

1. INTRODUCTION

- 1.1. This technical note sets out a review of the access arrangements that would be required to serve land to the east of the built up area of Horning on land identified as HOR 06. On behalf of the landowners, Smiths Gore has requested URS to respond to the following,
 - a) *Assess options for accessing such a housing site,*
 - b) *Consider the form of junction, visibility splays, etc., and*
 - c) *Set out preferred recommendations*

2. HIGHWAY NETWORK

- 2.1. The site lies to the south of the A1062, Norwich Road that runs on an east/west alignment linking the A1151 at Wroxham with the A149 at Potter Heigham. The site has a frontage onto this road that has been measured as 111 metres. Along this frontage the width of the A1062 varies between 5.3 and 5.7 metres. There is no footway on either side of the road in the vicinity of the site. The character of this stretch of the A1062 is shown on Plate 1.



Plate 1: A1062 passing the site

- 2.2. Through the village the road is subject to a 40mph speed limit. The limit ends just inside the boundary between the site and the adjacent housing estate. As it passes in front of the site the national speed limit of 60mph applies.
- 2.3. There is an existing field access at the eastern end of the site frontage. This can be seen in Plate 1.

3. ACCESS CONSIDERATIONS

- 3.1. The development site would contain around 26 dwellings. The level of traffic associated with a development of that size would be in the order of 150 vehicles entering and a similar volume leaving each day; that gives an annual average daily traffic (AADT) flow of 300 vehicles.
- 3.2. Consideration has been given to two forms of access that could be appropriate for this site, a roundabout or priority junction. Both of these junction types can be split into subcategories, standard roundabout (diameter greater than 28 metres) and mini roundabout, and simple or ghost island priority junction.

- 3.3. A mini roundabout can only be installed on roads where the speed limit is 30 mph or less, therefore that option is ruled out.
- 3.4. It is usual for County Councils to use the Design Manual for Roads and Bridges (DMRB) to define the appropriate standards for their networks with individual publications that set out local standards for roads within new developments. When reference is made to trunk roads in the DMRB, this applies to principle roads within the county network.
- 3.5. TA 23/81 Junctions and Accesses: Determination of Size of Roundabouts and Major/Minor Junctions introduced a diagram that gave the highway designer an indication of the type and scale of junction that might be appropriate for various levels of traffic. A refined version of that diagram that can now be found in TD 42/95 Geometric Design of Major/Minor Priority Junctions is presented as Figure 1.
- 3.6. From this diagram it can be seen that roundabouts are used when the minor roads flows are much higher than those identified in paragraph 3.1.

