HIGHWAY CONSTRUCTION DETAILS
(700 SERIES)

VOLUME 1:
GENERAL DETAILS

Warwickshire County Council

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PRODUCED BY

ENGINEERING DESIGN SERVICES
COMMUNITIES
SHIRE HALL
WARWICK
CV34 4SP

HIGHWAY CONSTRUCTION DETAILS: 700 SERIES
VOLUME 1: GENERAL DETAILS

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HIGHWAY CONSTRUCTION DETAILS: 700 SERIES
VOLUME 1: GENERAL DETAILS

NOTES FOR GUIDANCE

INTRODUCTION

GENERAL

1. These notes apply to all Design Offices preparing schemes for Warwickshire County Council. They refer to the Highway Construction Details: 700 Series (HCD 700s) listed on the preceding contents page.

2. Designers shall use the HCD 700s instead of any similarly titled drawings or details issued by Highways England (HE). HE's Highway Construction Details (HCDs) are contained in the Manual of Contract Documents for Highway Works: Volume 3.

3. HE's HCDs have generally been prepared for use on Motorways and Trunk Roads. Experience has shown that for County Roads there is a need to:

   3.1 modify some of the HCDs to suit local conditions; and
   3.2 produce details where none exist.

   The HCD 700s and associated Notes for Guidance reflect these needs.

4. In some cases, the Notes for Guidance listed below refer to numbered appendices such as Appendix 5/1. These numbered appendices relate to those included in the modified and extended Specification, which forms part of the County Council's standard contract document for highway construction works.

5. Companies tendering for County Council construction contracts will be issued with either the complete set of HCD 700s, or a set of those HCD 700 details that are relevant to the particular contract. All relevant HCD 700s will be listed in Appendix 0/4 of the modified and extended Specification.

6. From time to time, the HCD 700s and associated Notes for Guidance may be updated. At such times, the issue date and issue status will be amended accordingly.

7. Complete volumes of the HCD 700s may be sent to contractors or developers in pdf form. County Council staff sending out such copies must make recipients aware that the HCD 700s may be updated and reissued periodically. Recipients must also be made aware that it is their responsibility to ensure that they are working to the most up-to-date issue. This principle does not apply where copies are despatched to tenderers as part of a set of contract documents.

8. Designers should note that the HCD 700s represent the preferred requirements of the County Council. Nevertheless, in certain circumstances, variations may be necessary. In such circumstances, the variations shall be made clear on either the scheme specific construction drawings or the numbered appendices of the modified and extended Specification. Neither the HCD 700s nor the HCDs shall be altered in any way.

9. Designers wishing to apply any variation to the HCD 700s on County Council construction projects must first agree the variation with WCC's Design Services. Designers proposing to apply the HCD 700s on construction projects where the County Council is not the client must first agree to do so with the client concerned.

10. Any comments, queries or suggestions for improvement relating to the HCD 700s should be addressed to:

    The Group Manager
    Design Services
    Communities
    Shire Hall Post Room
    Northgate Street
    Warwick
    CV34 4SP

HIGHWAY CROSS SECTIONS

A 701.1 CUTTING & EMBANKMENT: SINGLE CARRIAGEWAY

1. Refer to B 701.1 and B 701.2 for edge details.

2. Lighting columns are usually positioned 2.0m back from the kerb face. This may be varied but if so, the new position must be stated in the contract documents. County Highways' Street Lighting section must approve in advance any variation to the usual position of lighting columns.

