

APPENDIX 15-2

TRAFFIC MANAGEMENT PLAN FOR CARRIG RENEWABLES WIND FARM DEVELOPMENT

REVISION D

Alan Lipscombe Traffic & Transport Consultants Ltd
Claran, Headford, Co Galway

Email - Info@alipscombetraffic.ie
Tel – 093 34777
Mob – 087 9308134

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1 INTRODUCTION

1.1 Purpose of note

The purpose of this Traffic Management Plan (TMP) is to set out traffic management measures that the Applicant will commit to provide during the construction stage of the proposed Carrig Renewables Wind Farm Development (Proposed Development). The successful completion of the Proposed Development will require significant coordination and planning and a comprehensive set of mitigation measures will be put in place before and during the construction stage of the Proposed Development in order to minimise the effects of the additional traffic generated on the surrounding road network. The measures are discussed and under the following headings;

- Section 2 – Delivery of abnormally sized loads transporting turbine components,
- Section 3 – Management of standard HGVs on the short 1.2km section of the L-5040 leading to the site,
- Section 4 – Traffic management measure during construction of the cable grid connection,
- Section 5 – General traffic management measures that will be implemented before, during and on completion of the construction of the Proposed Development.

It is confirmed that details for the Traffic Management Plan for the Proposed Development will be agreed with the Road Section of Tipperary County Council prior to construction.

On the occasions where reference is made to figures that are included in the EIAR prepared for the Proposed Development, these figures are include as Appended A.

2 DELIVERY OF ABNORMALLY SIZED LOADS TRANSPORTING TURBINE COMPONENTS

2.1 Proposed delivery route for abnormally sized loads

The proposed port of entry for the large wind turbine components is the Port of Foynes in County Limerick. From the port the delivery route travels east on the N69 before joining the M7 to the southwest of Limerick City. The route then travels south of Limerick on the M7 heading east in the direction of Roscrea and Borris-in-Ossory.

A detailed assessment commences at this point, which is shown in Figure 15-1a of the EIAR, where the proposed turbine delivery route turns left off the M7 junction 21 slip road to travel towards the Wind Farm Site on the national and local road network. The proposed turbine delivery route is as follows;

- Shannon-Foynes Port to the M7 south of Limerick City followed by the M7 towards to Junction 21 south of Borris-in-Ossory.
- From the M7 the turbine delivery route heads north of the R435 for 2.3km to the roundabout with the R445 to the west of Borris-in-Ossory.
- The turbine delivery route then turns left heading west on the R445 for 9.4 kms to the roundabout with the N62.
- From here the route travels west on the N62 for 19.6kms through Roscrea before traveling northwest to the town of Birr.
- Just to the south of Birr town centre the route then turns left onto the N52 travelling southwest for 7.1 kms through Riverstown to the junction with the L-5040 Local Road.
- At this location the route heads west on the L-5040 for 1.2kms to the proposed site access junction which is located on the north side of the local road.

An assessment of the turning requirements of the abnormally large loads transporting the turbine components was undertaken at the various pinch points along the route from the M7 to the site entrance, as identified in Figure 15-1b of the EIAR (attached in Appendix A of this report), with the swept path assessments undertaken for these locations discussed in Section 15.1.9 of the EIAR.

2.2 Traffic management measures for abnormally sized loads

The transport of large components is challenging and can only be done following extensive route selection, route proofing and consultation with An Garda Síochána, the local authority and its road section and roads authorities. Turbine components are usually transported in convoys of 3 vehicles

at night when traffic is lightest. This will be undertaken in consultation with the roads authorities, An Garda Síochána Traffic Corp and special permits are generally required.

A swept path analysis was undertaken at all locations using Autotrack in order to establish the locations where the wind turbine transporter vehicles will be accommodated, and the locations where some form of remedial measure may be required. In some cases, minor accommodation works are required along the turbine delivery route such as hedge or tree cutting, temporary relocation of powerlines/poles, lampposts, signage and local road widening. Any temporary works required to the public road network will be carried out in advance of turbine deliveries and following consultation and agreement with the relevant authorities. While transient traffic management measures will be implemented by An Garda Síochána as each convoy travels along the delivery route, it is not anticipated that any sections of the local road network will be closed.

A dry run involving a vehicle adapted to replicate the geometry of the extended transport vehicles will be undertaken over the entire turbine delivery route prior to the construction stage of the Proposed Development.

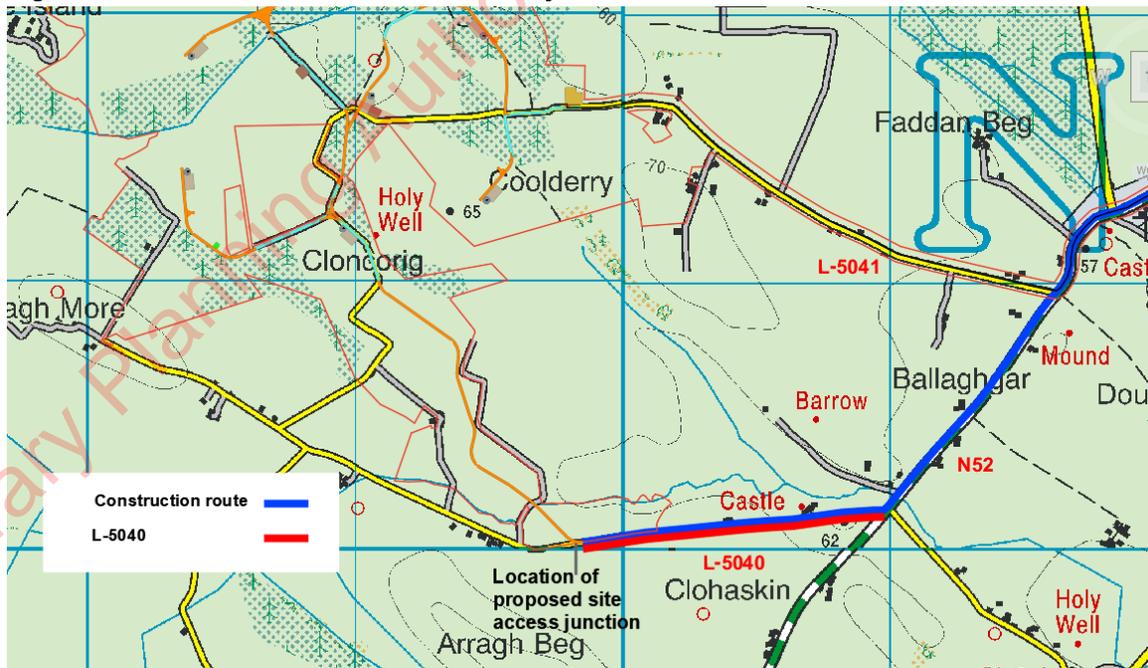
3 MANAGEMENT OF STANDARD HGVS ON L-5040 LEADING TO THE SITE

3.1 The need for L-5040 traffic management measures

The L-5040 local road forms the final section of the proposed delivery route between the N52 and the proposed new site access junction for all traffic generated during the construction phase of the Proposed Development, as shown in Figure 1. The exception to this is traffic generated during the construction of the cable grid connection that will access the site via the L-5041 to the north, also shown in Figure 1, and discussed further in Section 4 of this note. The key issues to be considered in the development of traffic management measures for this section of the general construction traffic delivery route are as follows;

- Receiving environment - Including the road geometry of the L-5040 and the existing development on the road.
- Year 2023 and construction year 2028 background traffic volumes.
- Development construction generated traffic and with construction traffic volumes - Volumes forecast to be generated during the construction stage of the proposed development and an assessment of “with development construction” traffic flows on the N52 / L-5040.
- Proposed construction traffic management measures for the N52 / L-5040.

Figure 1 Section of L-5040 on delivery route



Larger version of Figure 1 Included at rear of report

3.2 Receiving environment - the L-5040 between the N52 and the proposed site access junction

N52 / L-5040 junction

The N52 / L-5040 junction takes the form of a simple priority junction with the latter forming the minor arm of the junction. The L-1072 links into the N52 from the east forming a slightly staggered junction with the N52 and the L-5040.

Visibility for traffic movements between the N52 and the L-5040 are clear for drivers both exiting the L-5040 onto the N52, and for southbound traffic on the N52 to observe a vehicle waiting to turn right into the L-5040. The N52 is a standard Type 3 (6.0m) carriageway. At the junction with the N52 the L-5040 is a 2-way carriageway with standard STOP road markings and signage. The N52 / L-5040 junction is shown in Plate 1.

Plate 1 N52 / L5040 junction



The L-5040 and site access

From the junction with the N52 the L-5040 travels west towards the site access which is located approximately 1.2 kms from the N52 in the townland of Clohaskin. On this section of the L-5040 there are 3 residential / farm buildings. Based on a speed of 30 km/h it takes 2.4 minutes to drive this section of the L-5040. Just to the west of the N52 the L-5040 carriageway narrows to a width that varies between 3m and 4m which is generally sufficient for one-way traffic only. There are a

number of locations between the N52 and the proposed site access where the L-5040 widens and where 2-way traffic flow is provided for. It is noted that the management of construction traffic does not, however, rely on these passing opportunities, but rather the measures outlined in Section 3.5 below. An example of a passing opportunity is shown in Plate 2.

Plate 2 L-5040 between N52 and site



The location of the site access is shown in Figure 1 and Plates 3 to 5. The proposed junction design is discussed in Section 15.1.9 of the EIAR and shown in Figure 15-30 of the EIAR (included in Appendix A of this report).

Plate 3 Location of proposed access on L-5040



Plate 4 Location of proposed access looking east along the L-5040



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Plate 5 Location of proposed access looking west along the L-5040



3.3 Base year 2023 and construction year 2028 background traffic flows

All turning flow diagrams referred to in the section are included as Appendix B.

A classified turning count was undertaken by Traffinomics Ltd at the N52 / L-5040 junction on Thursday May 4th, 2023. Year 2023 traffic flow are shown for the All day, AM peak hour and PM peak hour time periods in terms of all vehicles and HGVs only in Figures B1 and B2 respectively. The observed 2023 traffic flows were factored to year 2028 construction year traffic flows based on growth estimated forecast by Transport Infrastructure Ireland (2023 to 2028 = +1.061%). Year 2028 turning flows for all day, AM peak and PM peak hours are shown in Figure B3 for all vehicles, and HGVs only in Figure B4, while the same information is summarised in Tables 1 and 2. Salient points to note in relation to background traffic volumes forecast for the construction year of 2028 are;

- AM and PM peak hours on the L-5040 were observed to be 08:00 to 09:00 and 18:00 to 19:00 respectively.
- 2-way traffic volumes on the N52 are relatively low compared to a capacity of 5,000¹ vehicles per day, with a 2-way daily flow of 2,340 vehicles forecast for the year 2028, and a maximum hourly flow of 262 vehicles (observed during the AM peak hour).
- A maximum background 2-way hourly flow of 30 vehicles is forecast on the L-5040, of which 3 of these vehicles are HGVs (this applies to the PM peak hour).

¹ For Type 3 Single National Secondary Road, Rural Road Link Design, DN-GEO-03031, June 2017, TII

It is concluded that background traffic flows forecast for the construction year of 2028 are relatively low on the N52 and very low on the L-5040.

Table 1 Background traffic flows on the L-5040, year 2028, all vehicles

Time period	Background		
	e/bound	w/bound	2-way
All day	138	129	267
AM peak hour	11	7	18
PM peak hour	18	12	30
Ave inter peak	7	8	15

Table 2 Background traffic flows on the L-5040, year 2028, HGVs

Time period	Background		
	e/bound	w/bound	2-way
All day	12	10	22
AM peak hour	0	0	0
PM peak hour	2	1	3
Ave inter peak	0	4	4

3.4 Wind farm construction generated traffic and with construction traffic flows

Construction generated traffic

During the construction period of 12 months, or 255 working days, for the Proposed Development the critical days in terms of the volume of deliveries made by standard HGV's, trucks and concrete mixers are as follows;

- Concrete foundation pours (7 days) – On these days 107 deliveries will be made to the site by concrete mixers. Based on a 10 hour day between 08:00 and 18:00 this will result in 11 movements to and from the site per hour.
- Site preparation and general construction (222 days) – On these days a total of 23,790 deliveries will be made to the site, coincidentally also with an average of 107 deliveries made per day by varies types of HGVs. Again, this will result in 11 deliveries made per hour.

There will be other days when deliveries are made to the site, including when the abnormally large loads carrying the turbine components deliver to the site. These deliveries will be made to the site

in convoys of 3 to 5 vehicles during nighttime hours with a Garda escort. The traffic management measures and geometric requirements for the abnormally sized deliveries are summarised in Section 2 of this note.

During the construction of the Proposed Development, it is estimated that 40 to 70 construction staff will travel to and from the site, with between 10 to 30 staff being on site at any one time. The contractor, in conjunction with all sub-contractors, will ensure that all trips made by construction staff will be made outside the time periods that deliveries are made to the site.

Forecast traffic movements on the L-5040 during busiest construction days, year 2028

The additional HGVs of various types (concrete mixers, artics, rigids and trucks) that are forecast to be generated on the 229 construction days described above are shown in Figures B5 and B6, while traffic flows with construction traffic are shown in Figures B7 and B8. The main points to note from the traffic flows which are summarised in Tables 3 and 4, are:

- On a typical weekday in 2028 it is forecast that there will be a total of 267 background daily traffic movements (all vehicle types) on the L-5040. It is forecast that this number will increase to 481 traffic movements on the busiest construction days.
- In terms of HGV movements only, it is forecast that the number of movements on the L-5040 will increase from a total of 22 movements to 236 movements.

When considering the level of traffic management required to accommodate the additional HGV movements generated by the Proposed Development, it is more appropriate to consider traffic volumes per hour.

- The busiest observed hour on the L-5040 is the PM peak hour (18:00 to 19:00) when it is forecast that there will be a total of 30 background vehicle movements in the year 2028, which is forecast to increase to 52 movements on the busiest construction days.
- In terms of HGVs only, it is forecast that there will be a maximum of 3 background HGV movements which will increase to 25 movements in one hour on the busiest construction days.

Table 3 Traffic flows on the L-5040, year 2028, background, construction and with development – all vehicles

Time period	Background Only			Construction Only			Background and Construction		
	e/bound	w/bound	2-way	e/bound	w/bound	2-way	e/bound	w/bound	2-way
All day	138	129	267	107	107	214	245	236	481
AM peak hour	11	7	18	11	11	22	22	18	40
PM peak hour	18	12	30	11	11	22	29	23	52
Ave inter peak	7	8	15	11	11	22	18	19	37

Table 4 Traffic flows on the L-5040, year 2028, background, construction and with development – HGVs

Time period	Background			Construction			With construction		
	e/bound	w/bound	2-way	e/bound	w/bound	2-way	e/bound	w/bound	2-way
All day	12	10	22	107	107	214	119	117	236
AM peak hour	0	0	0	11	11	22	11	11	22
PM peak hour	2	1	3	11	11	22	13	12	25
Ave inter peak	0	4	4	11	11	22	11	15	26

3.5 Proposed traffic management measures for L-5040 during construction

Summary of key points for consideration

The main points for consideration in the development of traffic management measures on the L-5040 during the construction of the Proposed Development are;

N52

- The N52 is a national secondary road. Transport Infrastructure (TII) will, in addition to Tipperary County Council, also therefore review the traffic management measures proposed.
- It is imperative, for the efficient progression of the construction phase of the wind farm, that construction related traffic is not unduly delayed when turning into the L-5040 from the N52.

L-5040 - geometry

- The section of the L-5040 is 1.2 kms in length. Based on an average speed of 30 km/h it takes 2.4 minutes to drive.

- In general, the L-5040 permits one-way traffic only, although there are passing opportunities on this section of the L-5040. It is noted that there is also an alternative route to the N52 via the L-5041 just to the north, as shown in Figure 1.

L-5040 – construction year 2028 traffic flows

- In terms of background traffic flows in the construction year 2028, a maximum 2-way hourly flow of 30 vehicles is forecast on the L-5040, of which 3 of these vehicles will be HGVs (observed during the PM peak hour 18:00 to 19:00).
- During the construction of the Proposed Development an average of 107 HGV trips will travel to and from the site along this section of the L-5040, equating to 11 trips to and from the site per hour during a 10 hour day.
- Between 10 and 30 construction staff will travel to and from the site per day, with a minimum of 2 staff traveling per car, resulting in a maximum of 15 cars trips to and from the Proposed Development site per day. It is proposed that these trips will take place in the time periods between the HGV convoys.

Key elements of proposed traffic management on the L-5040 during construction

Development construction generated standard HGV's

As set out above, 11 HGVs will travel to and from the site, each hour for 10 hours a day for a total of 229 days.

If permitted to access and leave the site at random times each of these HGV trips could potentially meet an on-coming construction HGV travelling in the opposite direction on the L-5040 in 26.4 minutes (11 x 2.4 minutes) out of each hour (44% of the time). Based on the relatively high chance of 2 construction generated HGVs meeting, it is proposed that the key component of the traffic management measures to be implemented during this period will be the implementation of a “**convoy system**” that will strictly control the arrivals to, and departures from the site in order to ensure that HGVs do not meet on the section of the L-5040 between the N52 and the proposed site access junction

Of the 24,539 deliveries (107 deliveries per full working day) that are estimated to be made to the site within the main construction phase (229 working days), 21,051 of these deliveries (86% or 197 days) will be for the delivery of concrete, infill materials and road construction materials. All of these deliveries will be made by 1 or 2 suppliers meaning that it will be relatively straight forward to have the materials arrive in convoys of 3 vehicles at a time, with 1 convoy arriving every 15 minutes, which covers the requirement for 11 deliveries per hour. Once empty, the vehicles would then exit the site in the same convoys during the time periods between the deliveries, which will be manually

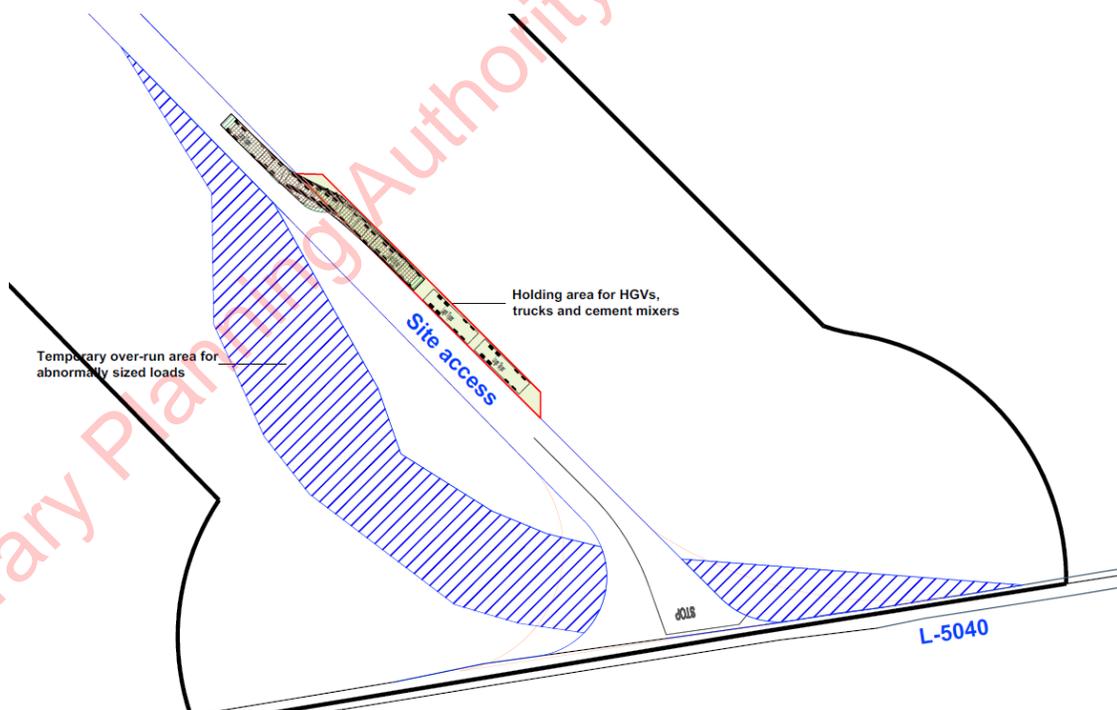
controlled on site. With approximately 2.4 minutes of each 15 minute period required for one convoy to access the site via the L-5040, and the same time required for a convoy to exit the site (total of 4.8 minutes) it will leaving approximately 10 minutes of each 15 minute period free of construction traffic and for contingencies.

