation Flows

4.3.1 Saturation flows are required for the form of traffic signal modelling used in the report and due to lack of observable congestion it was not possible to record saturation flows during the site visits. Therefore three sensitivity test scenarios were completed

- 800 PCU's per lane per hour;



- 1200 PCU's per lane per hour; and
- 1700 PCU's per lane per hour

#### 4.3.2

It should be emphasised that the three levels of lane saturation range from what is considered to be realistic at 1200 – 1700 per hour down to 800 which would be unlikely to occur in reality, however form a useful check to inform decisions.

## 5

## MODEL RESULTS

5.1 The turning flows used in the traffic modelling are shown in Table 4.3

Turning Counts (Vehicles)		
Approach 1 = Hounster Hill		
Approach 2 = Crafhole		
Approach 3 = West Street		
<i>From Approach 1 to</i>	Model Time of Year	
	<b>Summer</b>	Neutral
2	<b>135</b>	85
3	<b>0</b>	0
<i>From Approach 2 to</i>		
3	<b>0</b>	0
1	<b>235</b>	148
<i>From Approach 3 to</i>		
1	<b>38</b>	24
2	<b>102</b>	64

**Table 4.3 Modelled Traffic Flows**

5.1.1 For a traffic signal controlled junction the critical performance indicators are the Degree of Saturation (DoS), which applies to individual approaches and the Practical Reserve Capacity (PRC), which applies to the junction as a whole. For a junction to be considered to be operating within capacity individual DoS's should not exceed 90% and the PRC should be positive. If the DoS exceeds 90% or the PRC becomes a negative number the junction is operating above capacity and significant queues and delays can form.

Millbrook Linsig 3 Model		Results		capacity	mean max queue	cycle time	PRC
Neutral PM	Right Turn down Hounster Hill	800	167	4.9	48	1.4	
	Left turn from Cremyl	800	133	1.9			
	West Street Ahead	800	150	3.8			
Results		capacity		mean max queue	cycle time	PRC	
Neutral PM	Right Turn down Hounster Hill	1200	275	2.3	48	67.2	
	Left turn from Cremyl	1200	200	1.4			
	West Street Ahead	1200	200	1.4			
Results		capacity		mean max queue	cycle time	PRC	
Neutral PM	Right Turn down Hounster Hill	1700	390	1.9	48	136.9	
	Left turn from Cremyl	1700	283	1.2			
	West Street Ahead	1700	283	1.3			
Results		capacity		mean max queue	cycle time	PRC	
Summer PM	Right Turn down Hounster Hill	800	183	31.8	48	-42.4	
	Left turn from Cremyl	800	133	8.1			
	West Street Ahead	800	133	9.8			
Results		capacity		mean max queue	cycle time	PRC	
Summer PM	Right Turn down Hounster Hill	1200	275	5.6	48	5.3	
	Left turn from Cremyl	1200	200	2.7			
	West Street Ahead	1200	200	2.9			
Results		capacity		mean max queue	cycle time	PRC	
Summer PM	Right Turn down Hounster Hill	1700	390	3.5	48	49.2	
	Left turn from Cremyl	1700	390	2.1			
	West Street Ahead	1700	390	2.2			

**Table 5.1 Summary of Model Results**

5.1.2

The table above shows that in the neutral PM peak queuing is minimal. During the Summer PM peak queues are increased. All of the above show Hounster Hill as the worst performing approach