A 701.2 CUTTING & EMBANKMENT: DUAL CARRIAGEWAY

1. Refer to the notes for A 701.1.

EDGE OF PAVEMENT DETAILS

B 701.1 CARRIAGEWAYS WITH CONCRETE KERBING

1. Refer to F 702.1, F 702.2 and Appendix 5/1 for filter drain details.

B 701.2 CARRIAGEWAYS WITHOUT CONCRETE KERBING

1. Refer to the notes for B 701.1.

B 701.3 PAVING ON ROUNDABOUT ISLANDS

1. Kerb types shall be stated in the contract documents, either in a schedule or on the scheme specific drawings.

EDGE OF PAVEMENT DETAILS (cont'd)		
B 702.1	KERBS, EDGING & CHANNELS	
	1.	Refer to the notes for B 701.3.
B 704.2	ACCESS CONSTRUCTION	
	1.	Type 1 Access Construction is intended for residential use. Type 2 Access Construction is intended for industrial use.
B 704.3	BLOCK PAVING	
	1.	Block paving details shall be included in Appendix 11/1.
DRAINAGE		
F 701.1	SURFACE WATER DRAINS: BEDDING & TRENCH DETAILS	
	1.	The details of permitted alternatives are shown in Notes for Guidance: Annex 1, Table 1. Generally, three types of pipe material (vitrified clay, concrete and certain approved polymer materials) are permitted. Only pipes manufactured from the polymer materials specified in S.H.W. Table 5/1 will be permitted, unless they hold a current British Board of Agrément Roads and Bridges Certificate (or equivalent) stating that they are a suitable alternative for the 'usage' specified in S.H.W. Table 5/1.
	2.	Table 1 states the minimum cover requirement for each pipe group. Design engineers should examine the particular circumstances for each pipe length to determine whether or not the pipe group recommended by the table is appropriate. For example, if a pipe has a depth of cover less than 0.9m, but is located in soft ground so far from the carriageway that it is very unlikely to be trafficked; a concrete surround to the pipe may not be necessary.
	3.	It should be noted that bedding (including laying and any pipe surround) comprises all operations up to an including 0.3m above the pipe soffit. Backfilling comprises all operations from this point up to ground level, formation level or sub-formation level, whichever applies.
	4.	If sulphate-resisting cement needs to be used in any concrete pipe surround, it must be specified in Appendix 26/1.
	5.	It should be noted that all pipes are designed for the final serviceable condition. Pipes are not designed to take into account loadings imposed by construction traffic.
	6.	If surface water drains are to be adopted by the Sewer Authority, the specifications of that authority take precedence over the specifications provided in these details.
	7.	Bedding and trench details for the drains included in M.C.D. Vol. 3 have now been incorporated into this system.

F 702	FILTER DRAINS: BEDDING & TRENCH DETAILS	
	1.	The details of permitted alternatives are shown in Notes for Guidance: Annex 1, Table 2. Refer to the notes for F 701.1.
	2.	Group F7 drains alone shall only be used to drain formation/sub-formation where there is either no embankment, or where there is an embankment, but its height is negligible. Group F7 drains must not be used for the purpose of controlling the water table level. Where there is an embankment of a significant height, Group F7 drains must be accompanied by a suitable filter drain at the foot of the embankment.
F 707.1	CONCRETE PIPE SADDLES	
	1.	If surface water drains are to be adopted by the Sewer Authority, the Authority's specification for pipe connections takes precedence over the specification provided in this detail.
FENCES, STILES AND GATES		
H 701.1	BOUNDARY HEDGE	
	1.	Plant species in rural Warwickshire shall be chosen from those listed for hedges in that part of the county. The list of plant species can be found in the appropriate volume of 'Warwickshire Landscapes Guidelines'.
H 703.1	TIMBER FIELD GATES: TYPES 1, 2 & 3	
	1.	Gates shall comply with the requirements of S.H.W. Series 300. Additional requirements shall be specified in Appendix 1/15 and/or Appendix 3/1.
UNDERGROUND CABLE DUCTS		
I 701.1	NEW SERVICE DUCTS & PROTECTION OF EXISTING SERVICES	
	1.	The details of permitted duct alternatives are shown in Notes for Guidance: Annex 1, Table 3. Only two types of duct pipe material (vitrified clay and PVC-U) are permitted, and these shall comply with the requirements of S.H.W. Table 5/2.
MISCELLANEOUS		
K 701.1	TRENCH REINSTATEMENT IN CARRIAGEWAYS & PAVED AREAS	
	1.	Permitted materials shall be stated in Appendix 7/1. Any alterations to the depths of construction shown shall be stated in Appendix 7/2.
K 702.1	PEDESTRIAN GUARDRAILS	
	1.	Any special requirements shall be stated in Appendix 4/2.
	2.	High visibility pedestrian guardrail panels shall be provided at pedestrian crossing points.

MISCELLANEOUS (cont'd)		
K 703	REFUGES & PEDESTRIAN REFUGES	
	1.	Lighting details, including electrical work shall be stated in Appendix 14/2 and Appendix 14/4. There are two alternatives to the Standard Illuminated Refuge & Pedestrian Refuge (K 703.1), which are shown on details K 703.2 and K703.4. Wherever a refuge is required, designers should seek advice from the Communities' Traffic Group on which refuge detail to specify.

HIGHWAY CONSTRUCTION DETAILS (700 SERIES)
VOLUME 1: GENERAL DETAILS

NOTES FOR GUIDANCE ANNEX 1

TABLE 1: SPECIFICATION FOR SURFACE WATER DRAINS

PIPE GROUP	DEPTH OF COVER	PIPE MATERIAL					
		VITRIFIED CLAY		CONCRETE		APPROVED POLYMER MATERIAL	
		PIPE STANDARD	BEDDING & TRENCH DETAIL	PIPE STANDARD	BEDDING & TRENCH DETAIL	PIPE STANDARD	BEDDING & TRENCH DETAIL
S2	0.6m - 0.9m	refer to note 1.	Z	L	Z	refer to note 2.	Y
S3	0.9m – 5.0m	refer to note 1.	S	M	S	refer to note 2.	S
S7 (below c/way)	0.6m - 0.9m	refer to note 1.	Z1	M	Z1	refer to note 2.	Y1
S8 (below c/way)	0.9m – 5.0m	refer to note 1.	S1	M	S1	refer to note 2.	S1

