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LIDL GREAT BRITAIN LIMITED AND NORTHPORT LOCHALINE LIMITED

WORLD OF WATER AQUATICS, KINGS LANGLEY

3rd TRANSPORT TECHNICAL NOTE

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Contents

Page

Drawings

Appendices

Document Control Sheet

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1. INTRODUCTION

1.1. Ardent Consulting Engineers (ACE) have been instructed by Lidl Great Britain Limited and Northport Lochaline Limited to prepare a Transport Technical Note (TTN) in respect of a proposed Lidl Food Store on land to the west of the A41 / Watford Road (application reference 22/1764/FUL). The Local Planning Authority is Three Rivers District Council (TRDC), whilst Hertfordshire County Council (HCC) are the Local Highway Authority.

1.2. This ACE Transport Technical Note (TTN) provides a response to a TTN prepared by Evoke Transport, who were commissioned by TRDC to undertake an independent highway related review of the documentation and drawings prepared by Ardent Consulting Engineers following deferral at Committee. A summary of the key conclusions is provided below with the full Evoke Transport TTN report contained within **Appendix A** for completeness.

1.3. It should be noted that Evoke Transport Independent Highways Review does not highlight any fundamental reasons for refusal. In relation to the design review of the access arrangement, it was stated within the review that the *"Design generally compliant, with vehicle movements being accommodated" and "the existing situation has been generally accurately described and assessed".* Finally, it was noted that "*cycle and pedestrian generally appear to have been accurately considered"*

1.4. It is however noted the Independent Highways Review did raise the following comments that will be addressed and commented on within this report noting they do not highlight any fundamental reasons for refusal.

Proposed Access Arrangements

- *"In regard to the northbound right turn lane and the southbound right turn lane proposals meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), but do not meet the minimum requirements for a 40mph design speed;*

- *The through lane and turning lane widths are proposed to be retained as existing. These do not wholly meet minimum requirements however no safety*

concerns have been raised and retention of the existing provision appears suitable;

- *Level differences to be considered at next stage;*
- *Removal of the vegetation in the primary direction would still be required, as has been proposed within the design. This can be controlled by Condition imposed on any planning permission; and*
- *Road signing, lighting and drainage details to be provided at detailed design stage".*

Speed and Volume of on-coming traffic from the A41

- *"The ATC survey was undertaken during Hertfordshire school half term holidays and therefore the data may not represent normal traffic conditions"*
- *"It has not been possible to review the impact of the proposed development on the local highway network due to omissions of information around the baseline model, TEMPro growth, committed developments and due to 2036 being utilised for future year modelling 2036 is however considered to present a robust position, with a lower level of background growth likely occurring should opening year and post five-year scenarios be alternatively assessed."*

Cycle and Pedestrian Safety

- *"generally appears to have been accurately considered however it is recommended that the width between the two sets of tactile paving is increased to align with HCC standard."*

Acceptability of Crossing Points

- *"based on the above correspondence and recorded speeds, adequate visibility can be achieved, and the principles of the upgrade appear feasible. The impact of the 22/0491/FUL application not progressing and therefore the proposed toucan crossing upgrades not progressing should be considered"*

1.5. The purpose of this report is to review and provide a response to each of the key points raised in the independent highway review undertaken by Evoke Transport.

This report should also be read in conjunction with the previous documents submitted to support the planning application.

2. ARDENT RESPONSE TO INDEPENDENT HIGHWAY REVIEW

2.1 This section of the reports provides ACE's response to the independent highway review undertaken by Evoke Transport. For clarity, each comment received from Evoke Transport are show within this report is in *italics,* followed by Ardent Consulting Engineers response provided below each point.

Proposed Access Arrangement Comments

Junction

"Kerb radii of 10m and 12m have been proposed. This meets the minimum radius requirements provided in CD 123 5.6.1.

An illuminated traffic island is proposed on the access road at the junction. With reference to CD 123 the proposed minor arm approach lane width should be 4.0 metres for this junction arrangement either side of the island. The proposed design provides widths in excess of the minimum requirements. This is acceptable for this design and location."

2.2 The above point is noted, and no further commentary/amendments to the site access arrangement is required.

Horizontal Alignment

"The existing central reserves and central hatching omit the requirement for any hatched taper on approach to the right turn lanes and the design meets the minimum requirements as set out in CD 123 Table 6.1.1."

2.3 The above is noted, and no further commentary/amendments to the site access arrangement is required.

"The A41 adjacent to the site access location is subject to a 40mph speed limit, however we note that the speeds recorded in the Automatic Traffic Count (ATC) survey

of the northbound traffic (approaching from Hunton Bridge Roundabout) identified an 85th percentile speed of 29.7mph.

In accordance with CD 123 for a 30mph design speed, the following criteria should be met:

- *Turning Length = minimum of 10m (CD 123 6.4)*
- *Deceleration Length = minimum of 25m (CD 123 Table 5.22)*
- *Direct Taper Length = minimum of 5m (CD 123 Table 5.22)*

In accordance with CD 123 for a 40mph design speed, the following criteria should be met:

- *Turning Length = minimum of 10m (CD 123 6.4)*
- *Deceleration Length (CD 123 Table 5.22)*
- *Direct Taper Length (CD 123 Table 5.22)*

2.4 The above is noted and further information is provided below for each individual aspect raised in the independent highways review.

Northbound Right Turn Lane (from site onto A41)

"As above, the specific concern as to the acceptability of the right hand turn onto the A41 from the proposed development has been considered in detail.

No design issues with this aspect of the access design have been identified.

The access proposals have been modelled in the priority junction assessment tool (PICADY) and it is noted that the full model output report is included as Appendix I of the Transport Assessment.

The modelling therefore indicates that there will be sufficient gaps in the main, straight-ahead movements for traffic to turn right."

2.5 The above is noted and confirms that there will be sufficient gaps to allow for future development users to turn right from the access on to the A41, as demonstrated by the results of the junction modelling which is deemed suitable for a 40mph speed limit. This should therefore alleviate Councillors' concerns in relation to the suitability of this aspect of the arrangement.

Northbound Right Turn Lane (Old Mill Lane)

"The existing northbound right turn lane into Old Mill Road is proposed to be reduced in length. A 10m turning length is still provided with approximately 50m deceleration length, which meets the minimum requirements for a 40mph design speed as set out above.

2.6 The above is noted, and no further commentary/amendments to the proposed arrangement is required.

"The direct taper length for this right turn lane is proposed at 5m. While this meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), it is less than the minimum requirements for a 40mph design speed. "

2.7 In the first instance, it should be stressed that the above arrangement has been reviewed by the Local Highway Authority and two Independent Road Safety Audits, where it was concluded that the design would not give rise to any significant road safety concerns.

2.8 Notwithstanding the above, **ACE Drawing 187011-001J** has been updated to demonstrate how a 15m taper length could be provided (in line with CD 123 Table 5.22*)* for a 40mph speed limit, to alleviate the above concerns without significant impact on the proposed arrangement or requirement for additional modelling. The implementation of this increased direct taper would not have any significant impact on the proposed arrangement and should therefore not warrant refusal of the scheme. It is envisaged that this could be incorporated at detailed design stage, but the updated drawing included within this TTN should give confidence to the Committee that this can be delivered without significant impact on the overall operation of the junction.

Southbound Right Turn

"The existing southbound right turn lane into the site is proposed to be lengthened. A 10m turning length is still provided with approximately 40m deceleration length, which meets the minimum requirements for a 40mph design speed.

The direct taper length for this right turn lane is proposed at 5m. While this meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), it is less than the minimum requirements for a 40mph design speed."

2.9 In relation to the proposed 5m taper length, it should be stressed that this is the length of the taper that is currently provided in the existing junction arrangement, which operates in a safe and suitable manner with no recorded road traffic collisions that could be linked to the existing 5m taper length.

2.10 There are a number of constraints including the existing staggered crossing point and the proximity of the Old Mill Road / Watford Road junction. Therefore, careful consideration was given to ensure that both junction arrangements are designed appropriate to the local conditions without a detrimental impact on the operation of either junction.

2.11 It should be noted that the deceleration length provided will be in line with a 40mph speed limit (as per CD123) and provides a significant betterment over the existing arrangement. This would therefore allow for vehicles to decelerate before undertaking the turning manoeuvre reducing the risk of conflicts.

2.12 Furthermore, it can be demonstrated that on **ACE Drawing 187011-00J** that a Typical Length Articulated Vehicle can suitability manoeuvre and align within the lane without overhang or encroachment into oncoming lanes which further signifies the suitability of the proposed arrangement.

2.13 This arrangement has also been subject to two separate road safety audits undertaken by a third party, which raised no concerns with the arrangement as proposed.

2.14 When considering the above, a 5m taper length should be considered acceptable in this instance without providing any additional modifications to the agreed access arrangement at this stage, noting the existing situation and constraints.

Through Lane Widths

"In accordance with CD 123 6.8, all through lane widths should be between 3m and 3.65m.

As part of the proposals, all existing though lane widths are to be retained. Whilst the southbound lanes are c.3.4m, the northbound through lane is between c.4.3 and 4.65m.

These are all existing widths and allow for a suitable alignment through the junction and provide a familiarity to road users. The existing site conditions would suggest retention of these through lane widths appears suitable in this location. The accident data within the Transport Assessment identifies no accidents occurring at this location. "

2.15 The above is noted and no further commentary/amendments to the arrangement are required.

Turning Lane Widths

"*In accordance with CD 123 6.10, all turning lane widths shall meet the minimum requirement of 3.5m but shall not exceed 5m.*

The existing northbound right turn lane into Old Mill Road has a retained turning width of c.3.2m which is below the minimum requirement (albeit operates as existing).

The existing southbound right turn lane into the site, has a turning width starting at c.5.6m and narrowing down to c.3.57m by the site access turn in. This is below the minimum requirement but is recognised as an existing situation. The PIA data within the Transport Assessment shows no accidents in this location.

Whilst this exceeds the maximum 5m turning lane width, this arrangement accommodates the existing highway alignment and northbound right turn lane. Any attempt to reduce this to below 5m could negatively impact the overall alignment along the A41 and on balance the design is considered to be acceptable.

No safety issues were raised within the Road Safety Audit on this design matter"

2.16 The above is noted and has been confirmed that the proposed arrangement has been deemed acceptable by the Independent Highway Review. It is important to stress that careful consideration was given to the existing alignment as alluded to in the above comment. This allows for larger vehicles serving the site such as an articulated vehicle to align in the lane without encroachment into adjacent lanes.

2.17 This arrangement was also considered acceptable the HCC and two Road Safety Audits which raised no road safety concerns.

Vertical Alignment

"Full details of the vertical alignment and levels have not been provided. However, this would be provided at the detailed design stages (which is a standard approach). We would suggest that the omittance of any level details at this stage should not be considered fundamental to the design principles. The level differences will need to be considered at the next stage, together with any supporting structures or earthworks required."

2.18 It should be stressed that a vertical alignment review was undertaken in relation to visibility as demonstrated in **ACE Drawing Number 187011-002D**. The drawing confirms that the calculated visibility splays can be achieved in the vertical alignment in line with the DMRB, taken to a object height of 260mm to the circulatory carriageway of the roundabout.

2.19 It can be confirmed that a full vertical alignment and levels review will be undertaken as part of the detailed design stage. However, the assessment undertaken demonstrates that visibility can be achieved in the vertical alignment.

Visibility

"Visibility at the proposed site access location is shown below in Figure 2 (taken during the site visit) and reflects the development proposals with regards to achievable visibility in both directions.

It is noted that removal of the vegetation in the primary direction would still be required, as has been proposed within the design. This can be controlled by a Condition imposed on any planning permission.

Visibility from the proposed access has been shown as achievable in all directions in accordance with the recorded speeds."

2.20 To provide context, it should be stressed that the calculated visibility splays from the speed survey are not shown on the most recent access arrangement drawing (**ACE Drawing 187011-003I**), at the request of HCC.

2.21 Nonetheless, the initial purpose of the speed survey was to derive vehicle speeds to calculate visibility splays which was undertaken in February 2023. While it is noted that this was undertaken during the school holidays, typically flows are lighter and therefore traffic flows are still in free-flow conditions which ensures that the recorded 85th percentile speeds are still representative and suitable to use to calculate visibility splays.

2.22 Following this HCC requested that maximum achievable visibility splays are shown to the circulatory carriageway as they exceed calculated splays based on recorded vehicle speeds to provide a robust assessment.

2.23 **ACE Drawing 187011-003J** therefore demonstrates that a 2.4m x 120m visibility splay (in accordance with a 40mph speed limit) can be achieved to the north and a maximum splay of 2.4m x 79m to the south, which is a significant betterment than the existing arrangement and exceeds the required visibility based on the recorded vehicle speeds which provides a worst-case scenario.

"Given the speed surveys undertaken and correspondence with the local highway authority the visibility at the proposed junction is considered suitable and demonstrate visibility for the existing and proposed site conditions can be achieved.

Given the proposed access road speeds, the pedestrian/cyclist visibility splays demonstrated from the crossing point across the access road are suitable.

Given the proposed access road speeds, the eastbound forward visibility demonstrated on approach to the junction is suitable"

2.24 The above comments are noted, and no further commentary/amendments the site access arrangements are required.

Road Signs, Markings and Lighting

"Full details of signing have not been provided. However, this would be provided at the detailed design stages. The omittance of any signing details at this stage should not be considered fundamental to the design principles and is in line with standard practice.

Further, the proposed road markings as shown in the development proposals are suitable and in accordance with TSM Chapter 5.

Full details of lighting have not been provided. However, this would be provided at the detailed design stages. The omittance of any lighting details at this stage should not be considered fundamental to the design principles and the existing columns would be relocated accordingly if required. "

2.25 The above comments are noted and can be confirmed that full details of road signs, markings and lighting will be included at detailed design stage.

Swept Path Analysis

"The designer has undertaken swept path analysis for articulated vehicles around the site access. The proposals demonstrate that all relevant vehicles movements can be accommodated within the proposed design at the relevant and requested

forward gear speeds of 10kph. It should be noted that the 'right out' movement from the access has not been included."

2.26 It should be stressed that for the purposes of the planning application and in line with industry standards, left in and left out swept paths were showed as they typically are the worst case and most onerous manoeuvres at a T-junction arrangement. However, for completeness and to give confidence of the suitability of the proposed site access, **ACE Drawing 187011-001J** has been updated to show how a Max Legal Articulated Vehicle can turn right out of the access road on to the A41 without conflict or encroachment. This should therefore alleviate the concerns raised by the independent highways review.

