



Major/Minor Priority Junction Audit

TD42/95 – Geometric Design of Major / Minor Priority Junctions

Project: 3167.06 Land south of A259 New Road & east of Brook Lane, Rustington, West Sussex

Client: Commercial Development Projects Limited

Junction Location: New site access to development from A259 New Road

Drawing Reference: REDW-3167-131

Design Speed: 120 kph (70 mph)

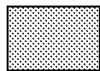
Prepared by: PMcL

Date: March 2017

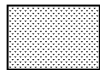
Key:



Advice only



Mandatory Section – Detailed design action



Departure/relaxation from standard required

TD42/95 Para	Design Standard	Comply Y/N	Design check comment	Departure from standard required
2.11	Choice of major/minor in Table 2/1 shows suitable junction arrangements	Y	No comment	
2.26	Priority junction may be used on dual carriageway. Option discounted	Y	No comment	
3.4	Horizontal alignment Should not be sited on sharp curves	Y	The major road has a radius of approximately 800 metres which will not adversely affect visibility	
3.6	Vertical alignment Best location for junctions on level ground not greater than 2% fall	Y	Major road gradient is less than 2%	
3.7	Where minor road joins junction on uphill gradient motorists may wrongly perceive junction form requiring longer gap to pull out into main road	Y	The site beneath the mini roundabout will be filled to raise levels. The minor road will approach the A259 on an uphill gradient but will incorporate a flat section adjacent to the merge lane	
5.2	Major/minor roads presents hazard for cyclists. Cyclists to be provided with safe passage through junction	Y	Cyclists will be diverted through the site before reaching the new junction	
5.12	Pedestrian facilities The requirements of pedestrians should be carefully considered	Y	No pedestrian activity is proposed at the new junction	
5.16	Guardrails should be provided to prevent indiscriminate crossing of the carriageway	Y	Guardrail provided at end of footpath/cyclepath to guide pedestrians into site and prevent cyclists cycling onto carriageway	
6.1	Landscaping The design of landscaping shall be agreed with Highway Authority. Shall not compromise visibility	Y	Landscaping shall be agreed with Highway Authority	



7.2	Design Speed Geometric standards for junctions are related to the traffic speed of the major road	Y	The acceleration lane length has been designed for the 85 th ile speed measured on the A259 New Road. This speed has been measured as 65mph (105kph). The acceleration taper length of 130m is sufficient for a design speed of 120kph	
7.3	Visibility Minor road traffic has to join or cross major road. It is therefore essential that minor road users have adequate visibility in each directions	Y	No right turn from junction. A visibility splay of 9x160m to the left is achievable at the egress	
7.4	Drivers approaching a major/minor priority junction from both the major road and minor road shall have unobstructed visibility as indicated in the following sections. The envelope of visibility for driver's eye height is as set out in TD9 (DMRB 6.1.1.2.2)	Y	160m forward visibility is achievable on the main road. Minor road junction levels will be raised to meet the major road levels and will be subject to detailed design	
7.5	Visibility – Major Road Drivers approaching the major/minor priority junction along the major road approaches shall be able to see the minor road entry from a distance corresponding to the Desirable Minimum Stopping Sight Distance (SSD) for the design speed of the major road	Y	160m forward visibility is achievable on the main road.	
7.6(a)	Visibility – Minor Road The principle of providing the required visibility for drivers approaching the junction from the minor road has three distinct features: a) Approaching drivers shall have unobstructed visibility corresponding to the Desirable Minimum Stopping Sight Distance (SSD) for the design speed of the minor road	Y	Visibility in excess of 90m is achievable for the minor road for a design speed of 30mph (48kph). Traffic will be negotiating an exit radius prior to entry to the acceleration lane. Minor road junction levels will be raised to meet the major road levels and will be subject to detailed design	
7.6(b)	b) From a point 15m back along the centre line of the minor road measured from the nearside edge of the major road, an approaching driver shall be able to see clearly the junction form and those peripheral elements of the junction layout	Y	Visibility from 15m back is achievable	
7.6(c)	c) The distance back along the minor road from which the full visibility is measured is known as the 'x' distance	Y	9m x 160m is achievable measured on offside kerb edge of egress	
7.7	If the line of vision lies partially within the major road carriageway. It shall be made tangential to the nearer edge of the major road	Y	Visibility is achievable	
7.8	In difficult situations, the 'x' distance may be taken as a relaxation from 9m to 4.5m	Y	9mx160m to the right is achievable	



