13. MATERIAL ASSETS

13.1 Introduction

13.1.1 Purpose of Section

The purpose of this section is to assess the traffic effects of additional traffic movements that will be generated on the surrounding road network due to the Proposed Development on the existing Roadstone site located in Ballyquin, County Clare.

13.1.1.1 Statement of Authority

This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the Senior Transportation Engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the NUI Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic and transport modelling, including for development related issued relating to various quarry developments.

13.1.1.2 Guidance and Legislation

This section of the EIAR has been completed in accordance with the guidance set out in Chapter 1. The assessment uses standard terminology to describe the likely significant effects associated with the Proposed Development. Further information on the classification of effects used in this assessment is presented in Section 1.7.2 of this EIAR.

13.1.2 Method and Section Structure

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland (TII), in the document *'Guidelines for Traffic and Transport Assessments, May 2014'*.

The Traffic and Transport Section of this report is set out as follows:

- Section 13.2 – Receiving Environment,
- Section 13.3 – Proposed Development and Traffic Generation,
- Section 13.4 – Proposed Development Access Junction,
- Section 13.5 – Traffic Effects of Proposed Quarry Extension and Restoration,
- Section 13.6 – Provision for Sustainable Modes,
- Section 13.7 – Likely and Significant Impacts and associated Mitigation Measures
- Section 13.8 – Summary / conclusion

13.2 Receiving Environment

13.2.1 Site Location and Network Summary

The location of the existing Roadstone Quarry in Ballyquin, County Clare, is shown in the context of the surrounding highway network in Figure 13-1. The Roadstone Ballyquin Quarry is located on the northern side of the R466 regional road approximately 4.8 kilometres northwest of O'Briensbridge and 8.7kms southeast of Broadford.

The existing access connects into the R466 Regional Road at a location where an 80 km/h speed limit applies. The existing quarry access has a wide junction mouth of >40 metres onto the R466. The existing junction is shown in Plates 13-1 to 13-5 and is discussed further in Section 13.5 of this EIAR.

13.2.2 Existing Traffic Volumes

A traffic count and speed survey was undertaken by Traffinomics Ltd at the existing Ballyquin access junction on the R466 on November 22nd 2022. The results of the traffic counts are summarised in Table 13-1 and shown for the AM peak hour, PM peak hour and 12 hour time periods in terms of cars /light goods vehicles (lgvs) in Figure 13-2, heavy goods vehicles (HGVs) in Figure 13-3 and in terms of passenger car units (pcus), where HGVs are given a weighting of 2.4, in Figure 13-4. The main points to note are as follows;

- The AM peak hour was observed to be 08:00 to 09:00 with the PM peak hour 16:00 to 17:00.
- In terms of quarry generated traffic a maximum of 23 HGV movements (11 in and 12 out) were observed during the PM peak hour with a total of 177 HGV movements (84 in and 93 out) observed during the 12 hour period between 07:00 and 19:00. A total of 16 car/lgv movements (8 in, 8 out) were observed on the quarry access during the 12 hour period.
- HGVs were observed to account for 91.7% of all traffic movements into and out of the existing Roadstone Ballyquin Quarry.
- Traffic flows on the R466 were observed to be relatively light with a maximum hourly 2-way flow observed to be 143 vehicles with 20.3% being HGVs during the PM peak hour, with the maximum 12 hour volume observed on the eastern R466 arm of the junction to be 1,454 vehicles with HGVs comprising 24.1%.

It is noted that the traffic flows discussed above were collected on a busy day when the Roadstone Ballyquin Quarry was undergoing infill operations under a previous planning permission that expired in May 2023.

The base year traffic volumes being generated since the traffic surveys were undertaken in November 2022 have been significantly lower than those observed at that time. A total of 2,554 tonnes of material was removed from existing stockpiles on a campaign basis during the 5 month period from January 2024 to May 2024 inclusive. Based on the material being removed using 25 tonne trucks, this resulted in a total of 102 truck movements to / from the site in that 5 month period. Based on 51 working weeks per year, with 11.5 hours per weekday (07:00 to 18:30) and 8 hour day on a Saturday (08:00 to 16:00), it may be determined that there are 3,340 hours in one year, and 1,392 hours in the 5 month period. On average this equates to 0.073 HGV trips (102 / 1,392) to and from the site per hour, or 0.84 HGV trips to and from the Roadstone Quarry site over the duration of an 11.5 hour day.

The base case for traffic generation for the facility is therefore 1 HGV trip to and from the site per day.

Table 13-1 Traffic flows at R466 / quarry junction - observed by time period and vehicle type, year 2022 (November)

Time period	Link	Observed year 2022				
		cars / lgvs	hgvs	All vehs	pcus	% hgvs
AM peak hour	R466 west	95	6	101	109	5.9%
	Quarry access	2	21	23	52	91.3%
	R466 east	93	27	120	158	22.5%
PM peak hour	R466 west	115	10	125	139	8.0%
	Quarry access	5	23	28	60	82.1%
	R466 east	114	29	143	184	20.3%
12 hour	R466 west	821	89	910	1,035	9.8%
	Quarry access	16	177	193	441	91.7%
	R466 east	825	262	1,087	1,454	24.1%

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Base mapping provided by MKO

Figure 13-1 Site location

PROJECT:	Proposed Quarry Extraction, Ballyquin, Co Clare		
CLIENT:	Roadstone		SCALE: NTS
AL PROJECT NO: 10050	DATE: 14.11.24		DRAWN BY: AL

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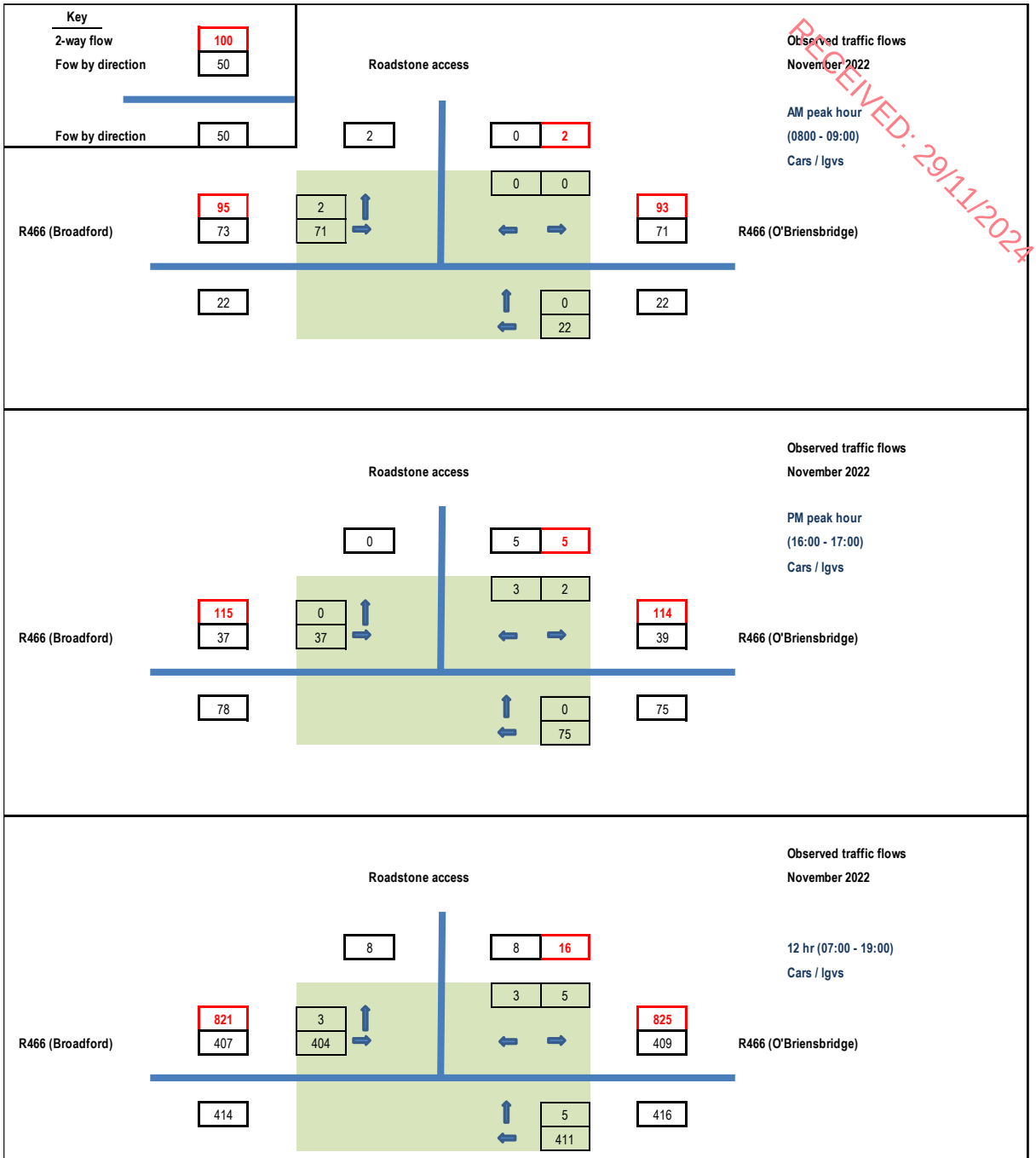

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Figure 13-2 Observed traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2022 November - car / lgv

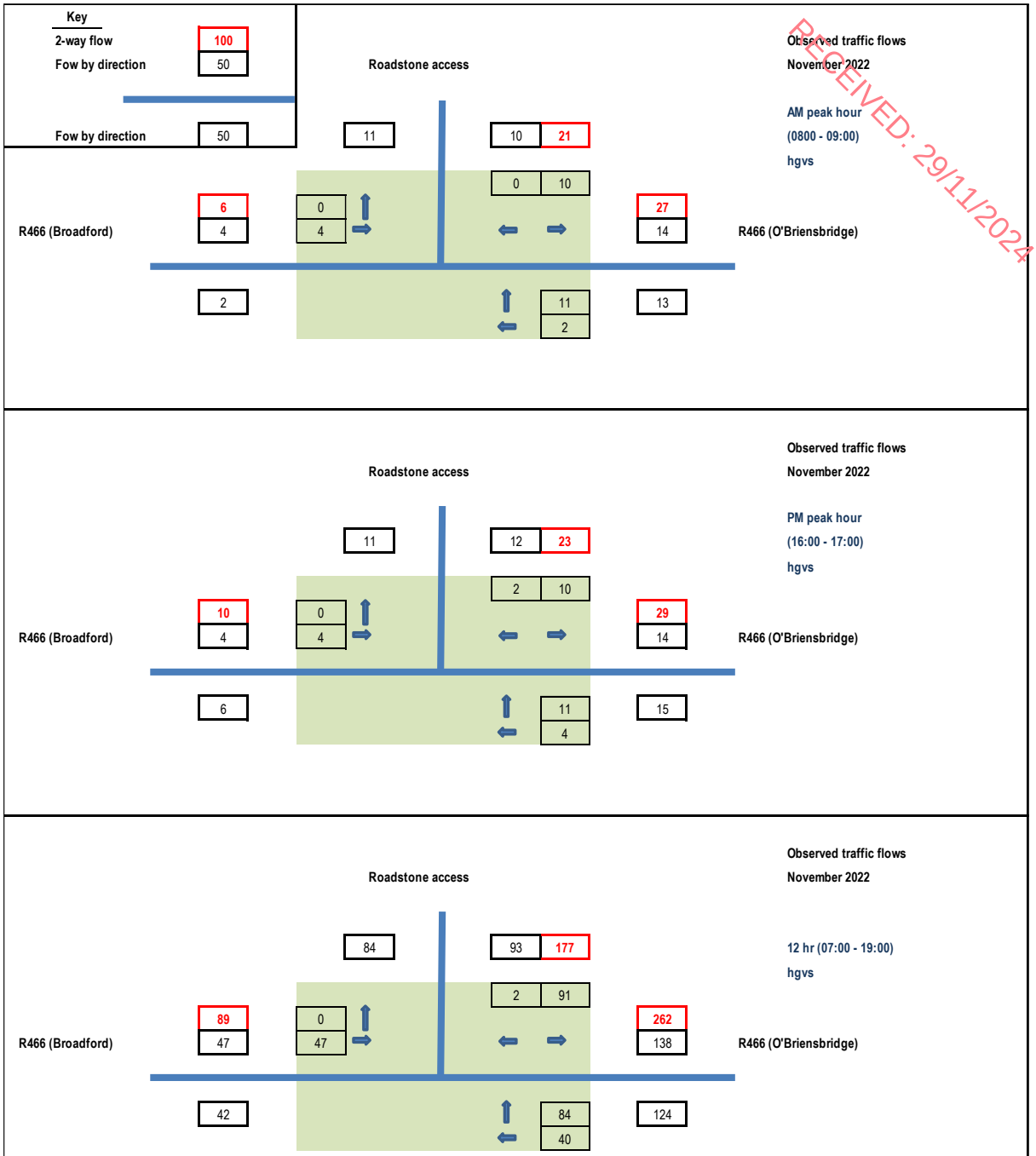

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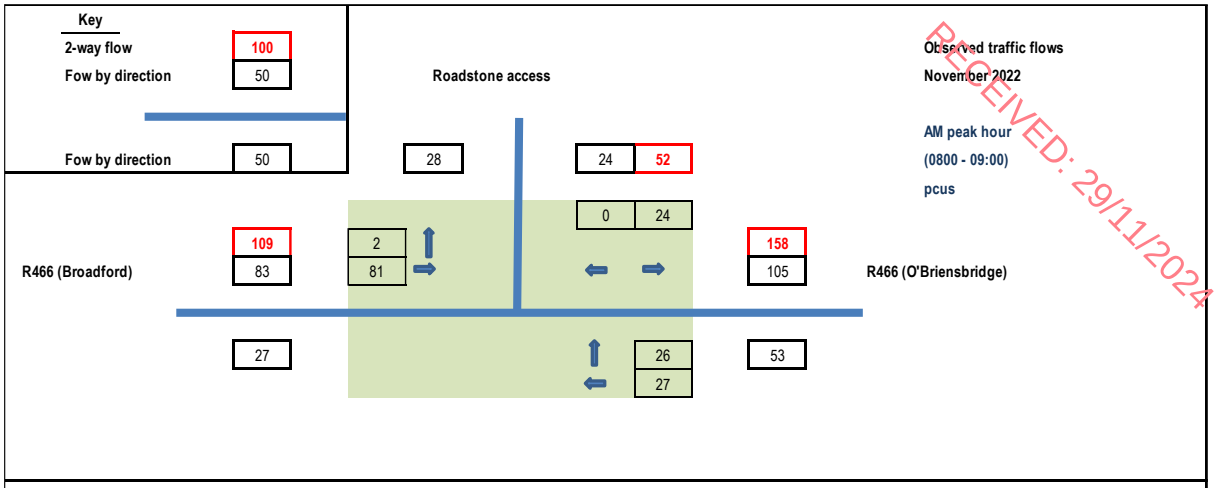
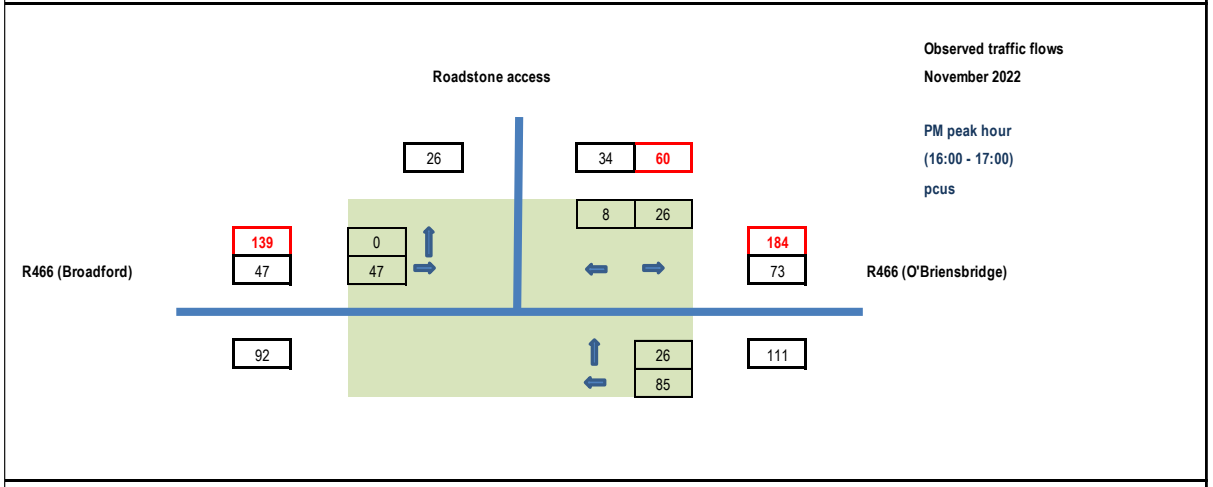
Figure 13-3 Observed traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2022 November - hgvs