Drainage

"Full details of the drainage have not been provided. However, this would be provided at the detailed design stages. The omittance of any drainage details at this stage should not be considered fundamental to the design principles and highway alignment."

2.27 It can be confirmed that details for the drainage will be provided as part of the detailed design stage. Full details of the drainage strategy are provided within **ACE Report 187011-13,** noting that there is no objection from the LLFA subject to detailed design comments.

Road Safety Audit and Designer's Response

2.28 It is noted that Evoke Transport, within the independent highways review, provided a review of the Road Safety Audit Stage 1 and Designer's Response (**ACE Report 187011-09**) undertaken in January 2023. In order to not repeat the identical comment multiple times, the comments raised by the independent highways review were accepted and noted by Ardent Consulting Engineers and no further commentary is required.

Speed and Volume of on-coming traffic from the A41

Vehicle Speeds

An ATC survey was commissioned by Ardent Consulting Engineers to alleviate the concerns previously raised by Hertfordshire Highways in relation to visibility along the A41 to the south (in the direction of the Hunton Bridge Roundabout).

The survey was located on the A41 Watford Road circa 75m to the south of the proposed access junction, recording approach vehicle types and speeds in the northbound direction as vehicles egress from the circulatory carriageway. It was undertaken between Wednesday 15th February and Tuesday 21st February 2023.

It should be noted that WebTAG Unit M1.2 – Data Sources and Surveys states that surveys should typically be carried out during a 'neutral' or representative month, avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. It is understood that Hertfordshire half term holidays fell between 13th February and 17th February 2023 and therefore the ATC data could be seen as not representing a neutral period and may not reflect normal traffic conditions. Justification should be provided as to the validity of this data.

The Transport Assessment states that the recorded 85th percentile vehicle speeds on the exit of the Hunton Bridge Roundabout on to the A41 Watford Road was 29.7mph (48kph). The southbound traffic was not surveyed. It should be noted that this is an average 85th percentile speed across the surveyed seven-day period. The ATC has been reviewed and the stated 85th percentile speed is accurate. For reference, the average seven-day speed was 26.4mph, the 5-day average speed was 26mph and the 5- day average 85th percentile speed was 29mph.

2.29 While it is accepted that the ATC survey was undertaken during the Hertfordshire half term holidays due to time constraints with the application, it should be stressed that the purposes of the ATC was to obtain vehicle speeds only, to calculate visibility splays from the site access. The resulting traffic flows were not used in any modelling or resulting calculations. Typically, while traffic flow levels are lower during holiday periods, traffic is likely to be more free flowing

2.30 In any case and as previously alluded to, HCC requested in their final set of comments (February 2023) that maximum achievable visibility splays should be showed, which exceeds that of the calculated splays and provides a robust assessment and assurance that more than required visibility can be achieved.

2.31 Therefore, the use of the speed survey to derive visibility was not incorporated within the final submission. The final visibility splays shown exceed the that of the speed survey and should therefore remain suitable as confirmed by HCC.

Existing Volume of Traffic

The volume of traffic during the morning peak period was considered within the site audit undertaken on 9 January 2024. We would note that the traffic volume did not appear excessive.

The right turn lane into Old Mill Road appeared to be operating below capacity and no queuing was observed outside the existing right turn lane length.

Further details on peak hour periods are included below

- *Weekday Morning Peak – 08:00 – 09:00 = 957*
- *Weekday Evening Peak – 16:00 – 17:00 = 952*

It should be noted that the evening peak hour utilised in the Transport Assessment (17:00 – 18:00) is not presented in the MCC outputs.

2.32 It should be stressed that the full outputs were included within Appendix B of the Transport Assessment (**ACE Report 187011-05E**). For completeness, the full outputs are included within **Appendix B** of this report.

"The existing volume of on-coming traffic from the A41 roundabout is also evidenced in the ATC survey results undertaken at the A41 exit arm of the Hunton Bridge Roundabout (A41 / M25 /A411 Hempstead Road) (undertaken 15 – 21 February 2023). The data is summarised below:

- *Weekday Morning Peak – 07:00 – 09:00 = 764*
- *Weekday Evening Peak – 16:00 – 17:00 = 1109*

As identified above, there is a difference between the existing traffic volumes surveyed in the MCC and ATC surveys, with examples below

- *Weekday Morning Peak – 07:00 – 09:00 = 193 higher in MCC than ATC*

- *Weekday Evening Peak – 16:00 – 17:00 = 181 lower in MCC that ATC*

Justification should be provided regarding the variation between the MCC and ATC surveyed traffic flows."

2.33 As alluded to previously, the ATC survey was undertaken to derive vehicle speeds only and was not used in any modelling as it was undertaken during the Hertfordshire school holidays where traffic levels are typically not representative/considered suitable for modelling purposes. It should also be noted that the ATC survey also only measured vehicle flows in the northbound direction and therefore does not account for the two-way flows along the A41 which is required to undertake junction modelling.

2.34 Therefore, as is usual practice when undertaking junction modelling, an MCC survey was undertaken to determine the existing two-way traffic levels on the network on the 11th October 2022. It should be stressed that while the peak periods within the report and modelling are labelled as AM and PM, the busiest period within the survey period was identified to use within the junction modelling as demonstrated in the below screenshot, representing the busiest periods for assessment

Time Period	A41 South						Watford Road						A41 North						Total
	Left to Watford Road			Straight to A41 (North)			Left to A41 (North)			Right to A41 (South)			Straigth to A41 (South)			Right to Watford Road			
	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	H/T
0730-0745	0	0	0	205	10	225	0	0	0	0	0	0	262	6	274	0	0	0	
0745-0800	0	0	0	211	11	233	1	0	1	0	0	0	237	11	259	1	0	1	
0800-0815	0	0	0	227	6	239	0	0	0	0	0	0	220	7	234	0	0	0	
0815-0830	0	0	0	249	7	263	0	0	0	0	0	0	223	4	231	0	0	0	**1960**
0830-0845	0	0	0	250	8	266	1	0	1	0	0	0	229	11	251	0	0	0	**1979**
0845-0900	1	0	1	189	5	199	0	0	0	0	0	0	231	12	255	0	0	0	**1940**
0900-0915	2	0	2	202	10	222	0	0	0	0	0	0	243	9	261	1	0	1	**1953**
0915-0930	2	0	2	195	8	211	1	0	1	0	0	0	218	9	236	0	0	0	**1909**
Hourly Total	**0**	**0**	**0**	**937**	**32**	**1001**	**2**	**0**	**2**	**0**	**0**	**0**	**909**	**33**	**975**	**1**	**0**	**1**	

Time Period	A41 South						Watford Road						A41 North						Total
	Left to Watford Road			Straight to A41 (North)			Left to A41 (North)			Right to A41 (South)			Straigth to A41 (South)			Right to Watford Road			
	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	Lights	HGV	PCU	H/T
1630-1645	2	0	2	255	3	261	2	0	2	1	0	1	232	3	238	1	0	1	
1645-1700	3	0	3	265	3	271	1	0	1	0	0	0	234	5	244	0	0	0	
1700-1715	1	0	1	286	3	292	2	0	2	1	0	1	246	4	254	2	0	2	
1715-1730	2	0	2	273	2	277	1	0	1	2	0	2	291	2	295	0	0	0	**2153**
1730-1745	2	0	2	282	5	292	1	0	1	5	0	5	228	3	234	1	0	1	**2183**
1745-1800	0	0	0	269	3	275	0	0	0	1	0	1	236	2	240	0	0	0	**2180**
1800-1815	0	0	0	265	4	273	1	0	1	1	0	1	244	2	248	1	0	1	**2152**
1815-1830	0	0	0	279	0	279	0	0	0	1	0	1	222	2	226	0	0	0	**2081**
Hourly Total	**8**	**0**	**8**	**1106**	**13**	**1132**	**5**	**0**	**5**	**8**	**0**	**8**	**999**	**14**	**1027**	**3**	**0**	**3**	

SUMMARY RESULTS OF A41 / WATFORD ROAD - 11/10/22

2.35 The MCC survey identified that the busiest period in each peak hour were as follows:

- AM (07:45-08:45) – 1,976 two-way flows along the A41; and
- PM (16:45-17:45) – 2,159 two-way flows along the A41.

2.36 For completeness, the northbound flows have been extracted from the above peaks which results in the following:

- AM (07:45-08:45) – 1,001 two- way flows along the A41; and
- PM (16:45-17:45) – 1,132 two-way flows along the A41

2.37 The difference between the ATC and MCC is therefore demonstrated below:

- AM (07:45-08:45) – 273 higher in MCC than ATC
- PM (16:45-17:45) – 23 higher in MCC that ATC

2.38 It can be seen that the MCC results in higher traffic levels than the ATC when considering the busiest period within the survey data and is therefore considered suitable to use within the junction modelling. This therefore should provide the independent highways review team with sufficient justification as to why the MCC has been used for junction modelling purposes and therefore should be considered acceptable as it provides a worst-case scenario.

Trip Generation

"It is acknowledged that pre-application feedback from HCC was provided to the Applicant in August 2020. Within this feedback, trip generation was accepted and HCC raised no objections or issues with the approach taken in respect of trip type."

2.39 It should also be noted that the above trip rates were agreed at pre-application stage and were used throughout the planning process as agreed with HCC.

"We have reviewed the TRICS data, including the acceptability of the selected criteria, and the approach is generally acceptable. New surveys have been added since 2020. Utilising these surveys could result in approximately 10 additional vehicle trips in the both the morning and evening peak, however this is not envisaged to have a material impact on the local highway network."

2.40 This is noted, though as highlighted above these have been agreed from the pre-application stage and was accepted throughout the planning process. Furthermore, no details were provided of the additional site and how comparable they are to the proposed development and location.

It is noted that the Transport Assessment and subsequent documents and assessments utilised the following peak hours:

- *Weekday morning peak: 08:00-09:00*
- *Weekday evening peak: 17:00-18:00*
- *Weekend peak: 11:00-12:00*

With regards to the weekday morning and evening peak hours, these are the network peak hours used (although we note that they differ to the actual peak hour of the land use).

It should however be noted that the TRICS peak hours refer to those which are identified within the selected surveys and are not necessarily location specific. In comparison, the ATC survey identifies a more accurate local network peak (MCC not referred to as the full outputs are not included). The surveys identify the following network peaks:

- *Weekday morning peak: 07:00-08:00*
- *Weekday evening peak: 16:00-17:00*
- *Weekend peak: 13:00-14:00*

2.41 As described above, the busiest time period within the survey period has been used to provide a robust assessment (07:45-08:45 and 16:45-17:45) and therefore represents the busiest network peak hour. While it is noted that the proposed food store busiest peak hour does not coincide with the traditional morning and evening peak hours, it does provide a robust assessment as the highway network is most sensitive to increases in these periods. Furthermore, the ATC survey was undertaken during the school holidays in the northbound direction only and therefore is not considered to demonstrate a more accurate local network peak.

2.42 This is confirmed within Evoke Transport's independent highways review which states that… *"The ATC survey was undertaken during Hertfordshire school half term holidays and therefore the data may not represent normal traffic conditions"*.

"The TRICS data for Garden Centres does not cover the 07:00 – 08:00 hour period, and therefore it would not be possible to alter the weekday morning peak trip generation. Trip generation for a garden centre during 0700 to 0800 are likely to be limited reflecting trading hours. The TRICS trip rates for the above alternative peak hours have been applied to the existing and proposed quantum of development. There is a small decrease against what is currently presented; however it does not result in a material change to the overall trips. The trip generation is therefore acceptable."

2.43 As previously alluded to, the ATC was only undertaken to derive vehicle speeds in the northbound direction from the Hunton Bridge roundabout and should not be relied on for junction modelling or any highway impact purposes. Further to this, the busiest hour during the MCC has been identified to ensure a robust assessment has been undertaken.

2.44 Notwithstanding the above, it is noted that the trip generation is considered acceptable by the independent highways review, and no further commentary will be provided.

Trip Type

"It is acknowledged that the trip generation exercise sets out all potential trips resulting from the proposed development, however this does not account for the typical characteristics of a food store which can generate different trip types. This includes pass by trips, diverted trips and transferred trips, along with new trips.

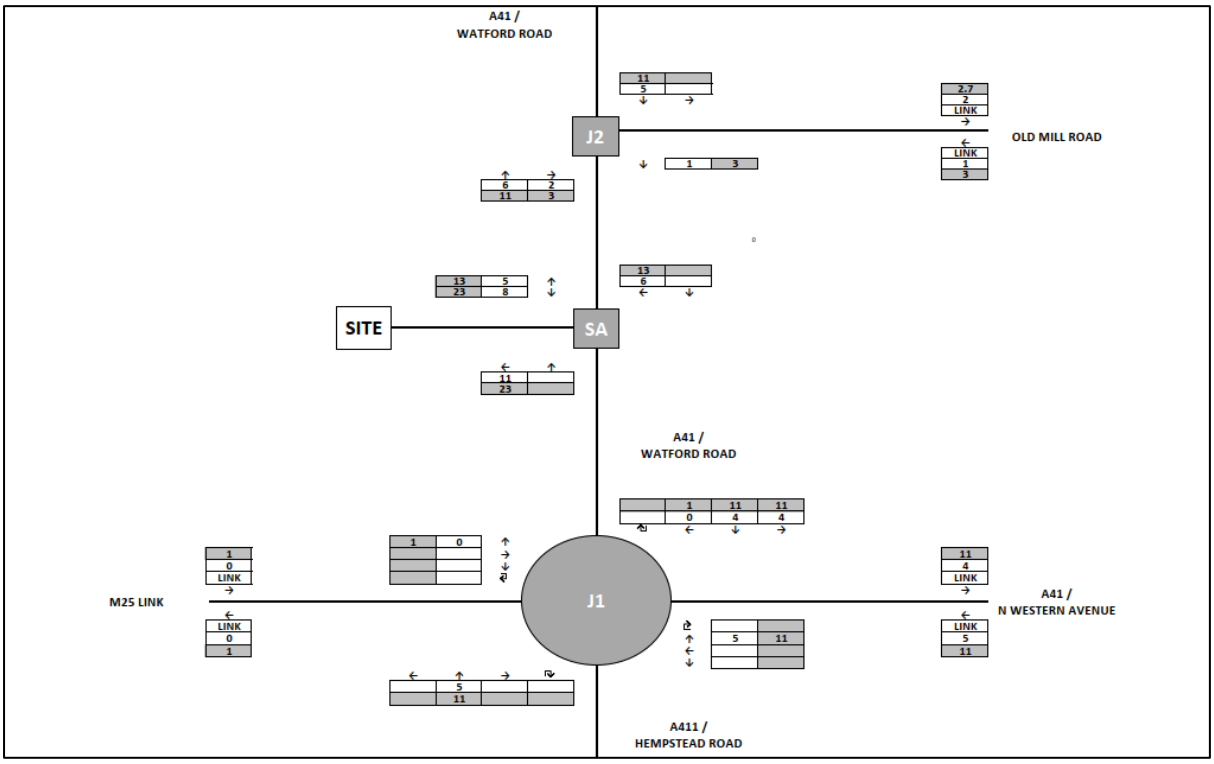
The Transport Assessment makes reference to the 95/2 and 14/1 TRICS Research Reports which provide guidance on the nature of pass by, diverted and transferred trips and concludes that the proportion of trips generally accepted to be non-primary is between 30 – 40%. The Transport Assessment suggests that up to 60% of the trips generated by the food store will be new or transferred trips, with the remaining 40% comprising an even split between pass-by and diverted trips.