## 6

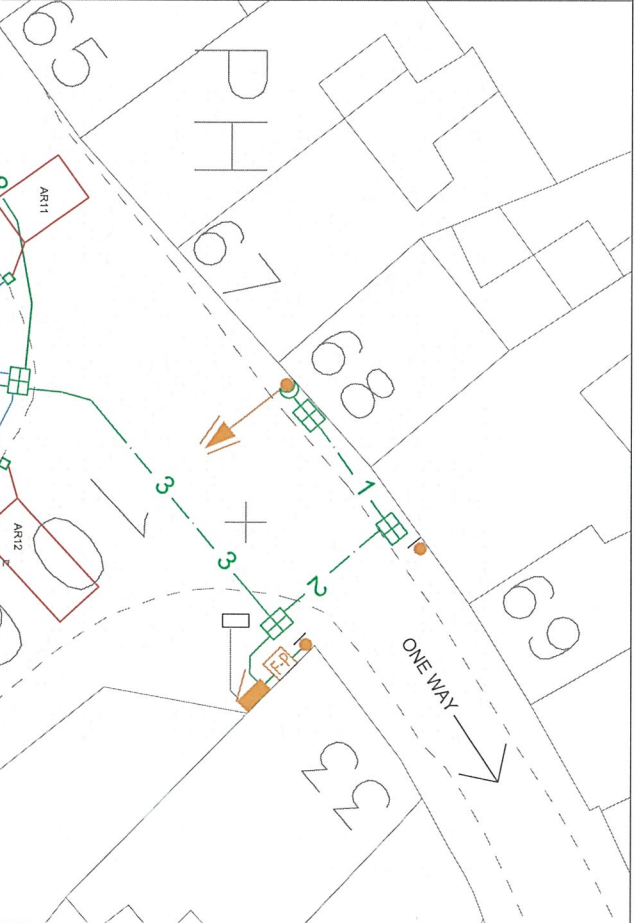
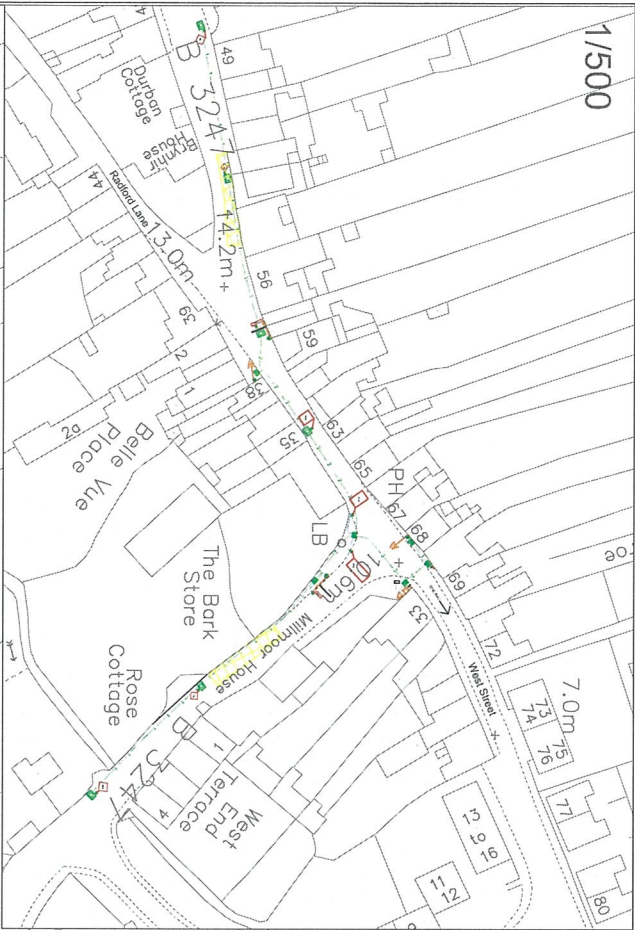
## CONCLUSION

