Applicant/client:	Persimmon Homes East Wales	**Subject:**	Access Design
Project no:	T23.135	**Document ref no:**	T23.135.TN. AD
Project name:	North West Barry Development	**Issue date:**	11 July 2025

Issue History

Document Reference	Date	Author	Checked	Approved
T23.135.TN.AD.D1	8/7/25	KEW	WD	PO'C

Technical Note

1 Introduction

1.1 Background

1.1.1 Asbri Transport Limited were appointed by Persimmon Homes East Wales in 2023 to produce a Transport Assessment (TA) to accompany a further representation in relation to candidate site CS449 further to the original Stage 1 Candidate Site submission made to the Vale of Glamorgan (VoGC) in September 2022.

1.1.2 The initial candidate site submission proposes the allocation of a new residential development of up to 180 dwellings on greenfield land on the north-western side of Barry, located to the west of the Waycock Cross junction.

1.1.3 There are ongoing discussions with the VoGC regarding the potential for a larger development at this site, with a total of 376 dwellings being proposed

1.1.4 As part of the development, it is proposed to construct a new junction from Port Road, to the west of the Waycock Cross roundabout at the location of the existing field gated access in the form of a signal-controlled junction, which would allow for the safe and timely exit of traffic from the development onto the local highway network, particularly for right turning traffic towards Cardiff. The traffic signals would help control traffic entering and existing the Waycock Cross junction having a 'platooning' effect.

1.1.5 Such an access would also provide enhanced Active Travel infrastructure in conjunction with the proposed Active Travel route between the Waycock Cross junction and Cardiff Airport.

Traffic signals at the proposed site access would provide for dedicated demand dependent green time for pedestrians and cyclists along this section of the A4226 Port Road.

1.1.6 The development traffic has been distributed and assigned to the local highway network on with an assumed east west split of 70%/30% for both peak periods for forecast traffic accessing the proposed development site. These proportions were agreed with the Vale of Glamorgan Council.

1.1.7 Adding the forecast development trips to the future year base flows provides an additional 101 and 106 vehicles to the junction flow totals during the AM and PM peaks respectively, which equates to an additional 1.2 vehicles per minute entering the junction during the peak hours. This results in a 3.5-3.6% increase in total junction flows in 2028 and 3.3-3.4% in 2038.

1.1.8 It is envisaged that the proposed development will have a marginal and inconsequential impact on the performance of the local highway network during the AM and PM peak hour periods, or throughout the course of the day.

1.1.9 Nevertheless, it is acknowledged that the local highway network currently experiences congestion during the network peak hours, which is likely to increase by 2028 and certainly by 2038.

1.1.10 Discussions with VoGC have requested an access strategy which assesses the junction and its relation to the performance of the Waycock Cross roundabout.

1.1.11 As such, this Access Strategy Technical Note undertakes a capacity assessment of the proposed signal junction with improvements with a development of 376 residential units.

2 Access Design

2.1 Introduction

2.1.1 As discussed above, it is proposed to construct a new junction from Port Road, to the west of the Waycock Cross roundabout at the location of the existing field gated access in the form of a signal-controlled junction.

2.1.2 A signal-controlled junction would allow for the safe and timely exit of traffic from the development onto the local highway network, particularly for right turning traffic towards Cardiff. The traffic signals would help control traffic entering and existing the Waycock Cross junction having a 'platooning' effect.

2.1.3 Following ongoing discussions with Vale of Glamorgan Council officers, a preliminary site access design in the form of a traffic signal controlled 3-arm junction with improved connections to the Waycock Cross junction, is shown at **Appendix A.** This design involves the local widening and minor realignment of the carriageway along the frontage of the proposed development site.

2.1.4 The widening would involve the use of land within the adopted highway boundary to the north of the carriageway on the northern side of the carriageway and taking land within the development site on the southern side of the carriageway. The extent of the existing adopted highway is shown in **Appendix B**.

2.1.5 For eastbound traffic approaching the site access there are 3 lanes at the stop line with 2 lanes heading eastwards to the Waycock Cross junction and a length of right-turning lane for vehicles accessing the proposed development site.

2.1.6 These 2 eastbound lanes continue to the Waycock Cross junction lengthening the current 2 lane section on approach to the junction. In the westbound direction there are 2 lanes at the stop line, with a length of left turn lane into the site as well as a dedicated lane for straight ahead traffic.

