

Appendix A

2018/2028 Reference Case
Update - Summary Technical
Note

A1

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Project title	WDC STA Phase 3	Job number
		211439-19
cc	Alan Law (WCC)	File reference
		211439-19.TN017
Prepared by	James Edwards	Date
		11 February 2013
Subject	Warwick and Leamington 2018/2028 Reference Case Update	

Introduction

This Technical Note has been produced to outline the recent changes applied to the 2018 and 2028 Warwick and Leamington Wide Area PARAMICS models. The purpose of these changes is to ensure that the model networks and demands are as up to date as possible for the purposes of both Development Control Assessments and the current work on the Strategic Transport Assessments.

For full details on the assumptions contained within the 2018 and 2028 Model networks, including variations and deviations from the Base model network, this note should be read in conjunction with the Warwick and Leamington Future Year Model Development Report¹ and the WCC STA Phase 2 Modelling Report².

Objective

The purpose of this update is to ensure that 2018 and 2028 network conditions and demands are reflected as accurately as is possible within the current PARAMICS models. In particular the following elements need to be considered within the updated modelling:

- The Ridgeway school has closed and the trips associated with this school have been diverted to Woodloes School
- Stoneleigh Park has now been granted consent and so should be included as a committed development.
- The proposed scheme for the A46/Birmingham Road junction now appears highly unlikely to proceed and so the scheme assumed within the modelling is inappropriate as are the committed development demands assumed to access the site via the revised scheme. Furthermore, a hotel on the site has been granted permission and is now open, this should be included within the modelling.

¹ R115196.R002 WarLeam Future Year Development Report, JMP Consultants, May 2012

² 211439-19.R006 – Warwick STA Phase 2 Modelling Report, Arup, February 2013, Appendix B

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Zone Revisions

As well as the aforementioned changes, a number of zones have been observed to exist within the model network that have been carried forwards from the recent 2011 Base model extension but are no longer utilised. Having reviewed these zones in detail it has been confirmed that no demand is generated by their existence and in most cases there are no links contained within the zone boundaries upon which traffic can load.

Whilst these zones do not affect the current model operation, future year distributions can be affected by their presence and manual adjustments are required to overcome the influence that their presence has.

As a result the first stage of this model update process has been to remove the following zones from the model network:

- Zone 73
- Zone 508
- Zone 509
- Zone 510
- Zone 511
- Zone 513

The Ridgeway School

During the latest round of STA modelling, the site of the Ridgeway School has been identified as a possible area for future development. This school has closed and the trips associated with it have been diverted to the site of Woodloes School. Whilst these changes have already taken place they have not been reflected within the modelling.

Assigning future development and associated demand to the site of the Ridgeway School without first diverting the existing zone demand could over-predict the impacts of the additional trips in this area. This is particularly pertinent when considering the issues noted in the second Phase of the STA work around the A429/Spinney Hill roundabout and access to Montague Road.

Within the Reference Case, the inbound and outbound trip generation associated with zone 362 has now been diverted to zone 363.

Stoneleigh Park

Stoneleigh Park should be considered as committed development in all future assessments. Matrices for Stoneleigh Park were derived during the second phase of the STA work but it was considered within the broad assumptions regarding the various growth allocations being tested within the STA.

In order that Stoneleigh Park can be included in all future assessments the trip generation associated with the development has been transferred into the committed development matrix.

During the previous STA work the level of interaction between the Stoneleigh Park Development and the Warwick and Leamington Model network was assessed using CITEware. This reveals that approximately 43% of the overall trip generation associated with the site was likely to interact with the Warwick and Leamington Road network.

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Furthermore, it was predicted that the generated trips would enter and exit the model via both the A46 and the B4113 represented by zones 504 and 506 respectively. The overall trip generation proportions associated with these zones is illustrated within the following Table:

Table 1 - Stoneleigh Park Zone Distributions

Zone	Inbound Proportion	Outbound Proportion
504	13.5%	16.6%
506	6.7%	6.7%

The hourly trip generation figures, derived during the second phase of STA testing, were multiplied by these factors to provide the relevant distribution of trip gen between the two zones. The resultant trip generation values were then distributed across the network using a census journey to work distribution extracted from CITEware.

Whilst these zones do not affect the current model operation, future year distributions can be affected by their presence and manual adjustments are required to overcome the influence that their presence has.

The resultant trip generation values were then added to the existing 2018 and 2028 Committed Development Matrices. The hourly trip generation totals, across both zones, is summarised within the following Table:

Table 2 - Stoneleigh Park Trip Generation

	Overall Trip Gen		Assigned Trip Gen	
	Inbound	Outbound	Inbound	Outbound
0700 to 0800	421	72	69	33
0800 to 0900	757	111	121	57
0900 to 1000	439	98	76	35
1600 to 1700	109	383	78	33
1700 to 1800	91	670	123	51
1800 to 1900	46	238	46	19

IBM 'Opus 40'

During previous iterations of modelling within the area of Warwick and Leamington, a committed scheme and development has been assumed in the area of the A46/Birmingham Road 'Stanks' Island which involved redevelopment of the IBM car park and some of the site into B1 use which would be accessed via a fifth arm directly off the Island. Furthermore the existing four arms of the roundabout were to be signalised to improve the traffic management in this area. Finally, the existing site access, which is via a left in – left out arrangement off the Birmingham Road was to be closed off.

This scheme now looks unlikely to proceed and so it has been recommended that the assumptions contained within the model, for this area of the network, be reverted back to those which have been assumed within the Base model. As a result, the signalisation scheme that has been included within the modelling has been removed. The left-in left-out access off the Birmingham Road has been reinstated and the link through the site has been severed. Calibration assumptions, such as visibility,

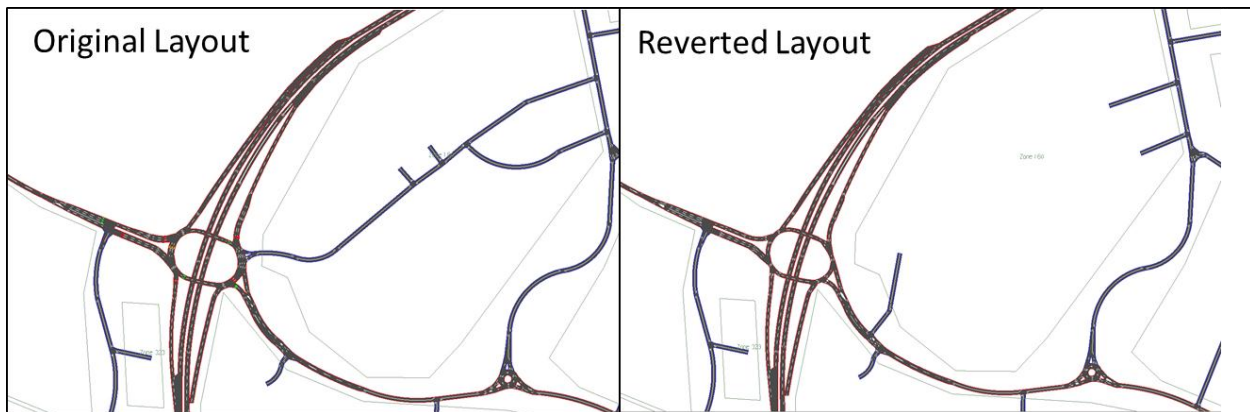
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gap acceptance and car park assumptions have all been set to reflect the original baseline parameters. The configuration of the network before and after these changes have been applied is illustrated within the following Figure:

Figure 1 - IBM Network Changes



As well as the changes to the network, all trip generation assumptions associated with zone 160, contained within the existing Committed Development Matrix (Level 4) have initially been set to zero.

Following on from the removal of this development it was then necessary to update the trip generation within the committed development matrices to reflect the presence of a hotel that has opened on the site since the last model update. A 122 bedroom hotel has opened on the site and this has been included within the updated reference case. Initially, trip generation figures were provided by WCC which were distributed across the model network using a CITEware gravity distribution. The distribution was manually amended so that trips were only distributed between the development site and external zones on the assumption that the nature of the trips generated by the hotel is most likely to be strategic rather than local.

The trip generation associated with the development is summarised within the following Table:

Table 3 - Hotel Trip Generation

	In	Out	Total
0700 to 0800	8	18	26
0800 to 0900	13	31	44
0900 to 1000	17	21	39
1600 to 1700	16	10	28
1700 to 1800	23	12	34
1800 to 1900	19	11	29

HGV Matrix Levels

As the number of matrix levels contained within a PARAMICS model network increases so does the time it takes for a single simulation run to complete. This is further exacerbated by the presence of multiple vehicle types. Within the current Reference Case the growth associated with the HGV vehicle types has been stored within a separate matrix level. This means that two matrix levels

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control the assignment of HGV movements across the model network via four separate vehicle types. Since HGV growth is relatively static, and not prone to procedures such as peak spreading or redistribution, these two matrix levels have been aggregated within the current Reference Case models to provide additional capacity for development demands to be assigned therein without an unnecessary impact on model run times.

Summary

The inclusion of the changes outlined within the previous sections of this note are necessary to ensure that the model that is being utilised for both development control and STA purposes is as up to date as possible and reflects the likely future year conditions both in terms for demand and network interventions.

The changes have been applied to both 2018 and 2028 Reference Case models and it is recommended that these are the models upon which future development transport impact assessments are based as well as any future Strategic Transport Assessment work.