For the remaining 32 days when various suppliers will deliver to the site a similar approach will be adopted with deliveries scheduled into 3 vehicle convoys from the same supplier.

In order to be able to control effectively the timing of convoys of HGVs travelling along the L-5040, a holding area will be required at each end of the L-5040. At the western end the holding area will be situated on the site access road just within the site, as shown in Figure 2. At the eastern end the proposed holding area will be on the same strip of land located on the southern side of the L-5040 required to be available for the delivery of the abnormally large loads, shown as Option A in Figure 3. An alternative option, shown as Option B, is also available on a strip of land available on the east side of the N52.

The retention of the existing 3m x 215m visibility splays at the N52 / L-5040 junction is shown in Figure 4, which demonstrates that the proposed holding area will not impact on this. It is noted that that this proposed holding area will be closed off during all times outside of delivery hours.

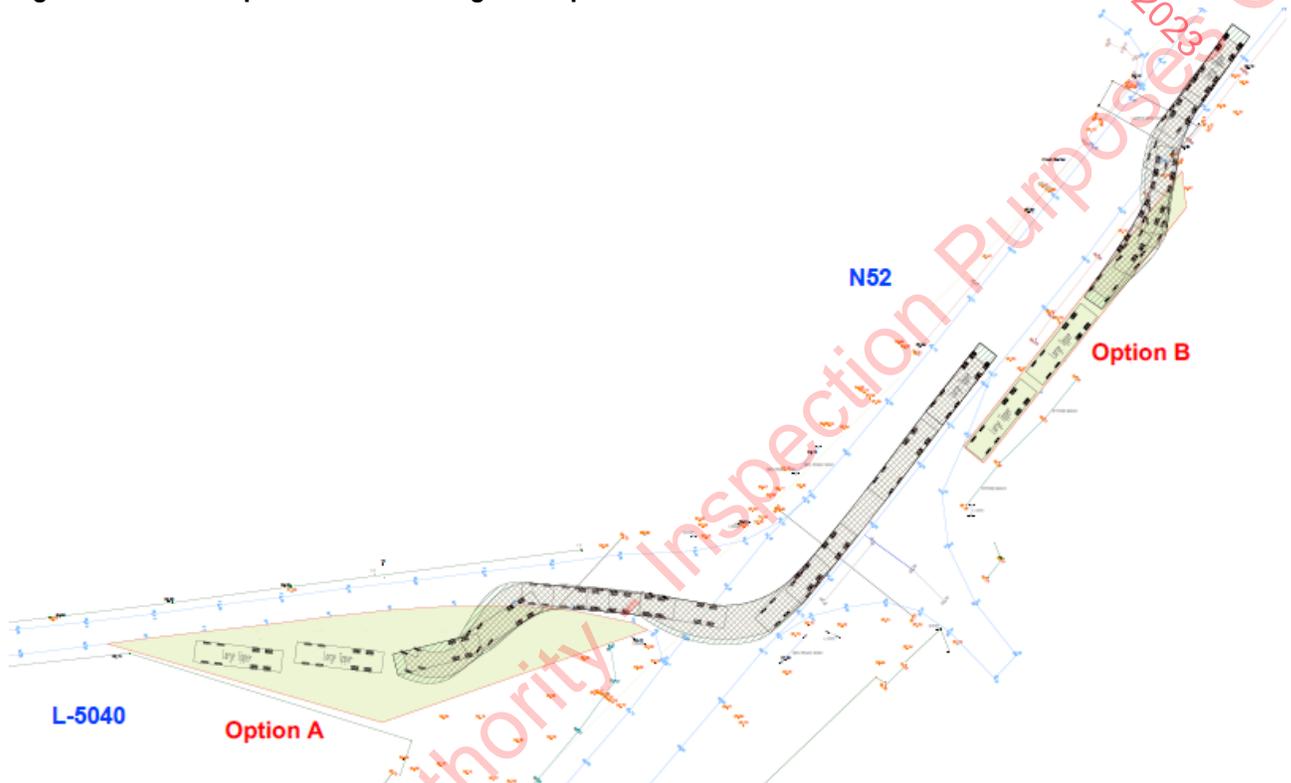
Figure 2 Proposed HGV holding area on site access



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At all times when the deliveries are taking place it is proposed that there will be one member of staff located at the holding area adjacent to the site entrance on the western extent of the L-5040 and one member of staff located at the holding area at the eastern end of the L-5040. The 2 will be in continuous radio contact during delivery times.

Figure 3 Proposed HGV holding area options at east end of L-5040

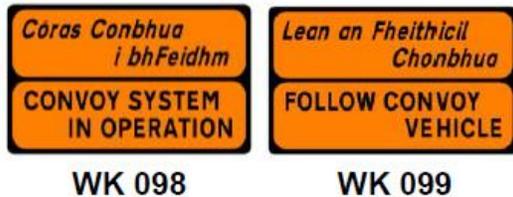


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The size of convoys could vary depending on the number of trucks/HGVs each supplier has available, although a minimum convoy of 3 HGVs is proposed. Maintaining control of the arrival times of each convoy will be essential for the above to operate in practice. In order to control this, it is proposed that each convoy travelling to the site will arrive at the holding area located at the eastern end of the L-5040 in pre-determined 15 minute intervals. Each inbound convoy would then be released by the radio operator located at the eastern end of L-5040 to travel westbound along the L-5040, while the radio operator located within the site boundary holds back the convoy waiting to exit the site. The process would then be repeated in reverse with the convoy exiting the site released to travel eastbound along the L-5040 while any HGVs arriving to site are held at the eastern holding area on the L-5040. In practice GPS tracking or similar could be used to assist the traffic management operators on the ground, and the quarries/providers, to maintain consistent time periods between convoys travelling to and from the site.

This process will be repeated 4 times per hour between the hours of 08:00 to 18:00. In the unlikely event that construction HGVs do meet on the L-5040 site staff will be on stand-by to assist.

It is proposed that the CONVOY SYSTEM IN OPERATION, Sign WK 098 of Chapter 8 of the Traffic Signs Manual, modified to include FOR CONSTRUCTION HGVs, will be implemented at either end of the L-5040. While it is not proposed at this stage, a convoy vehicle, which would escort each HGV convoy along the L-5040, may be considered. If such a measure is included the convoy vehicle would be fitted with the FOLLOW CONVOY VEHICLE, Sign WK099.



Local background traffic

Based on the low volumes of background traffic forecast during the construction period, together with the frequent passing opportunities that exist on the route, it is considered that background cars (27 movements per hour) will have adequate opportunities to pass the 11 HGV's forecast to travel to and from the site per hour.

For the existing HGV / agricultural trips (3 per hour) it is proposed to engage with the drivers, which are likely to be local and generated by the 3 dwellings / farms on this section of the L-5040, in order to establish origins / destinations and times of these trips to determine if they may be separated from development construction traffic on a time basis. As detailed above, construction traffic will travel on this section of the L5040 for approximately 5 min in each 15 minute period, or for approximately 20 minutes in each hour.

4 TRAFFIC MANAGEMENT MEASURES DURING CONSTRUCTION OF CABLE GRID CONNECTION

In addition to traffic management measures required for additional traffic movements generated during the construction of the Wind Farm site, traffic arrangements and diversion routes identified for the grid connection works are included in Section 15.1.7 of the EIAR. Sections along the grid connection underground electrical cabling route where there will be road and pedestrian footpath closures, diverted traffic, and Stop/Go traffic control are identified.

It is proposed that the 38kV onsite electrical substation in the townland of Faddan More is connected by means of an underground 38kV electricity cable to the existing 110kV Dallow substation located in the townland of Clondallow, north of Birr, Co. Offaly. The proposed underground electrical cabling route is approximately 17.4km in length and is located predominately within the public road corridor. For the extent of the underground electrical cabling route that will impact on the public road network the Grid Connection is considered in 11 sections, as indicated in Figure 15-6 of the EIAR, which is included in Appendix A of this report. All EIAR Figures 15-7a to 15-7k which are referred to in the following text are also included in Appendix A.

The 11 sections of the route on the public road network are as follows;

Section 1 – (length 2.0 kms) – The 38kV Substation will be situated within a commercial forestry plantation located within the Proposed Development site with the cable route linking into the L-5041. From this point the electrical cabling route will continue south-east along the L-5041 for approx. 2.0km before joining the N52 in the townland of Ballaghar, County Tipperary. For this section of the underground electrical cabling route the carriageway width of the local road is narrow and local road closure at the location where the section of the underground electrical cabling route is being constructed will be required. Based on an average rate of 150m of cable being constructed in one day, it is estimated that this section of the underground electrical cabling route will take up to 13 days to complete. The location of the construction will be transient in nature with the extent of the section of road closed kept to a minimum. Local diversions will be put in place during the construction of this section with potential detour route indicated in Figure 15-7a. It is estimated that the diversion incurred by local traffic during the construction of this section of the cable route will be a maximum of 3.9 kms.

Section 1 – (length 2.0 kms) – The 38kV Substation will be situated within a commercial forestry plantation located within the Proposed Development site with the cable route linking into the L-5041. From this point the electrical cabling route will continue south-east along the L-5041 for approx. 2.0km before joining the N52 in the townland of Ballaghar, Co. Tipperary. For this section of the underground electrical cabling route, the carriageway widths of the local road are narrow and local road closure at the location where the section of the underground electrical cabling route is being

constructed will be required. Based on an average rate of 150m of cable being constructed in one day, it is estimated that this section of the underground electrical cabling route will take up to 13 days to complete. The location of the construction will be transient in nature with the extent of the section of road closed kept to a minimum. Local diversions will be put in place during the construction of this section with a potential detour route indicated in Figure 15-7a. It is estimated that the diversion incurred by local traffic during the construction of this section of ten cable route will be a maximum of 3.9 kms.

Section 2 – (length 2.6kms kms) – The underground electrical cabling route then continues northeast along the N52 for approximately 2.6kms to a point where it meets the L-9520. While there are locations on this section of the cable grid where a full road closure may be required it is considered that 1 lane of traffic will be retained during most days, with 2-way traffic flow retained by means of a “stop and go” traffic management arrangement. Construction of this section of the underground electrical cabling route will take approximately 17 days. In the event that a full road closure is required the potential diversion route is shown in Figure 15.7b which will result in a diversion of 3.0 kms.

Section 3 – (length 0.4kms) – This section of the route heads east on the L-9520 for 0.4kms to link into the L-1071. The carriageway is narrow and will require a full road closure during the approximately 3 days required for construction. The potential diversion route shown in Figure 15.7c will not result in any additional distance travelled for local trips.

Section 4 – (length 1.3kms) – This section of the route heads northeast on the L-1071 for 1.3kms to link back into the N52 just to the west of Riverstown. The carriageway is narrow and will require a full road closure during the approximately 9 days required for construction. The potential diversion route shown in Figure 15.7d will result in an additional length of up to 0.9kms for local trips.

Section 5 – (length 0.2kms kms) – This section continues on the N52 in a northeast direction between the L-1071 and the R489 in Riverstown. Should a full road closure be required during the construction of this short 0.2km section of the underground electrical cabling route, the diversion, as shown in Figure 15.7e, will be approximately 4.6 kms.

Section 6 – (length 1.2kms) – The underground electrical cabling route then travels northwest on the R489 for approximately 1.2km to the junction with the L5045 just to the east of Killeen National School. It is considered that during the construction of the section of the electrical cable grid route that 2-way, or one-way with a “stop and go” facility will be retained during the approximate 8 days of construction. In the event that a road closure is required at any location on this part of the route the potential diversion, which would add a maximum of 4.6km to a local trip, is shown in Figure 15.7f.

Section 7 – (length 1.7kms) – This section of the route heads north past Killeen National School on the L-5045 to link into the L-70065. The carriageway is narrow and will require a full road closure

during the approximately 11 days required for construction. The potential diversion route shown in Figure 15.7g will result in an addition length of up to 3.7kms for local trips.

Section 8 – (length 1.1kms kms) – The underground electrical cabling route then continues east along the L-70065 for approximately 1.1km where it turns on to the R439 on the northeastern edge of the Birr urban area. It is considered that a one-lane stop and go type arrangement will be retained on all 7 construction days. In the event that a road closure is required, a potential diversion route for this section is shown in Figure 15.7h, which would add 4.9kms to each trip impacted.

Sections 9 and 10 – (length 0.5 km and 2.0 kms) – Both of these sections of the route are on the R439 heading north out of Birr where a one-lane stop and go type arrangement will be retained on the 3 and 13 days required for construction respectively. Potential diversion routes, should they be required, are shown for Section 9 in Figure 15.7i (7.1kms) and for Section 10 in Figure 15.7j (3.1kms).

Section 11 – (0.7km) – The final section of the route heads northwest from the R439 on the L-70152 to the access of the existing 110kV Dallow substation, in County Offaly. This section of the L-70152 is narrow and will require to be close during the approximate 5 days required for construction. The potential diversion route is shown in Figure 15.7k which will result in a diversion of approximately 4.2kms to local traffic.

It is estimated that the underground electrical cabling route will take 91 days, or 5 months to construct.

With respect to the traffic volumes that will be generated during the construction of the underground electrical cabling route, it is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 4 made by a car to transport 10 construction staff to and from the Site.

5 GENERAL TRAFFIC MANAGEMENT MEASURES

A detailed **Traffic Management Plan (TMP)** will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on site.

The detailed TMP will include the following:

Traffic Management Coordinator – A competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Development and this person will be the main point of contact for all matters relating to traffic management.

Delivery Programme – A programme of deliveries will be submitted to Tipperary County Council and other relevant authorities in advance of deliveries of turbine components and for general construction materials to the Wind Farm Site. Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse and An Garda Síochána, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required.

Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Contract Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided.

A Pre and Post Construction Condition Survey – A pre-condition survey of roads associated with the Proposed Development, including falling weight deflectometer tests and a structural assessment of all culverts and bridges, will be carried out prior to construction commencement to record the condition of the road network. A post construction survey will be carried out after works are completed. Where required the timing of these surveys will be agreed with the local authority.

Implementation of temporary alterations to road network at critical junctions – At locations where required highlighted in Section 15.1.8 of the EIAR.

Identification of delivery routes – These routes will be agreed and adhered to by all contractors.

Travel plan for construction workers to Wind Farm Site – While the assessment above has assumed the worst case that construction workers will drive to the Wind Farm Site, the construction

company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking.

Travel plan for construction workers to underground electric cabling route – Due to the transient nature of the underground grid connection construction site which will generally be on a section of the public road, construction workers will be transported to and from the site by the construction company at the beginning and end of each shift.

Traffic management measures on L-5040 - Marshalling (at site access and eastern end of L-5040) and control of traffic will be in operation during all of the 229 construction days discussed above.

Traffic management measures on L-5041 within site boundary – Short term periodic closures of the sections of the L5041 within the Proposed Development site boundary will be required throughout the construction phase. Alternative diversion routes will be available to all local residents along the L-5041 and L-5040, and access will be maintained for landowners and turbary rights holders throughout the construction phase.

Temporary traffic signs – As part of the traffic management measures temporary traffic signs will be put in place at the N52 / L-5040 junction for the duration of the construction phase. All measures will be in accordance with the “Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works” (Department of Transport, Tourism and Sport (DoTT&S)) and “Guidance for the Control and Management of Traffic at Roadworks” (DoTT&S). A member of construction staff (flagman) will be present at this location for the duration of the construction phase. Signage warning construction delivery of the convoy system will be implemented on approach to L-5040.

Drivers – Will follow normal rules of the road and to receive toolbox talk regarding the delivery route and planned hold points prior to any deliveries.

Normal permitted axial loads - Not to be exceeded.

Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

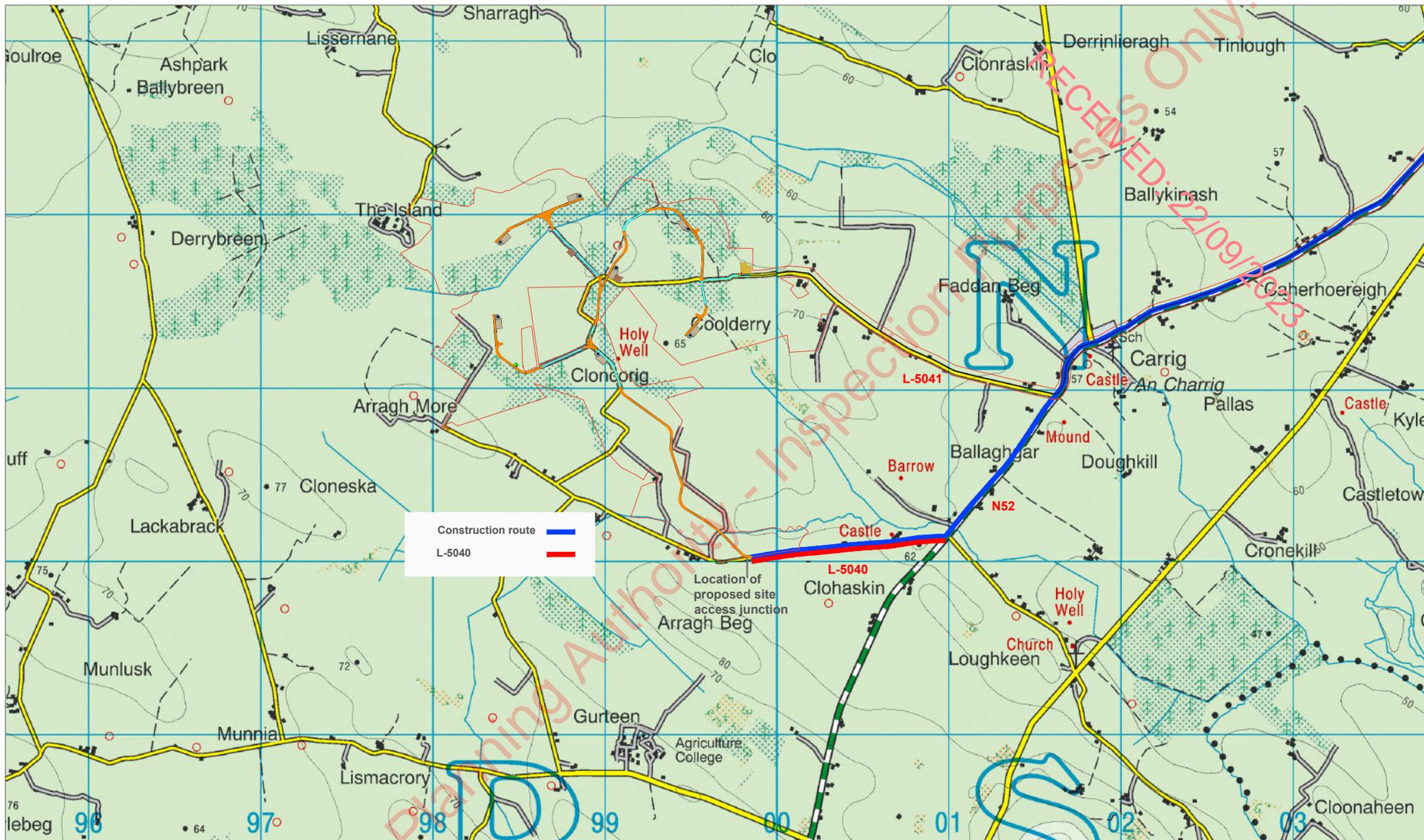
Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on Site and sweeping / cleaning of local roads as required.

It is confirmed that details for the Traffic Management Plan for the subject development will be agreed with the Road Section of Tipperary County Council prior to construction and contact will be maintained with the Road and Traffic Section throughout the construction phase.