TABLE 2: SPECIFICATION FOR FILTER DRAINS

PIPE GROUP	DEPTH OF COVER	PIPE MATERIAL					
		VITRIFIED CLAY		CONCRETE		APPROVED POLYMER MATERIAL	
		PIPE STANDARD	BEDDING & TRENCH DETAIL	PIPE STANDARD	BEDDING & TRENCH DETAIL	PIPE STANDARD	BEDDING & TRENCH DETAIL
F2	0.9m – 2.0m	ES	G	L	G	refer to note 2.	J
F3	0.9m – 2.0m	ES	L	L	L	refer to note 2.	L
F4	0.9m – 2.0m	ES	H1	L	H1	refer to note 2.	I
F5	0.9m – 2.0m	ES	M	L	M	refer to note 2.	M
F6	0.9m – 2.0m	ES	K	L	K	refer to note 2.	K
F7	refer to note 3.	not applicable	not applicable	not applicable	not applicable	refer to note 2.	P
F8	refer to note 3.	ES	Q	L	Q	refer to note 2.	Q
F9A	0.6m	not applicable	not applicable	not applicable	not applicable	refer to note 2.	R
F9B	0.6m	not applicable	not applicable	not applicable	not applicable	refer to note 2.	R

NOTES

1.	As per HA 40/01: Where the nominal diameter (DN) = 150mm, the pipe crushing strength shall be 22KN/m. Where DN ≥ 225mm, the pipe standard shall be ≥ Class 160.
2.	Approved polymer materials shall be those listed in S.H.W. Table 5/1. Alternative polymer materials may be permitted, provided that they hold a current British Board of Agrément Roads and Bridges Certificate (or equivalent) stating that they are a suitable alternative for the 'usage' specified in S.H.W. Table 5/1.
3.	The depth of cover on Group F7 drains shall be 0.3m plus the thickness of lower sub-base layer if specified. The depth of cover on Group F8 drains shall be 0.6m, or the external pipe diameter + 0.05m + the thickness of lower sub-base layer (if specified), whichever is the greater.
4.	Where PVC-U (ultra-rib twin wall) pipes are to be used, the short-term ring stiffness shall be ≥ 8.0KN/m². The fifty-year stiffness shall be ≥ 3.0KN/m².

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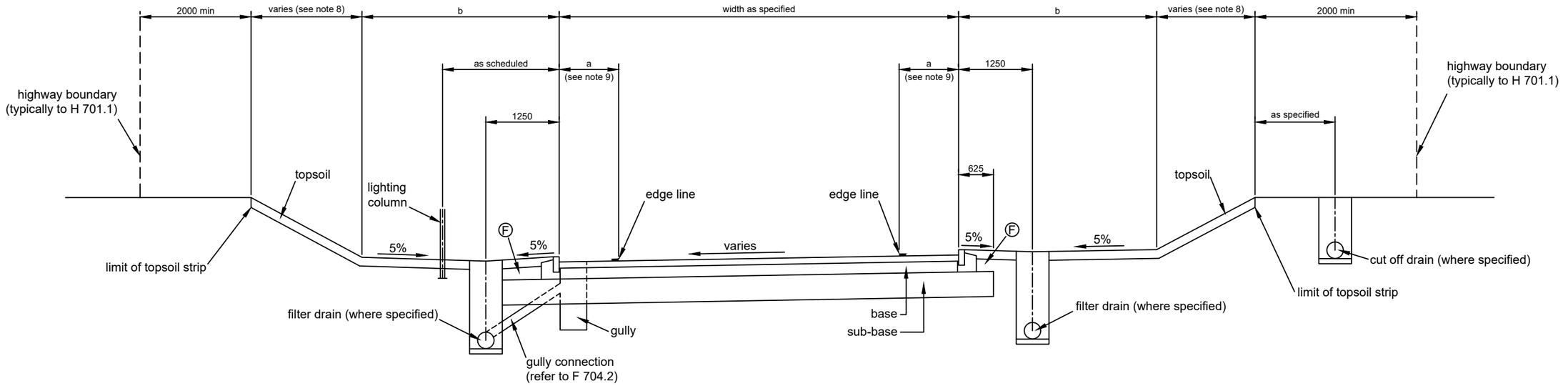
NOTES FOR GUIDANCE ANNEX 1