The 2018 and 2028 Reference Case models have been updated in accordance with the process outlined within this note and these have been assigned the following references:

- 2018 WLWA Reference Case Network Feb2013
- 2028 WLWA Reference Case Network Feb2013

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	James Edwards	Alan Law	James Edwards
Signature			

Appendix B

Revised Allocation Hourly Trip Generation Tables

B1

Hourly Trip Generation Totals

Hourly Trip Generation Totals		0700 to 0800		0800 to 0900		0900 to 1000		1600 to 1700		1700 to 1800		1800 to 1900	
Area	PARAMICS Zones	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Additional Windfalls with Gateway and Proactive Relocations	78	9	38	14	56	14	26	41	14	56	14	43	14
	85	9	38	14	56	14	26	41	14	56	14	43	14
	327	9	38	14	56	14	26	41	14	56	14	43	14
	160	9	38	14	56	14	26	41	14	56	14	43	14
Reallocation of Employment Land (eg. 45 Tournament Fields and 25 Warwick Gardens)	157	17	70	26	102	26	47	74	25	102	26	78	25
	105	55	74	95	109	65	56	81	76	105	84	77	45
29 Ridgeway school	362	5	20	7	29	7	14	21	7	29	7	22	7
3 Leam Fire Station	41	4	16	6	24	6	11	17	6	24	6	18	6
4 Riverside House	326	4	16	6	24	6	11	17	6	24	6	18	6
28 Severn Trent Land - South Harbury Lane	907	49	67	85	98	59	51	73	68	94	76	69	40
6 Station Approach	63	10	42	15	61	16	28	44	15	61	15	47	15
7 IBM Car Park	160	7	28	10	41	10	19	30	10	41	10	31	10
Kenilworth School and	503	15	61	22	90	23	41	65	22	90	22	68	22
Kenilworth 6th Form College	503	8	34	12	49	12	23	36	12	49	12	37	12
Rangemaster	81	7	28	10	41	10	19	30	10	41	10	31	10
46 Thwaites	908	20	84	31	122	31	56	89	29	122	31	93	30
22 Myton Gardens	902	157	318	263	465	200	228	343	219	457	240	342	153
23 South of Gallows Hill	903	125	185	214	271	151	138	202	172	263	191	194	105
30 Woodside Farm	901	17	70	26	102	26	47	74	25	102	26	78	25
31 Golf Lane	909	6	27	10	39	10	18	28	9	39	10	29	9
32 Whitnash East	910	43	182	66	265	68	122	193	64	265	66	202	65
33 Red House Farm	911	18	75	28	110	28	51	80	27	110	28	84	27
33a Red House Farm East of Eden Court (Green Belt)	912	3	14	5	20	5	9	15	5	20	5	16	5
36 Thickthorn (Green Belt)	900	305	260	536	385	343	217	294	414	359	467	256	211
26 South Harbury Lane (Lower Heathcote Farm)	904	124	181	213	265	149	136	197	171	257	190	190	104
27 South Harbury Lane (Lower Heathcoet Farm) - Additional Ar	905	37	50	64	74	44	38	55	51	71	57	52	30
29 South Harbury Lane (Grove Farm)	906	97	130	167	192	115	99	143	133	185	148	136	79
lapworth	520	5	20	7	29	7	13	21	7	29	7	22	7
hampton magna	209	5	20	7	29	7	13	21	7	29	7	22	7
barford	208	5	20	7	29	7	13	21	7	29	7	22	7
bishops tachbrook	206	5	20	7	29	7	13	21	7	29	7	22	7
radford semele	533	5	20	7	29	7	13	21	7	29	7	22	7
rowington	520	5	20	7	29	7	13	21	7	29	7	22	7
shrewly	520	5	20	7	29	7	13	21	7	29	7	22	7
hatton	520	5	20	7	29	7	13	21	7	29	7	22	7
norton lindsey	518	5	20	7	29	7	13	21	7	29	7	22	7
cubbington	532	5	20	7	29	7	13	21	7	29	7	22	7
leek wootton	201	5	20	7	29	7	13	21	7	29	7	22	7
burton green	502	5	20	7	29	7	13	21	7	29	7	22	7

Appendix C

Mitigation Schedule & Sketches

Appendix C Contents

APPC.00 Scheme Cost Breakdown & Mitigation Plot

APPC.01 Thickthorn Roundabout

APPC.02 Kenilworth Gyratory

APPC.03 A452/Bericote Roundabout

APPC.04 A452/Blackdown Roundabout

APPC.05 A452 Spinney Hill Roundabout

APPC.06 Emscote Road/Greville Road

APPC.07 Princes Drive/Warwick New Road

APPC.08 Bath Street/High Street

APPC.09 Adelaide Road/Avenue Road

APPC.10 Dormer Place/Adelaide Road

APPC.11 Myton Road Roundabout

APPC.12 Priory Road/Smith Street/St Nicholas

APPC.13 Castle Hill Gyratory Signals

APPC.14 Europa Way/Myton Road Roundabout

APPC.15 Shires Retail Park Roundabout

APPC.16 Europa Way Roundabout

APPC.17 Grey’s Mallory Roundabout

APPC.18 A46/Birmingham Road 'Stanks Island'