2.1.7 The proposed site access is shown in greater detail in **Appendix C**, showing the intervisibility splays of the signal stop lines. **S**wept path analysis, shown in A**ppendix D**, includes**;**

- Max legal length articulated vehicles travelling East to West and West to East along Port Road
- 11.2m refuse collection vehicles travelling all movements through the site access.

3 Junction Modelling

3.1 LinSig

3.1.1 As in the main modelling addendum document the Linsig software has been used to model the operation of the proposed signal-controlled site access in conjunction with the Waycock Cross junction. The outputs of LinSig provide several measurements to ascertain information of a junction's operation. The key measurements which are considered in this assessment are:

- 'Degree of Saturation' (DoS),
- Mean Maximum queue length in PCUs
- Average Delay in seconds per PCU
- Practical Reserve Capacity (PRC)

3.1.2 The main indicators of the performance of a junction are given by the DoS for each traffic movement at the junction as well as the PRC for a measure of the overall performance of the junction. The peak capacity is realised when the demand flow at the entry is great enough to cause a continuous queue of vehicles to wait on approach to the stop line. This is reached when the DoS attains a value of 1, even though congestion and delay generally occurs when the DoS reaches 0.9.

3.1.3 The PRC is a measure of the overall junction performance. The junction is modelled to achieve the best overall result balancing the opposing traffic flows to provide the optimal traffic signal timings and operation. A positive PRC shows there is reserve capacity at a junction while a negative PRC indicates a junction is over capacity.

3.2 Waycock Cross Junction Base Model

3.2.1 The 2025 base year modelling of the Waycock Cross junction has been reported in detail in the Modelling Addendum. The models have been run to optimise for the model as a whole with regards to signal timings. This base model was used as a base for modelling the future year junction layout and demand scenarios for the 2028 and 2038 future years as follows:

- Base;
- Base + Development;
- Base + Committed Development; and
- Base + Committed Development + Development

3.3 Site Access Junction Modelling

3.3.1 For the purposes of this analysis the proposed site access junction has been added to the Linsig Base model for the future year base and with development scenarios. For comparative purposes the results for the proposed site access junction and the Port Road arm of Waycock Cross junction are shown in **Table 3.1** for the 2028 Future year base and with development scenario.

3.3.2 These results show only a marginal and inconsequential increase in congestion and delay on the approach to the Waycock Cross junction from the west, with the addition of development traffic, with no particular capacity issues at the site access junction.

Movement	2028							
	2028 Base				2028 Base+Development			
	Q	Delay	DoS	PRC	Q	Delay	DoS	PRC
AM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	0.3	4.6	40.3%	-6.3	3.4	6.0	43.9%	-15.6
Port Rd Ahead	22.8	58.9	95.7%		71.7	135.7	104.0%	
Site Access								
Port Rd Ahead					1.2	6.7	19.4%	
Port Rd Ahead					7.5	8.8	46.1%	
Port Rd Right					7.5	8.8	46.1%	
Site Access Left & Right					2.2	51.2	43.5%	
Port Rd WB Ahead/Left					7.8	9.0	48.6%	
Pedestrian Crossing								
Port Rd EB Ahead/Left	16.3	1.8	45.7%		0.1	1.1	14.7%	
Port Rd EB			45.7%		3.0	1.4	34.9%	
Port Rd WB Ahead	0.2	1.4	32.9%		0.3	1.4	34.1%	
PM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	0.1	2.4	18.6%	4.8	0.4	2.5	19.5%	-6.7
Port Rd Ahead	15.0	10.9	67.9%		14.6	11.1	71.1%	
Site Access								
Port Rd Ahead					1.5	6.3	12.6%	
Port Rd Ahead					7.3	8.7	46.5%	
Port Rd Right					7.3	8.7	46.5%	
Site Access Left & Right					1.0	47.0	20.9%	
Port Rd WB Ahead/Left					18.0	13.8	76.9%	
Pedestrian Crossing								
Port Rd EB Ahead/Left	14.0	1.6	40.7%		0.1	1.0	9.2%	
Port Rd EB			40.7%		3.0	1.4	33.5%	
Port Rd WB Ahead	0.5	1.9	51.0%		0.6	2.0	54.5%	

Table 3.1 2028 Port Road Results – Base with Development

3.3.3 The results for 2038 are shown in **Table 3.2**. These results show that while there is increased congestion and delay at the Waycock Cross junction there is only a marginal and inconsequential increase in congestion and delay, on the approach to the Waycock Cross junction from the west, with the addition of development traffic, with no particular capacity issues at the site access junction.