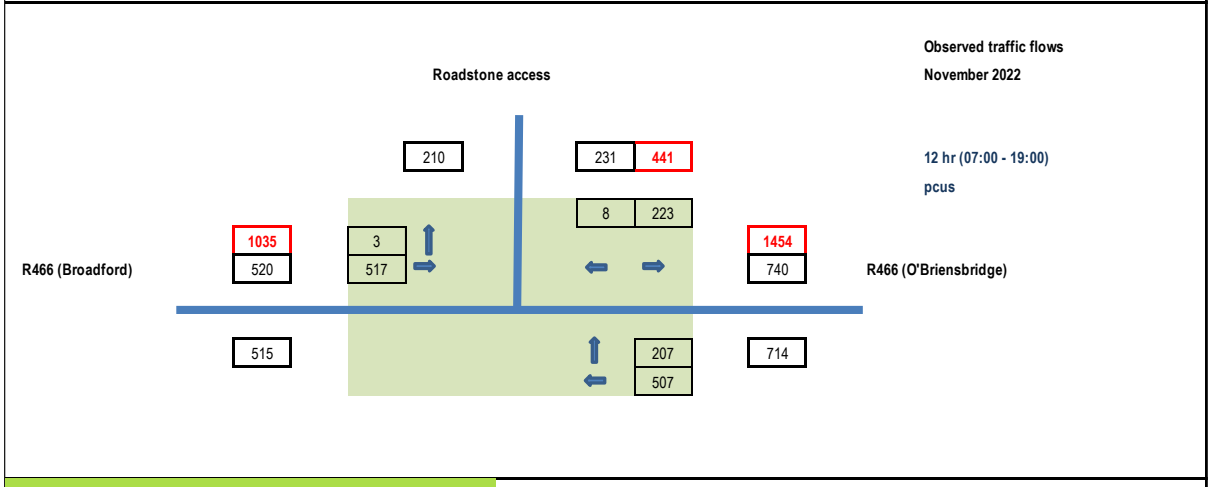


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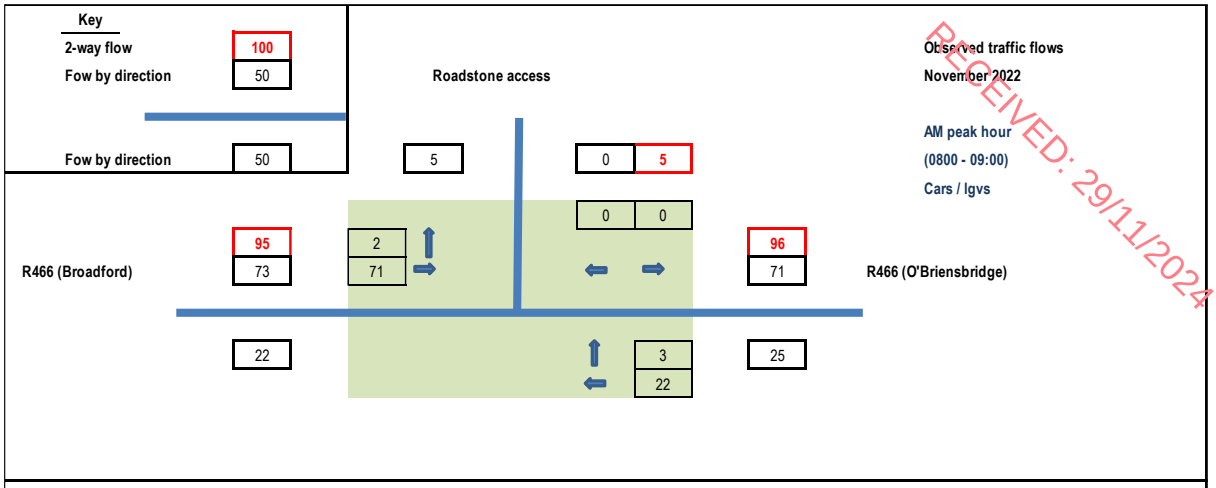
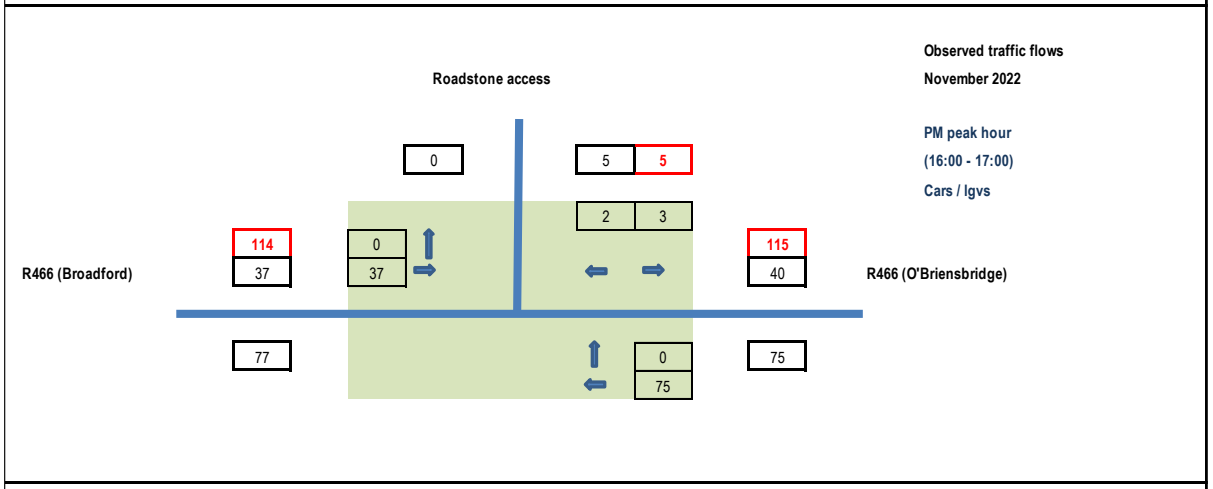
Figure 13-4 Observed traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2022 November - pcus





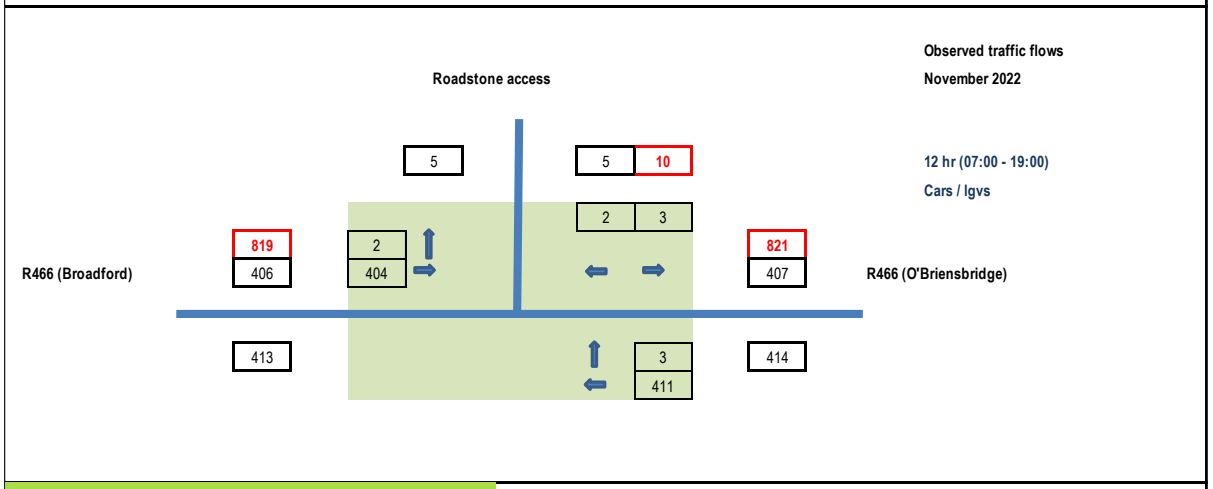


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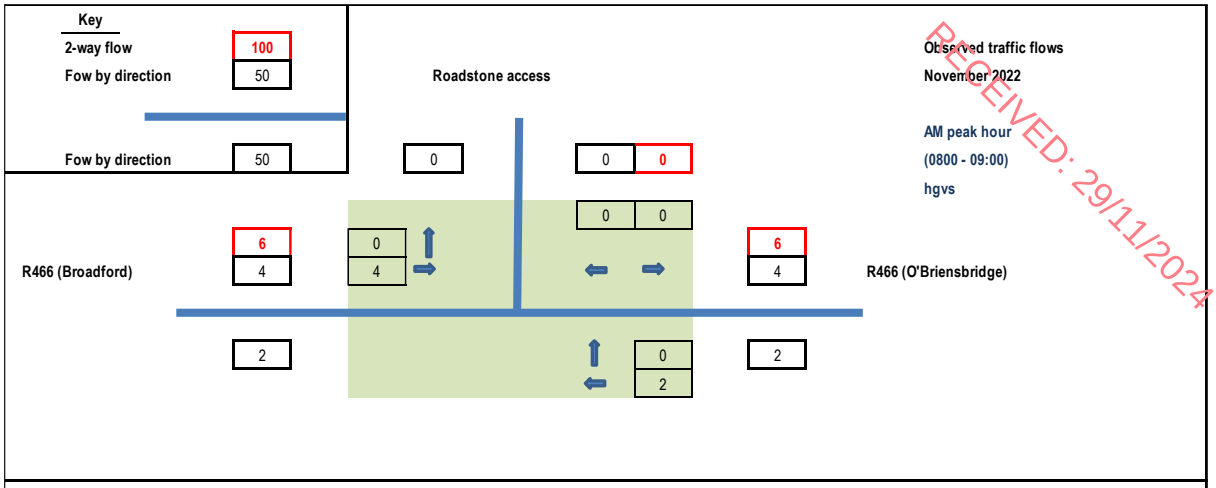
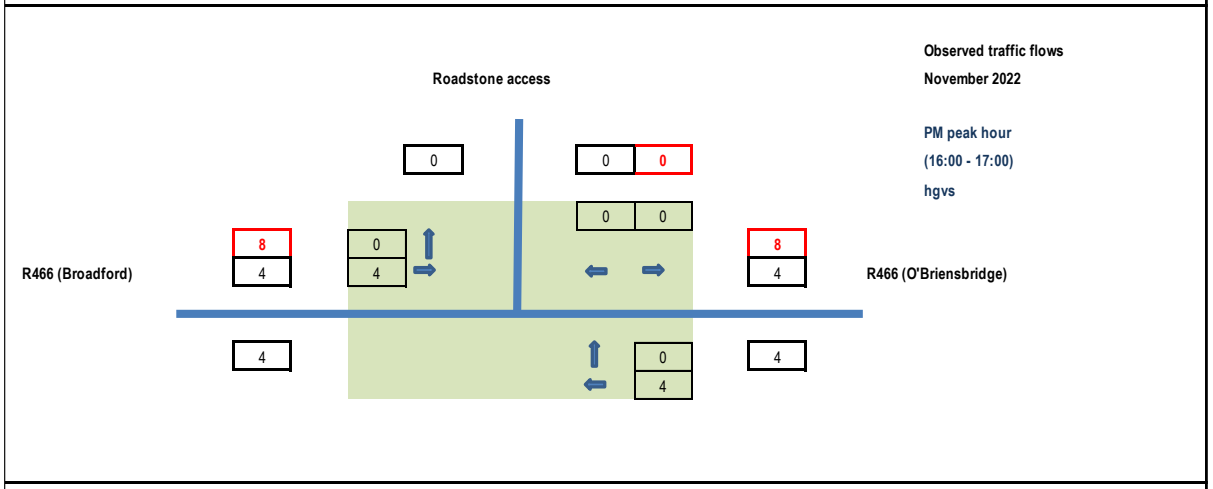
Figure 13-5 Observed traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2022 November - car / lgv
Low quarry activity





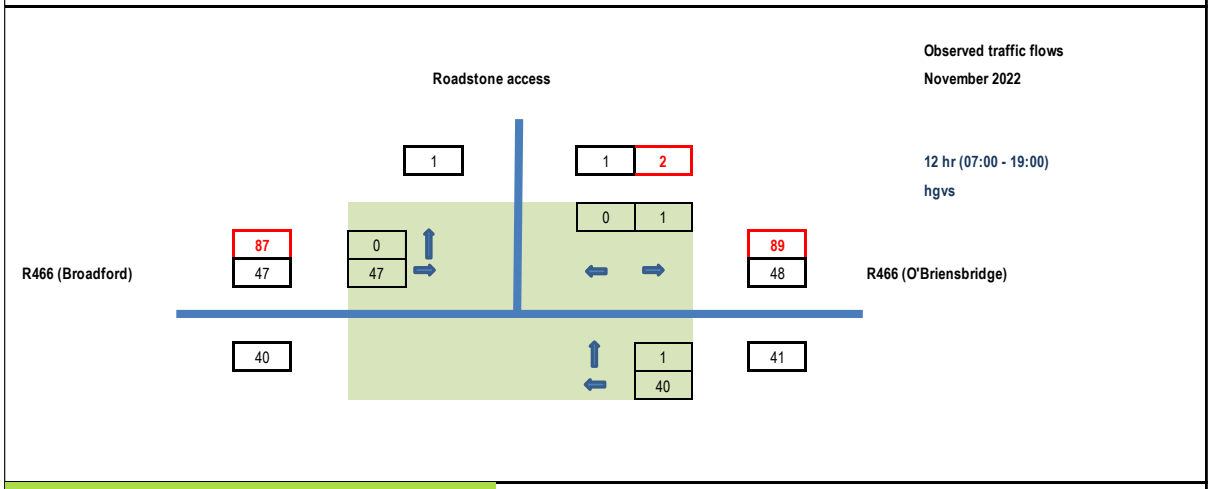


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Figure 13-6 Observed traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2022 November - hgvs
Low quarry activity

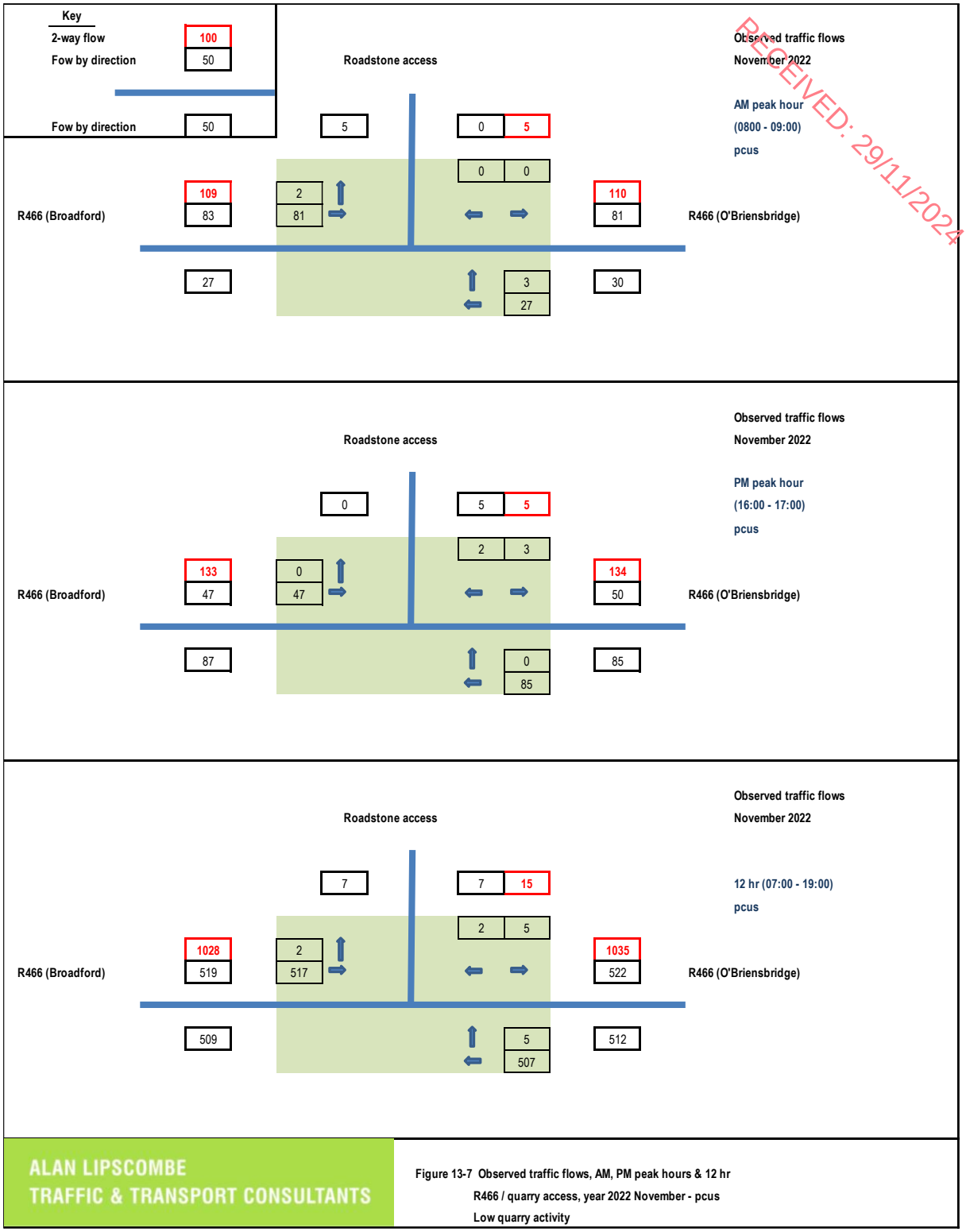

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Figure 13-7 Observed traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2022 November - pcus
Low quarry activity

The year 2022 traffic volumes, based on the low quarry activity set out above and used for the purpose of this assessment, are set out in Table 13-2 and shown for the AM peak hour, PM peak hour and 12 hour time periods in terms of cars / lgvs in Figure 13-5, HGVs in Figure 13-6 and in terms of passenger car units (pcus) in Figure 13-7.

With respect to traffic flows on the R466, with the Roadstone Quarry traffic reduced to reflect the low quarry activity the maximum hourly 2-way flow is reduced from 143 vehicles to 123 vehicles with 6.6% being HGVs during the PM peak hour, with the maximum 12 hour volume observed on the eastern R466 arm of the junction reducing from 1,087 vehicles to 910 vehicles, with 9.8% being HGVs.

The speed data collected during the traffic survey is discussed subsequently in Section 13-5 of this EIAR. The traffic data collected at the site by Traffinomics Ltd is included as Appendix 13-1.

Continuous traffic count data obtained from the closest automatic count site maintained by TII was used to determine the seasonal profile for traffic volumes on the R466 adjacent to the existing Roadstone Ballyquin Quarry. Automatic traffic count data from a site located on the R445 between Castletroy and Annacotty was used with the traffic flows observed in the busiest month of September established to be 7.1% higher than the volumes observed in the survey month of November. The observed traffic flows were therefore factored by 1.071 in order to establish the seasonally adjusted base 2024 traffic flows, which are summarised in Table 13-3 and shown for cars / lgvs in Figure 13-8, HGVs in Figure 13-9 and in terms of pcus in Figure 13-10.

