

6.4.1 Junction Visibility Standards

<div> <div>Major or Priority (Road A)</div> <div>Minor or Non-Priority (Road B)</div> </div>	County Roads				Residential Housing Estate Roads (1)			
	Classified 'A' Roads	Classified 'B' & 'C' Roads	'Rural' Unclassified Road > 40 mph	'Urban' Unclassified Road < 40 mph	Local Distributor Road	Major Access Road	Minor Access Road	Shared Surface Road
Local Distributor Road	★	★			9x90			
Major Access Road	★	★			9x70 (2)	9x70 (2)		
Minor Access Road	★	★	★	★	4.5x70	4.5x60	4.5x45	
Shared Surface Road				★		2.4x60	2.4x45	2.4x30
Shared Driveways Drive (3)	★	★	★	★		2.4x60	2.4x45	2.4x20

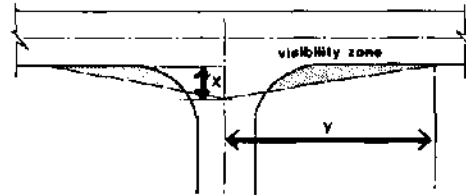
(1) In cases where the major or non-priority residential road does not meet the TMS requirements of this guide treat as an 'urban' unclassified road.

(2) 'X' distance may be reduced to 4.5m when minor road serving less than 100 dwellings.

(3) For shared drives serving up to 5 dwellings the 'X' distance may be reduced to 2.4m. For single private drives the 'X' distance may be reduced to 2.0m.

★ See table a. below

TABLE A



Visibility zones for traffic turning out of non-priority roads are defined by "X" distance and visibility distance ("Y" distance) as shown

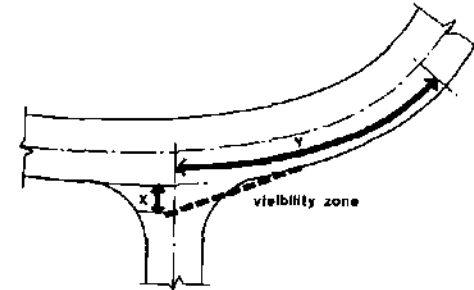
Y Distance

SPEED Kph Mph		ROAD CLASSIFICATION	Y
50	30	All types, except class 1 roads	70m
50	30	Class 1 roads- 'A' signed	90m
60	37	All classified roads	90m
70	43	-	120m
85	53	-	150m
100	62	-	215m
120	74	-	295m

X Distance

The "X" distance will vary according to the proposed use of the junction.

Normally a "X" distance of 9.0m will be required however this may be reduced to 4.5m where the minor road serves less than 100 dwellings.

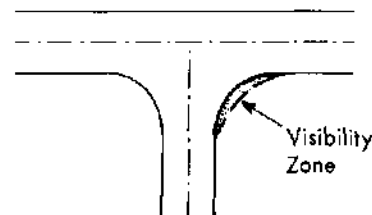


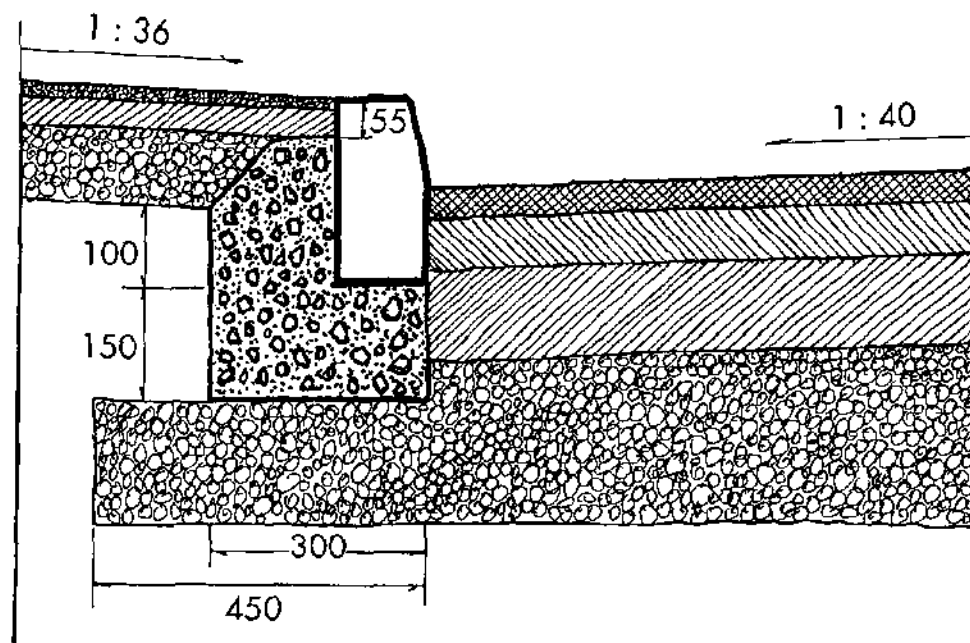
Where road curvature would cause the sight line to exclude part of the carriageway from the visibility zone, the sight line should be drawn tangentially to the edge as shown.

Left Turn Junction Visibility Zones

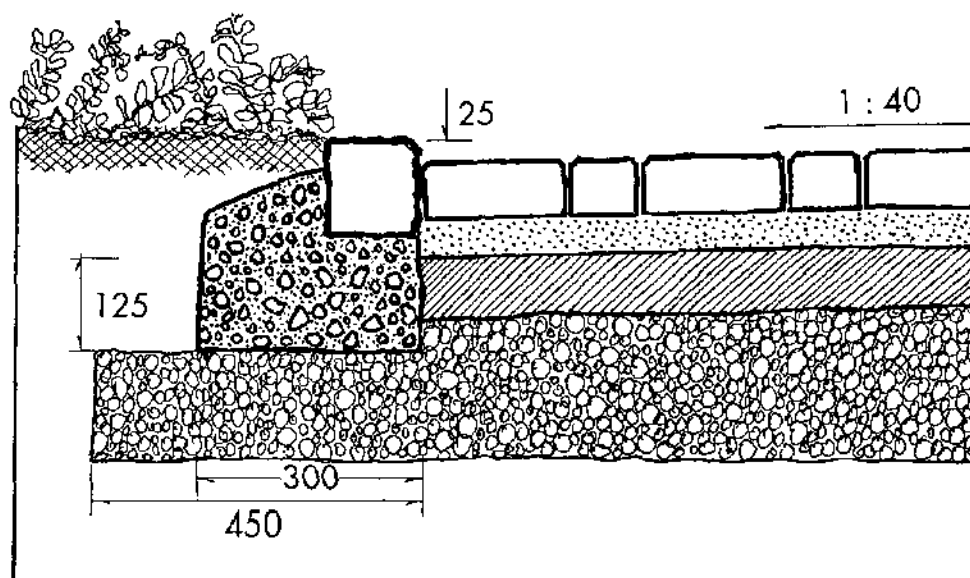
As general guidance, it is suggested that visibility should be ensured for vehicles turning left into a non-priority road by providing a visibility radius tangential to the kerb (i.e. inside the kerb radius). Suggested normal visibility radii for different junction angles and kerb radii are as shown below.