While this is likely a robust estimate, it should be noted that no evidence is presented to justify these percentages. We would highlight that a Retail Impact Assessment should generally be produced and considered alongside the Transport Assessment in the assessment of potential trip types."

2.45 It should be stressed that the methodology undertaken is industry standard based on the TRICS 95/2 and 14/1 Research Reports and is commonly accepted on similar sites.

2.46 For the purposes of the assessment, "transferred" and "new" trips have been grouped together and any transferred trips have been allocated as 'new' trips on the road network, which allows for a robust assessment.

2.47 There has been no detailed consideration of the supermarkets or retail outlets that any potential transferred trips could derive from, so all "transferred" trips are classified as "new" trips on the network as showed in Figure 6 within the supporting Transport Assessment (see extract below).



2.48 The above extract shows the "new and transferred" trips grouped together. It is therefore concluded that there would be a maximum increase of 72 two-way trips in the evening peak hour, noting this does not account for the trips generated by the existing retail use.

2.49 Given, no due consideration has been given to the retail impact of the transferred trips, a Retail Impact Assessment (RIA) is not required in this instance. Further to this, the Planning Officer noted that the sites lawful use is material in determining the level of assessment needed to justify the retail use and was deemed that an RIA was not required for planning purposes. This should alleviate the concerns raised by the independent highways review.

Trip Distribution

"To distribute trips, and in the absence of observed traffic counts, 2011 Census 'Usual Resident Population' data for the existing residential population of the surrounding area available on the Official Labour Market Statistics has been used to estimate the proportion of vehicle trips that could travel along each key route to/from the site. The more detailed methodology explained in Section 6.1.14 of the Transport Assessment is noted and acceptable, although we would reiterate the above point on trip types"

2.50 As highlighted above, all transferred trips have been allocated as new trips for a robust assessment and therefore should alleviate the concerns raised on this particular matter.

2.51 It is noted that the distribution overall is considered acceptable, and no further commentary will be provided.

Impacts of Development

"Comment on the impact of the development cannot be completed due to the following reasons:

- *Baseline not modelled in PICADY*

2.52 It is noted that the Baseline (2022) has not been modelled in PICADY. The reasoning for this is owing to the substantial amendments between the two junction arrangements was not considered a comparable assessment.

2.53 Though it should be noted that the junction operates within sufficient capacity with a maximum RFC of 0.41 in the weekend period and 0.28 in the evening peak period during a "With Development 2036" scenario. It is therefore considered that a Baseline scenario would not provide any meaningful information in this instance given the proposed development is to result in an increase of movements and site access is predicted to operate well within capacity with the proposed scheme in place.

- *No evidence of TEMPro growth factors utilised for future year traffic flows*

2.54 The TEMPro growth factors are contained within Figure 18 of the supporting Transport Assessment for the Three Rivers District area. For clarity these are reproduced below:

- *AM 2022 to 2036 = 1.0715*
- *PM 2022 to 2036 = 1.0805*

2.55 This should alleviate the concerns raised by the Independent Highway Review.

"Note that the committed toucan crossing linked to the 22/0491/FUL permitted application for the Warner Bros studio has been included in the design (see further commentary below) however there is no evidence to whether any further committed developments have been included in the modelling and if so, no evidence on what developments have been included."

2.56 It can be confirmed that no further Committed Developments have been included within the assessment. This approach was considered acceptable by HCC throughout the planning process. Notwithstanding, the 2036 TEMPro future year allows for allocated sites and the resulting growth in traffic to provide a robust assessment. The 2036 future year also coincides with the Local Plan horizon year and therefore provides a comprehensive assessment.

"2036 future year stated, and 2046 future year modelled in PICADY – would expect an opening year assessment and post five years to be provided."

2.57 While it is noted that an opening year assessment and post 5 years is usually provided when considering traffic impacts, a 2036 future year is considered more robust in this instance. For example, should an opening year of 2026 be considered/achieved (subject to receiving planning approval), this would indicate a future year of 2031 which is 5 years prior to the 2036 future year included within ACE's modelling.

2.58 This should therefore provide some clarity to the independent highway review to why a 2036 future year has been used and give reassurance that it provides a worst-case scenario and a robust assessment of the proposed arrangement.

Cycle (and pedestrian) Safety

Cycle Facilities – Widths

"The existing shared use footway/cycleway and staggered crossing has been accommodated within the proposed design.

In accordance with LTN 1/20 Table 6-3, the minimum width requirements for a shared use facility is 3m.

This allows cycle flows of up to 300 cyclists per hour however cycle flows will be much lower than this figure and therefore a 3m width is acceptable.

The existing and retained sections of shared use footway/cycleway meet the 3m minimum width requirement. Where new sections of footway are proposed, these appear to meet the 3m width requirement."

2.59 It is noted that the independent highways review considers the widths of the cycle route to be acceptable and therefore no further commentary will be provided.

Cycle Facilities – Horizontal Alignment

"On the southbound approach to the access road, there is an alignment change. The horizontal curvature of the footway/cycleway here meets the minimum radii requirements as shown in LTN 1/20 Table and allows for a robust 20kph design speed."

2.60 It is noted the horizontal alignment of the cycle route is considered acceptable and no further commentary will be provided.

Hazard Paving

"Corduroy and tactile paving has been proposed throughout and appears suitable in defining the proposed and existing route through the proposed junction works."

2.61 It is noted that the hazard paving is considered suitable and accepted by the Independent Highways Review. Ardent Consulting Engineers agree with the above and no further commentary will be provided.

Crossing Islands

"It is proposed to relocate the existing staggered crossing to the north, to accommodate an increased deceleration length for the southbound right turn lane into the site.

The proposed staggered crossing is c.4m width, meeting the requirements of "Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice" Table 4.11.3.6

The tactile crossing widths are suitably proposed at 3.2m to accommodate the 3m width footway/cycleways.

The crossing segregation between the two sets of tactile paving on the staggered island is c.1.35m. "Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice" Section 4 Table 4.11.3.6 suggests this distance should be a minimum of 1.8m.

A preferable width of 3m between crossing limits is often recommended, allowing for cyclists to manoeuvre between the crossings on the island.

It is recommended that the distance is increased to align with HCC requirements. This can be addressed at detailed design stage."

2.62 In light of the above, **ACE Drawing 187011-001J** has been updated to demonstrate how a longer stagger of 1.8m on the island could be provided to ensure that cyclists could safely manoeuvre through the stagger. At this stage of the process, it is envisaged that this would be implemented and investigated further at detailed design stage. Though at this stage, should alleviate the concerns raised by the independent highways review by demonstrating that this minor amendment could be implemented if deemed as a requirement.

Acceptability of Crossing Points

The proposed toucan crossing upgrades, which are illustrated in 187011-SK07 Rev A have been reviewed; the proposed toucan crossing upgrades suitably demonstrate that the proposed staggered island could be upgraded to accommodate a signalised toucan crossing arrangement, with additional road markings and extension of the proposed tactile paving required.

Whilst no forward visibility has been shown to the signal heads on drawing 187011-SK07 Rev A, the supporting report 'Transport Statement Addendum 187011-R-11 July 2023' makes reference to an additional drawing (187011-SK08) which was produced to demonstrate forward visibility to the signal heads.

2.63 This is noted. **ACE Drawing 187011-SK08** has been appended to this report for completeness.

This report suggests visibility in the southbound direction is achievable for a 40mph design speed, and whilst northbound forward visibility of only 100m can be achieved, that this should be acceptable and that it was deemed acceptable to the HCC signals team.

Based on the above correspondence and recorded speeds, adequate visibility can be achieved and that the principles of the upgrade appear feasible.

2.64 This is noted and no further commentary is provided.

It is however not clear whether consideration has been given to the possibility of the 22/0491/FUL application not progressing and therefore the possibility of the proposed toucan crossing upgrades not progressing. It may be worth exploring the impact on this development should the application/scheme not come forward, and specifically whether an alternative improvement option should be explored, and in what form this would be.

2.65 It should be stressed that **ACE Drawing 187011-SK07** was prepared to ensure the infrastructure associated with the proposed development would not prejudice the

deliverability of the toucan crossing, which is set by the planning condition of the Warner Bros application (22/0481/FUL).

2.66 It should be noted that there is no formal requirement set out by HCC or TRDC to deliver a Toucan Crossing for the Lidl application in the event that the Warner Bros application does not proceed.

2.67 It is also considered that sufficient improvements to the wider pedestrian and cycling infrastructure have already been allowed for within the planning application including the relocation of the existing staggered crossing facility and associated works to accommodate this including the conversion of the footway on the eastern edge of the A41 to a cycle route. It also includes a significant betterment in cycling and pedestrian infrastructure at the site access itself, with a dropped kerb crossing facility provided with sufficient visibility to approaching vehicles.

2.68 The above should therefore alleviate the concerns raised by the independent highways review.

3. SUMMARY AND CONCLUSIONS

3.1 Ardent Consulting Engineers (ACE) have been instructed by Lidl Great Britain Limited and Northport Lochaline Limited to prepare a Transport Technical Note (TTN) in respect of a proposed Lidl Food Store on land to the west of the A41 / Watford Road (application reference 22/1764/FUL).

3.2 This report provides a response to a Transport Technical Note prepared by 'Evoke Transport' who were commissioned by TRDC to undertake an independent highway review of the documentation and drawings prepared by Ardent Consulting Engineers following deferral at Committee.

3.3 This report provides a comprehensive response to each individual point raised by the independent highways review with further justification provided where necessary on the junction design, traffic flows and suitability of pedestrian and cycling infrastructure.

3.4 In light of the above, **ACE Drawing 187011-003J** has also been updated to reflect the comments received in relation to the junction design as follows:

- An increased taper length has been provided from 5m to 15m on the northbound right turn lane in to Old Mill Lane;
- It has been demonstrated how a maximum legal length articulated vehicle can turn right from the realigned site access road to the A41 without encroachment or conflict. This was allowed for in the original submission but was not demonstrated on the drawings as the left in / left out manoeuvres are more onerous; and
- The stagger length between the tactiles on the relocated crossing has been increased from 1.3m to 1.8m to be in line with the HCC Highway Design Guide.

3.5 The Automatic Traffic Count undertaken in February 2023 was used to derive vehicle speeds only to calculate visibility splays. While it is noted that this was undertaken

in the February half term, typically traffic flows are lower and are free flowing ensuring that representative 85th percentile speeds are recorded.

3.6 The junction modelling undertaken in the Transport Assessment made use of the Manual Classified Count, and this report confirms that this remains a robust assessment as the flows are higher than those recorded in the ATC.

3.7 While the trip generation was considered acceptable in the Independent Highways review, further justification was given to support the peak hours used and that they coincide with the busiest highway network period.

3.8 For the purposes of the assessment, "transferred" and "new" trips have been grouped together and effectively all transferred trips have been allocated as new trips which allows for a robust assessment. Therefore, no consideration has been given to the retail impact of the surrounding supermarkets and was considered acceptable to the LPA during the planning process.

3.9 While it is noted that an opening year assessment and post 5 years is usually provided when considering traffic impacts, a 2036 future year is considered more robust in this instance as it provides a worst-case scenario.

3.10 There is no formal requirement set out by HCC or TRDC to deliver a Toucan Crossing for the Lidl application in the event that the Warner Bros application does not proceed. Though, careful consideration has been given to ensure the development proposals do not prejudice the delivery of a Toucan Crossing in the future.