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FIGURES

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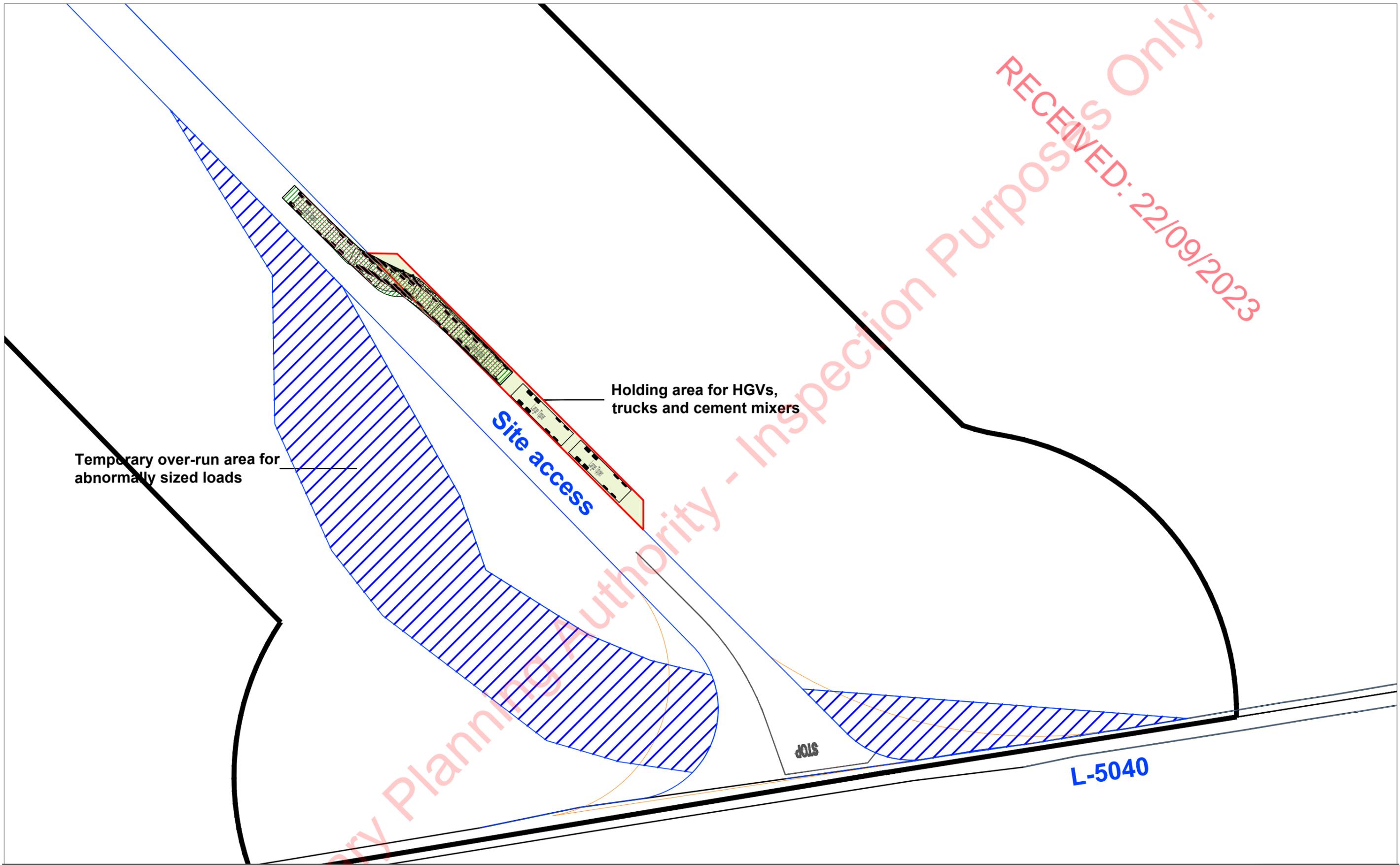
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Figure 1 Section of L-5040 on construction delivery route

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PROJECT NO: 9920	DATE: 23.08.23
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Temporary over-run area for abnormally sized loads

Holding area for HGVs, trucks and cement mixers

Site access

L-5040

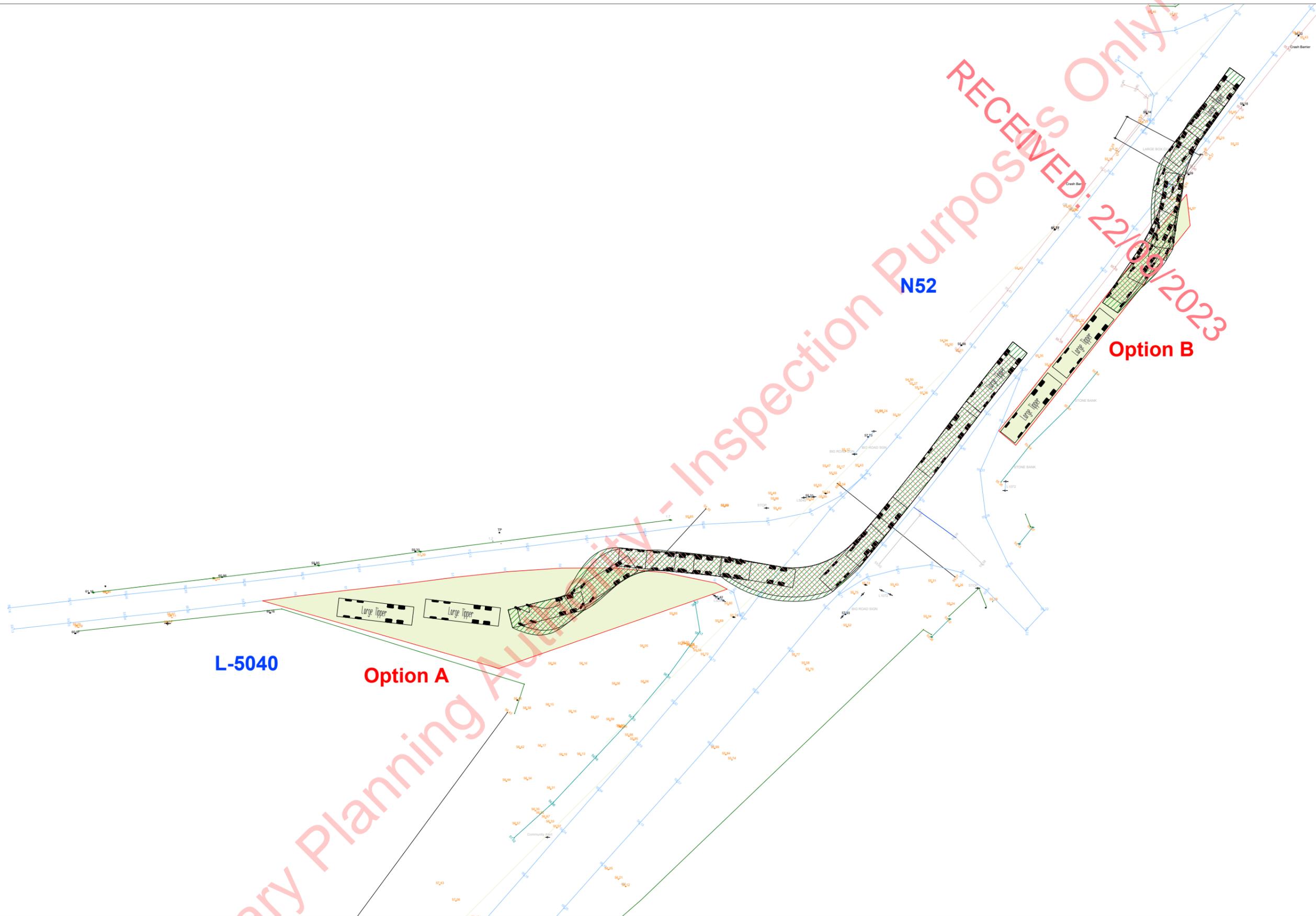
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Figure 2 Proposed HGV holding area on site access road

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CLIENT: AIP	SCALE: 1:500	
PROJECT NO: 9920	DATE: 21.08.23	DRAWN BY: AL

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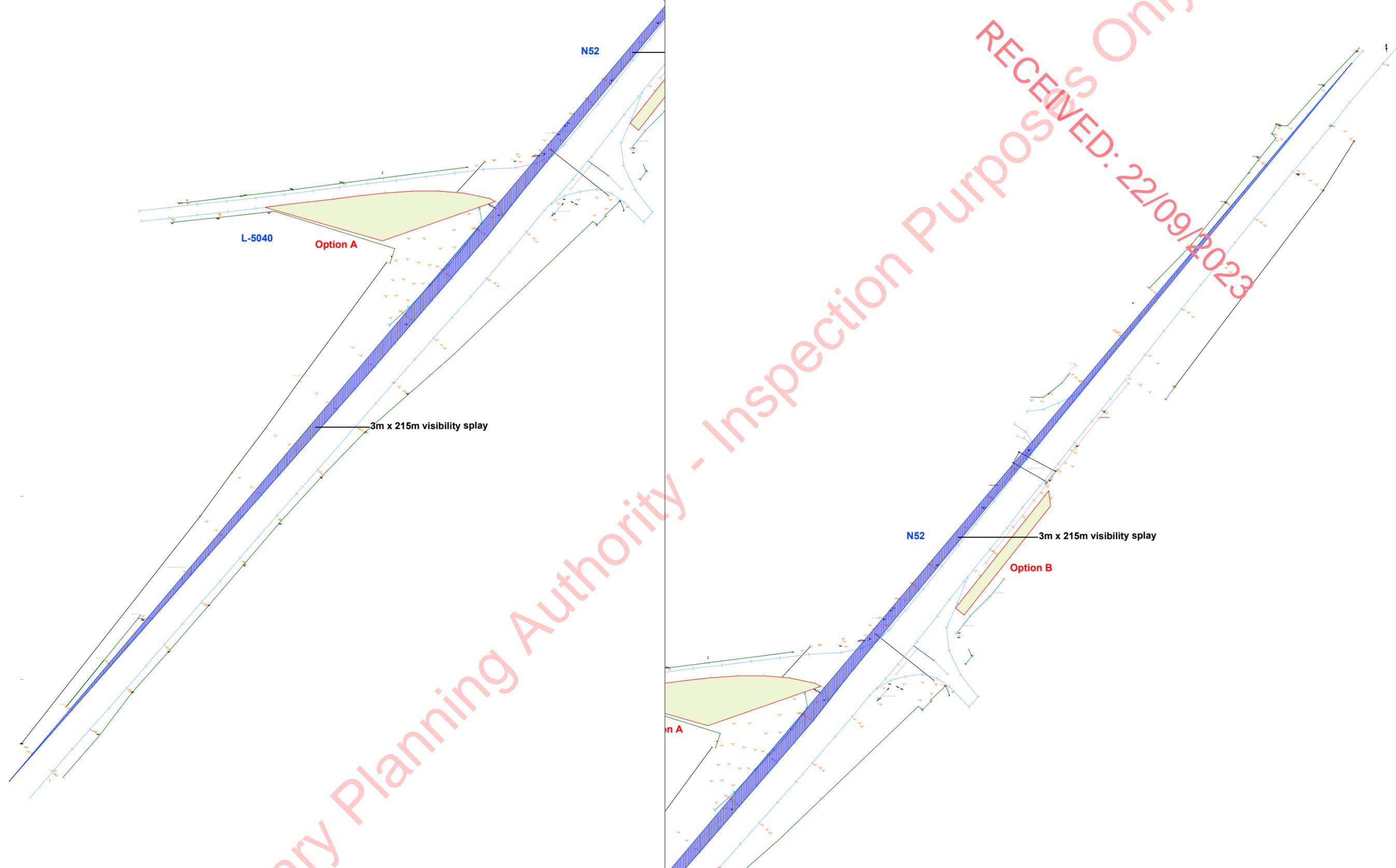
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Figure 3 Proposed HGV holding area options at east end of L-5040

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Figure 4 Retention of visibility splays at N52 / L5040 junction

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DATE:	21.09.23
SCALE:	1:1000
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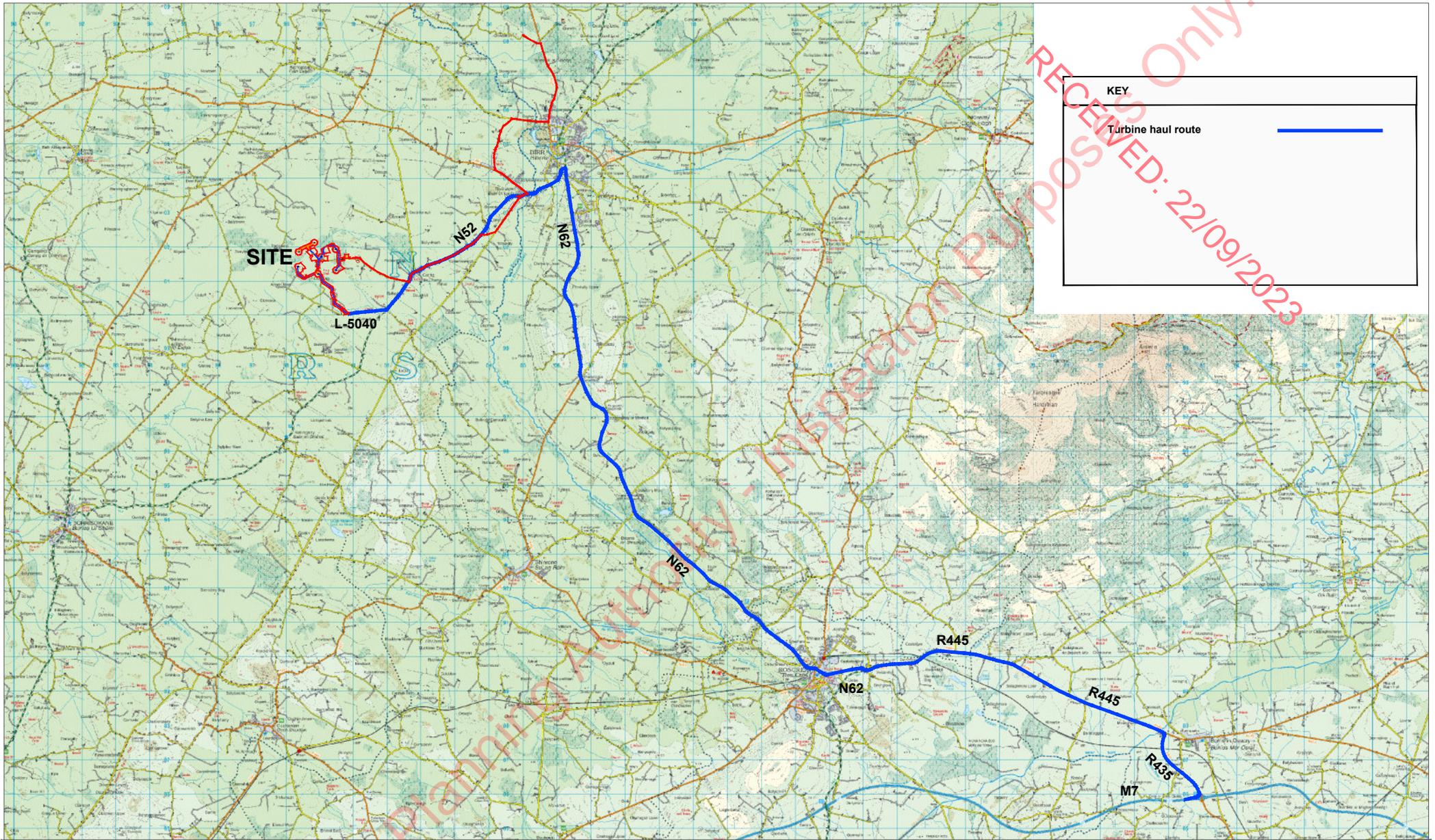
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Appendix A Figures from the EIAR

Figure 15-1a	Site location and turbine delivery route
Figure 15-1b	Turbine delivery route Autotrack location plan
Figure 15-6	Proposed cable grid connection route
Figure 15-7a	Diversion route during closure of cable grid section 1
Figure 15-7b	Diversion route during closure of cable grid section 2
Figure 15-7c	Diversion route during closure of cable grid section 3
Figure 15-7d	Diversion route during closure of cable grid section 4
Figure 15-7e	Diversion route during closure of cable grid section 5
Figure 15-7f	Diversion route during closure of cable grid section 6
Figure 15-7g	Diversion route during closure of cable grid section 7
Figure 15-7h	Diversion route during closure of cable grid section 8
Figure 15-7i	Diversion route during closure of cable grid section 9
Figure 15-7j	Diversion route during closure of cable grid section 9
Figure 15-7k	Diversion route during closure of cable grid section 9
Figure 15-30	Location 12 – Access junction on L-5040

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Figure 15-1a Site location and turbine delivery route

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CLIENT: AIP

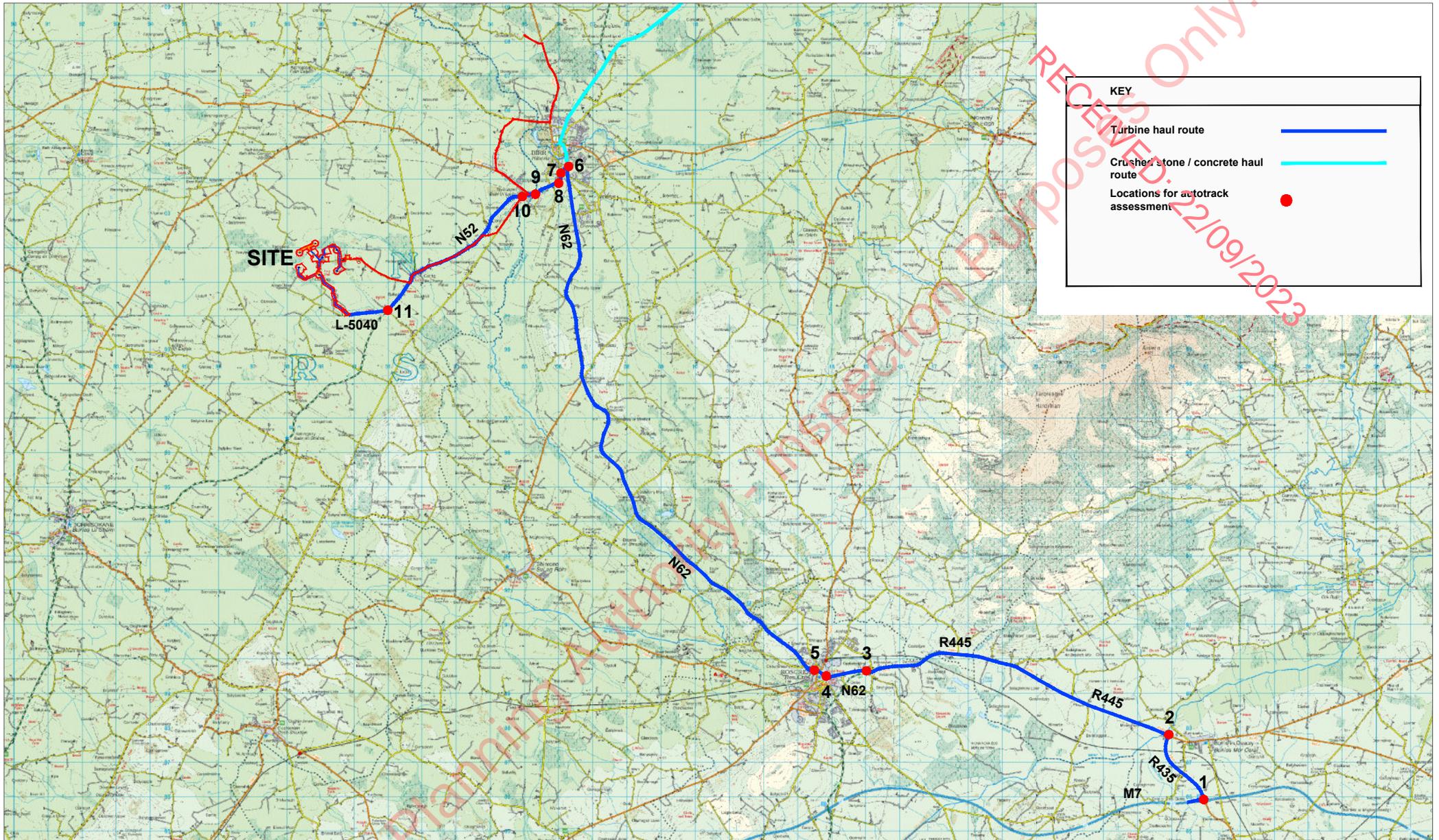
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Figure 15-1b Turbine delivery route autotrack assessment location plan