Junction deflection (degrees)	Kerb radius		
	4m	6m	10m
80	10m	11m	19m
90	9m	10m	19m
100	8m	9m	19m





Cross-section through Major Access Road



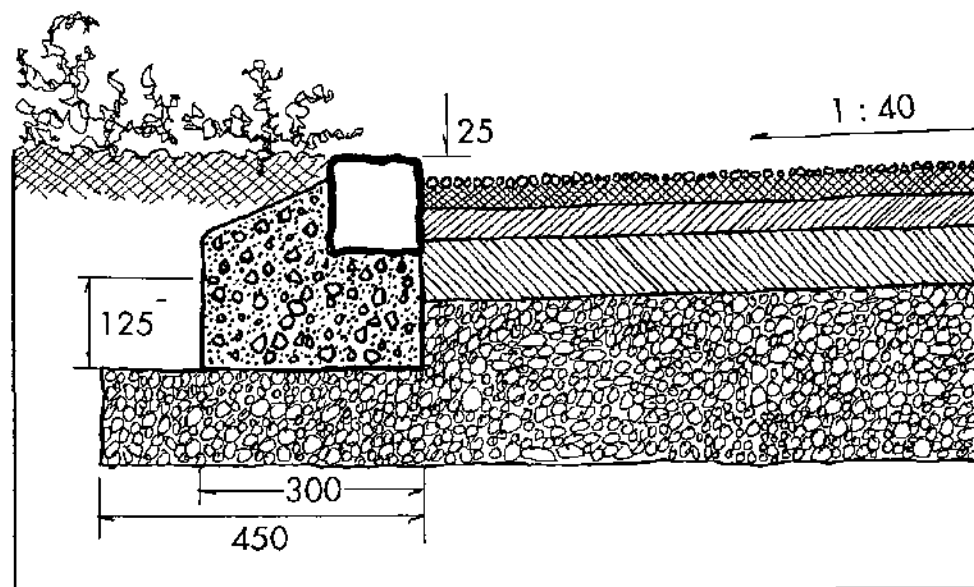
Cross-section through Block Paved Road

Road Adoption Advance Payment Code (APC) Highways Act 1980 Section 219

6.5.1. The Advance Payments Code applies throughout Suffolk.

6.5.2. Within six weeks of Building Regulations approval you will receive an Advance Payments Code Notice telling you how much money is to be deposited with the Highway Authority or what security must be given before building work (even the foundations) can start. The sum of money will be the amount which the County Surveyor, or his agent, where appropriate, calculates it would cost to do the street works. To start work on houses without a deposit being made is an offence and the Highway Authority will be quite prepared to prosecute.

6.5.3. One point to note is that the Advance Payments Code requires the County Surveyor or his agent to serve a Notice specifying the sum to be deposited or secured by the Developer in respect of the same unit of land for which Buildings Regulations approval has been given. Accordingly, if a Developer submits for Building Regulations approval plans of a very large number of houses, he must expect to be served with an Advance Payments Code Notice requiring the deposit or the securing of a very large sum of money. The estate cannot be subsequently divided for the purposes of the deposit and Developers are therefore asked to consider the advantages of sub-dividing their estates into manageable phases before seeking approval of plans in accordance with Building Regulations.



Cross-Section through Shared Surface Road

Section 38 Agreements and Procedures

6.5.4. Provided developers have entered into an Agreement under Section 38 of the Highways Act 1980, no deposit need be made under the APC Notice. The Agreement will provide that if a road is constructed to the satisfaction of the Highway Authority, in accordance with the plans attached, the Highway Authority will, on expiry of a maintenance period (normally 12 months), thereafter maintain that road. The Developer will be absolved from any further liability for maintenance.

6.5.5. Prospective purchasers and Building Societies are also likely to favour the existence of a Section 38 Agreement since this should (provided both Developer and Surety do not go bankrupt at the same time) guarantee there will be no future road charges to be paid.

6.5.6. The Highway Authority will require the Section 38 Agreement to be supported by either a cash deposit from the Developer or a Bond given by an approved Surety. Inspection and legal fees are payable by the Developer.

6.5.7. Where an Estate Developer wishes to complete a Section 38 Agreement he should apply to the County Surveyor, or his agent as appropriate, as soon as practicable. At the Developer's request and where it is considered reasonable to do so, the site may be divided into a number of stages and an Agreement completed for each stage of the site before building work commences on the dwellings in that stage.



6.5.8. Initially, the Developer should forward, for each Agreement, two copies of each relevant drawing for approval, together with drainage calculations and a soil survey where this has been requested. One copy of the layout will be returned to the Developer showing the area that the Council is prepared to accept as forming part of the Agreement. Eight coloured layouts and three copies of the road and surface water sections will be required. All of the land owned by the Developer should be indicated by a red outline.

6.5.9. The County Solicitor (or the legal advisor in the case of an Agent Authority) will prepare a draft Agreement which will be sent to the Developer or his Solicitors for approval. Once the draft has been approved the engrossment will be prepared and despatched for sealing by the Developer and the Surety Company.

6.5.10. Written evidence of approval of surface water drainage from the water authority or their agents will be required where appropriate before the Section 38 can be signed. Written evidence of adoption of the surface water drainage by the Water Authority will be required before the highway can be adopted.

6.5.11. Only when the Developer and his Surety have sealed the engrossment may house building work commence, unless deposits have been made or a temporary Bond provided, but the Agreement will not show on Local Searches until it has been sealed by all parties.

6.5.12. Whilst it is not an offence to commence roadworks before the Agreement is completed or a deposit paid, the Developer is advised :-

- to ensure that any work carried out complies with the plan approved by the County Surveyor, and
- that the County Council's inspection fees have been paid, so that it is inspected by the County Council's Area Surveyor, or by the appropriate officer of the District Council in the areas where the District Councils act as the County Surveyor's agent.

All drawings must be to scale and properly presented

6.5.13. Free hand sketches and 'not to scale' drawings will not be accepted. Adequate details of existing topography shall be shown both on and adjoining the site to enable setting out to be accurately located. **THE ROAD PROPOSALS SHALL BE SHOWN IN THE FOLLOWING DETAIL :-**

- 1/2500 scale site location plan with north point (this can be included with the 1/500 scale layout plan).
- A 1/500 scale plan (or larger) showing the road together with full details of curves, footpaths, cycleways, vehicular access, surface water sewers and manholes, and all services within the proposed highway. With some developments a 1/200 scale plan will be required for the Agreement.