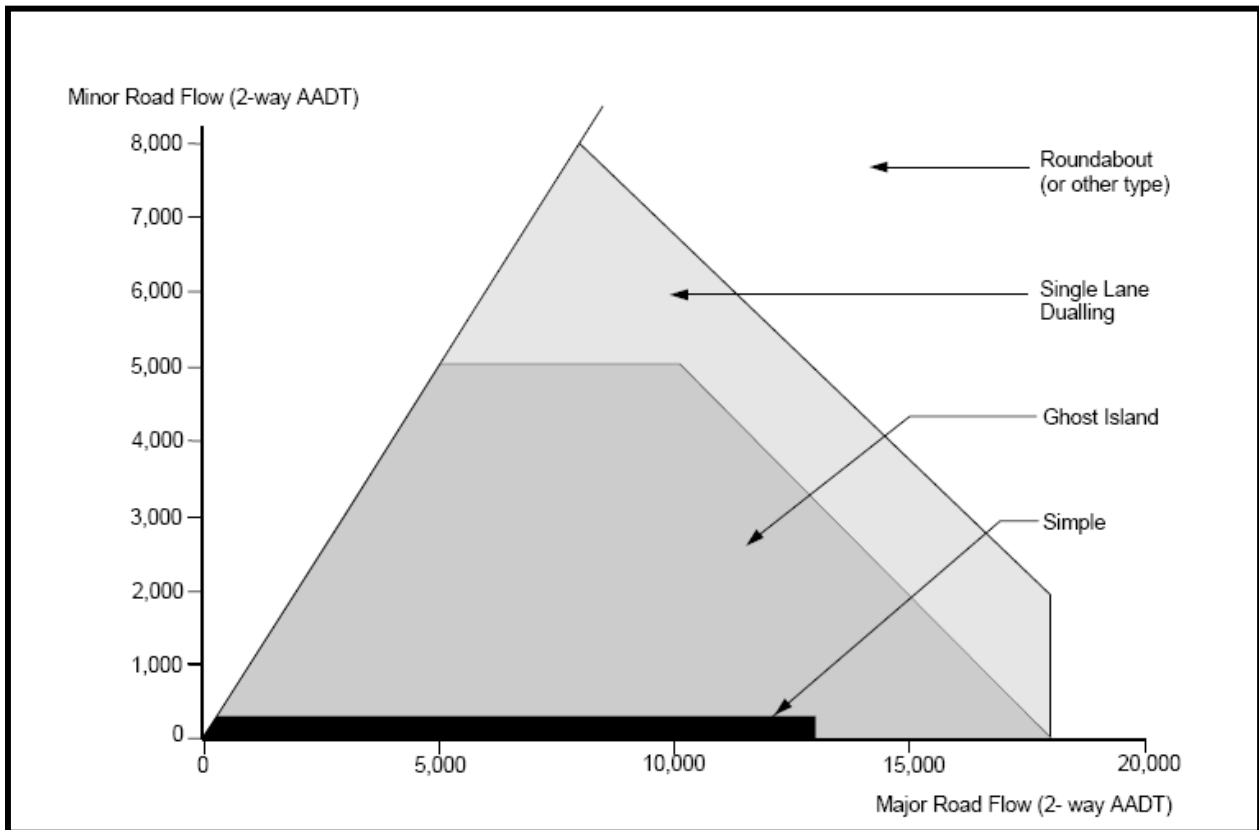


Figure 1: Guidance on Appropriate Form of Junction

- 3.7. The relevant design standard is set out in TD 41/95 **Vehicular Access to All-Purpose Trunk Roads**. The geometric standards given in this Standard are only relevant to direct accesses where use is forecast to be less than 500 AADT in the design year. Further advice on the form of the junction is set out in Table 2/2 of that Standard. That table is reproduced

below as Table 1. It can be seen that 'Layout 3' is applicable "Small Development e.g. up to 30 dwellings", which encompasses the development proposal.

Table 1: Recommended Standard Access Layouts

	Field Access	Single Dwelling	Small Development e.g. up to 30 dwellings	Medium sized Development e.g. industrial estate	Larger sized Development e.g. housing development	Where Large Vehicle likely	"Gateway Entry"	Diverge Taper e.g. PFS entrance	Merge Taper e.g. PFS exit
Direct Access Layout	1	2	3	3,4,5	4,5	6,7	8	9	10
Traffic using the access AADT	Less than 10 movements a week	Less than 50 movements a week	0 - 300	3:0 - 300 4:0 - 500 5:300-500	300 - 500	6:0 - 300 7:0 - 500	0 - 300 para 2.30	Para 2.31	Para 2.34
Layout suitable for carriageway configuration	Single Dual	Single Dual	Single	3 - Single 4 - Dual (Single as a relaxation) 5 - Single	(single as a relaxation) 4 - Dual 5 - Single	6 - Single 7- Single	Single	Single Dual	Dual 2 and above