Movement	2038							
	2038 Base				2038 Base+Development			
	Q	Delay	DoS	PRC	Q	Delay	DoS	PRC
AM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	0.4	5.7	46.9%	-23.6	4.2	7.8	50.8%	-33.7
Port Rd Ahead	87.9	245.2	111.3%		117.4	369.0	120.3%	
Site Access								
Port Rd Ahead					2.6	6.8	20.8%	
Port Rd Ahead					8.3	9.1	49.2%	
Port Rd Right					8.3	9.1	49.2%	
Site Access Left & Right					2.2	51.2	43.5%	
Port Rd WB Ahead/Left					8.8	9.3	51.9%	
Pedestrian Crossing								
Port Rd EB Ahead/Left	18.0	1.9	48.8%		0.1	1.1	14.7%	
Port Rd EB Ahead/Right			48.8%		3.6	1.5	34.9%	
Port Rd WB Ahead	0.3	1.4	35.1%		0.3	1.4	36.4%	
PM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	0.1	2.6	20.6%	-9.6	1.1	2.6	20.9%	-20.8
Port Rd Ahead	17.6	14.7	75.1%		17.5	14.0	76.0%	
Site Access								
Port Rd Ahead					1.6	6.3	13.4%	
Port Rd Ahead					8.2	9.0	49.3%	
Port Rd Right					8.2	9.0	49.3%	
Site Access Left & Right					1.0	47.0	20.9%	
Port Rd WB Ahead/Left					19.3	14.6	78.8%	
Pedestrian Crossing								
Port Rd EB Ahead/Left	15.2	1.7	40.7%		0.1	1.0	9.7%	
Port Rd EB Ahead/Right			40.7%		3.5	1.4	35.5%	
Port Rd WB Ahead	0.6	2.0	54.2%		0.6	2.1	55.8%	

Table 3.2 2038 Port Road Results – Base with Development

3.3.4 For comparative purposes the future year models have also been run for the Base + Committed development flow and the Base + Committed + Development flow scenarios. The committed developments as specified by the VoGC are the Cardiff & Vale College and the North of Rhoose developments as described in the modelling addendum.

3.3.5 The results for the proposed site access junction and the Port Road arm of Waycock Cross junction for these future year scenarios are shown in **Table 3.3** for the 2028 and **Table 3.4** for the 2038 Future years.

3.3.6 As expected, the addition of background traffic growth up to 2038 and committed development traffic pushes the Waycock Cross junction over capacity with increasing levels of congestion and delay. Again, the addition of development traffic shows only a marginal and inconsequential increase in congestion and delay on the approach to the Waycock Cross junction from the west, with no capacity issues at the site access junction.

Movement	2028							
	2028 Base+Committed				2028 Base+Committed+Devlopment			
	Q	Delay	DoS	PRC	Q	Delay	DoS	PRC
AM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	5.6	8.3	52.8%	-17.8	5.7	8.6	56.3%	-27.0
Port Rd Ahead	77.9	167.0	106.4%		105.9	284.7	114.3%	
Site Access								
Port Rd Ahead					3.3	7.1	25.4%	
Port Rd Ahead					8.8	9.4	51.0%	
Port Rd Right					8.8	9.4	51.0%	
Site Access Left & Right					2.2	51.2	43.5%	
Port Rd WB Ahead/Left					13.6	11.7	66.4%	
Pedestrian Crossing								
Port Rd Ahead/Left	0.1	1.1	17.7%		0.1	1.1	18.9%	
Port Rd Ahead/Right	4.1	1.4	35.6%		4.1	1.5	38.4%	
Port Rd WB Ahead	0.4	1.7	45.4%		0.4	1.7	46.5%	
PM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	1.5	2.7	23.4%	-23.9	2.6	3.0	23.5%	-31.4
Port Rd Ahead	18.9	15.2	76.7%		19.6	18.7	77.1%	
Site Access								
Port Rd Ahead					2.8	12.0	19.7%	
Port Rd Ahead					13.0	18.2	64.7%	
Port Rd Right					13.0	18.2	64.7%	
Site Access Left & Right					0.8	31.5	10.0%	
Port Rd WB Ahead/Left					41.9	61.4	99.7%	
Pedestrian Crossing								
Port Rd Ahead/Left	0.1	1.0	11.1%		0.1	1.0	11.5%	
Port Rd Ahead/Right	4.1	1.5	36.3%		7.9	1.5	37.8%	
Port Rd WB Ahead	0.6	2.1	55.8%		0.7	2.1	57.0%	