- Longitudinal section of proposed road and sewers together with existing ground levels. The levels must be related to Ordnance Datum. The horizontal scale should be the same as the layout plan, the vertical scale 1/100 or larger. The long section should be sufficient to enable the works to be properly set out.
- A typical cross section of the road, footpaths, cycleways and shared cycleways, showing the construction proposed to a scale of 1/50 or larger.
- Cross sections will be required where differences in ground level between the road and the adjoining existing ground level exceeds 0.5 metres.

Any departure from the agreed plans will require the prior approval of the Highway Authority. Revised 1/500 layout plans (as constructed) will be required.

Adoption of Roads

6.5.14. The Highway Authority can be recommended to adopt estate roads, footways, together with cycleways and linking footpaths and visibility splays, provided that :-

- the Developer (not the Contractor) completes a Section 38 Agreement.
- all work is completed in accordance with the approved details and in compliance with the specification of works and materials;
- advance notice is given at designated stages in the works to allow for proper inspection and the checking of materials by the County Surveyor's representative.

Stage	Percentage reduction of Original Bond Sum
Completion of Part One Works	maximum 50%
Completion of Part Two Works	maximum 40%
Completion of Maintenance Period	10%

Bond Reduction Table

6.5.15. The Agreement will require the Developer to carry out the work expeditiously and in phase with the building works. Completed sections of road of reasonable length may be adopted in advance of the completion of the whole estate.

6.5.16. Completion certificates are issued in two stages, Part One and Part Two.

6.5.17. A set of prepaid cards will be sent to the developer at the time of agreeing Section 38 details to be returned to the Area Surveyor or Agent Authority at the relevant stages of construction. Return of cards will be a pre-requisite of bond release. Bond reductions may be appropriate at the following stages of construction (see table opposite).

6.5.18. The Agreement will only be prepared after submission to, and the agreement of plans by, the County Surveyor or his agent authority.

6.5.19. The areas that may be offered for adoption are : carriageways, bus laybys, cycleways, footways and footpaths, verges (where appropriate) and visibility splays.

6.5.20. Amenity areas, private car parking spaces, play areas and other open spaces not necessary for highways purposes must be excluded from the Section 38 plans. The maintenance of these areas should be discussed with the District Council.

6.5.21. It is the County Council's policy that roads within housing estates serving six or more houses should be constructed to adoption standards. A shared driveway will normally serve a maximum of five residential properties.





6.5.22. Street lighting will be adopted by the relevant authority when the installation is required by the County Council having regard to its policy. Street lighting will normally be required on all estate developments.

6.5.23. Further advice on street lighting is given in Section 6.3 of this guide.

Structures to be adopted

6.6.1. Developers seeking the adoption, by the Highway Authority, of bridges, culverts or retaining walls supporting the highway should satisfy the following five-stage procedural requirements :-

- APPROVAL IN PRINCIPLE to outline structural proposals Form TA1(SCC)1993
- APPROVAL OF DETAILED DRAWINGS
- DESIGN AND CHECK CERTIFICATE for detailed calculation and drawings Form TA2(SCC)1993
- NOTIFICATION OF PROGRESS OF WORKS
- COMPLETION INFORMATION Form 277(SCC)

Approval in Principle (Form TA1(SCC)1993)

6.6.2. The purpose is to ensure that adequate regard is paid to appropriate Codes of Practice, Bridge Design Standards and soils information. The form should be completed by the developer or his agent at the earliest time to ensure that the type of structure proposed will be acceptable for adoption. Where possible a preliminary General Arrangement Drawing should be included in the documents for approval.



6.6.3. Proper consideration of soils information in interpretive reports, structural form, geometry and finishes are essential at this stage.

6.6.4. It is inadvisable to commence detailed structural designs prior to agreement of the 'approval in principle'.

Approval of Detailed Drawings

6.6.5. The purpose is to ensure that working drawings include adequate details for the satisfactory performance and maintenance of the structure. The Developer should submit working drawings as soon as they are available. It is intended that this should be a process of liaison leading to submission, for formal approval, of FORM TA2(SCC)1993 and the design and check certificates which must be completed by suitably qualified persons.

Design and Check Certificate (Form TA2(SCC)1993)

6.6.6. The purpose is to ensure that detailed design calculations and drawings comply with the agreed 'approval in principle'. The developer or his agents should submit calculations, approved drawings, design and check certificates for acceptance by the County Council prior to commencement of any works.



Notification of Progress

6.6.7. On acceptance of the design and check certificate the developer will be advised of the stages at which inspection of the works, by the County Council, will be required. Notification cards may be used for this purpose or where progress of works necessitate, telephone the County Bridge Engineer, Ipswich 230000, ext. 5486. The above forms TA1(SCC)1993 and TA2(SCC)1993, and a Schedule of Design Documents (T.A.S.) relating to Highway Bridges and Structures can be obtained in writing from the County Surveyor.

Completion of Works (Form 277(SCC)).

6.6.8. On completion of the work the developer must submit Form 277(SCC) for record purposes. This form acts as an as-built record of the structure, including photographs, details of services, clearances and proprietary products used. Adoption may not proceed without the completion of Form 277(SCC).

Other Retaining Walls

6.6.9. Any length of retaining wall within 4 metres of the edge of the metalled carriageway or footway (if in existence) and which at any point is 1.3m above ground level, shall be erected in accordance with plans, sections and specifications approved by the Highway Authority.

