



D8: Traffic Impact Assessment

REPORT

Carpe Diem PV

IMPACT ASSESSMENT REPORT

August 2023

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Quality Management

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TABLE OF CONTENTS

1. BACKGROUND	1
2. STUDY PURPOSE AND SCOPE	1
3. LOCALITY AND PROPOSED LAND USE	2
4. SITE VISIT	2
5. EXISTING SURROUNDING ROAD NETWORK	2
6. EXISTING TRAFFIC VOLUMES	5
7. LATENT RIGHTS	5
8. FUTURE ROAD NETWORK AND MASTER PLAN	5
9. SITE ACCESS	5
10. DEVELOPMENT TRIP GENERATION AND TRIP REDUCTION	6
11. TRIP DISTRIBUTION AND TRIP ASSIGNMENT	7
12. TRAFFIC IMPACT AND CAPACITY ANALYSIS	7
13. PARKING REQUIREMENTS	9
14. INTERNAL CIRCULATION	9
15. PUBLIC TRANSPORT AND NON-MOTORISED TRANSPORT	9
16. RISK RATING METHODOLOGY.....	10
17. CONCLUSION	11
18. RECOMMENDATIONS	12

ANNEXURES

Annexure A: Figures

Annexure B: Risk Rating Methodology

ABBREVIATIONS

ADT - Average Daily Traffic

ADTT - Average Annual Daily Truck Traffic

BESS - Battery Energy Storage System

COE - City Of Ekurhuleni

GLA - Gross Leasable Area

NMT – Non-Motorised Transport

PV – Photovoltaic

PWV – Pretoria-Witwatersrand-Vereeniging

TIA – Traffic Impact Assessment

TMP – Traffic Management Plan

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
1. Background	Koleko Solutions was appointed by Legacy EMC (Pty) Ltd, on behalf of JUWI Renewable Energies (Pty) Ltd, to conduct a Traffic Impact Assessment for a proposed Photovoltaic (PV) renewable energy facility in Carmel, Gauteng. The proposed development will comprise of a photovoltaic solar facility. The Solar PV is proposed to be situated on the following farm areas: • Portion 5 of the Farm Varkenslaagte No. 119. • Portions 1, 11, 27 and 28 of the Farm Doornfontein No. 118, Merafong City, Gauteng The site is located ± 85 km from Johannesburg to the Southwest direction in the Gauteng Province. According to the Committee of Transport Officials Technical Management of Highways 16¹ (COTO TMH 16, 2012), a Traffic Impact Assessment (TIA) is required if the proposed new infrastructure is expected to generate more than 50 additional vehicle trips in an hour. Based on the counts, the development is not expected to generate over 10 vehicle trips per hour. According to TMH 16, a TIA is not required for the development. However, a TIA was conducted to ensure that the development is comprehensively assessed. Koleko was appointed to conduct a TIA for the proposed development and this report summarizes the findings of the assessment.	Annexure A
2. Study Purpose and Scope	The objective of the TIA was to provide findings of the traffic investigation conducted to assess the impact of the traffic generated by the proposed new PV Facility on the external	Annexure A

¹ COTO, TMH16, South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, August 2012

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	road network surrounding the study area. The scope of work for the traffic study entailed the following: Koleko Solutions was appointed by Legacy EMC (Pty) Ltd, on behalf of JUWI Renewable Energies (Pty) Ltd, to conduct a Traffic Impact Assessment for a proposed Photovoltaic (PV) renewable energy facility in Carmel Eskom Distribution Centre, Gauteng. The proposed development will comprise of a photovoltaic solar facility. The Solar PV is proposed to be situated on the following farm areas: • Portion 5 of the Farm Varkenslaagte No. 119. • Portions 1, 11, 27 and 28 of the Farm Doornfontein No. 118, Merafong City, Gauteng The site is located ± 85 km from Johannesburg to the Southwest direction in the Gauteng Province. According to the Committee of Transport Officials Technical Management of Highways 161 (COTO TMH 16, 2012), a Traffic Impact Assessment (TIA) is required if the proposed new infrastructure is expected to generate more than 50 additional vehicle trips in an hour. Based on the counts, the development is not expected to generate over 10 vehicle trips per hour. According to TMH 16, a TIA is not required for the development. However, a TIA was conducted to ensure that the development is comprehensively assessed. Koleko was appointed to conduct a TIA for the proposed development and this report summarizes the findings of the assessment.	
3. Locality and Proposed Land Use	This site is located in the Merafong City Municipal area within proximity of the Carmel Distribution Center – Eskom. The closest main road to the proposed site is the R501 which lies to the north of the site.	Annexure A

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	There are a few residential areas to the south of the proposed site and Mine Mechanization and Equipment (Pty) Ltd to the north of the site. Refer to Figure 1 and 2 in Annexure A for the study area maps. The current land use for the site is for agricultural purposes. The proposed land use is for a PV facility. Therefore, rezoning will be required.	
4. Site Visit	A site visit was conducted on the 27th of October 2022 and the 28th of June 2023. The site visit focused on observing the general road network layout, road conditions, modes of transport available in the area, traffic safety, and some land-use aspects that were relevant to this study.	Annexure A
5. Existing Surrounding Road Network	The following roads are likely to be impacted by the trips that will be generated from the proposed development: • R501: This is a Class 2 SANRAL-owned, paved road. This road has one lane per direction and is oriented in the east-west direction. The road aligns on the northern side of the proposed development. The road does not cut through the Farm. At the time when the site assessment was conducted, the road pavement was in good condition. There is no need for any road surface upgrades. The posted speed limit is 120 kmph and the average speed of the road was observed to be 102 kmph, according to the SANRAL Multi Station Yearbook Summary 2019. • D92-1020: This is a paved road with 1 lane in each direction. This road is on the southwest side of the property. The road passes through a small portion of the proposed development boundary. This road functions as a class 3 road and has a posted speed limit of 100. The road pavement is in a fair condition for vehicles to travel along safely and does not need any surface upgrades. Refer to Figure 2 in Annexure A, for the locality of this road. • Road 1: This is a paved road with 1 lane in each direction. This road is on the western side of the proposed site, and it provides access to the Eskom Carmel Distribution station. The posted speed limit along this road is 60 kmph and the	Annexure A

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	road functions as a class 5 road. At the time when a site visit was conducted, the road pavement was in an acceptable condition for vehicles to travel along safely. Figure 2 in Annexure A, show the study area maps. • Road 2: This is a gravel road, and it is on the southwest side of the proposed site and provided access to the site. This road functions as a class 5 road and has a posted speed limit of 60 kmph. The section below outlines the intersections that were assessed as part of the TIA. • R501/ Road 0 intersection: This is a four way stop-controlled intersection. The intersection is characterised by the following geometry: • The R501 has one designated left turning lane, one shared through and right turning lane in the westbound direction. • A designated right turning lane, a shared through and right turning lane in the eastbound direction. • One shared left, through and right turning lanes in both the northbound and southbound directions. At the time when the site assessment was conducted, pavement at the intersection was in an average condition for vehicles to travel along safely. Some sections at the intersection had deteriorating shoulders, fading stop and lane division road marking lines. • R501/ Road 3 intersection: This is a stop controlled, T-junction where traffic along the R501 has priority. The intersection is characterised by the following geometry: • A shared left, through and right turning lane in all intersection legs. At the time when the site assessment was conducted, the southbound leg was still gravel. • Road 0/Road 1 intersection: This is a stop controlled, T-junction where traffic along Road 0 has priority. The intersection is characterised by the following geometry:	

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	• A shared left, through and right turning lane in all intersection legs. • There is a stop sign at the distribution entrance road connection stop point. At the time when the site assessment was conducted, the pavement at the intersection was in an average condition where there are deteriorating road shoulder. • Road 0/Road 2 intersection: This is a priority-controlled intersection with no road markings or signage. At this intersection, traffic along Road 0 has priority. The intersection is characterised by the following geometry: • A shared left, through and right turning lane in all intersection. At the time when the site assessment was conducted, the westbound leg of the intersection was gravel roads. In general, there is a need for periodic and routine maintenance of the road which includes repainting the lane markings, replacing broken road studs/ cat-eyes, and general upkeep of the signs and guardrails will improve road safety. This will be the responsibility of the road authority.	
6. Existing Traffic Volumes	Traffic counts were carried out on 16th of February 2023. The counts were conducted for 6-hour in the AM and PM peak periods, and the following peak hours were noted: 1. AM peak: between 6:30 and 7:30 2. PM peak: between 15:45 and 16:45 The following intersections were surveyed during the mentioned periods: A. R501/Onyx Drive Intersection B. R501/Road 3 Intersection The existing traffic volumes, during the peak hours, are indicated in Figures 4 and 5, Annexure A.	Annexure A

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
7. Latent rights	At the time of the study, no latent rights information had been confirmed by the municipality.	Annexure A
8. Future Road Network and Master Plan	There are no planned K routes or PWV routes in the vicinity of the site location. Therefore, none were taken into consideration in the study.	Annexure A
9. Site Access	In the proposed development, two accesses are proposed. The first access is intended to intersect the R501 and is located at the top of the proposed site. The second access is planned on the southwest side of the development along Road 3. Figure 14 in Annexure A provides a visual representation of the proposed site layout, including the classification of roads. This information is crucial for evaluating whether the proposed development aligns with the appropriate design standards and identifying the need for any modifications or improvements. Considering the roads involved, it is noted that the R501 can accommodate abnormal loads, making it suitable for heavy vehicles during the construction phase. To identify potential conflict areas, please refer to Figure 15 in Annexure A, which highlights the identified conflict zones. One of these zones pertains to the top proposed access via the R501, which does not meet the TRH26² standards for a Class 2 road requiring a minimum spacing of 5 kilometers between intersections. An alternative option is to relocate this access to D92-1020, which is classified as a Class 3 road. To ensure adherence to the guidelines, refer to Figure 16 in Annexure A, which illustrates the recommended layout.	Annexure A
10. Development Trip Generation and Trip	The Carpe Diem PV facility will generate trips during the construction and operational phases.	