TABLE 3: SPECIFICATION FOR NEW SERVICE DUCTS

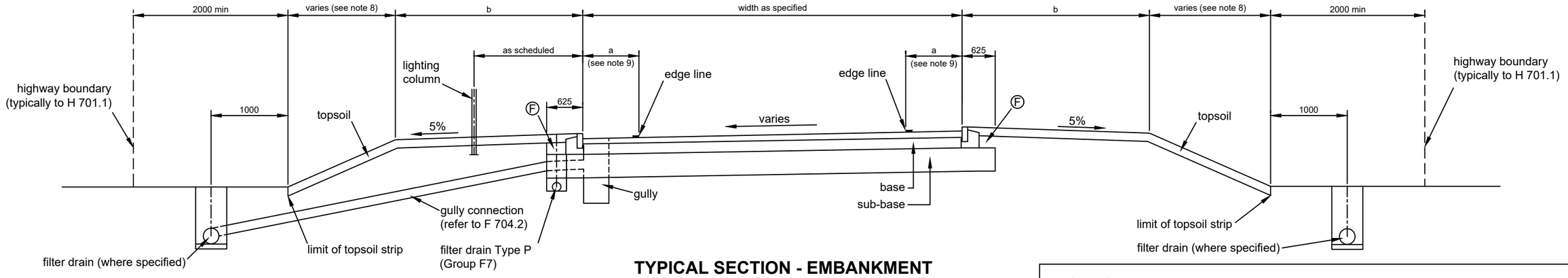
DUCT GROUP	DEPTH OF COVER	DUCT PIPE MATERIAL			
		VITRIFIED CLAY		PVC-U	
		DUCT PIPE STANDARD	BEDDING & TRENCH DETAIL	DUCT PIPE STANDARD	BEDDING & TRENCH DETAIL
D1	0.90m min. (below c/way)	ES	D1	refer to note 1.	D1
D2	0.75m min. (below verge)	ES	D2	refer to note 1.	D2

NOTES

1.	The duct pipe standard for PVC-U duct pipes shall be in accordance with S.H.W. Table 5/2.

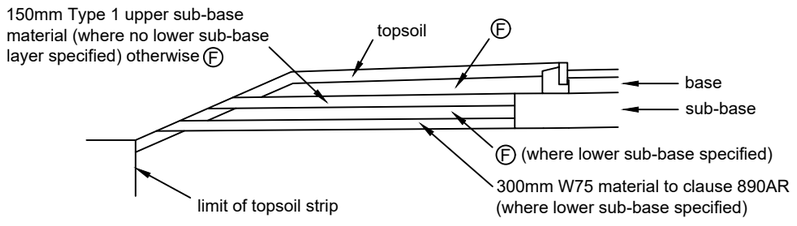


TYPICAL SECTION - CUTTING



TYPICAL SECTION - EMBANKMENT

MINIMUM WIDTH REQUIREMENTS		
Posted speed limit	Width of hardstrip (a)	Verge width (b)
≤ 40mph	Not Required	2500mm
≥ 50mph	1000mm	2500mm



DETAIL WITHOUT FILTER DRAIN

NOTES

1. Any scheme specific cross section layouts shall take precedence over this detail.
2. On balanced carriageways, the edge detail shall be the same on both sides and match the detail for the low side of carriageway. Refer to B 701.1 for edge details.
3. Depth of topsoil shall be 150mm unless stated otherwise.
4. Verges may be widened to 4.5m to accommodate footways. Refer to B 704.1 for footway details.
5. Ⓕ = Fill material on sub-base materials and base.
6. The position of lighting columns may vary where footways are required.
7. Refer to F 702.1 and F 702.2 for filter drain details.
8. Cutting and embankment slopes shall be 1:2 unless otherwise specified on scheme specific drawings. For embankments with heights in excess of 3m, slope stability calculations are normally required.
9. The 1000mm hardstrip dimension shall be measured from the edge of carriageway (typically the kerb face), to the running lane side of the edge line.
10. For sub-base details and the position of the Earthworks Outline, refer to A 701.3.
11. Vehicle Restraint System may be required, but is not shown for simplicity.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: HIGHWAY CROSS SECTIONS

TITLE: CUTTING & EMBANKMENTS: SINGLE CARRIAGEWAYS

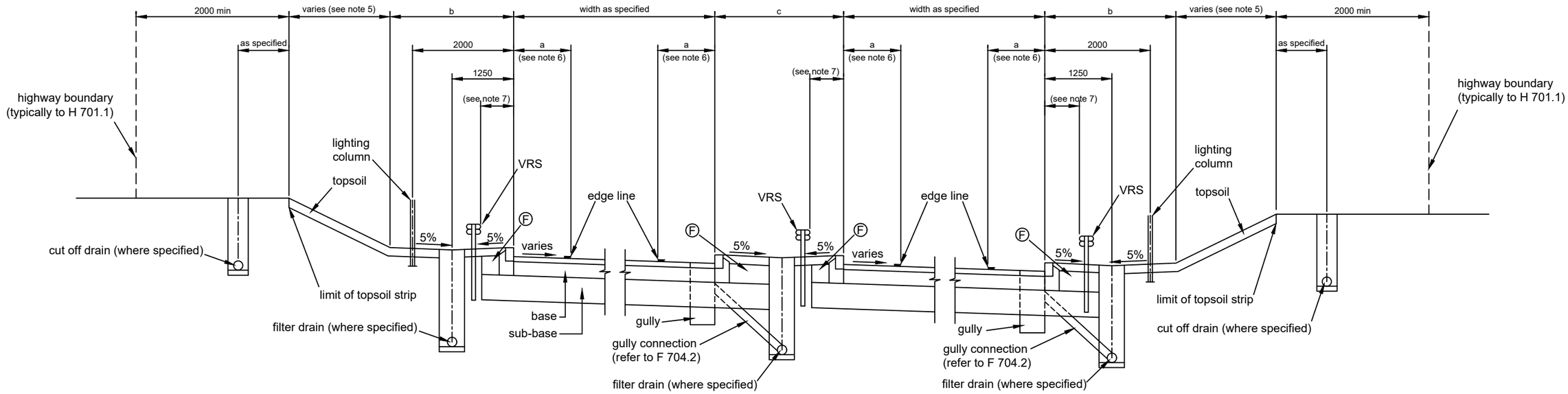
DRAWN	CHECKED	APPROVED	ISSUE
RJP	DM	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
A 701.1	A3	MAY 2018

