

ADDENDUM NOTE

Project: Ysgol y Graig, Cefn Coed y Cymmer, Merthyr Tydfil – Transport Options Appraisal
Subject: Access Improvements to the Godre'r Coed Playing Fields Site
Date: 25/08/17
File Ref: 70033398 – ADN01

Introduction

This Addendum Note has been prepared in support of the Consultation Draft Transport Options Appraisal report (June 2017) concerning the relocation of Ysgol y Graig to a new site. The report identified access constraints associated with the Godre'r Coed Playing Fields site, concerning the Maesgwynne roundabout (formed by Maesgwynne / High Street / Brecon Road). Based on its existing arrangement and traffic demand, these were namely;

- The absence of deflection on the northbound approach;
- Damage to the deflection build-out from the southbound approach linked to it being struck by vehicles; and,
- The lack of pedestrian facilities.

This Note considers potential improvement options to the junction to improve access to the proposed school site by all modes.

Existing Junction Arrangement

The mini-roundabout is formed by High Street (north), Brecon Road (south) and Maesgwynne (west). The arrangement comprises a slightly domed central circular white road marking and accompanying clockwise arrow markings. The existing arrangement is shown in **Figure 1**.



Figure 1 – Maesgwynne Mini-Roundabout Junction – Looking north from Brecon Road towards High Street

Kerbed traffic splitter islands are present on the northern and southern arms at the give way lines. Design Manual for Roads and Bridges (DMRB) Guidance TD54/07 – *Design of Mini Roundabouts*

indicates that traffic splitter islands may be provided to increase conspicuity or assist provision of adequate deflection of the path of vehicles approaching a mini-roundabout. A build out is present on the northern arm to provide deflection for vehicles travelling in a southbound direction.

The Inscribed Circle Diameter (ICD) of the existing mini-roundabout is c.14m which is smaller than the 16-20m typically associated with this type of junction.

On approach to the junction from the south, Brecon Road comprises a straight road past Cyfarthfa Castle with minimal frontages. Immediately to the south of the mini-roundabout, there is a gateway feature comprising;

- A road narrowing,
- 'Welcome to Cefn Coed y Cymmer' sign indicating speed cameras are present; and,
- Road markings comprising 'SLOW/ARAF', a 30mph roundel and crocodile teeth, as shown in **Figure 2**.



Figure 2 – Cefn Coed Y Cymmer Gateway Feature on Brecon Road (south of mini roundabout junction)

The presence of these features suggests that there has potentially been an issue with speeding in the past on this section of carriageway. The current provision of a mini-roundabout at the High Street, Brecon Road and Maesgwynne junction is likely to have traffic calming benefits. There is no recent personal injury collision history associated with the junction based on a review of the most recent 5 years of data.

Junction Improvement Options

Overview

Analysis undertaken in support of the Consultation Draft Transport Options Appraisal report showed that movements by 9.8m buses and 15m coaches egressing the proposed school via Godre'r Coed Road / Pontycapel Road (to the north of the playing fields site) were highly constrained due to;

- The carriageway width,
- Lack of a continuous footway,
- Road gradients,
- Visibility; and,
- Swept paths for large vehicles (buses and coaches).

Due to these constraints, it is recommended that all bus and coach movements both accessing and egressing from the site are made via Maesgwynne / Cyfarthfa Gardens to the south and east, rather than using existing roads to the north.

The location of the existing traffic splitter islands on the Brecon Road and High Street approaches at the Maesgwynne mini-roundabout do not appear on the OS base (recommendations for a topographical survey are made in the conclusion to this note if the proposals are progressed). Swept path analysis of movements by refuse trucks, 9.8m buses and 15m coaches has been undertaken, with a visual interpretation of whether these manoeuvres were likely to be constrained by the existing highway layout and geometry. For 15m coaches, the following constraints were identified in relation to the existing road geometry;

- Tracking over the centreline into opposing vehicular flows (Maesgwynne); and,
- Likely impact on the existing kerbed traffic islands on the High Street and Brecon Road arms.

These constraints are identified in **Figure 3** and the supporting drawings (ATR-00002 and ATR-00010) in **Appendix ADN01**. The swept path analysis indicates that a coach turning left from Brecon Road to Maesgwynne would only be able to complete this manoeuvre if a vehicle was not waiting on the give way line on Maesgwynne.

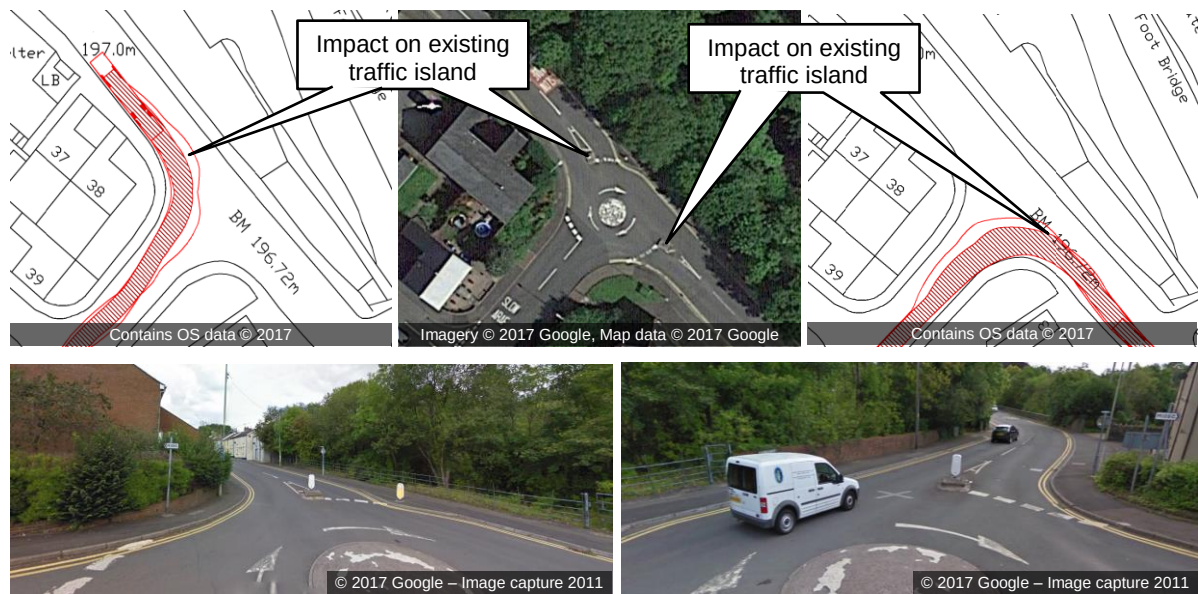


Figure 3 – Vehicle Swept Path Analysis (15m Luxury Coach) – Left Turn Manoeuvres - Egress from Godre'r Coed Playing Fields Site Via Maesgwynne and Access from Brecon Road

Right turning movements from High Street to Maesgwynne (to access to the site) and from Maesgwynne to Brecon Road (when egressing the site) are likely to require the coach to overrun the domed central marking.

Swept path analysis has been undertaken for a 9.8m bus and a fire engine based on the existing highway arrangement for manoeuvres between Brecon Road and Maesgwynne. Drawings ATR-00004 and ATR-00006 in **Appendix ADN01** suggests that the bus may have to overrun the centreline on Maesgwynne to avoid any impact to the nearside kerb or kerbed traffic island when performing a left turn from Brecon Road.

Movements by 9.8m buses and fire engines egressing the site, turning right from Maesgwynne to Brecon Road appear to be achievable (albeit some overrun of the central domed marking) based on the existing highway geometry as shown in drawings ATR-00011 and ATR-00012 in **Appendix ADN01**.

Improvement Options

Two improvement options have been identified to improve access to the proposed school site via this junction by large vehicles. Both of these include provision for a raised table top to act as a traffic calming feature and the provision of new zebra crossing to address the constraints identified in the main report relating to pedestrian crossing provision.

The extent and location of these features respectively is the same for both options, which comprise;

1. **Mini-roundabout:** Minor modifications to the existing arrangement which will reposition the roundabout to achieve better deflection, removing the need for traffic splitter islands which impact upon the manoeuvrability of large vehicles.
2. **T-junction:** Reconfiguring the junction to give priority for north-south through movements. As with Option 1, this arrangement will remove the need for traffic splitter island which impact upon manoeuvres undertaken by large vehicles.

The following sections provide a commentary regarding the suitability of each of the proposed improvement schemes.

Mini-Roundabout

Given the land constraints it has not been possible to enlarge the ICD above 14m. The arrangement shown in **Figure 4** and to scale in drawing SK-00001 in **Appendix ADN02**, pulls the roundabout towards the south-west to aid deflection. The physical traffic splitter islands on the approach arms are removed and will be replaced with white lining.