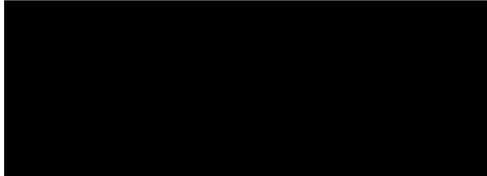
7.9	Similarly, although the 'y' distance shall always be provided, there is little advantage in increasing it	Y	9mx160m to the right is achievable	
7.10	These visibility standards apply to new junctions and to improvements to existing junctions	Y	9mx160m to the right is achievable	
7.11	Where the major road is a dual carriageway with a central reserve of adequate width	n/a	No right turns possible at site entrance	
7.14	Design Vehicle Allowance shall be made for the swept turning paths of long vehicles where they can reasonably be expected to use the junction	Y	Track swept paths for a 16.5m articulated lorry have been produced. Junction is of sufficient size to provide access for this vehicle	
7.22	At dual carriageway junctions the through lane widths should be maintained	Y	Lane widths remote from junction will be maintained	
7.25	Carriageway widths around curves Where carriageway widths are taken around short radius corners, added width shall be provided to cater for the swept path of larger goods vehicles	Y	Track swept paths for a 16.5m articulated lorry have been produced. Junction is of sufficient size to provide access for this vehicle	
7.45	Traffic islands and refuges Traffic islands should be provided in the mouth of the minor road at major/minor junctions	Y	Traffic island is provided	
7.46	Physical islands shall have an area of at least 4.5sqm	Y	Larger island is provided	
7.47	Where a traffic island serves as a refuge for pedestrians it shall be at least 1.5m wide and have dropped kerbs	Y	No pedestrians/cyclists proposed at new access although island is large enough to cater for pedestrians/cyclists at a future date if required	
7.52(a)	Diverging tapers and lanes Nearside diverging tapers shall not be provided at simple junctions. They shall be provided where left turning traffic is greater than 600 vehicles AADT	Y	An auxiliary lane diverge is provided	
7.54	Nearside diverging tapers shall be formed by a direct increase to a width of 3.5m contiguous to the corner into the minor road (preferably of radius at least 20m where the main road design is 85 kph and at least 40m above this speed). The width around the radius will depend on the radius selected. A give way line shall be provided so that left turning traffic gives way to traffic turning right	N	An entry radius of 20m is provided due to site constraints. The width of carriageway is sufficient for 16.5m articulated vehicles turning. The entry radius is not a speed reducing feature as Table 7.2 shows that smaller entry radii are acceptable and Fig.7/12 shows traffic giving way, therefore potentially stopped in advance of the radius. The proposal is therefore compliant with Fig.7/12 although does not provide a 40m entry radius. Advance roundabout signing and hazard signing has been introduced to highlight the presence of junction.	
7.55	The desirable length of the nearside diverging taper shall be as Table 7/5a and Table 7.5b	Y	Adequate nearside diverge is provided via an auxiliary lane	
7.59	Merging tapers shall only be used at dual carriageway junctions. They shall be provided where a B road junction joins an A dual carriageway road having a design speed of 85 kph or above	Y	Merging taper has been provided	