APPC.19 Bericote Road Stoneliagh Road

APPC.20 Kenilworth Road/Westhill Road

APPC.21 Europa Way Corridor – Part 1

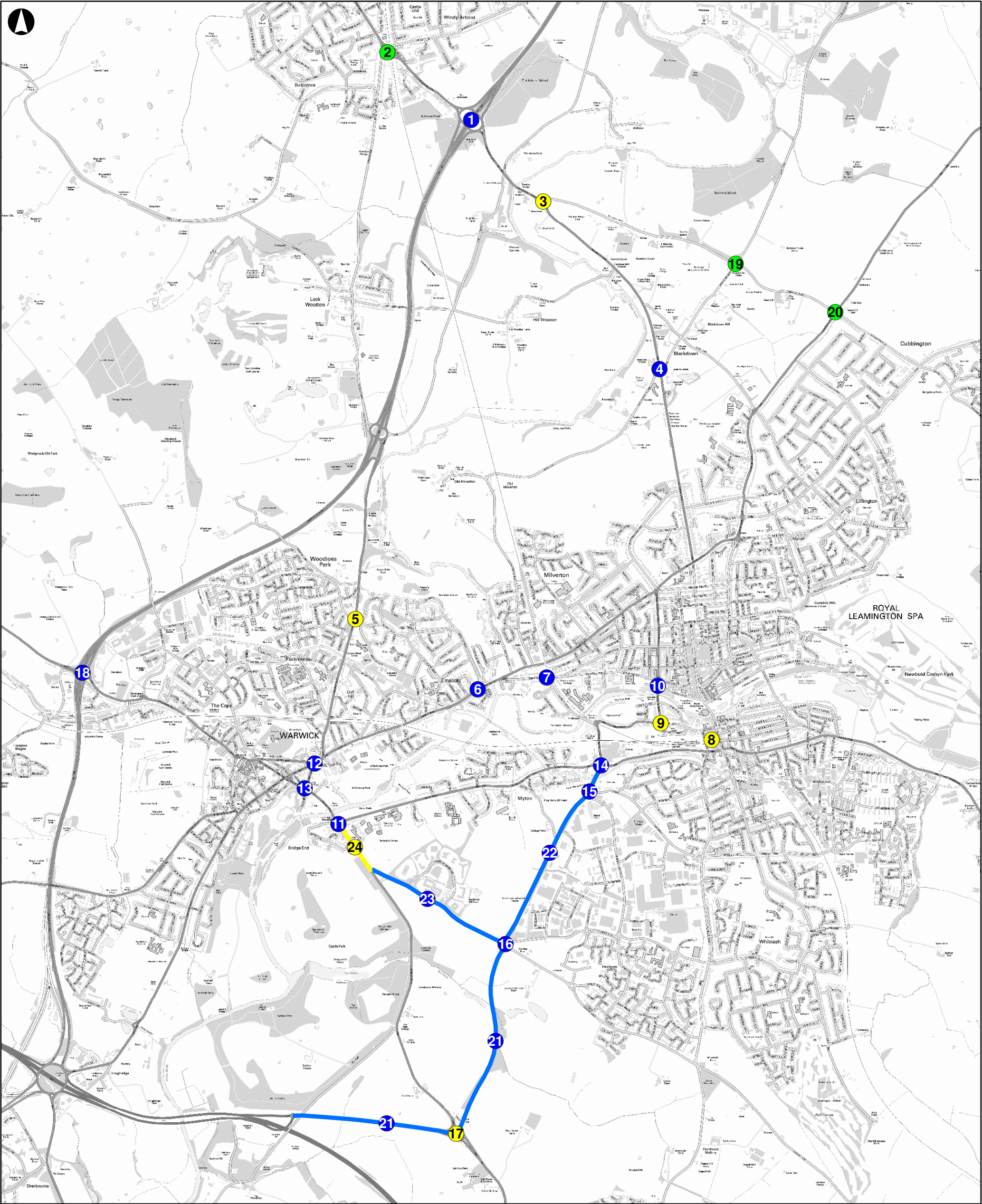
APPC.22 Europa Way Corridor – Part 2

APPC.23 Gallows Hill – 2 Lanes

APPC.24 Banbury Road – 2 Lanes

MITIGATION COST BREAKDOWN

MITIGATION COST BREAKDOWN			Design Services		(£1000's)	Works cost		48%				
Scheme	Grade	Comments	Physical Works	Signals		Sketch?	Works	Signals	Commuted Sums	Total	Drawing Number	
Thickthorn Roundabout	Grade 1	Both schemes are intrinsically linked to the delivery of local placed allocations	Major	Yes		Yes	750	45	83	£1,250,000	01	
Kenilworth Gyratory	Grade 3		Minor	Yes		Yes	100	40	83	£300,000	02	
A452/Bericote Roundabout	Grade 2	Growth in the North is more likely to trigger the need for early delivery	Major	Yes		Yes	750	35	83	£1,250,000	03	
A452/Blackdown Roundabout	Grade 1		Major	Yes		Yes	350	35	83	£650,000	04	
A452 Spinney Hill Roundabout	Grade 2	Improvement of the routes into Warwick from the South & West may reduce the	Medium	No		Yes	300			£450,000	05	
Emscote Road/Greville Road	Grade 1	Delivery of schemes in unison safeguards functionality of Emscote Corridor.	Minor	Yes		Yes	400	35	83	£750,000	06	
Emscote Road Bridge	Grade 3A	Additional testing to determine the impact of scheme delivery without the Bridge indicates acceptable outcome, therefore scheme costs not included in final assessment	Major	No								n/a
Princes Drive/Warwick New Road	Grade 1		Medium	Yes		Yes	150	35	83	£350,000	07	
Bath Street/High Street	Grade 1	Provides potential oppourtunity for public transport interchange facilities near Leamington Station	Medium	Yes		Yes	250	35	83	£500,000	08	
Adelaide Road/Avenue Road	Grade 2	Delivery of schemes in unison will enhance benefits	Minor	Yes		Yes	150	35	83	£350,000	09	
Dormer Place/Adelaide Road	Grade 2		Minor	Yes		Yes	100	35	83	£300,000	10	
Myton Road Roundabout	Grade 1	Potential for synchronisation of these signal schemes with between each scheme as well as with existing Coventry Road/Coton End signalised junction increases overall potential benefit of implementation substantially.	Major	Yes		Yes	250	35	83	£500,000	11	
Priory Road/Smith Street/St Nicholas	Grade 1		Medium	Yes		Yes	100	35	83	£300,000	12	
Castle Hill Gyratory Signals	Grade 1		Medium	Yes		Yes	350	35	83	£650,000	13	
Europa Way/Myton Road Roundabout	Grade 1	Delivery of schemes in unison will enhance benefits, Shires Retail can be further enhanced to priorities public transport movements	Medium	Yes		Yes	1,000	40	83	£1,600,000	14	
Shires Retail Park Roundabout	Grade 1		Major	Yes		Yes	750	40	83	£1,250,000	15	
Europa Way Roundabout	Grade 1	MOVA or similar should be considered to optimise the scheme performance Further investiagtion should be undertaken inclusive of downstream affects of M40 J12 works which may minimise the need and extent of the scheme that is delivered here	Medium	Yes		Yes	500	40	83	£900,000	16	
Grey's Mallory Roundabout	Grade 2		Medium	Yes		Yes	250	45	83	£500,000	17	
A46/Birmingham Road 'Stanks Island'	Grade 1	Smaller version of original scheme implemented, MOVA to be considered for adoption	Medium	Yes		Yes	850	45	83	£1,400,000	18	
Bericote Road Stoneliagh Road	Grade 3	Delivery of schemes in unison will enhance benefits	Minor	No		Yes	350			£500,000	19	
Kenilworth Road/Westhill Road	Grade 3		Minor	No		Yes	350			£500,000	20	
Europa Way Corridor – Part 1	Grade 1	Delivery of Dualled sections are likely to be essential to compliment ATM works and reduce propenseny for queues to propagate back, from Warwick, onto the	Major	No		Yes	3,750			£5,550,000	21	
Europa Way Corridor – Part 2	Grade 1		Major	No		Yes	2,000			£2,950,000	22	
Gallows Hill – 2 Lanes	Grade 1	Scheme should be considered alongside development access strategies to ensure	Major	No		Yes	1,000			£1,500,000	23	
Banbury Road – 2 Lanes	Grade 2	Scheme reduced to two lane sections north of Gallows Hill and South of Myton b	Medium	No		Yes	600			£900,000	24	
ATM "Managed Motor Ways"	Grade 1	Additional Consideration Required	Major	Yes		no	n/a				£10,000,000	n/a
Sustainable Travel Infrastructure	Grade 1	Extensive sustainable travel infrastructure should be constructed to encourage modal shift and thus alleviate pressure on the road network. It is likely that this contribution would be best spent on provision of K2L cycle route between Kenilworth and Leamington, completion of the existing cycle networks - this has been termed "Missing Links" and provision of new cycle infrastructure linking proposed developments to the existing cycle network. Provision of "Missing Links" may involve working closely with WDC in order to provide the shortest routes to key destinations (e.g. Use of Victoria Park to link the town centre with the proposed cycle infrastructure for Ford Foundry, linking Connect2 to Kenilworth town centre and linking Warwick town centre to the rail station). Provision should include toucan/pedestrian crossings to avoid severance. Provision of minor schemes has not been included in these costs but provision of bus shelters should also be included. Included in terms of modal shift assumption (15%)	Minor	No		no		n/a	n/a		£2,000,000	n/a
Virtual P&Rs	Grade 1	Virtual Park and Rides accrue the benefits of standard park and ride facilities without incurring the costs of providing expensive infrastructure. Developers would be encouraged to provide additional parking at edge of town sites which could then be utilised for P&R facilities. Instead of providing a bespoke bus services to the P&R facilities, a two stage bus journey would be made where the first stage would provide a direct service to the town centres or employment sites with perhaps one or two stop on route thus avoiding. The second stage would distribute local trips around housing areas or employment areas This would maximise potential of new bus routes provided by developers which are necessary ensure sustainable access to their developments and to meet model share targets. Such facilities would be easier to deliver where there is a critical mass of development proposed in one area. Suitable sites may include developments along the A452 corridor to the south of Leamington or close to the sites next to the A46 proposed at Kenilworth. Included in terms of modal shift assumption (15%)	Minor	No		no		n/a	n/a		£2,000,000	n/a



Legend

- Grade 1
- Grade 2
- Grade 3

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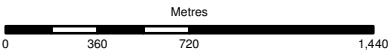
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Job Title
Warwick District
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Mitigation Schemes

Scale at A3

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Job No
211439-19

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Information

Drawing No
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Issue
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Job Title
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Thickthorn Roundabout

Scale at A3
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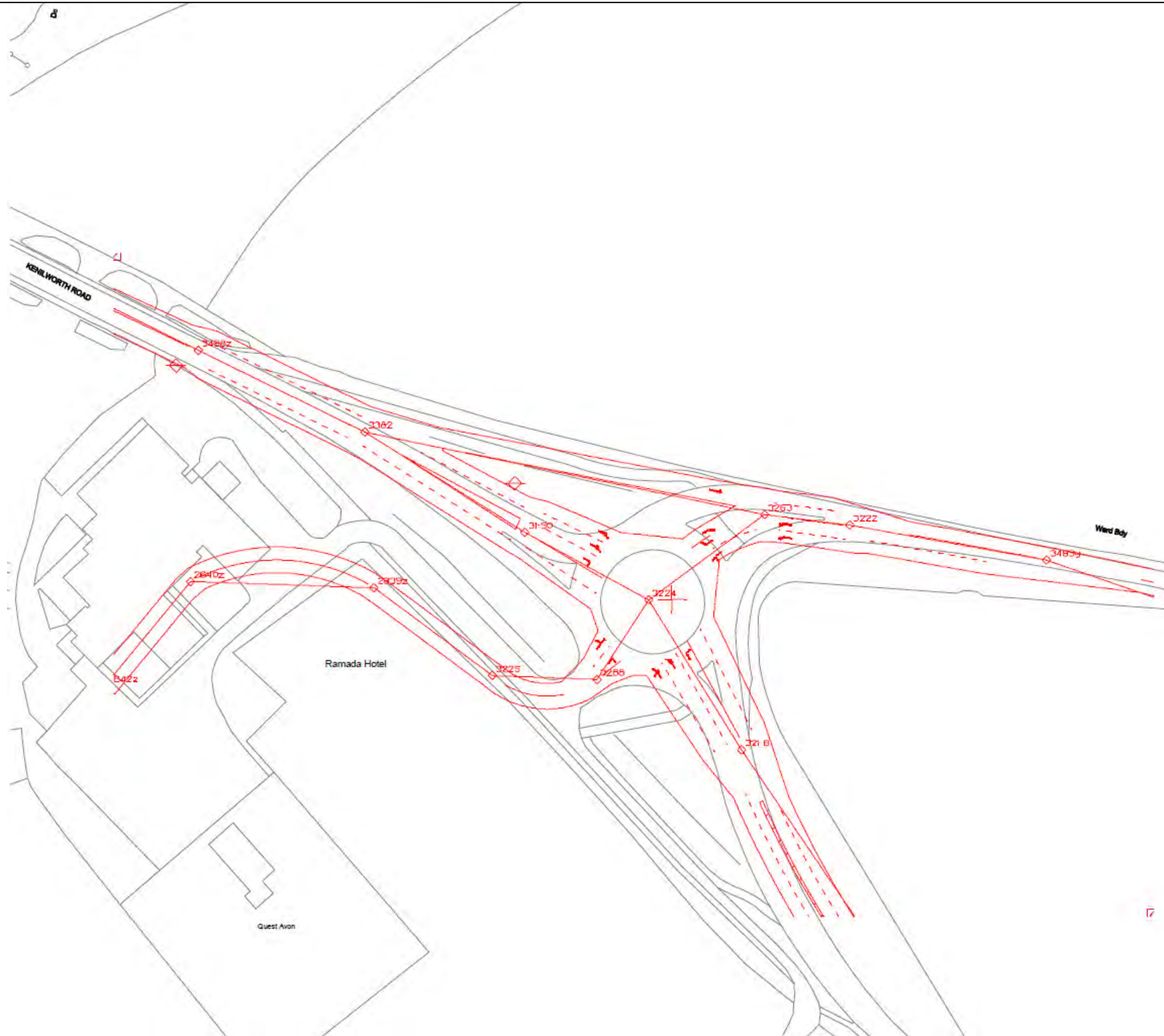
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Drawing No APPC.02	Issue P1
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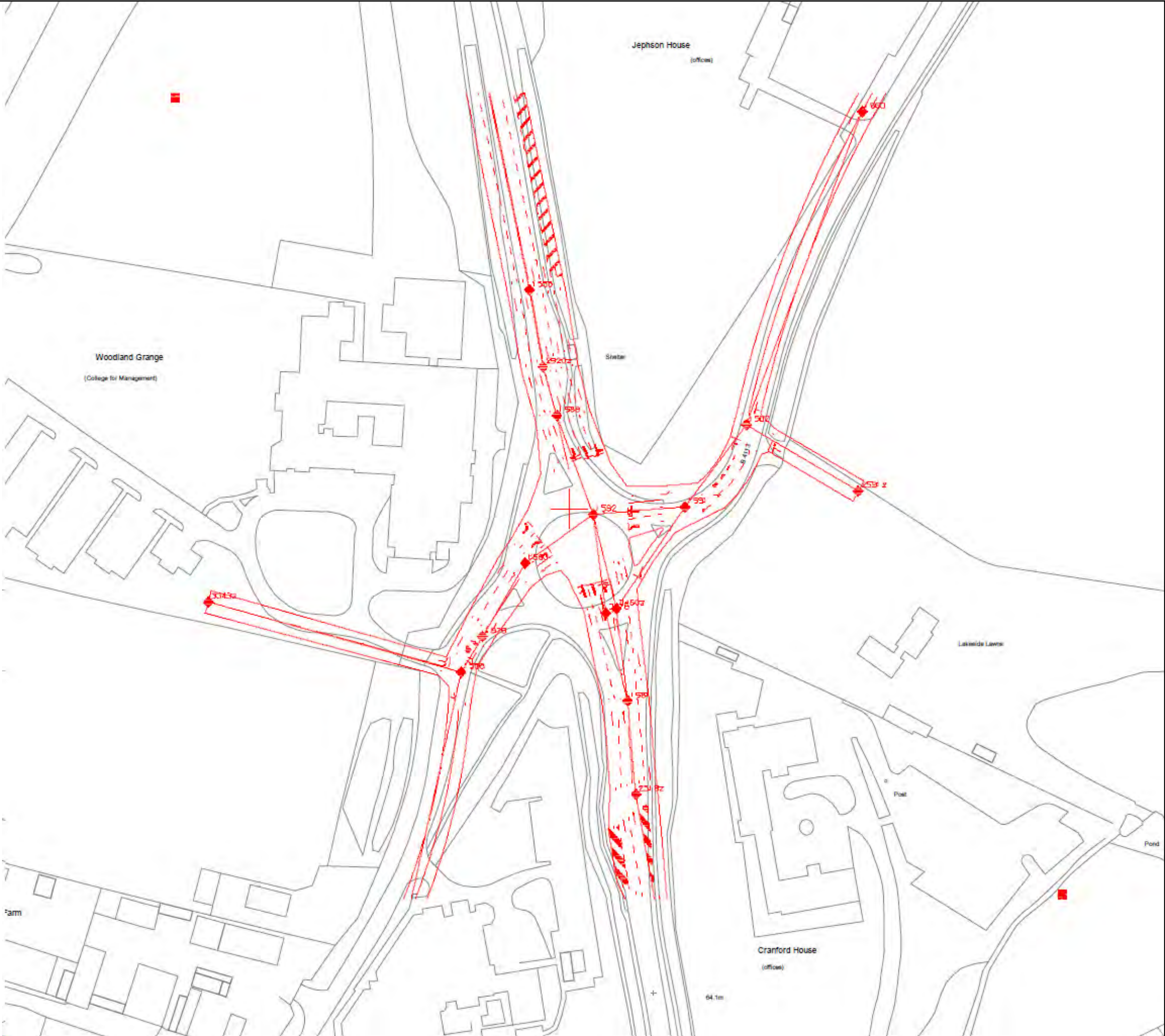
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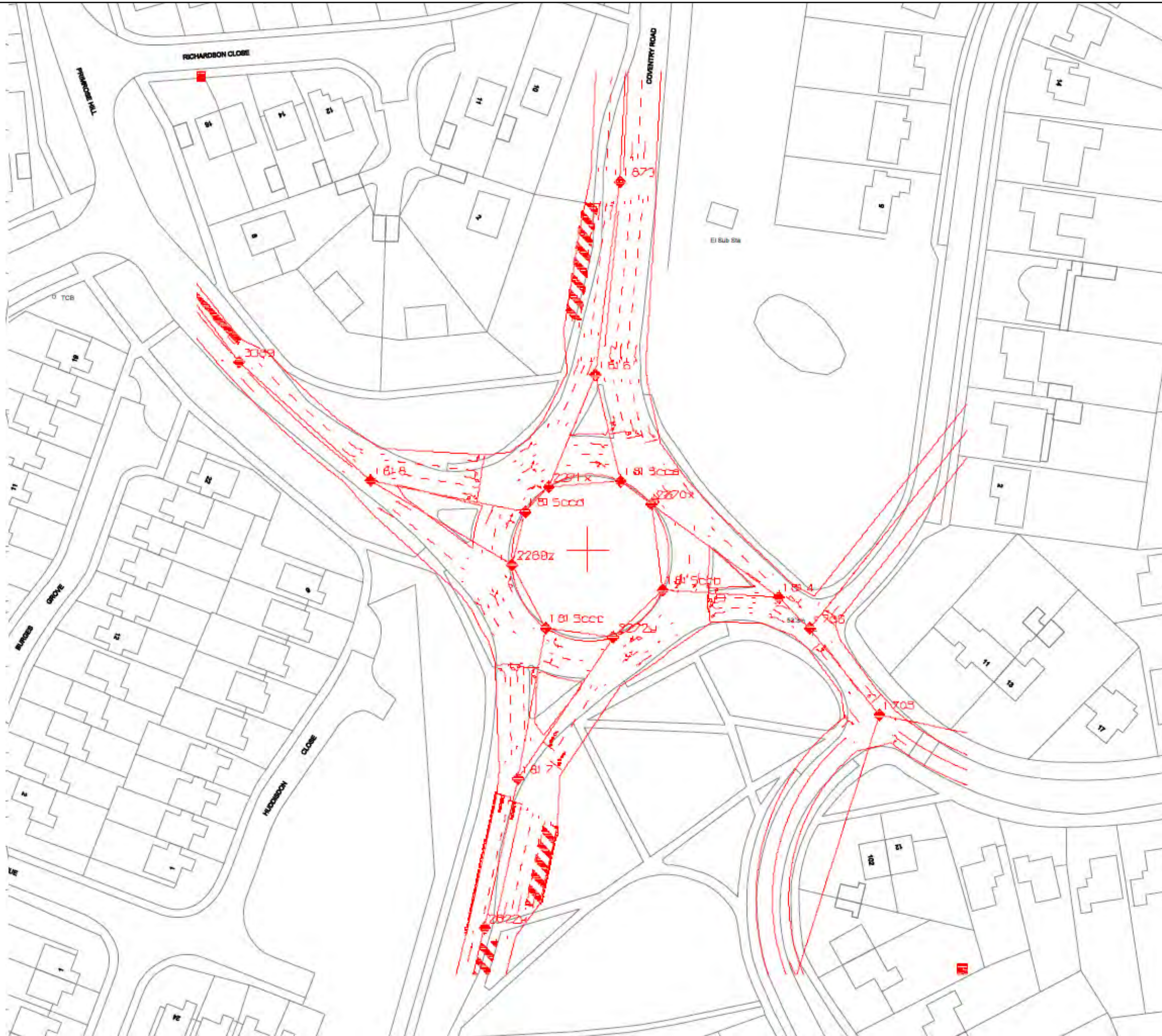
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A452 Blackdown Roundabout