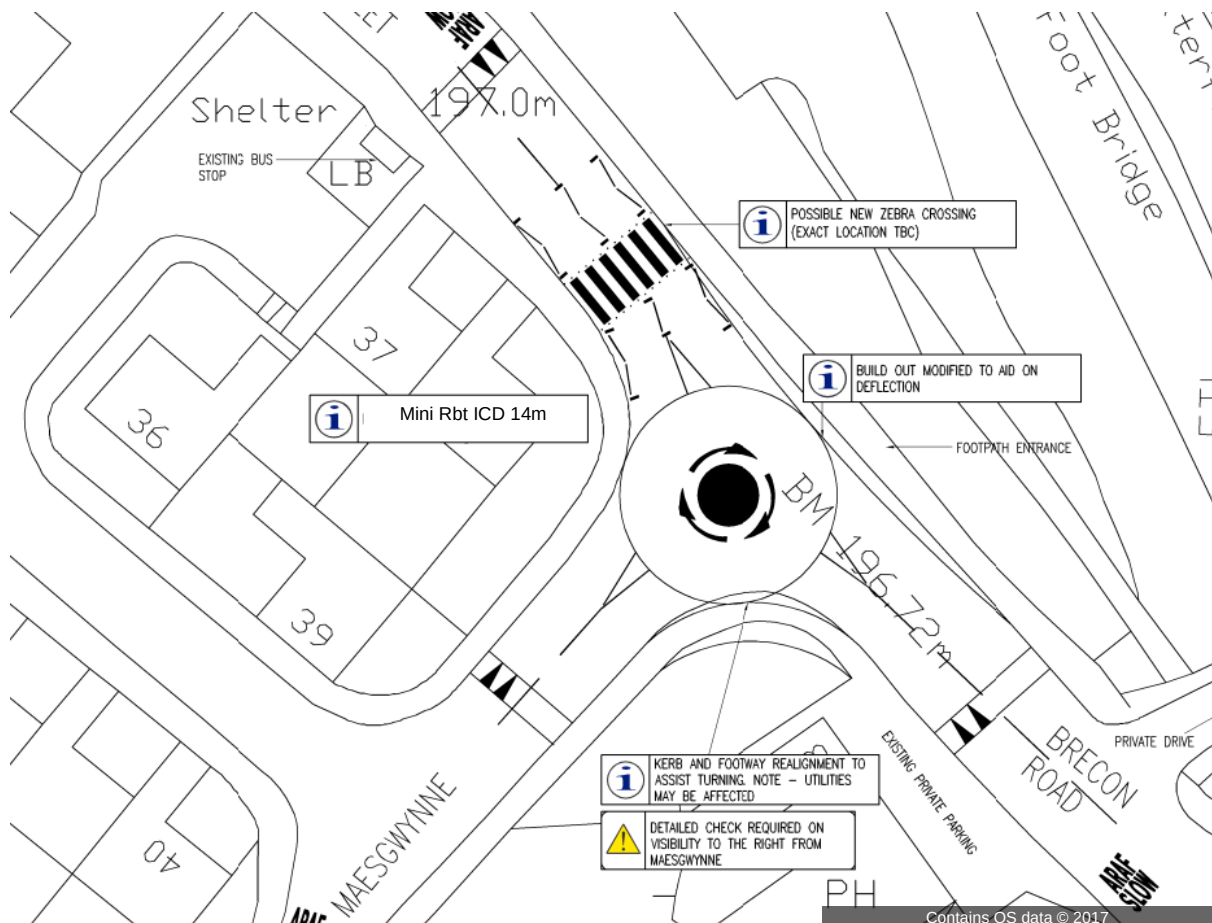


Figure 4 – Mini-Roundabout Improvement Option Maesgwynne

Due to the land constraints, a nearside rather than offside shift has been achieved, in accordance with the principles set out in Figure 6.1 of TD54/07 – *Design of Mini Roundabouts*. The lateral shift is c.1m, with a rate of shift of approximately 1 in 15 achieved. This arrangement will reduce visibility from Brecon Road right to the Maesgwynne arm.

The proposed arrangement will require some realignment to the footway on the southern side of the carriageway linking Maesgwynne to Brecon Road. No utility searches have been undertaken to

determine whether any will need to be diverted. Some existing signposts (shown in **Figure 1**) could be removed or relocated to enable a footway of the same width as at present to be re-provided, subject to the land being within the highway boundary.

The visibility distance 'D' from Maesgwynne to Brecon Road, is approximately 28m, when measured back at a distance of 9m from the give way line. Table 6/1 of TD54/07 indicates that for a two second gap acceptance period, a visibility distance of 35m is required where the 85th percentile speed on the arm to the right (i.e. Brecon Road) is 30mph. No speed data is currently available for this junction, but based on the posted speed limit, this analysis suggests that a departure from standards may be required.

Figure 5 shows the tracking of a 15m coach based on this junction arrangement. These movements are also shown in drawings SK-00001 – ATR01-03 in **Appendix ADN02**. The swept path analysis indicates that the coach will overrun the centre line and the domed central marking to complete its manoeuvres, although there will be no impact or overrunning of the kerbs as happens with the building out and traffic splitter islands for the existing arrangement.



Figure 5 – Swept Path 15m Coach at Improved Maesgwynne Roundabout Junction

Given the minor alterations to the junction arrangement associated with this option, it is not anticipated to have a significant impact on the results of the capacity modelling completed within the main consultation report (*Table 6.5*). This modelling forecast that the junction would operate within capacity in both the AM and PM periods in the design year should vehicular access to the proposed school site be taken from the mini-roundabout. No further model runs have been undertaken for this improvement option.

The opportunities and constraints associated with this junction arrangement are set out below;

Opportunities

- Speed table for traffic calming,
- Formalised pedestrian crossing provision,
- Improved deflection on the nearside,
- No impact on kerbs or kerbed traffic splitter islands by coaches or overrunning of pavement,
- Junction forecast to operate within capacity

Constraints

- Potential impact on utilities
- Coaches need to overrun centre line and the domed central marking,
- Visibility from Brecon Road (right) to Maesgwynne reduced (may require departure from standards),
- Footway will need to be adjusted to maintain widths, subject to land being within the highway boundary.

T-Junction

This arrangement, shown in **Figure 6** and drawing **SK-00002** in **Appendix ADN02** retains the current kerblines, with the exception of that linking Brecon Road to Maesgwynne. The kerb and footway has been realigned at this location to assist vehicular turning to the same extent as for the mini-roundabout option. The same constraints relating to potential utilities and removal or relocation of signposts apply.

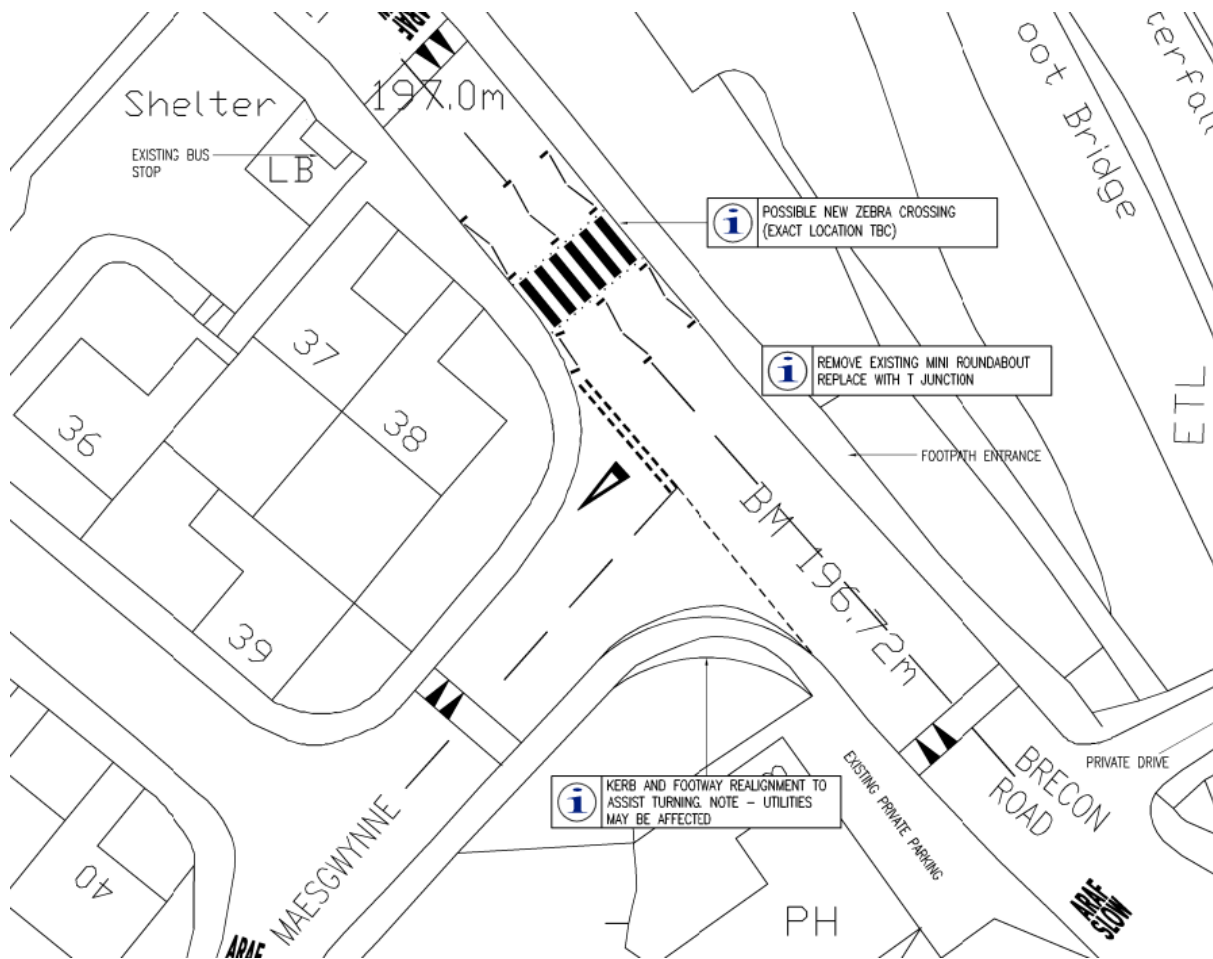


Figure 6 – Standard 3 Arm Priority Junction

Figure 7 shows the tracking of a 15m coach based on this junction arrangement. These movements are also shown in drawings **SK-00002 – ATR01-03** in **Appendix ADN02**. The swept path analysis indicates that the coach will overrun the centre line to complete all movements.



Figure 7 – Swept Path 15m Coach at Proposed 3 Arm Priority Junction

Vehicle tracking has also been undertaken of a 9.8m bus arriving and departing from the site via Brecon Road. The swept paths are shown in **Figure 8** and show that there is minimal overrun of white lining for vehicles of this size. This vehicle tracking is shown in drawings ATR-00101 and ATR-00102 in **Appendix ADN02**. As swept path analysis has been undertaken for all movements for a 15m coach as a worst case scenario, these track runs have not been repeated for all movements by other large vehicles.