² COTO, TRH26, *South African Road Classification and Access Management Manual*, Version 1.0, August 2012

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
Reduction	Typically for a TIA, the trip generation rates provided in COTO TMH17³ would be used to calculate the trip generation during the operational phase. However, the Trip Generation rates for a PV facility are not included. The manual for Traffic Impact Studies of the Department of Transport (DOT) published in 1995 (Report No 93/635) nor does the ITE Trip Generation manual provide for these rates. Thus, the number of trips were estimated based on the anticipated traffic during the construction and operational phase. Construction Phase: Based on the expected construction vehicle volumes, it is expected that the facility will generate 5 construction vehicles during the AM and PM peak hours. Out of these vehicles 10 will be private vehicles and 10 will be construction trucks. A directional split of 90/10 (in/ out) and 10/90 (in/ out) was applied during the AM and PM peak periods, respectively. The majority of the workers at the proposed development are expected to use public transport to travel to and from the site. Operations Phase: Traffic counts were conducted on 16th of February 2023 at the study site. During operation phase, it is expected that the facility will generate not more than 5 vehicles during the AM and PM peak hours. Most of these vehicles will be maintenance vehicles and as a result they might not frequent the site. Therefore, most trips are expected to be generated when there is a breakdown at the facility. The 5 vehicles were incorporated into the traffic model as the worst-case scenario. A directional split of 80/20 (in/ out) and 20/80 (in/ out) was applied during the AM and PM peak periods, respectively. The majority of the workers at the proposed development are expected to use public transport. At the time when the site visit	

³ COTO, TMH17, *South African Trip Data Manual*, Version 1.0, September 2012

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	was conducted for the basic assessment, there were no minibus taxis that travelled along the R501.	
11. Trip Distribution and Trip Assignment	The assumptions made concerning the expected trip distribution were based on the location of the site access in relation to the surrounding road network, the existing traffic volumes, travel patterns as well as the land use nature of the proposed development.	
12. Traffic Impact and Capacity Analysis	TRAFFIX, a micro-analytical traffic evaluation tool for intersection and network analysis, was used to assess the impact at the two intersections in this report. Five scenarios were analysed in detail to assess the performance of each of the intersections. All the intersections operated under capacity and with an acceptable level of service (LOS A) for all scenarios. These scenarios are: • Scenario 1: 2022 Existing AM and PM peak hour traffic volumes. This scenario was based on existing geometry. The scenario evaluated the current operating conditions, for the existing AM and PM peak hour traffic. In this scenario, all the intersections analysed operated at an acceptable level of service (LOS A). Based on the analysis, it was found that road upgrades were not required to accommodate the existing traffic volumes. The analysis results are shown in Figures 4 and 5 in Annexure A. • Scenario 2: 2023 Construction AM and PM peak hour traffic volumes. This scenario was based on the existing geometry. The scenario evaluated the intersection operating conditions for the background traffic volumes including the proposed construction phase of the development for the year. A growth rate of 1.5% per annum was applied to the background 2022 traffic volumes to determine the 2023 background traffic demand. In this scenario, all the intersections analysed operated at an acceptable level of	Annexure A

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	service (LOS A) and did not require upgrades. The analysis results are shown in Figures 8 and 9 in Annexure A. • Scenario 3: 2023 Existing AM and PM peak hours plus development traffic volumes. This scenario was based on the existing geometry. The scenario evaluated the intersection operating conditions for the background traffic volumes including the proposed development. In this scenario, all the intersections analysed operated at an acceptable level of service (LOS A). Based on the analysis, it was found that road upgrades were not required to accommodate the existing traffic volumes. The analysis results are shown in Figures 6 and 7 in Annexure A. • Scenario 4: 2028 Background AM and PM peak hour traffic volumes. This scenario was based on the existing geometry and intersection control. The scenario evaluated the intersection operating conditions for the background traffic volumes excluding the proposed development for the year 2028. A growth rate of 1.5% per annum was applied to the background 2022 traffic volumes to determine the 2028 traffic demand. In this scenario, all the intersections analysed operated at an acceptable level of service (LOS A) and did not require any upgrades. The analysis results are shown in Figures 10 and 11 in Annexure A. • Scenario 5: 2028 Total AM and PM peak hour traffic volumes. This scenario was based on the existing geometry and intersection control. The scenario evaluated the intersection operating conditions for the 2028 background traffic with the development traffic. A growth rate of 1.5% per annum was applied to the background 2022 traffic volumes to determine the 2028 background traffic demand. In this scenario, all the intersections analysed operated at an acceptable level of service (LOS A) and did not require road upgrades. The analysis results are shown in Figures 12 and 13 in Annexure A.	

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
13. Parking Requirements	Based on the information provided by the client, the proposed development should have an allowance for up to 10 parking bays due to the low expected demand to the PV facility.	
14. Internal Circulation	The proposed on-site circulation should comply with the TRH 26 manual.	
	According to the COTO TRH26 ⁴ standards, it is recommended that the access road to the property should have a minimum lane width of 3.0 m with a 10 m road reserve.	
15. Public Transport and Non-Motorised Transport	The majority of the workers at the proposed development are expected to use public transport. At the time when the site visit was conducted, there were no minibus taxis that travelled along the R501. There is evidence of wear of vegetation along intersections which could be as a result of pedestrian movement.	
	To cater to these pedestrians, sidewalks with a minimum width of 1,5m should be constructed at these intersections. A taxi stop may be warranted along the R501 to allow workers to board and disembark from taxis safely and conveniently.	
16. Risk Rating Methodology	The impact of the proposed project was evaluated using a risk rating methodology. This methodology is described in detail in Annexure B. From a traffic impact perspective, the duration of the traffic impact from the project is expected to be long term as the impact will cease after the operational life of the activity. Traffic impact from the project during decommissioning is expected to be as during construction. The scope of the project's influence is limited to the specific site and its immediate vicinity (local). There will be only a minor negative effect on the surrounding traffic network as the construction and operational phases will generate minor traffic. The project is not anticipated to yield any positive impacts on the surrounding road system.	

⁴ COTO, TRH26, *South Africa Road Classification and Assess Management Manual*, Version 1.0, August 2012

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	The likelihood of the traffic impact of the project is probable, as the traffic impact assessment considered a worst-case scenario, and construction vehicles may not operate during peak periods. Nevertheless, it is essential to acknowledge that once the traffic impact is incurred, it cannot be reversed. Regarding the potential loss of irreplaceable resources, the site poses a very low risk in this regard from a traffic perspective. The cumulative impact of traffic generated by the proposed project is projected to be low since the activity is localized, and any cumulative effect is likely to be negligible. Once the evaluation components have been ranked for each impact, the significance of potential impact is assessed using the following formula: SP (significance points) = (intensity + duration + spatial extent + irreplaceable + reversibility) x probability. Based on the above methodology, the proposed project is to have a low impact on its surrounding area from a traffic perspective since it scored 28 significance points. Thus, it is likely to contribute to positive decisions about whether to proceed with the proposed project.	
17. Conclusion	Based on the findings of this study, the following conclusions were made: • A renewable energy facility is proposed to be developed along the Portion 5 of the Farm Varkenslaagte No. 119, and Portion 27 of the Farm Doornfontein No. 118, which is in Carmel, Gauteng under the Merafong City Local Municipality. • The proposed plant has a GLA of 7,422,000 m². • Access to the development will be provided through a gravel road.	

CARPE DIEM PV TRAFFIC IMPACT ASSESSMENT		
Description		Reference
	• Based on the information provided by the client, during operation there is an expected 10 vehicles per hour IN and OUT of the facility. During construction and decommissioning there is an expected 10 vehicles per hour IN and OUT of the facility of which 5 are trucks. • Traffic counts were conducted at three intersections adjacent to the development. • All the intersections operated under capacity and with an acceptable level of service (LOS A) for the existing and future scenarios. • No road upgrades were found to be required to accommodate the traffic generated from the development during the construction, operational and decommissioning phases. • This parking generation rate was used to calculate the expected parking requirements at the proposed development, based on the GLA of each site. • It is recommended that at least 10 parking bays be provided on site. • To cater to the pedestrian movements, sidewalks are to be constructed along the roads that lead to the proposed development sites. • To improve road safety, sections within the surrounding road network that have fading road markings should be repainted. Road signage	
18. Recommendations	From a traffic engineering perspective, the proposed development on the Carpe Diem site is expected to have a minimal traffic impact on the current surrounding road network. Hence, no detrimental issues were identified.	