Table 13-2 Traffic flows at R466 / quarry junction - observed by time period and vehicle type, year 2022 (November) – adjusted to low quarry activity base traffic

Time period	Link	Observed year 2022				
		cars / lgvs	hgvs	All vehs	Pcus	% hgvs
AM peak hour	R466 west	95	6	101	109	5.9%
	Quarry access	5	0	5	5	0.0%
	R466 east	96	6	102	110	5.9
PM peak hour	R466 west	114	8	122	133	6.6%
	Quarry access	5	0	5	5	0.0%
	R466 east	115	8	123	134	6.5%
12 hour	R466 west	819	87	906	1,028	9.6%
	Quarry access	10	2	12	15	16.7%
	R466 east	821	89	910	1,035	9.8%

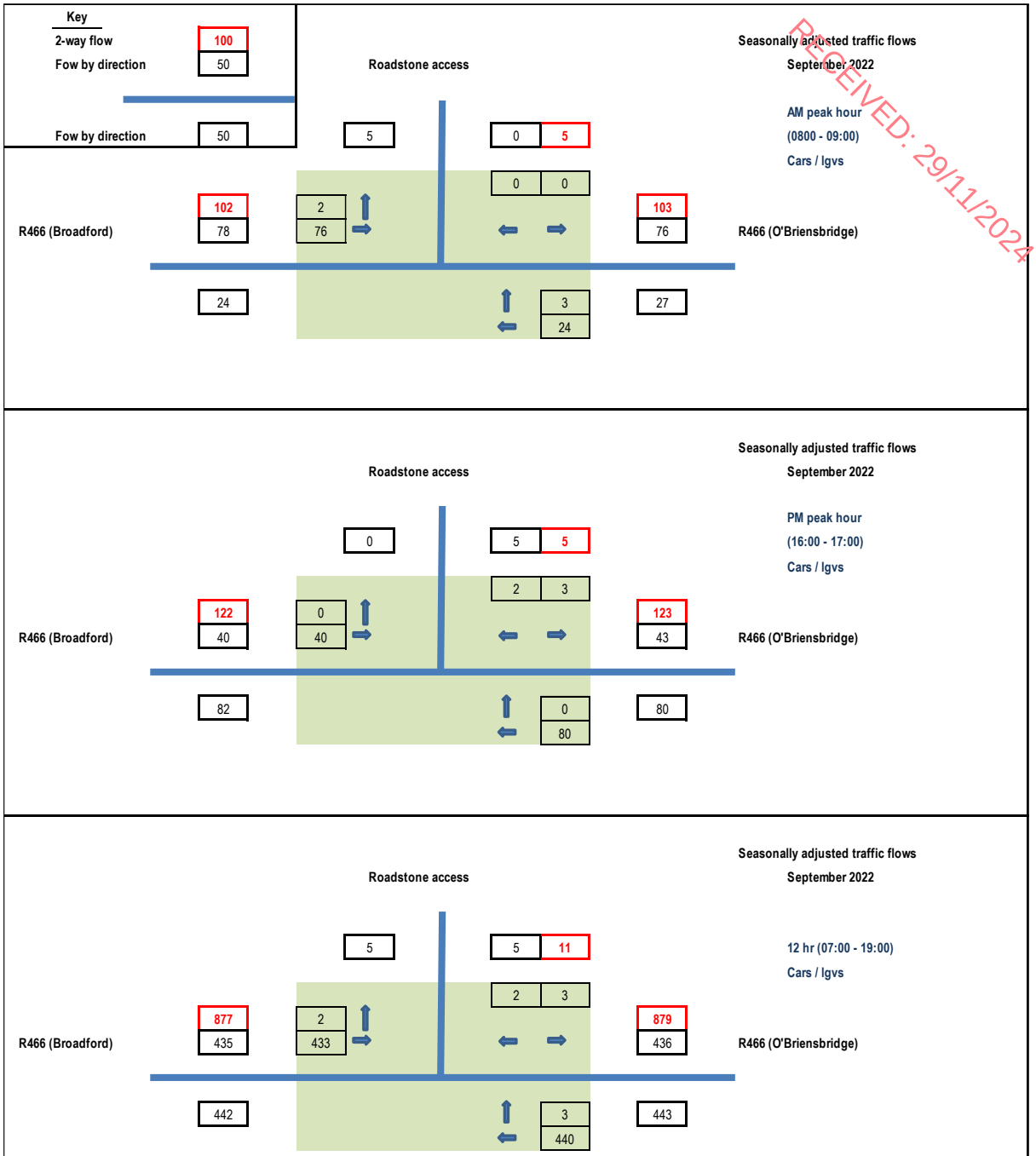

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Figure 13-8 Observed traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2022 Seasonally adjusted,
- car / lgv

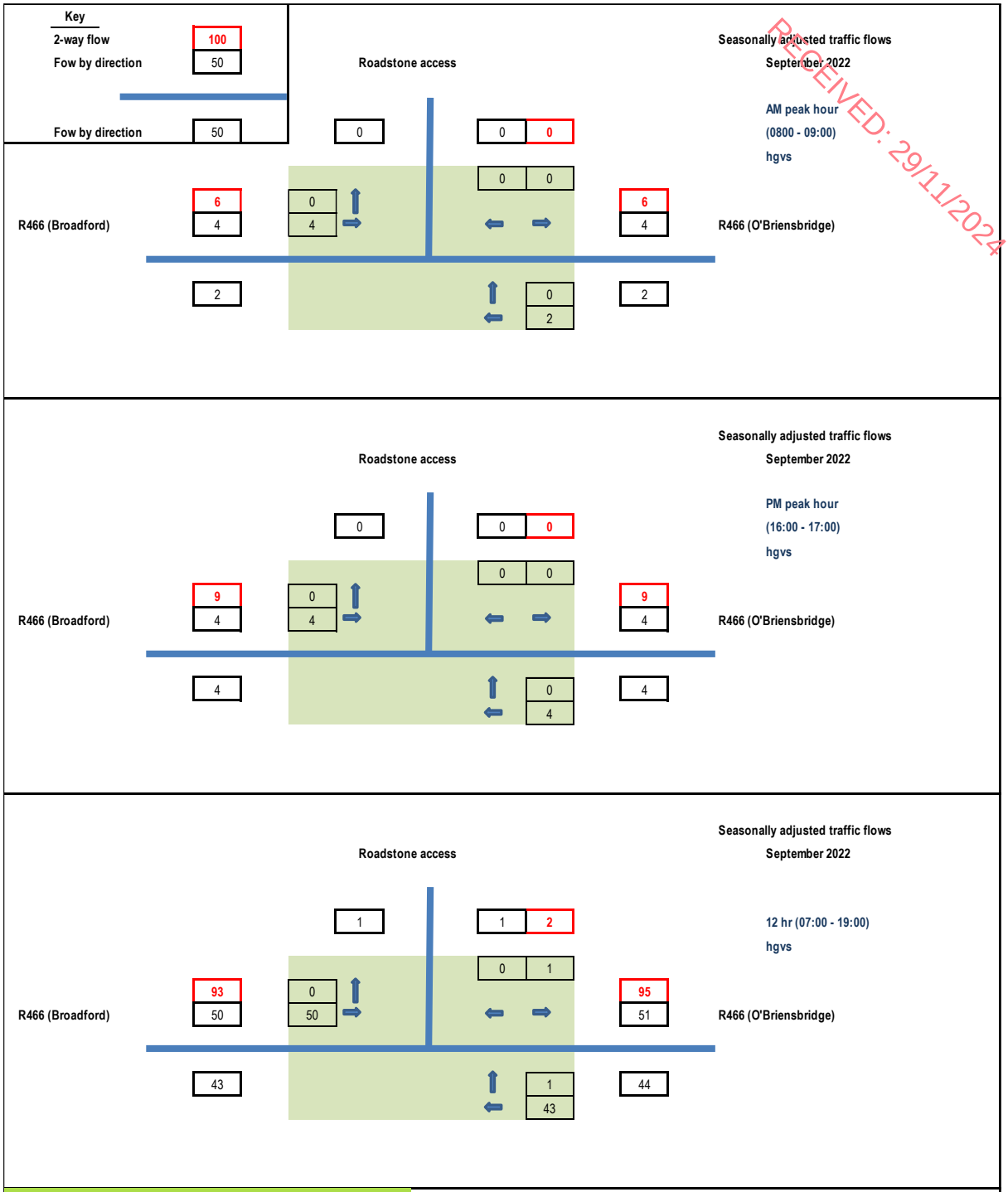

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Figure 13-9 Observed traffic flows, AM, PM peak hours & 12 hr R466 / quarry access, year 2022 Seasonally adjusted, - hgvs

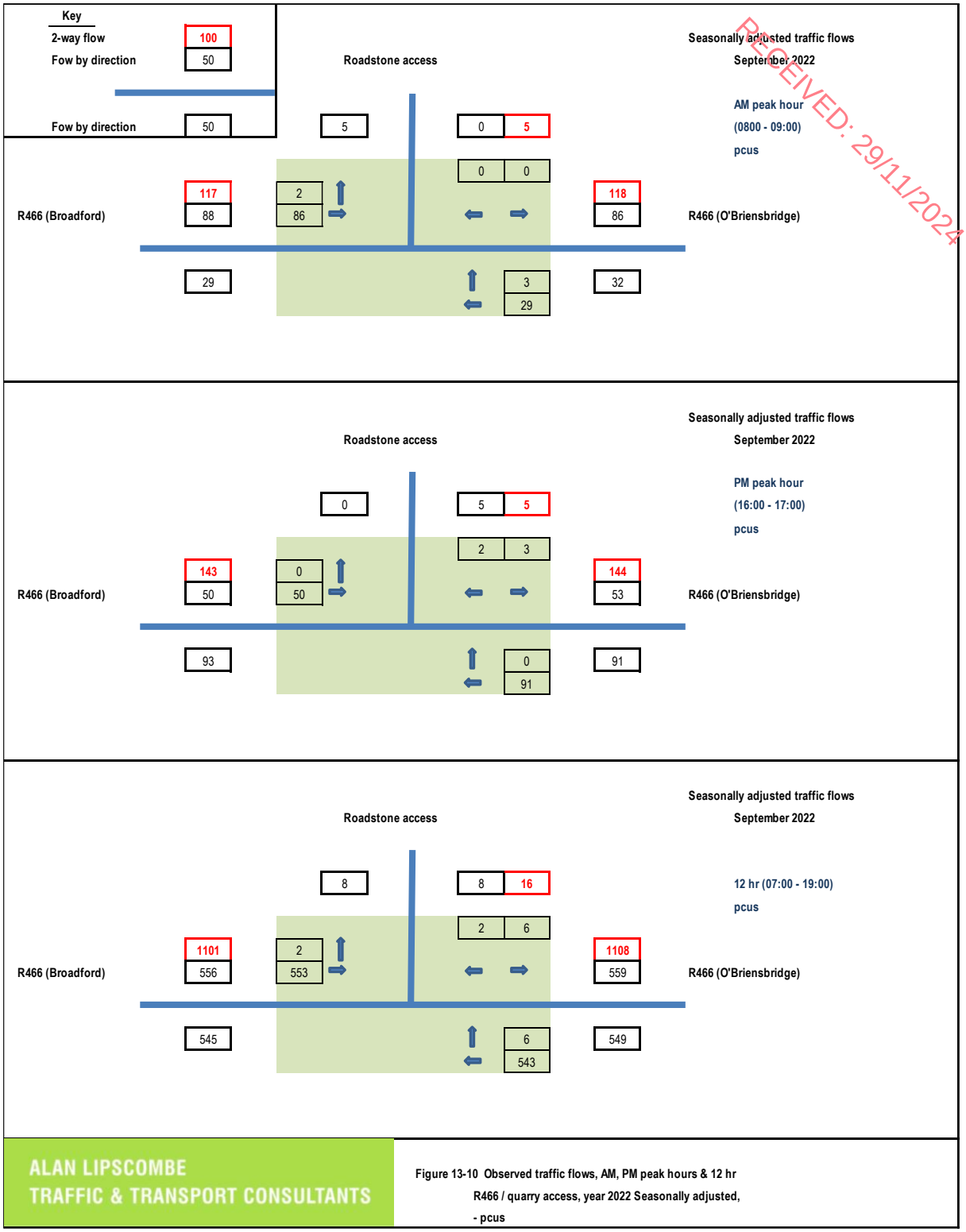

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Figure 13-10 Observed traffic flows, AM, PM peak hours & 12 hr R466 / quarry access, year 2022 Seasonally adjusted, - pcus

13.2.3 Future Year Traffic Volumes

As is set out in Section 13.3.1, the Proposed Development will take place over a 20 year period. With a proposed commencement year of 2026 and a 20 year period of operations the future year for the purpose of this assessment is the year 2046.

Commencement year 2026 and future year 2046 traffic flows were determined from 2024 seasonally adjusted flows by applying an annual growth factor determined from TII's Project Appraisal Guidelines for National Roads Unit 5.3, Table 6.2. Annual growth indices are set out for cars / lgvs in Table 13-4 and for HGVs in Table 13-5 with derived growth rates between the years considered in the assessment shown by vehicle type in Table 13-6. Based on a medium growth scenario the figures show that between the years 2024 to 2026 the volume of cars and lgvs is forecast to grow by 5.2%, and by 14.4% between the years 2024 and 2046. For HGVs TII forecasts indicate that between the years 2024 to 2026 the volume of HGVs will grow by 13.9%, and by 66.1% between the years 2024 and 2046.

Based on the above, traffic forecasts are shown in terms of cars / lgvs, HGVs and pcus in Figures 13-11 to 13-13 for the opening year 2026, and in Figures 13-14 to 13-16 for the future year 2046. Background traffic flows are shown by time period and vehicle type for the base year 2024 and the study years 2026 and 2046 in Table 13-7.

Table 13-3 Traffic flows at R466 / quarry junction – observed and seasonally adjusted, by time period and vehicle type, year 2022

Time period	Link	Observed year 2022				Seasonally adjusted year 2022			
		cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus
AM peak hour	R466 west	95	6	101	109	102	6	108	117
	Quarry access	5	0	5	5	5	0	5	5
	R466 east	96	6	102	110	103	6	109	118
PM peak hour	R466 west	114	8	122	133	122	9	131	143
	Quarry access	5	0	5	5	5	0	5	5
	R466 east	115	8	123	134	123	9	132	144
12 hour	R466 west	819	87	906	1,028	877	93	970	1,101
	Quarry access	10	2	12	15	11	2	13	16
	R466 east	821	89	910	1,035	879	95	975	1,108

Table 13-4 TII Traffic growth indices, light vehicles (County Clare)

Year	Lights - Annual factor			Lights - Cumulative index		
	Low	Medium	High	Low	Medium	High
2022	1.0111	1.0127	1.0161	1.000	1.000	1.000
2023	1.0111	1.0127	1.0161	1.011	1.013	1.016
2024	1.0111	1.0127	1.0161	1.022	1.026	1.032
2025	1.0111	1.0127	1.0161	1.034	1.039	1.049
2026	1.0111	1.0127	1.0161	1.045	1.052	1.066
2027	1.0111	1.0127	1.0161	1.057	1.065	1.083
2028	1.0111	1.0127	1.0161	1.068	1.079	1.101
2029	1.0111	1.0127	1.0161	1.080	1.092	1.118
2030	1.0009	1.0028	1.0063	1.081	1.095	1.125
2031	1.0009	1.0028	1.0063	1.082	1.098	1.132
2032	1.0009	1.0028	1.0063	1.083	1.102	1.140
2033	1.0009	1.0028	1.0063	1.084	1.105	1.147
2034	1.0009	1.0028	1.0063	1.085	1.108	1.154
2035	1.0009	1.0028	1.0063	1.086	1.111	1.161
2036	1.0009	1.0028	1.0063	1.087	1.114	1.169
2037	1.0009	1.0028	1.0063	1.088	1.117	1.176
2038	1.0009	1.0028	1.0063	1.089	1.120	1.183
2039	1.0009	1.0028	1.0063	1.090	1.123	1.191
2040	1.0005	1.0026	1.0097	1.091	1.126	1.202
2041	1.0005	1.0026	1.0097	1.091	1.129	1.214
2042	1.0005	1.0026	1.0097	1.092	1.132	1.226
2043	1.0005	1.0026	1.0097	1.092	1.135	1.238
2044	1.0005	1.0026	1.0097	1.093	1.138	1.250
2045	1.0005	1.0026	1.0097	1.093	1.141	1.262
2046	1.0005	1.0026	1.0097	1.094	1.144	1.274

Table 13-5 TII Traffic growth indices, hgvs (County Clare)

Year	Lights - Annual factor			Lights - Cumulative index		
	Low	Medium	High	Low	Medium	High
2022	1.0314	1.0330	1.0364	1.000	1.000	1.000
2023	1.0314	1.0330	1.0364	1.031	1.033	1.036
2024	1.0314	1.0330	1.0364	1.064	1.067	1.074
2025	1.0314	1.0330	1.0364	1.097	1.102	1.113
2026	1.0314	1.0330	1.0364	1.132	1.139	1.154
2027	1.0314	1.0330	1.0364	1.167	1.176	1.196
2028	1.0314	1.0330	1.0364	1.204	1.215	1.239
2029	1.0314	1.0330	1.0364	1.242	1.255	1.284
2030	1.0128	1.0148	1.0186	1.258	1.274	1.308
2031	1.0128	1.0148	1.0186	1.274	1.293	1.333
2032	1.0128	1.0148	1.0186	1.290	1.312	1.357
2033	1.0128	1.0148	1.0186	1.306	1.331	1.383
2034	1.0128	1.0148	1.0186	1.323	1.351	1.408
2035	1.0128	1.0148	1.0186	1.340	1.371	1.435
2036	1.0128	1.0148	1.0186	1.357	1.391	1.461
2037	1.0128	1.0148	1.0186	1.375	1.412	1.488
2038	1.0128	1.0148	1.0186	1.392	1.433	1.516
2039	1.0128	1.0148	1.0186	1.410	1.454	1.544
2040	1.0173	1.0192	1.0290	1.434	1.482	1.589
2041	1.0173	1.0192	1.0290	1.459	1.510	1.635
2042	1.0173	1.0192	1.0290	1.484	1.539	1.683
2043	1.0173	1.0192	1.0290	1.510	1.569	1.731
2044	1.0173	1.0192	1.0290	1.536	1.599	1.782
2045	1.0173	1.0192	1.0290	1.563	1.630	1.833
2046	1.0173	1.0192	1.0290	1.590	1.661	1.886

Table 13-6 TII derived growth rates by vehicle type

Vehicle type	Period	Factor		
		Low	Medium	High
Cars / lgvs	2022 - 2026	1.045	1.052	1.066
	2022 – 2046	1.094	1.144	1.274
hgvs	2022 - 2026	1.132	1.139	1.154
	2022 – 2046	1.590	1.661	1.886

Table 13-7 Traffic flows at R466 / quarry junction – traffic flows by time period and vehicle type, seasonally adjusted traffic flows year 2022 and background traffic flows for years 2026 and 2046

Time period	Link	Seasonally adjusted year 2022				Background traffic year 2026				Background traffic year 2046			
		cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus
AM peak hour	R466 west	102	6	108	117	107	7	114	124	116	11	127	142
	Quarry access	5	0	5	5	5	0	5	5	5	0	5	5
	R466 east	103	6	109	118	108	7	115	125	117	11	128	143
PM peak hour	R466 west	122	9	131	143	128	10	138	152	139	14	1531	173
	Quarry access	5	0	5	5	5	0	5	5	5	0	5	5
	R466 east	123	9	132	144	129	10	139	153	140	14	154	174
12 hour	R466 west	877	93	970	1,101	923	106	1,029	1,177	1,003	155	1,158	1,375
	Quarry access	11	2	13	16	11	2	13	16	11	2	13	16
	R466 east	879	95	975	1,108	925	108	1,033	1,184	1,005	157	1,162	1,382