3.8. The form of a Layout 3 access layout is shown in Figure 2.

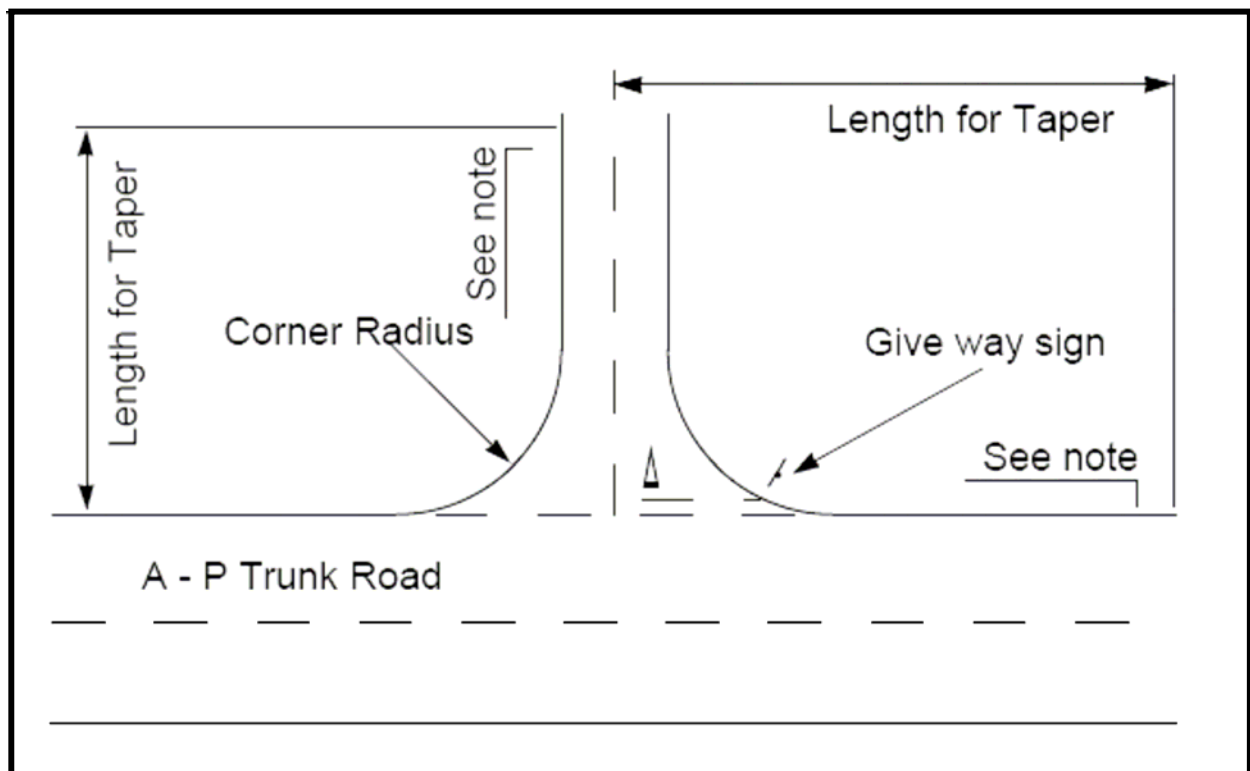


Figure 2: Form of Simple Access Layout

3.9. The next consideration is the visibility splay that needs to be provided. There are two components, the distance back along the minor road from which the visibility is measured ('X' distance) and the distance along the major road that can be seen from the minor road ('Y' distance).

- 3.10. TD 41/95 advises that the 'X' distance of 4.5m shall be provided for a direct access where the traffic flow in the design year is forecast not to exceed 500 AADT.
- 3.11. If the traffic approaching from the west enters the visibility splay while still in the 40 mph limit a 'Y' distance of 120 metres is required. If it falls outside the speed limit the length of the visibility splay will need to increase to 215 metres unless a speed survey can provide evidence of actual speeds that would warrant a shorter distance.
- 3.12. Traffic approaching from the east can legally travel at up to 60 mph; therefore the visibility splay needs to extend for 215 metres unless a lesser distance can be justified through the results of a speed survey. The procedure for collecting data to determine the speed is provided in TA 22/81 **Vehicle Speed Measurement on All Purpose Roads**.
- 3.13. The dimensions set out above have been plotted on Figure A1 that is included with this technical note as Appendix A. To the east, the line of vision lies partially within the major road carriageway. In that circumstance the visibility splay is made tangential to the nearer edge of the major road running carriageway. This concept is shown diagrammatically in Figure 3. The resultant length along the carriageway is approximately 120 metres. A consequence is that if the length of the A1062 subject to the 40 mph limit were extended to include the site and the visibility for the access, there would be no change in the area of non-highway land that fell within the visibility splay.