- 6.1.1 The Quantitative figures above do not show queue levels of concern. The qualitative observations made on site raise a greater level of concern, as to the likely net benefit of installing the proposed traffic signals. The only cause of delay was due to larger vehicles making very slow and careful progress through narrow sections, if the composition of traffic flow were unchanged then this would still be the case under traffic signal control. In relation to this the negative influence of driver behaviour should be considered. An example would be the school coach that took two minutes to navigate a three point turn within an area that would be within the internal section of proposed traffic signals (shown in **Appendix 1**). In addition the boat transport lorry took 40 seconds to navigate this same area. The LINSIG model shows an optimised average cycle time of the signals of 48 seconds. In such a situation undoubtedly drivers would receive a green on the opposing approach and not be able to proceed while such vehicles made manoeuvres like this. This would potentially violate government guidance, that states there is a duty on the traffic signal designer to avoid new signal sites falling in to disrepute with users.
- 6.1.2 The presence of signals may exacerbate driver frustration, as drivers would possibly feel they had a level of priority when under a green signal. This may to an extent replicate the situation which occurred with the abandoned give and take priority scheme.
- 6.1.3 Careful consideration must be given to the existence of four significant pinch point reservoirs that exist on the approaches to the proposed signals. These are in addition to the very narrow stretch within the proposed interior area of the signals between the stop lines. There is a risk that tail end blocking could possibly occur. This is where a platoon passing on green may not be able to progress smoothly through one of the pinch points, with the effect that when the signals change state the opposing platoon may be impeded due to the presence of blocked back vehicles.
- 6.1.4 In addition it is very important to consider the increase in pollution related to noise and emissions that would occur. If traffic signals were installed at this low flow site the number of newly generated incidents of vehicles stopping and starting should be considered in respect of pollution generation as the topography of the site lends itself to the possible canyon pollution effect. For example the site is not unlike Gunnislake which is now an AQMA due to in part to vehicles waiting at traffic signals in Gunnislake.
- 6.1.5 Currently traffic flows can be considered low for example on the busiest approach average summer peak hour flow is approximately 4 vehicles a minute with the neutral peak being closer to 2 vehicles a minute on average (this was confirmed at the site visit, where periods of several minutes elapsed between vehicle arrivals).

## **6.2 Recommendations and Further Work**

- 6.2.1 A topographical survey would confirm if geometric restrictions apply or not, especially in relation to the pinch points and reservoirs on the approaches to signals.
- 6.2.2 Consideration should be given to removal of certain classifications of vehicle from the route, as these were the only cause of congestion witnessed on site visits. Operating this removal with the highway in its current form should be considered, this is to avoid any unnecessary effort and cost related to signal installation and ongoing future operation.
- 6.2.3 Consideration must be given to any unique circumstances or driver behaviours occurring during the summer months, as this report has only been able to cover empirical site visits and observations for the neutral time of year.





PROJECT MANAGER		CS	APPROVED BY	SE
DRAWN BY		AW	CHECKED BY	SE
SCALE		As Shown	SCALE @ A1	
DRAWING NO		ED000002_03	REVISION	



CORNWALL COUNCIL

PROJECT: Raime Peninsula Traffic Management

LOCATION: Raime Peninsula

DATE: 01/02/2023

PROJECT MANAGER: CS

DRAWN BY: AW

CHECKED BY: SE

APPROVED BY: SE

SCALE: As Shown

DRAWING NO: ED000002\_03

© The Planning & Transport Department of Cornwall Council. It is hereby acknowledged that the information contained in this document is for guidance only and does not constitute a guarantee or warranty of any kind. The Council accepts no responsibility for any loss or damage arising from the use of this information. The Council is not responsible for any loss or damage arising from the use of this information.

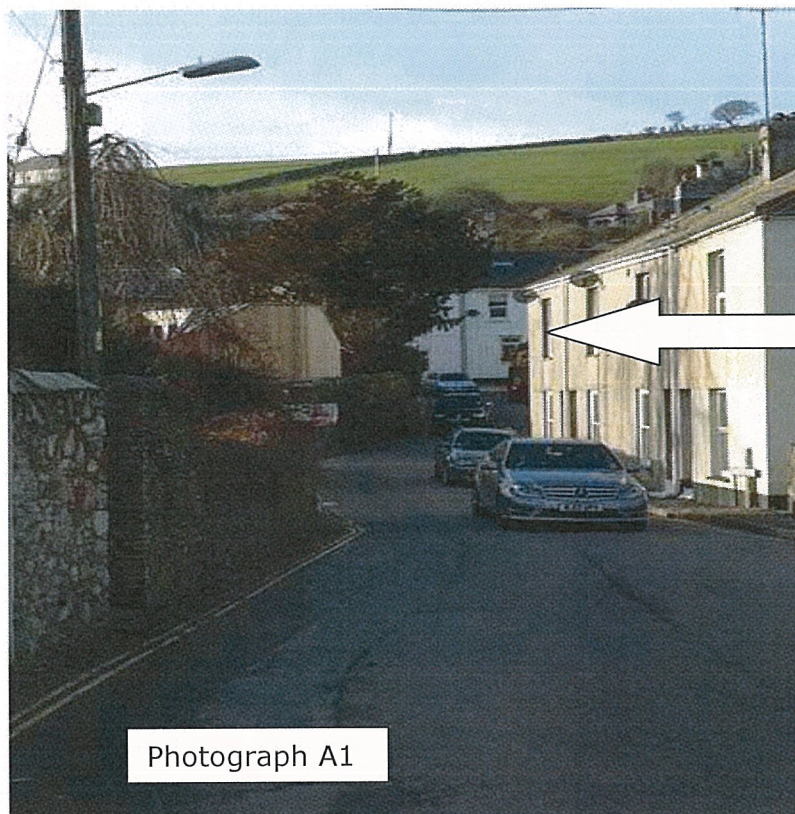
## **Appendix 1 Site Observations and Photographs**