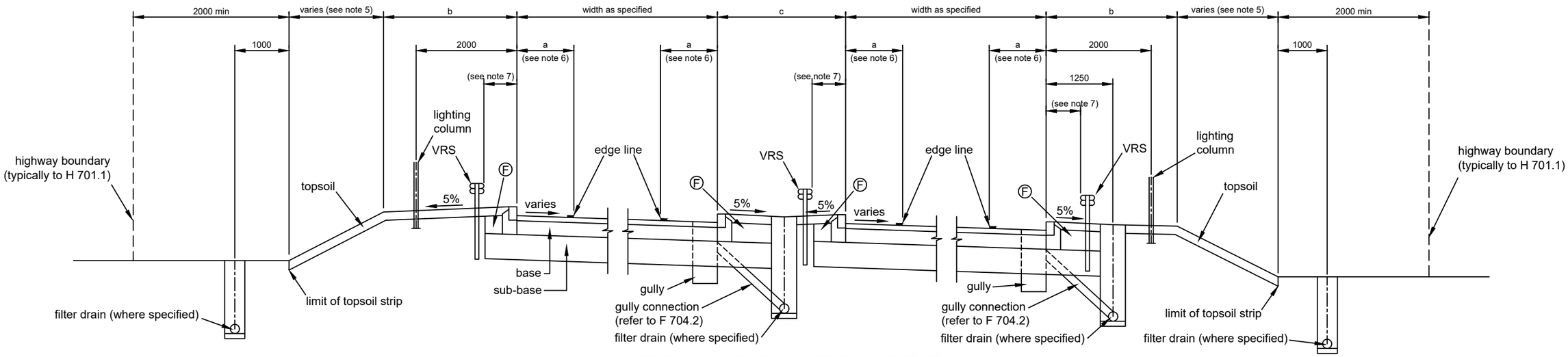
PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	FEB 2017

0mm 50mm 100mm 150mm 200mm



TYPICAL SECTION - CUTTING



TYPICAL SECTION - EMBANKMENT

MINIMUM WIDTH REQUIREMENTS

Posted speed limit	With hardstrip			Without hardstrip	
	Width of hardstrip (a)	Verge width (b)	Width of central reserve (c)	Verge width (b)	Width of central reserve (c)
≤ 60mph	1000mm (see note 9)	2500mm (see note 9)	1800mm (see note 9)	3500mm	1800mm
70mph	1000mm	2500mm	2500mm	Not appropriate	

NOTES

1. On balanced carriageways, the edge detail shall be the same on both sides and match the detail for the low side of carriageway. Refer to B 701.1 for edge details.
2. Depth of topsoil shall be 150mm unless stated otherwise.
3. (F) = Fill material on sub-base materials and base.
4. Refer to F 702.1 and F 702.2 for filter drain details.
5. Cutting and embankment slopes shall be 1:2 unless otherwise specified on scheme specific drawings. For embankments with heights in excess of 3m, slope stability calculations are normally required.
6. The 1000mm hardstrip dimension shall be measured from the edge of carriageway (typically the kerb face), to the running lane side of the edge line.
7. Set-back to comply with current road restraint system standards.
8. For sub-base details and the position of the Earthworks Outline, refer to A 701.3.
9. At ≤ 60mph the inclusion of a hardstrip is to be agreed with the Overseeing Organisation.

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Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: HIGHWAY CROSS SECTIONS

TITLE: CUTTING & EMBANKMENTS: DUAL CARRIAGEWAYS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	DM	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
A 701.2	A3	MAY 2018

PREVIOUS ISSUES

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2	MAY 2010
3	APR 2016
4	FEB 2017