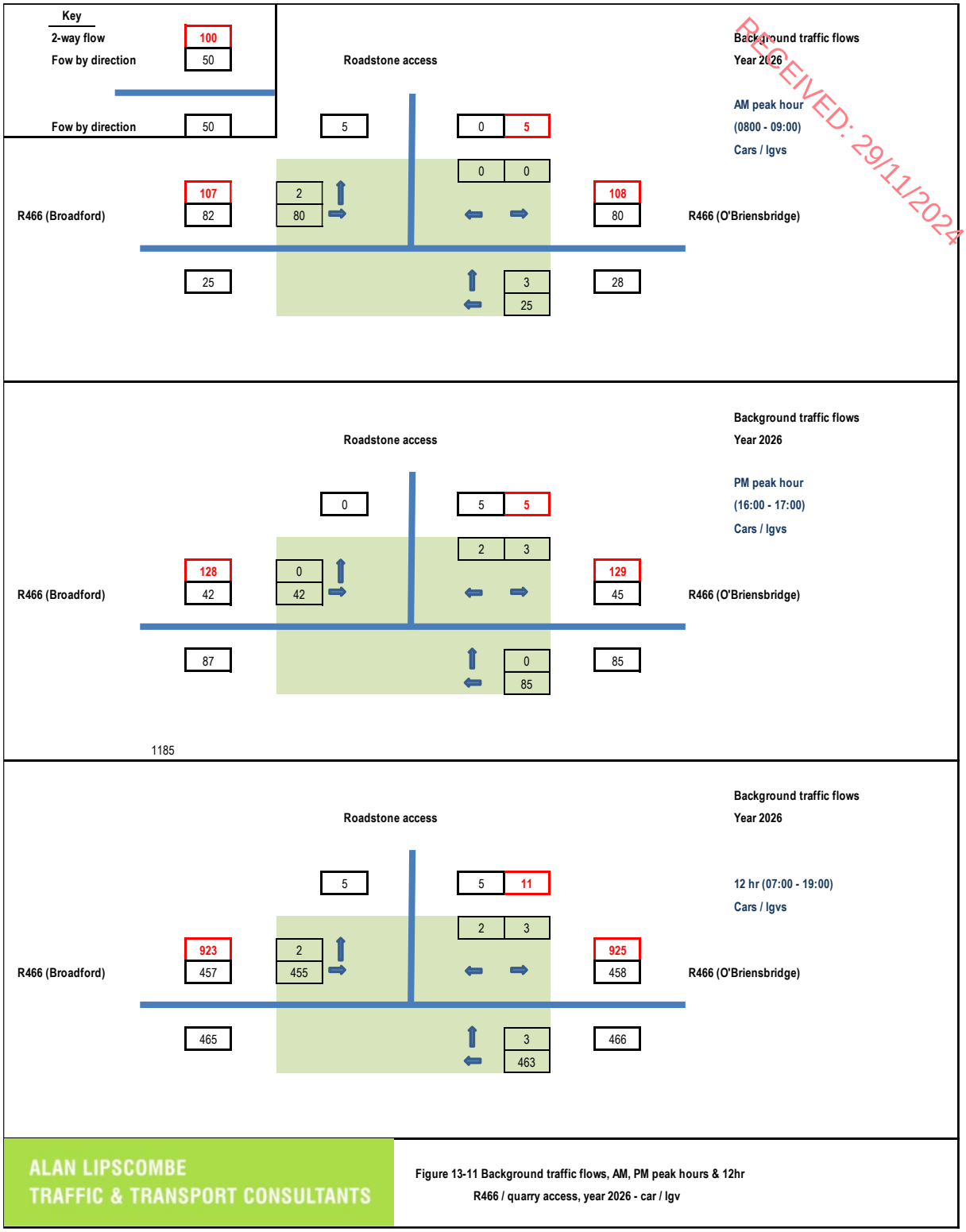

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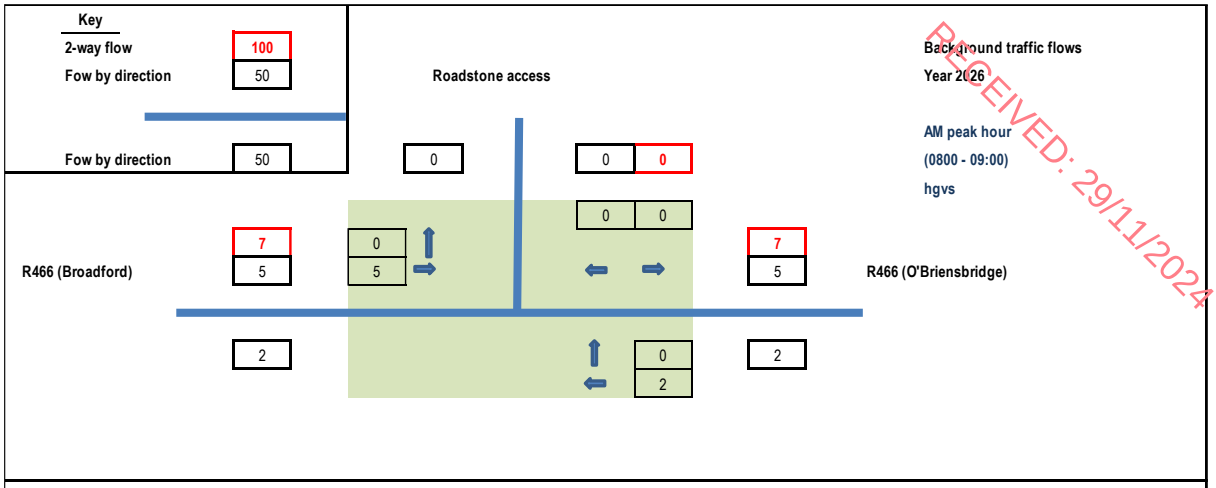
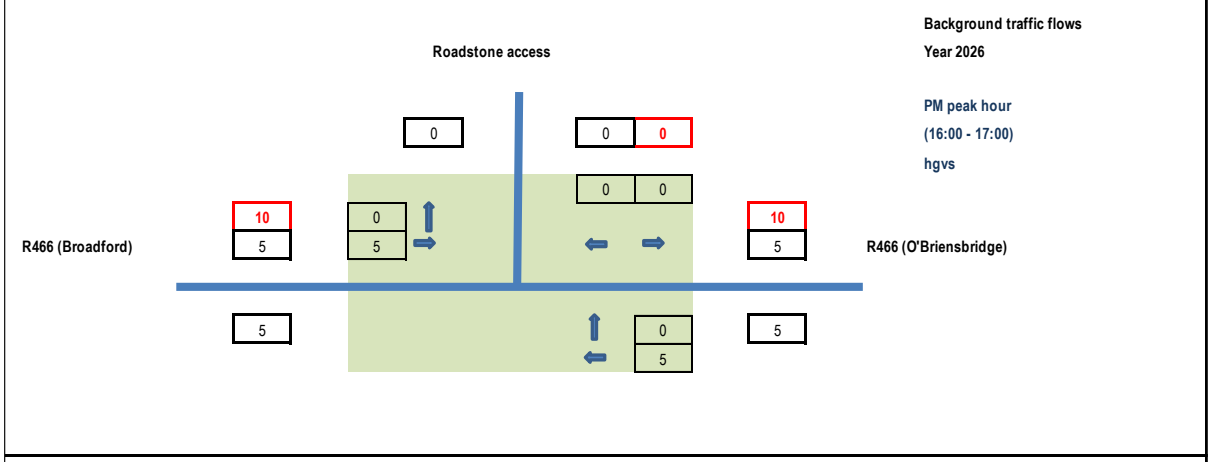
Figure 13-11 Background traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2026 - car / lgv





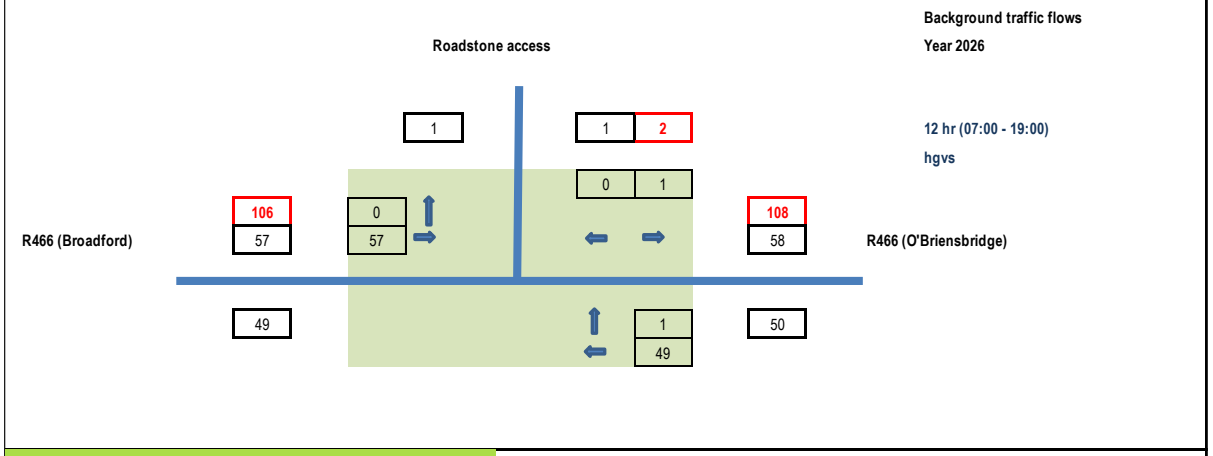


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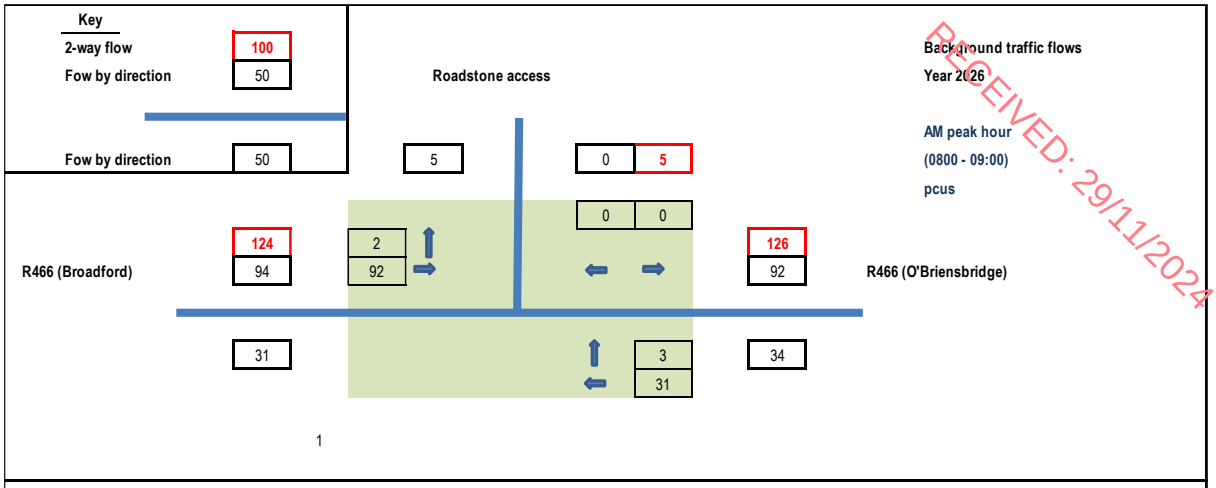
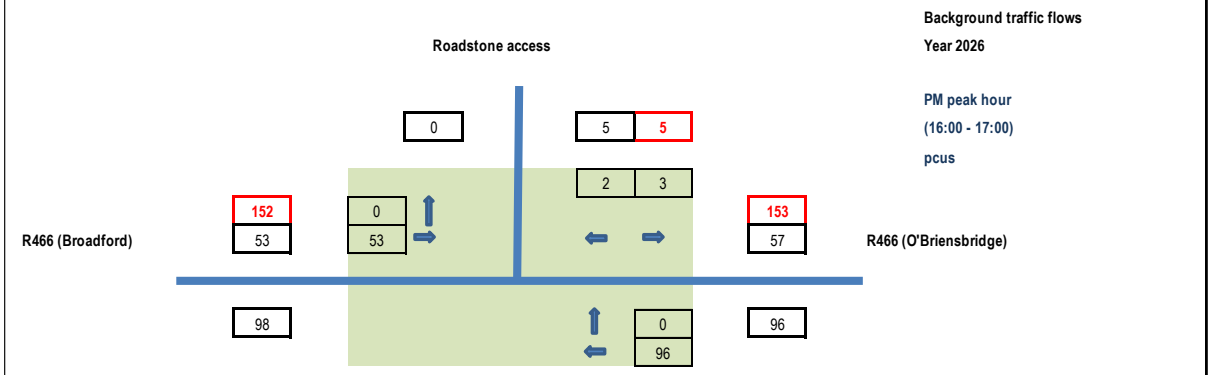
Figure 13-12 Background traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2026 - hgvs





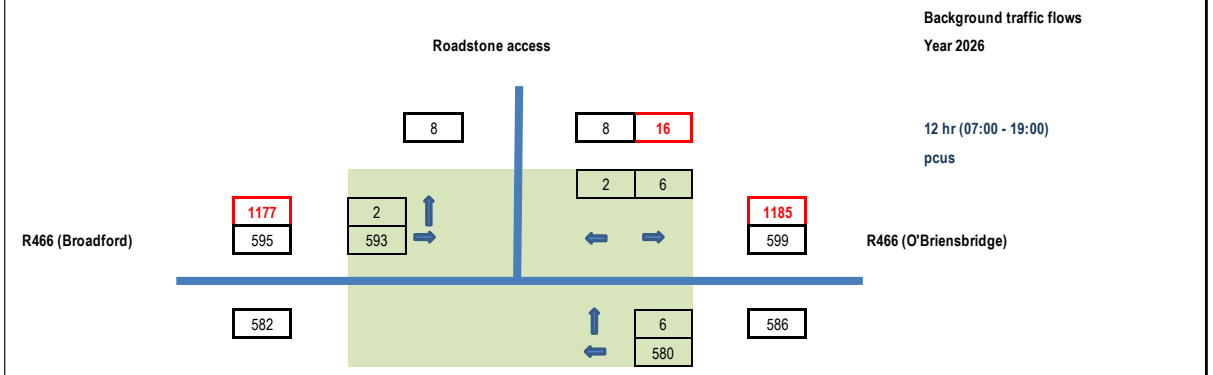


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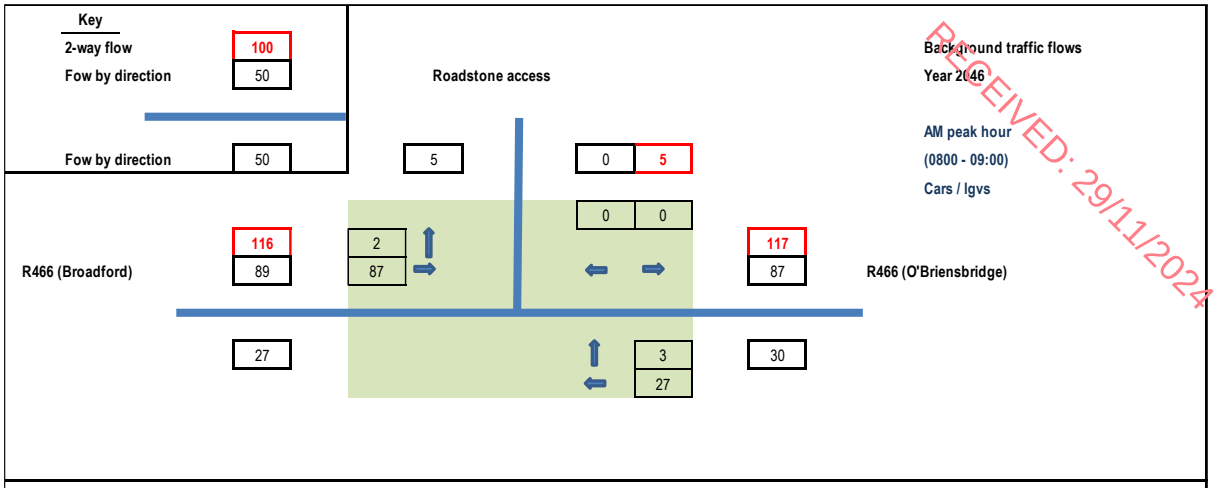
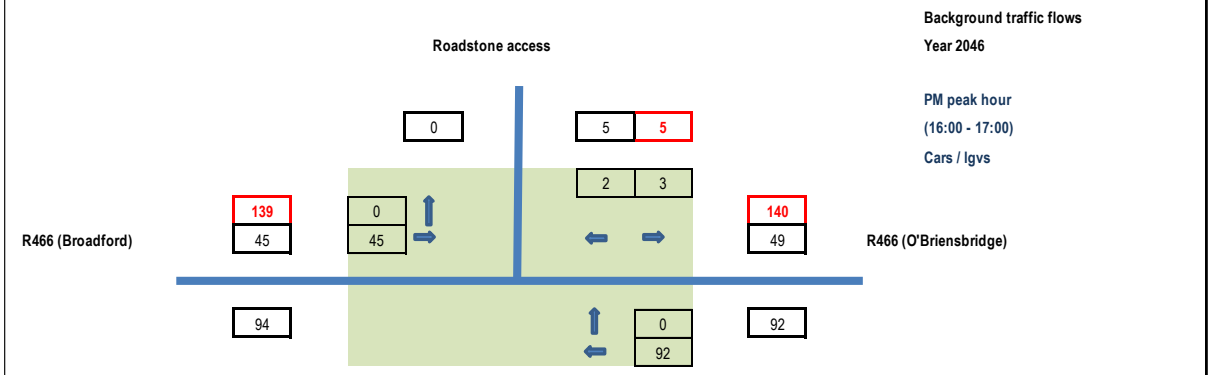
Figure 13-13 Background traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2026 - pcus