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CLIENT: AIP

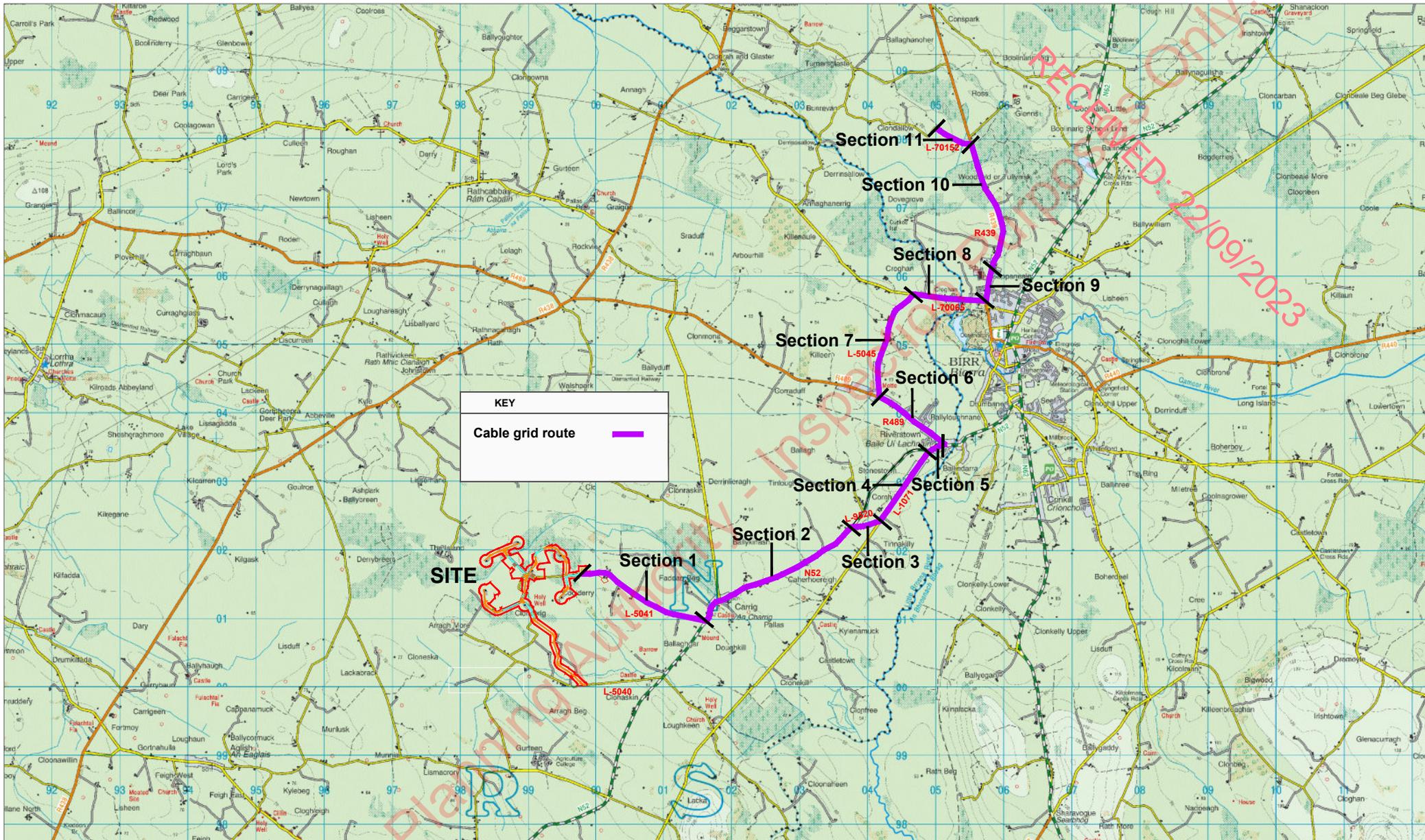
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PROJECT NO: 9920

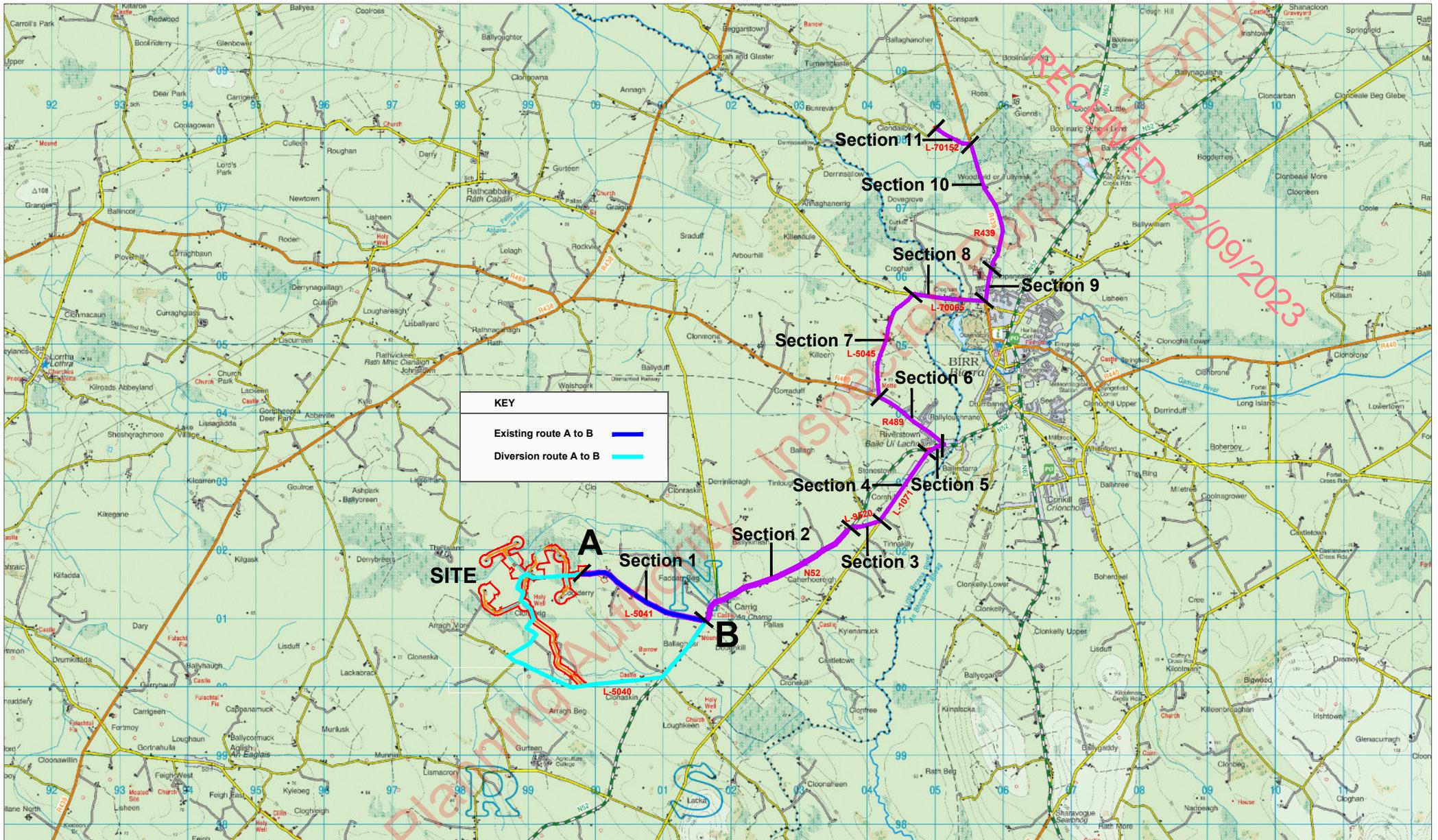
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NOTES:		Figure 15-6 Proposed cable grid connection route	
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PROJECT NO: 9920	DATE: 20.09.23		



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Figure 15-7a Diversion route during closure of cable grid connection Section 1

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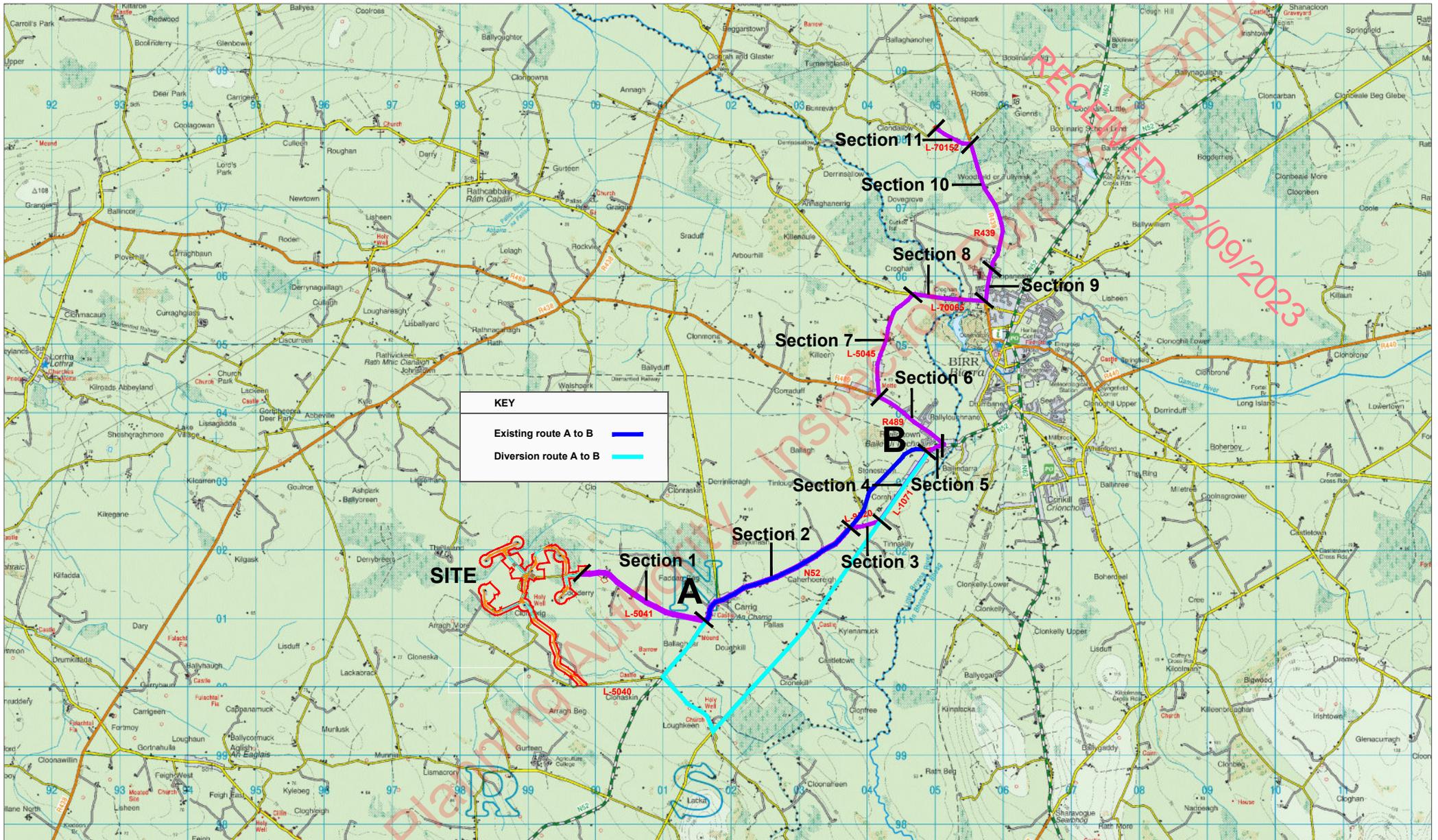
SCALE: NTS

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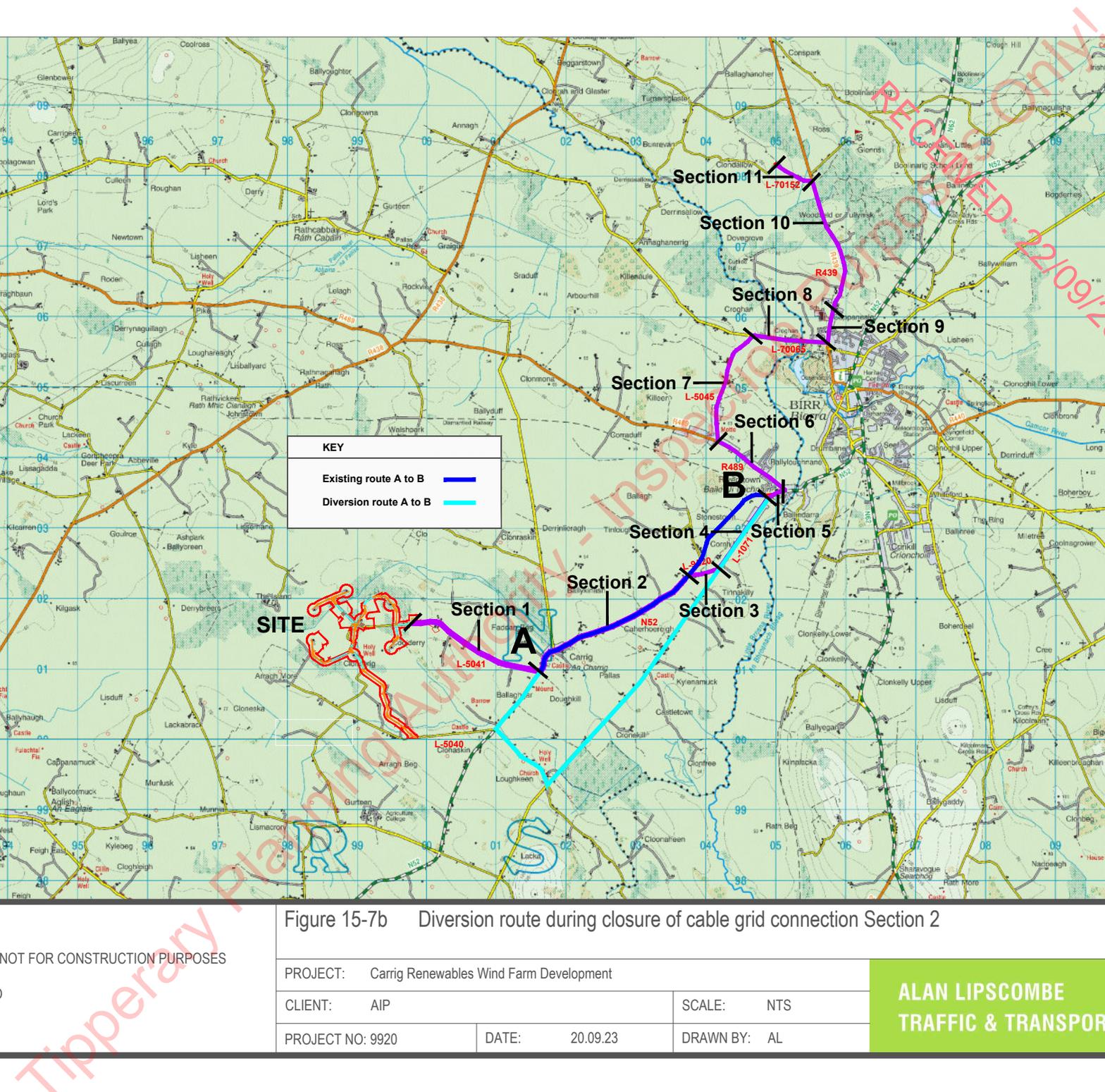


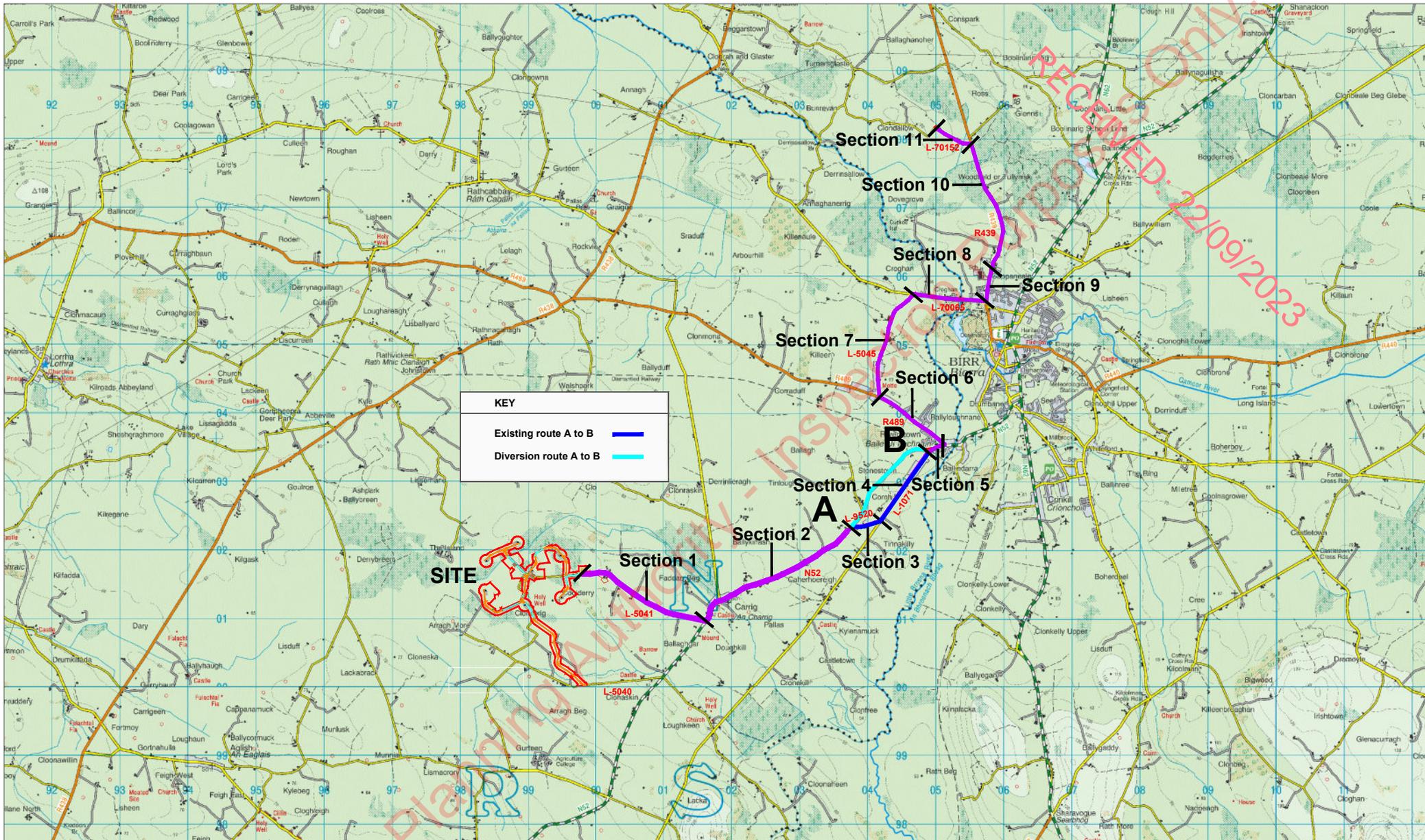
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Figure 15-7b Diversion route during closure of cable grid connection Section 2

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Figure 15-7c Diversion route during closure of cable grid connection Section 3