Table 3.3 2028 Port Road Results – Committed and Development

Movement	2038							
	2038 Base+Committed				2038 Base+Committed+Devlopment			
	Q	Delay	DoS	PRC	Q	Delay	DoS	PRC
AM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	7.1	11.4	60.3%	-36.1	7.1	11.7	63.6%	-44.9
Port Rd Ahead	124.7	400.3	122.5%		152.6	493.6	130.4%	
Site Access								
Port Rd Ahead					3.6	7.2	26.7%	
Port Rd Ahead					9.5	9.8	54.1%	
Port Rd Right					9.5	9.8	54.1%	
Site Access Left & Right					2.2	51.2	43.5%	
Port Rd WB Ahead/Left					14.8	12.5	69.5%	
Pedestrian Crossing								
Port Rd Ahead/Left	0.1	1.1	18.6%		0.1	1.2	19.8%	
Port Rd Ahead/Right	5.2	1.5	37.8%		5.2	1.6	40.6%	
Port Rd WB Ahead	0.5	1.8	47.9%		0.5	1.8	48.6%	
PM Peak								
Waycock Cross - Port Road Eastbound								
Port Rd Left	2.5	3.1	24.8%	-42.2	2.0	2.8	24.7%	-50.4
Port Rd Ahead	20.4	22.8	81.4%		21.1	19.8	81.6%	
Site Access								
Port Rd Ahead					2.3	7.7	17.5%	
Port Rd Ahead					10.8	11.7	58.1%	
Port Rd Right					10.8	11.7	58.1%	
Site Access Left & Right					0.9	41.8	16.0%	
Port Rd WB Ahead/Left					22.8	19.3	85.5%	
Pedestrian Crossing								
Port Rd Ahead/Left	0.1	1.1	11.6%		0.1	1.1	12.1%	
Port Rd Ahead/Right	7.4	1.5	38.3%		6.3	1.6	39.8%	
Port Rd WB Ahead	0.6	2.1	56.0%		0.7	2.1	57.1%	

Table 3.4 2038 Port Road Results – Committed and Development

4 Conclusion

4.1 Conclusion

4.1.1 The combination of the signal-controlled site access junction, the proposed widening and realignment of the A4226 Port Road along the frontage of the North West Barry LDP site immediately to the west of the Waycock Cross junction, will provide for a safe and controlled access to the development site for all highway users.

4.1.2 The proposed improvements to the eastbound approach to the Waycock Cross junction will provide benefit to traffic using Port Road with the addition of development traffic having a marginal and inconsequential impact upon the junction's performance.

4.1.3 The proposed new site access junction and associated local carriageway widening can be accommodated within the adopted highways boundary on the northern side of the carriageway and within the development site to the south of the existing carriageway.

Appendices

Appendix A

existing crossing provision

removal of some footway to accommodate widening

proposed extension of 30mph speed limit

30

58.81m

56.54m

3.5m

3.5m

3.66m

3.5m

3.5m

3.5m

3.25m

3m

3m

R12m

R12m

Hafod Lon

Green Farm (Kennels)

Ty-newydd Farm

Ruin

183

179

179

189

3m footways in line with aspirations for active travel route to tie into existing footways

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Drawing Title

Site access proposal
Signalled junction

Job No

T23.135

Job Title

Weycock Cross

Client

Persimmon (East Wales)