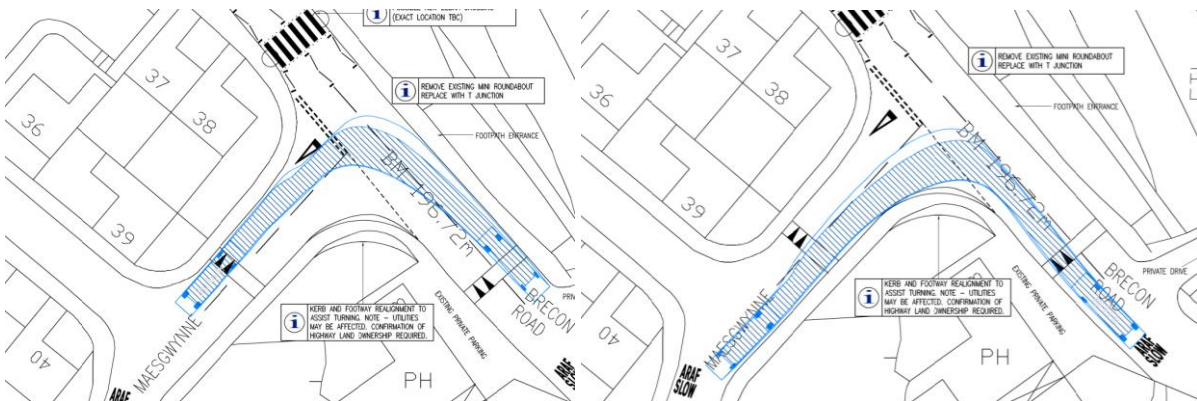


Figure 8 – Standard 3 Arm Priority Junction: 9.8m Bus Swept Path to/from Brecon Road

Capacity modelling of this arrangement has been undertaken for the two study periods at the start and end of the school day, using the TRL PICADY program for priority junctions. The results are summarised in **Table 1**. The traffic flows used are the same as those tested in the Consultation Draft Transport Options Appraisal report for the existing highway arrangement (in the 2017 and 2020 assessment years).

Where the Ratio of Flow to Capacity (RFC) is 0.85 or above, it is considered that arm is operating at above its theoretical capacity. A threshold of 0.85 is used rather than 1.00 given the standard margin of error of $\pm 15\%$. The modelling indicates that the junction would operate within its theoretical capacity for the 'Do Something Option B' scenario of all traffic arriving and departing via Maesgwynne. This option assumes all vehicular traffic associated with the provision of the school on the playing fields site would access the development via Maesgwynne.

Road NAME	AM PEAK		PM PEAK	
	RFC	Queue (Vehs)	RFC	Queue (Vehs)
Base Year (2017)				
Maesgwynne (Left turn)	0.05	0.1	0.04	0.0
Maesgwynne (Right turn)	0.12	0.1	0.11	0.1
High Street	0.04	0.1	0.05	0.1
Assessment Year (2020) – Do Something B, All Development Traffic In and Out via Maesgwynne				
Maesgwynne (Left turn)	0.23	0.3	0.56	1.3
Maesgwynne (Right turn)	0.31	0.4	0.58	1.3
High Street	0.32	0.7	0.33	0.7

Table 1- Junction Modelling, Three Arm Priority Junction Arrangement

The opportunities and constraints associated with this junction arrangement are set out below;

Opportunities

- Speed table for traffic calming
- Formalised pedestrian crossing provision
- Coaches can manoeuvre to and from Maesgwynne without overrunning pavements or impacting upon kerbs.
- Visibility from Brecon Road to Maesgwynne greater than for mini-roundabout option

Constraints

- Potential impact on utilities
- Coaches need to overrun centre line
- Potentially higher vehicle speeds on the major arms in spite of speed table relative to existing and proposed mini-roundabout.
- Footway will need to be adjusted to maintain widths, subject to land being within the highway boundary.

Recommendations & Next Steps

Based on the vehicular tracking and visibility splays, the T-junction option is preferable in terms of improving the existing junction to provide access to the new school via Maesgwynne. This arrangement removes the issue of visibility to the right from Maesgwynne associated with the existing and proposed mini-roundabout options.

Both improvement options deliver similar benefits to pedestrian movement, with formalised provision connecting to the school to enable access by pupils, staff and visitors.

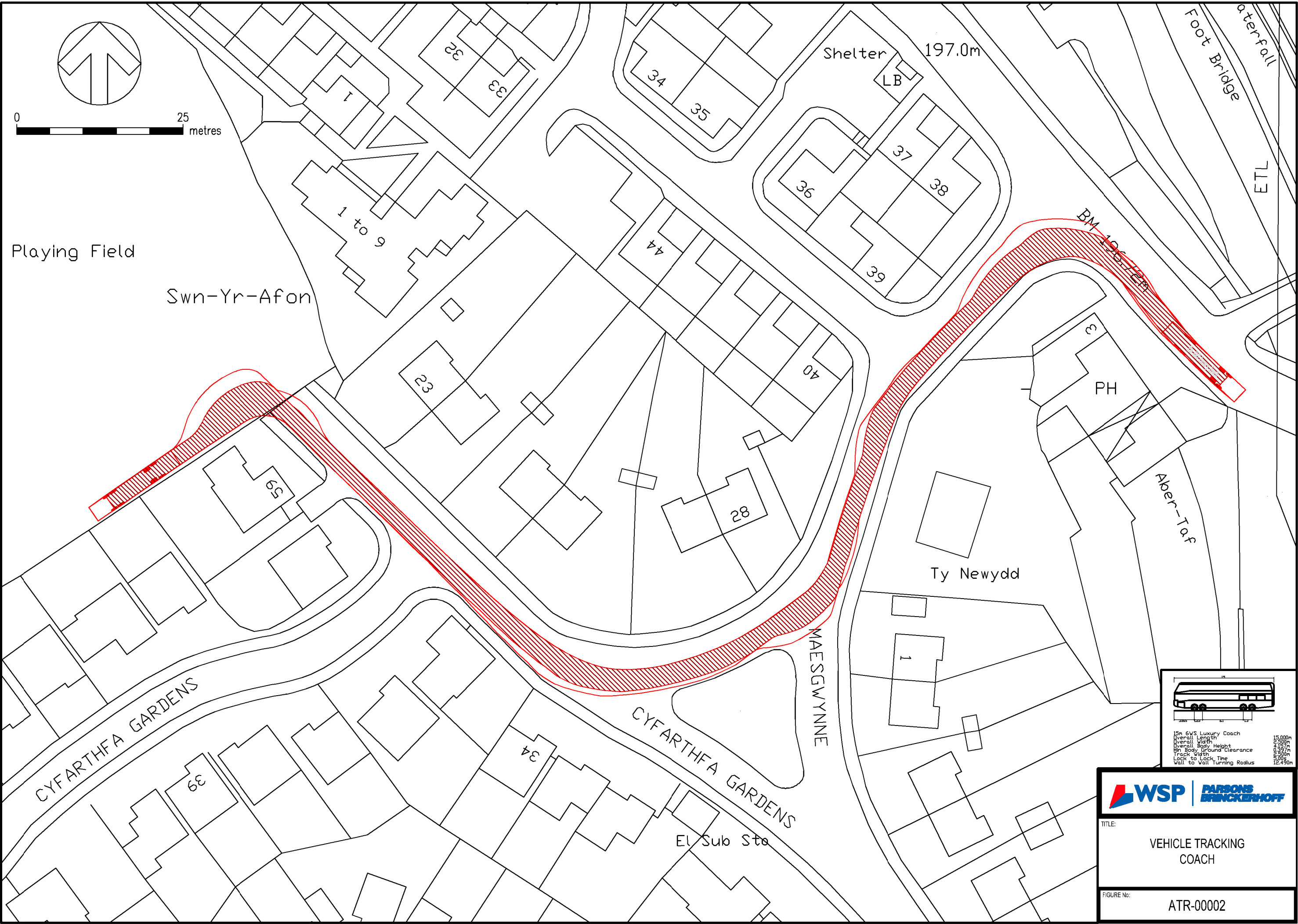
For both improvement schemes, consideration should be given to the application of Traffic Regulation Orders (TROs) to extend double yellow line parking restrictions to ensure that any on-street parking does not restrict manoeuvres by coaches and or 9.8m buses wishing to access the school site.

A full topographic and speed survey are recommended in support of development of the design and the associated road safety audit. A statutory undertakers search and confirmation of the extent of the land boundary will also be required to progress the development of this junction improvement scheme.

Appendix ADN01

Swept Path Analysis (Existing Arrangement)

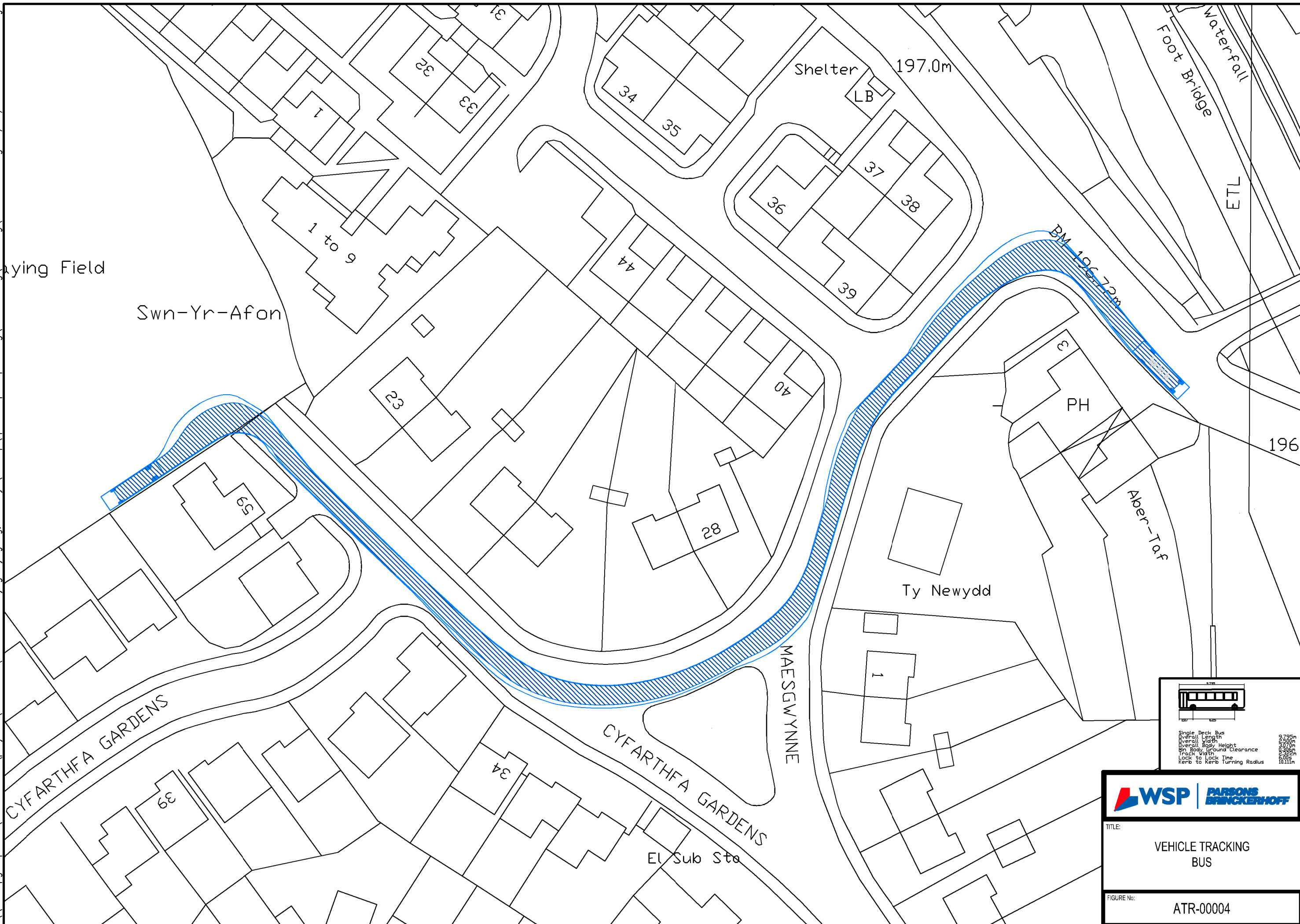
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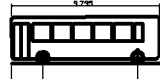