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CLIENT: AIP

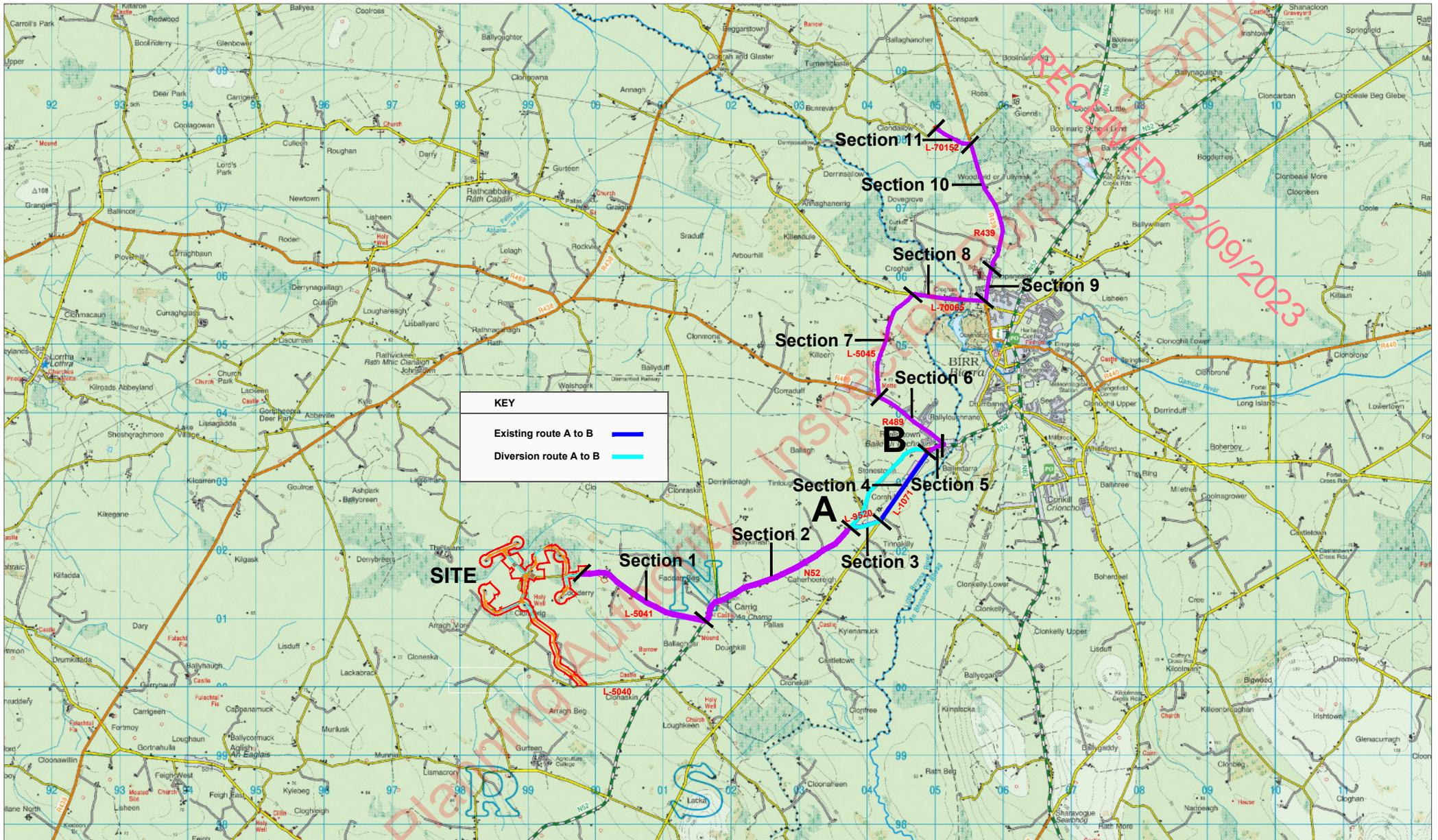
SCALE: NTS

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Figure 15-7d Diversion route during closure of cable grid connection Section 4

PROJECT: Carrig Renewables Wind Farm Development

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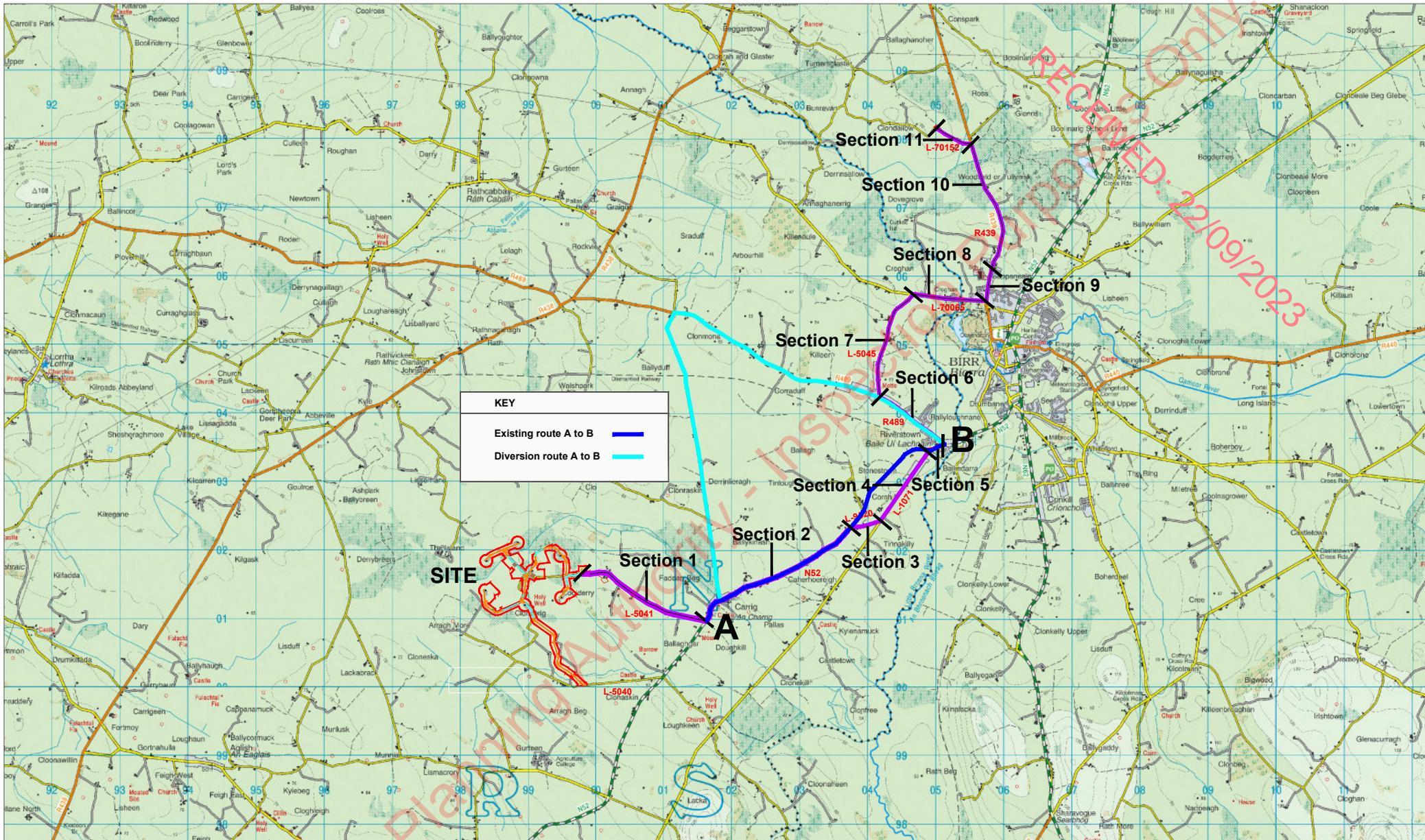
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Figure 15-7e Diversion route during closure of cable grid connection Section 5

PROJECT: Carrig Renewables Wind Farm Development

CLIENT: AIP

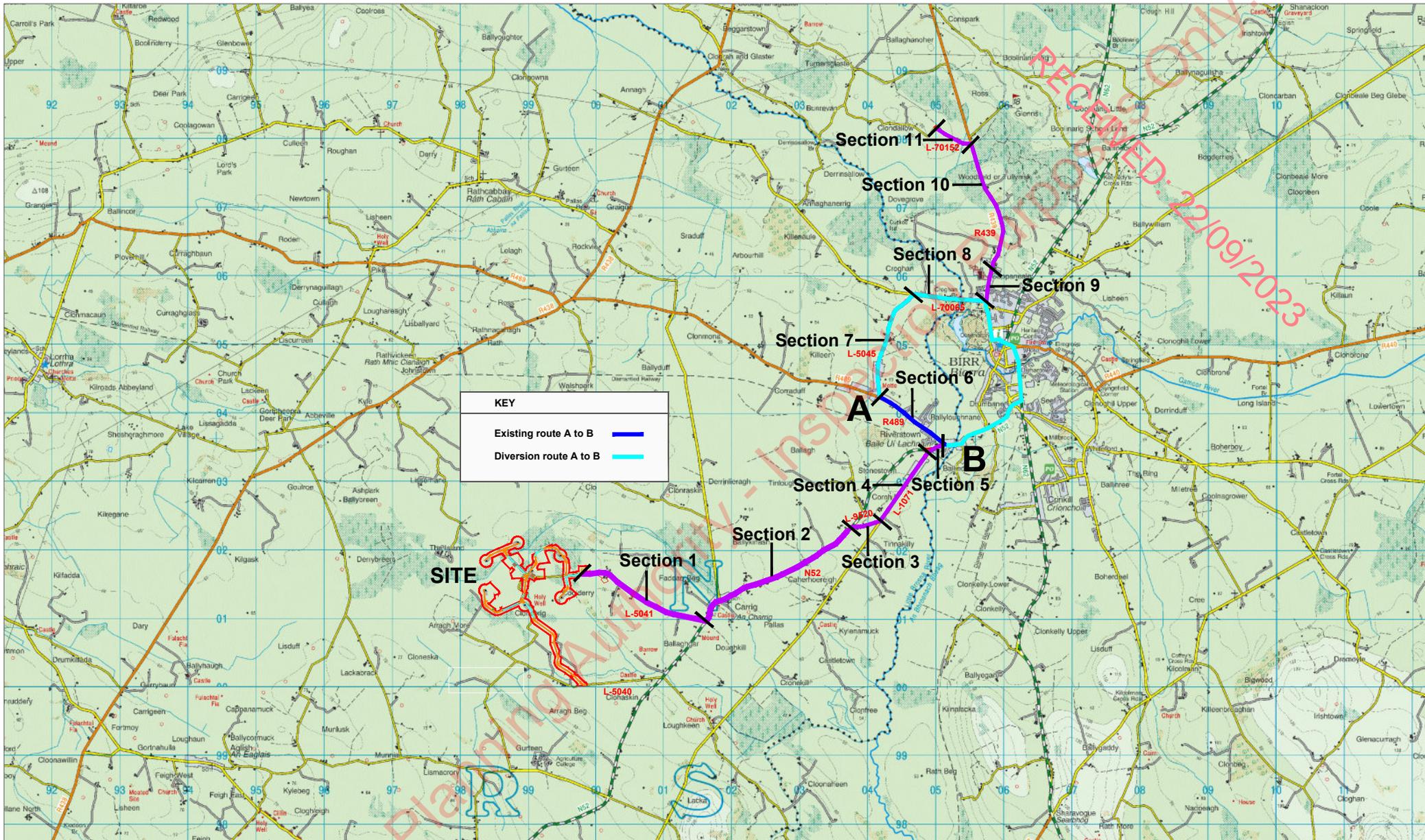
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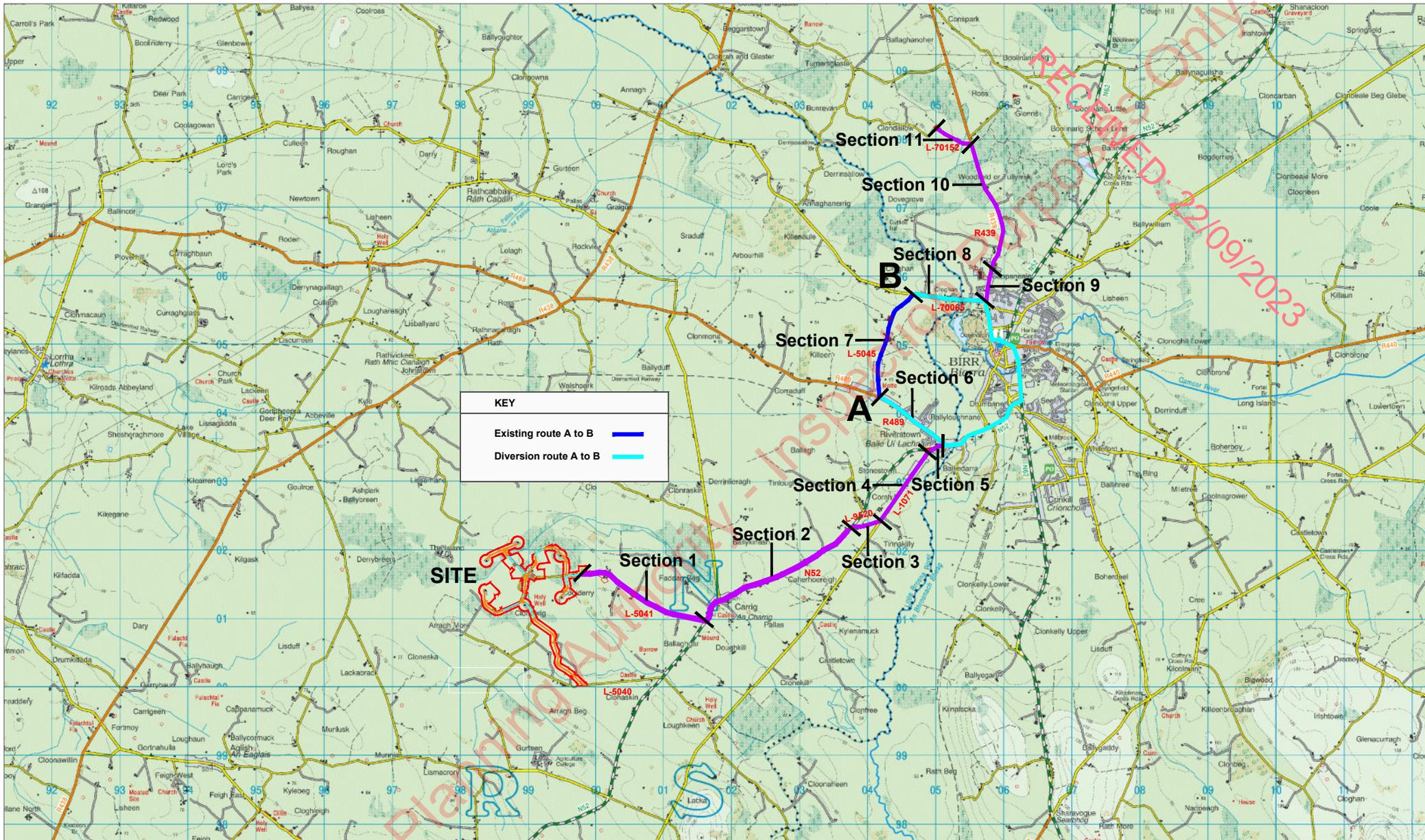


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Figure 15-7f Diversion route during closure of cable grid connection Section 6

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Figure 15-7g Diversion route during closure of cable grid connection Section 7

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CLIENT: AIP

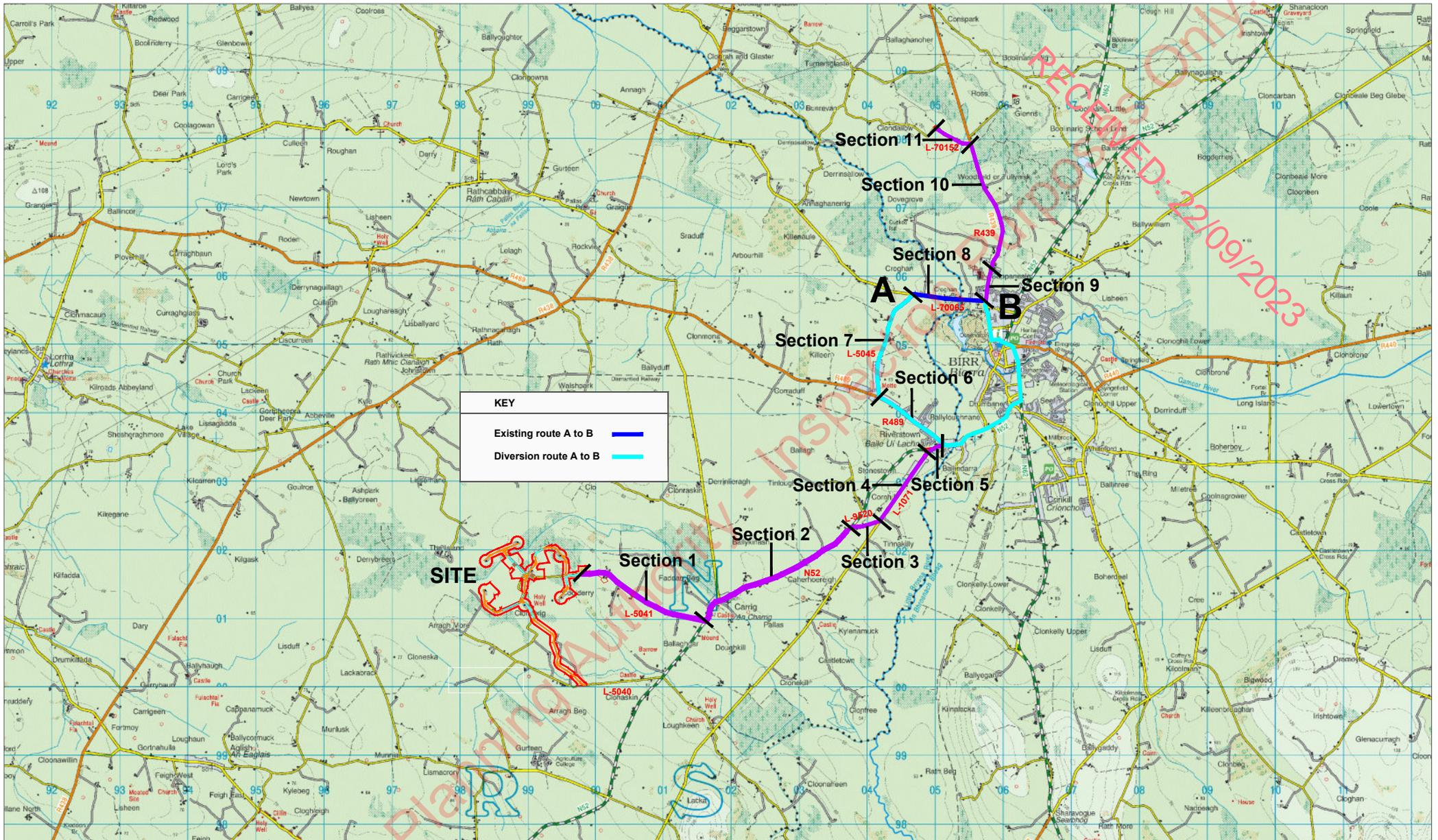
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Figure 15-7h Diversion route during closure of cable grid connection Section 8