Scale at A3

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211439-19	Information
Drawing No	Issue
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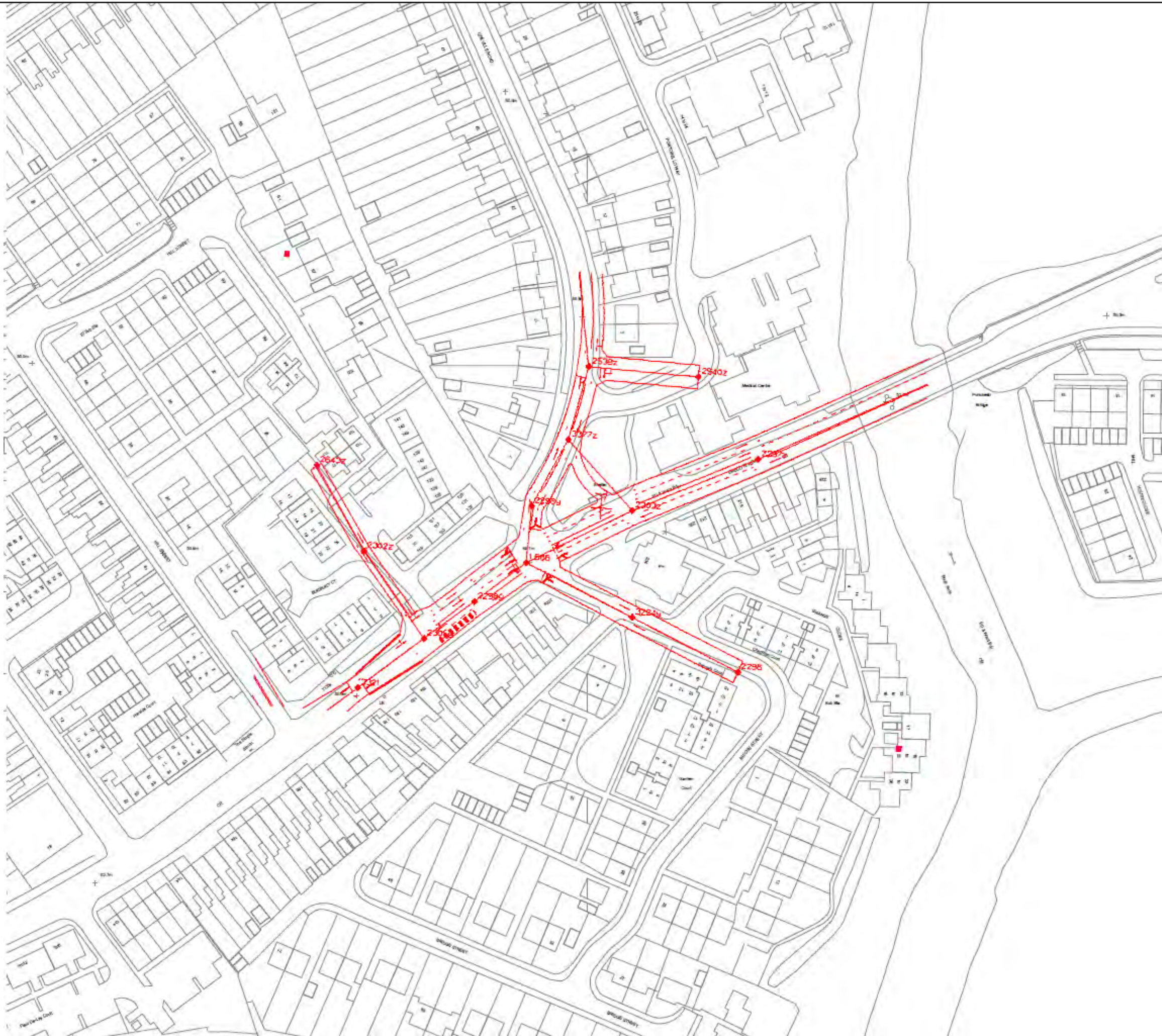
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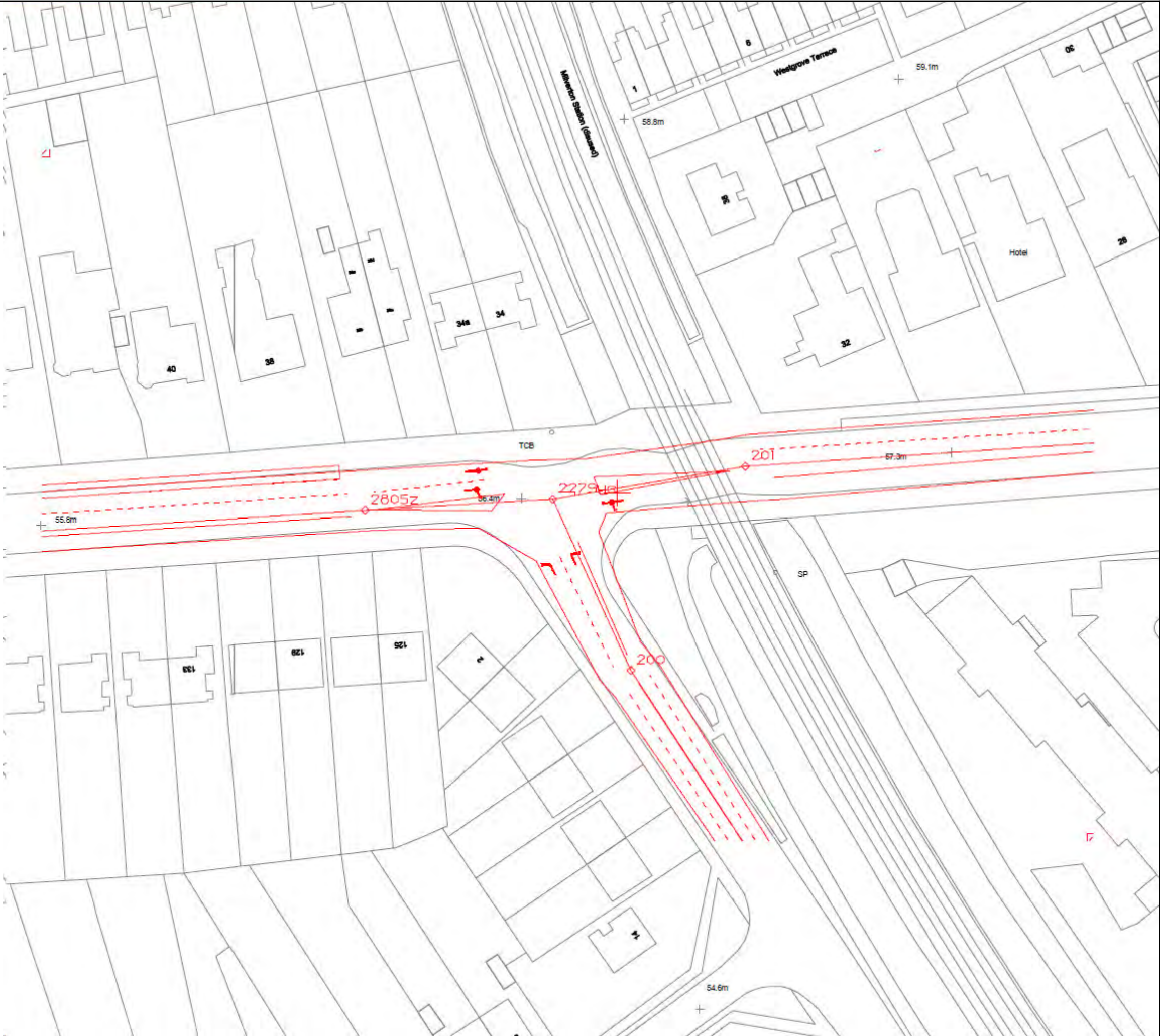
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N.T.S.