Annexures

Annexure A: Figures

Annexure B: Risk Rating Methodology

Annexure A

Figures

Figure 1: Regional Road Network

Figure 2: Study Area

Figure 3: Existing Geometry

Figure 4: 2023 Existing AM peak hour traffic volumes and Capacity Analysis Results

Figure 5: 2023 Existing PM peak hour traffic volumes and Capacity Analysis Results

Figure 6: 2023 Existing AM peak hour traffic volumes and Developing Capacity Analysis Results

Figure 7: 2023 Existing PM peak hour traffic volumes and Developing Capacity Analysis Results

Figure 8: Construction Phase- 2023 AM Peak Hour Traffic Volumes and Capacity Analysis Results

Figure 9: Construction Phase- 2023 PM Peak Hour Traffic Volumes and Capacity Analysis Results

Figure 10: 2028 Background AM Peak Hour Traffic Volumes and Capacity Analysis Results

Figure 11: 2028 Background PM Peak Hour Traffic Volumes and Capacity Analysis Results

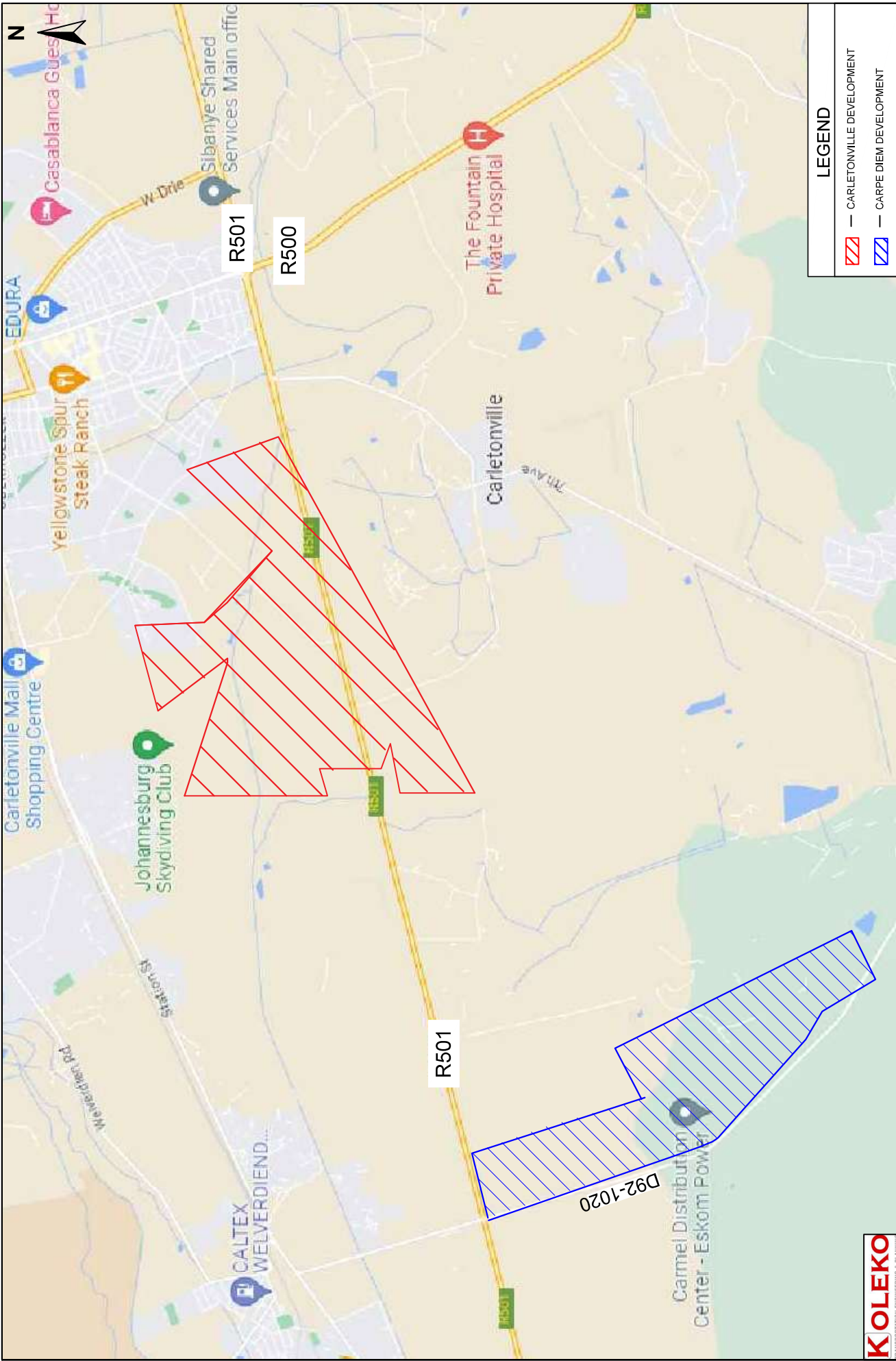
Figure 12: 2028 Total AM Peak Hour Traffic Volumes and Capacity Analysis Results