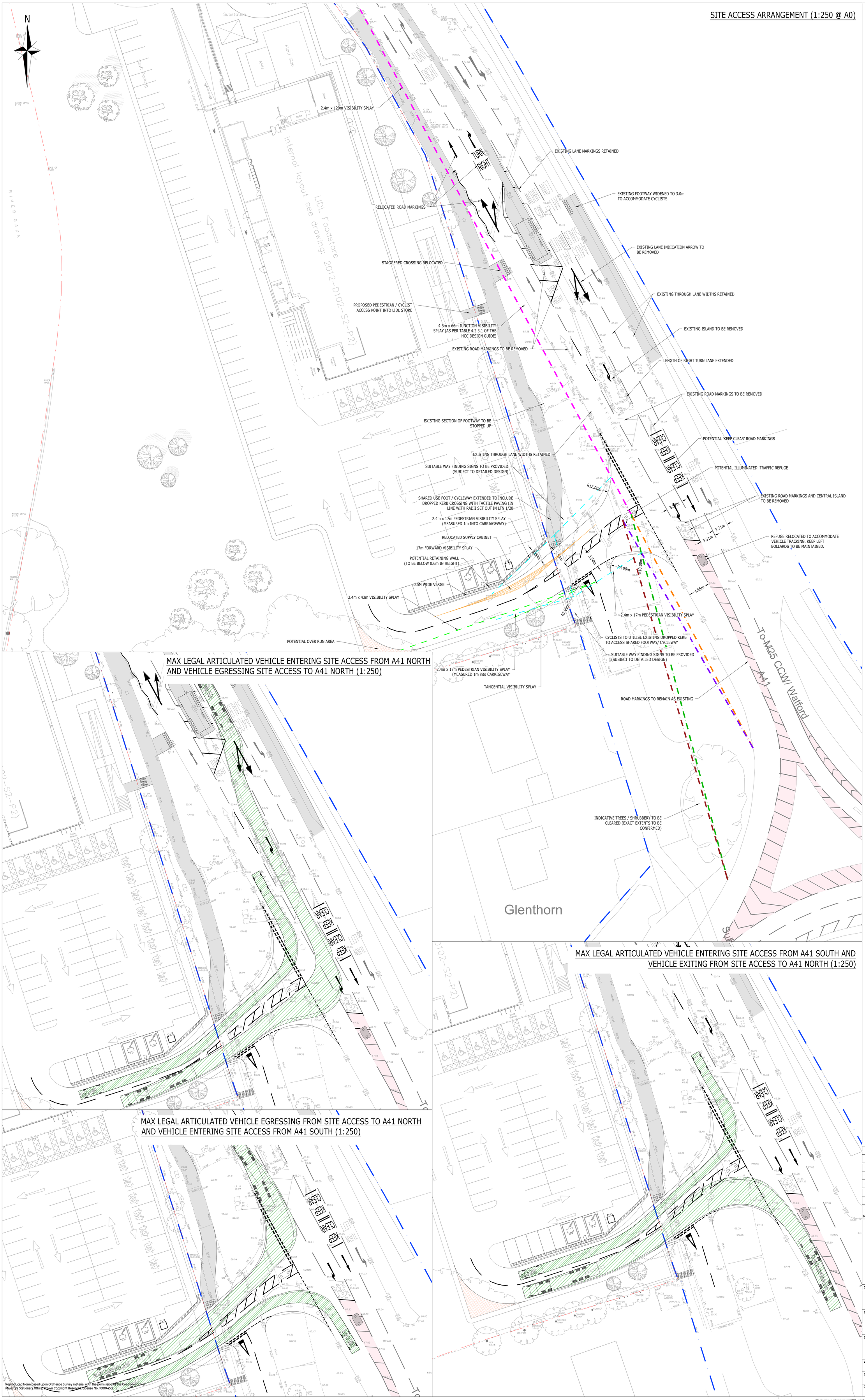
3.11 Overall, the Independent Highways Review does not highlight any fundamental reasons for refusal. In relation to the design review of the access arrangement, it was stated within the review that the *"Design generally compliant, with vehicle movements being accommodated" and "the existing situation has been generally accurately described and assessed".* Finally, it was noted that "*cycle and pedestrian generally appear to have been accurately considered"*

3.12 In conclusion, this Transport Technical Note demonstrates that safe and suitable access could be provided to serve the site from the A41 and would be no severe off-

site highway impacts that would warrant a reason for refusal particularly in light of the NPPF.

Drawings

SITE ACCESS ARRANGEMENT (1:250 @ A0)



MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 NORTH AND VEHICLE EGRESSING SITE ACCESS TO A41 NORTH (1:250)

MAX LEGAL ARTICULATED VEHICLE EGRESSING FROM SITE ACCESS TO A41 NORTH AND VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH (1:250)

MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH AND VEHICLE EXITING FROM SITE ACCESS TO A41 NORTH (1:250)

NOTES:

1. ACCESS SHOWN INDICATIVELY AND SUBJECT TO DETAILED DESIGN AND AGREEMENT WITH HIGHWAY AUTHORITY.
2. REDLINE BOUNDARY SHOWN INDICATIVELY BASED ON PLANS RECEIVED. TO BE CONFIRMED WITH THE DESIGN TEAM.
3. HIGHWAY BOUNDARY SHOWN BASED ON OS PLAN RECEIVED FROM HCC.
4. EXISTING ROAD MARKINGS BASED ON GOOGLE EARTH IMAGERY.
5. SUBJECT TO JUNCTION CAPACITY ASSESSMENT / ASSESSMENT OF LEVELS / EXTENDED TOPO SURVEY TO COVER EASTERN SIDE OF A41.

KEY:

INDICATIVE SITE BOUNDARY

INDICATIVE HIGHWAY BOUNDARY (BASED OFF OS)

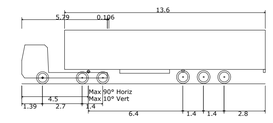
2.4m x 84m JUNCTION VISIBILITY SPLAY BASED ON MAXIMUM ACHIEVABLE VISIBILITY (SUBJECT TO MANAGEMENT OF TREES)

4.5m x 84m JUNCTION VISIBILITY SPLAY BASED ON MAXIMUM ACHIEVABLE VISIBILITY (SUBJECT TO MANAGEMENT OF TREES)

2.4m x 56m JUNCTION VISIBILITY SPLAY BASED ON DMRB MFS2 CALCULATIONS USING MEASURED SPEEDS

4.5m x 56m JUNCTION VISIBILITY SPLAY BASED ON DMRB MFS2 CALCULATIONS USING MEASURED SPEEDS

VEHICLE SPECIFICATION (NOT TO SCALE)



Max Legal Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.500m
Overall Body Height	3.632m
Min Body Ground Clearance	0.396m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.870m

FOR INFORMATION ONLY

Rev	Description	Drn	Chk	App	Date
I	UPDATED TO HCC COMMENTS	RDS	AG	ATB	03.05.23
H	UPDATED TO HCC COMMENTS	RDS	AG	ATB	13.04.23
F	UPDATED TO HCC COMMENTS	RDS	AG	ATB	29.03.23
E	MEASURED SPEEDS VISIBILITY SPLAYS ADDED	RDS	AG	ATB	02.03.23
D	MINOR AMENDS	RDS	AG	ATB	07.02.23
C	HCC COMMENTS	RDS	AG	ATB	07.02.23
B	CLIENT COMMENTS	RDS	AG	ATB	12.01.23
A	AMENDS TO REFLECT RSA STAGE 1	RDS	AG	ATB	10.01.23

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E-mail: enquiries@ardent-ce.co.uk

Client: NORTHPORT PROPERTY LIMITED

Project Title: WORLD OF WATER AQUATICS, KINGS LANGLEY

Drawing Title: SITE ACCESS ARRANGEMENT

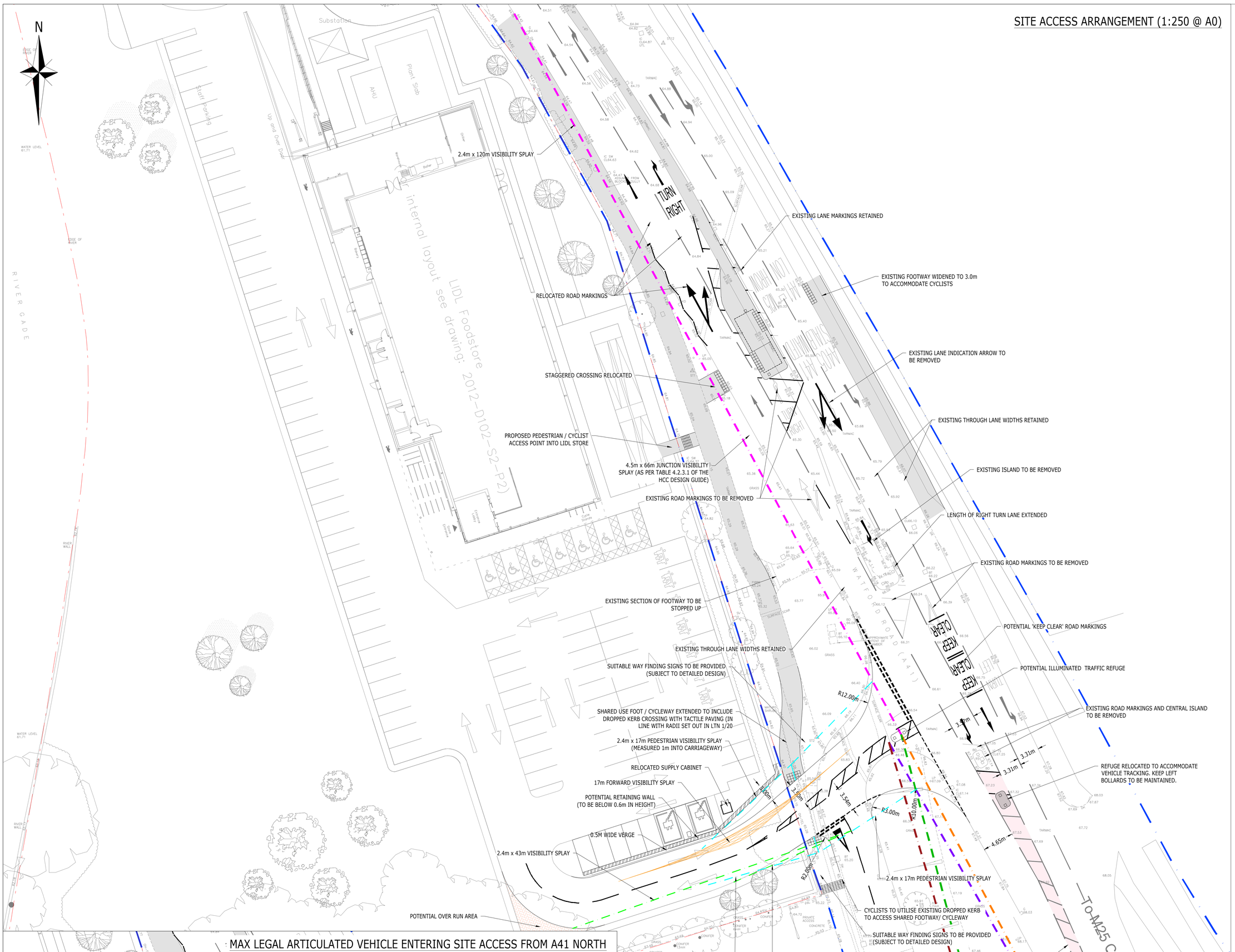
A0 Scale	Date	Designed by
AS SHOWN	16.12.22	RDS
Drawn by	Checked by	Approved by
RDS	ATB	DM

Drawing Number: 187011-001 Rev I

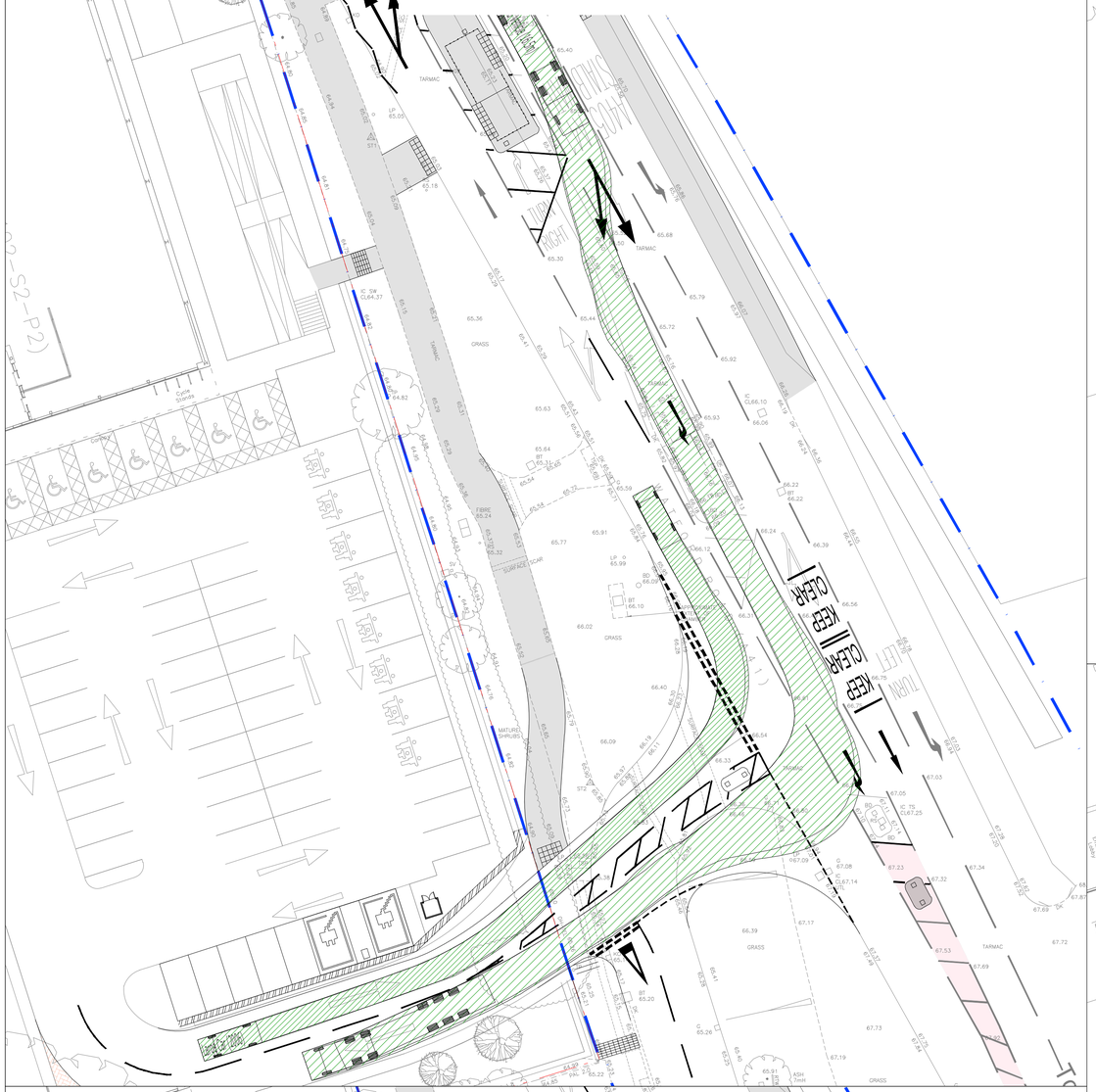
User name: Ryan Smith

File Location: y:\ardent projects\187011 - world of water aquatics, kings langley - revised scheme\technical\acad\drawings\187011-001i potential site access.dwg