PROJECT: Carrig Renewables Wind Farm Development

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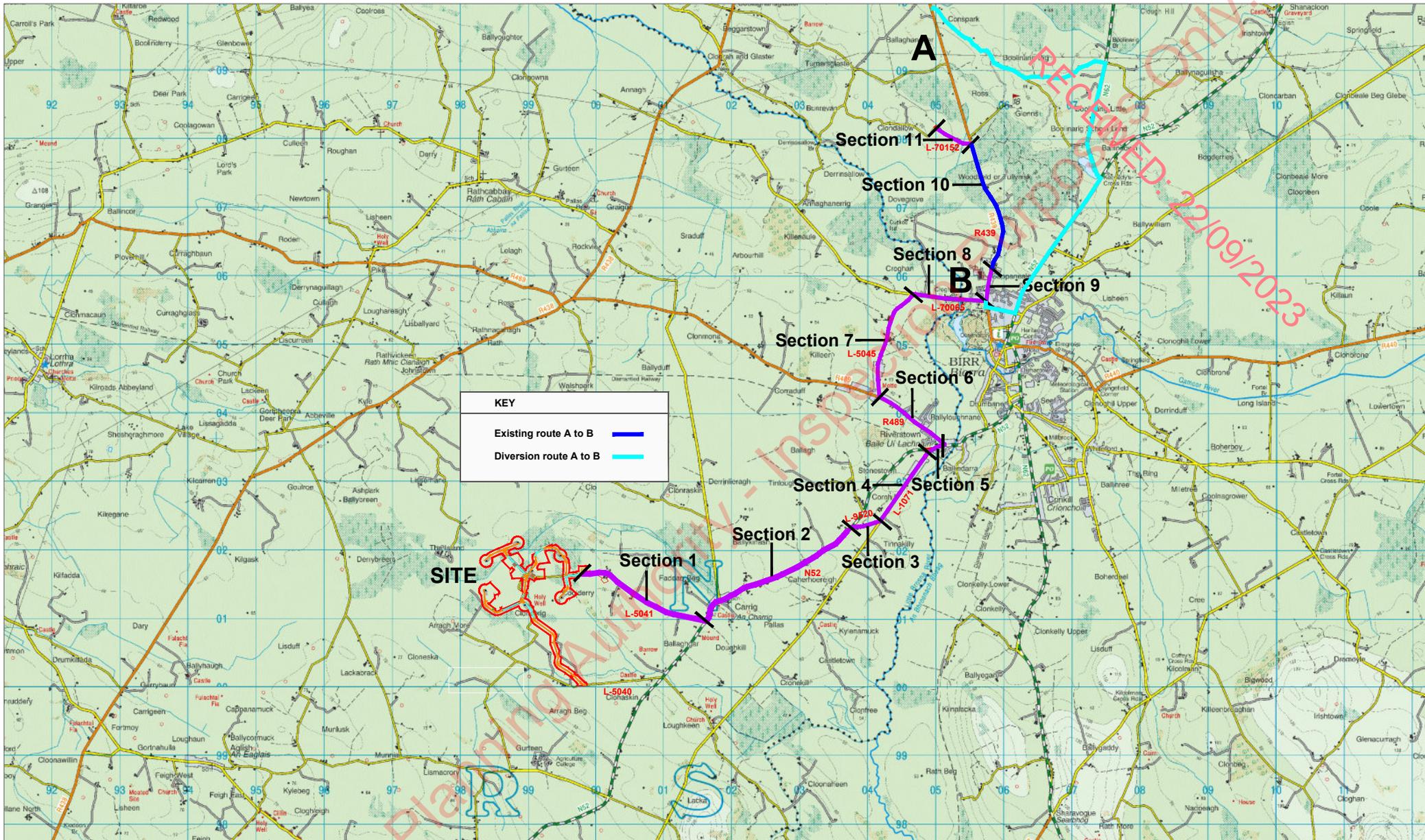
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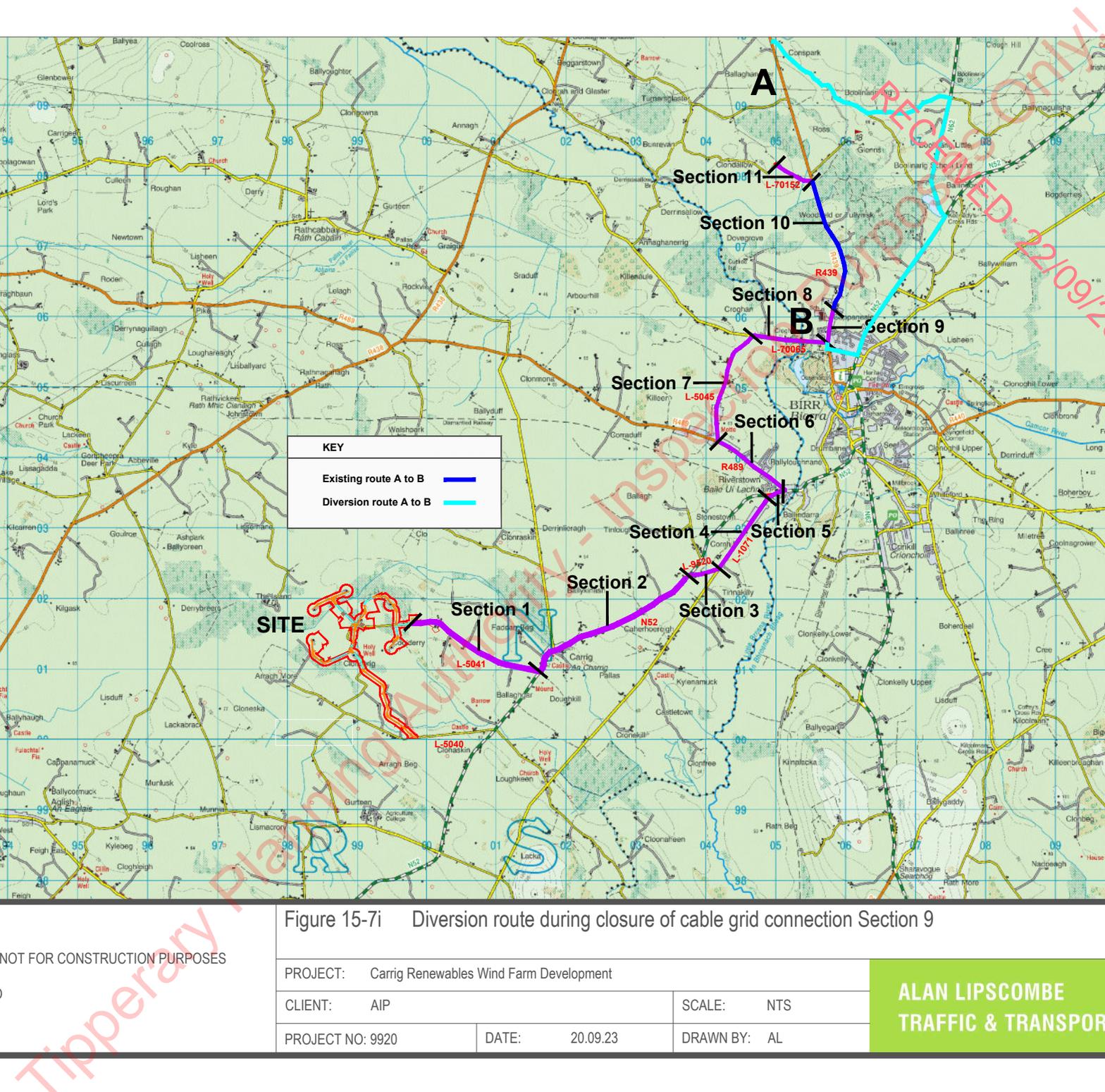


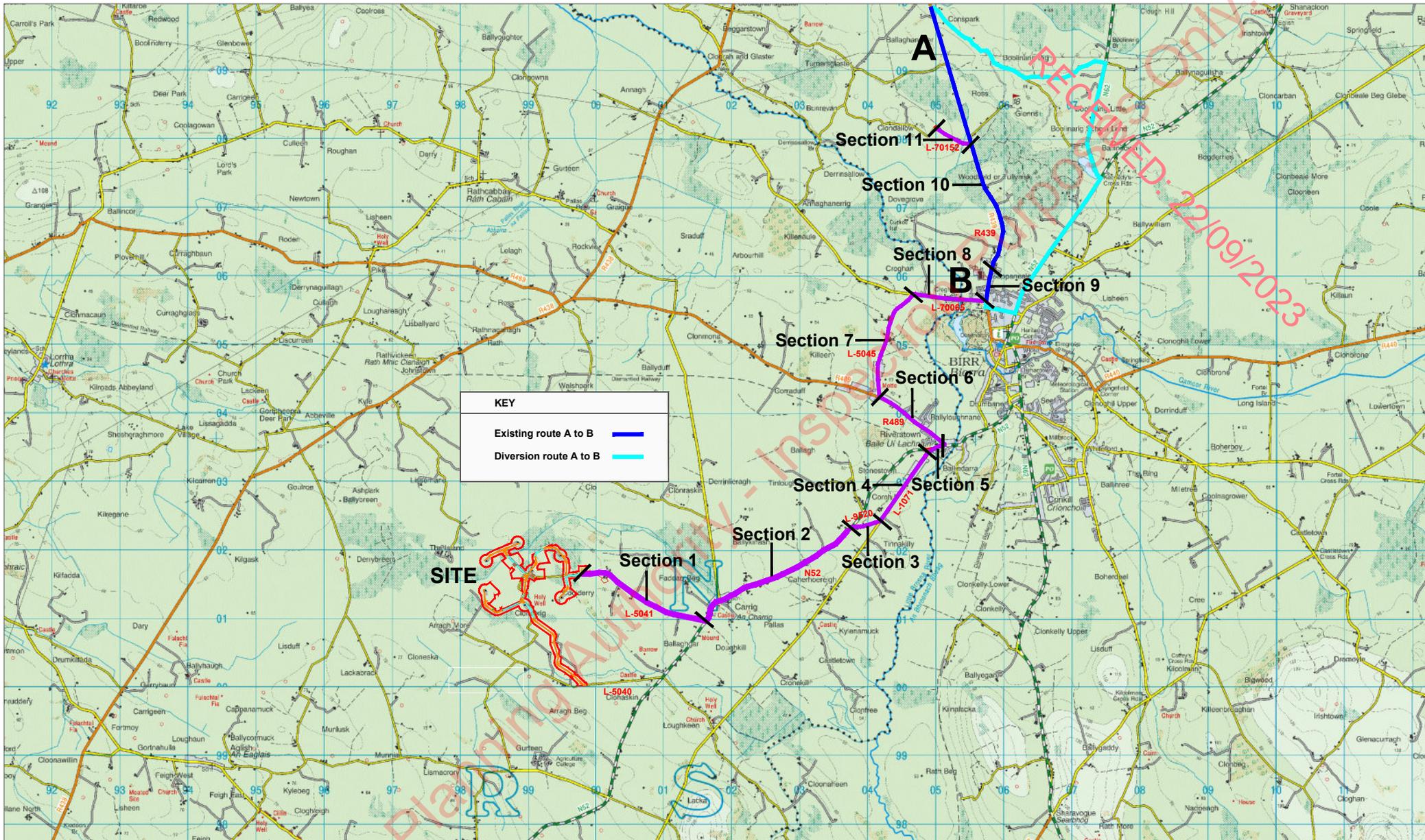
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Figure 15-7i Diversion route during closure of cable grid connection Section 9

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Figure 15-7j Diversion route during closure of cable grid connection Section 10

PROJECT: Carrig Renewables Wind Farm Development

CLIENT: AIP

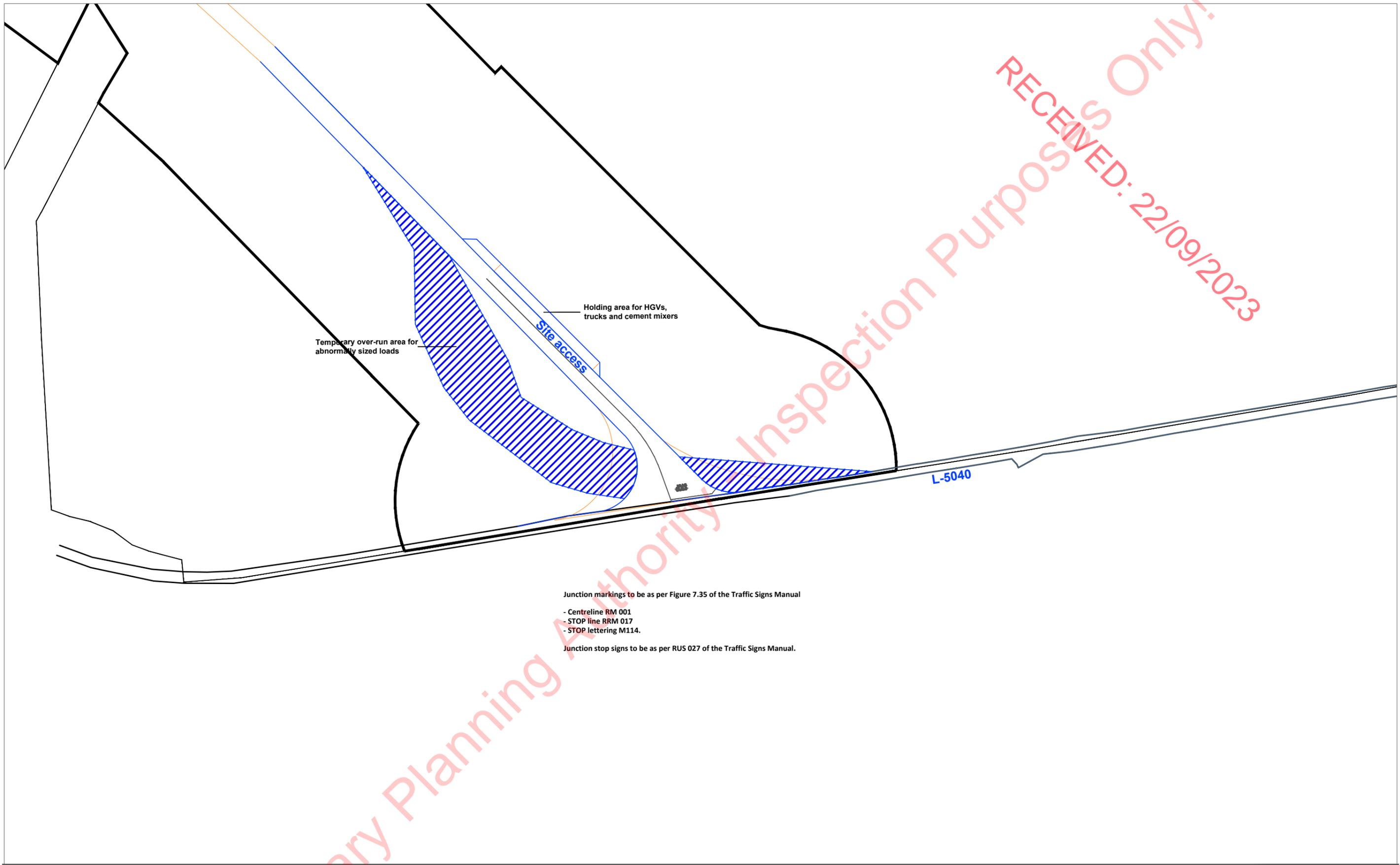
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Figure 15-30 Location 12 - Access junction on L-5040, junction layout

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CLIENT: AIP	DATE: 23.08.23	DRAWN BY: AL
PROJECT NO: 9920		

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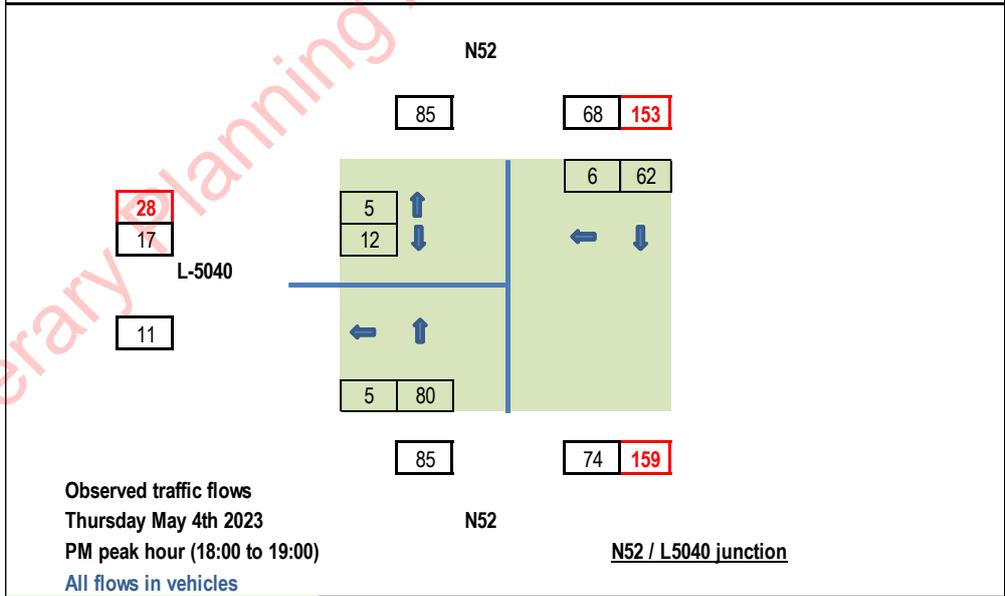
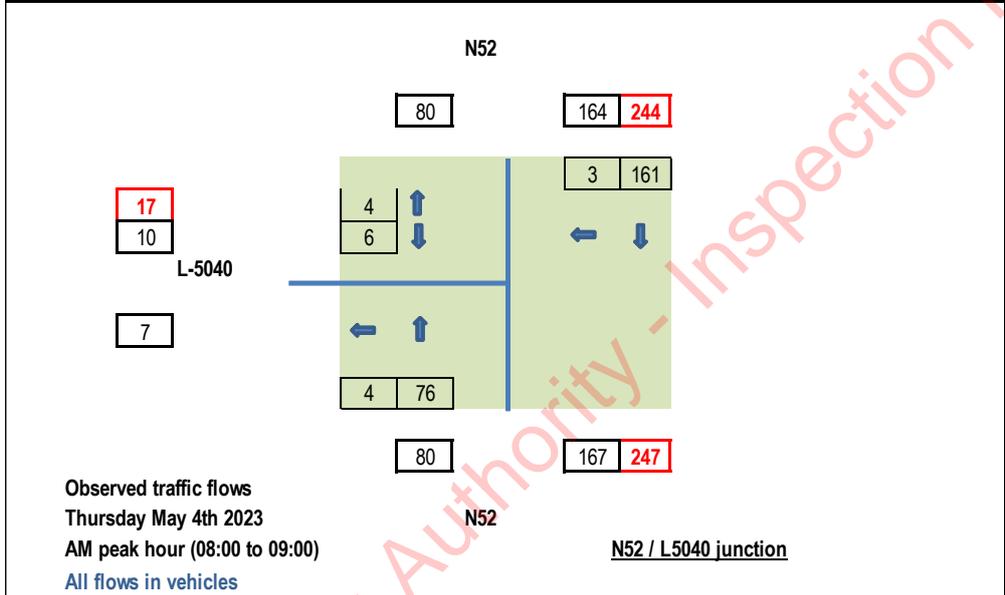
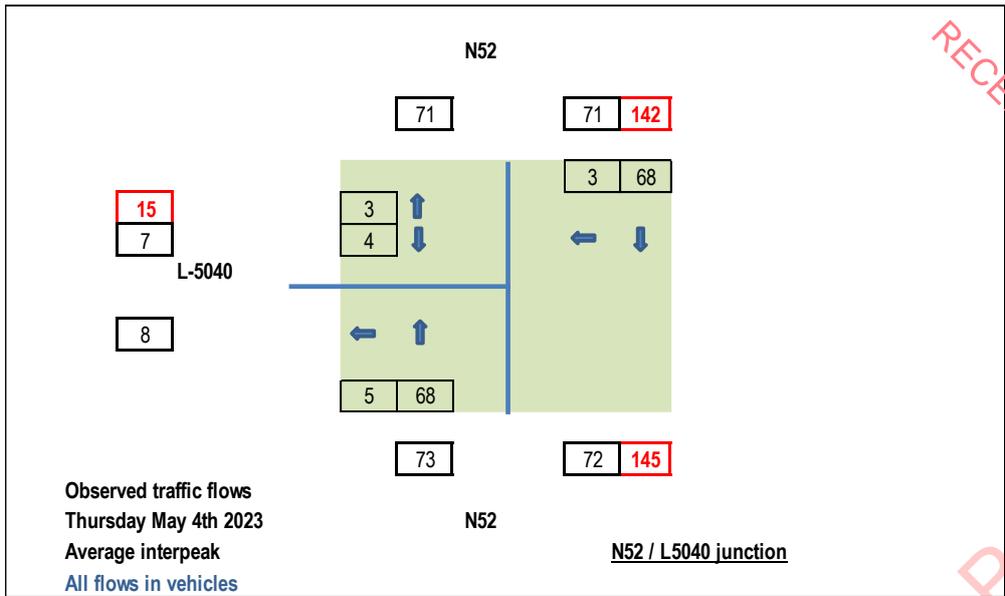
Appendix B Traffic flows at N52 / L-5040 junction

Figure B1	Observed traffic flows at N52 / L-5040 junction, year 2023, all vehicles
Figure B2	Observed traffic flows at N52 / L-5040 junction, year 2023, HGVs
Figure B3	Background traffic flows at N52 / L-5040 junction, year 2028, all vehicles
Figure B4	Background traffic flows at N52 / L-5040 junction, year 2028, HGVs
Figure B5	Construction traffic flows at N52 / L-5040 junction, year 2028, all vehicles
Figure B6	Construction traffic flows at N52 / L-5040 junction, year 2028, HGVs
Figure B7	With construction traffic flows at N52 / L-5040 junction, year 2028, all vehicles
Figure B8	With construction traffic flows at N52 / L-5040 junction, year 2028, HGVs