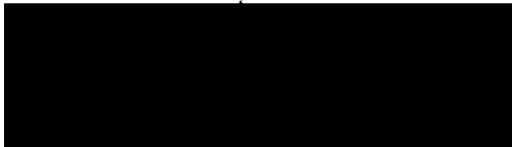
7.61	A separate turning lane, preferably of radius at least 25m where the main road design speed is 85kph and at least 30m above this speed shall be used to introduce the merging taper from the minor road. The initial width of the lane which will depend on the radius of the turning lane determined from Table 7/2 should be decreased at a constant taper depending on the design speed (Fig 7/13)	Y	30m radius provided between minor road and merging lane	
7.62	The length of the taper to be used are given in Table 7/6. The minimum initial width of a merging taper shall be 3.5m	Y	A 130m taper has been provided to accord with a 120kph design speed	
7.72	For the left turn merge to the main road, the minor road channelising islands shown in Figs 7/18 and 7/19 shall be designed so as to provide a constant width of turn into the major road. Width in accordance with Table 7/2. If there is a taper as shown on Figs 7/13 and 7/19, the widths shall be as set out in paras 7.58-7.62. Hatched markings as Figs 7/18 and 7/19	Y	Constant width on exit provided. Width complies with Table 7/2	
7.73	For the left turn diverge from the major road, the channelising island described in para.7.72 and shown in figs 7/18 and 7/19 shall be designed so as to provide a constant width around the turn to the minor road. The width shall be determined from Table 7/2. Hatched markings as Figs 7/18 and 7/19	Y	Constant width on exit provided. Width complies with Table 7/2	
7.76	Drainage and crossfall From considerations of surface water drainage and driver comfort. The road camber on the major road shall be maintained through the junction and the minor road graded into the channel line of the major road. Checks to be made for flat areas	Y	The junction levels and drainage shall be designed to comply with this requirement at detailed design stage	
7.77	Traffic Signs and Road Markings The need for, and layout of, traffic signs and road markings is an integral part of the design process and no junction design is complete without these features having been included	Y	Details of road markings and advance direction signs will be provided at detailed design stage. The planning layouts show the markings proposed together with advanced roundabout signs and hazard boards	
7.78	The policy and detailed guidance on these aspects are given in the Traffic Signs Manual	Y	Road markings and signs to be in accordance with TSRGDs and TSMs	



Lead design engineer: Mr Paul McLaughlin BSc CEng MICE MCIHT:
Date: 15th March 2017
Signed:



Checked: Mr Robert Watts CEng MICE MCIHT:
Date: 15th March 2017
Signed:





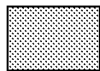
Design Audit of Proposed shared footpath/cyclepath TD90/05 – The Geometric Design of Pedestrian, Cycle & Equestrian Routes

Project: 3167 Land south of A259 New Road & east of Brook Lane, Rustington, West Sussex
Client: Commercial Development Projects Limited
Junction Location: East of new site access to development from A259 New Road
Drawing Reference: REDW-3167-120-Rev A & REDW-3167-130-A
Design Speed: 30 kph reduced to 10kph at bends
Prepared by: PMcL
Date: August 2015

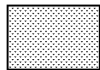
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Detailed design action



Departure/relaxation from standard required

TD90/05 Para	Design Standard	Comply Y/N	Design check comment	Departure from standard required
1.6	As with all highway design, there is a need to balance issues of safety and practicality. This advice Note provides 'preferred' and 'acceptable' minimum values based upon the best available evidence, but in exceptional circumstances it may be appropriate to apply some flexibility in using these figures over short distances and where other measures are used such as 'SLOW' markings to encourage lower speeds	Y	Due to site constraints the shared footpath/cyclepath has a reduced SSD of 10m (10kph) at the bends into the site. This reduction is acceptable and in accordance with Table 3.2. Additional 'SLOW' markings proposed for this short length	
2.4	A design speed of 30kph should be most off-site cycle routes. However, where the cyclist would expect to slow down the design speed may be reduced to 10kph over short distances	Y	Reduction in design speed to 10kph required at bends where will slow down in any event	
2.5	Design speeds appropriate for different route types: Acceptable minimum = 10kph General provision = 30kph	Y		
3.2	Visibility SSD is the distance for a rider to perceive, react and stop safely in adverse conditions SSDs for cyclists are given in Table 3.1	Y	Reduced design speed on bends required and permitted in Table 3.1	
3.3	Eye and object heights Designers should ensure that an object at the minimum SSD is visible from a range of heights of 1.0m to 2.2m	Y	Shared route is level and vertical visibility is achievable	