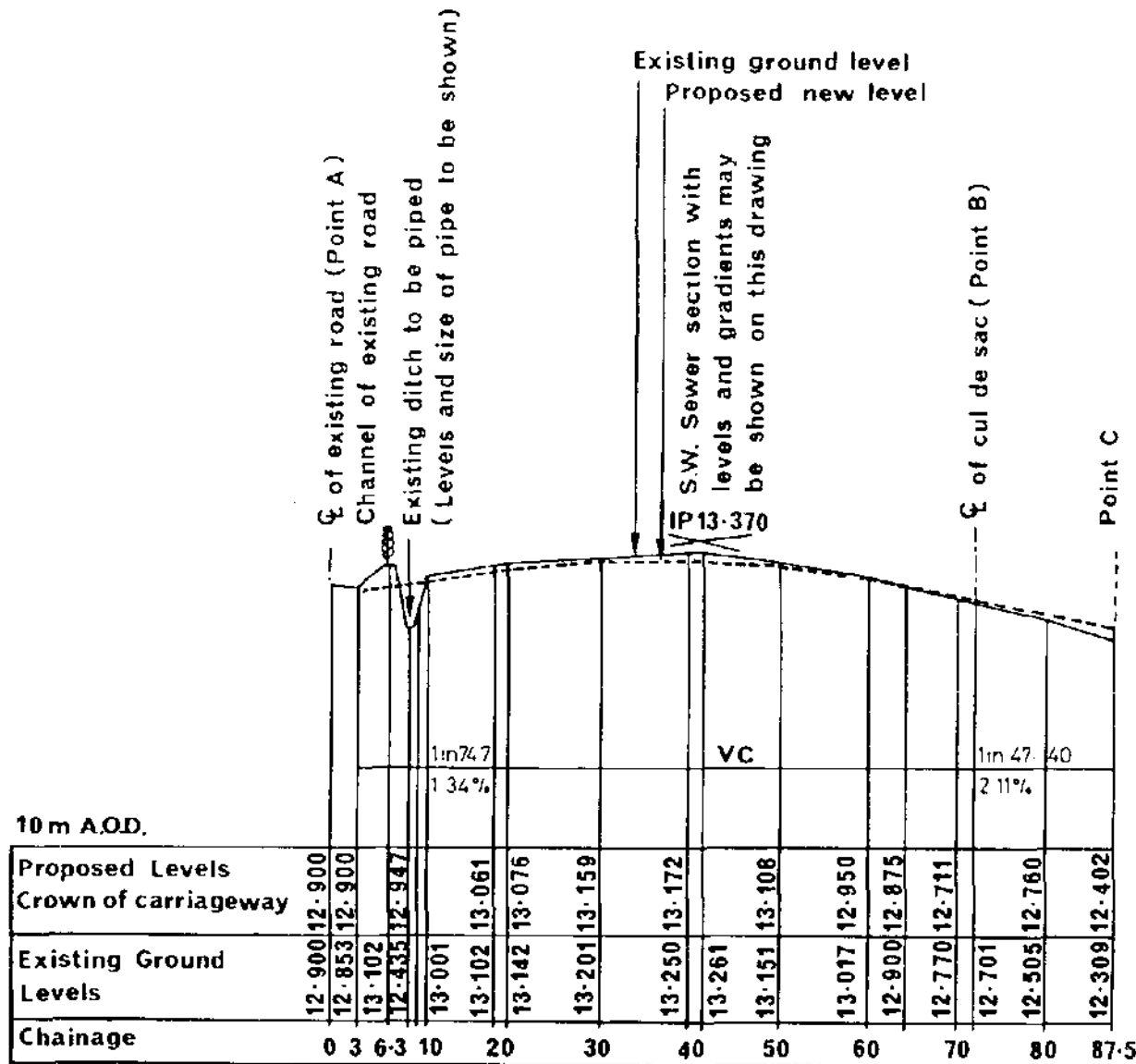
Road Construction

6.7.1. The Developer must obtain the prior approval of the County Surveyor in writing to the form of construction proposed. The 'Specification for Housing Estate Roads', which is published by the County Surveyor, allows a choice of materials.

6.7.2. The depths of construction can only be determined after investigations and tests on site and are particularly related to the California Bearing Ratio (CBR) value and frost susceptibility of the sub- grade (refer to the specification). The Developer should make the necessary arrangements with an approved Laboratory holding NAMAS accreditation for the necessary testing and for on- site investigation and reports. The County Council are able to carry out the investigations on a rechargeable basis.

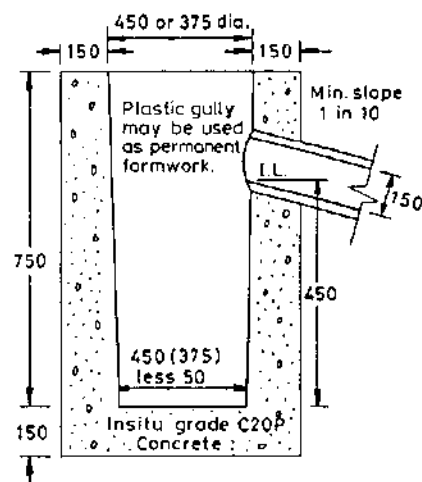


Typical Longitudinal Section

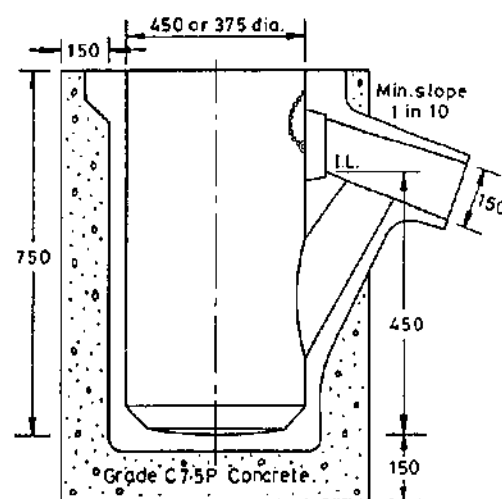


The proposed road shall have a maximum gradient of 1 in 40 for a distance of 10 m from the channel of the existing road

Identification of road to be given.
Name if known.



INSITU UNTRAPPED (U)



PRECAST TRAPPED (T)

Highway (Surface Water) Drainage

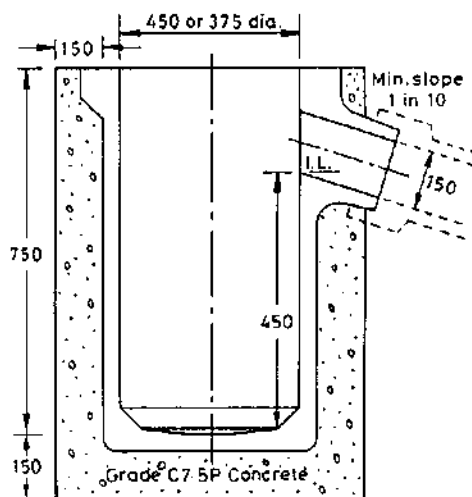
6.8.1. Only surface water pipelines that take water from highway areas will be adopted by the County Council or its agent authorities as highway drains and should be designed in accordance with the following paragraphs.

6.8.2. Where pipelines take water from adoptable areas and roof water from dwellings they may be eligible for adoption by Anglian Water Services Limited as public surface water sewers. Adoption of these sewers will, typically, be the subject of agreements under Section 104 of the Water Industry Act 1991, between the developer and Anglian Water Services Limited provided they are designed and constructed to the requirements of Anglian Water.