Job No 211439-19	Drawing Status Information
Drawing No APPC.06	Issue P1



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Client
Warwickshire County Council

Job Title
**Warwick District
Strategic Transport Assessment**

Princes Drive/Warwick New Road

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information
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Drawing No APPC.07	Issue P1
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Client
Warwickshire County Council

Job Title
**Warwick District
Strategic Transport Assessment**

Bath Street/High Street

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.08		



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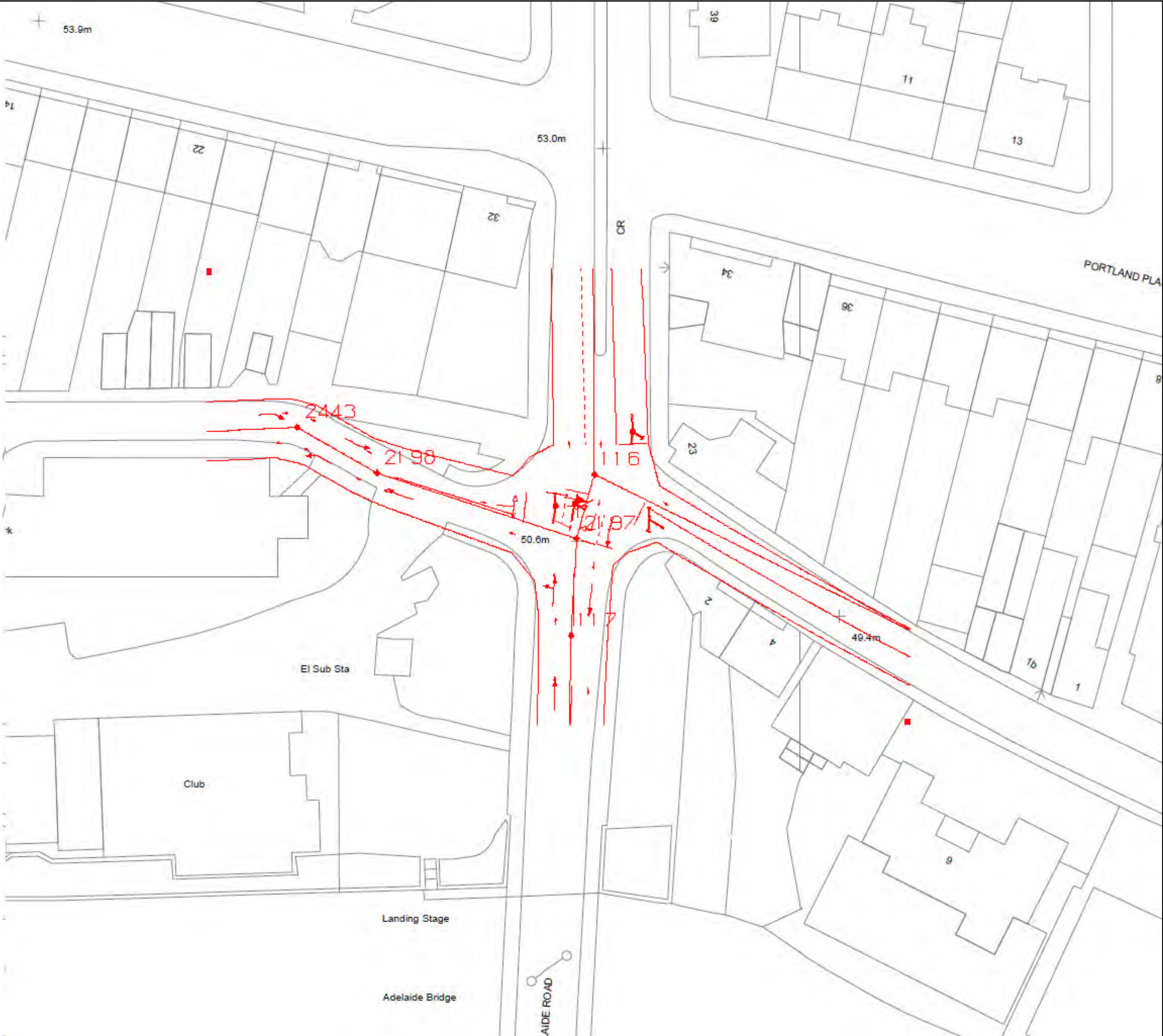
Job Title
**Warwick District
Strategic Transport Assessment**

Adelaide Road/Avenue Road

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information
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Drawing No APPC.09	Issue P1
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Job Title
**Warwick District
Strategic Transport Assessment**

Dormer Place/Adelaide Road

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.10		

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Issue	Date	By	Chkd	Appd
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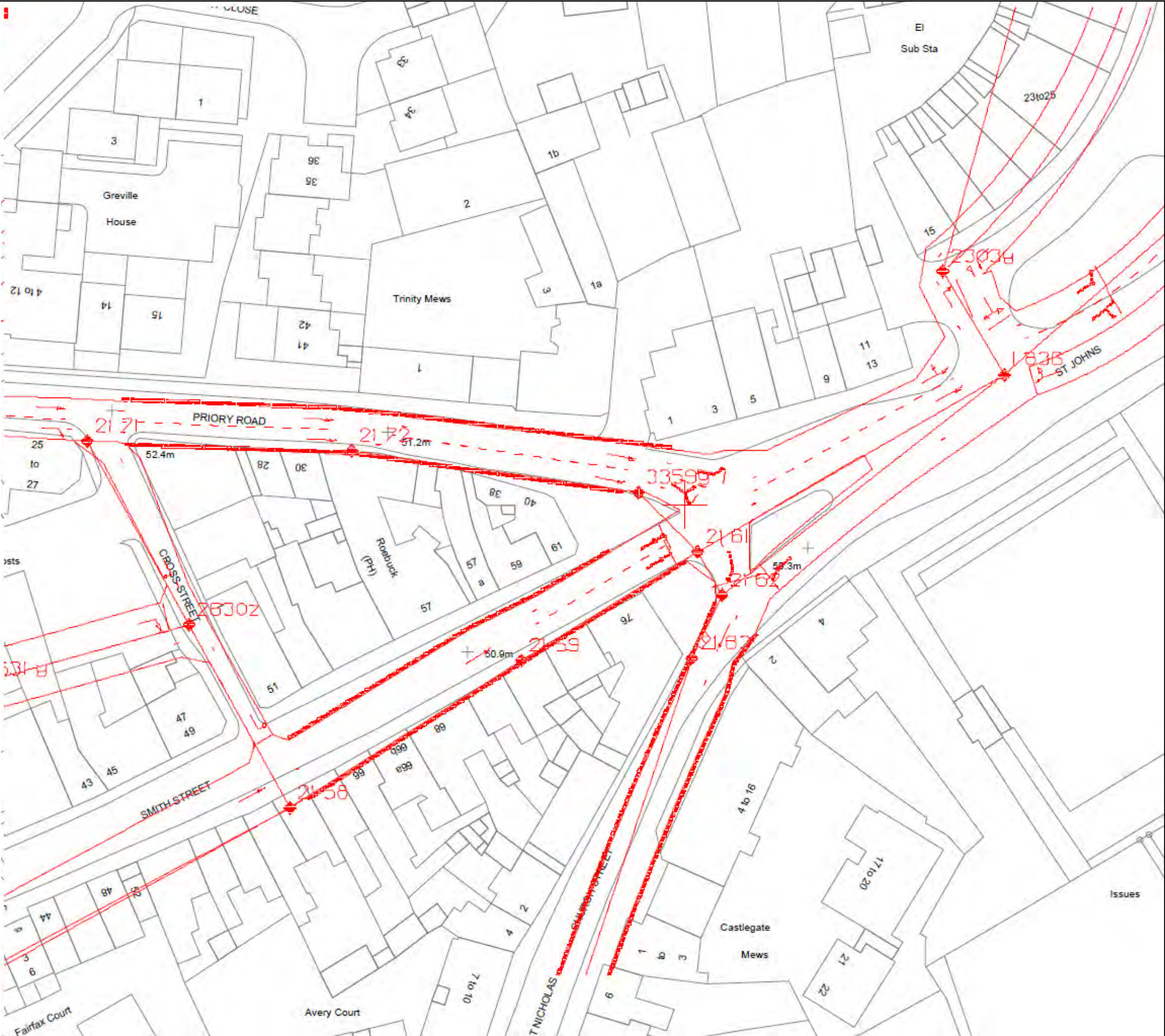
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Strategic Transport Assessment

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Job No 211439-19	Drawing Status Information	
Drawing No APPC.11		Issue P1