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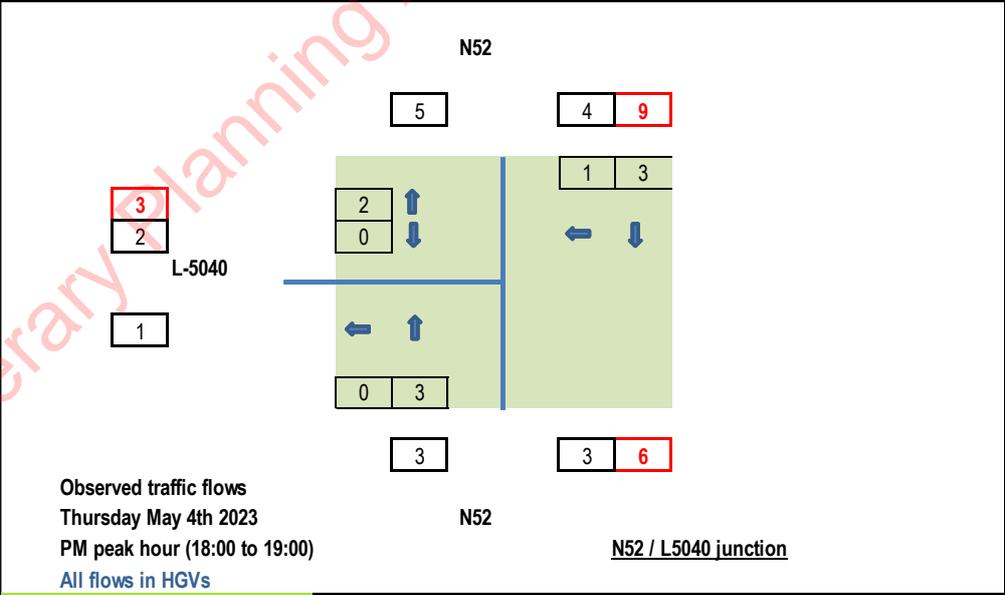
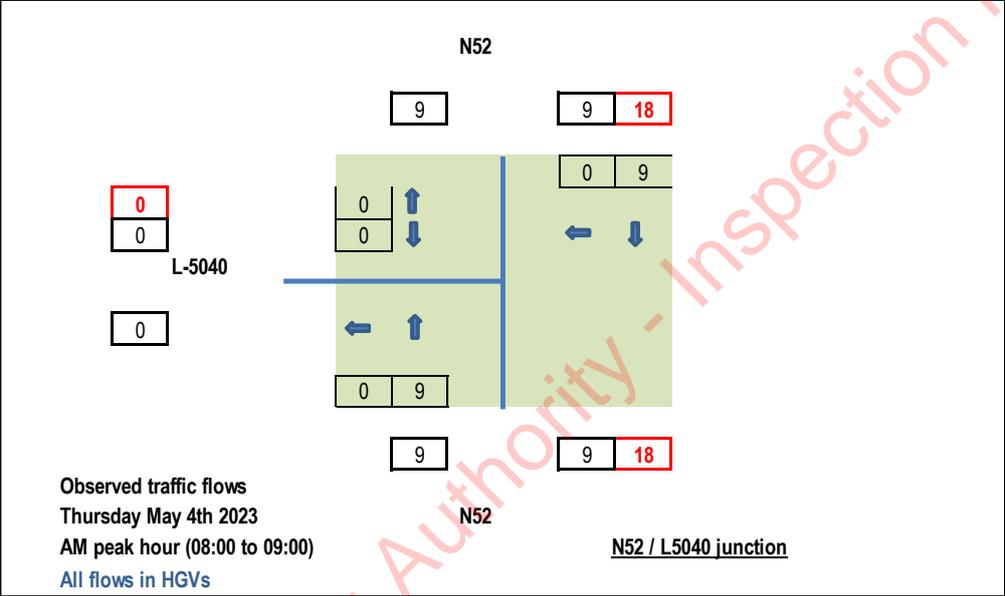
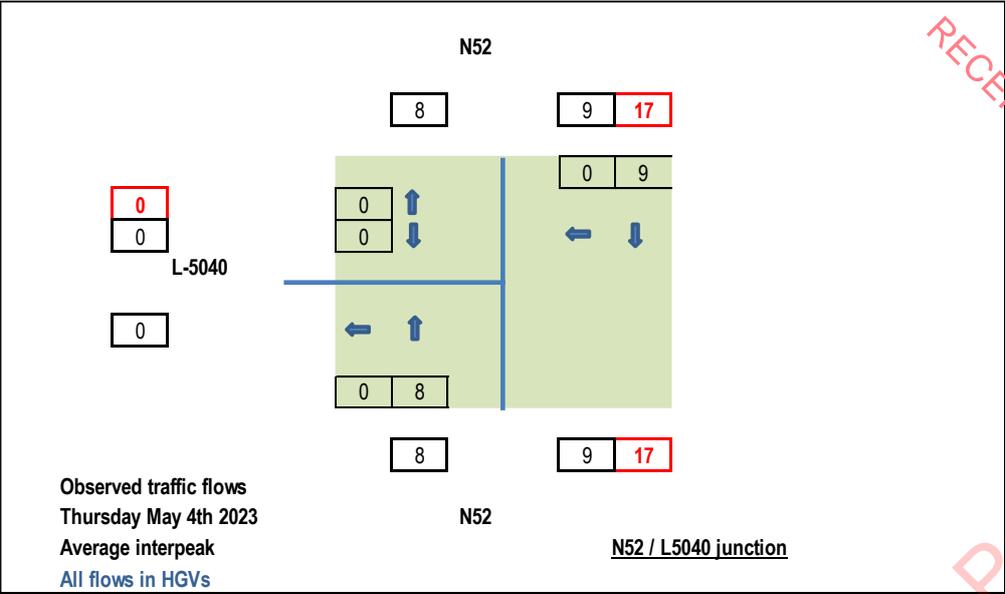
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Figure B1 Observed traffic flows at N52 / L-5040 junction
 Year 2023 - All vehicles

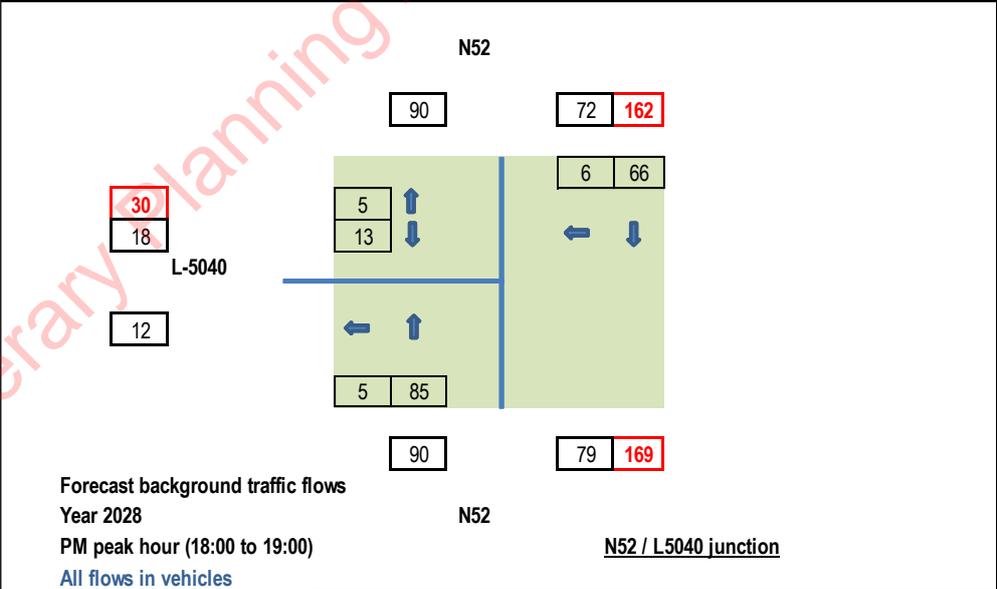
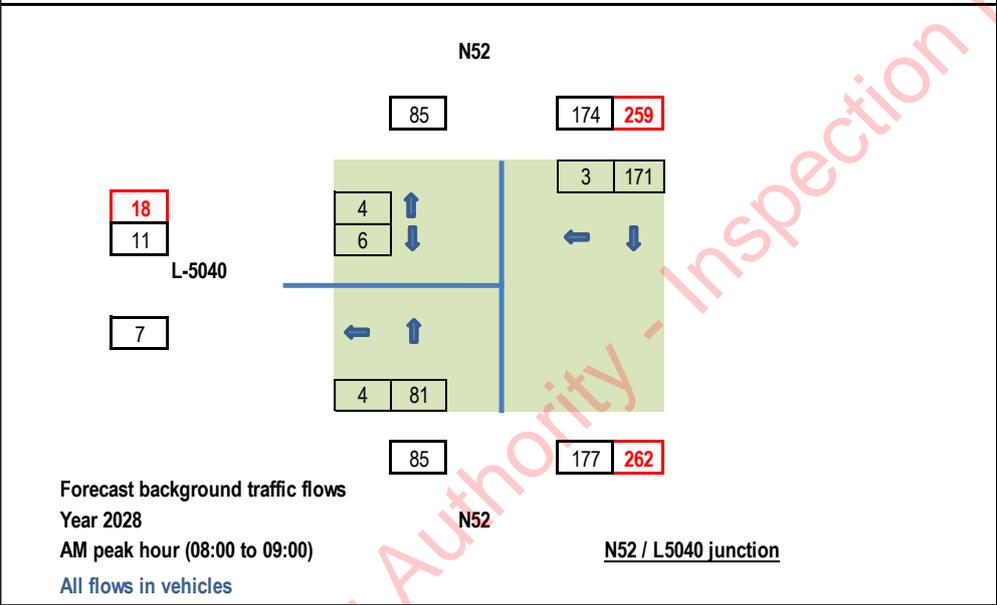
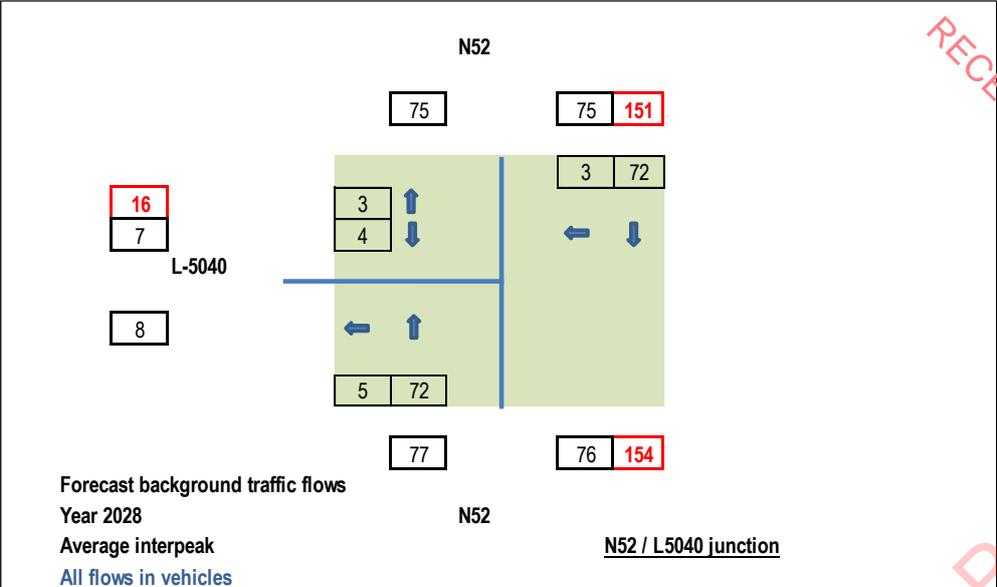
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Figure B2 Observed traffic flows at N52 / L-5040 junction
 Year 2023 - HGVs

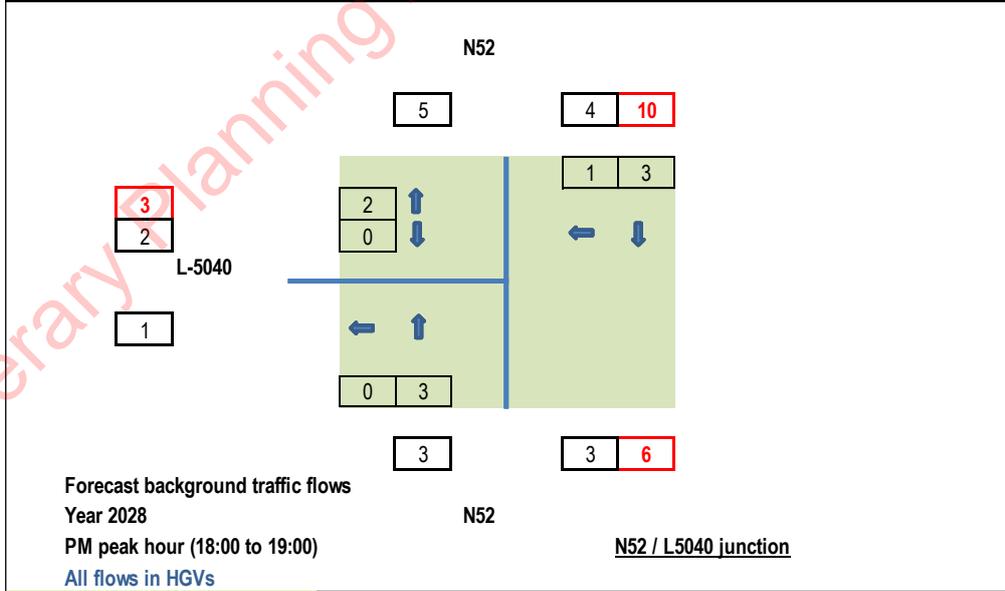
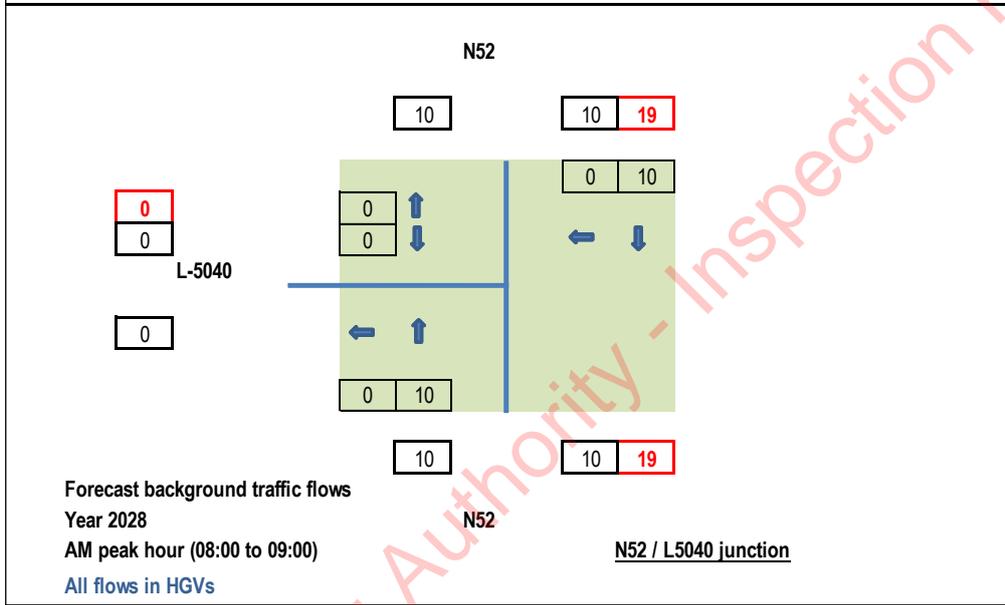
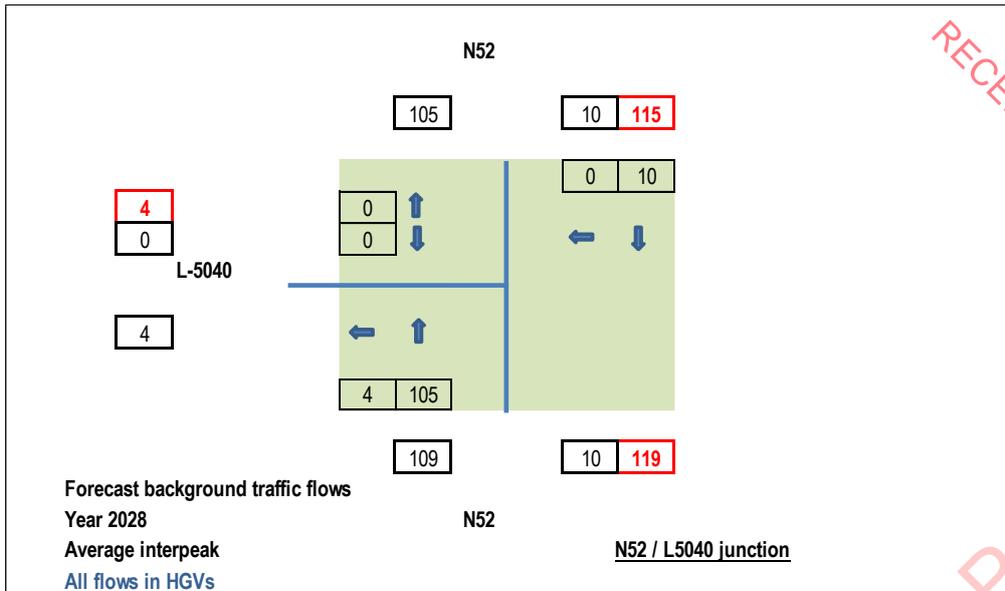
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**Figure B3 Background traffic flows at N52 / L5040 junction
Year 2028 - All vehicles**

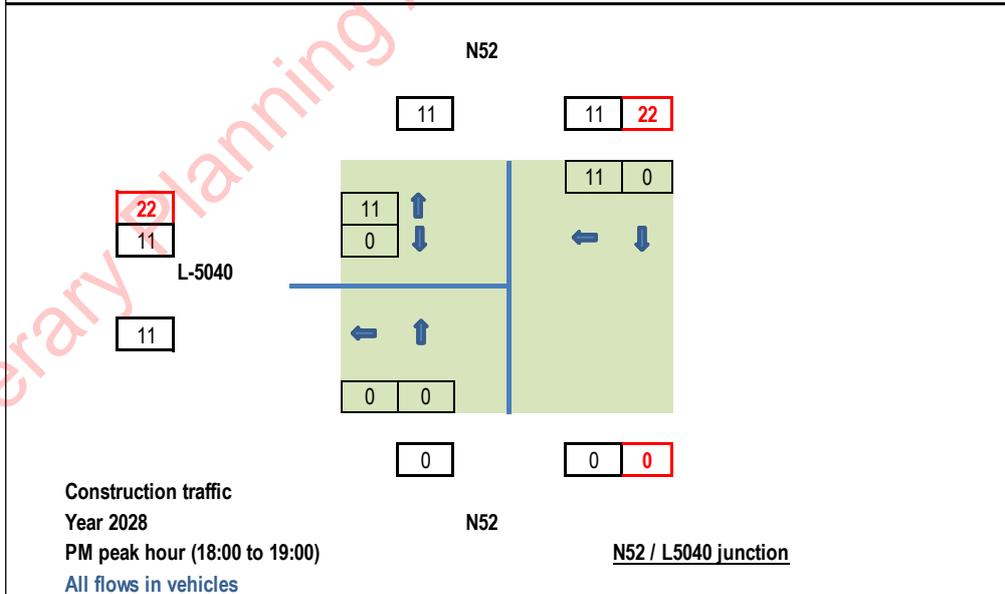
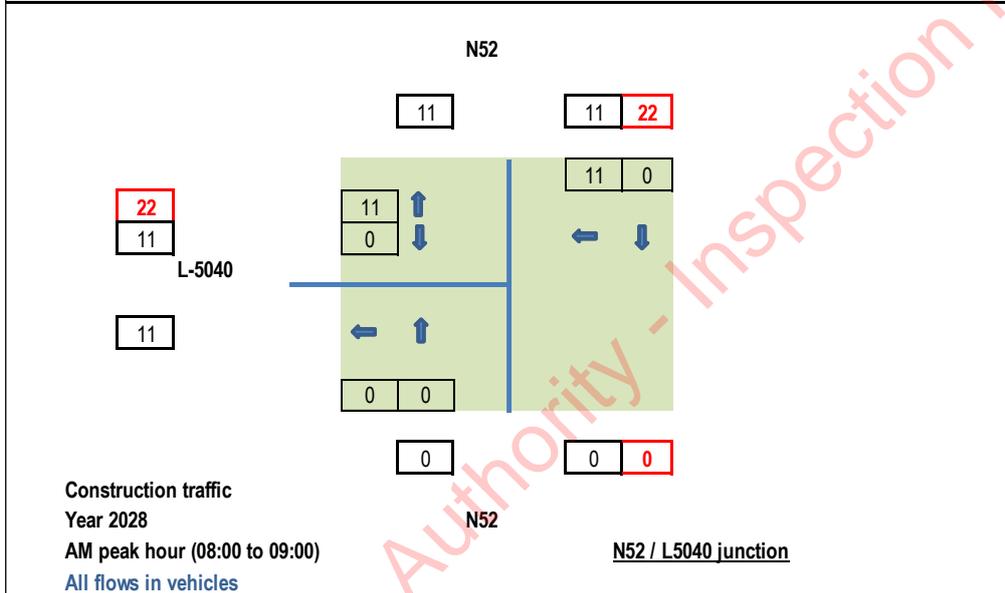
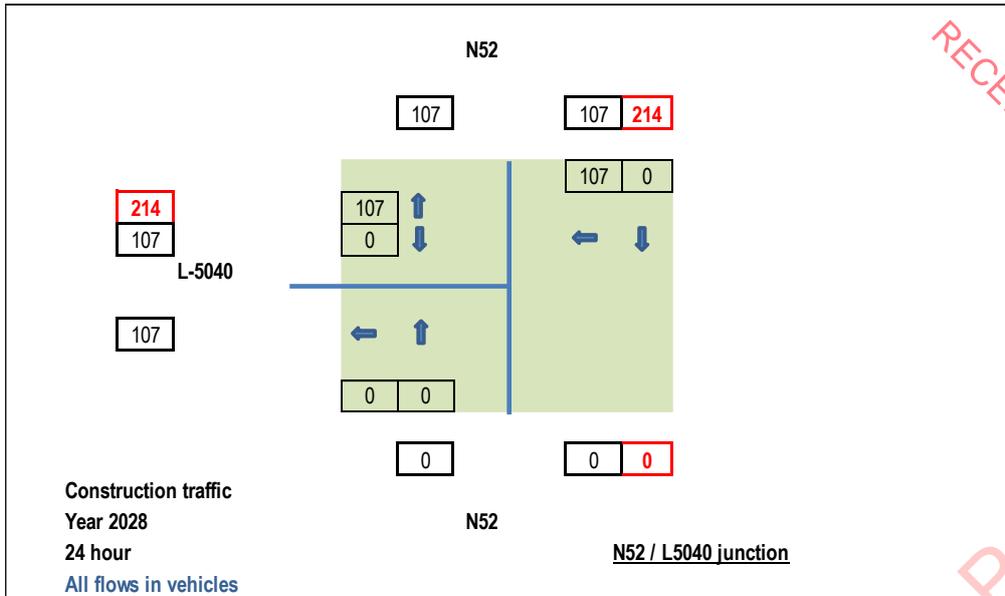
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Figure B4 Background traffic flows at N52 / L-5040 junction
 Year 2028 - HGVs