*Weds 5<sup>th</sup> March  
Site Visit by Alan Shailles  
15.30 – 17.30 pm*

At 15.35pm upon arrival the gaps in traffic at the junction were up to 2 minutes. Generally traffic flow was very low.

At 16.06 pm 3 transit vans platooned through following a Travis Perkins delivery lorry, vehicles were in a platoon probably having bunched up on the approach down the hill.

The Travis Perkins Delivery Lorry was then seen returning and waiting on the wrong side of the road tucked in to the West Street junction apron. The driver undertook this manoeuvre to achieve visibility and let any oncoming vehicles pass down the inside of the vehicle on the non standard side before progressing through the junction as shown in the photo below.



Delivery Lorry waiting in offside area of carriageway

Photograph A1

At this time it was observed that vehicles were waiting correctly before entering the yellow box adjacent to Dodbrook house.

To the South East of the yellow box towards Cremyl there is narrow geometry where vehicles exiting the junction were naturally adopting a central line when egressing the narrow section unopposed as shown in photograph A2. This



highlights the reservoir and pinch point to the South of the proposed signals



Egressing vehicles adopting  
central carriageway path  
through reservoir and pinch  
point to the South of  
proposed signals

Photograph  
A2



**Photograph A3** shows a second narrow pinch point to the South of the proposed traffic signals which also has no footway.

At 16.15 PM Traffic was observed to be very intermittent and arriving in bursts with no perceptible sign of queueing other than when large vehicles travelled through the study area. An example is shown in **Photograph A4**.