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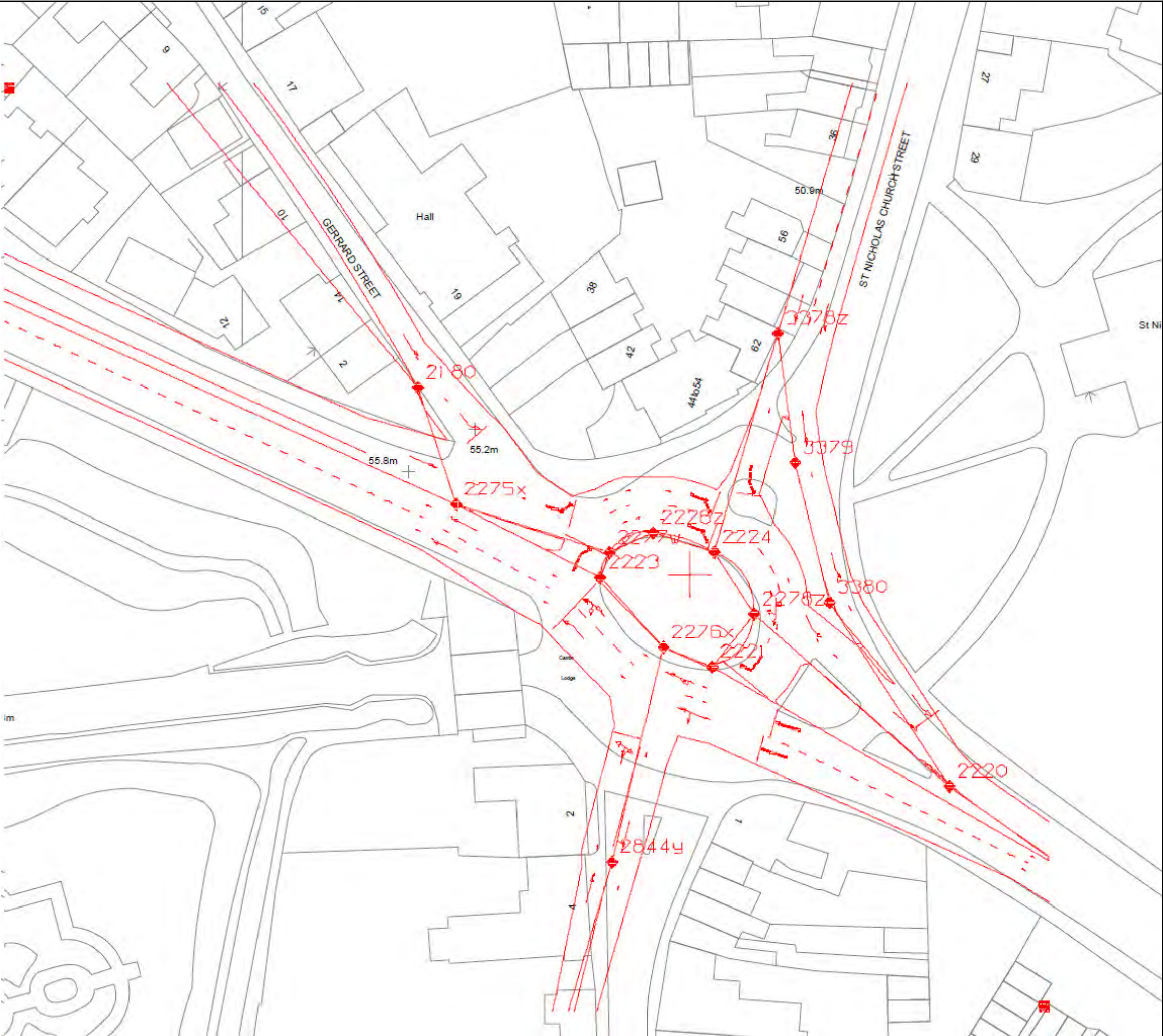
Client
Warwickshire County Council

Job Title
**Warwick District
Strategic Transport Assessment**

Priory Road/Smith Street/St Nicholas

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.12		



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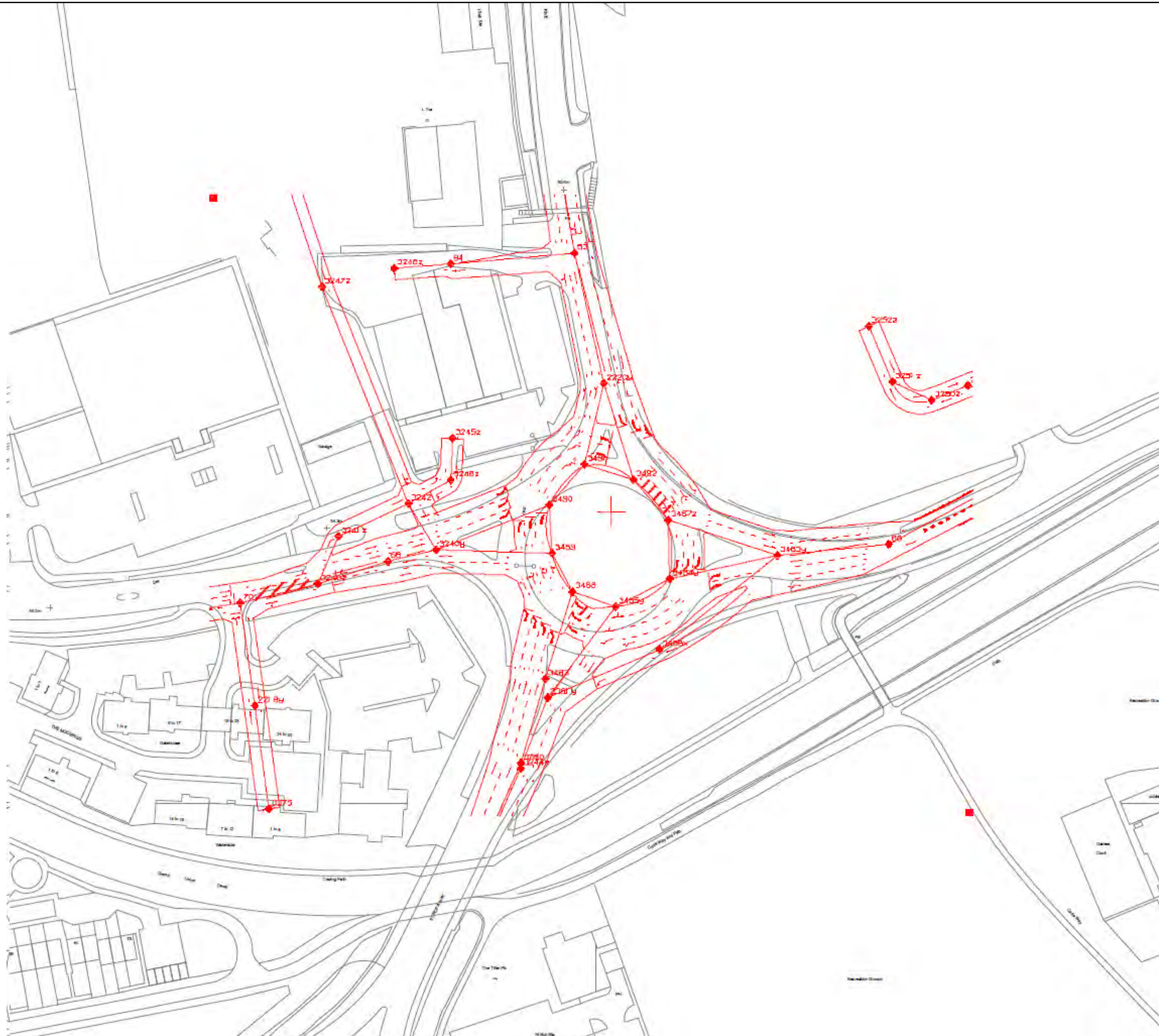
Job Title
**Warwick District
Strategic Transport Assessment**

Castle Hill Gyratory Signals

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information
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Drawing No APPC.13	Issue P1
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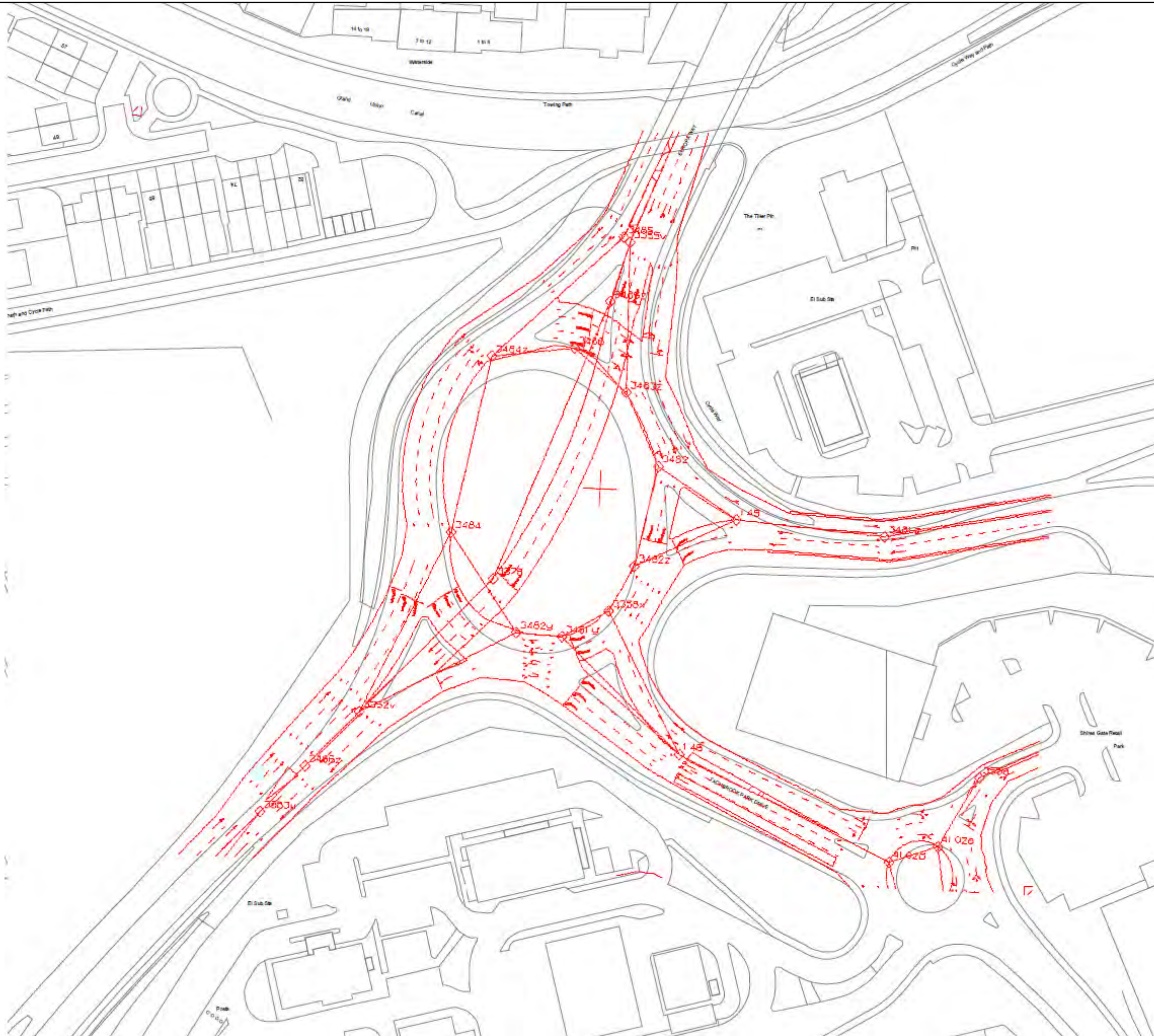
Warwickshire County Council

Warwick District
Strategic Transport Assessment

Europa Way/Myton Road Roundabout

N.T.S.