Scale	1:1
Designed by	KEW
Drawn by	KEW
Approved by	WD
Date 1st issued	
Document ref. no	T23.135.CAD.S.D3
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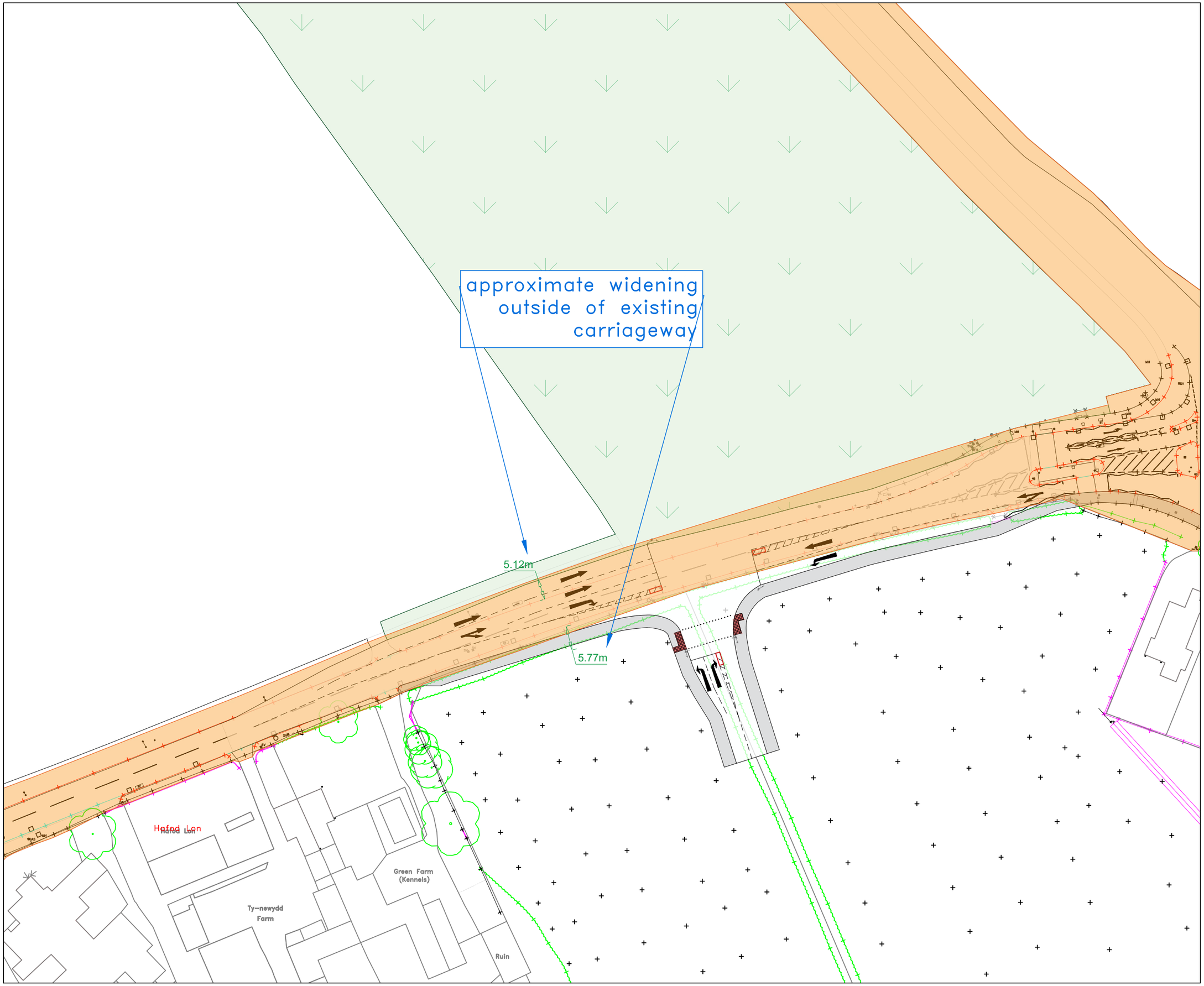
Revision History

Rev	Date	Amendment	Editor

Appendix B



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Drawing Title

Site access proposal
Signalled junction
Adopted Highway Extent

Job No

T23.135

Job Title

Weycock Cross

Client

Persimmon (East Wales)