3.5	Momentary Obstructions Street furniture, trees & shrubs should be located outside of the envelope of the SSD	Y	The visibility envelope will be kept clear	
3.6	Any crossing of a trafficked road should be located such that drivers of vehicles have full visibility of NMUs	Y	Proposed shared path does not cross carriageways	
3.7	A visibility splay should be provided for NMUs approaching crossings	Y	No crossings are proposed	
4.2	Alignment Changes in horizontal alignment should normally be via simple circular curves rather than straight sections	Y	Circular curves are proposed at bends	
4.4	The preferred minimum radius for cycle routes is 25m. For sections of route where the design speed is 10kph, a preferred minimum radius of 4m should be provided and consideration should be given to widening the track and providing warning signs	Y	A minimum 4m radius is provided on bend into site. The route is widened to 3.5m at the first bend on entry to site with additional 'SLOW' markings added	
4.5	Vertical Severe crest curves are unlikely to occur along cycle tracks and hence achieving adequate forward visibility in the vertical direction will rarely cause difficulties. However, this should be checked	Y	The shared route is flat	
6.1	Crossfall HD39 (DMRB 7.2.5) considers footway crossfalls. For cycle and equestrian facilities, the values used for footways may be adopted up to a maximum of 5%. Crossfalls greater than 3% can create difficulties for cyclists when the surface is icy	Y	Design crossfall to be limited to 2.5% (1/40)	
6.2	Crossfall can be either to one side of cambered. However on bends, adverse crossfall should be avoided	Y	Adverse crossfall to be avoided on bends	
7.16	Cross-Section Shared & Adjacent Use Routes for NMUs Shared use facilities should generally be restricted to where flows of either cyclists or pedestrians are low and hence the potential for conflict is low. Unsegregated shared facilities have operated satisfactorily down to 2m wide with combined pedestrian and cycle use of up to 200 per hour. However, the preferred minimum width for an unsegregated facility is 3.0m	Y	The shared route adjacent to the A259 New Road is 3.0m.	
7.21	Boundary Treatments	Y	The route within the site narrows is 3.3m between east boundary fence and proposed service yard wall. Para 7.21 suggest a 0.25m 'kerb shyness' distance of 0.5m for a route bounded on both sides. This	



			reduces the effective width of route on the site to 2.3m which is deemed acceptable for this short straight length of shared footpath/cyclepath	
7.22	It is desirable to provide physical separation between NMU routes and carriageways. For pedestrians and cyclists the preferred separation between the NMU route and the carriageway is 1.5m, with an acceptable separation of 0.5m. The higher value of 1.5m should, where possible, be used on roads with speed limits in excess of 40mph	Y	A distance separation between the NMU route and the A259 main carriageway is 1.5m. For some of the new footway/cycleway the width reduces to 1.0m	
7.24	Hazards Adjacent to NMU Routes Where an NMU route is adjacent to hazards such as a ditch or embankment slopes steeper than 1:3 a separation greater than that in paragraphs 7.22 and 7.23 should be considered	Y	Route adjacent to A259 New Road does not have large level differences or ditches present. Where a retaining wall or embankment is proposed a pedestrian guardrail is also proposed	

Lead design engineer: Mr Paul McLaughlin BSc CEng MICE MCIHT:
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