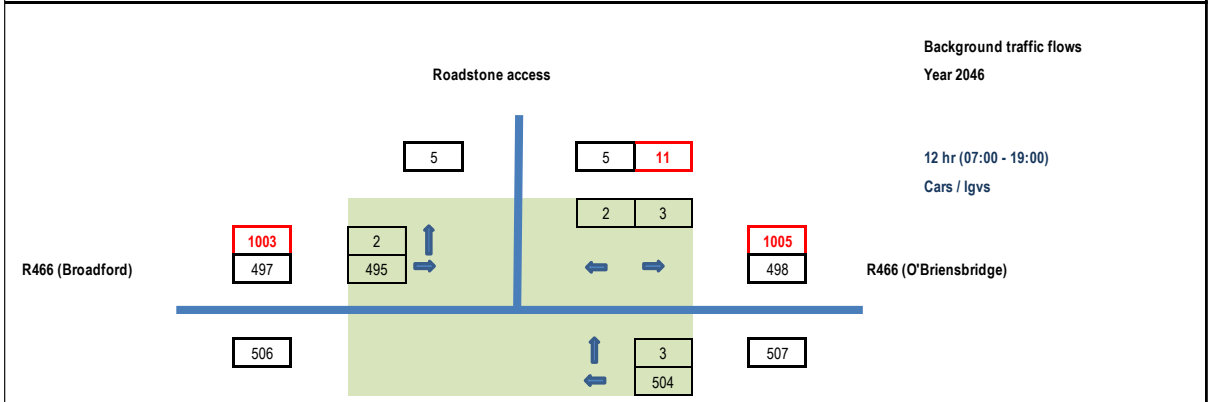


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Figure 13-14 Background traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2046 - car / lgv

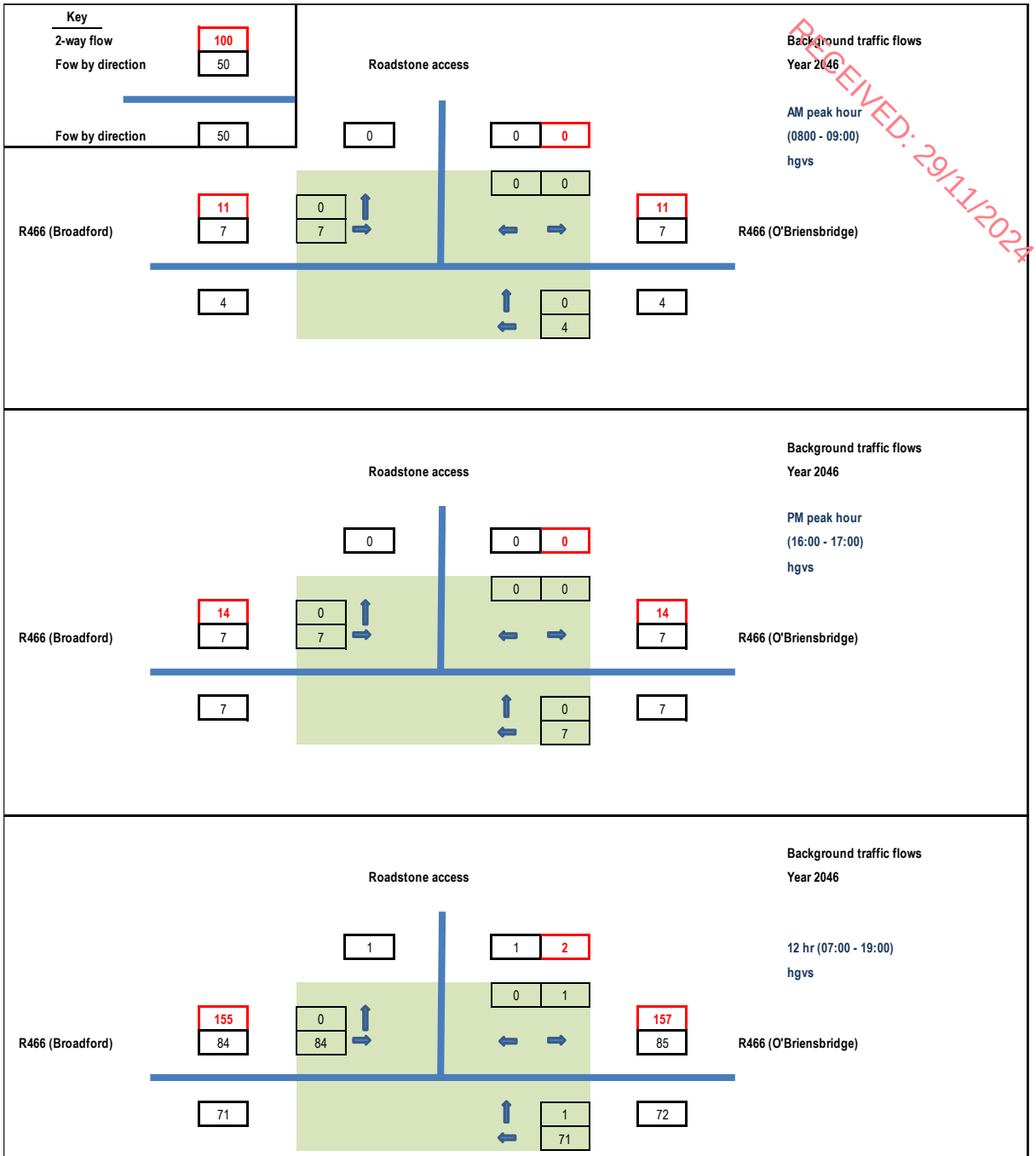

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Figure 13-15 Background traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2046 - hgvs

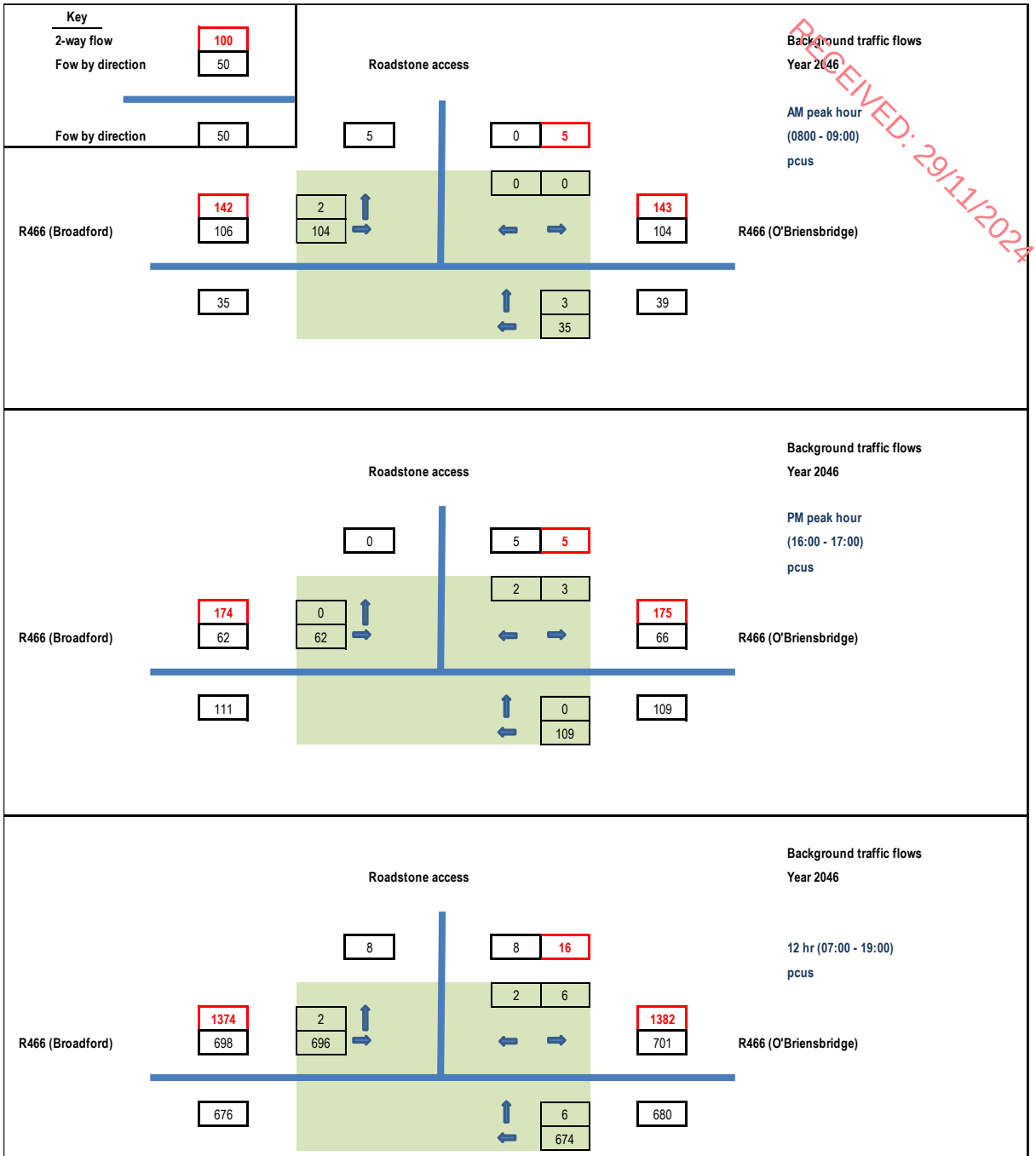

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Figure 13-16 Background traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2046 - pcus

13.3 Proposed Development and Traffic Generation

13.3.1 Trip Generation of Existing Quarry and Proposed Quarry Restoration

The existing traffic volumes generated by the Roadstone Ballyquin Quarry are low and are set out in Section 13.2.2.

The details of the Proposed Development are provided in Chapter 3 of this EIAR. The development proposal which is the subject of this EIAR includes the proposed sand extraction and the infilling and restoration of an existing and future quarry void back to original land contours. It is proposed that both elements of the Proposed Development, the sand extraction and the infill and restoration of the existing void, will take place over a 20 year period.

Trip generation of Proposed Development during construction

As set out in Section 3.3 of this EIAR, the construction works associated with the Proposed Development will be minimal, with much of the work confined to the internal network. It is estimated that construction phase will last 1 month with the additional traffic generated at the R466 / quarry access junction being a maximum 4 truck movements per hour, which is the same traffic generation estimated for the operational stage, as set out below.

Trip generation of proposed sand extraction during operation

As part of the Proposed Development a total of 1,428,571 tonnes of sand will be extracted from the existing Roadstone Quarry site. Based on uniform extraction over a 20 year period this equates to 71,429 tonnes per year. With the assumption that the sand will be extracted using 25 tonne trucks this will result in a total of 2,857 truck movements to / from the site per year. Based on 51 working weeks per year, with 11.5 hours per day weekday (07:00 to 18:30) and 8 hour day on a Saturday (08:00 to 16:00), the sand will be extracted during 3,340 hours per year, which results in an average 0.9 HGV trips to and from the site per hour.

Trip generation of restoration during operation

Over the same 20 year period a total of 4,471,200 tonnes of infill material will be imported to the site. Based on the same calculation as set out above this will result in 8,942 truckloads during the 3,340 working hours per annum, resulting in an average of 2.7 truckloads travelling to and from the site per hour.

Total trip generation during operation

For the purpose of testing the traffic related impacts of the Proposed Development on the surrounding road network the total additional truck movements that will be generated by the Ballyquin Quarry site will be as follows;

- To / from the site per hour = 3.6 trucks (rounded to 4).
- Loads to / from the site per weekday – (07:00 -18:30) 11.5 hours = 40.6 trucks (rounded to 41).

- Loads to / from the site per Saturday – (08:00 -16:00) 8 hours = 28.3 trucks (rounded to 29).
- Loads to and from the site per week (65.5 hours) = 236 trucks.

In addition to the above additional HGV trips it is estimated that an additional 5 staff will work on the site as a result of the Proposed Development, with 5 additional car trips assumed to travel to and from the site in the AM and PM peak hours respectively.

A substitute consent was granted for the Ballyquin Quarry in 2015 under S261A of the Planning and Development Act 2000 by Clare County Council (03.SU.0040/EUQY93). As part of this consent the number of HGV trips permitted was as follows:

- 2.2 HGV trips in and out of the development per hour,
- Or based on and 82 hour week (06:00 to 20:00 weekdays and 06:00 to 18:00 on Saturday), 180 trips in and out per week.

Therefore compared to the number of HGV movements already permitted as part of the planning permission above, the Proposed Development represent an increase in the following numbers of HGVs trips to and from the site,

- An increase from 2.2 HGV trips to 3.6 HGV trips, or +1.4 HGV trips in and out of the Roadstone Ballyquin Quarry per hour, or,
- An increase from 176 HGV truck movements to 236 HGV truck movements, or + 60 HGV movements in and out of the quarry per week.

The impacts of the proposed modest increase in trip generation associated with the Proposed Development is assessed in Section 13.4 of this EIAR.

The additional traffic forecast to be generated by the Proposed Development is shown for the AM peak hour, PM peak hour and 12 hour time periods in terms of cars / lgvs in Figure 13-17, HGVs in Figure 13-18 and in terms of pcus in Figure 13-19, and is summarised in Table 13-8.

Table 13-8 Summary of additional development trip generation by time period and vehicle type

Time period	Into quarry				Out of quarry				2-way			
	cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus
AM peak hour	0	4	4	10	0	4	4	10	0	8	8	19
PM peak hour	0	4	4	10	0	4	4	10	0	8	8	19
12-hour	0	40	40	96	0	40	40	96	0	80	80	192

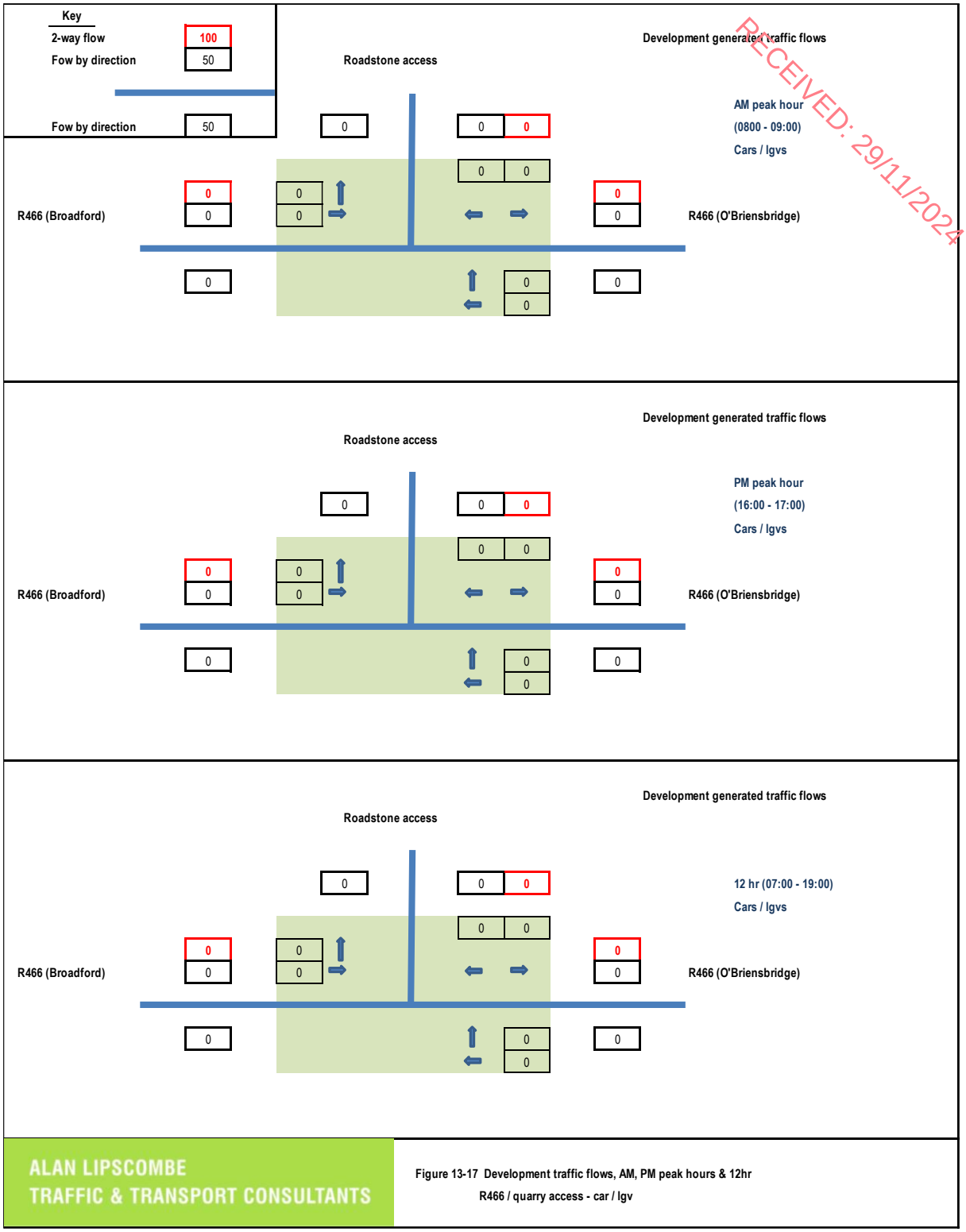

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Figure 13-17 Development traffic flows, AM, PM peak hours & 12hr
R466 / quarry access - car / lgv