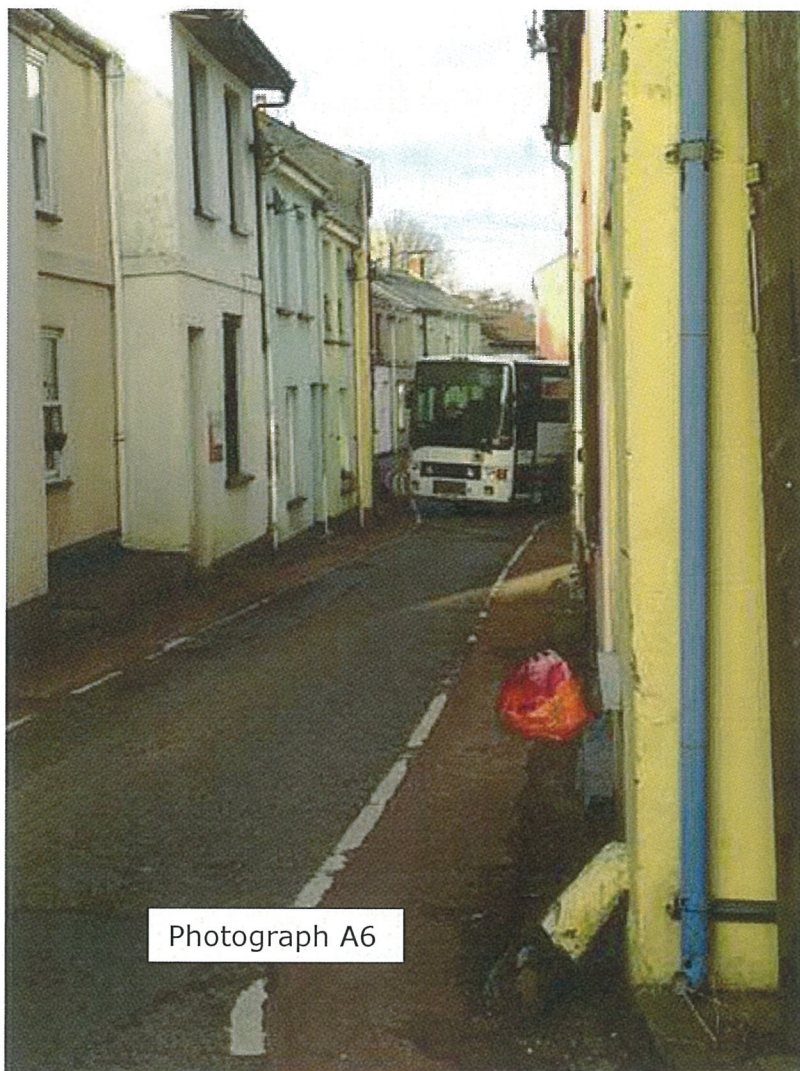
Photograph  
A4



The boat lorry in Photograph A4 damaged one of the buildings as shown in Photograph A5. There are several boatyards in the area so movements like those shown in photograph A5 are assumed to be regular.

Photograph A4 also highlights a particular geometrical restriction where the silver car is shown positioned in the same area as the proposed stop line for the downhill approach to the traffic signals.





At 16:47 PM a school coach was observed travelling East to West and was recorded taking 2 minutes to travel through the narrow section and proposed internal area of the traffic signals. This was due to the driver making a 3 point turn to negotiate the narrow stretch.



Photograph A7

After 5pm traffic flow dropped considerable with regular periods of traffic silence. Flows were so low by 5.30pm the site visit finished.



*Weds 5<sup>th</sup> March*  
*Site Visit by Alan Shailes*  
*8.30 – 9.30 am*

Upon arrival it was observed vehicles were managing themselves successfully negotiating the narrow section through courtesy.

At 8.32 am a large Spar Lorry travelled outbound shown below this successfully made passage however dominated the highway as shown.

Between 8.35 and 8.45 am primary school children were observed leaving three houses within the vicinity of the proposed traffic signals with parents.



Photograph A8



A traffic count between 8.35 – 8.40 across the junction showed 16 vehicle movements including 1 motorbike 2 pedalcycles and 1 OGV.

At 8.43am the Spar HGV returned in a Southerly direction and came in to a conflict with a North bound scaffold lorry. The scaffold lorry chose to courtesy reverse and let the spar lorry through. This lorry was then shown to have a platoon of at least ten vehicles behind it that had in effect bunched up down the hill behind the Spar lorry.

This manoeuvre is outlined in sequential Photographs A10 – A16 below (photograph A16 also shows the close proximity of vehicles and pedestrians within the internal area of the proposed traffic signals):-