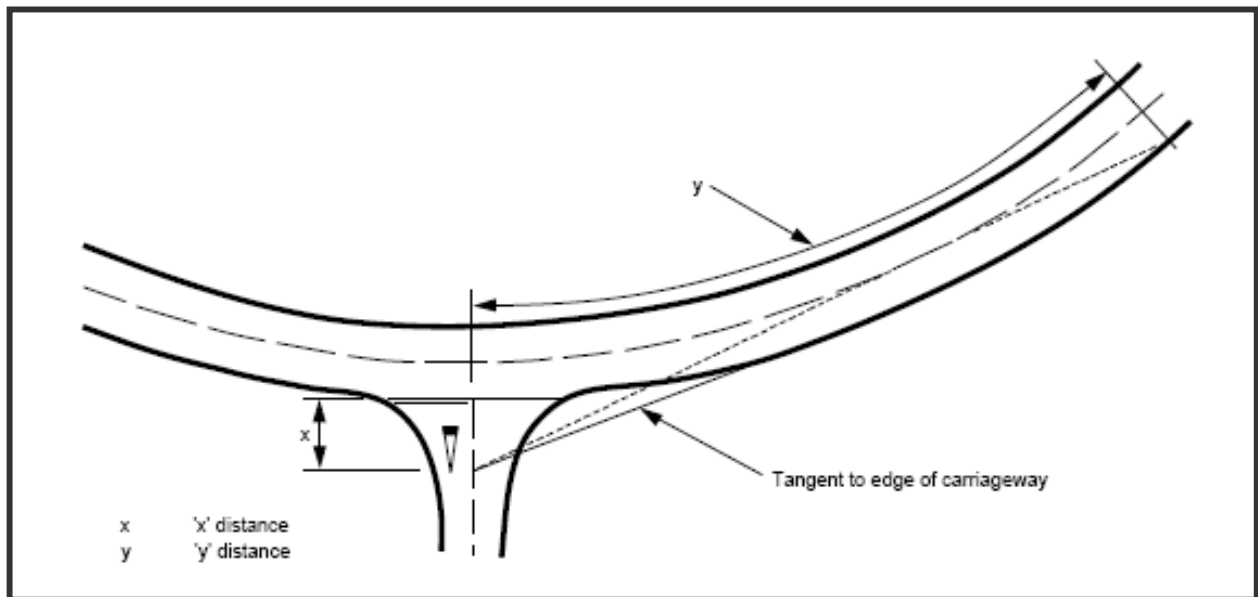


Figure 3: Visibility Standards with a Curved major Road

- 3.14. In order to comply fully with the standard the location of the access means that it extends into the neighbouring field.
- 3.15. The publication Manual for Streets promotes a considerable reduction in the size of visibility splays. This relates to both the 'X' and 'Y' distances. The 'X' distance of 4.5 metres enables drivers to look for gaps as they approach the junction. This increases junction capacity for the minor arm. Manual for Streets recommends that an 'X' distance of 2.4 m should

normally be used in most built-up situations, as this represents a reasonable maximum distance between the front of the car and the driver's eye.

3.16. Based on a review of practice in other countries, research, the skidding resistance that can be achieved on roads, and the study of sites by the authors of the publication, Manual for Streets recommended that a significant reduction in safe stopping distances (SSD) could be achieved where speeds were 60 kph or less. Examples of the differences can be seen for design speeds of 50 and 60 kph. The SSDs from DMRB are 70 and 90 metres respectively and the revised values recommended in manual for Streets are 43 and 56 metres, a reduction of nearly 40%.

3.17. Although a speed limit of 40 mph takes one outside the range for which Manual for Streets applies, if the flexibility that is promoted in that document is applied to this site, in conjunction with an extension of the 40 mph speed limit, it should be possible to contain the site access within the area identified as HOR 06. However the access would still need to be located towards the eastern edge of the site.



Plate 2: Norwich Road to the west of the site

4. PEDESTRIAN FACILITIES

4.1. As can be seen from Plate 2 there are no footways along Norwich Road that can be linked into the site. However there does not appear to be any impediment to extending one or both of the footways running alongside Abbott Road (Plate 3).

4.2. This would provide a more direct link to the main attractions in the village as there is an existing footpath link between Abbott Road and The Avenue and another link between Leeds Way and Mill Hill.



Plate 3; Eastern end of Abbott Road

5. OTHER CONSIDERATIONS

5.1. It should be noted that if the scale of the development were to exceed 30 dwellings the access would need to be formed as a ghost island priority junction. Because of the presence of the barn, which is at points within 0.5 metres of the north side of the carriageway, the widening would need to take place on the south side.