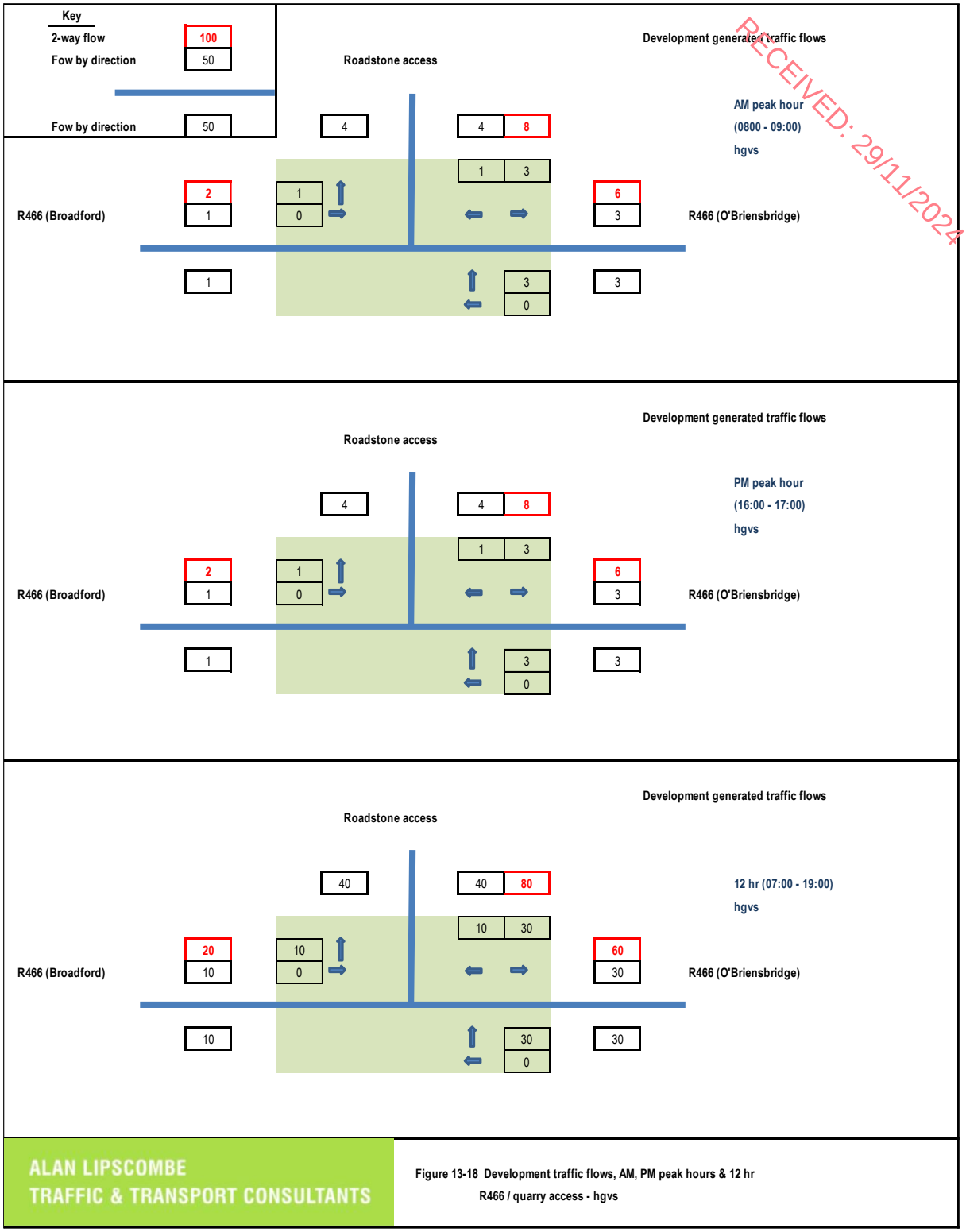

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Figure 13-18 Development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access - hgvs

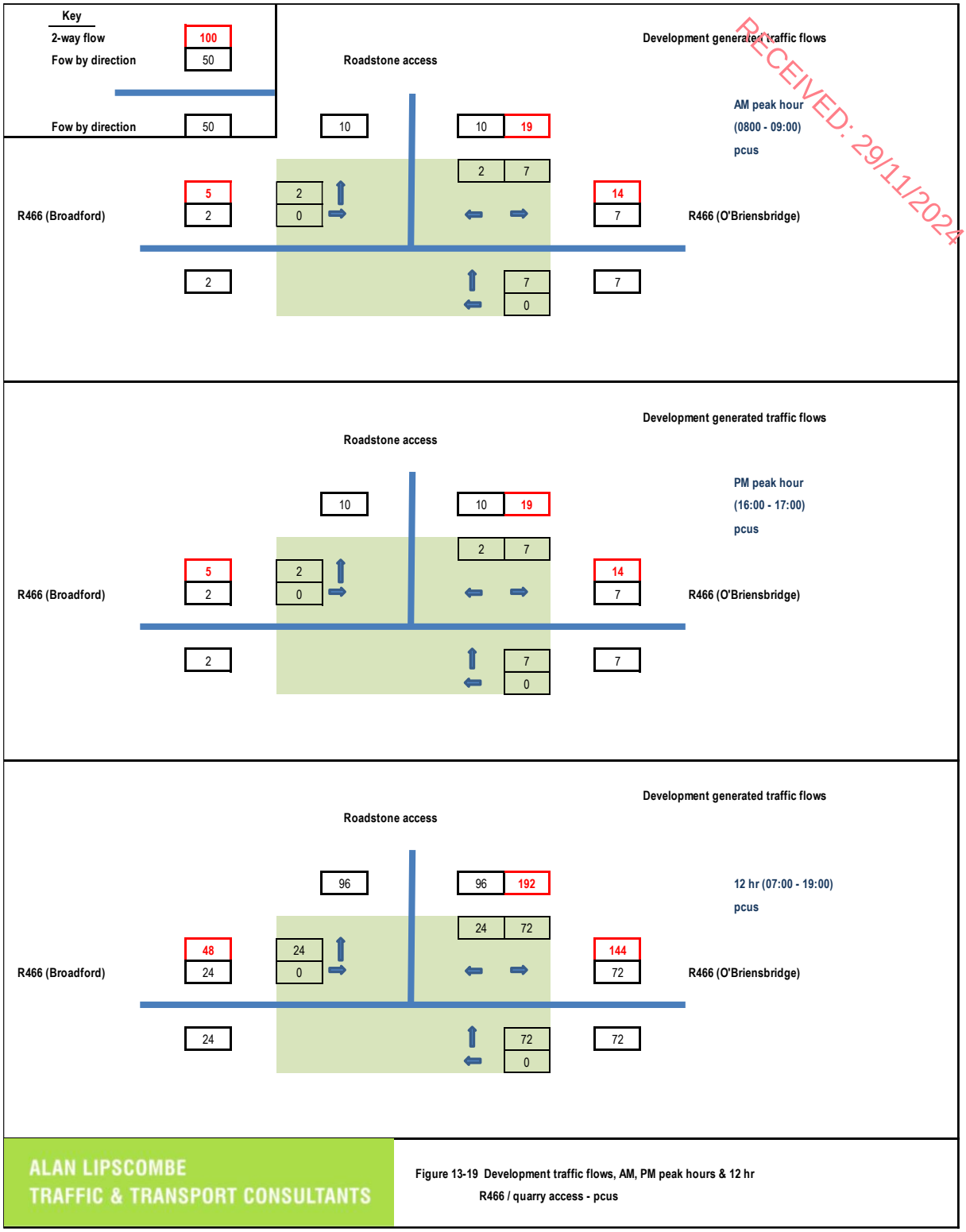

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Figure 13-19 Development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access - pcus

13.4 Traffic Effects of Proposed Development

With development traffic flows are shown for the commencement year 2026 in terms of cars / lgvs in Figure 13-20, HGVs in Figure 13-21 and in terms of pcus in Figure 13-22, with the same information shown for the future year 2046 in Figures 13-23 to 13-25. A summary of commencement year 2026 and future year 2046 background traffic levels at the R466 / quarry access junction, together with additional traffic generated by the Proposed Development are shown by vehicle type in Tables 13-9 and 13-10 below, while the percentage increase in traffic flows resulting from the Proposed Development are shown in Tables 13-11 and 13-12. The main points to note from the tables are set out below.

It is noted that as the base case for traffic generation for the Roadstone Ballyquin Quarry is so low in terms of truck movements (i.e. 1 movement in and out per day) it is not practical to express changes in traffic flows on the quarry access in percentage terms, so these are discussed in terms of actual traffic volumes.

Commencement year 2026

In the commencement year 2026 it is forecast that in terms of pcus the Proposed Development will result in a maximum 11.5% increase in traffic flows on the R466 during the peak hours (AM peak hour, + 14 pcus), and a maximum 12.2% increase (+144 pcus) during the 12 hour period. In terms of HGVs on the R466 the Proposed Development will result in a maximum of +6 HGVs on the eastern arm of the R466 in one hour, resulting in an increase in HGVs of 85.7% in the AM peak hour, while it is forecast that there will be a 55.6% increase (+60 HGVs) during the 12 hour period.

It is noted that while the % increase in HGVs forecast for the R466 appear high this is due to the existing numbers of HGVs being low.

With respect to traffic generation on the quarry access road, the following increase in traffic volumes are forecast as a result of the Proposed Development.

- While there are no truck movements generated during the peak hours at present, it is forecast that there will be 4 truck trip in and out (8 movements) generated by the Proposed Development during peak hours,
- There is one truck trip (2 movements) generated by the existing activity on site. It is forecast that this will increase to a total of 40 truck trips (or 80 movements) with the Proposed Development.
- It is noted for comparison purposes that the Proposed Development (40 truck trips) is forecast to generate less than half of the 88 truck trips that were observed to be generated by the Roadstone Ballyquin Quarry during the November 2022 traffic surveys discussed in Section 13.2.2.

Future year 2046

As set out in Section 13.3.1 of this EIAR, it is estimated that the same volume of additional traffic movements will be generated by the Proposed Development for each of the 20 years, so the increase in traffic volumes in the year 2046 will be the same in absolute terms as described above.

What is worth considering for the future year 2046 is the maximum daily traffic volumes that are forecast on the R466 for the background and with Proposed Development scenarios. In order to determine an expansion factor to convert the 12 hour traffic flows to 24 all day flows reference was again made to the TII automatic traffic count data from the R445. From this data it was established that 24 hour traffic volumes are a 1.25 times the 12 hour traffic flows. Based on this the maximum traffic volumes in pcus forecast on the R466 adjacent to the Roadstone Ballyquin Quarry access are as follows;

- Existing development traffic - 12 hour = 1,382 pcus, - 24 hour = 1,728 pcus
- With Proposed Development traffic- 12 hour = 1,526 pcus, - 24 hour = 1,908 pcus

Link flow capacities are provided for various rural road link layouts in Table 6.1 of the publication Rural Road Link Design DN-GEO-03031, TII, June 2017, with the capacity for the R466, a Type 3 single carriageway with no hard shoulders, given as 5,000 pcus. Based on this capacity and the traffic flows above it may be determined that by the year 2046 the R466 is forecast to operate at 34.5% of link capacity with the existing low level activity at the Roadstone Ballyquin Quarry, increasing to 38.1% of capacity with the additional traffic that is forecast to be generated by the Proposed Development. This shows that in terms of the link capacity on the R466 the impact of the Proposed Development will be slight and that the R466 will remain will within link capacity.

The junction capacity test presented in the subsequent Section 13.4.2 adds further to the network capacity assessment.

Table 13-9 Traffic flows at R466 / quarry junction – background traffic flows and development generated traffic flows, by time period and vehicle type, year 2026

Time period	Link	Background traffic				Development traffic				With development traffic			
		cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	Pcus	cars / lgvs	hgvs	All vehs	pcus
AM peak hour	R466 west	107	7	114	124	0	2	2	5	107	9	116	129
	Quarry access	5	0	5	5	0	8	8	19	5	8	13	24
	R466 east	108	7	115	125	0	6	6	14	108	13	121	139
PM peak hour	R466 west	128	10	138	152	0	2	2	5	128	12	140	157
	Quarry access	5	0	5	5	0	8	8	19	5	8	13	24
	R466 east	129	10	139	153	0	6	6	14	129	16	145	167
12 hour	R466 west	923	106	1,029	1,177	0	20	20	48	923	126	1,049	1,225
	Quarry access	11	2	13	16	0	80	80	192	11	82	93	208
	R466 east	925	108	1,033	1,184	0	60	60	144	925	168	1,093	1,328

Table 13-10 Traffic flows at R466 / quarry junction – background traffic flows and development generated traffic flows, by time period and vehicle type, year 2046

Time period	Link	Background traffic				Development traffic				With development traffic			
		cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	hgvs	All vehs	pcus	cars / lgvs	Hgvs	All vehs	Pcus
AM peak hour	R466 west	116	11	127	142	0	2	2	5	116	13	129	147
	Quarry access	5	0	5	5	0	8	8	19	5	8	13	24
	R466 east	117	11	128	143	0	6	6	14	117	17	134	158
PM peak hour	R466 west	139	14	1531	173	0	2	2	5	139	16	155	177
	Quarry access	5	0	5	5	0	8	8	19	5	8	13	24
	R466 east	140	14	154	174	0	6	6	14	140	20	160	188
12 hour	R466 west	1,003	155	1,158	1,375	0	20	20	48	1,003	175	1,178	1,423
	Quarry access	11	2	13	16	0	80	80	192	11	82	93	208
	R466 east	1,005	157	1,162	1,382	0	60	60	144	1,005	217	1,222	1,526

Table 13-11 Traffic flows at R466 / quarry junction – % increase in traffic flows due to proposed development, by time period and vehicle type, year 2026

Time period	Link	Background traffic			
		cars / lgvs	hgvs	All vehs	pcus
AM peak hour	R466 west	0.0%	28.6%	1.8%	3.9%
	Quarry access	NA	NA	NA	NA
	R466 east	0.0%	85.7%	5.2%	11.5%
PM peak hour	R466 west	0.0%	20.0%	1.4%	3.2%
	Quarry access	NA	NA	NA	NA
	R466 east	0.0%	60.0%	4.3%	9.4%
12 hour	R466 west	0.0%	18.9%	1.9%	4.1%
	Quarry access	NA	NA	NA	NA
	R466 east	0.0%	55.6%	5.8%	12.2%

Table 13-12 Traffic flows at R466 / quarry junction – % increase in traffic flows due to proposed development, by time period and vehicle type, year 2046

Time period	Link	Background traffic			
		cars / lgvs	hgvs	All vehs	pcus
AM peak hour	R466 west	0.0%	18.2%	1.6%	3.4%
	Quarry access	NA	NA	NA	NA
	R466 east	0.0%	54.5%	4.7%	10.0%
PM peak hour	R466 west	0.0%%	14.3%	1.3%	2.8%
	Quarry access	NA	NA	NA	NA
	R466 east	0.0%	42.9%	3.9%	8.3%
12 hour	R466 west	0.0%	12.9%	1.7%	3.5%
	Quarry access	0.0%	NA	NA	NA
	R466 east	0.0%	38.2%	5.2%	10.4%

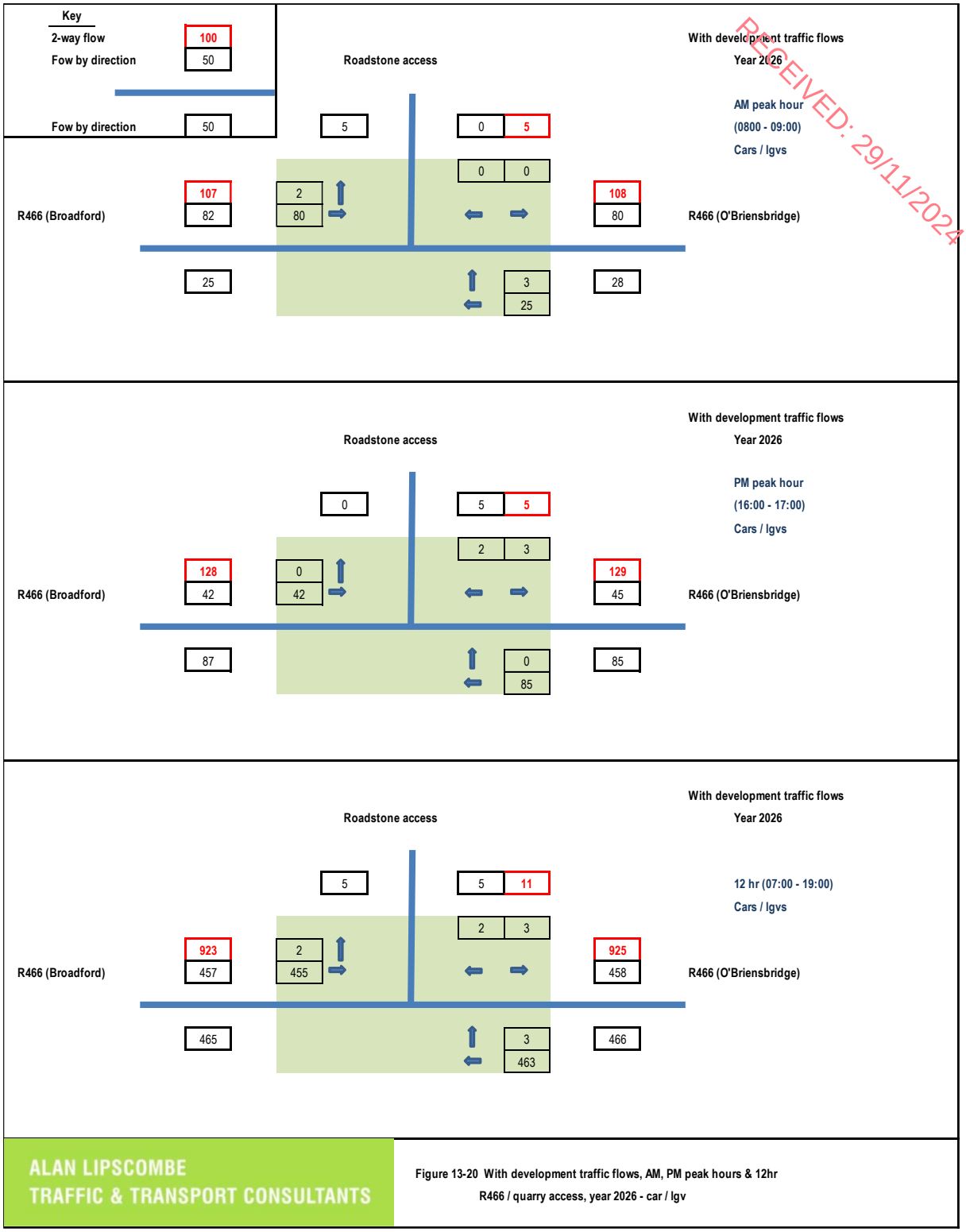

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Figure 13-20 With development traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2026 - car / lgv