Photograph  
A10





Photograph  
A11



Photograph  
A12



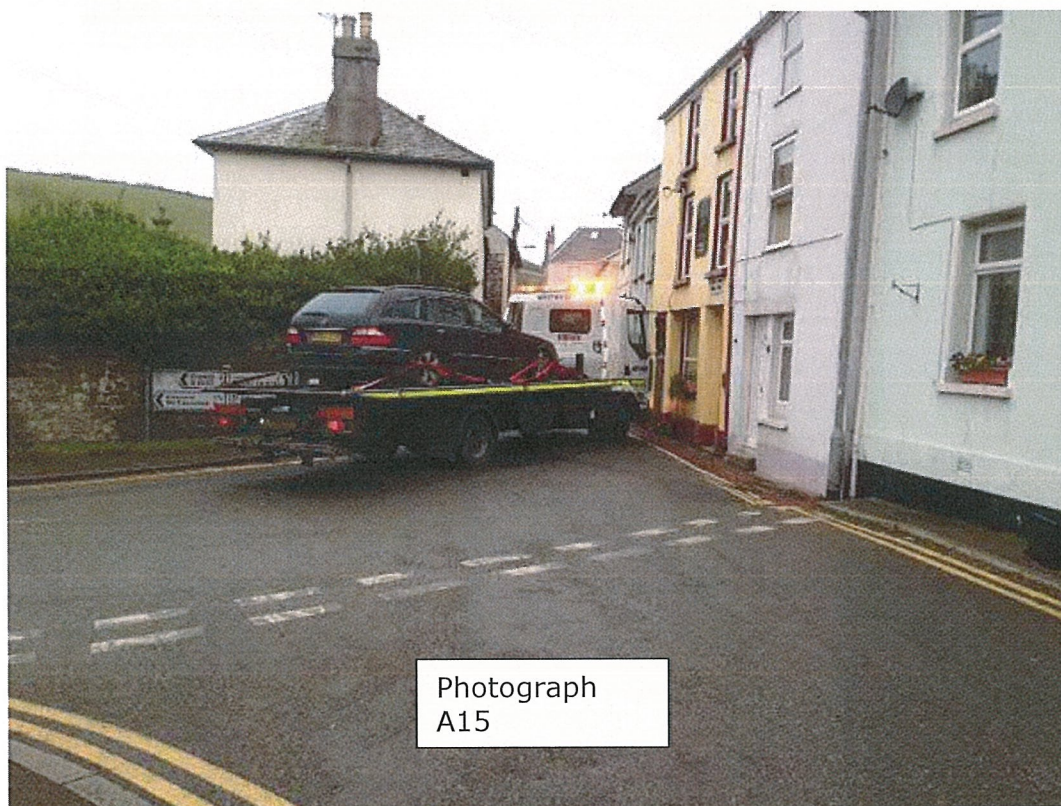


Photograph  
A13





Photograph  
A14



Photograph  
A15





Pedestrians using recently  
installed Red Coloured High  
Friction Surface Pedestrian

Photograph A16

Reply to questions raised by Rame Cluster Group



Comments on the final draft for review version of the Rame Peninsula Traffic Management.

Report Ref EDG0205/F1 rev A

The following points should be addressed to finalise the report.

1. A comment on the inclusion of a lay-by on the B3247 east of Tregantle farm and on the road into Wilcove, even if this is simply to state that there should be no difficulty in achieving this subject to permission of the landowner. Comment was included in the previous version circulated to the Transport Infrastructure sub group of the Rame NDP.

Response: Where a road is only wide enough for one line of vehicles the consideration of passing place facilities may be considered as a solution subject to the composition of vehicle movement, type of road and availability of land and buildability.

2. On page 9 reference is made to the problem of proliferation of signs for the circulatory system. These comments are accepted but we consider that there should be some balancing comments on the benefits of introducing the circulatory system, particularly in relation to the need for a solution in Millbrook.

Response: All traffic schemes must adhere with the rural highways best practice guidelines which sets out the councils expectations on traffic signing proliferation; however a pragmatic approach to signing in some cases will be considered where the benefits of signing outweigh the environmental consequences e.g. road safety.

3. In the final paragraph on page 10 the paragraph opens with the statement that 'The voluntary system could be augmented with the use of prohibitory signs and traffic regulation orders'. We agree and believe reference could be given here to perhaps introducing it at Hounsters Hill. Response: there are technical, procedural and practical reasons that need to be overcome before we could commit to this type of TRO.

- If a TRO is proposed it will require statutory and public consultation and there is no guarantee that the Order will be made. It may be difficult to get public support considering that the return route is longer and along a lower class of road; Road Haulage organisations will likely challenge where it affects running costs

- Exemptions will be required to this type of TRO e.g. 'Except for Access'. These will dilute the effectiveness of the restriction depending on where it is located.

- Communication of the restriction to drivers – Signing has to be appropriate and legal.

- Cornwall Council cannot enforce this type of TRO. The support of Devon and Cornwall Police is integral to this type of order being implemented.

- The practical considerations of a large HGV being prevented access to Millbrook also need examination to ensure that there would be appropriate turning areas.

- It is considered that it will be difficult to persuade drivers to follow the longer alternative route without significant promotion of a voluntary one way route involving liaison and communication with Hauliers etc.