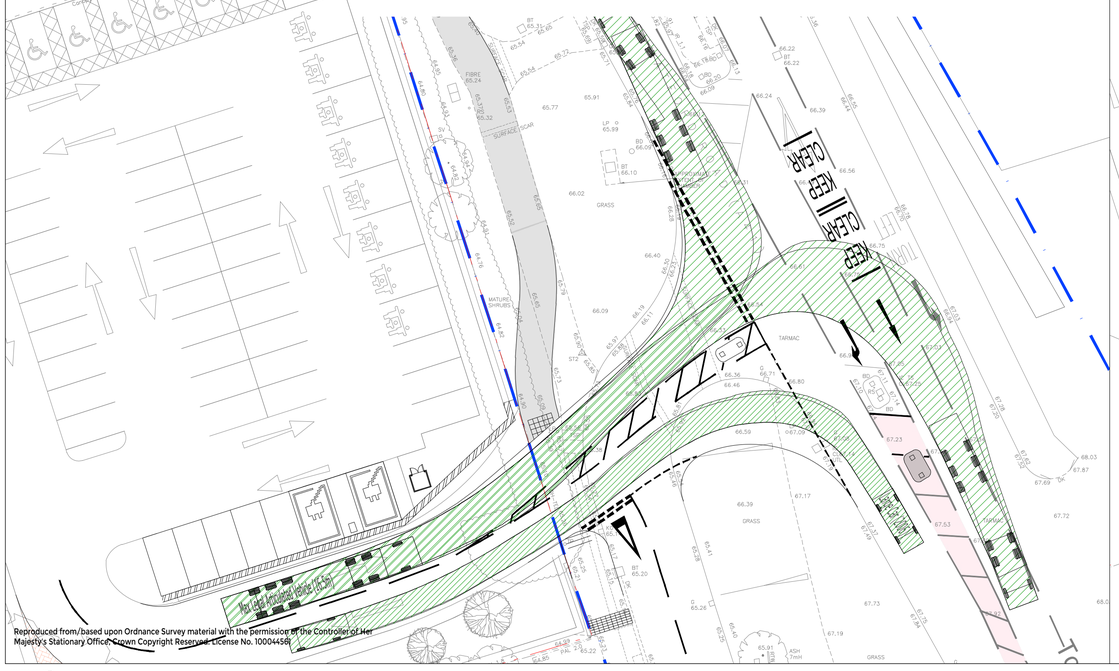
SITE ACCESS ARRANGEMENT (1:250 @ A0)



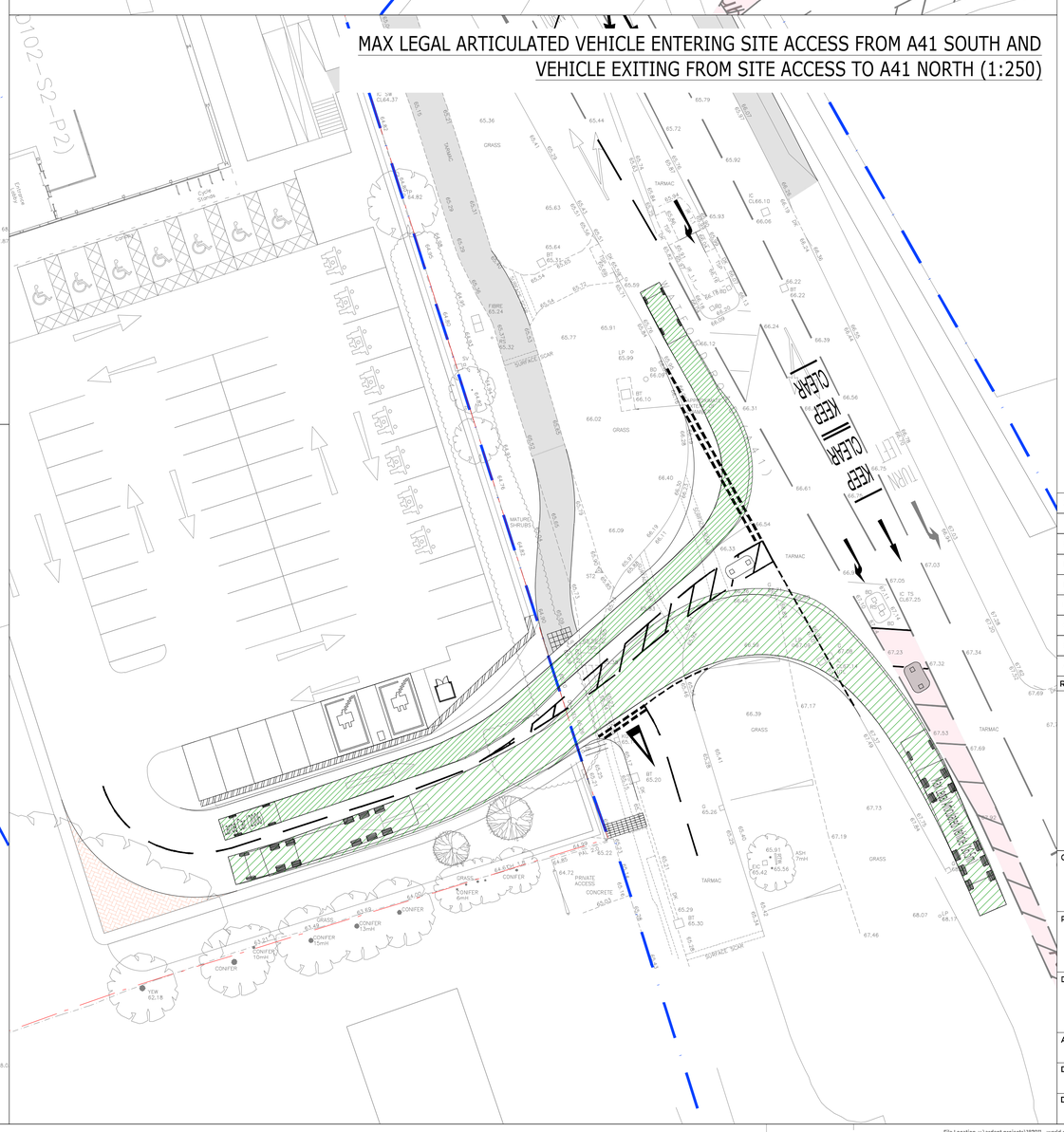
MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 NORTH AND VEHICLE EGRESSING SITE ACCESS TO A41 NORTH (1:250)



MAX LEGAL ARTICULATED VEHICLE EGRESSING FROM SITE ACCESS TO A41 NORTH AND VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH (1:250)



MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH AND VEHICLE EXITING FROM SITE ACCESS TO A41 NORTH (1:250)



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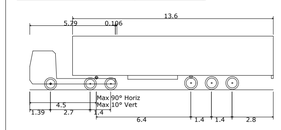

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Rev	Description	Drn	Chk	App	Date
J	UPDATED TO HIGHWAY REVIEW COMMENTS	RDS	AG	ATB	30.01.23
I	UPDATED TO HCC COMMENTS	RDS	AG	ATB	03.05.23
H	UPDATED TO HCC COMMENTS	RDS	AG	ATB	13.04.23
F	UPDATED TO HCC COMMENTS	RDS	AG	ATB	29.03.23
E	MEASURED SPEEDS VISIBILITY SPLAYS ADDED	RDS	AG	ATB	02.03.23
D	MINOR AMENDS	RDS	AG	ATB	07.02.23
C	HCC COMMENTS	RDS	AG	ATB	07.02.23
B	CLIENT COMMENTS	RDS	AG	ATB	12.01.23
A	AMENDS TO REFLECT RSA STAGE 1	RDS	AG	ATB	10.01.23

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Client

NORTHPORT PROPERTY LIMITED

Project Title:

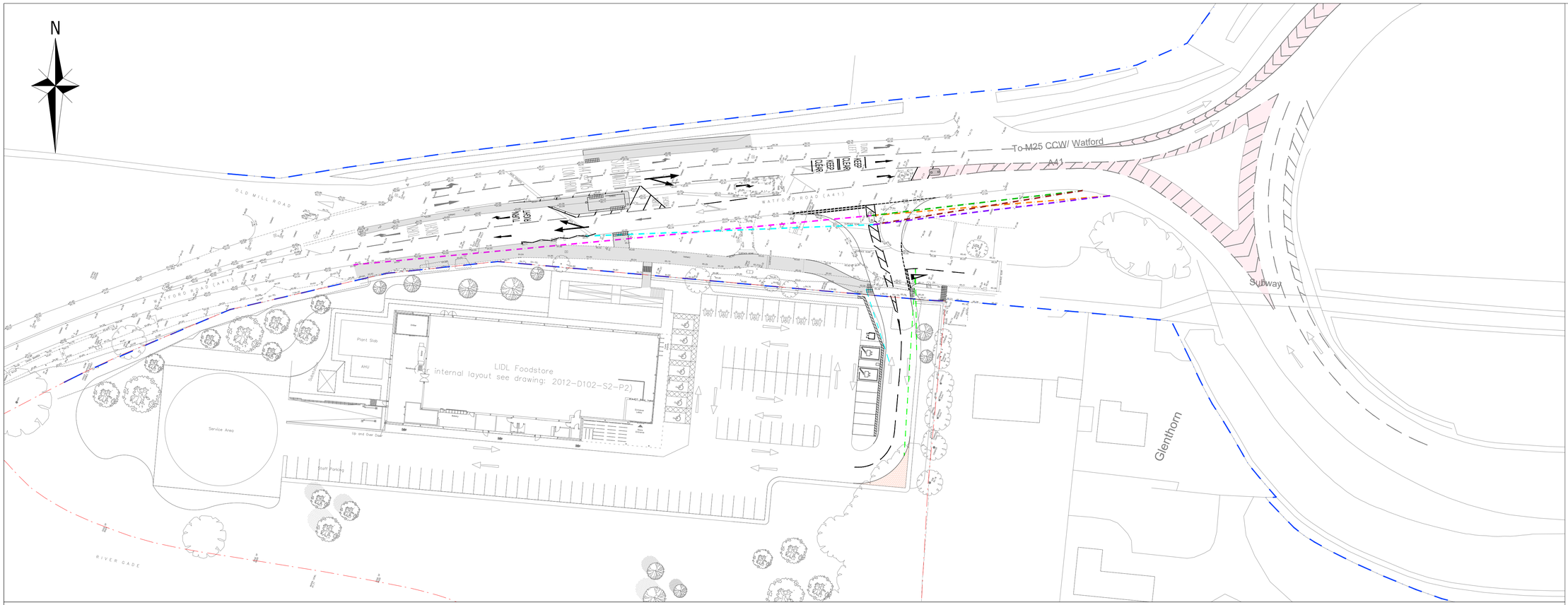
WORLD OF WATER AQUATICS, KINGS LANGLEY

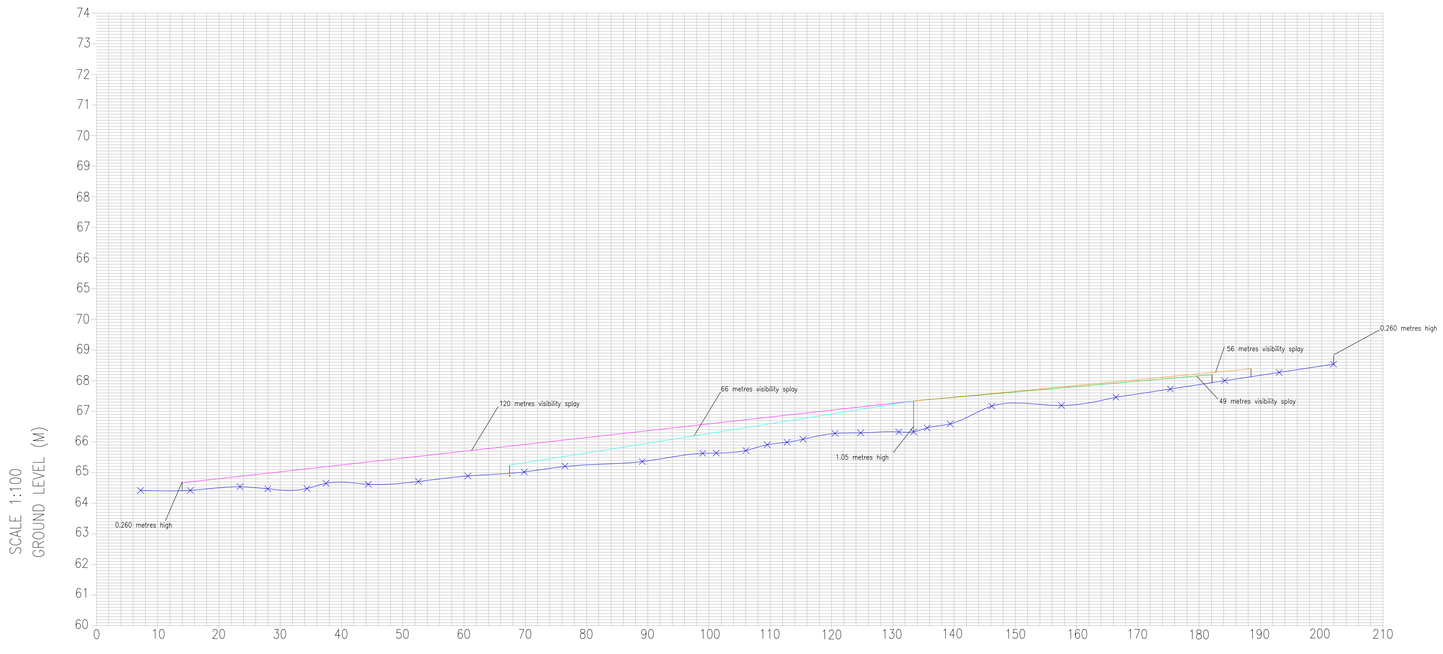
Drawing Title:

SITE ACCESS ARRANGEMENT

A0 Scale	Date	Designed by
AS SHOWN	16.12.22	RDS
Drawn by	Checked by	Approved by
RDS	ATB	DM

Drawing Number: 187011-001 Rev J





NOTES

1. VISIBILITY IS ALSO SUBJECT TO THE CUTTING BACK OF EXISTING HEDGEROW AND DETAILED DESIGN.

KEY:

INDICATIVE SITE BOUNDARY

INDICATIVE HIGHWAY BOUNDARY (BASED OFF OS)

FOR INFORMATION ONLY

Rev	Description	Drn	Chk	App	Date
D	UPDATED ACCESS ARRANGMENT	RDS	AG	ATB	10.10.23
C	MEASURED VISIBILITY SPLAYS ADDED	RDS	AG	ATB	02.03.23
B	MINOR AMENDS	RDS	AG	ATB	09.02.23
A	HCC COMMENTS	RDS	AG	ATB	07.02.23

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Client: NORTHPORT PROPERTY LIMITED

Project Title: WORLD OF WATER AQUATICS, KINGS LANGLEY

Drawing Title: VERTICAL ALIGNMENT REVIEW

A1 Scale	Date	Designed by
1:500	06.01.22	RDS
Drawn by	**Checked by**	**Approved by**
RDS	AG	ATB

Drawing Number	Rev
187011-002	D

NOTES:

1. POTENTIAL TOUCAN CROSSING SHOWN INDICATIVELY AND SUBJECT TO DETAILED DESIGN AND AGREEMENT WITH HIGHWAY AUTHORITY (NOT TO BE DELIVERED OR FUNDED BY THIS PLANNING APPLICATION).
2. REDLINE BOUNDARY SHOWN INDICATIVELY BASED ON PLANS RECEIVED. TO BE CONFIRMED WITH THE DESIGN TEAM.
3. HIGHWAY BOUNDARY SHOWN BASED ON OS PLAN RECEIVED FROM HCC.
4. EXISTING ROAD MARKINGS BASED ON GOOGLE EARTH IMAGERY.
5. TOUCAN CROSSING TO BE DELIVERED BY WARNER BROTHERS STUDIOS LIMITED IN ACCORDANCE WITH CONDITION 11 OF TRDC PLANNING REF 22/0491/FUL.
6. LOCATION OF SIGNAL HEADS ARE INDICATIVE AND SUBJECT TO CONFIRMATION.