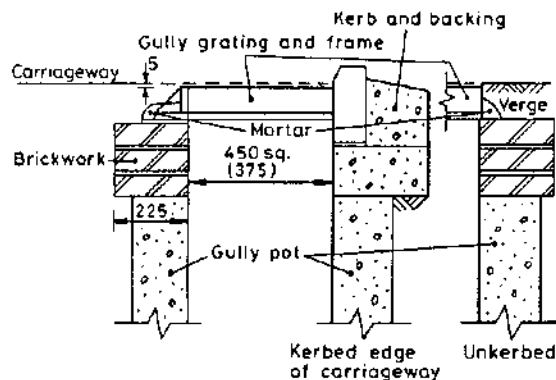
6.8.3. When a developer wishes to use an existing highway surface water drain he will be expected to carry out the necessary on-site investigations and to prove its adequacy.

6.8.4. Surface water shall be collected by means of trapped gullies and discharged wherever possible through a pipe system to an adequate surface water drain, ditch or watercourse. Consent to discharge will be required from the National Rivers Authority.





PRECAST UNTRAPPED (U)



GULLY GRATING DETAIL

6.8.5. The design of the surface water drainage system must receive the approval of the County Surveyor or his agent authority. The 'Rational (Lloyd- Davies) method' shall be used as the basis for the design of surface water sewer systems as set out in Road Note 35 'A guide for engineers in the design of storm water systems' used in conjunction with the 'Tables for Hydraulic Design of Pipes Metric Edition' published by HMSO. Soakaway drainage will not normally be accepted.

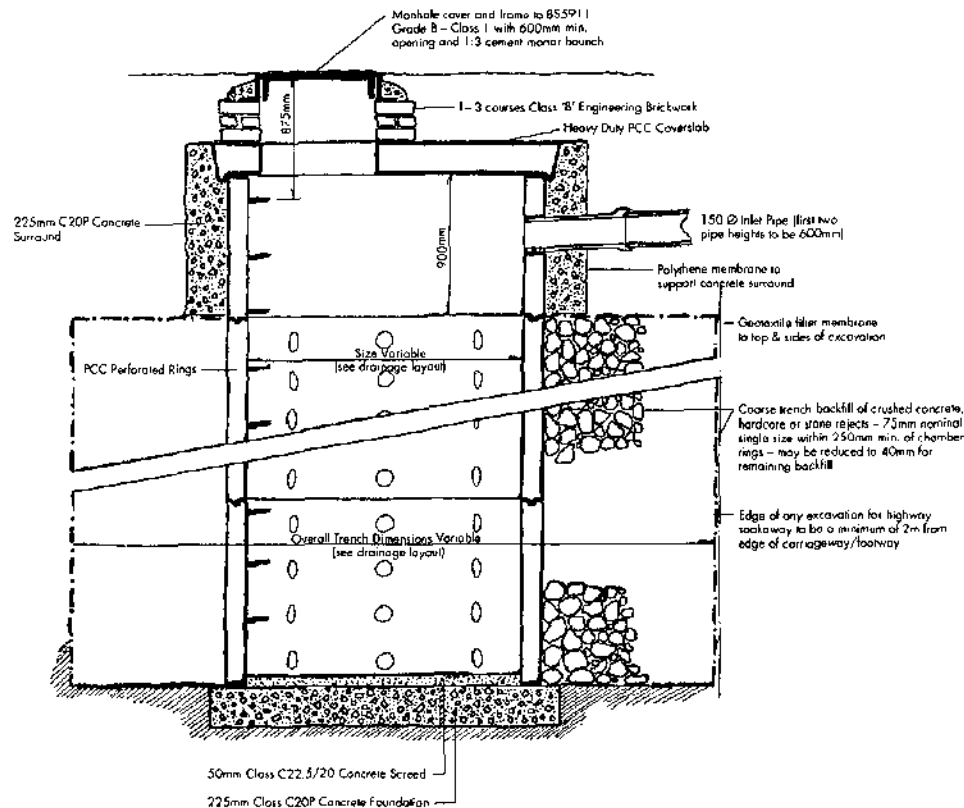
The following design parameters shall be used:

- Storm frequency - once per annum (in some cases a longer return frequency period may be required)
- Time of entry - 3 minutes.
- Minimum full bore velocity - 0.76m/sec.
- Maximum full bore velocity - 3.1m/sec.
- Impermeability factor - 1.0 over whole width of highway (including footpaths and verges).
- Coefficient of friction 0.6mm
- The following formula should be used in calculating the rate of flow :-

$$Q \text{ (litres/sec)} = 2.778 \times R \times A_p$$

where R is the rainfall in mm/hour
and A_p is the cumulative impermeable area in hectares.

HIGHWAY SOAKAWAY



For developments consisting of a short cul-de-sac only it will be sufficient to use the formula $Q / 0.0003 A_p R$ where A_p = impermeable area in sq. metres and R = 50 mm/hr. Q is in litres/sec.

- The minimum size of a carrier drain is 225mm diameter (gully connections generally 150mm diameter).

6.8.6. Where no positive drainage is proven to exist the use of soakaways may be considered if the applicant obtains :-

- N.R.A. approval for the use of soakaways;
- The soakaways are designed in accordance with BRE Digest 365

Any approved soakaway must be located in open areas at least 2m away from any road/footway construction. The area of the soakaway must be adopted by the Highway Authority.

6.8.7. To assist in the checking of drainage calculations the format shown on Drawing No. DC113 should be used.

Gullies : Spacing to be designed.

Manholes : Maximum spacing 75 metres (but required at all changes of direction and gradient).

Gully connections max. length 10m.



Highway (Surface Water) Drainage Design Sheet

[illegible]

Foul Drainage - Prospective public foul sewers must be designed to the satisfaction of AWSL and will normally be the subject of agreement under Section 104 of the Water Industry Act 1991.

Road Lighting

6.9.1. Road Lighting Systems in accordance with the current version of BS 5489 will be required on all roads and footpaths which are to be adopted, and on any existing roads and footpaths which are to be modified and adopted, or where the increased use of the road justifies it.

6.9.2. Lighting systems designed to 'footway standard' will not be allowed except by prior agreement with the Lighting Engineer and in any case will be confined to short extensions to existing estates which have 'footway standard' lighting systems.

Conservation Areas

6.9.3. The style of lighting equipment will be specified by the Highway Authority. This is likely to include decorative lanterns. Early consultations with the lighting engineer is recommended.

Equipment

6.9.4. In all areas, except Conservation Areas, conventional Road Lighting equipment will be used. A list of approved equipment will be issued, and the developer will be free to choose from this list. The developer must still obtain the Lighting Engineer's approval to the equipment offered prior to installation.

6.9.5. The lighting points will be controlled by electronic photo-electric cells set with a 70 LUX switch-on setting, a negative switching ratio, and a 6 year guarantee.



Mains Supplies

6.9.6. All road lights and signs should be fed directly from Eastern Electricity's low voltage distribution mains. Only in exceptional circumstances will a private cable network feeding the lighting columns be allowed and then only by prior arrangement with the Lighting Engineer.