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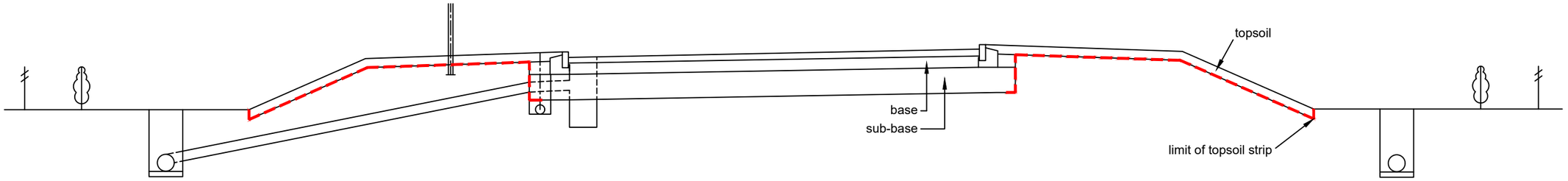
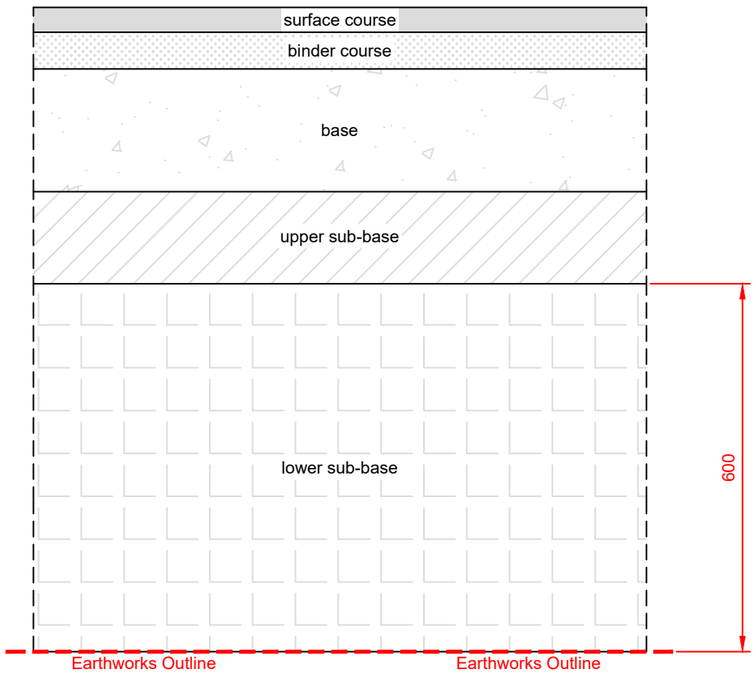
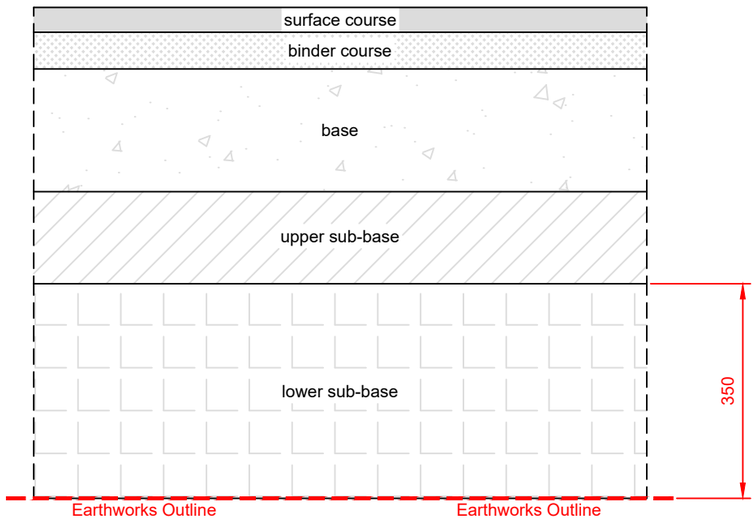


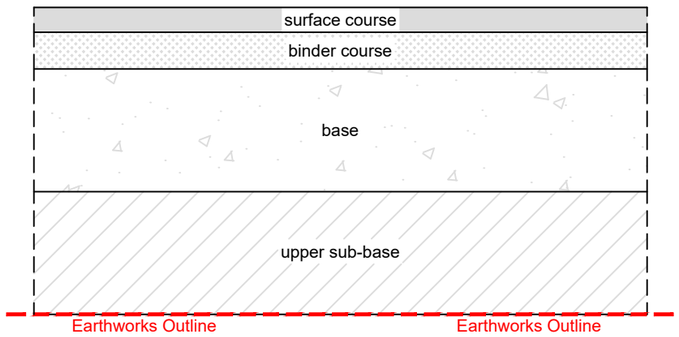
EARTHWORKS OUTLINE EXTENTS



SUB-BASE ARRANGEMENT TYPE A



SUB-BASE ARRANGEMENT TYPE B



SUB-BASE ARRANGEMENT TYPE C

EXAMPLE DESIGNS FOR DETERMINING THE EARTHWORKS OUTLINE POSITION			
CBR (%)	Type	Upper Sub-Base (mm)	Lower Sub-Base (mm)
<2	A	150	600
2-15	B	150	350
>15	C	200	0

NOTES

1. Sub-base depths are for general guidance only. Always refer to scheme specific information.
2. Upper sub-base is a Type 1 unbound mixture to S.H.W. Clause 803, Type 2 unbound mixture (if it contains at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) unbound mixture to S.H.W. Clause 805.
3. Lower sub-base is W150 to clause 890AR. Use of W75 to clause 890AR is permitted for lower sub-base construction widths of less than 1.5m.
4. For areas with CBR values of less than 1.5% seek specialist geotechnical advice.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: HIGHWAY CROSS SECTIONS