Figure 13: 2028 Total AM Peak Hour Traffic Volumes and Capacity Analysis Results

Figure 14: Classification of Roads

Figure 15: Zones of Conflict

Figure 16: Proposed Solutions



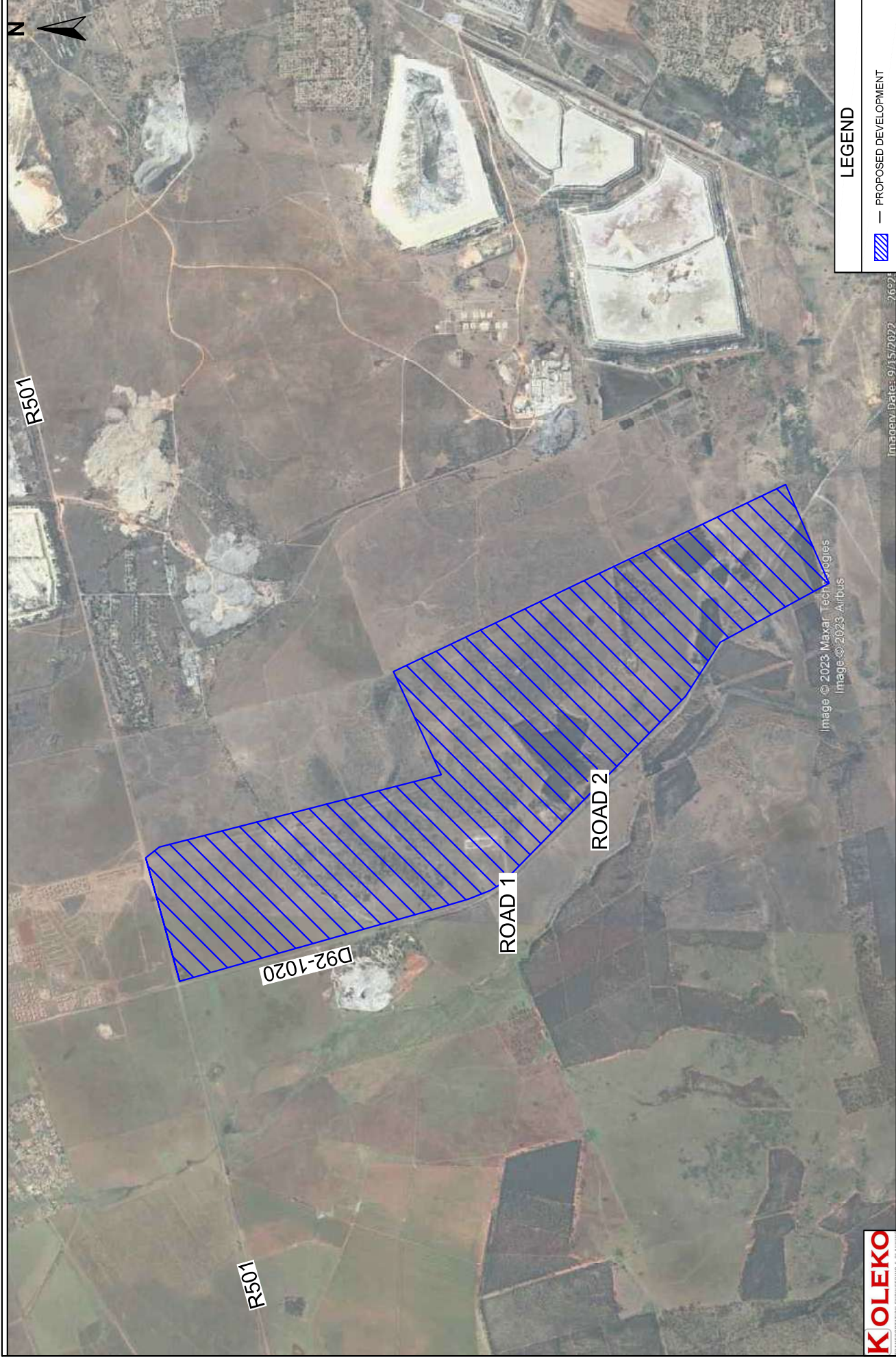
LEGEND

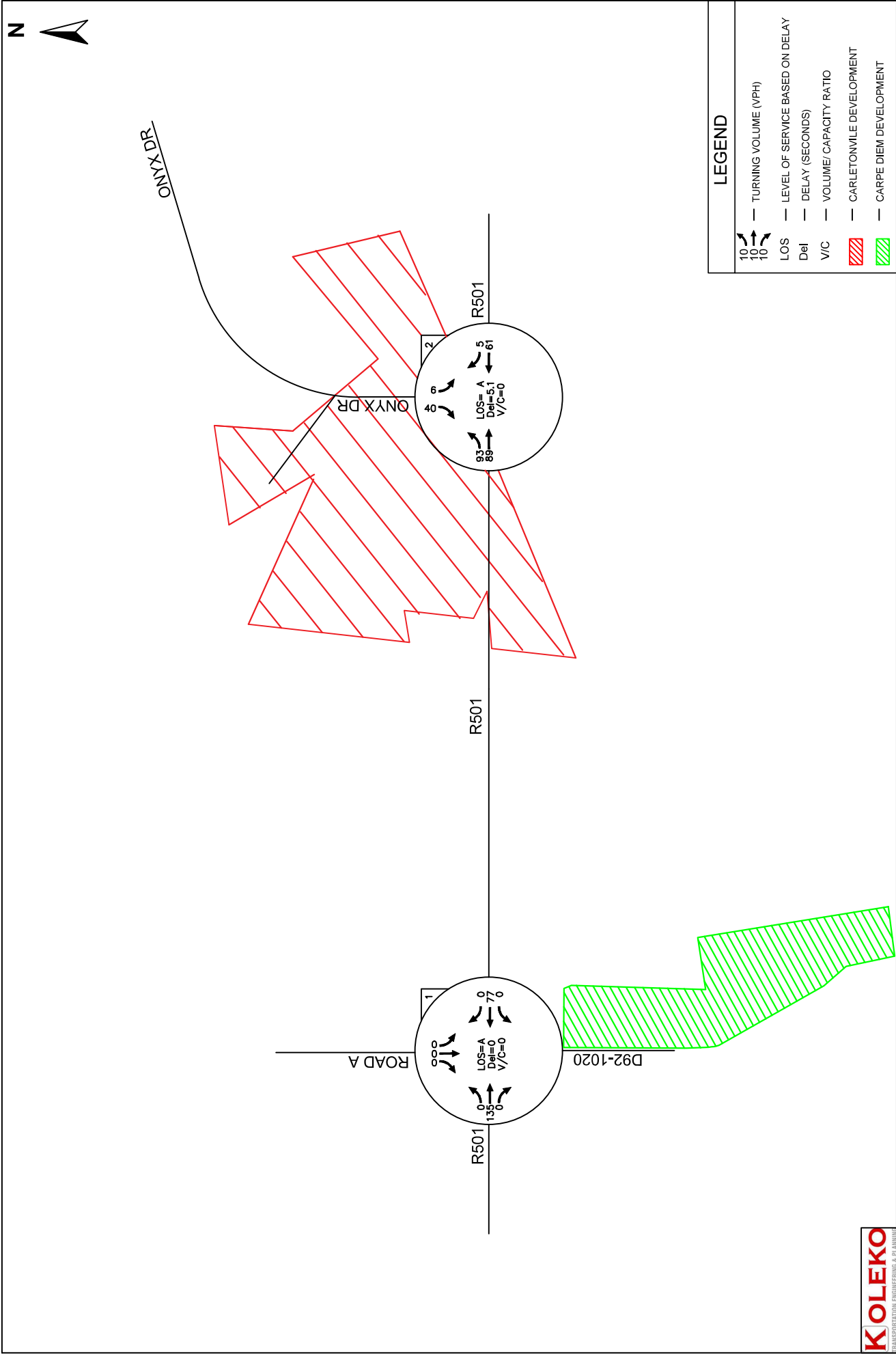
-  CARLETONVILLE DEVELOPMENT
-  CARPE DIEM DEVELOPMENT