6.9.7. Roundabouts at the entrance and within the development will be lit in accordance with BS 5489, Part 4 and Part 2. The minimum value of the lighting level on the roundabout will be equal to the average value on the approach road with the highest defined lighting category.

6.9.8. In small developments in small villages the lighting level may be varied by prior agreement of the Lighting Engineer.

Design Approval

6.9.9. The developer will submit two copies of plans showing his proposed road lighting layout for approval. Calculations of lighting levels will be presented for each road in accordance with BS 5489, Part 2, Appendix B or BS 5489, Part 3, Appendix A.

6.9.10. The drawing shall be a minimum scale of 1:500 and show houses, private drives and drop kerbs. The drawing will also show existing lighting within 100m of any new road.

Design Aids for Visibility on Bends

6.10.1. To construct a forward visibility curve around a bend as shown in Figure B.

Speed	0	5	10	15	20	25	30 mph
	0	8	15	26	32	40	48 kph
Stopping distance	0	6	14	23	33	45	60 m

Figure A

a line should be drawn parallel to the inside kerb, 1.5m into the carriageway;

the required stopping distance commensurate with the expected speed of the vehicle should be ascertained from Figure A and measured back along the vehicle path from tangent point A;

the stopping distance should then be divided into equal increments of approximately 3m, and the increment points numbered in sequence;

the same stopping distance with the same number of increments should then be repeated around the curve, finishing at a full stopping distance beyond the tangent point B;

the area which has to be kept clear of obstruction should then be constructed by joining increments of the same number together, i.e. 1 to 1, 2 to 2, etc.

Figure C indicates that very substantial reductions in mean vehicle speeds occur with successive reductions in curve radii below 100m. It is suggested, however, that this data be used only as guidance to the likely speeds on bends of 90° or tighter. It should also be noted that Figure C represents mean vehicle speeds only and a safety factor of 20% should be added to these speeds when considering the stopping distances and the forward visibility which should be provided.

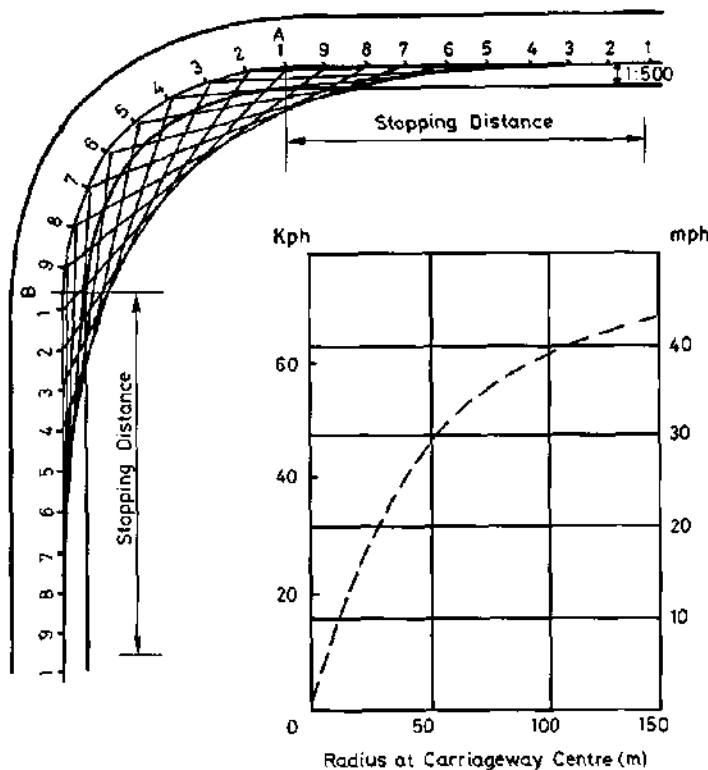
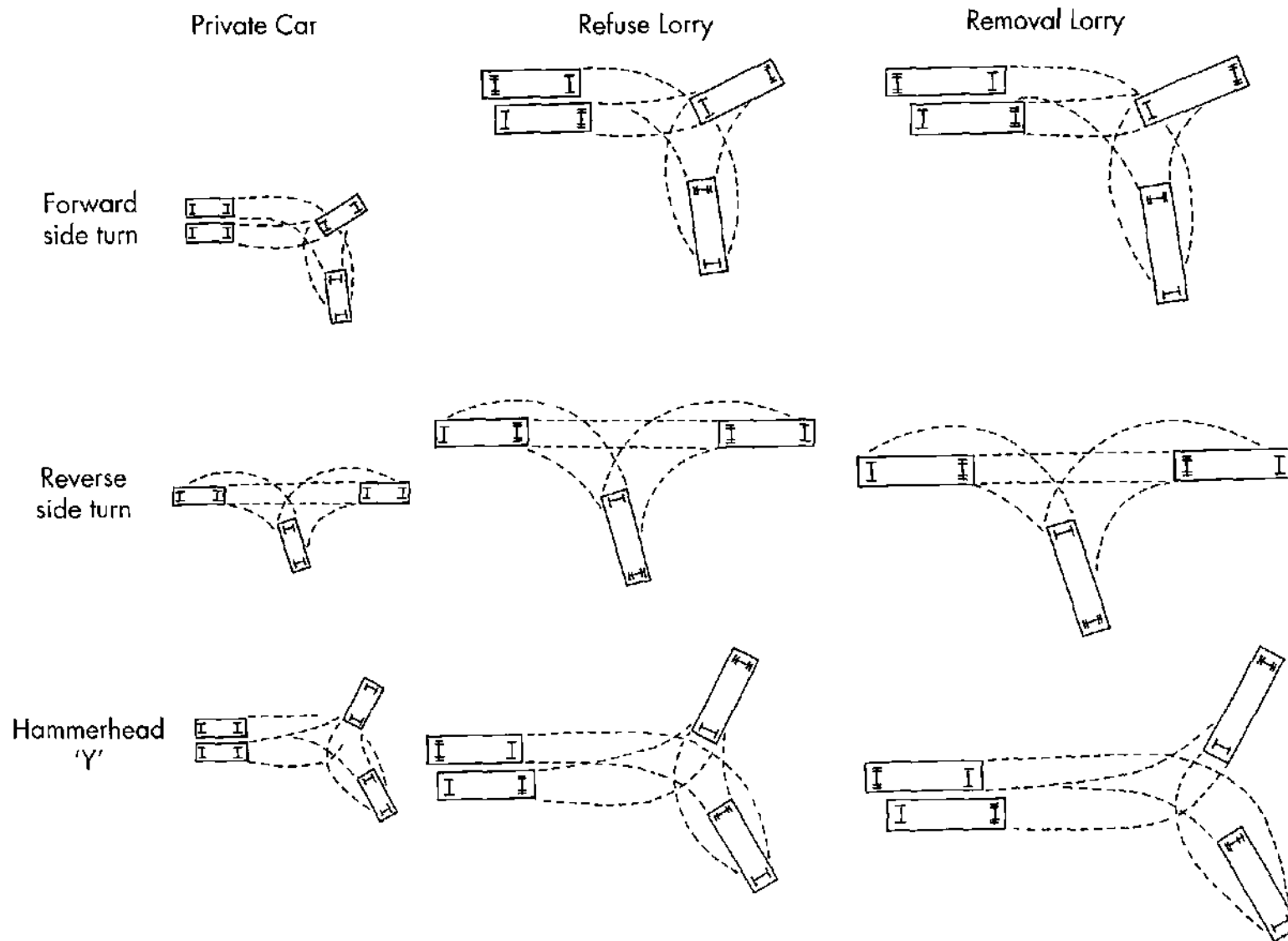