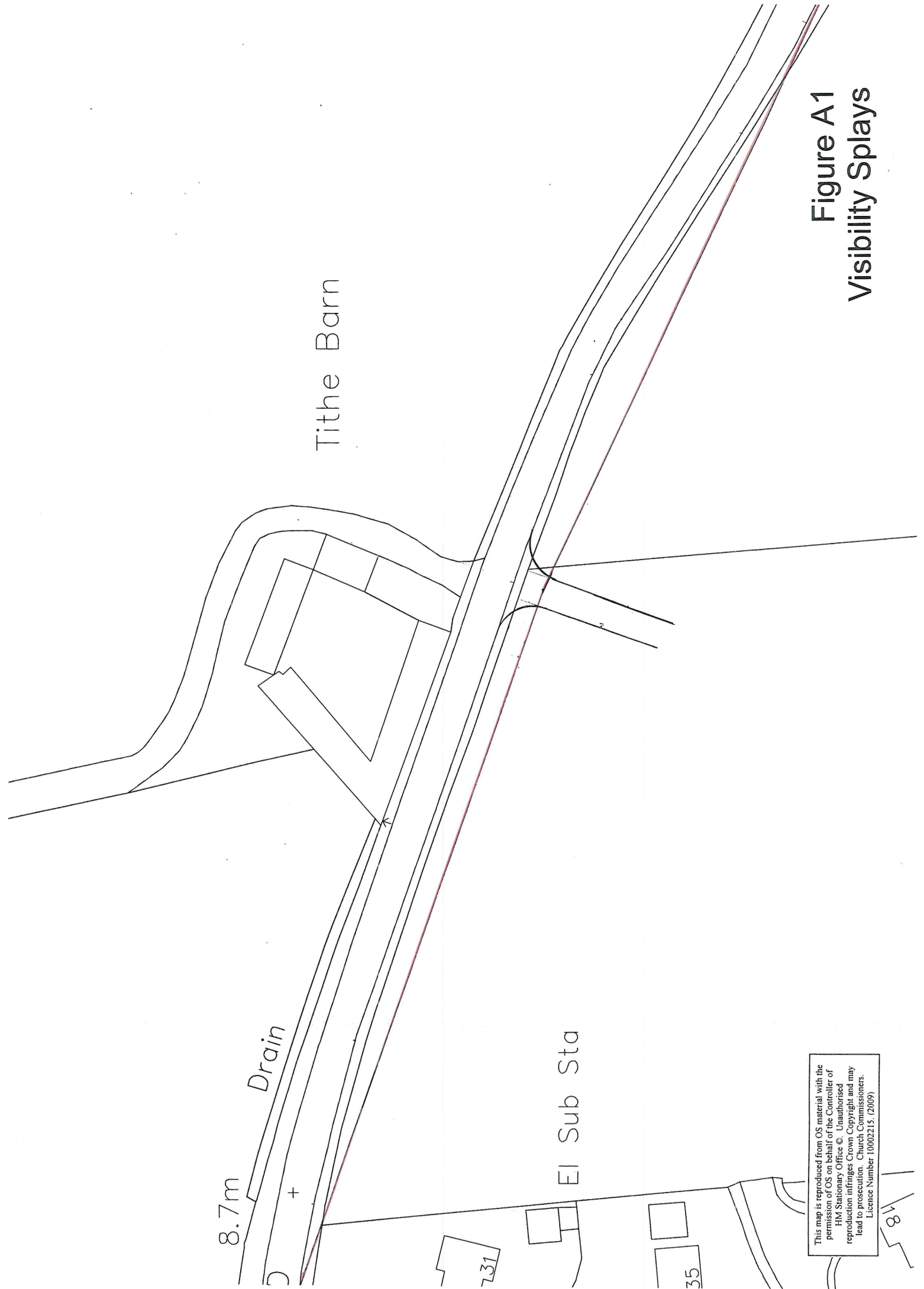
- 5.2. The forward visibility along Norwich Road to the east of the site is substandard. It is possible that if a new access were agreed without a change in the speed limit, there would be a requirement to provide some clearance of vegetation to the north of the carriageway so that a full sight stopping distance of 215 metres could be provided.



Plate 4: Vegetation on north side of Norfolk Road

Appendix A
Visibility Splays

Figure A1
Visibility Splays



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