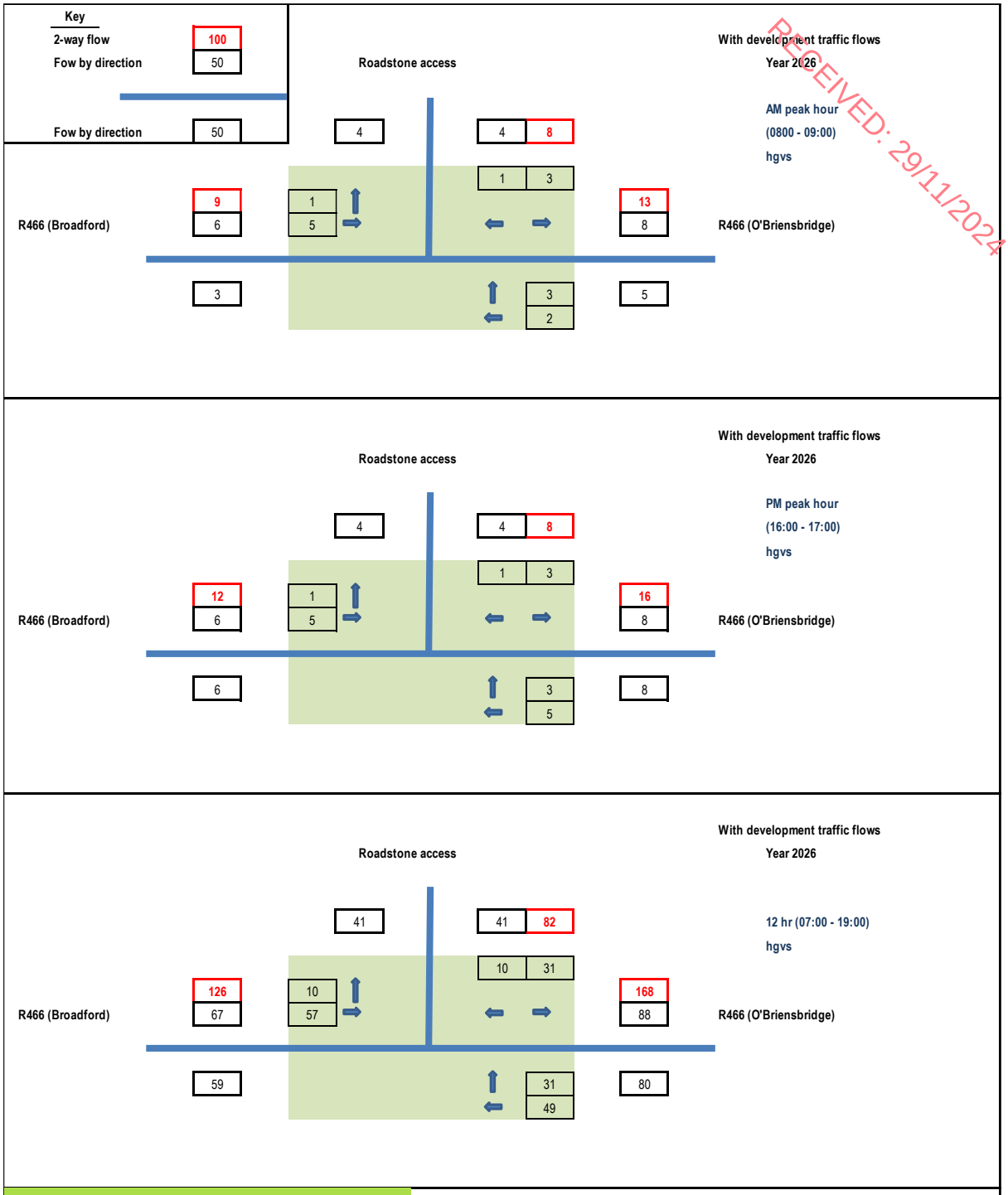

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Figure 13-21 With development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2026 - hgvs

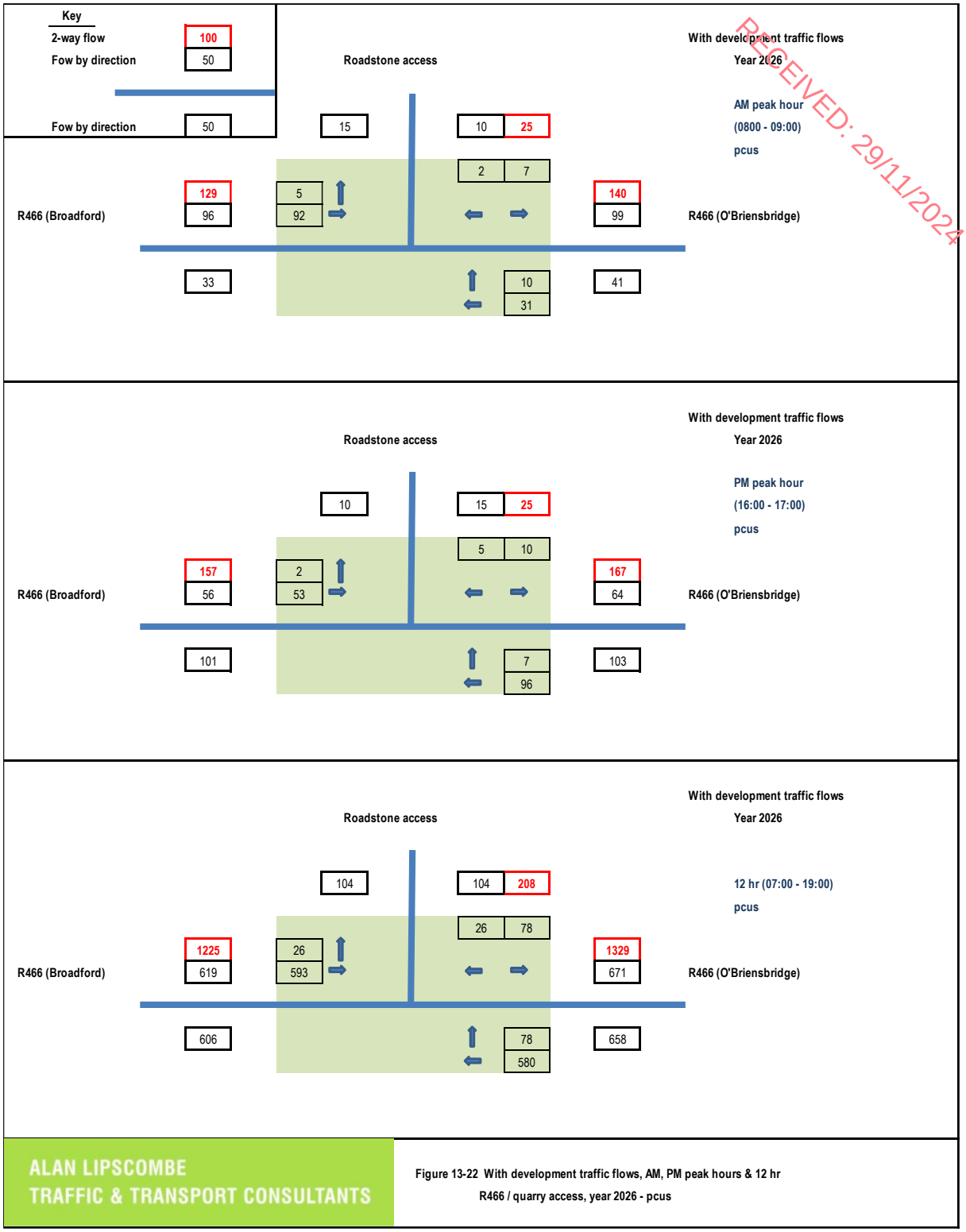

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Figure 13-22 With development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2026 - pcus

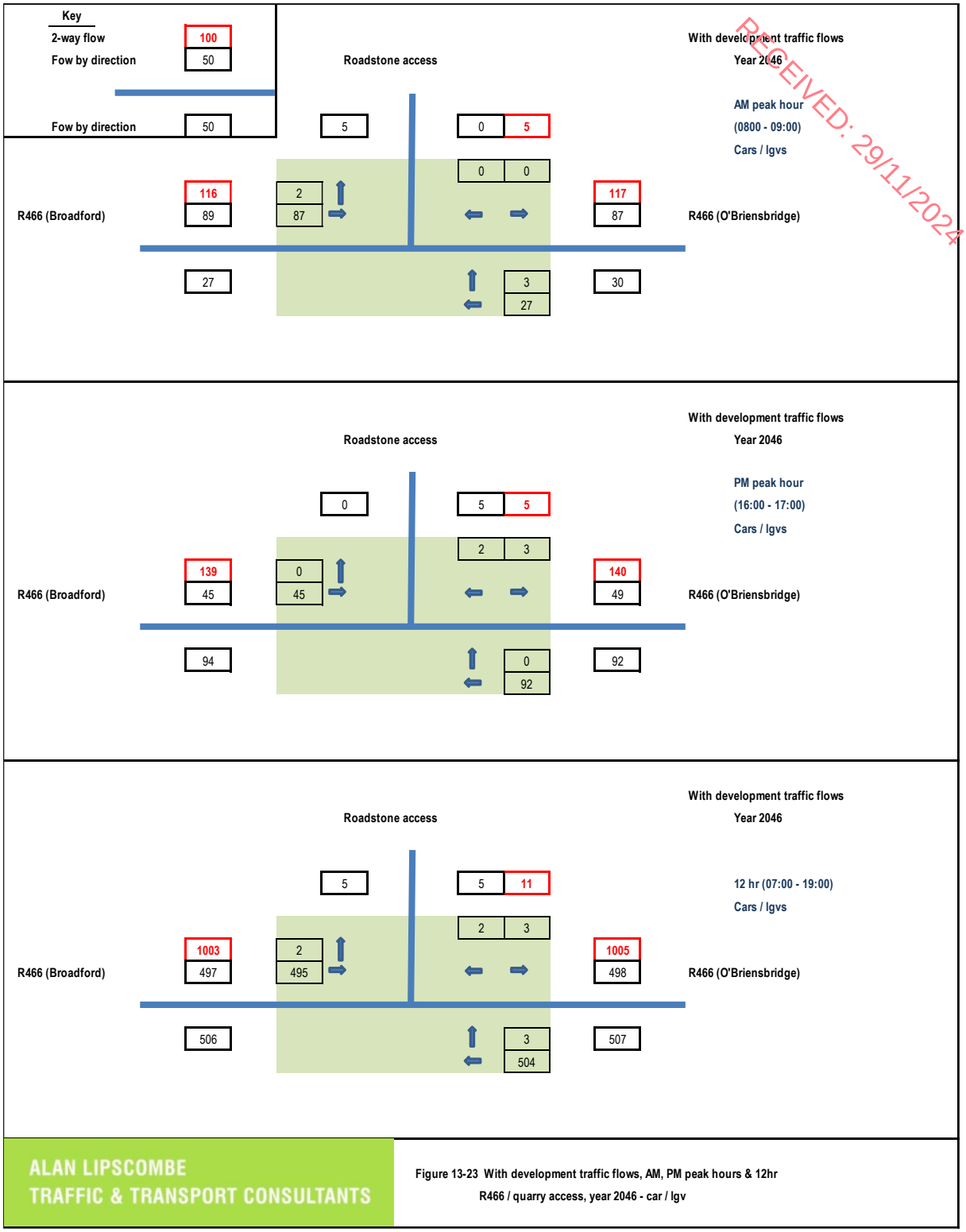

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Figure 13-23 With development traffic flows, AM, PM peak hours & 12hr
R466 / quarry access, year 2046 - car / lgv

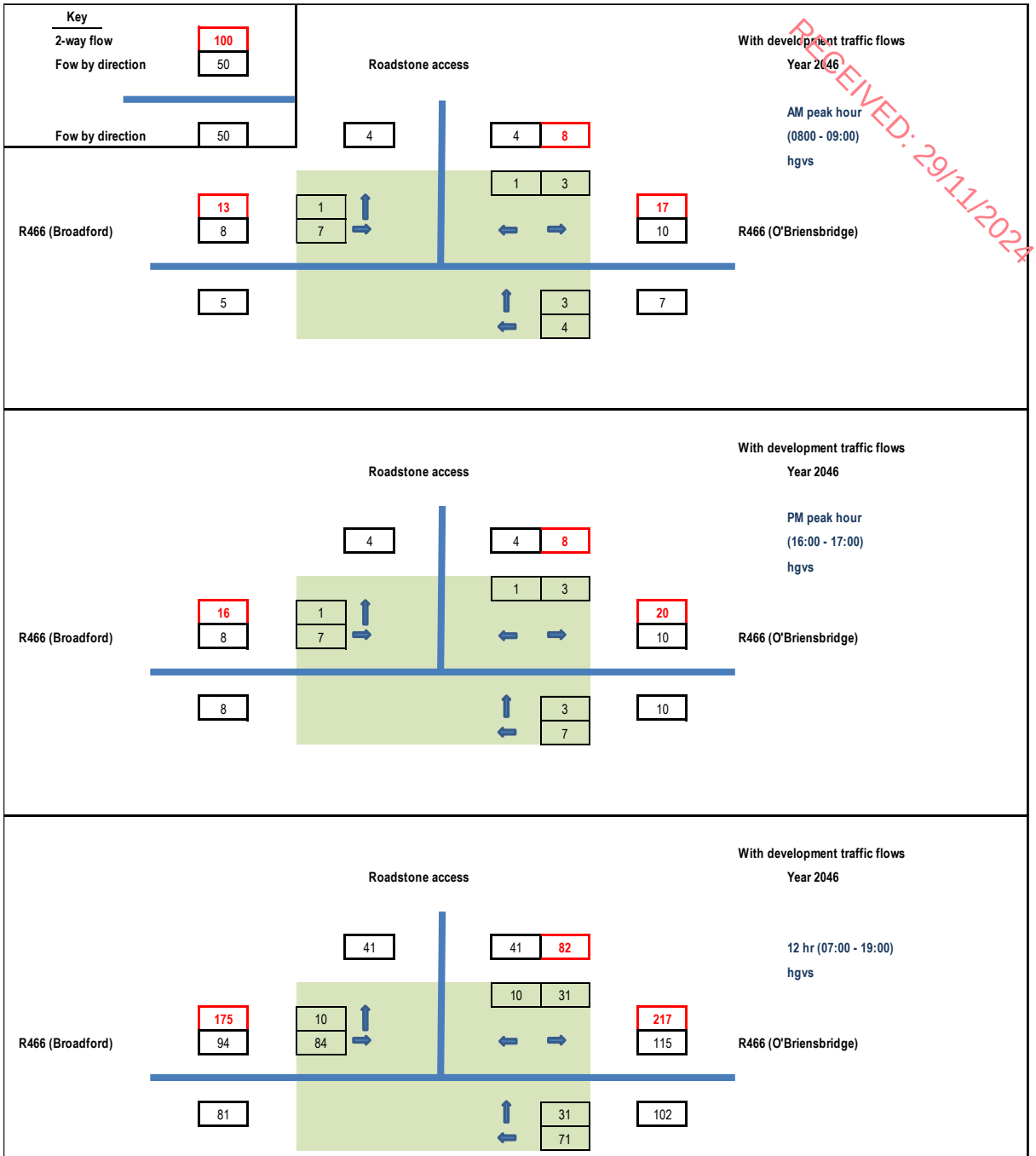

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Figure 13-24 With development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2046 - hgvs

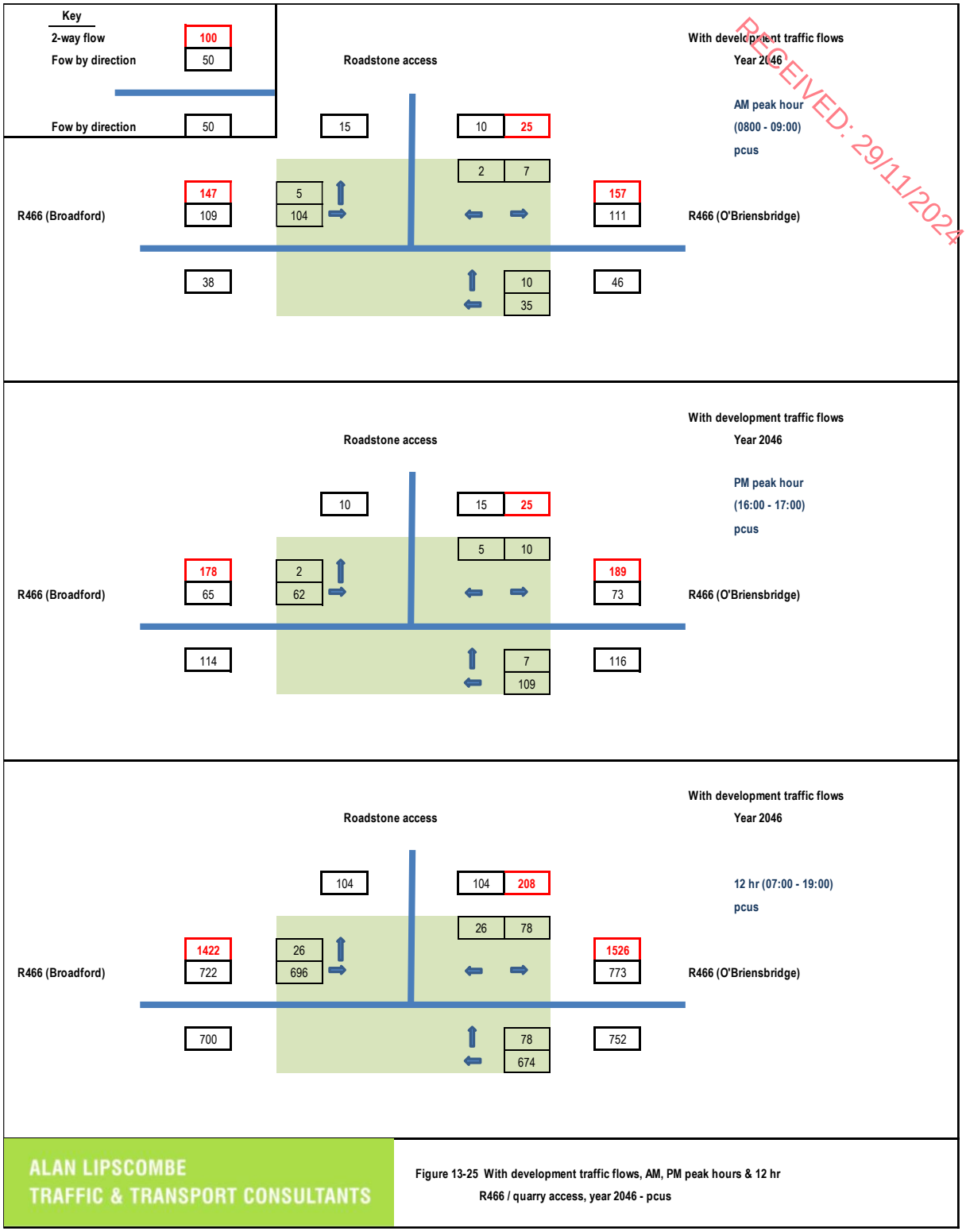

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Figure 13-25 With development traffic flows, AM, PM peak hours & 12 hr
R466 / quarry access, year 2046 - pcus

13.4.2 Effect on R466 / Quarry Access Junction

Advice relating to the extent of the road network, or junctions, that should be included in a traffic impact assessment for a proposed development are set out in Table 2.2 of Traffic and Transport Assessment Guidelines (PE-PDV-02045), TII, May 2014. One of the thresholds in the document is that locations where a proposed development is forecast to result in a +10% increase in traffic flows on an adjoining road should be included, or a +5% for locations that are already congested.