KEY:

INDICATIVE SITE BOUNDARY

INDICATIVE HIGHWAY BOUNDARY (BASED OFF OS)

120m FORWARD VISIBILITY SPLAY TO PRIMARY SIGNAL HEAD

INDICATIVE PRIMARY SIGNAL HEAD

INDICATIVE PRIMARY SIGNAL HEAD

100m FORWARD VISIBILITY SPLAY (MAXIMUM ACHIEVABLE)

FOR INFORMATION ONLY

DRAFT

NOT FOR CONSTRUCTION

Rev	Description	Drn	Chk	App	Date

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Client

NORTHPORT PROPERTY LIMITED

Project Title:

WORLD OF WATER AQUATICS, KINGS LANGLEY

Drawing Title:

POTENTIAL TOUCAN SIGNAL HEAD VISIBILITY

A2 Scale	Date	Designed by
1:250	26.04.23	RDS
Drawn by	Checked by	Approved by
RDS	AG	DRAFT
Drawing Number		Rev
187011-SK08		-

Appendix A

Evoke Transport Independent Highways Review

WORLD OF WATER AQUATIC CENTRES

Client:	Three Rivers District Council
Document Type:	Technical Note
Document Reference:	R-23-0172-01B
Date:	25 January 2024

1. Introduction

1.1.1. Evoke Transport Planning Consultants Ltd (Evoke) has been commissioned by Three Rivers District Council (TRDC) to undertake an independent highway review of a live planning application (ref: 22/1764/FUL) which proposes the "demolition of existing building and erection of retail food store, (Use Class E(a)), with associated access, parking and amenities" at the existing World of Water Aquatic Centres Ltd, Hempstead Road, Watford, WD4 8QG.

1.1.2. TRDC is the local planning authority (LPA) and Hertfordshire County Council (HCC) is the local highway authority (LHA).

1.1.3. It is acknowledged that, at the TRDC Planning Committee on 16 November 2023, Members of the Planning Committee agreed to defer the application to seek an independent highway review of the current scheme. It was agreed that the application should return to a future Planning Committee.

1.1.4. It is understood that Planning Committee members specifically requested a review of the following:

- Proposed access arrangements, having specific regard to the right turn from the proposed development onto the A41
- Speed and volume of on-coming traffic from the A41
- Cycle safety
- Acceptability of crossing points

1.1.5. In order to review the highway proposals in support of the proposed development, we have considered the below information / documents:

- Transport Assessment (January 2023)
- Transport Assessment Addendum (July 2023)
- 2nd Transport Technical Note (December 2023)
- Manual Classified Count (MCC) traffic survey at Watford Road / A41 Watford Road junction (undertaken 11 October 2022)
- Automatic Traffic Count (ATC) traffic survey at A41 exit arm of the Hunton Bridge Roundabout (A41 / M25 /A411 Hempstead Road) (undertaken 15 – 21 February 2023)
- Site Access Arrangement (187011-001 Rev I)
- Consultation responses from HCC
- Road Safety Audit Stage 1 (dated January 2023) and Road Safety Designer's Response (January 2023)

1.1.6. A site visit was undertaken on 9 January 2024 during the morning peak hour of between 08:00 and 09:00. The existing site conditions and highway layout were reviewed in conjunction with the development proposals.

1.1.7. The review of the proposed highway works and associated documents is included below, with comments set out against each of the four key concerns raised by the Planning Committee as set out above.

2. Proposed Access Arrangements – Design Review

2.1.1. The topographical survey base mapping obtained to support the proposed development and the access arrangement were reviewed against the existing site conditions to ensure that there were no anomalies and that all constraints have been considered within the development proposals. The proposed access designs presented have used the topographical mapping for the base, this increases the level of accuracy compared with using OS Base mapping.

2.1.2. The development proposals, access design and topographical survey base mapping appear both consistent and representative of the existing site conditions.

2.2. Overview

2.2.1. A technical review has been undertaken on Ardent drawings reference 'Site Access Arrangement - 187011-001 Rev I' and 'Potential Toucan Crossing Upgrade Review – 187011-SK07 Rev A'. We note the specific concern raised as to the acceptability of the right hand turn form the proposed development and commentary on this is provided below.

2.2.2. It is understood that the 'Potential Toucan Crossing Upgrade' has come at the request of the local highway authority to demonstrate how the development proposals can be upgraded at a future date to meet off-site improvements required for a third-party development in proximity to the site.

2.2.3. The design review has been carried out in accordance with relevant guidance documents and referenced accordingly. The guidance referred to is listed below:

- *Design Manual for Roads and Bridges - CD 123 Geometric design of at-grade priority and signal-controlled junctions (CD 123)*
- *Local Transport Note 1/20 – Cycle Infrastructure Design (LTN 1/20)*
- *Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice (HCC Section 4)*
- *Traffic Signs Manual - Chapter 5 - Road Markings (TSM Chapter 5)*

2.2.4. Design issues raised within the site review have been shown on the plan in **Appendix A** with reference to their applicable paragraph numbers from within this highway review document.

2.3. Levels

2.3.1. As shown on the topographical survey base mapping, there is a clear level difference between the A41 and the site, reducing the feasibility of certain junction options. This is shown below in Figure 1.

Figure 1 – Level Difference at Site Access Location

2.4. Site Access Arrangement Review (187011-001 Rev I)

Junction

2.4.1. The proposed access width is 7.3m, which meets the requirements of "*Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice*."

2.4.2. Kerb radii of 10m and 12m have been proposed. This meets the minimum radius requirements provided in CD 123 5.6.1.

2.4.3. An illuminated traffic island is proposed on the access road at the junction. With reference to CD 123 5.8, the proposed minor arm approach lane width should be 4.0 metres for this junction arrangement either side of the island. The proposed design provides widths in excess of the minimum requirements. This is acceptable for this design and location.

Horizontal Alignment

2.4.4. The existing ghost island right turn lanes are proposed to be modified to accommodate the junction access location and development requirements.

2.4.5. The existing central reserves and central hatching omit the requirement for any hatched taper on approach to the right turn lanes and the design meets the minimum requirements as set out in CD 123 Table 6.1.1.

2.4.6. The A41 adjacent to the site access location is subject to a 40mph speed limit, however we note that the speeds recorded in the Automatic Traffic Count (ATC) survey of the northbound traffic (approaching from Hunton Bridge Roundabout) identified an 85th percentile speed of 29.7mph.

2.4.7. In accordance with CD 123 for a 30mph design speed, the following criteria should be met:

- Turning Length = minimum of 10m (CD 123 6.4)
- Deceleration Length = minimum of 25m (CD 123 Table 5.22)
- Direct Taper Length = minimum of 5m (CD 123 Table 5.22)

2.4.8. In accordance with CD 123 for a 40mph design speed, the following criteria should be met:

- Turning Length = minimum of 10m (CD 123 6.4)
- Deceleration Length = minimum of 40m (CD 123 Table 5.22)
- Direct Taper Length = minimum of 15m (CD 123 Table 5.22)

Northbound Right Turn Lane (from site onto A41)

2.4.9. As above, the specific concern as to the acceptability of the right hand turn onto the A41 from the proposed development has been considered in detail.

2.4.10. No design issues with this aspect of the access design have been identified.

2.4.11. The access proposals have been modelled in the priority junction assessment tool (PICADY) and it is noted that the full model output report is included as Appendix I of the Transport Assessment.

2.4.12. With reference to the egress movement from the site onto the A41 within the 2036 + development scenario (see further comments below on this), the site egress stream during the weekday peak shows a maximum ratio to flow capacity (RFC) of 0.28 (PM period) with a queue of 0.4 passenger car units (PCU's), and during the weekend peak there is an RFC 0.41 and a queue of 0.8 PCU's. An RFC of 0.85 would normally be taken as the junction/movement operating above the theoretical capacity and the queuing prediction in the model is less than 1 vehicle.

2.4.13. This point is further exemplified by turning movements detailed in the Transport Assessment which show a low level of additional trips making the right turn movement out of the site onto the A41, especially when compared to the existing flows. Approximately 13 vehicles in the weekday morning peak and approximately 39 vehicles in the weekday evening peak make this movement.

2.4.14. The modelling therefore indicates that there will be sufficient gaps in the main, straight ahead movements for traffic to turn right.

Northbound Right Turn Lane (Old Mill Lane)

2.4.15. The existing northbound right turn lane into Old Mill Road is proposed to be reduced in length. A 10m turning length is still provided with approximately 50m deceleration length, which meets the minimum requirements for a 40mph design speed as set out above.

2.4.16. The direct taper length for this right turn lane is proposed at 5m. While this meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), it is less than the minimum requirements for a 40mph design speed.

Southbound Right Turn Lane

2.4.17. The existing southbound right turn lane into the site is proposed to be lengthened. A 10m turning length is still provided with approximately 40m deceleration length, which meets the minimum requirements for a 40mph design speed.

2.4.18. The direct taper length for this right turn lane is proposed at 5m. While this meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), it is less than the minimum requirements for a 40mph design speed.

Through Lane Widths

2.4.19. In accordance with CD 123 6.8, all through lane widths should be between 3m and 3.65m.

2.4.20. As part of the proposals, all existing though lane widths are to be retained. Whilst the southbound lanes are c.3.4m, the northbound through lane is between c.4.3 and 4.65m.

2.4.21. These are all existing widths and allow for a suitable alignment through the junction and provide a familiarity to road users. The existing site conditions would suggest retention of these through lane widths appears suitable in this location. The accident data within the Transport Assessment identifies no accidents occurring at this location.

Turning Lane Widths

2.4.22. In accordance with CD 123 6.10, all turning lane widths shall meet the minimum requirement of 3.5m but shall not exceed 5m.

2.4.23. The existing northbound right turn lane into Old Mill Road has a retained turning width of c.3.2m which is below the minimum requirement (albeit operates as existing).

2.4.24. The existing southbound right turn lane into the site, has a turning width starting at c.5.6m and narrowing down to c.3.57m by the site access turn in. This is below the minimum requirement but is recognised as an existing situation. The PIA data within the Transport Assessment shows no accidents in this location.

2.4.25. Whilst this exceeds the maximum 5m turning lane width, this arrangement accommodates the existing highway alignment and northbound right turn lane. Any attempt to reduce this to below 5m could negatively impact the overall alignment along the A41 and on balance the design is considered to be acceptable.

2.4.26. No safety issues were raised within the Road Safety Audit on this design matter.

Vertical Alignment

2.4.27. Full details of the vertical alignment and levels have not been provided. However, this would be provided at the detailed design stages (which is a standard approach). We would suggest that the omittance of any level details at this stage should not be considered fundamental to the design principles. The level differences will need to be considered at the next stage, together with any supporting structures or earthworks required.

Visibility

2.4.28. Visibility at the proposed site access location is shown below in Figure 2 (taken during the site visit) and reflects the development proposals with regards to achievable visibility in both directions.

Figure 2 – Visibility at site access (to north and south respectively)

2.4.29. It is noted that removal of the vegetation in the primary direction would still be required, as has been proposed within the design. This can be controlled by a Condition imposed on any planning permission.

2.4.30. Visibility from the proposed access has been shown as achievable in all directions in accordance with the recorded speeds.

2.4.31. Given the speed surveys undertaken and correspondence with the local highway authority the visibility at the proposed junction is considered suitable and demonstrate visibility for the existing and proposed site conditions can be achieved.

2.4.32. Given the proposed access road speeds, the pedestrian/cyclist visibility splays demonstrated from the crossing point across the access road are suitable.

2.4.33. Given the proposed access road speeds, the eastbound forward visibility demonstrated on approach to the junction is suitable.

Road Signs, Markings and Lighting

2.4.34. Full details of signing have not been provided. However, this would be provided at the detailed design stages. The omittance of any signing details at this stage should not be considered fundamental to the design principles and is in line with standard practice.

2.4.35. Further, the proposed road markings as shown in the development proposals are suitable and in accordance with TSM Chapter 5.

2.4.36. Full details of lighting have not been provided. However, this would be provided at the detailed design stages. The omittance of any lighting details at this stage should not be considered fundamental to the design principles and the existing columns would be relocated accordingly if required.

Swept Path Analysis

2.4.37. The designer has undertaken swept path analysis for articulated vehicles around the site access. The proposals demonstrate that all relevant vehicles movements can be accommodated within the proposed design at the relevant and requested forward gear speeds of 10kph. It should be noted that the 'right out' movement from the access has not been included.

Drainage

2.4.38. Full details of the drainage have not been provided. However, this would be provided at the detailed design stages. The omittance of any drainage details at this stage should not be considered fundamental to the design principles and highway alignment.

2.5. Road Safety Audit and Designers Response

2.5.1. A Road Safety Audit Designers Response (187011-09 January 2023) has been produced following a Stage 1 Road Safety Audit (RSA1).

2.5.2. The Designers Response provides comment on the issues raised as part of the RSA1. As part of this design review, the RSA1 'Audit Items' have been reviewed with comment below:

Audit Item No. 3.1.1

2.5.3. The response with regards to the posted speed limit and accident history are suitable. As noted within the designers response, this is an existing layout arrangement with a priority junction and right turn lane and therefore no major highway changes are proposed.