TITLE:
VEHICLE TRACKING
COACH

FIGURE No:
ATR-00002

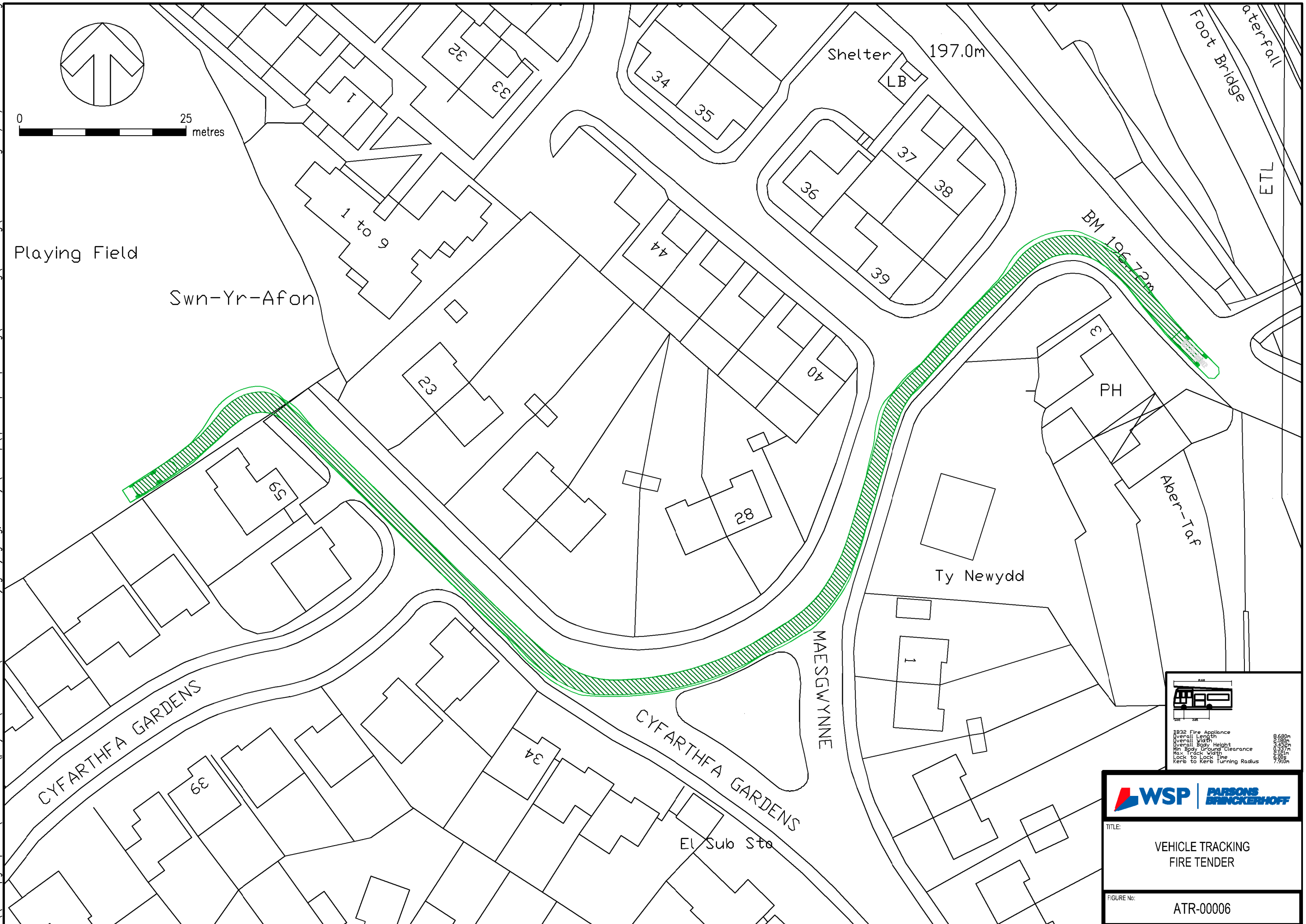


	
Single Deck Bus	9.75m
Overall Length	2.50m
Overall Width	2.50m
Overall Body Height	3.07m
Min Body Ground Clearance	0.30m
Track Width	2.50m
Lock to Lock Time	5.00s
Kerb to Kerb Turning Radius	10.11m

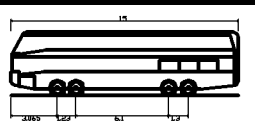
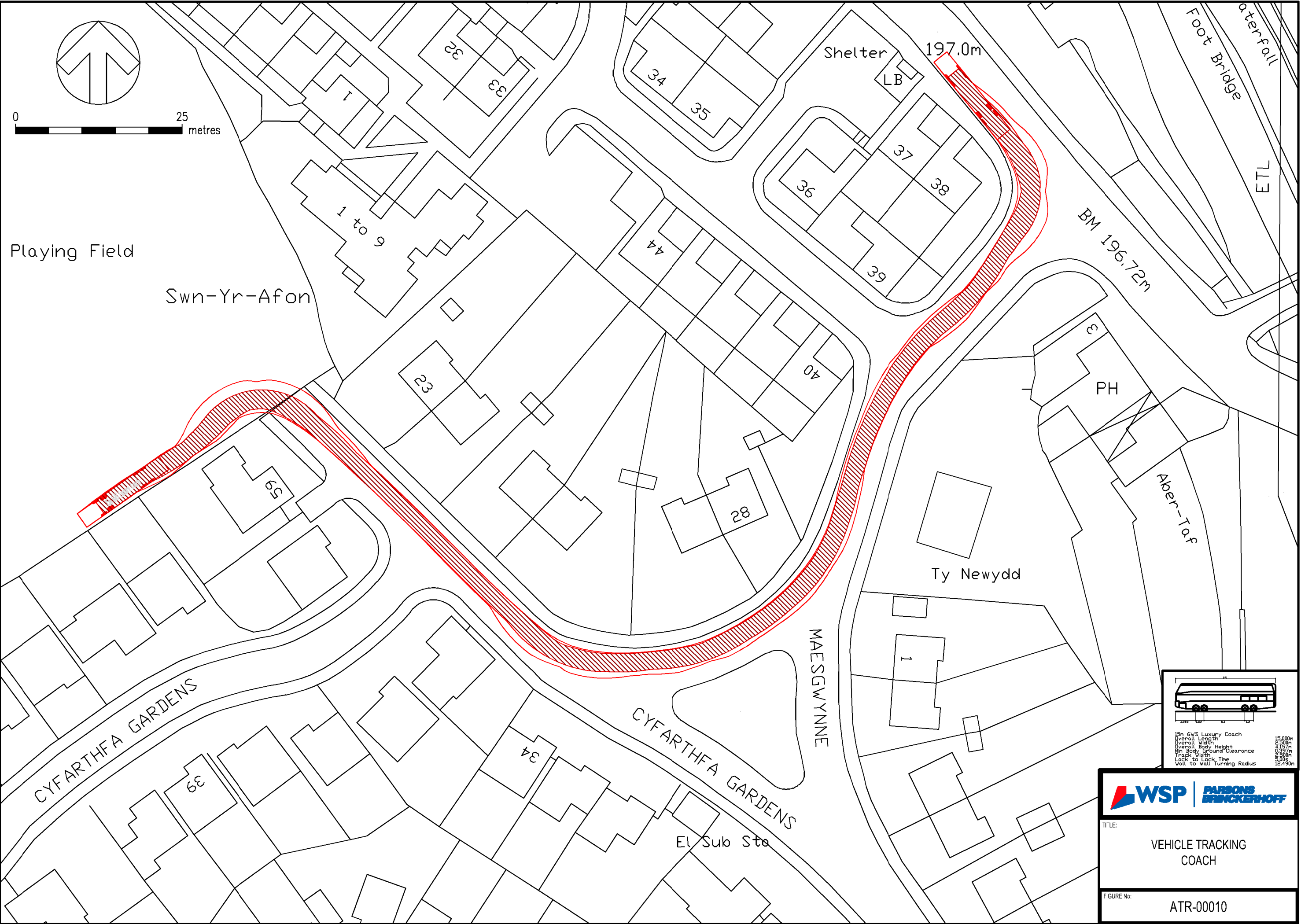