TITLE: SUB-BASE & THE EARTHWORKS OUTLINE

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	2

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
A 701.3	A3	MAY 2018

PREVIOUS ISSUES: 1 FEB 2017

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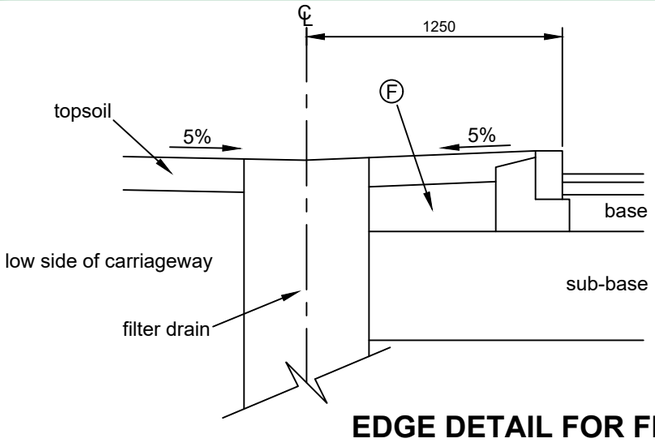
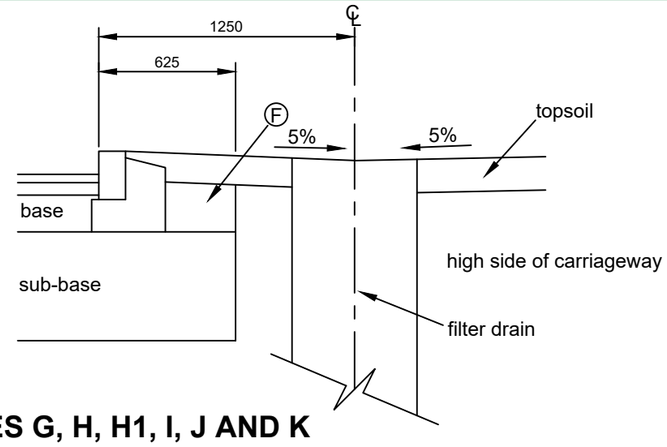
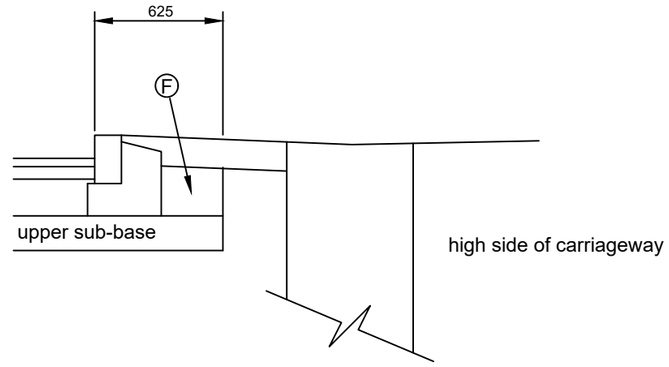
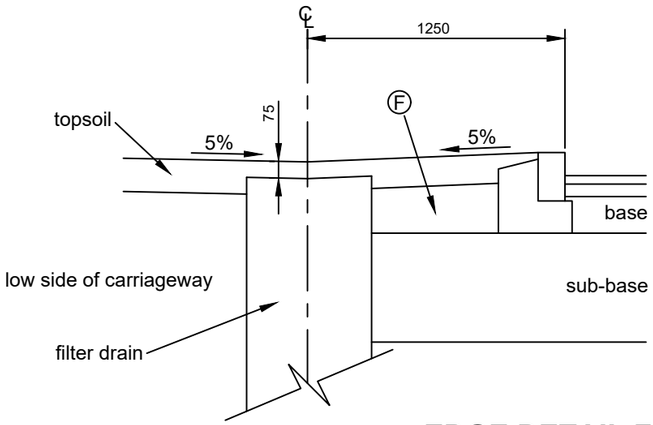