Job No 211439-19	Drawing Status Information
Drawing No APPC.14	Issue P1



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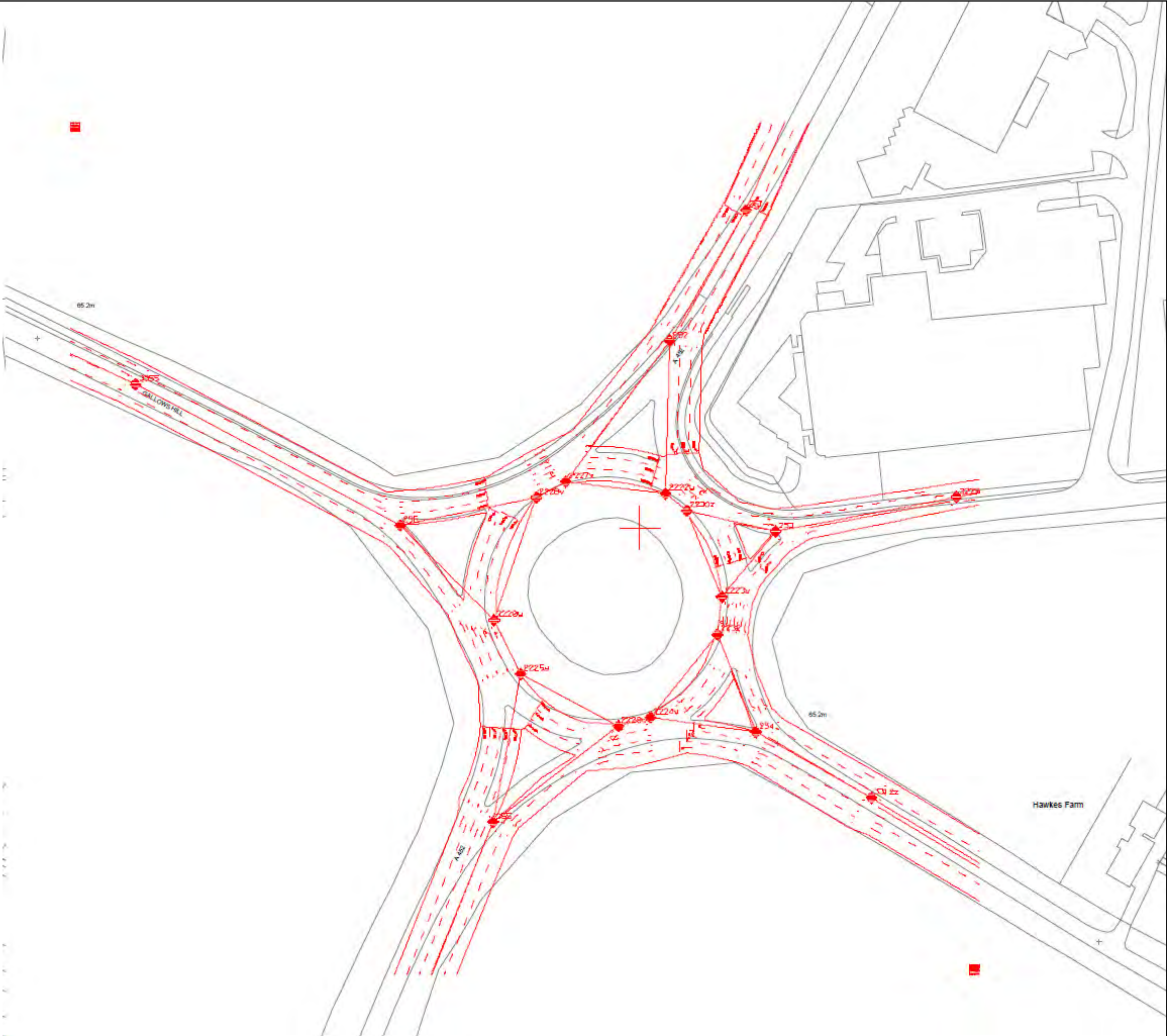
Warwickshire County Council

Warwick District
Strategic Transport Assessment

Scale at A3

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Job No 211439-19	Drawing Status Information	
Drawing No APPC.15		Issue P1



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Job Title
**Warwick District
Strategic Transport Assessment**

Europa Way Roundabout

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.16		



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Issue	Date	By	Chkd	Appd
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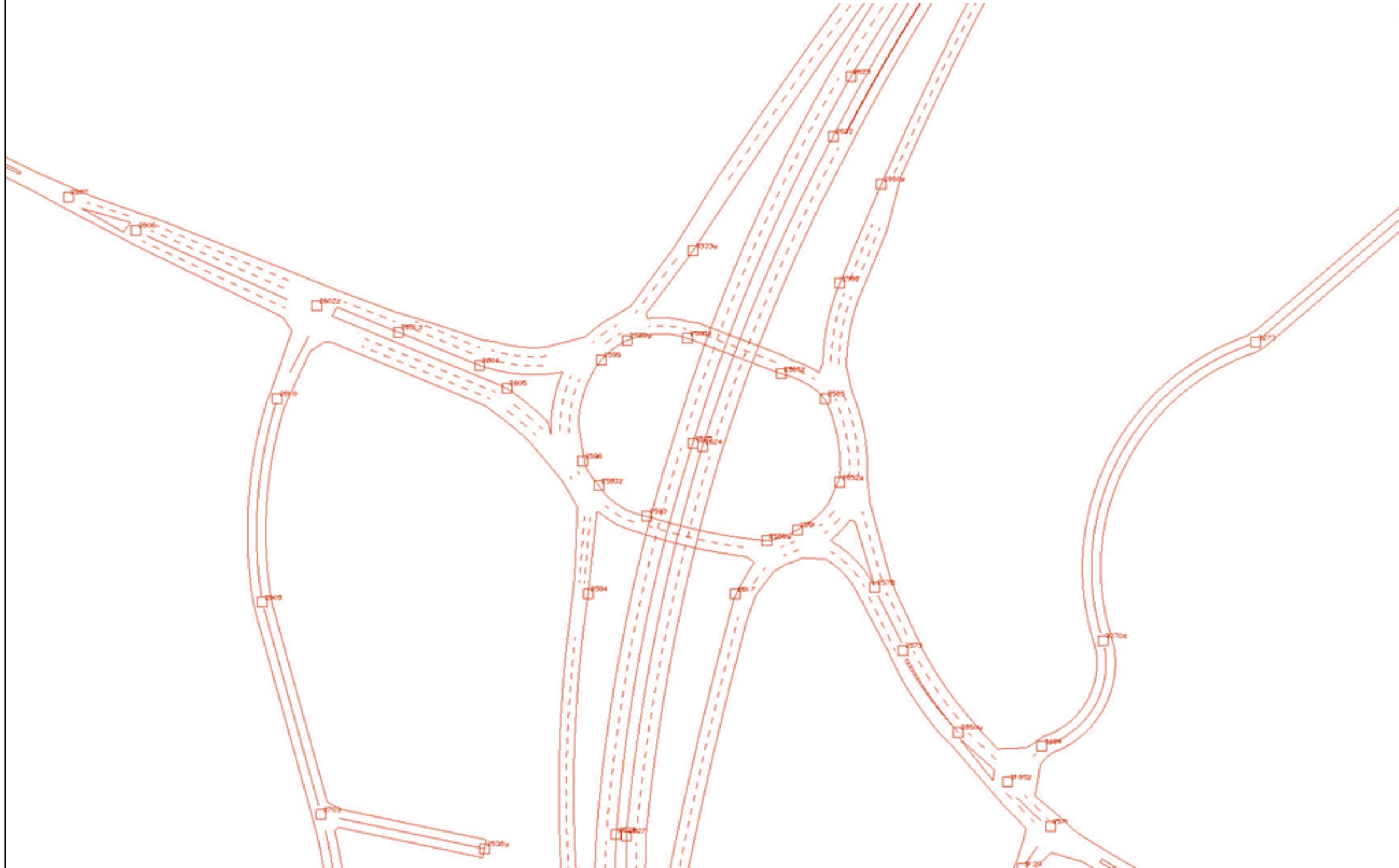
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Job No 211439-19	Drawing Status Information
Drawing No APPC.17	Issue P1