2.5.4. The recorded speeds would also suggest that speeds are not excessive on approach to the junction.

Audit Item No. 3.1.2

2.5.5. Response suitable with item to be assessed at detailed design stages.

Audit Item No. 3.1.3

2.5.6. Response suitable with item to be assessed at detailed design stages.

Audit Item No. 3.3.1

2.5.7. Consultant has responded to item raised and provided junction modelling to demonstrate capacity concerns. Consultant has also demonstrated vertical visibility is achievable.

Audit Item No. 3.3.2

2.5.8. Consultant has not accepted RSA1 problem or recommendation. However, the rationale to not relocate the access or provide other junction options appears justified, and in particular, the site levels and the proximity to the existing roundabout appear to have guided the design to provide a feasible option. Given this is an existing junction arrangement and the consultant has provided evidence that the junction operation in terms of capacity is adequate, the response is suitable.

Audit Item No. 3.3.3

2.5.9. Consultant has made amendment to the design to accommodate this item with vegetation noted as to be removed.

Audit Item No. 3.4.1

2.5.10. Consultant has made amendment to the design to accommodate this item and the responses are as appropriate for this stage of the process.

Audit Item No. 3.4.2

2.5.11. Consultant has made amendment to the design to accommodate this item and demonstrated that visibility is achievable.

Audit Item No. 3.4.3

2.5.12. Consultant has made amendment to the design to accommodate this item to provide the recommended non-motorised user requirements.

3. Speed and Volume of on-coming traffic from the A41

3.1. Vehicle Speeds

3.1.1. An ATC survey was commissioned by Ardent Consulting Engineers to alleviate the concerns previously raised by Hertfordshire Highways in relation to visibility along the A41 to the south (in the direction of the Hunton Bridge Roundabout).

3.1.2. The survey was located on the A41 Watford Road circa 75m to the south of the proposed access junction, recording approach vehicle types and speeds in the northbound direction as vehicles egress from the circulatory carriageway. It was undertaken between Wednesday 15th February and Tuesday 21st February 2023.

3.1.3. It should be noted that WebTAG Unit M1.2 – Data Sources and Surveys states that surveys should typically be carried out during a 'neutral' or representative month, avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. It is understood that Hertfordshire half term holidays fell between 13th February and 17th February 2023 and therefore the ATC data could be seen as not representing a neutral period and may not reflect normal traffic conditions. Justification should be provided as to the validity of this data.

3.1.4. The Transport Assessment states that the recorded 85th percentile vehicle speeds on the exit of the Hunton Bridge Roundabout on to the A41 Watford Road was 29.7mph (48kph). The southbound traffic was not surveyed. It should be noted that this is an average 85th percentile speed across the surveyed seven-day period. The ATC has been reviewed and the stated 85th percentile speed is accurate. For reference, the average seven-day speed was 26.4mph, the 5-day average speed was 26mph and the 5-day average 85th percentile speed was 29mph.

3.2. Existing Volume of Traffic

3.2.1. The volume of traffic during the morning peak period was considered within the site audit undertaken on 9 January 2024. We would note that the traffic volume did not appear excessive.

3.2.2. The right turn lane into Old Mill Road appeared to be operating below capacity and no queuing was observed outside the existing right turn lane length, as shown in Figure 3 below.

Figure 3 – Right Turn into Old Mill Lane

3.2.3. The existing volume of (weekday) on-coming traffic from the A41 roundabout is further evidenced in the MCC survey results undertaken at the Watford Road / A41 Watford Road junction (site access) on Monday 11th October 2022.

3.2.4. Further details on peak hour periods are included below.

- Weekday morning peak 08:00 – 09:00 = 957
- Weekday evening peak 16:00 – 17:00 = 952

3.2.5. It should be noted that the evening peak hour utilised in the Transport Assessment (17:00 – 18:00) is not presented in the MCC outputs.

3.2.6. The existing volume of on-coming traffic from the A41 roundabout is also evidenced in the ATC survey results undertaken at the A41 exit arm of the Hunton Bridge Roundabout (A41 / M25 /A411 Hempstead Road) (undertaken 15 – 21 February 2023). The data is summarised below:

- Weekday average morning peak 07:00 – 08:00 = 873 / 08:00 – 09:00 = 764
- Weekday average evening peak 16:00 – 1700 = 1133 / 17:00 – 18:00 = 1109

3.2.7. As identified above, there is a difference between the existing traffic volumes surveyed in the MCC and ATC surveys, with examples below:

- Weekday morning peak 08:00 – 09:00 = 193 higher in MCC than ATC
- Weekday evening peak 16:00 – 17:00 = 181 lower in MCC than ATC

3.2.8. Justification should be provided regarding the variation between the MCC and ATC surveyed traffic flows.

3.3. Future additional volume of traffic

3.3.1. When considering the volume of traffic, it is important to consider the proposed future levels of traffic as a result of the proposed development.

Trip Generation

3.3.2. It is acknowledged that pre-application feedback from HCC was provided to the Applicant in August 2020. Within this feedback, trip generation was accepted and HCC raised no objections or issues with the approach taken in respect of trip type.

3.3.3. We have reviewed the TRICS data, including the acceptability of the selected criteria, and the approach is generally acceptable. New surveys have been added since 2020. Utilising these surveys could result in approximately 10 additional vehicle trips in the both the morning and evening peak, however this is not envisaged to have a material impact on the local highway network.

3.3.4. It is noted that the Transport Assessment and subsequent documents and assessments utilised the following peak hours:

- Weekday morning peak: 08:00 – 09:00
- Weekday evening peak: 17:00 – 18:00
- Weekend peak: 11:00 – 12:00

3.3.5. With regards to the weekday morning and evening peak hours, these are the network peak hours used (although we note that they differ to the actual peak hour of the land use).

3.3.6. With regards to the selected weekend peak, this matches the Discount Retail Store peak identified in the TRICS surveys, compared to the Garden Centre peak identified in the TRICS surveys which was 14:00 – 15:00. This variation is not considered to result in a material impact.

3.3.7. It should however be noted that the TRICS peak hours refer to those which are identified within the selected surveys and are not necessarily location specific. In comparison, the ATC survey identifies a more accurate local network peak (MCC not referred to as the full outputs are not included). The surveys identify the following network peaks:

- Weekday morning peak: 07:00 – 08:00
- Weekday evening peak: 16:00 – 17:00
- Weekend peak: 13:00 – 14:00

3.3.8. The TRICS data for Garden Centres does not cover the 07:00 – 08:00 hour period, and therefore it would not be possible to alter the weekday morning peak trip generation. Trip generation for a garden centre during 0700 to 0800 are likely to be limited reflecting trading hours. The TRICS trip rates for the above alternative peak hours have been applied to the existing and proposed quantum of development. There is a small decrease against what is currently presented; however it does not result in a material change to the overall trips. The trip generation is therefore acceptable.

Trip Type

3.3.9. It is acknowledged that the trip generation exercise sets out all potential trips resulting from the proposed development, however this does not account for the typical characteristics of a food store which can generate different trip types. This includes pass by trips, diverted trips and transferred trips, along with new trips.

3.3.10. The Transport Assessment makes reference to the 95/2 and 14/1 TRICS Research Reports which provide guidance on the nature of pass by, diverted and transferred trips and concludes that the proportion of trips generally accepted to be non-primary is between 30 – 40%. The Transport Assessment suggests that up to 60% of the trips generated by the food store will be new or transferred trips, with the remaining 40% comprising an even split between pass-by and diverted trips.

3.3.11. While this is likely a robust estimate, it should be noted that no evidence is presented to justify these percentages. We would highlight that a Retail Impact Assessment should generally be produced and considered alongside the Transport Assessment in the assessment of potential trip types.

Trip Distribution

3.3.12. To distribute trips, and in the absence of observed traffic counts, 2011 Census 'Usual Resident Population' data for the existing residential population of the surrounding area available on the Official Labour Market Statistics has been used to estimate the proportion of vehicle trips that could travel along each key route to/from the site. The more detailed methodology explained in Section 6.1.14 of the Transport Assessment is noted and acceptable, although we would reiterate the above point on trip types.

Impact of Development

3.3.13. Comment on the impact of the development cannot be completed due to the following reasons:

- Baseline not modelled in PICADY
- No evidence of TEMPro growth factors utilised for future year traffic flows
- Note that the committed toucan crossing linked to the 22/0491/FUL permitted application for the Warner Bros studio has been included in the design (see further commentary below) however there is no evidence as to whether any further committed developments have been included in the modelling and if so, no evidence on what developments has been included
- 2036 future year stated and 2036 future year modelled in PICADY – would expect an opening year assessment and post five years to be provided.

3.3.14. It is noted that HCC also queried the use of the 2036 future year in the initial pre-application advice given in February 2021, where it was requested that, in order for a full assessment of the impact of the proposals to be made, an opening year and post five-year assessment should be provided.

3.3.15. The use of a 2036 future year is however considered a robust position as this would include a higher level of background growth, when compared with the opening and post five-year assessment scenarios.

4. Cycle (and pedestrian) Safety

4.1.1. The following comments on the consideration of cycle safety in the development proposals are provided. Pedestrian safety has also been considered.

Cycle Facilities - Widths

4.1.2. The existing shared use footway/cycleway and staggered crossing has been accommodated within the proposed design.

4.1.3. In accordance with LTN 1/20 Table 6-3, the minimum width requirements for a shared use facility is 3m.

4.1.4. This allows cycle flows of up to 300 cyclists per hour however cycle flows will be much lower than this figure and therefore a 3m width is acceptable.

4.1.5. The existing and retained sections of shared use footway/cycleway meet the 3m minimum width requirement. Where new sections of footway are proposed, these appear to meet the 3m width requirement.

Cycles Facilities – Horizontal Alignment

4.1.6. On the southbound approach to the access road, there is an alignment change. The horizontal curvature of the footway/cycleway here meets the minimum radii requirements as shown in LTN 1/20 Table and allows for a robust 20kph design speed.

Hazard Paving

4.1.7. Corduroy and tactile paving has been proposed throughout and appears suitable in defining the proposed and existing route through the proposed junction works.

Crossing Islands

4.1.8. It is proposed to relocate the existing staggered crossing to the north, to accommodate an increased deceleration length for the southbound right turn lane into the site.

4.1.9. The proposed staggered crossing is c.4m width, meeting the requirements of "*Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice*" Table 4.11.3.6

4.1.10. The tactile crossing widths are suitably proposed at 3.2m to accommodate the 3m width footway/cycleways.

4.1.11. The crossing segregation between the two sets of tactile paving on the staggered island is c.1.35m. "*Roads in Hertfordshire: Highway Design Guide 3rd Edition Section 4 – Design Standards and Advice*" Section 4 Table 4.11.3.6 suggests this distance should be a minimum of 1.8m.

4.1.12. A preferable width of 3m between crossing limits is often recommended, allowing for cyclists to manoeuvre between the crossings on the island.

4.1.13. It is recommended that the distance is increased to align with HCC requirements. This can be addressed at detailed design stage.

5. Acceptability of Crossing Points

5.1.1. The proposed toucan crossing upgrades, which are illustrated in 187011-SK07 Rev A have been reviewed; the proposed toucan crossing upgrades suitably demonstrate that the proposed staggered island could be upgraded to accommodate a signalised toucan crossing arrangement, with additional road markings and extension of the proposed tactile paving required.

5.1.2. Whilst no forward visibility has been shown to the signal heads on drawing 187011-SK07 Rev A, the supporting report 'Transport Statement Addendum 187011-R-11 July 2023' makes reference to an additional drawing (187011-SK08) which was produced to demonstrate forward visibility to the signal heads.

5.1.3. This report suggests visibility in the southbound direction is achievable for a 40mph design speed, and whilst northbound forward visibility of only 100m can be achieved, that this should be acceptable and that it was deemed acceptable to the HCC signals team.

5.1.4. Based on the above correspondence and recorded speeds, adequate visibility can be achieved and that the principles of the upgrade appear feasible.

5.1.5. It is however not clear whether consideration has been given to the possibility of the 22/0491/FUL application not progressing and therefore the possibility of the proposed toucan crossing upgrades not progressing. It may be worth exploring the impact on this development should the application/scheme not come forward, and specifically whether an alternative improvement option should be explored, and in what form this would be.

6. Conclusions and Summary

6.1.1. Evoke has undertaken an independent highway review of an active planning application (ref: 22/1764/FUL) which proposes the "demolition of existing building and erection of retail food store, (Use Class E(a)), with associated access, parking and amenities" at the existing World of Water Aquatic Centres Ltd, Hempstead Road, Watford, WD4 8QG).