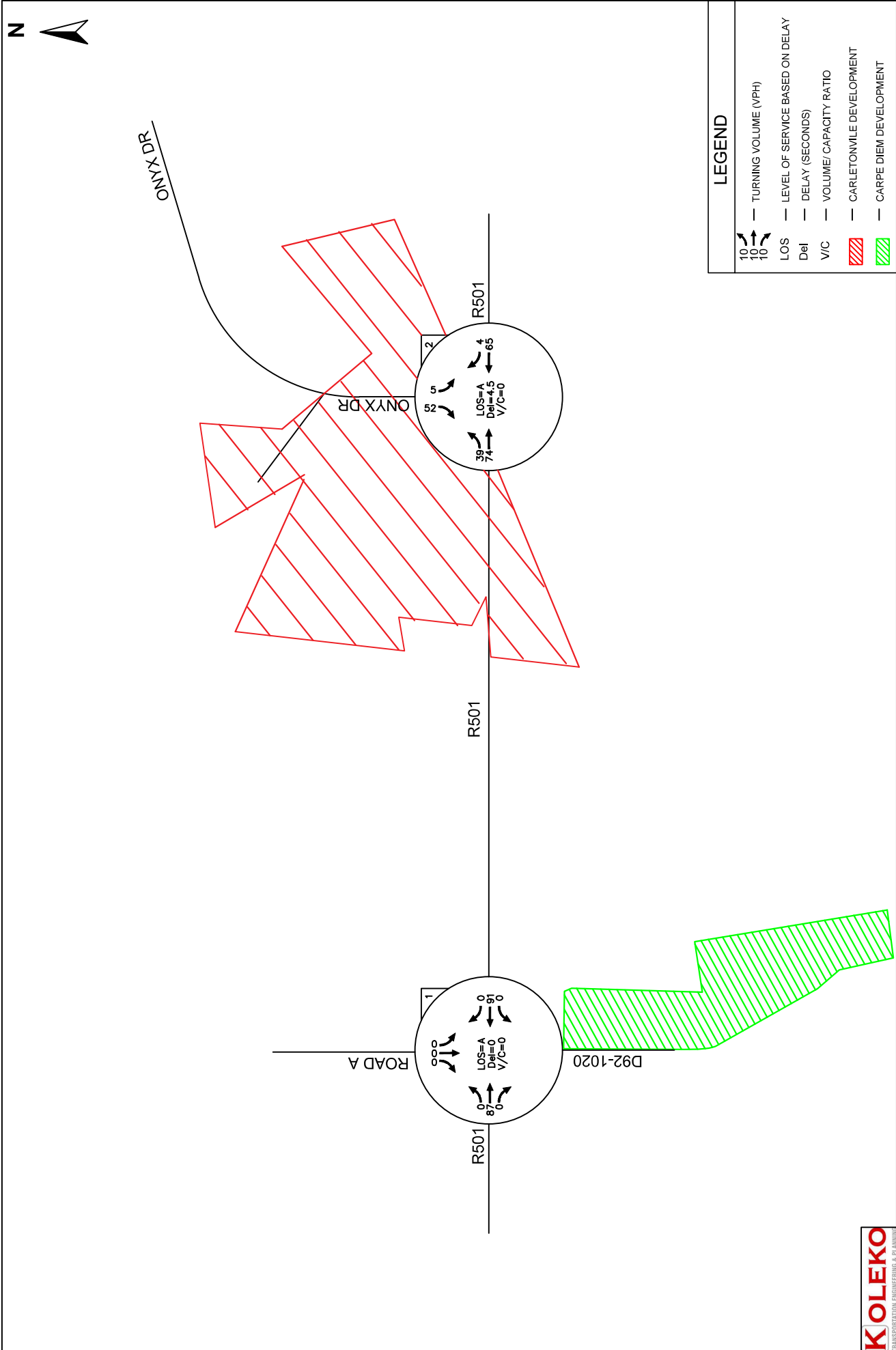
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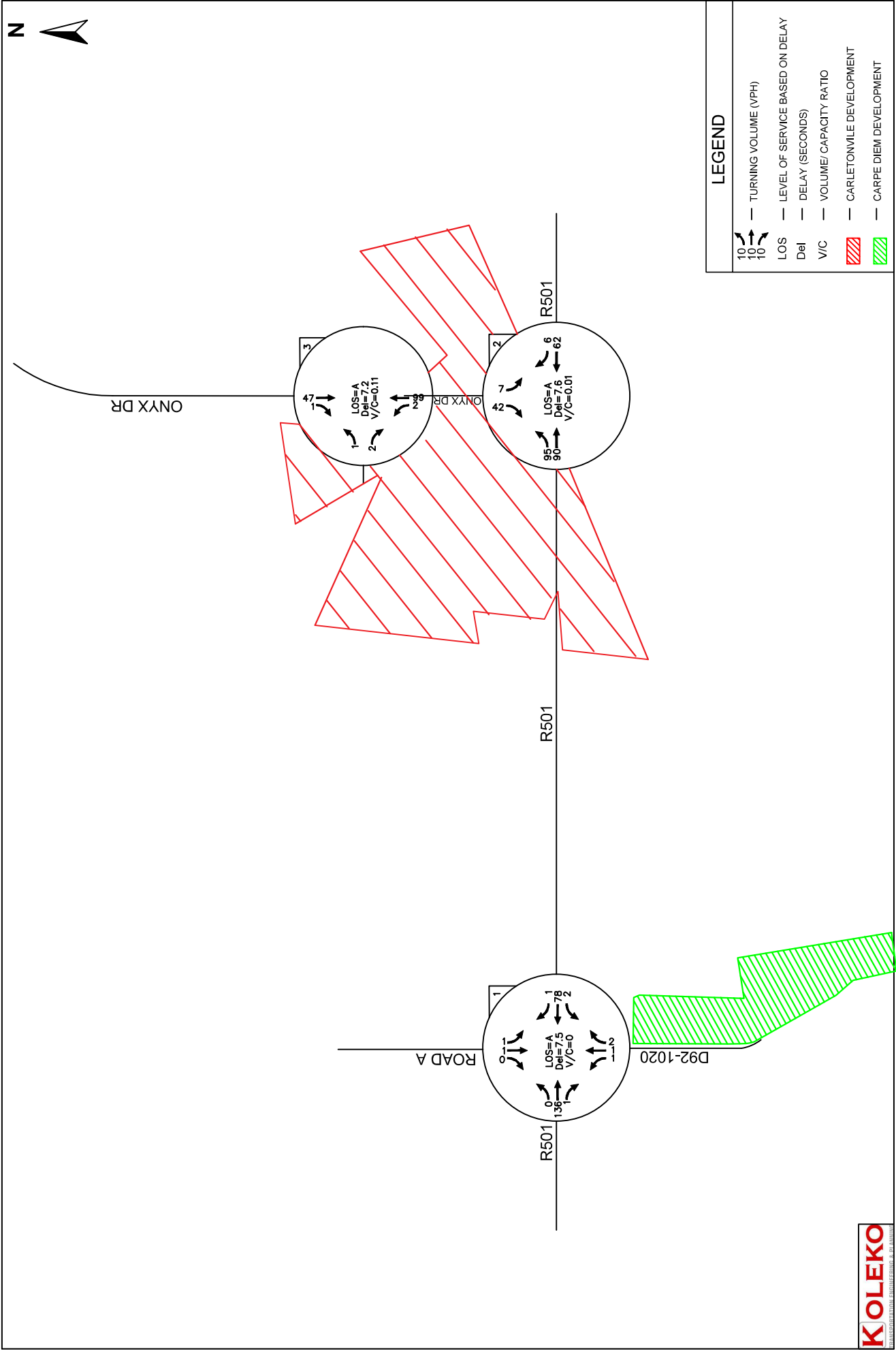
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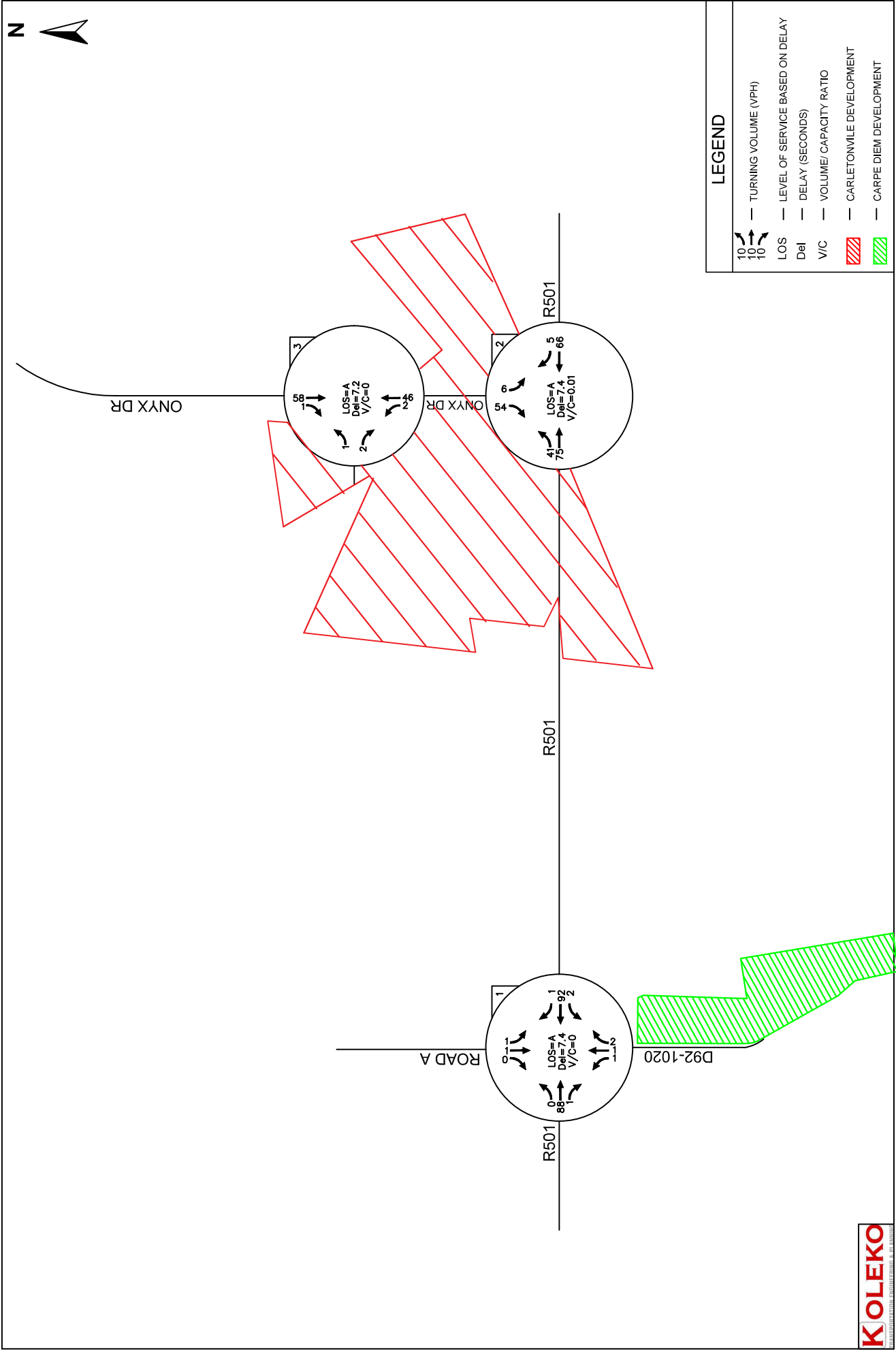
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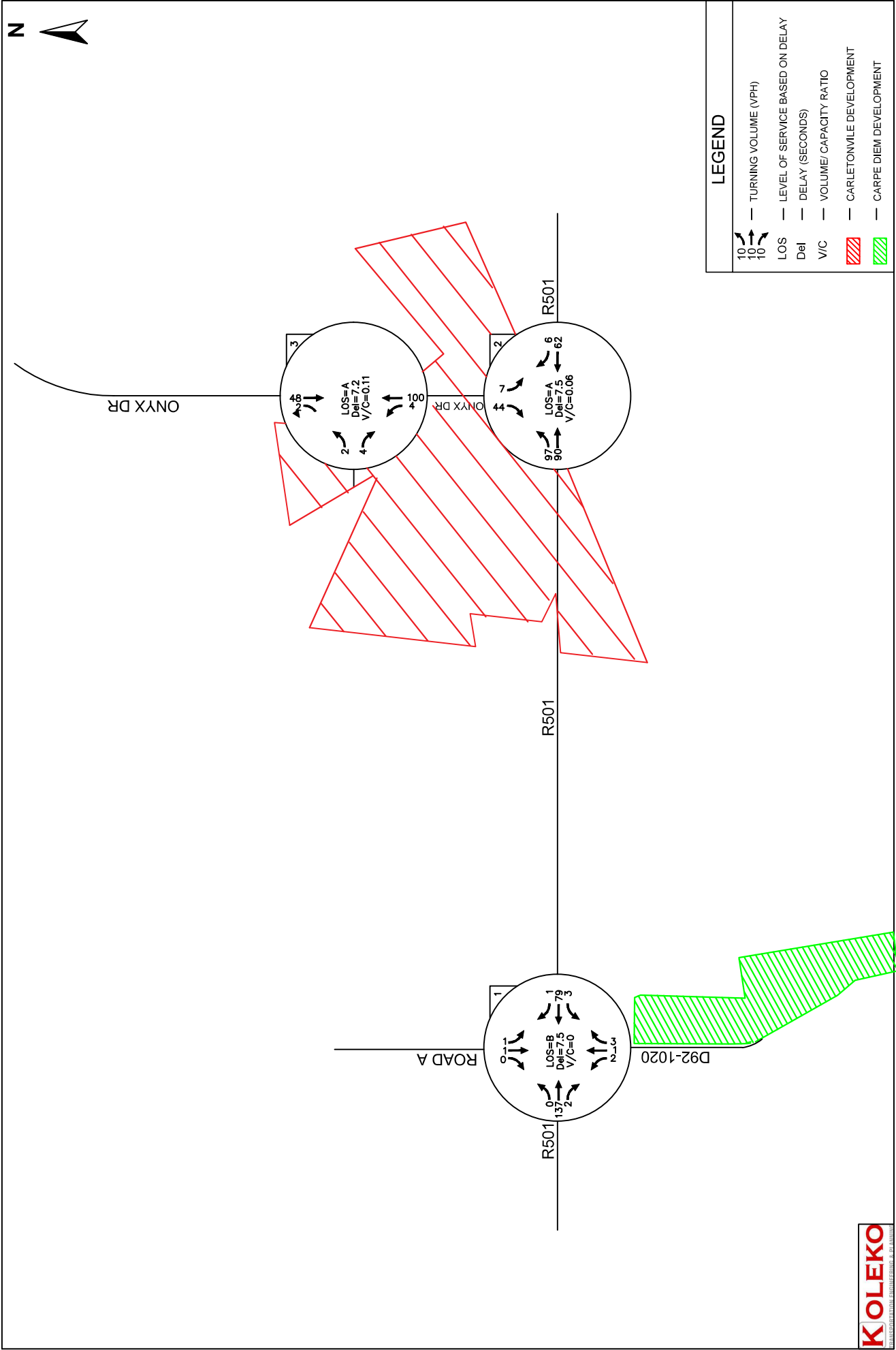