TITLE:
**VEHICLE TRACKING
BUS**

FIGURE No:
ATR-00004



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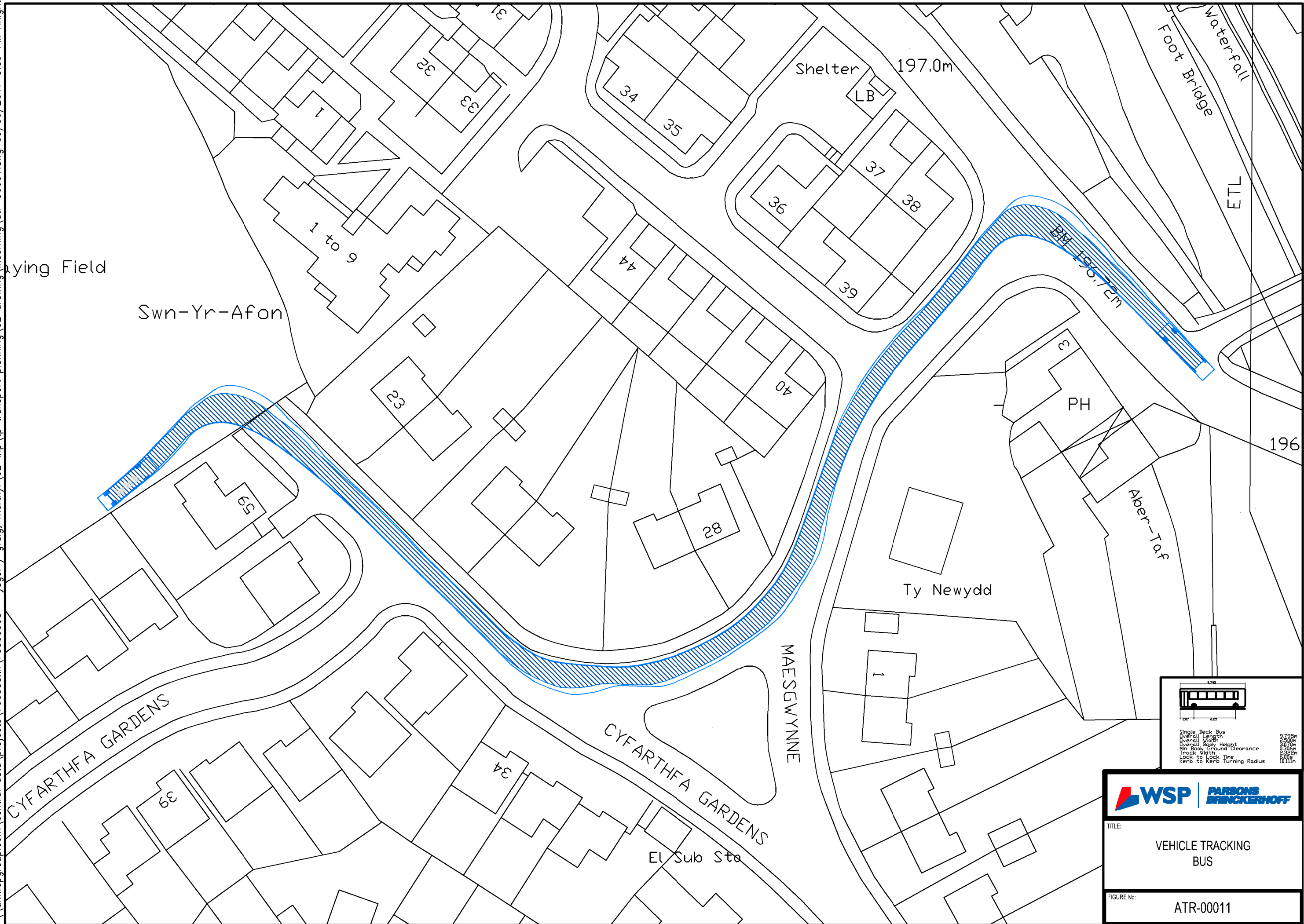


15m 6VS Luxury Coach	15.000m
Overall Length	2.500m
Overall Width	4.250m
Overall Body Height	0.500m
Min Body Ground Clearance	0.500m
Track Width	5.000m
Lock to Lock Time	12.450m
Wall to Wall Turning Radius	



TITLE:
VEHICLE TRACKING
COACH

FIGURE No:
ATR-00010





TITLE:
VEHICLE TRACKING
BUS

FIGURE No:
ATR-00011

Playing Field

Swn-Yr-Afon

Shelter 197.0m

 $\langle L$

BM 196.72m

P

Akber-Topf

Ty Newydd

MAESGWYNNE

CYFARTHFA GARDENS

~~El Sub Sta~~



DB32 Fire Appliance	
Overall Length	8.68
Overall Width	2.18
Overall Body Height	3.45
Min Body Ground Clearance	0.33
Max Track Width	2.12
Lock to Lock Time	6.00
Kerb to Kerb Turning Radius	7.91



TITLE:

VEHICLE TRACKING
FIRE TENDER

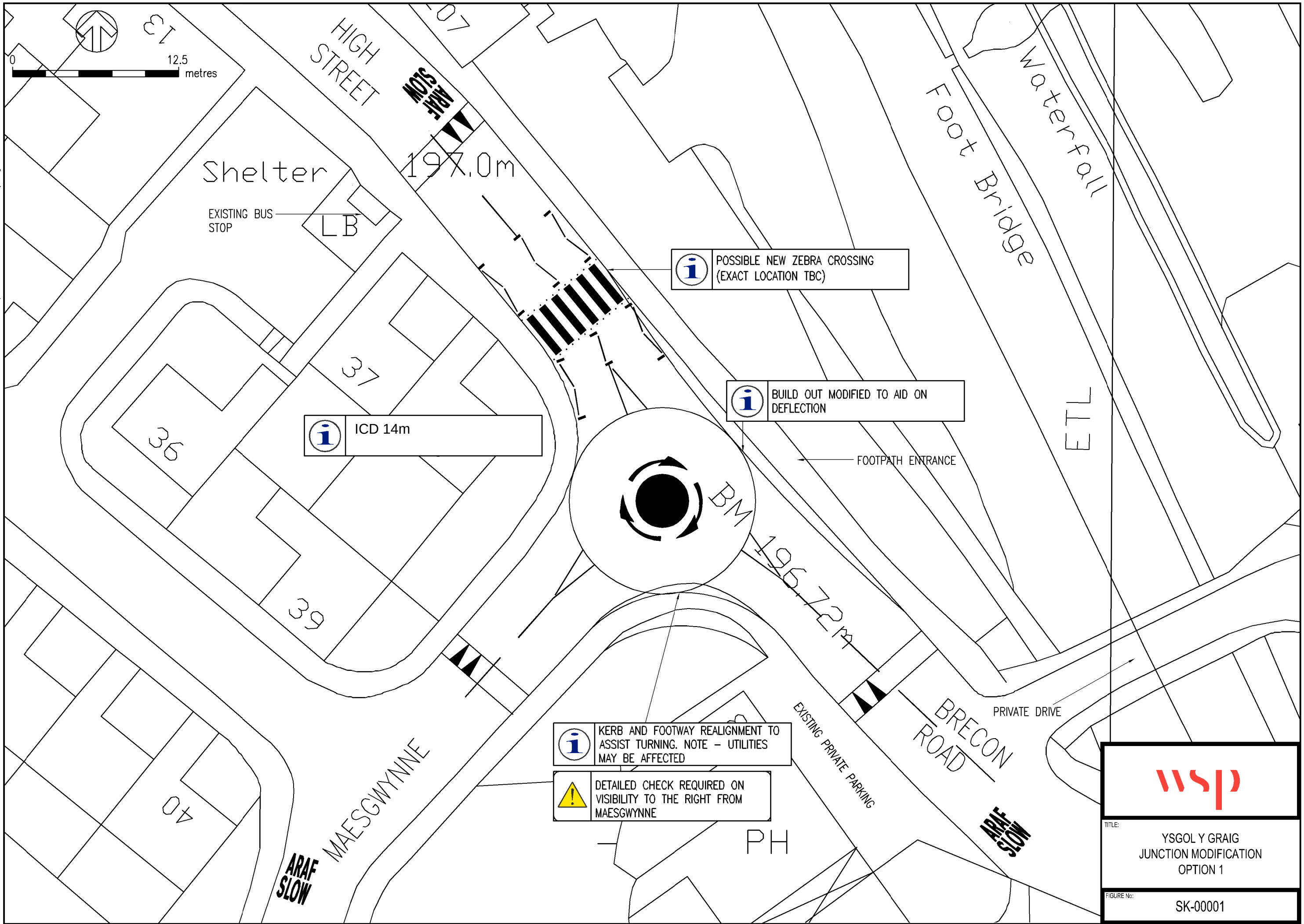
FIGURE No:

ATR-00012

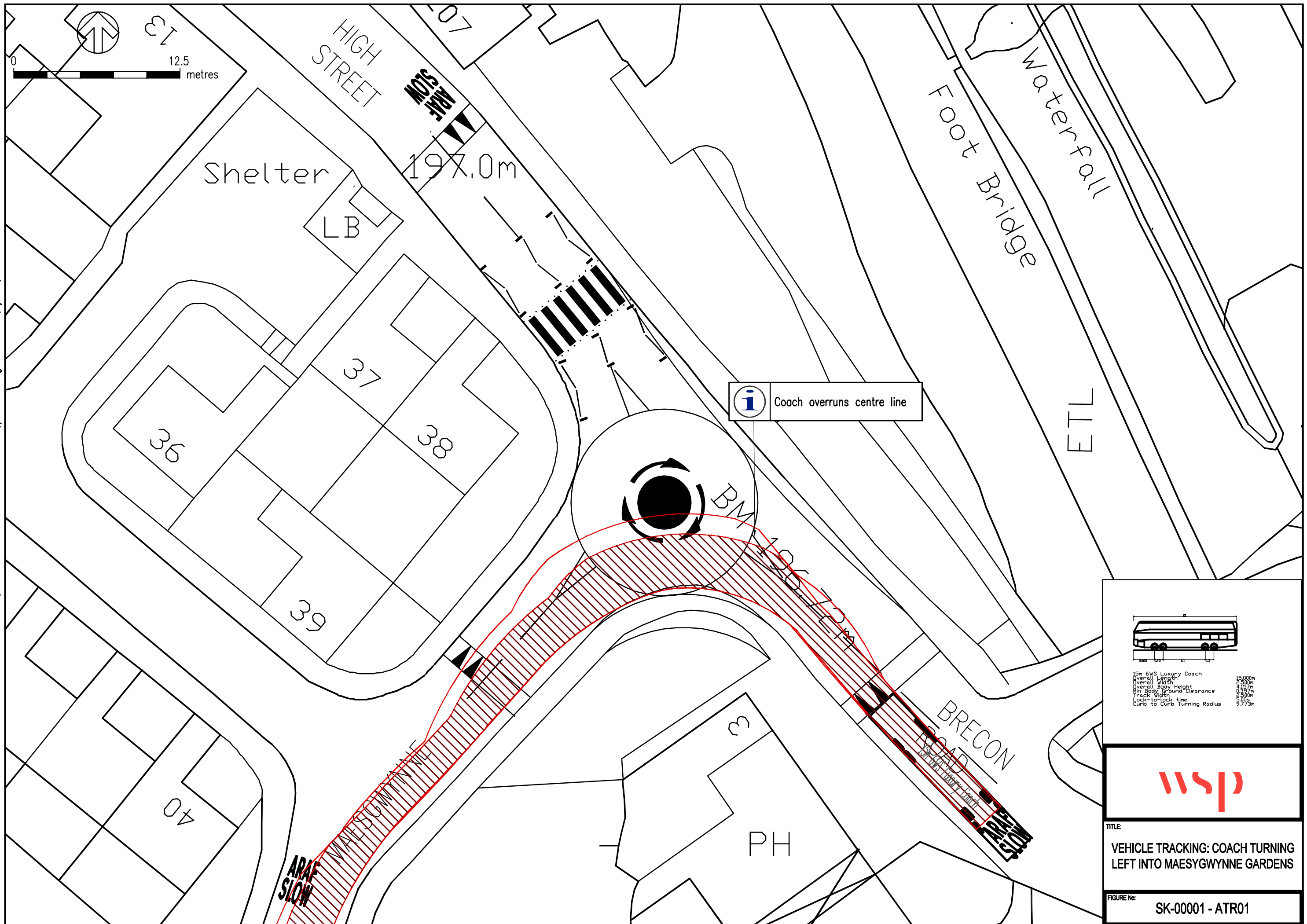
Appendix ADN02

**Junction Improvement Layout Arrangements
& Swept Path Analysis**

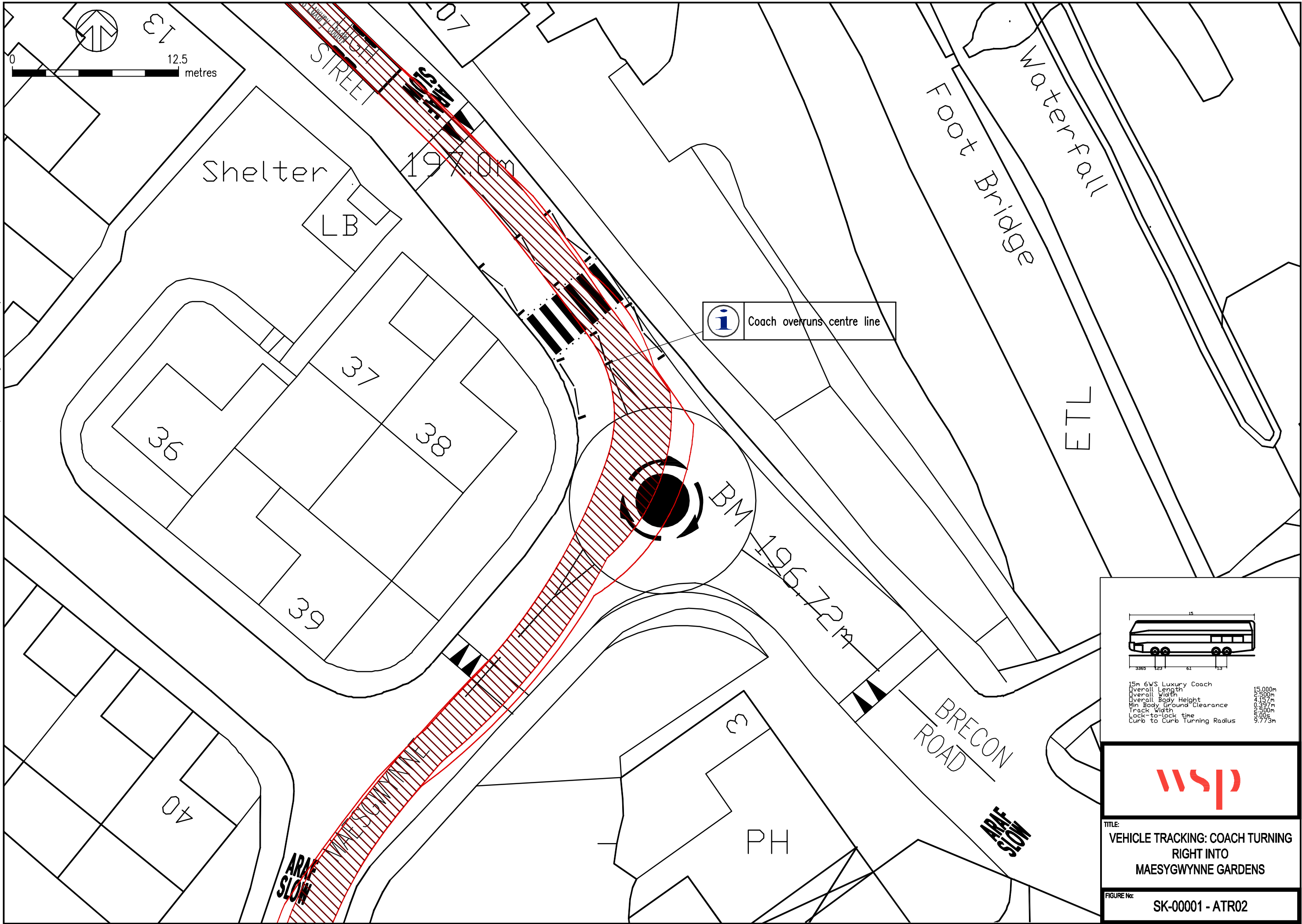
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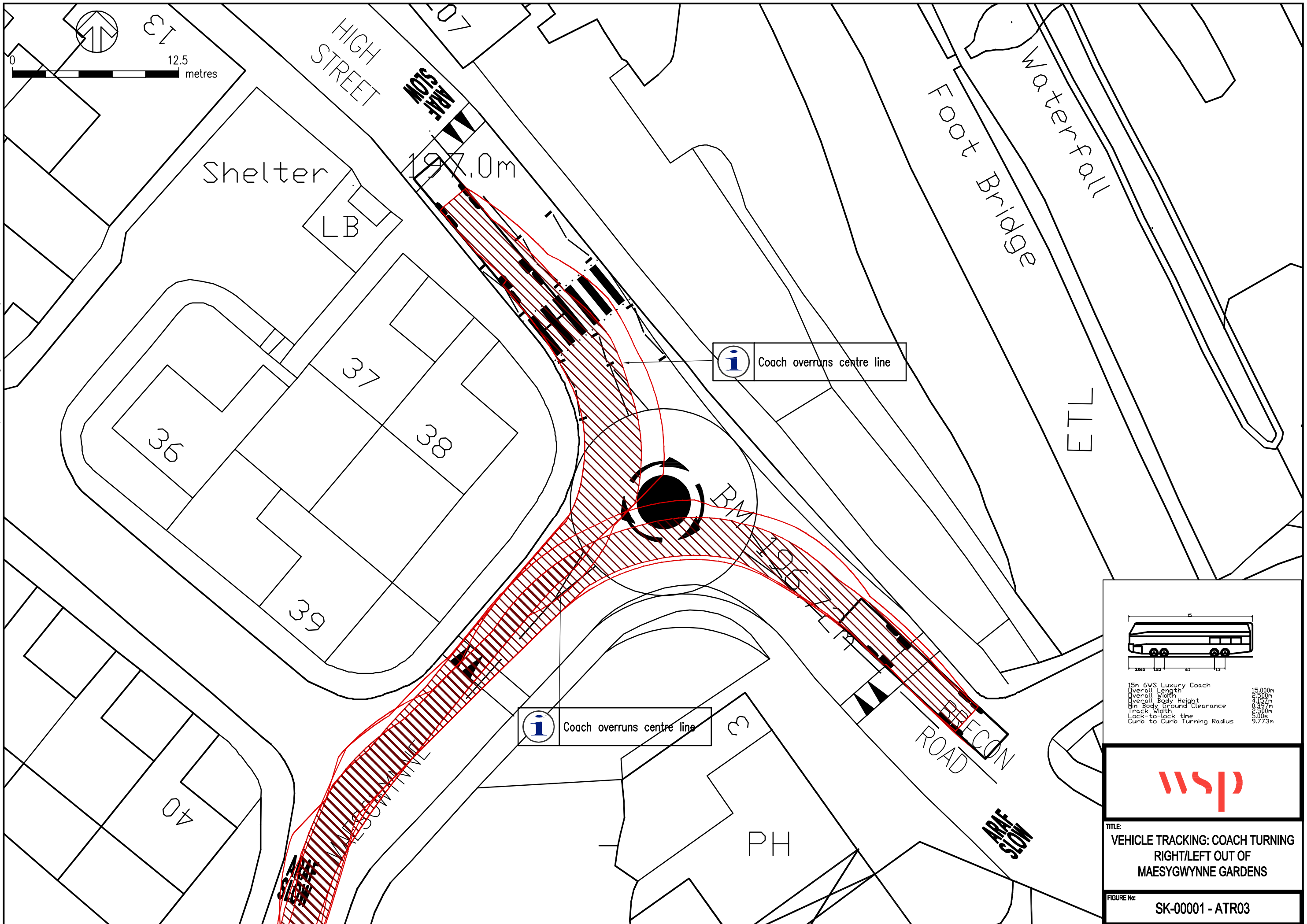
	