6.1.2. The request for an independent review comes as a result of a TRDC Planning Committee on 16 November 2023 where the Committee agreed to defer the application to allow a review of the following items to be undertaken:

- Proposed access arrangements, having specific regard to the right turn from the proposed development onto the A41
- Speed and volume of on-coming traffic from the A41
- Cycle safety
- Acceptability of crossing points

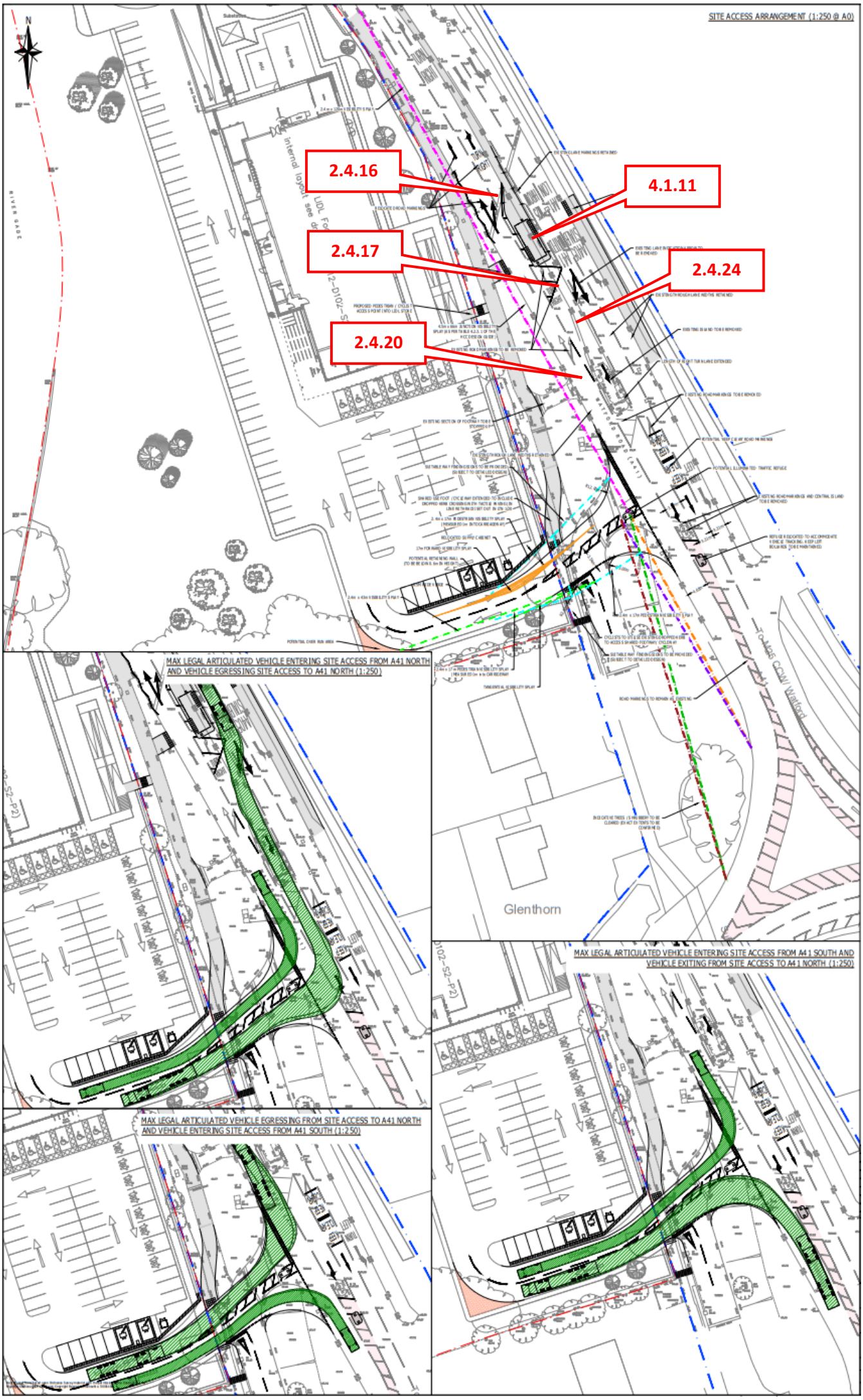
6.1.3. The key supporting application documents and consultation responses have been considered together with a site audit. The key conclusions of the above highway review are summarised below:

- **Proposed Access Arrangements – Design Review**: Design generally compliant, with vehicle movements being accommodated however it is noted that:
  - In regard to the northbound right turn lane and the southbound right turn lane proposals meets the minimum requirements for a 30mph design speed (in accordance with the recorded vehicle speeds), but do not meet the minimum requirements for a 40mph design speed
  - The through lane and turning lane widths are proposed to be retained as existing. These do not wholly meet minimum requirements however no safety concerns have been raised and retention of the existing provision appears suitable
  - Level differences to be considered at next stage
  - Removal of the vegetation in the primary direction would still be required, as has been proposed within the design. This can be controlled by a Condition imposed on any planning permission.
  - Road signing, lighting and drainage details to be provided at detailed design stage
- **Speed and Volume of on-coming traffic from the A41**: the existing situation has been generally accurately described and assessed. However, it should be noted that:
  - The ATC survey was undertaken during Hertfordshire school half term holidays and therefore the data may not represent normal traffic conditions
  - It has not been possible to review the impact of the proposed development on the local highway network due to omissions of information around the baseline model, TEMPro growth, committed developments and due to 2036 being utilised for future year modelling
  - 2036 is however considered to present a robust position, with a lower level of background growth likely occurring should opening year and post five-year scenarios be alternatively assessed.

- **Cycle and Pedestrian Safety:** generally appears to have been accurately considered however it is recommended that the width between the two sets of tactile paving is increased to align with HCC standards
- **Acceptability of Crossing Points:** based on the above correspondence and recorded speeds, adequate visibility can be achieved and the principles of the upgrade appear feasible**.** The impact of the 22/0491/FUL application not progressing and therefore the proposed toucan crossing upgrades not progressing should be considered

APPROVAL					
Number:	**Name:**		**Position:**	**Date:**	**Modifications:**
01A	Author:	Pia Tiley	Principal Consultant	12/01/2024	
	Checked:	Richard Stacey	Managing Director	15/01/2024	
	Approved:	Richard Stacey	Managing Director	15/01/2024	
01B	Author:	Pia Tiley	Principal Consultant	25/01/2024	Updated following client comments
	Checked:	Richard Stacey	Managing Director	25/01/2024	
	Approved:	Richard Stacey	Managing Director	25/01/2024	

APPENDIX A – DESIGN REVIEW WITH REPORT REFERENCES


SITE ACCESS ARRANGEMENT (1:250 @ A0)
2.4.16
4.1.11
2.4.17
2.4.24
2.4.20
Internal layout see dr
Glenthorn
MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 NORTH AND VEHICLE EGRESSING SITE ACCESS TO A41 NORTH (1:250)
MAX LEGAL ARTICULATED VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH AND VEHICLE EXITING FROM SITE ACCESS TO A41 NORTH (1:250)
MAX LEGAL ARTICULATED VEHICLE EGRESSING FROM SITE ACCESS TO A41 NORTH AND VEHICLE ENTERING SITE ACCESS FROM A41 SOUTH (1:250)

Appendix B
MCC Outputs

Manual Classified Turning Counts, World of Water, Watford

DATE: TUESDAY 11th OCTOBER 2022

LOCATION: A41 / WATFORD ROAD

ARM: A41 (SOUTH)

TIME / CLASS	LEFT TO WATFORD ROAD					STRAIGHT TO A41 (NORTH)					TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	
7:30 - 7:45	0	0	0	0	0	0	1	205	10	216	216
7:45 - 8:00	0	0	0	0	0	0	4	211	11	226	226
8:00 - 8:15	0	0	0	0	0	0	0	227	6	233	233
8:15 - 8:30	0	0	0	0	0	0	2	249	7	258	258
HOURLY TOTAL	0	0	0	0	0	0	7	892	34	933	933
8:30 - 8:45	0	0	0	0	0	0	1	250	8	259	259
8:45 - 9:00	0	0	1	0	1	0	4	189	5	198	199
9:00 - 9:15	0	0	2	0	2	0	2	202	10	214	216
9:15 - 9:30	0	0	2	0	2	0	2	195	8	205	207
HOURLY TOTAL	0	0	5	0	5	0	9	836	31	876	881
PERIOD TOTAL	0	0	5	0	5	0	16	1728	65	1809	1814
16:30 - 16:45	0	0	2	0	2	0	4	255	3	262	264
16:45 - 17:00	0	0	3	0	3	0	7	265	3	275	278
17:00 - 17:15	0	0	1	0	1	0	6	286	3	295	296
17:15 - 17:30	0	0	2	0	2	0	8	273	2	283	285
HOURLY TOTAL	0	0	8	0	8	0	25	1079	11	1115	1123
17:30 - 17:45	0	0	2	0	2	1	4	282	5	292	294
17:45 - 18:00	0	0	0	0	0	2	3	269	3	277	277
18:00 - 18:15	0	0	0	0	0	0	3	265	4	272	272
18:15 - 18:30	0	0	0	0	0	1	3	279	0	283	283
HOURLY TOTAL	0	0	2	0	2	4	13	1095	12	1124	1126
PERIOD TOTAL	0	0	10	0	10	4	38	2174	23	2239	2249

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DATE: TUESDAY 11th OCTOBER 2022

LOCATION: A41 / WATFORD ROAD

ARM: WATFORD ROAD

TIME / CLASS	LEFT TO A41 (NORTH)					RIGHT TO A41 (SOUTH)					TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	
7:30 - 7:45	1	0	0	0	1	0	0	0	0	0	1
7:45 - 8:00	2	0	1	0	3	0	0	0	0	0	3
8:00 - 8:15	0	0	0	0	0	0	0	0	0	0	0
8:15 - 8:30	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTAL	3	0	1	0	4	0	0	0	0	0	4
8:30 - 8:45	0	0	1	0	1	0	0	0	0	0	1
8:45 - 9:00	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30	0	0	1	0	1	0	1	0	0	1	2
HOURLY TOTAL	0	0	2	0	2	0	1	0	0	1	3
PERIOD TOTAL	3	0	3	0	6	0	1	0	0	1	7
15:00 - 15:15	0	0	2	0	2	0	0	1	0	1	3
15:15 - 15:30	0	0	1	0	1	0	0	0	0	0	1
15:30 - 15:45	0	0	2	0	2	0	0	1	0	1	3
15:45 - 16:00	1	0	1	0	2	0	0	2	0	2	4
HOURLY TOTAL	1	0	6	0	7	0	0	4	0	4	11
16:00 - 16:15	0	0	1	0	1	0	0	5	0	5	6
16:15 - 16:30	2	0	0	0	2	0	0	1	0	1	3
16:30 - 16:45	0	0	1	0	1	1	0	1	0	2	3
16:45 - 17:00	0	0	0	0	0	0	0	1	0	1	1
HOURLY TOTAL	2	0	2	0	4	1	0	8	0	9	13
PERIOD TOTAL	3	0	8	0	11	1	0	12	0	13	24

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DATE: TUESDAY 11th OCTOBER 2022

LOCATION: A41 / WATFORD ROAD

ARM: A41 (NORTH)

TIME / CLASS	STRAIGHT TO A41 (SOUTH)					RIGHT TO WATFORD ROAD					TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	PEDAL CYCLE	MOTOR CYCLE	LIGHT	HEAVY	TOTAL	
7:30 - 7:45	0	6	262	6	274	0	0	0	0	0	274
7:45 - 8:00	1	4	237	11	253	1	0	1	0	2	255
8:00 - 8:15	1	1	220	7	229	1	0	0	0	1	230
8:15 - 8:30	1	6	223	4	234	1	0	0	0	1	235
HOURLY TOTAL	3	17	942	28	990	3	0	1	0	4	994
8:30 - 8:45	0	4	229	11	244	1	0	0	0	1	245
8:45 - 9:00	1	3	231	12	247	0	0	0	0	0	247
9:00 - 9:15	0	2	243	9	254	0	0	1	0	1	255
9:15 - 9:30	1	4	218	9	232	0	0	0	0	0	232
HOURLY TOTAL	2	13	921	41	977	1	0	1	0	2	979
PERIOD TOTAL	5	30	1863	69	1967	4	0	2	0	6	1973
15:00 - 15:15	0	4	232	3	239	0	0	1	0	1	240
15:15 - 15:30	0	4	234	5	243	0	0	0	0	0	243
15:30 - 15:45	0	3	246	4	253	0	0	2	0	2	255
15:45 - 16:00	0	1	291	2	294	1	0	0	0	1	295
HOURLY TOTAL	0	12	1003	14	1029	1	0	3	0	4	1033
16:00 - 16:15	0	6	228	3	237	0	0	1	0	1	238
16:15 - 16:30	0	1	236	2	239	0	0	0	0	0	239
16:30 - 16:45	1	2	244	2	249	1	0	1	0	2	251
16:45 - 17:00	0	0	222	2	224	0	0	0	0	0	224
HOURLY TOTAL	1	9	930	9	949	1	0	2	0	3	952
PERIOD TOTAL	1	21	1933	23	1978	2	0	5	0	7	1985

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Queue Lengths, World of Water Watford

DATE: TUESDAY 11th OCTOBER 2022

LOCATION: A41 / WATFORD ROAD

ARM A41 (SOUTH)

Max Queue in 5 minute	LANE 1
07:35	0
07:40	0
07:45	0
07:50	0
07:55	0
08:00	0
08:05	0
08:10	0
08:15	0
08:20	0
08:25	0
08:30	0
08:35	0
08:40	0
08:45	0
08:50	0
08:55	0
09:00	0
09:05	0
09:10	0
09:15	0
09:20	0
09:25	0
09:30	0
16:35	0
16:40	0
16:45	0
16:50	0
16:55	0
17:00	0
17:05	0
17:10	0
17:15	0
17:20	0
17:25	0
17:30	0
17:35	0
17:40	0
17:45	0
17:50	0
17:55	0
18:00	0
18:05	0
18:10	0
18:15	0
18:20	0
18:25	0
18:30	0

ARM WATFOR ROAD

Max Queue in 5 minute	LANE 1
07:00	0
07:05	0
07:10	0
07:15	0
07:20	0
07:25	0
07:30	0
07:35	0
07:40	0
07:45	0
07:50	0
07:55	0
08:00	0
08:05	0
08:10	1
08:15	0
08:20	0
08:25	0
08:30	0
08:35	0
08:40	0
08:45	0
08:50	1
08:55	0
16:00	0
16:05	0
16:10	1
16:15	1
16:20	0
16:25	0
16:30	1
16:35	0
16:40	0
16:45	0
16:50	1
16:55	1
17:00	0
17:05	1
17:10	1
17:15	0
17:20	0
17:25	0
17:30	0
17:35	1
17:40	0
17:45	0
17:50	1
17:55	0

ARM A41 (NORTH)

Max Queue in 5 minute	LANE 1	LANE 2	LANE 2
07:00	0	3	0
07:05	0	17	0
07:10	0	0	0
07:15	0	0	0
07:20	0	2	0
07:25	0	3	0
07:30	0	5	0
07:35	0	2	0
07:40	0	10	0
07:45	0	0	0
07:50	0	0	0
07:55	0	0	0
08:00	0	0	1
08:05	0	0	0
08:10	0	8	1
08:15	0	6	0
08:20	0	15	0
08:25	0	11	0
08:30	0	31+	0
08:35	0	31+	0
08:40	0	12	0
08:45	0	0	0
08:50	0	0	1
08:55	0	0	0
16:00	0	0	0
16:05	0	0	0
16:10	0	2	0
16:15	0	0	0
16:20	0	0	1
16:25	0	0	0
16:30	0	0	0
16:35	0	0	0
16:40	0	0	0
16:45	0	0	0
16:50	0	3	1
16:55	0	3	0
17:00	0	0	0
17:05	0	0	1
17:10	0	0	0
17:15	0	0	0
17:20	0	0	0
17:25	0	0	1
17:30	0	0	0
17:35	0	2	0
17:40	0	3	0
17:45	0	2	0
17:50	0	0	0
17:55	0	0	0