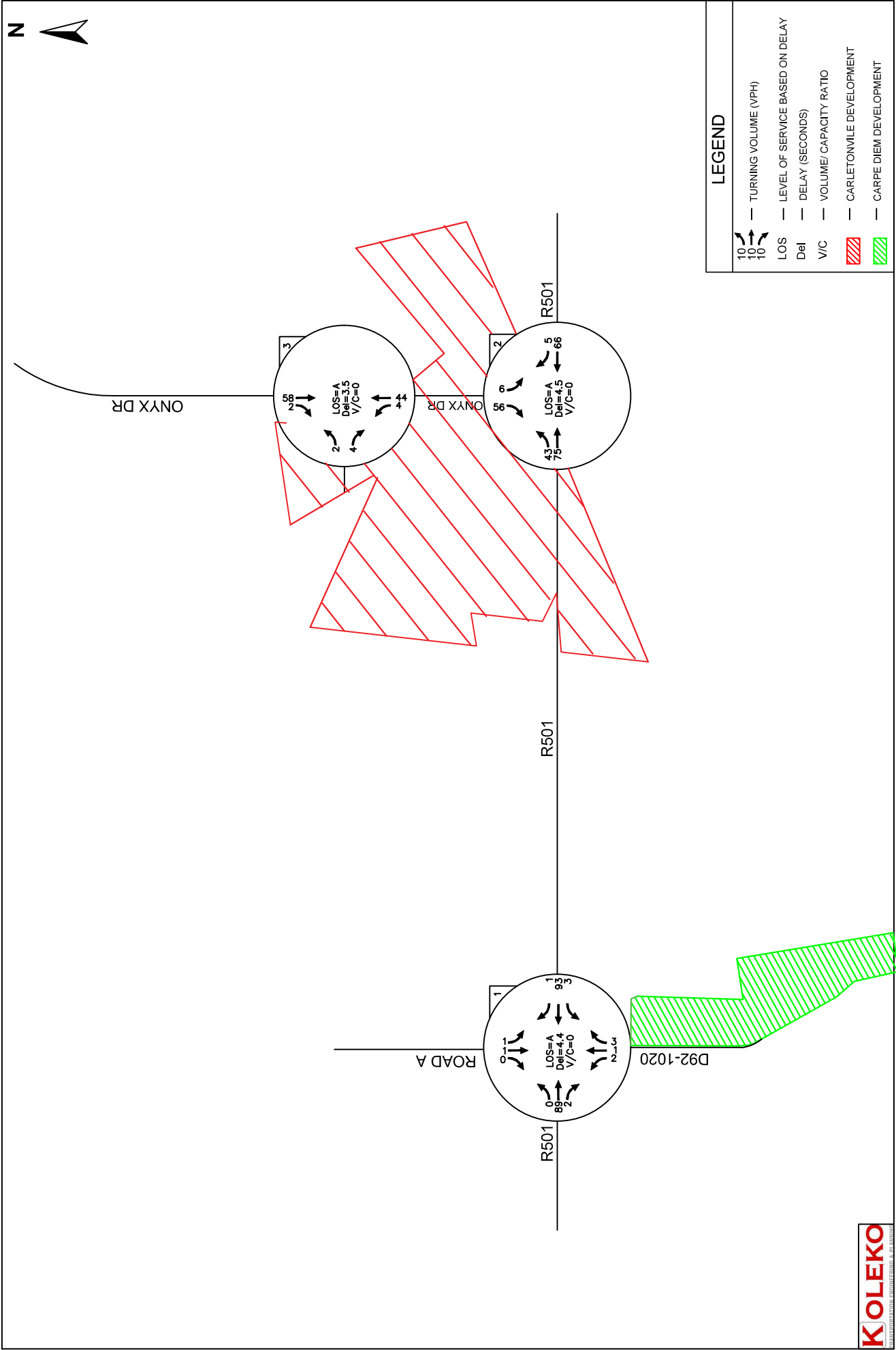


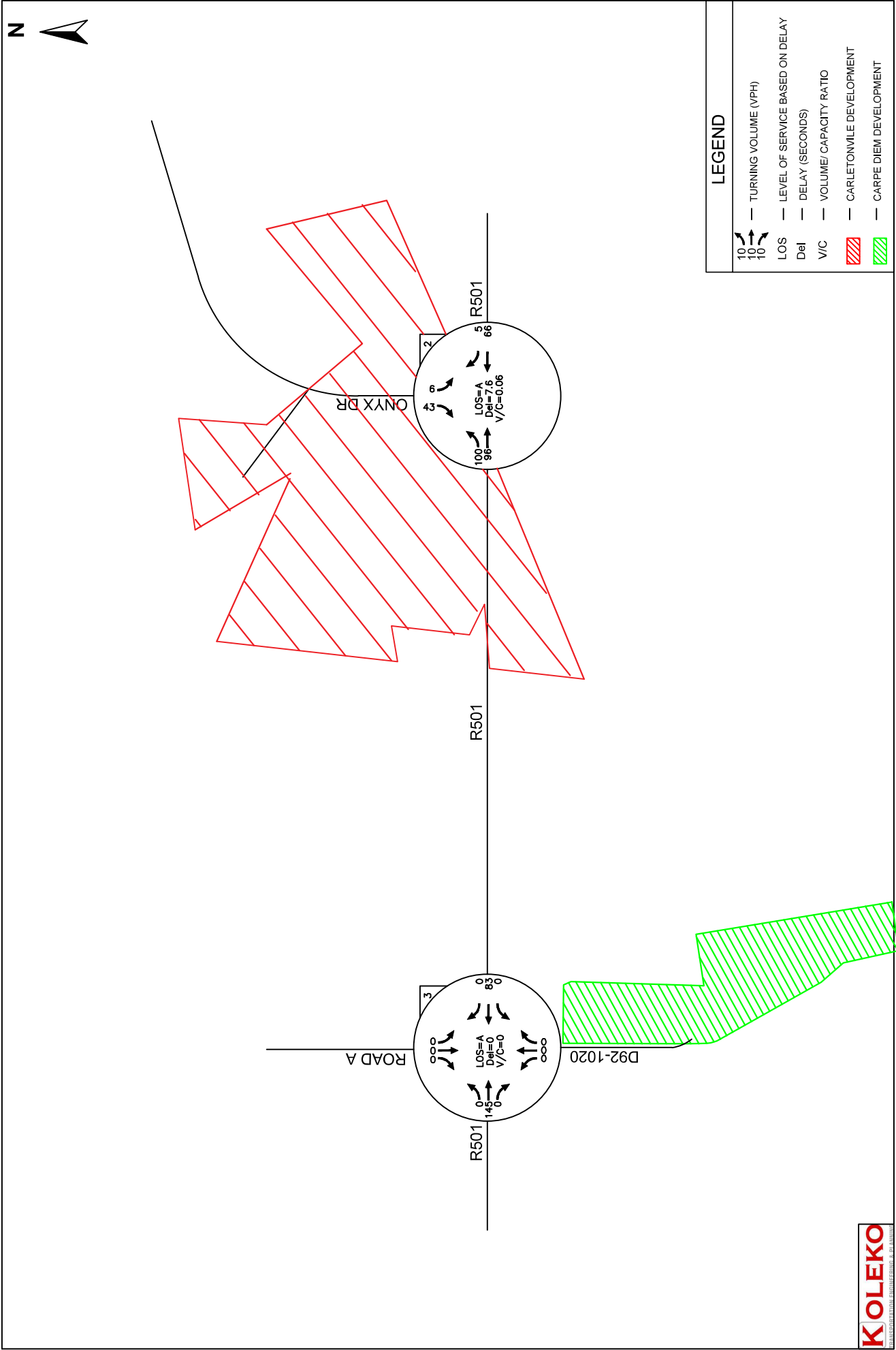


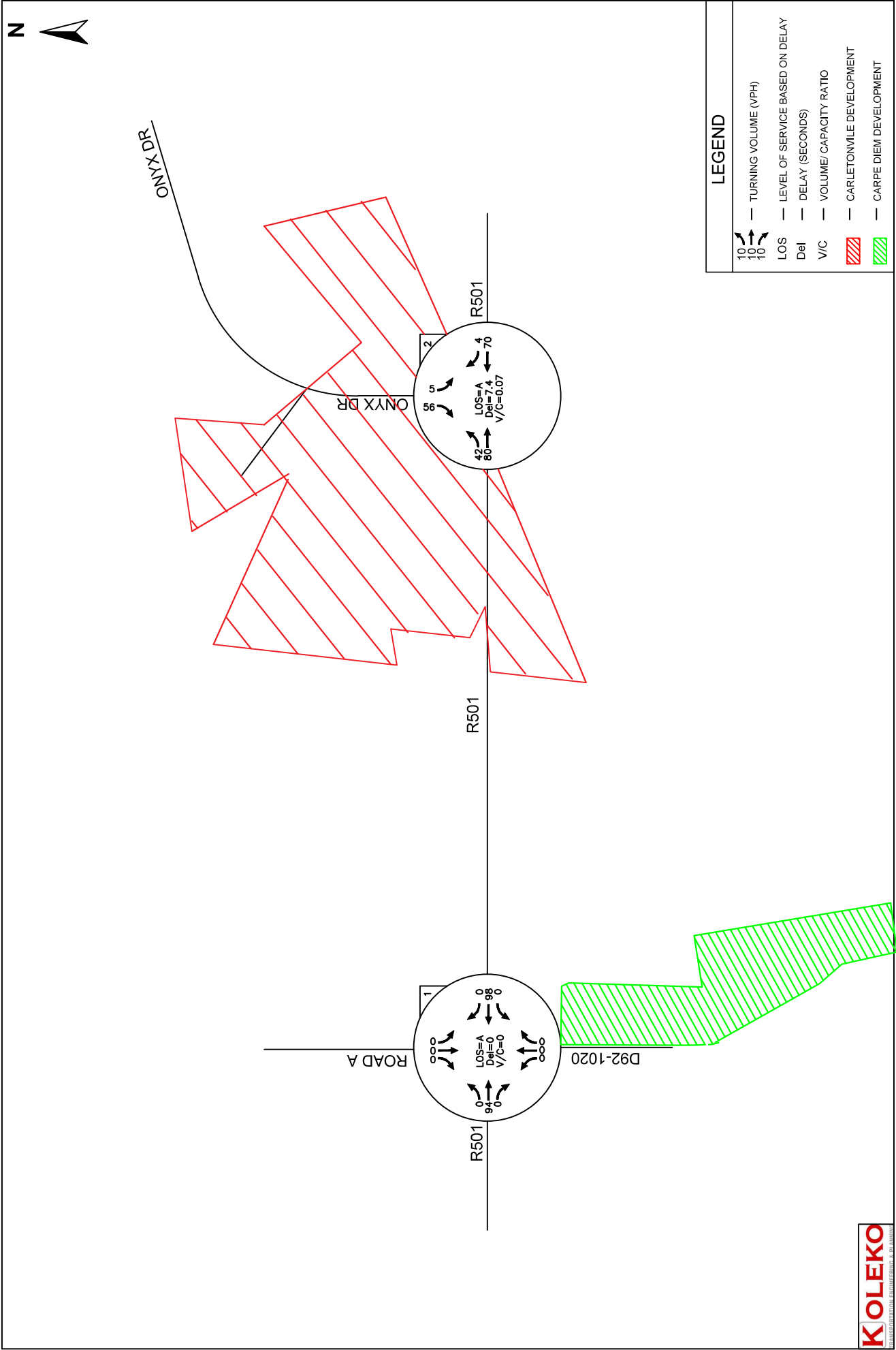


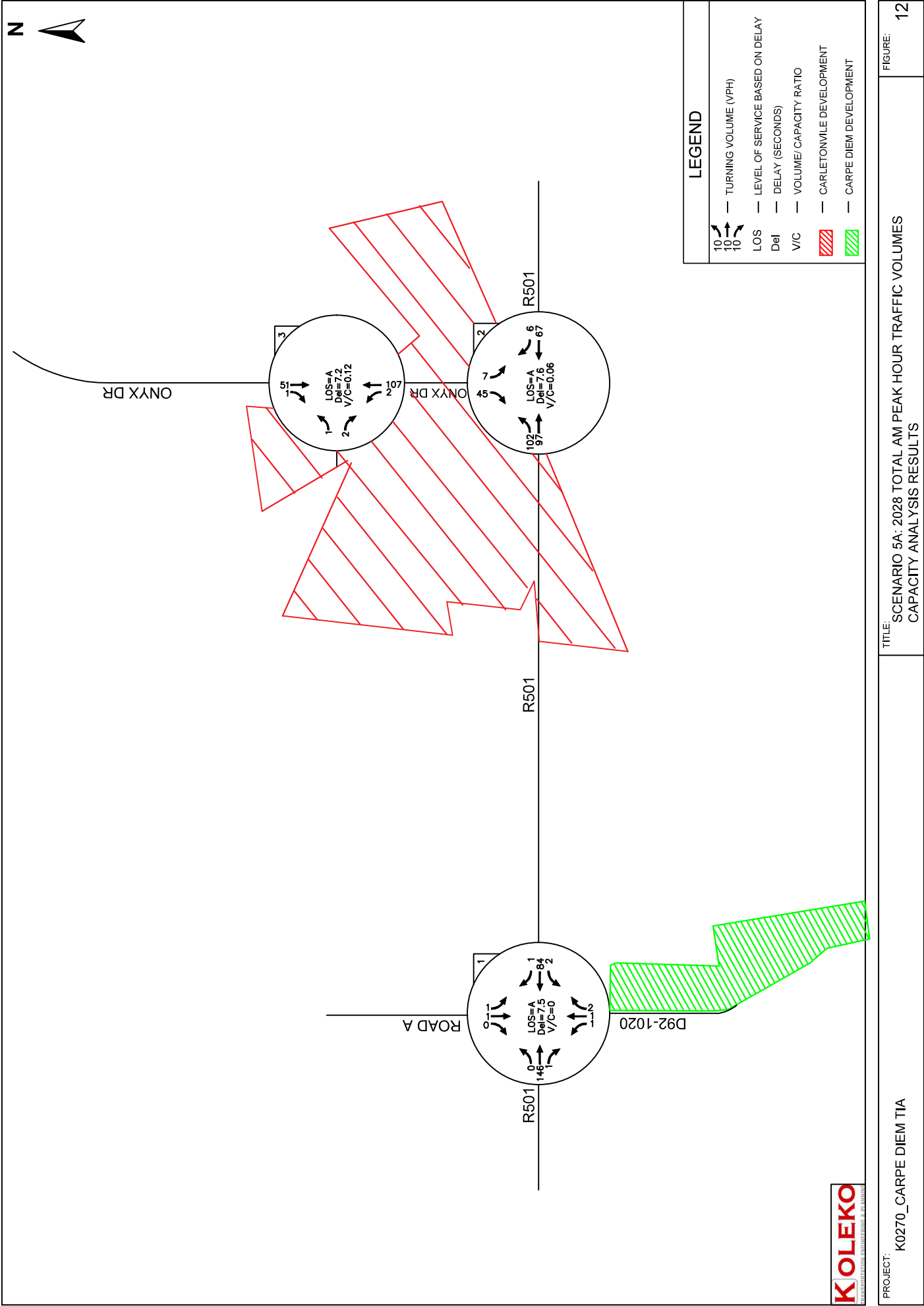


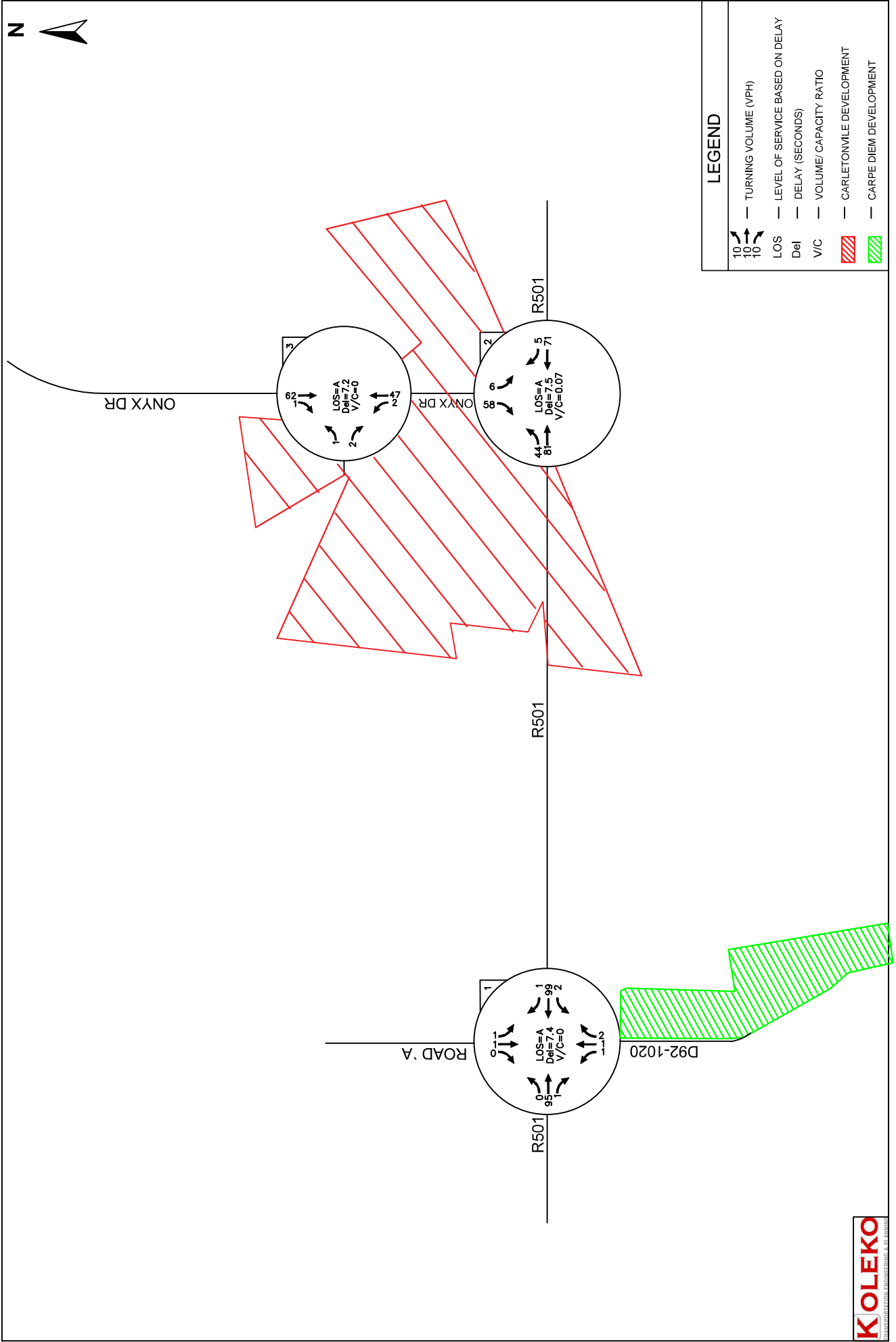












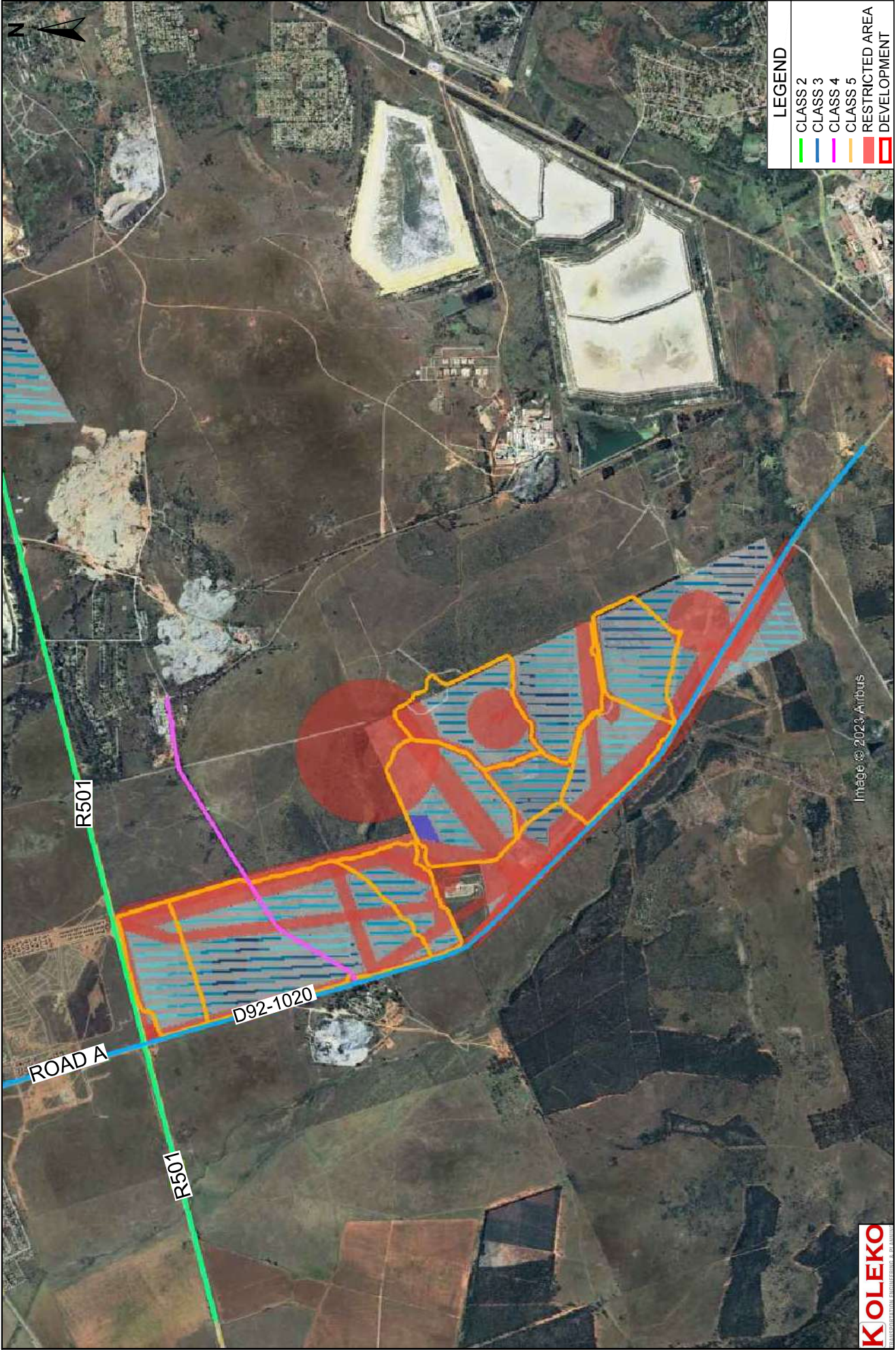


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LEGEND

- NEW PROPOSED ROAD
- NEW PROPOSED SITE ACCESS
- RESTRICTED AREA
- DEVELOPMENT

Annexure B

Risk Rating Methodology

The following methodology has been applied to the prediction and assessment of impacts. Potential impacts have been rated in terms of the direct, indirect, and cumulative nature of the impact:

- **Direct** impacts – are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable;
- **Indirect** impacts – of an activity are indirect or induced changes that may occur because of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity;
- **Cumulative** impacts – are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present, or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The significance of each potential impact, with and without the implementation of the proposed mitigation measures, will be assessed based on the following variables (evaluation components):

- **Spatial extent** – The size of the area that will be affected by the impact;
- **Intensity (or Magnitude)** – The anticipated severity of the impact;
- **Duration** – The timeframe during which the impact will be experienced;
- **Probability** – The probability of the impact occurring;
- **Reversibility** – The “reversibility” of the environmental impacts of the proposed development after project cessation or decommissioning; and
- **Irreplaceability** – The “irreplaceability” of natural characteristics in the area that may be impacted upon by the proposed development.

Using the criteria above, the impacts were further be assessed with the use of quantifiable values as described below.

Evaluation of criteria by means of quantitative ratings and descriptions:

Criteria	Description	Quantitative Rating
Duration	Temporary (less than a year)	1
	Short term (1 to 6 years)	2
	Medium term (6 to 15 years)	3
	Long term (the impact will cease after the operational life of the activity)	4
	Permanent (mitigation will not occur in such a way or in such a time span than the impact can be considered transient)	5
Spatial extent	Site specific	1
	Local (less than 2 km from the site);	2
	Regional (within 30 km of the site)	3
	National (beyond Provincial boundaries and within National boundaries)	4
	International / Transboundary (Beyond National boundaries)	5
Intensity Applicable to Negative Impacts (at indicated spatial extent)	None (Biophysical and/or social functions and/or processes will remain unaltered)	0
	Very Low (Biophysical and/or social functions and/or processes might be negligibly altered)	2
	Low (Biophysical and/or social functions and/or processes might be slightly altered)	4
	Medium (Biophysical and/or social functions and/or processes might be notably altered)	6
	High (Biophysical and/or social functions and/or processes might be considerably altered)	8