Figure B

Figure C

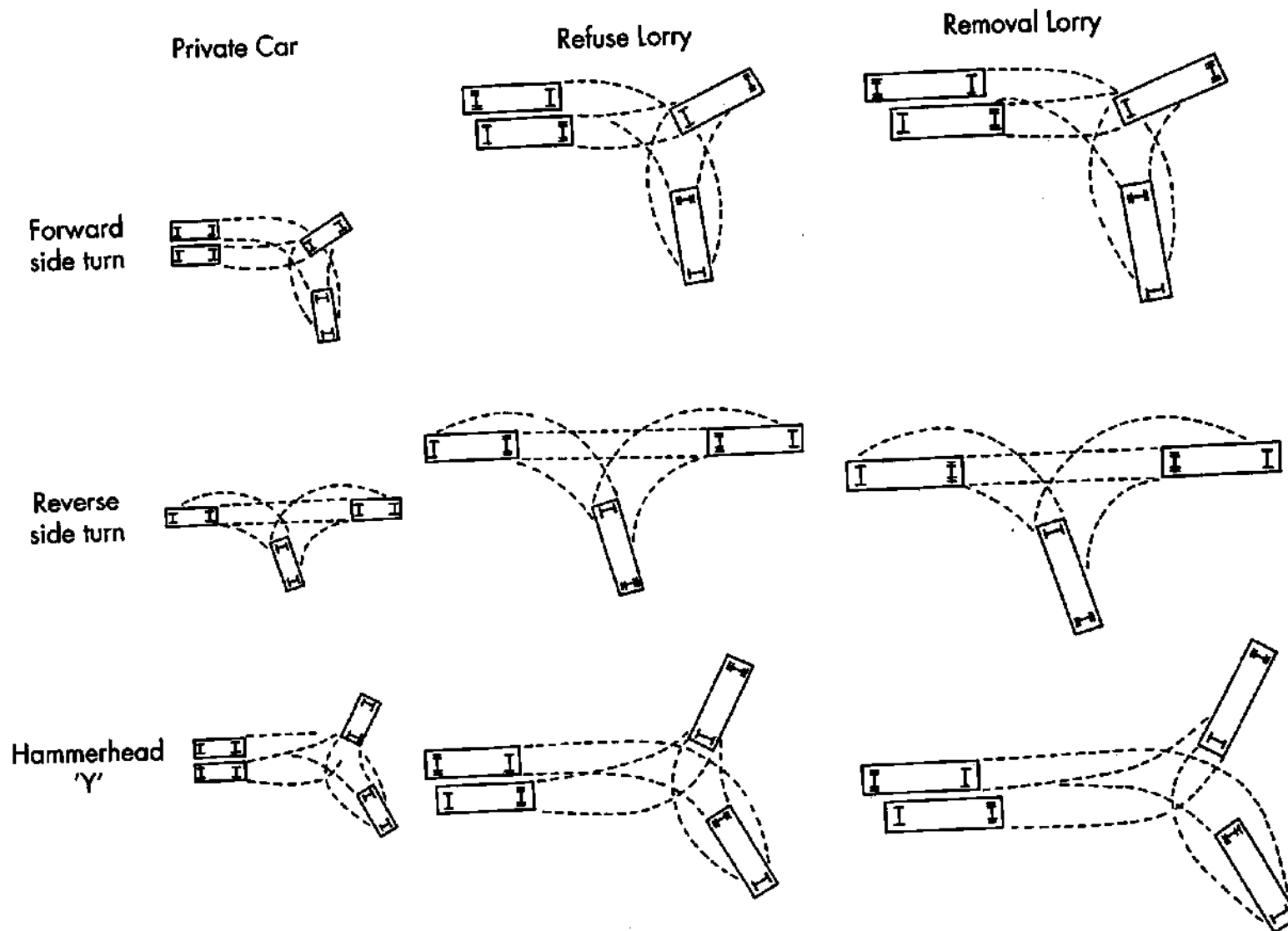


6.11 Swept Path Diagrams



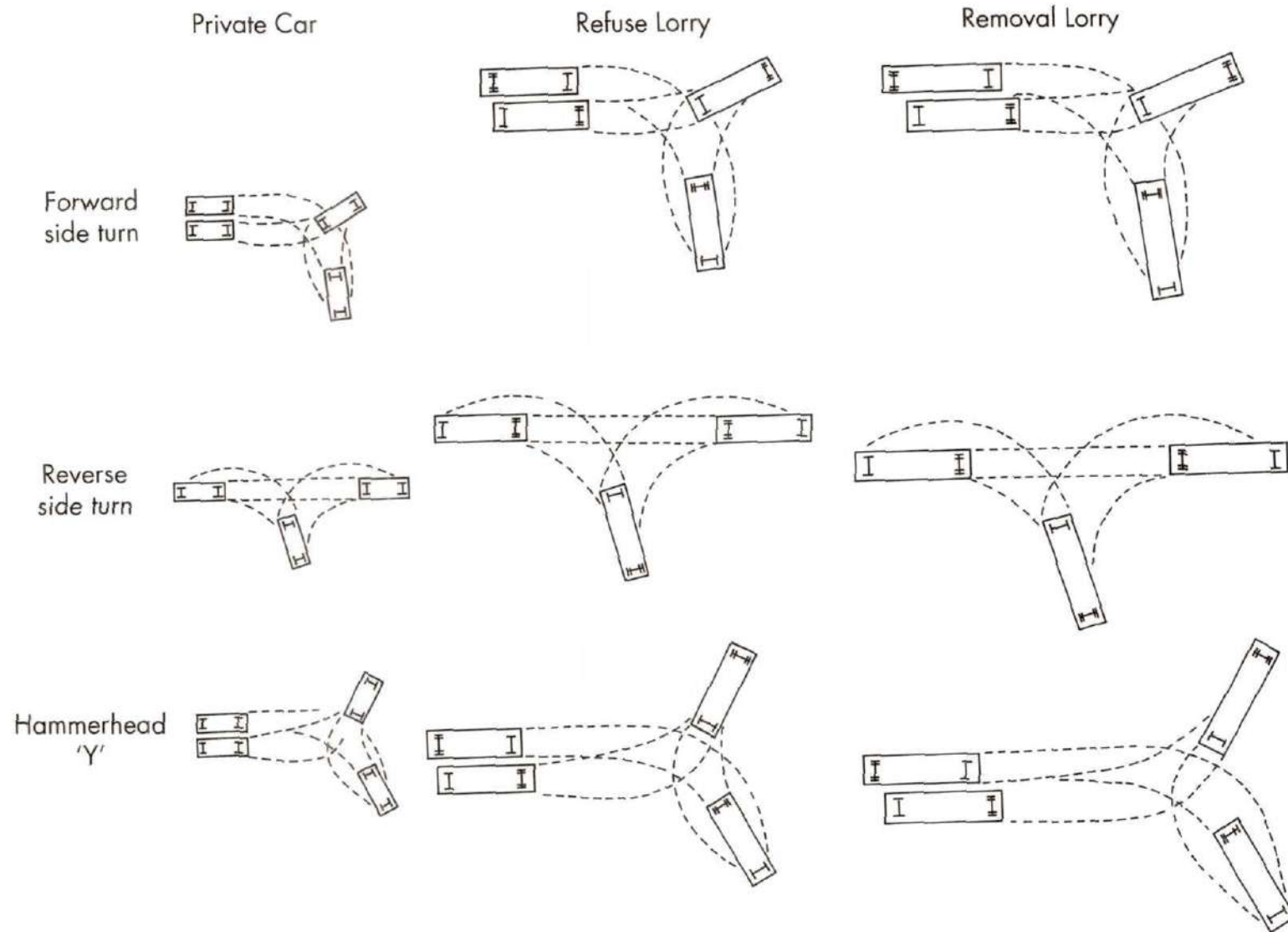
Scale 1 : 500

6.11 Swept Path Diagrams



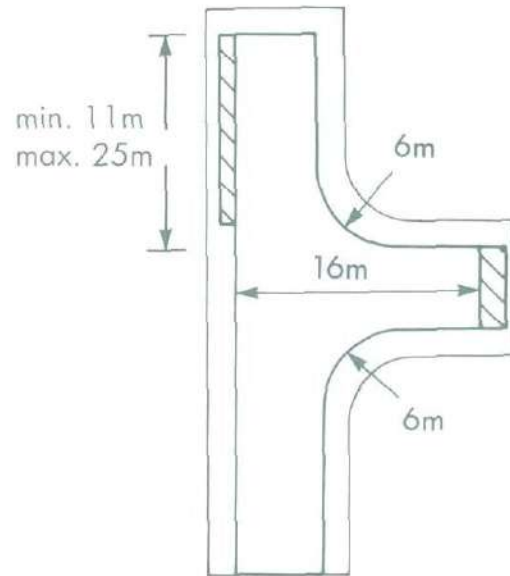
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6.11 Swept Path Diagrams

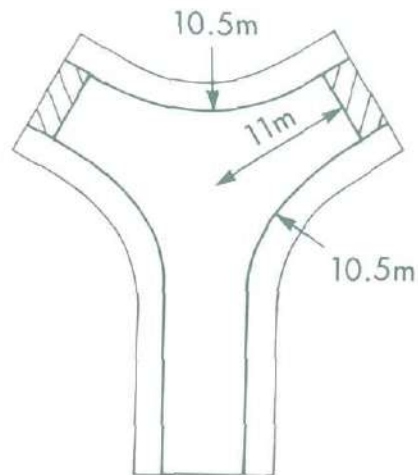