TITLE:	YSGOL Y GRAIG JUNCTION MODIFICATION OPTION 1
FIGURE No:	SK-00001



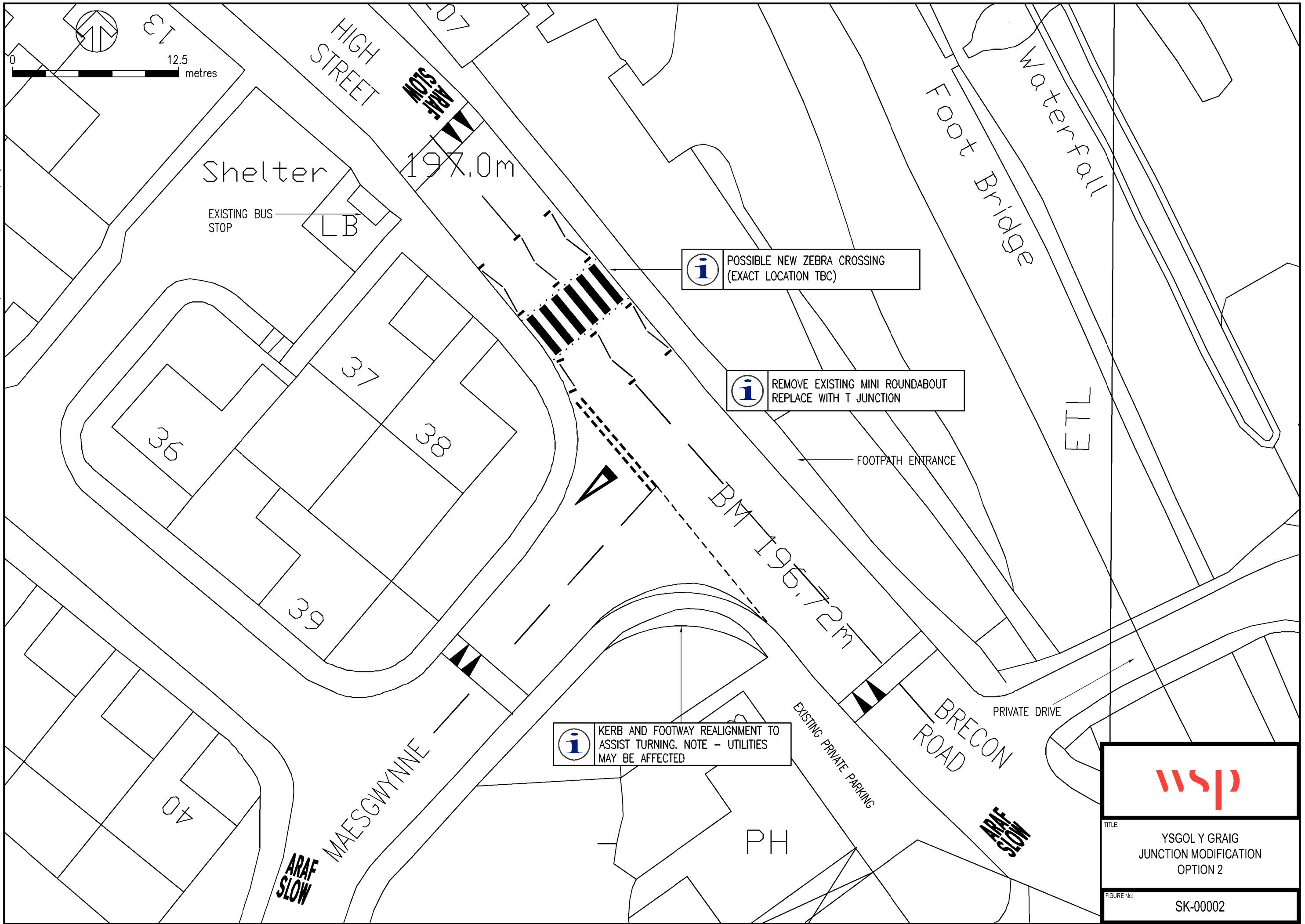
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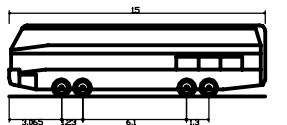
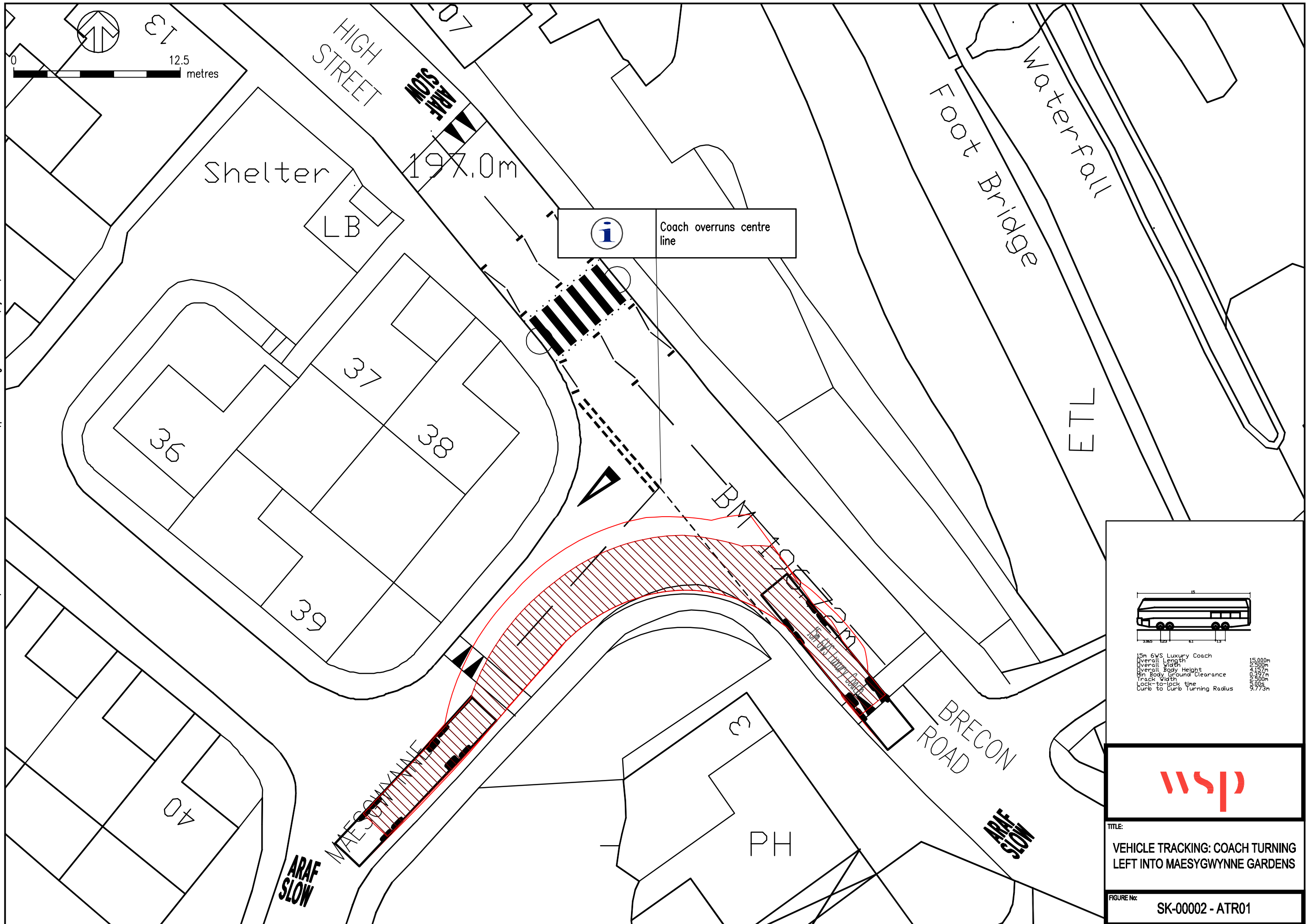


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15m 6WS Luxury Coach
Overall Length 15.000m
Overall Width 2.500m
Overall Body Height 4.157m
Min Body Ground Clearance 0.397m
Track Width 2.500m
Lock-to-lock time 5.00s
Curb to curb Turning Radius 9.773m