Scale	NTS
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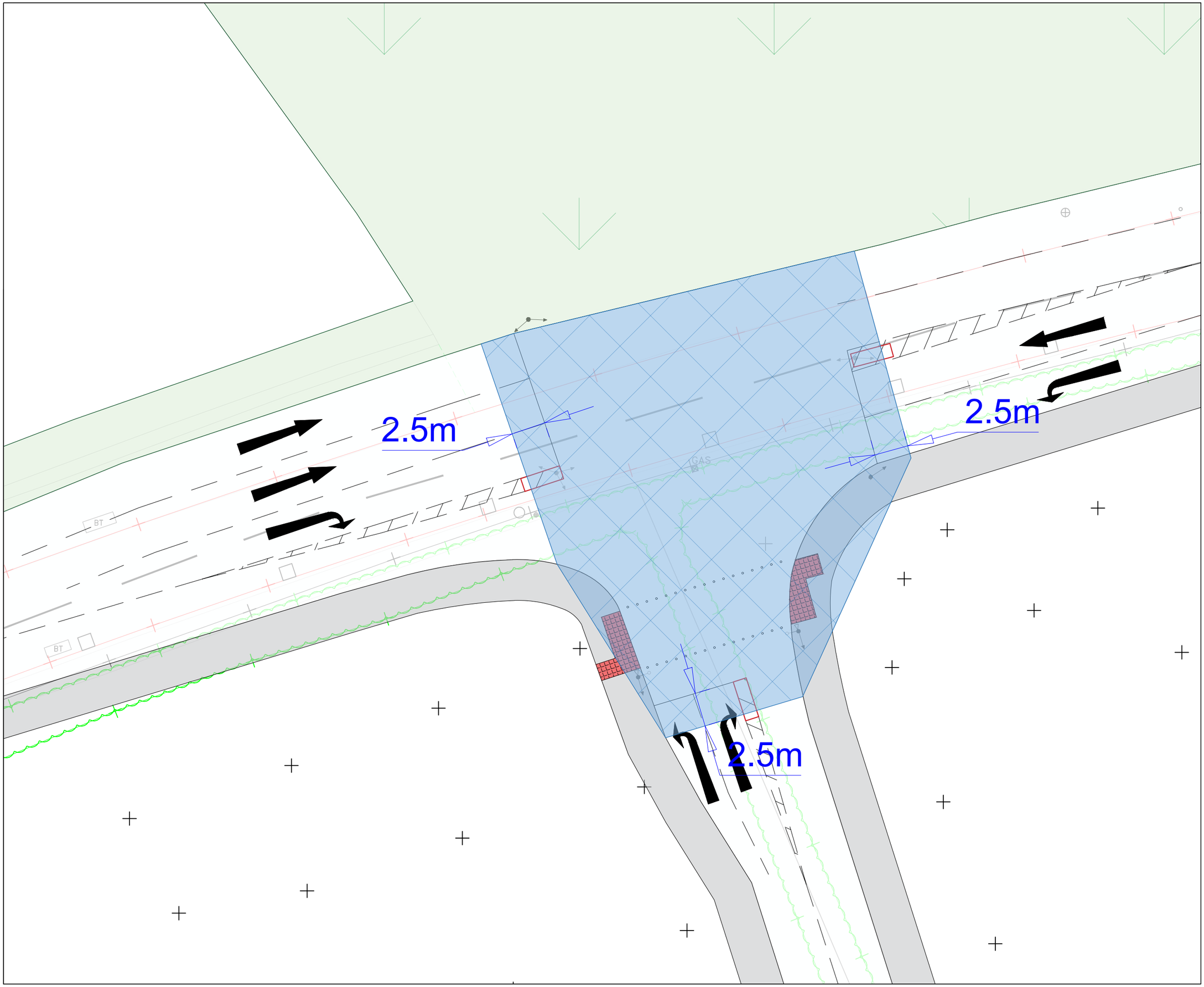
Revision History

Rev	Date	Amendment	Editor

Adopted highway

Appendix C



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Drawing Title

Site access proposal Sginalled junction Intervisibility

Job No

T23.135

Job Title

Weycock Cross

Client

Persimmon (East Wales)

Scale	4:1
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Rev	Date	Amendment	Editor

Adopted highway

Appendix D

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Drawing Title

Site access proposal Max legal length articulated vehicle

Job No

T23.135

Job Title

Weycock Cross

Client

Persimmon (East Wales)

Scale	2:1
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Revision History

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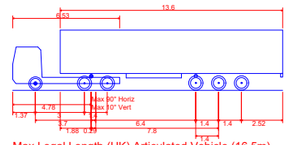
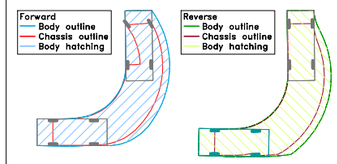


Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m



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Drawing Title

Site access proposal
Refuse collection vehicle

Job No

T23.135

Job Title

Weycock Cross

Client

Persimmon (East Wales)

Scale	1:1
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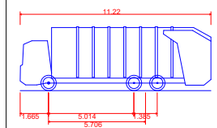
Revision History

Rev	Date	Amendment	Editor



Phoenix 2 Duo Recycler (P2-15W with Elite 6x4 chassis)

Overall Length	11.220m
Overall Width	2.530m
Overall Body Height	3.756m
Min Body Ground Clearance	0.309m
Track Width	2.530m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.550m