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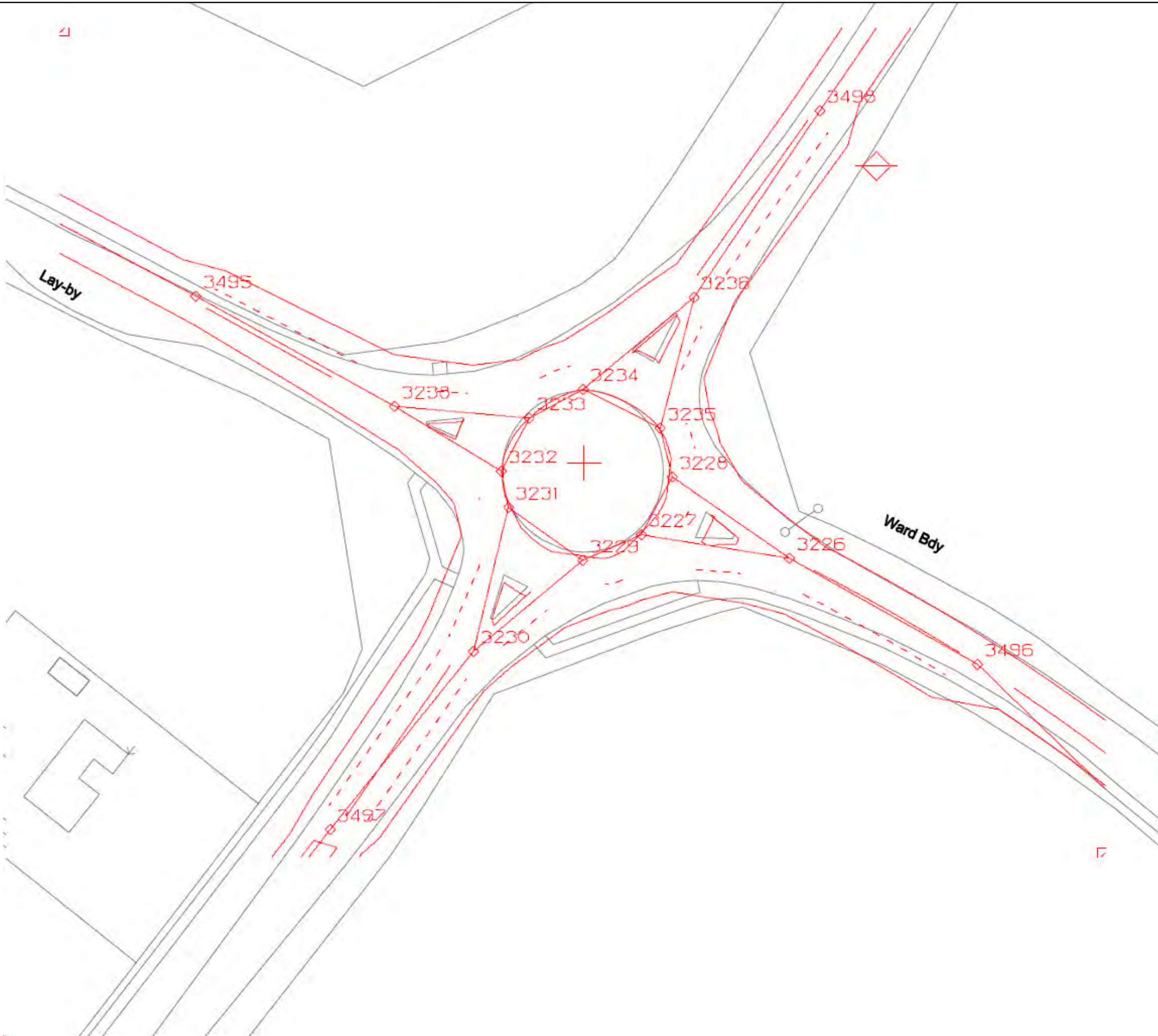
Warwickshire County Council

Warwick District
Strategic Transport Assessment

A46/Birmingham Road 'Stanks Island'

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Job No 211439-19	Drawing Status Information
Drawing No APPC.18	Issue P1



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Job Title

Warwick District
Strategic Transport Assessment

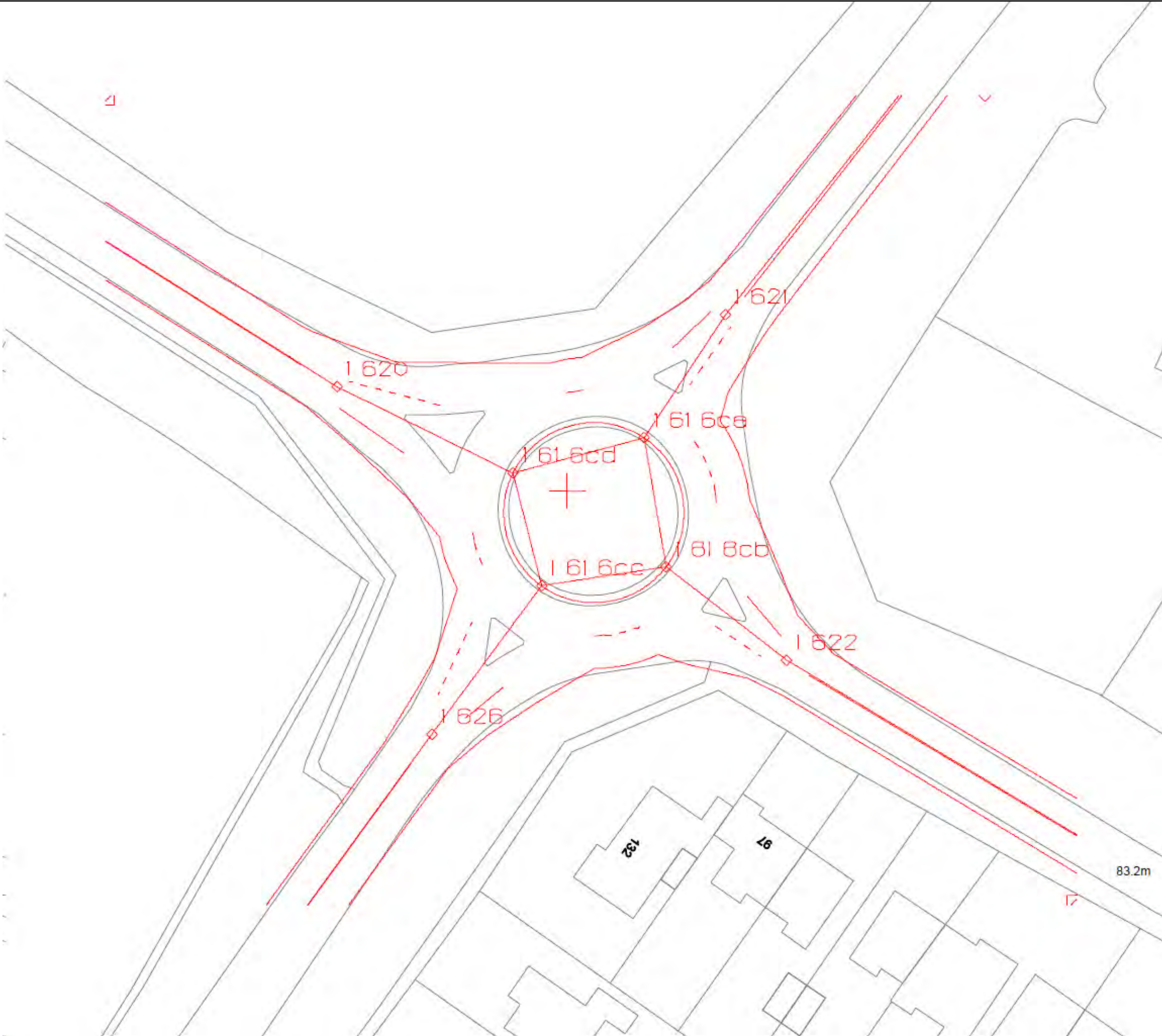
Bericote Road Stoneliegh Road

Scale at A3

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Job No	Drawing Status
211439-19	Information

Drawing No	Issue
APPC.19	P1



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Strategic Transport Assessment**

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211439-19	Information

Drawing No	Issue
APPC.20	P1



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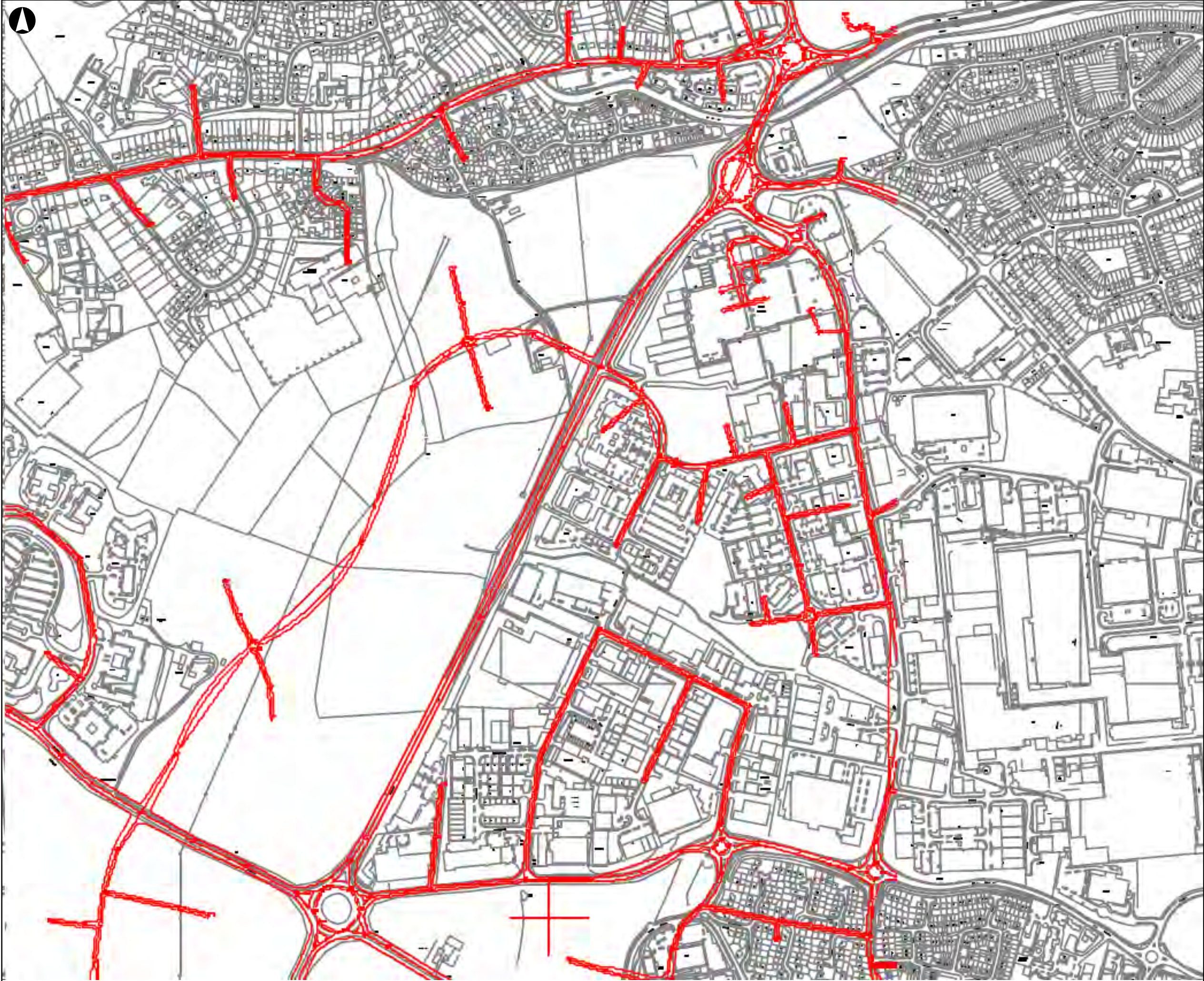
Job Title
**Warwick District
Strategic Transport Assessment**

Europa Way Corridor – Part 1

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information
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Drawing No APPC.21	Issue P1
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Job Title
**Warwick District
Strategic Transport Assessment**

Europa Way Corridor – Part 2

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.22		



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Client
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Job Title
**Warwick District
Strategic Transport Assessment**

Gallows Hill – 2 Lanes

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.23		



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Job Title
**Warwick District
Strategic Transport Assessment**

Banbury Road – 2 Lanes

Scale at A3
N.T.S.

Job No 211439-19	Drawing Status Information	Issue P1
Drawing No APPC.24		