As it is forecast that the R466 to the east of the of the existing quarry access will increase by a maximum of 13.9% during the AM peak hour and 11.4% during the PM peak hour and exceeds the 10% threshold, it was determined that a detailed capacity assessment should be undertaken for the R466 / quarry access junction.

Junction capacity tests were undertaken using the industry standard junction simulation software PICADY, which permits the capacity of any junction to be assessed with respect to existing or forecast traffic movements and volumes for a given time period. The capacity for each movement possible at the junction being assessed is determined from geometric data input into the program with the output used in the assessment as follows:

- Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.
- Degree of Saturation or Ratio of Flow to Capacity (% Sat or RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each movement. Ideally each movement should operate at a level of no greater than 85% of capacity, in accordance with TII requirements.
- Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

Scenarios Modelled

The junction capacity tests were undertaken for the AM and PM peak hours, with the Proposed Development traffic accessing the Roadstone Ballyquin Quarry Site and for background traffic levels forecast for the opening year 2026 and future year 2046.

R466 / Quarry Access Junction Capacity Test Results

The AM and PM peak hour traffic flows at the R466/ quarry junction are shown in terms of pcus for the opening year 2026 in Figure 13-22, with the same information shown for the future year 2046 in Figure 13-25.

The results of the junction capacity tests are set out in Tables 13-13 and 13-14. The figures show that the Proposed Development will have a slight effect on the operation of the junction, with a maximum ratio of flow to capacity (RFC) forecast to be 1.9% for the right turn into the site during the AM peak hour, and 2.5% for traffic exiting the quarry during the PM peak hour. The assessment shows that the junction is forecast to operate well within the acceptable limit of 85% as specified by TII in the Traffic and Transport Assessment Guidelines.

Table 13-13 Junction capacity test results, R466 / quarry access junction, AM and PM peak hours, with development traffic, opening year 2026.

Period	Location	With development traffic		
AM		RFC	Queue (vehicles)	Delay (minutes)

Period	Location	With development traffic		
	From quarry	1.6%	0.02	0.10
	Right turn from R466	1.9%	0.02	0.10
PM		RFC	Queue (vehicles)	Delay (minutes)
	From quarry	2.5%	0.03	0.10
	Right turn from R466	1.3%	0.01	0.09

Table 13-14 Junction capacity test results, R466 / quarry access junction, AM and PM peak hours, with development traffic, future year 2046.

Period	Location	With development traffic		
AM		RFC	Queue (vehicles)	Delay (minutes)
	From quarry	1.6%	0.02	0.10
	Right turn from R466	1.9%	0.02	0.10
PM		RFC	Queue (vehicles)	Delay (minutes)
	From quarry	2.5%	0.03	0.10
	Right turn from R466	1.3%	0.02	0.09

13.5 Proposed Development Access Junction

A site visit was undertaken to inspect the existing quarry access on Friday 18th August, 2023. The existing layout is in the form of a priority type junction with the quarry access road forming the minor arm of the junction. The existing quarry approach to the junction is wide and unmarked, as shown in Plates 13-1 to 13-5.

It is proposed to improve the existing quarry access approach arm to the junction by introducing the following measures, which are illustrated in Figure A13-2-1 included as Appendix 13-2.

- Junction delineated with edge of carriageway markings including radii of 13m and 1:10 tapers for 25m for left in and left out movements in accordance with Section 5.5.5(a) and (b) of DN –GEO-03060 Geometric Design of Junction, TII, for junctions providing for HGV's,

- STOP junction markings and STOP signs in accordance with Figure 7.35 of the Traffic Signs Manual.

Then above mesasures will improve safety at the existing junction by channeling traffic flow and reducing speeeds of trucks accessing and exiting the site.

In the proximity of the existing quarry access junction the R466 has a designated speed limit of 80 kph. A speed survey was undertaken on the R466 by Trafficnomics Ltd over a 7 day period commencing on Tuesday 22nd November, 2023, with the results determined to be as as follows;

- Eastbound 85th percentile speed = 86.7 kph
- Westbound 85th percentile speed = 90.7 kph.

Visibilitys splay requirements for traffic exiting the minor arm onto the major R466 arm of a junction are set out by design speed in the Clare Councty Development Plan 2023 – 2029, Appendix 1 Development Management Guidleines, Table 1. For a design speed of 85 kph the visibility splay requirement is for a visibility triangle taken from a point on the centreline of the minor road, or the quarry access road, to a point 160m along the nearside carriageway edge.

The visibility splays currently available at the junction were measured on site. To the west the existing visibility splay is currently constrained by boundary fencing, a service post and a hedgerow, as shown in Plates 13-2 and 13-3 to a distance of <40 mteres. To the east the existing visibility splay is constrained by an existing hedgerow to a distance of appoximately 40 metres, as shown in Plates 13-4 and 13-5.

Based on the observations made on site it is suggested that the hedgerow on the northern side of the R466 to the west and east of the quarry access is maintained in order to provide the required visibility splays at this existing junction on the public road network. The required visibility splays are shown in Figure 13-2-2 of Appendix 13-2.

Autotrack assessments for large tipper trucks making the critical left in movement and opposing right out movements are shown for the proposed junction layout in Figure A13-2-3 of Appendix 13-2. The figure confirms that the junction layout proposed will accommodate all vehicles requiring access to the Proposed Development site.

Plate 13-1 Roadstone Ballyquin Quarry access

Plate 13-2 Roadstone Ballyquin Quarry access – visibility along the R466 to the right (west)

Plate 13-3 Roadstone Ballyquin Quarry access – existing boundary along the R466 to the right (west)

Plate 13-4 Roadstone Ballyquin Quarry access – visibility along the R466 to the left (east)

Plate 13-5 Roadstone Ballyquin Quarry access – existing boundary along the R466 to the left (east)

13.6 Provision for Sustainable Modes of Travel

13.6.1 Walking and Cycling

The provision for these modes is not relevant for the Proposed Development as travel distances will likely exclude any permanent employees walking or cycling to work.

13.6.2 Public Transport

Again, this mode is not relevant to the subject development.

13.7 Likely and Significant Impacts and Associated Mitigation Measures

13.7.1 'Do-Nothing' Scenario

If the Proposed Development does not proceed there will be no traffic impact in terms of changes in traffic levels on the surrounding road network.

13.7.2 Proposed Development

If the Proposed Development proceeds, the proposed junction improvements described in Section 13.4 and shown in Figures A13-2-1 and A13-2-2 of Appendix 13-2 will form part of the development. While the proposed improvements are not designed to increase the capacity of the junction, they will provide benefits in terms of road safety by providing a safer environment for all traffic negotiating the junction.

If the Proposed Development proceeds it is forecast that the increase in traffic levels on the R466 and development access junction will result in the follow;

- A maximum increase in flow on the R466 of 13.9% for a peak hour, and 13.2% all day,
- A maximum ratio of flow to capacity used at the R466 / Roadstone Ballyquin Quarry access junction of 2.5% in the future year 2046, while up to 85% is within acceptable limits.

Based on the above it is forecast that the Proposed Development will have a negative effect on traffic flows passing through the R466 / Roadstone Ballyquin Quarry access junction. It is forecast that the effects will be slight for general traffic driving past the site on the R466, and slight for existing traffic turning into and out of the existing Roadstone quarry site. These effects will be long term, lasting for 20 years. The negative effects on existing traffic turning into and out of the existing site access will however be mitigated by safety improvements provided by the proposed improved junction layout.

13.7.3 Residual Impacts

Slight increases in traffic delays will be incurred for traffic accessing and exiting the existing quarry, while the increase in delays to general traffic on the R466 will be slight. It is therefore forecast that there will be a slight long term residual impact on general traffic flow on the R466 as a result of the Proposed Development.

13.7.4 Cumulative Effects

A detailed assessment of all developments within a 5 km radius at varying stages in the development process (from pre-planning to operational), is set out in Section 2.6 of Chapter 2 with all developments included listed in Appendix 2-3. The potential for cumulative traffic effects with the Proposed Project are assessed based on the following criteria;

- Project status (pre-planning to operational)
- Degree of overlap with the Proposed Project delivery highway network (low to high)
- Traffic volumes (low to high).

As set out in Table 13-15 there are 3 permitted or proposed wind farms which are considered to have a high potential risk of traffic related cumulative impacts with the Proposed Project (Carrownagowan Wind Farm, Fahybeg Wind Farm and Lackareagh Wind Farm) and 2 proposed wind farms that are determined to have a medium risk of cumulative traffic related impacts with the Proposed Development Project (Oatfield Wind Farm and Knockshanvo Wind Farm). For the permitted Fahybeg Wind Farm it is proposed that access will be gained to the site via the Roadstone Ballyquin Quarry junction off the R466. During the construction of the permitted Fahybeg Wind Farm the cumulative impacts with the Proposed Development will therefore be negative, will be temporary and, based on the traffic volumes associated with both development, will be slight in terms of severity. The cumulative impacts with all other wind farms listed in Table 13-15 and the Proposed Development, will also be negative and temporary and will be imperceptible to slight in terms of severity.

The same information is set out for all other forms of proposed development within a 5 km radius of the Proposed Development in Table 13-16. Of the 7 proposed developments listed it was determined that all would have a low risk of having cumulative impacts with the Proposed Development

As determined above, the effects during the construction, operation or decommissioning phases of the Proposed Development will be not significant. Therefore, no significant cumulative effects are foreseen.

Table 13-15 Summary of wind farms considered in cumulative assessment and potential for cumulative traffic effects with Proposed Development

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential for cumulative traffic effects
1 – Carrownagowan Wind Farm (19 Turbines), County Clare, ABP Reference 309799	Permitted	High	Medium	High
2 – Fahybeg Wind Farm (8 Turbines) and underground grid connection cable, County Clare, CCC Planning Reference 23/148, ABP Reference 317227	Permitted	High	Medium	High
3 – Lackareagh Wind Farm (7 Turbines), County Clare, recently submitted planning application	Proposed	High	Medium	High
4 – Oatfield Wind Farm (11 Turbines), County Clare, ABP Reference 318782	Proposed	Medium	Medium	Medium
5 – Knockshanvo Wind Farm (9 Turbines), County Clare, ABP Reference 315797 (pre-planning)	Proposed	Medium	Medium	Medium

Table 13-16 Summary of other development applications considered in cumulative assessment and potential for cumulative traffic effects with Proposed Development

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential for cumulative traffic effects
1 – ABP Reference 318505 Proposed construction of a 110kV underground grid connection cable connecting the permitted Carrownagowan Wind Farm to the existing 110kV substation at Ardnacrusha within the townlands of Caherhurly, Killokennedy. Cloongaheen West, Leitrim, Castlebank, Ballykeelaun, County Clare.	Proposed	Medium	Low	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential for cumulative traffic effects
2 – Montpelier, O'Briensbridge, County Limerick, LCC Planning Reference 19/1128 Permission to relocate the existing Ardnacrusha / Birdhill 38 kV Line.	Permitted	Low	Low	Low
3 – Montpelier, Castleconnell, County Limerick, LCC Planning Reference 19/941 Permission to relocate the existing Ardnacrusha / Nenagh / Birdhill 38 kV Line.	Permitted	Low	Low	Low
4 – Ballyglass, Coolderry, Dromintobin North, Reanabrone , and Oakfield Ardnacrusha , Co Clare CCC Planning Reference 22/591 ABP Reference 316043 Permission for a solar array.	Permitted	High	Low	Low
5 – Clonlara Co Clare, CCC Planning Reference 20/740. or the construction of a total of 70 Dwelling houses	Permitted	Low	Medium	Low

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential for cumulative traffic effects
6 – Broadford Community Hall, Coolagh, Broadford, Co. Clare, CCC Planning Reference 23/88. For change of use from dressing rooms to a creche and preschool with minor elevational and internal alterations and all associated site works.	Permitted	High	Low	Low
7 – Faheymore North, O'Briensbridge), Co. Clare. ABP Planning Reference QD0011 and SU0127. Extension to existing sand and gravel quarry.	Permitted	High	Low	Low

13.8 Summary / Conclusion

The sand extraction and restoration proposed for the existing Roadstone Ballyquin Quarry located off the R466 between O'Briensbridge and Broadford in County Clare will be implemented together with proposed improvements to the existing development access junction on the R466. It is demonstrated that the increase in traffic that will be generated by the Proposed Development will have slight negative impacts on general traffic on the R466 and existing traffic movements generated by the quarry, which will be adequately accommodated by the proposed improved R466 / Roadstone Ballyquin Quarry access junction.

13.9 Built Services and Waste Management

13.9.1 Introduction

This section of the EIAR addresses the likely significant effects of the Proposed Development on built services and waste management.

13.9.1.1 Statement of Authority

This section of the EIAR has been prepared by Eoin O'Sullivan and reviewed by Michael Watson, all of MKO. Eoin is an experienced geo-environmental scientist and has over 15 years' experience in the design, implementation and interpretation of all phases of geo-environmental and geotechnical site investigations. Eoin has also got extensive experience in the preparation of material assets assessments and reports for EIAs. Eoin has also experience in completing EPA licence applications and in the preparation of Environmental Impact Assessment Reports for renewable energy projects, quarries and a number of non-hazardous landfill sites and anaerobic digesters for both public and private clients. Eoin holds an MSc in Environmental Engineering and is a Chartered Member of the Chartered Institute of Water and Environmental Management (CWEM) and Chartered Environmentalist (CEnv) with the Society of Environment. Michael has over 20 years' experience in the environmental sector and had worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael completed an MA in Environmental Management at NUI, Maynooth in 1999. Michael is a professional geologist (PGeo) and full member of IEMA.

13.9.1.2 Methodology and Guidance

This section of the EIAR has been prepared in line with the guidance set out by:

- *Advice Notes for Preparing Environmental Impact Statements – Draft September 2015' (EPA, 2015).*
- *Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).*

The assessment of likely significant effects on material assets uses the standard methodology and classification of effects, as presented in Section 1.7.2 of Chapter 1 Introduction. A full description of the Proposed Development is provided in Chapter 3 Description of the Proposed Development.

13.9.2 Receiving Environment

13.9.2.1 Electricity

There are both overhead and underground electricity cables on the site of the Proposed Development. Damage of overhead and underground electricity cables during site operations could potentially result in serious injury or death.

13.9.2.2 Other Services

There are other services such as water supply and telecommunications present at the site of the Proposed Development and in the vicinity of the site.

13.9.2.3 Waste Management

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. The expected waste volumes generated on site are unlikely to be large enough to warrant segregation and recycling of various waste streams at the Proposed Development site. A designated Waste Storage Area (WSA) will be maintained on site which will cater for segregation and recycling of various waste streams. Where recycling of waste is not possible, waste material will either be collected by or be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the site is Fitzgerald Waste Management Ltd in Limerick, located approximately 18km to the south of the Proposed Development site.

Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skips. It will also be made clear that the burning of waste material on site is forbidden. Further details on waste management are presented in the WMP.

13.9.3 Likely Significant Effects and Associated Mitigation Measures

13.9.3.1 'Do-Nothing' Scenario

If the Proposed Development is not permitted, the site would remain largely unaltered as a result of the Do-Nothing Scenario. The potential for additional investment and employment in the area in relation to the operation of the quarry and infilling would be lost.

13.9.3.2 Construction Phase

13.9.3.2.1 *Services*

There are existing overhead and underground electricity cables and other services present on the site of the Proposed Development and in the vicinity of the site, the damage of which has the potential to result in serious injury or death. This has a potential Temporary Significant Negative effect.

Mitigation Measures

The mitigation measures include the following:

- Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works.
- Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified.
- The contractor will comply with the standard construction codes of practice in relation to working around electricity, gas, water and telecommunications networks.

Residual Effects

Following the implementation of the above mitigation measures, there will be a Temporary Slight Negative Residual effect during the construction phase of the Proposed Development.

Significance of Effects

Based on the assessment above there will be no significant effects.

13.9.3.2.2 *Waste Generation*

The construction phase will have the potential to produce municipal waste (site office, canteen) and construction/demolition waste (wood, rubble, metal, etc.) which will need to be processed at local waste processing facilities. These are largely composed of metal and other recyclable materials which would be brought to specialised facilities for processing/recycling such items.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will be identified across the site. These areas will need to be easily accessible to waste collection vehicles. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the site.

The Waste Management Act 1996 (Act) and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. Poor waste management has the potential to cause a Temporary Moderate Negative effect.

Mitigation Measures

The following mitigation measures will be implemented:

- Extensive waste categorisation will be in place to ensure the highest possible quality of recycling of the respective categories and to prevent an accumulation of pollutants in the material cycle – it is anticipated that the following waste types, at a minimum, will be segregated:
    - Concrete rubble;
    - Electrical Waste
    - Plastics;
    - Oils;
    - Metals;
    - Glass; and
    - Timber.
- To minimise the generation of waste and waste disposed to landfill, wastes will be managed in accordance with the waste hierarchy and relevant regulatory controls.
- Waste will be clearly labelled and segregated on site. Measures will be taken to ensure that wastes cannot blow away.
- Housekeeping measures will be followed for the storage of materials to ensure that materials are protected as much as possible.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site.

- Any hazardous wastes generated (such as chemicals, fuels and oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required).
- All staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained. As a minimum, the following waste management data will be provided:
    - Quantity of materials and waste removed from site by type in volume and weight.
    - Outcome of the materials and waste on and off site.
    - Waste transfer notes.
    - Hazardous waste consignment notes.

Residual Effects

A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included in Appendix 3-1 of this EIAR. The CEMP includes details of material management and outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to in order to complete the works in an appropriate manner. Following implementation of the mitigation measures above, residual impacts of non-hazardous waste emissions for the construction and decommissioning phases will have a Temporary Slight Negative effect.

13.9.3.3 Operational Phase

There will be no operational phase effects or associated effects on built services and waste management associated with the Proposed Development.

13.9.4 Cumulative Impact Assessment

The potential cumulative effect of the Proposed Development and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Development will have on the surrounding environment when considered cumulatively and in combination with relevant approved, proposed, and existing projects in the vicinity of the Proposed Development site.

On the basis of the assessment above, the Proposed Development will have no impact on built services and waste management. It is assumed also that all mitigation measures in relation to the other cumulative projects, as set out in Section 2.5 of Chapter 2: Background to the Proposed Development will also be implemented. It is on this basis that it can be concluded that there would be a Long-term Imperceptible cumulative impact on built services and waste management from the Proposed Development and other developments in the area.