	Very High (Biophysical and/or social functions and/or processes might be severely altered)	10
Intensity Applicable to Positive Impacts (at indicated spatial extent)	None (Biophysical and/or social functions and/or processes will remain unaltered)	0
	Very Low (Biophysical and/or social functions and/or processes might be negligibly enhanced)	2
	Low (Biophysical and/or social functions and/or processes might be slightly enhanced)	4
	Medium (Biophysical and/or social functions and/or processes might be notably enhanced)	6

Criteria	Description	Quantitative Rating
Probability	High (Biophysical and/or social functions and/or processes might be considerably enhanced)	8
	Very High (Biophysical and/or social functions and/or processes might be substantially enhanced)	10
	Improbable (5% to no chance of occurring)	1
	Probable (5% - 25% chance of occurring)	2
	Medium Probability (25% - 75% chance of occurring)	3
	Highly probable (75% - 95% chance of occurring)	4
	Definite (greater than 95% chance of occurring)	5
Reversibility	No impact	0
	Impact will be reversible	1
	High potential that impact might be reversed	2
	Moderate potential that impact might be reversed	3
	Low potential that impact might be reversed	4
	Impact cannot be reversed	5
Irreplaceability	None	0
	Very low potential for loss of irreplaceable resources	1
	Low potential for loss of irreplaceable resources	2
	Moderate potential for loss of irreplaceable resources	3
	High potential for loss of irreplaceable resources.	4
CUMULATIVE impact	Definite loss of irreplaceable resources	5
	High: The activity is one of several similar pasts, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.	
	Medium: The activity is one of a few similar pasts, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socioeconomic resources of local, regional or national concern.	
	Low: The activity is localised and might have a negligible cumulative impact.	
	None: No cumulative impact on the environment.	

Once the evaluation components have been ranked for each impact, the significance of potential impact are assessed (or calculated) using the following formula:

$$\text{SP (significance points)} = (\text{intensity} + \text{duration} + \text{spatial extent} + \text{irreplaceable} + \text{reversibility}) \times \text{probability}.$$

The maximum value is 150 SP (significance points). The unmitigated and mitigated scenarios for each environmental impact should be rated as per the table below (Table 2).

Definition of significance ratings (positive and negative):

Significance Points	Environmental Significance	Description
125 – 150	Very high (VH)	An impact of high or very-high significance which could influence a decision about whether to proceed with the proposed project, regardless of available mitigation options.
100 – 124	High (H)	Cumulative Impacts: The activity is one of several similar pasts, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional, or national concern.