Scale 1 : 500

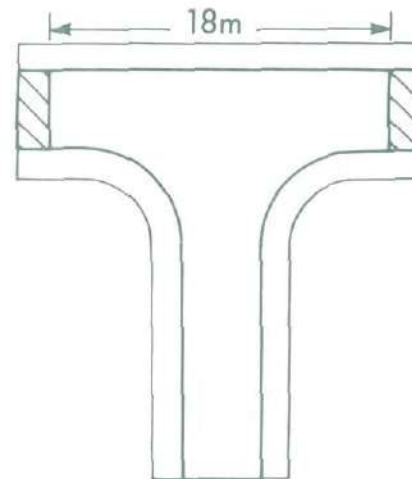
6.12 Typical Turning Heads



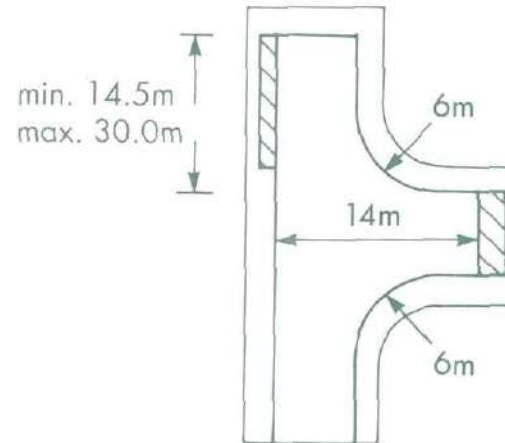
Type A



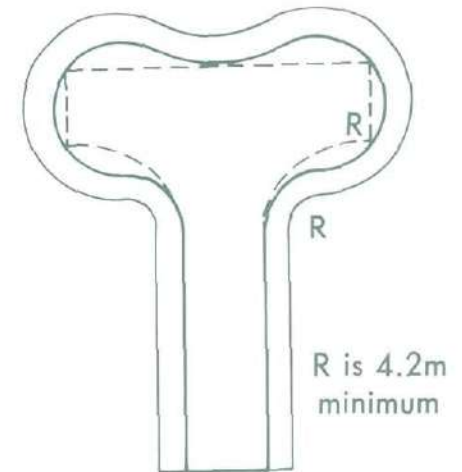
Type B



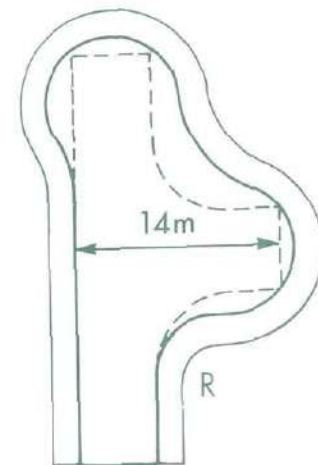
Type C



Type D



Type E



Type F



Indicates vehicle overhang