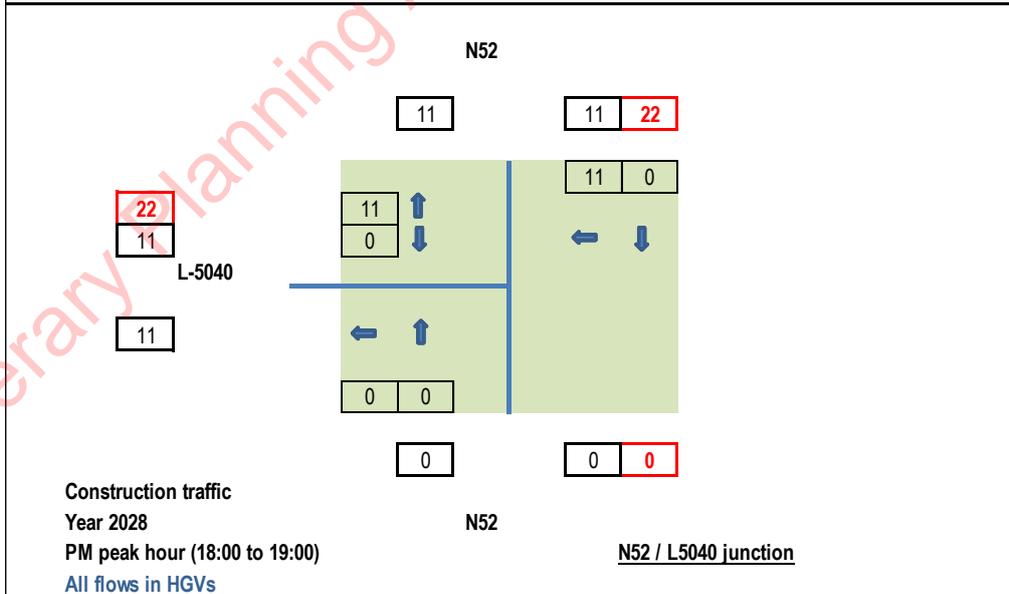
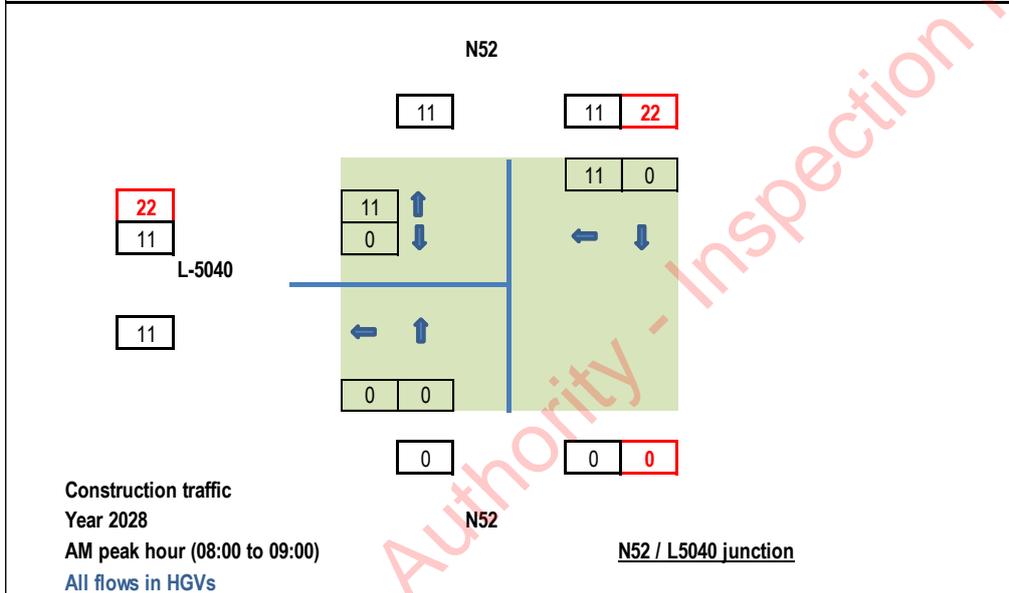
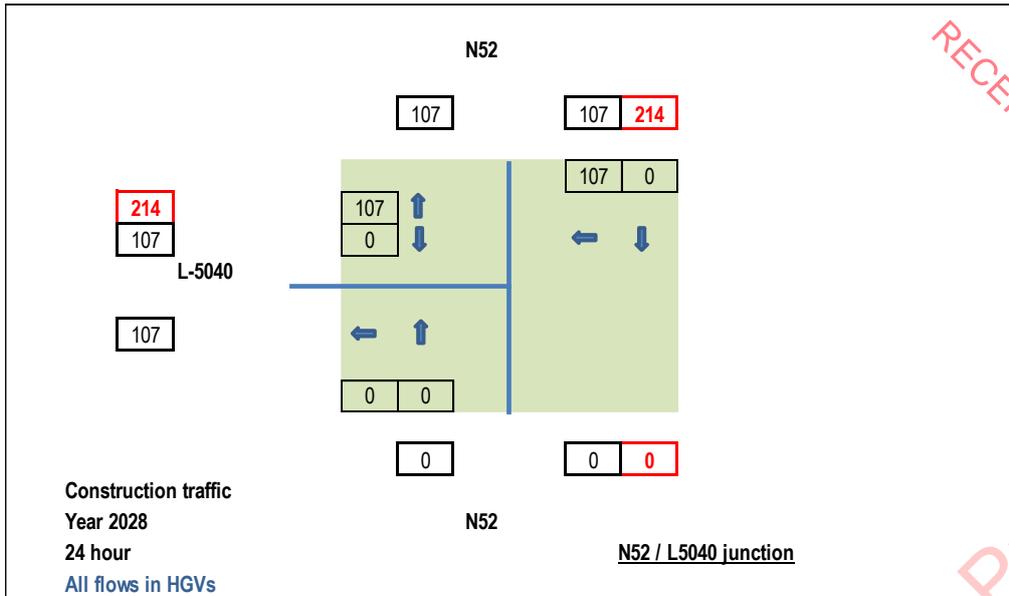
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Figure B5 Construction traffic flows at N52 / L-5040 junction
Year 2028 - All vehicles

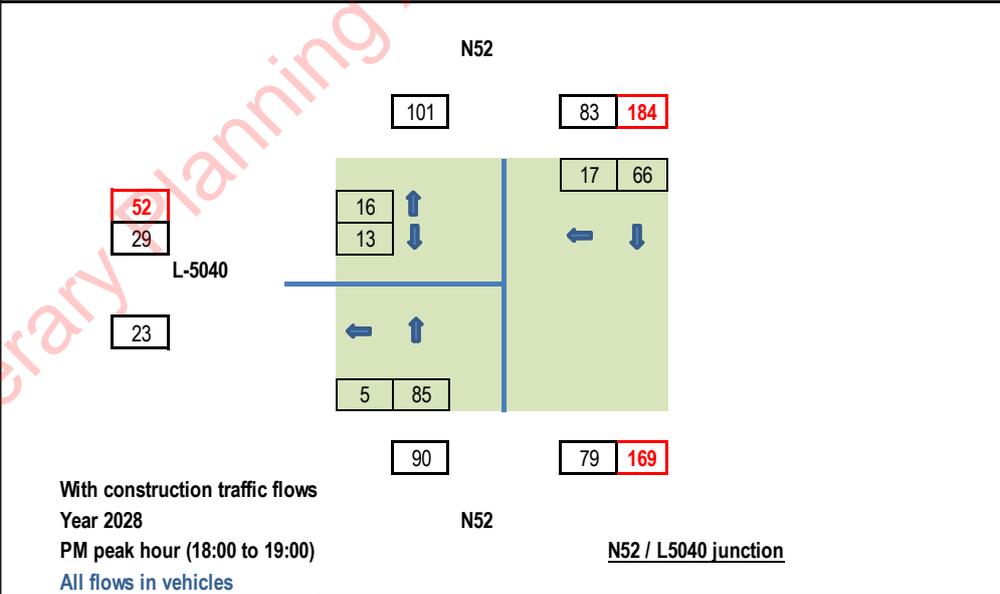
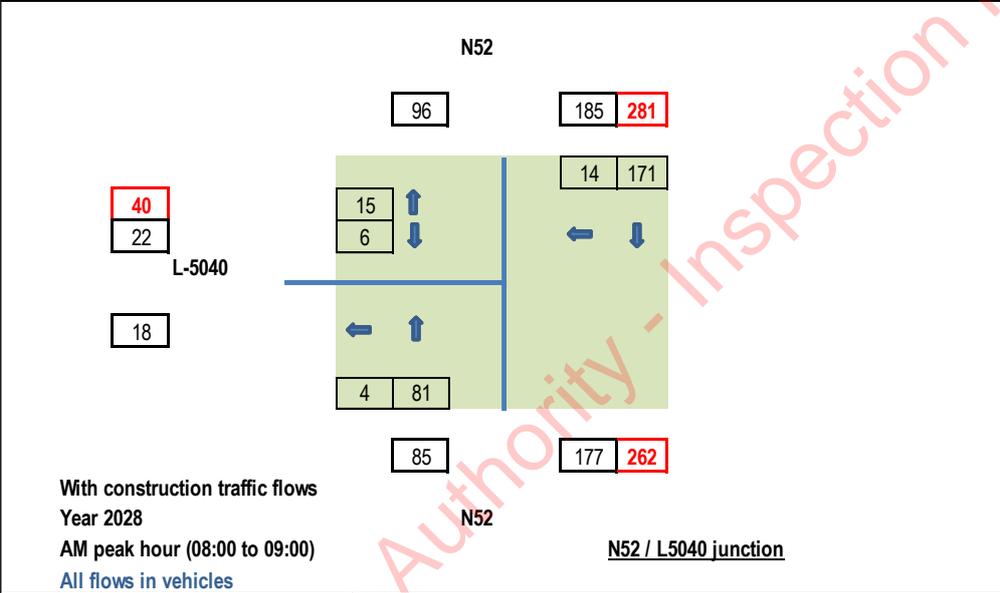
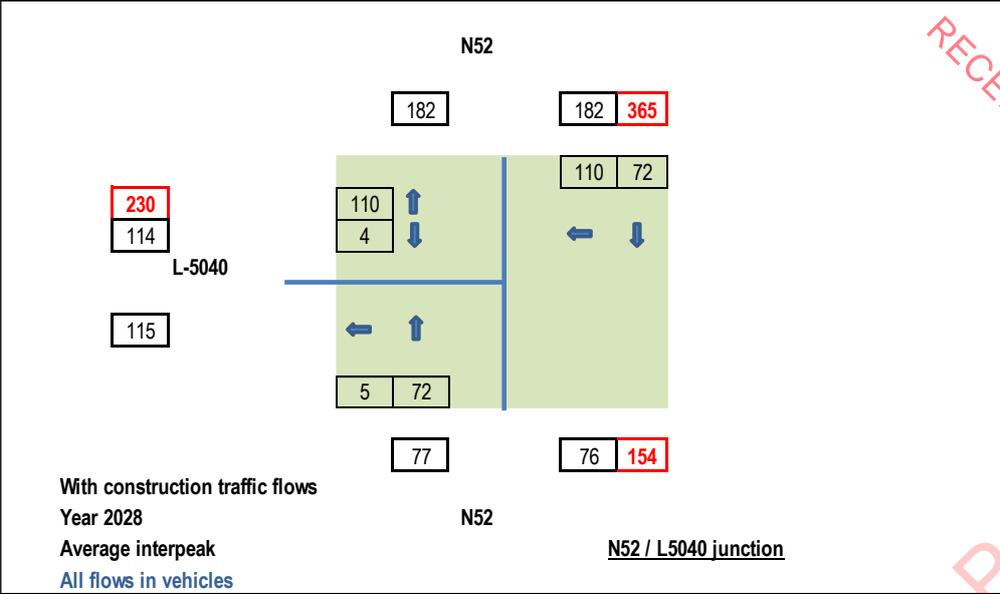
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Figure B6 Construction traffic flows at N52 / L-5040 junction
Year 2028 - HGVs

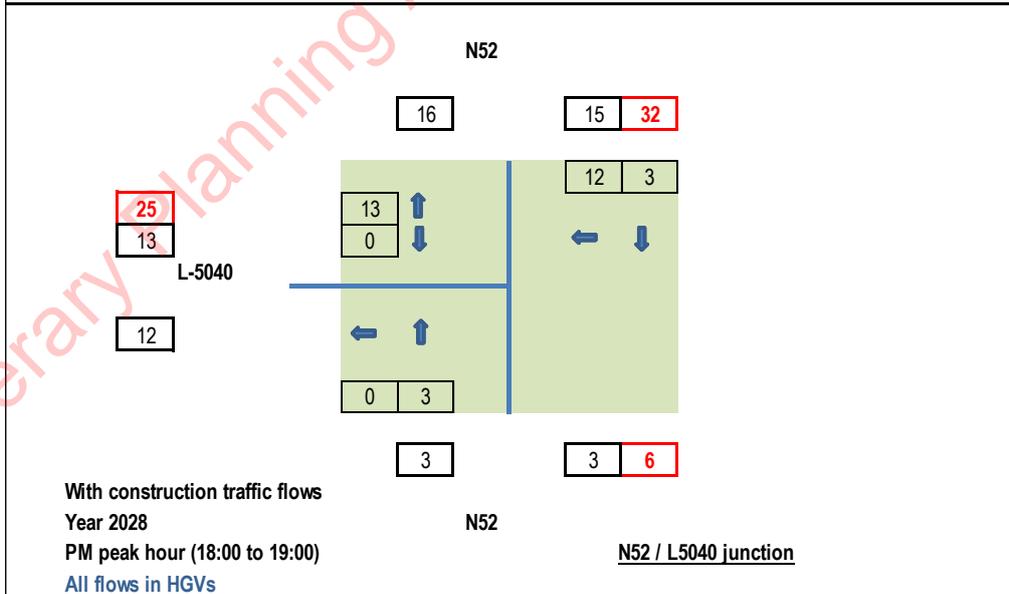
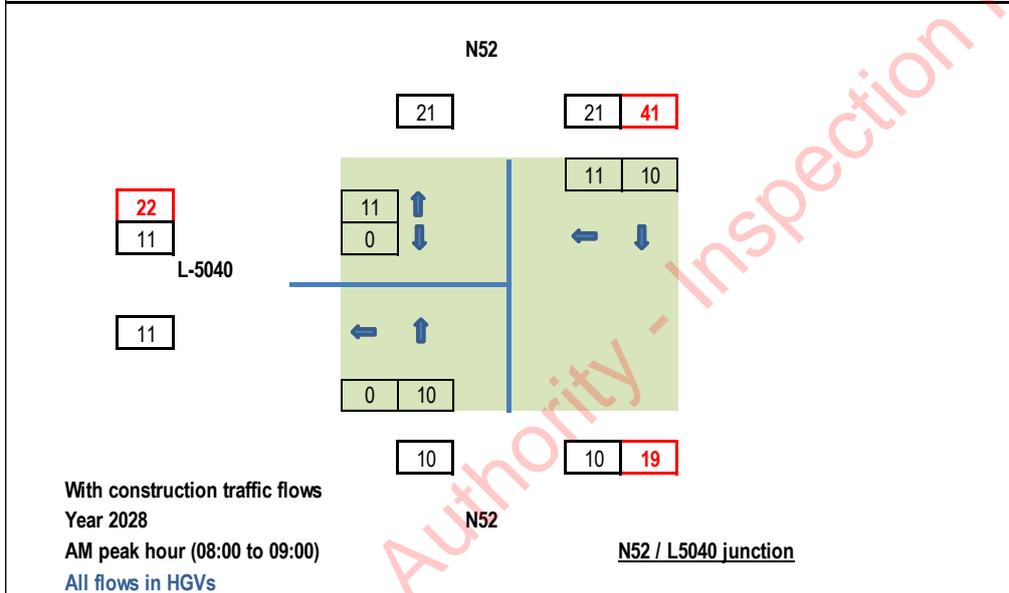
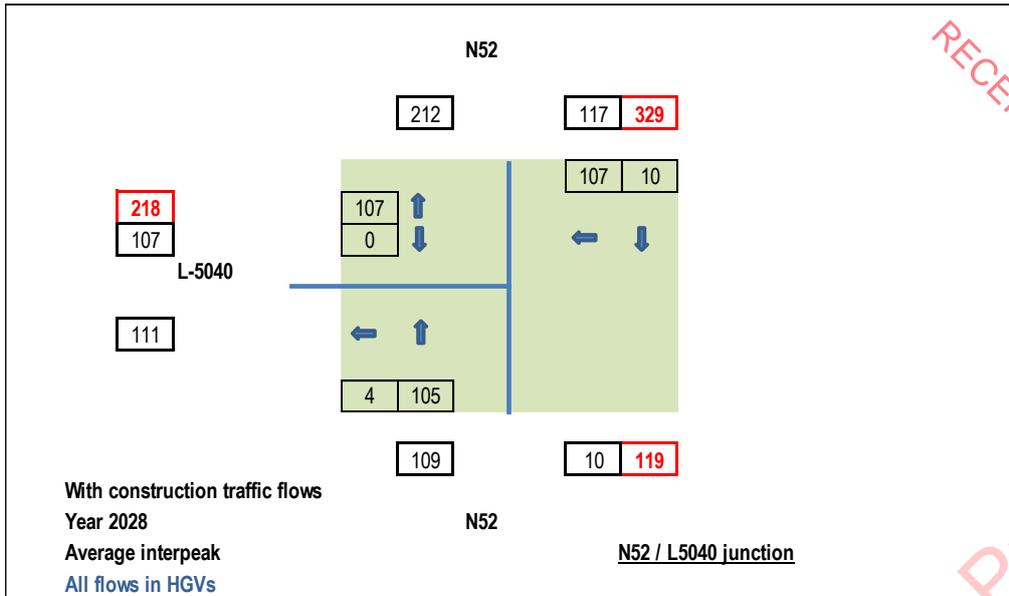
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Figure B7 With construction traffic flows at N52 / L5040 junction
 Year 2028 - All vehicles

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Figure B8 With construction traffic flows at N52 / L-5040 junction
Year 2028 - HGVs