75 – 99	Moderate-high (MH)	If left unmanaged, an impact of moderate-high significance could influence a decision about whether to proceed with the proposed project. Mitigation options should be re-evaluated.
40 – 74	Moderate (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether to proceed with the proposed project. Cumulative Impacts: The activity is one of a few similar pasts, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional, or national concern.
<40	Low (L)	An impact of low significance is likely to contribute to positive decisions about whether to proceed with the proposed project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation. Cumulative Impacts: The activity is localised and might have a negligible cumulative impact.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/ effect and is likely to contribute to positive decisions about whether to proceed with the proposed project.

IMPACT ASSESSMENT REPORT
CARPE DIEM PV

Direct Traffic Impacts (minor):

Construction Phase TIA and Decommissioning Phase TIA			
Nature of Impact: Traffic congestion on all access roads and roads in the vicinity of the site during construction with impacts on intersection capacity, road infrastructure adequacy and parking requirements.			
PREFERRED ALTERNATIVE			
Criteria	Rating Before mitigation	Rating After mitigation	
Status and Nature of the Impact	Negative		None
Magnitude	Very Low (2)		N/A
Duration	Short term (2)		N/A
Spatial extent	Regional (3)		N/A
Irreplaceability of resources	None (0)		N/A
Reversibility of impact	Impact will be reversible (1)		N/A
Probability of impact occurring	Highly probable (4)		N/A
TOTAL (SP) / Significance	Low Negative (32)		-
Cumulative impacts	Low Negative		-
Proposed Mitigation Measures	No mitigation measures are necessary to be implemented during the construction (or decommissioning) phase, as the impacts on the road network will be minimal and it will not be necessary for any mitigation measures. No road upgrades were found to be required to accommodate the traffic generated from the development both during the construction and decommissioning phases. It is recommended that at least 10 parking bays be provided on site for private vehicles and trucks.		

IMPACT ASSESSMENT REPORT
CARPE DIEM PV

Operational Phase TIA		
Nature of Impact: Impact on traffic volumes during the operational phase.		
The operational phase of this project is not expected to generate significant traffic volumes.		
PREFERRED ALTERNATIVE		
Criteria	Rating Before mitigation	Rating After mitigation
Status and Nature of the Impact	Negative	-
Magnitude	Very Low (2)	-
Duration	Long term (4)	-
Spatial extent	Local (2)	-
Irreplaceability of resources	None (0)	-
Reversibility of impact	No impact (0)	-
Probability of impact occurring	Improbable (1)	-
TOTAL (SP) / Significance	Low Negative (8)	N/A
Cumulative impacts	Low Negative	-
Proposed Mitigation Measures	No road upgrades were found to be required to accommodate the traffic generated from the development during the operational phase. It is recommended that at least 10 parking bays be provided on site for private vehicles and trucks.	