4. In section 6.5 reference is made to a document covering highway diversion including the B3247. The report says the Rame group could receive a copy on request. We wish to receive a copy.

Response: It is understood that this report is still in draft form – A copy will be provided when available. Neil Grigg at Cormac Bodmin is compiling – ngrigg@cormacltd.co.uk.

5. In Antony we support the recommendations for Junction option3 and also junction option 8. However, we are not convinced that option 5 is viable, because it will involve HGV's moving from a standing stop up the hill out of the village while also negotiating a sharp bend. Response: It is considered that option 5 would be viable as modern vehicles will be capable of negotiating the hill even from a standing start, it is accepted that this option will result in HGV's travelling through the village, but they will travel at a lower speed than if they were directed to travel downhill through the village. This option is also more likely to be buildable than the significantly more costly scheme options presented. Modifying the road layout at this location to allow HGV access through the village has a significant impact on route availability throughout the Rame network

6. The last sentence of section 7.4.4 is considered very weak. It should be replaced with words to the effect. It is therefore recommended that s desire to improve the junction via option 3 because it is central to the long term economic viability of the whole of Rame by providing a safe route for HGV's onto the peninsula and to provide for additional commuter traffic capacity to allow development on the peninsula.

Response: We cannot agree to this statement without a business case being produced. We will revise the report to clarify this. ."

7. There is frequent comment throughout the report that in Millbrook the road is too narrow to allow two HGV's to pass but no solution other than further work to design and assess the viability of a traffic light system. We consider that a low cost solution would be to prohibit HGV's from proceeding up Hounsters Hill. This could be achieve by putting an advisory sign for HGV's to turn left at Four Lanes End School because of a restriction to HGVs half a mile ahead, and prohibitory signs at the main turning into Millbrook where any vehicle that had ignored the early sign or vehicles coming from Millbrook would be advised to turn left. It might also be necessary to place sign at the bottom of Hounsters Hill to stop a HGV travelling up the hill from West Lane up the hill rather than turning left onto the B3247. Response: This results in similar responses to question 3 above. There would need to be a thorough investigation of turning facilities at Millbrook at the prohibition point. There is the temptation for drivers to abuse a restriction further out of the village on the basis of being allowed 'Access'.



8. There is great disappointment that the only recommendation in Crafhole is for more traffic studies. That is what has been happening for the past 10 years. We would like to see the option of two build-outs included in the report. We believe with some changes in road daytime parking might be acceptable to residents along the road providing it is coupled with changes in road layout but not without this happening. Residents are convinced that removal of parked cars will increase speeds, speed watch has already recorded speed of over 35 mph through the village, and the report acknowledges this, making the road less safe and reducing further the quality of life along the road.

Response: The report proposes that measures are carried out to control speeds in the village via a phased approach. This ensures that the problems are dealt with without constructing features that could be seen as a detriment to the village (sign proliferation). It should be emphasised that the proposed waiting restrictions on the Eastern side of the Village are daytime only when it is considered that vehicle speeds will be constrained by volume of traffic. Although there may have been incidences of drivers exhibiting bad behaviour in relation to speeds (as there can be at any location), this will need to be quantified in relation to normal speeds overall through this section of carriageway. Cornwall Council will require speed surveys carried out with their own monitoring equipment. Further work such as the buildouts would be considered following the Traffic Regulation Order and subject to the results of the before and after speed surveys. It should be noted that a 24 hour restriction on parking is not thought to be appropriate given the light traffic flows outside the day time period.

9. There has been discussion over the provision of Heritage Signs for Mount Edgcumbe Country Park as the last sign is at Trerulefoot. We would like to see this added to the report with guidance on where the additional signs should be located.

Response: Brown signing will need to be reviewed in accordance with our policy. We are mindful of upcoming potential changes following the ongoing Dft review of brown signing as part of an overall review of signing within the Traffic Signs Regulations and General Directions (TSRGD 2015). We discussed splitting HGV and cars movements to different routes during our NCH meeting. Options for this could be considered once the impact of any changes within the DFT review of signing policy is complete and the TSRGD 2015 is issued.