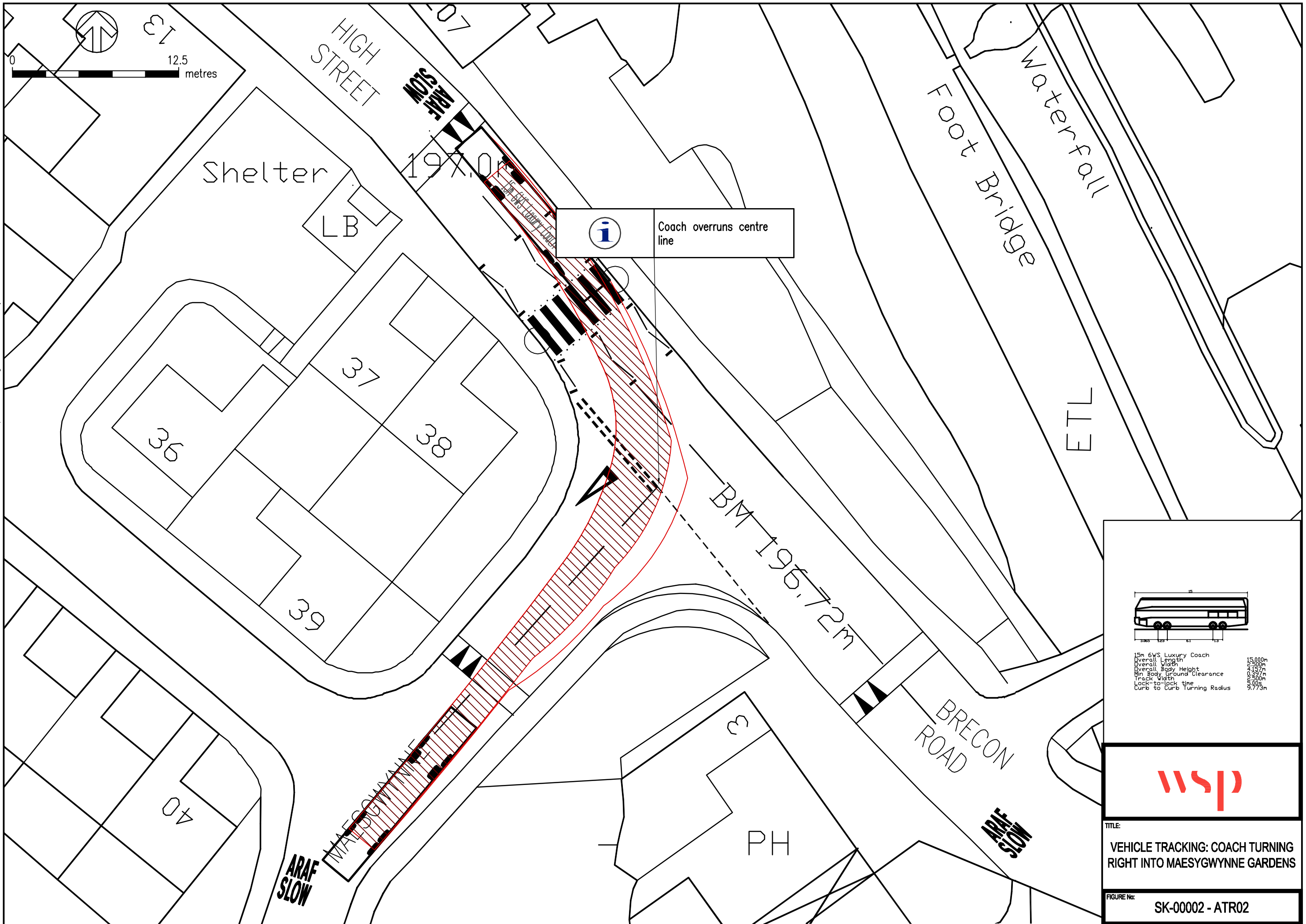


TITLE:

VEHICLE TRACKING: COACH TURNING
LEFT INTO MAESGYWYNNE GARDENS

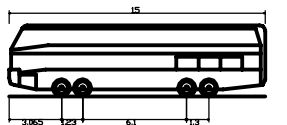
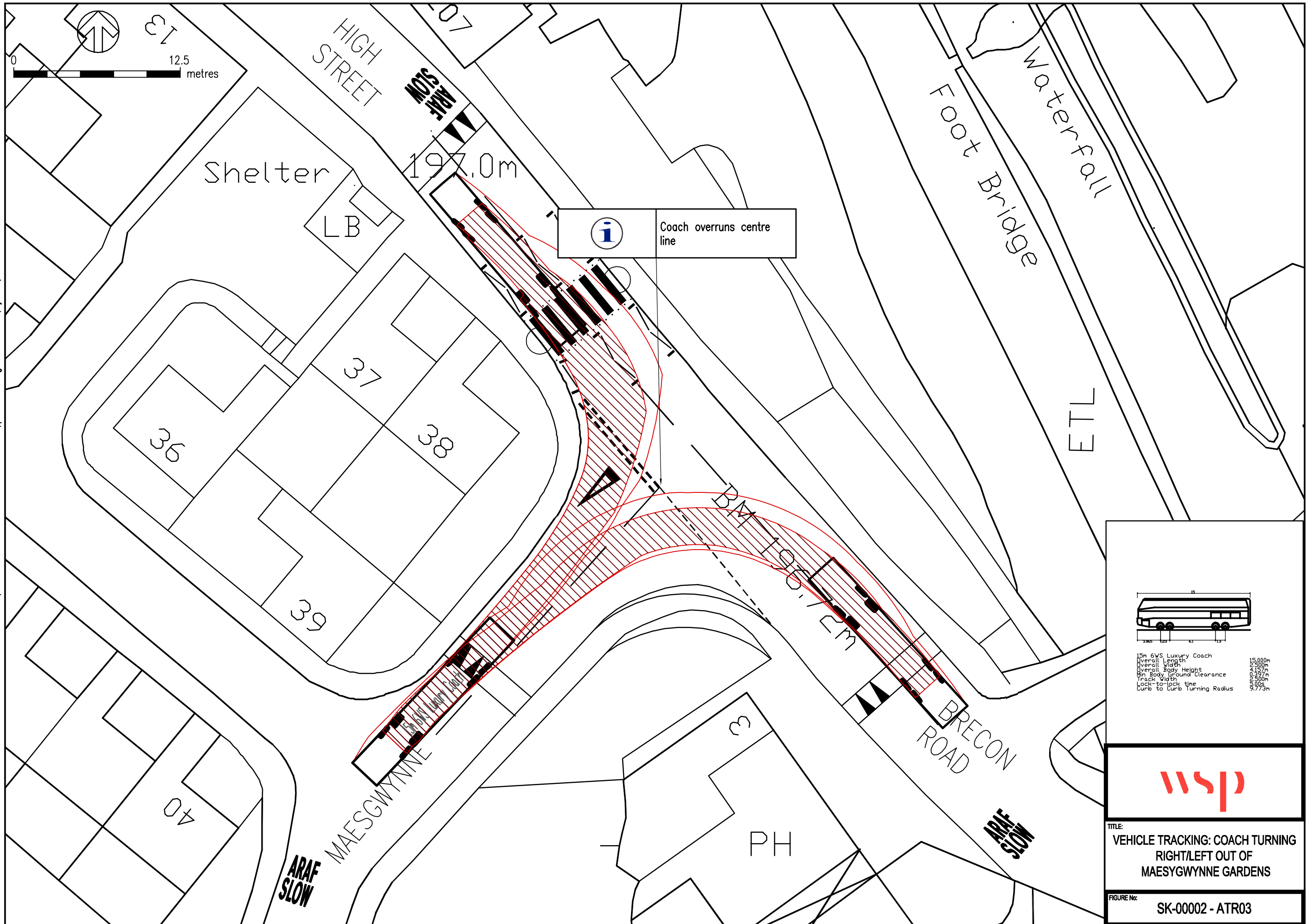
FIGURE No:

SK-00002 - ATR01



TITLE:
VEHICLE TRACKING: COACH TURNING
RIGHT INTO MAESYGYWNNE GARDENS

FIGURE No:
SK-00002 - ATR02



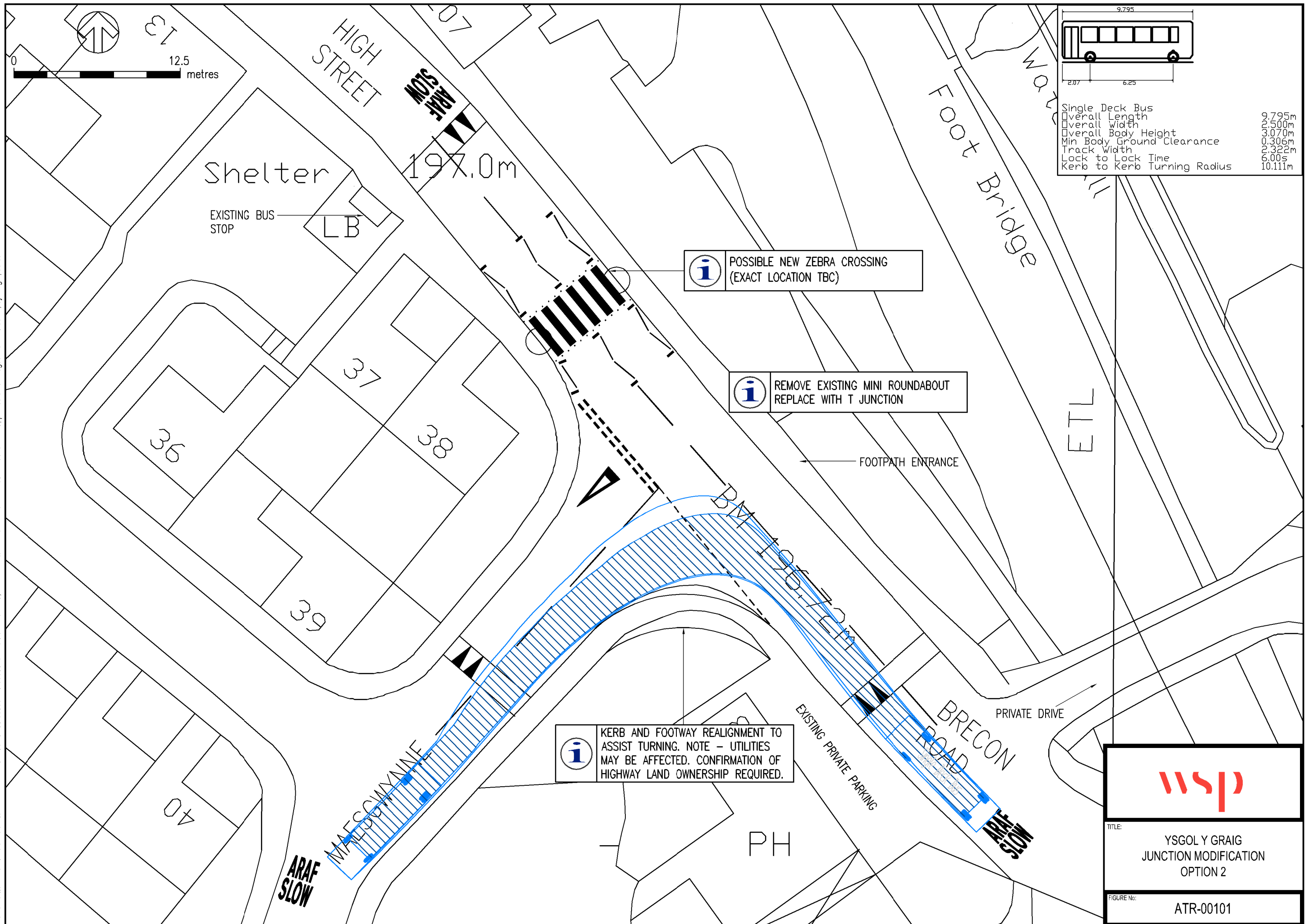
15m 6WS Luxury Coach
Overall Length 15.00m
Overall Width 2.50m
Overall Body Height 4.15m
Min Body Ground Clearance 0.39m
Track Width 2.50m
Lock-to-lock time 5.00s
Curb to curb Turning Radius 9.773m



TITLE:
VEHICLE TRACKING: COACH TURNING
RIGHT/LEFT OUT OF
MAESGWYNNE GARDENS

FIGURE No:
SK-00002 - ATR03

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