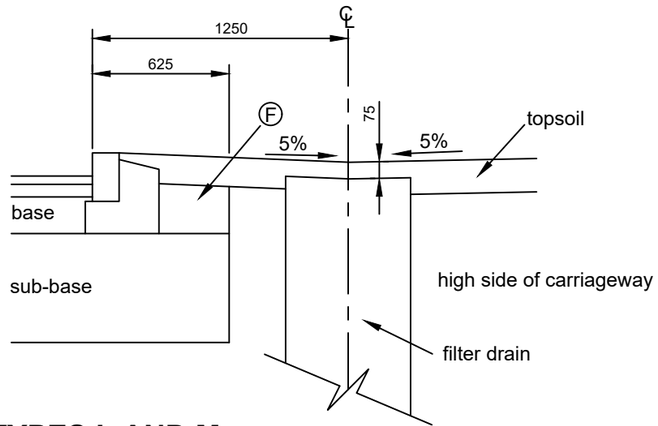


EDGE DETAIL FOR FILTER DRAIN TYPES G, H, H1, I, J AND K

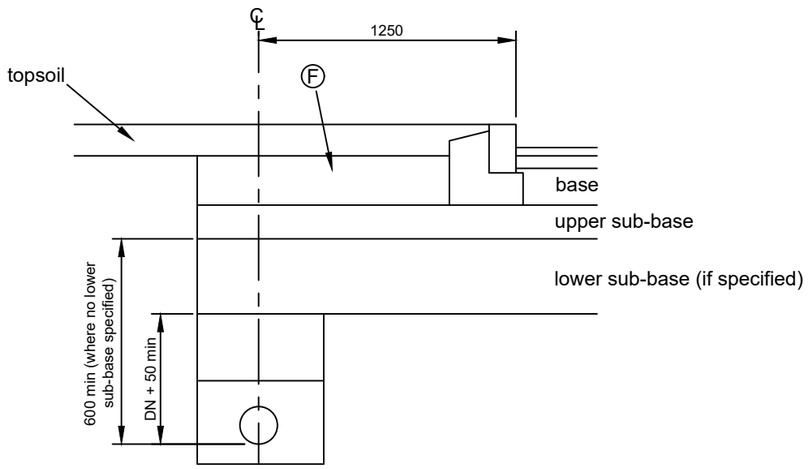


Ⓕ WHERE NO LOWER SUB-BASE SPECIFIED

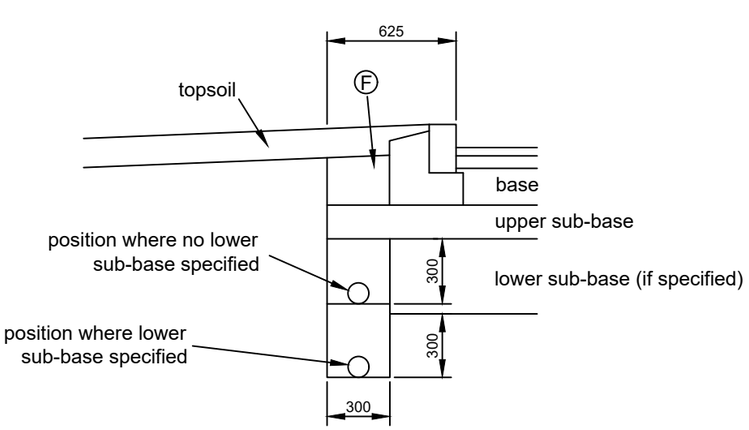




EDGE DETAIL FOR FILTER DRAIN TYPES L AND M



EDGE DETAIL FOR FILTER DRAIN TYPE Q (GROUP F8)



EDGE DETAIL FOR FILTER DRAIN TYPE P (GROUP F7)

NOTES

1. Depth of topsoil shall be 150mm unless stated otherwise.
2. Ⓕ = Fill material on sub-base materials and base.
3. Refer to F 701.1 for surface water drain details.
4. Refer to F 702.1 and F 702.2 for filter drain details.
5. Refer to Appendix 5/1 for pipe and bedding alternatives.
6. DN denotes nominal diameter of pipe.
7. For sub-base details and the position of the Earthworks Outline, refer to A 701.3.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: CARRIAGEWAYS WITH CONCRETE KERBING

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 701.1	A3	MAY 2018

PREVIOUS ISSUES

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2	MAY 2010
3	APR 2016
4	FEB 2017

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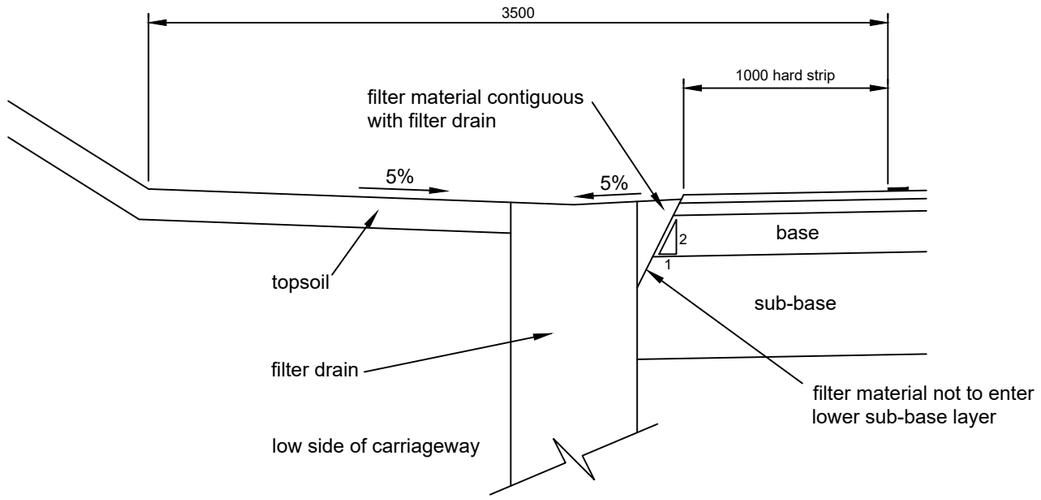
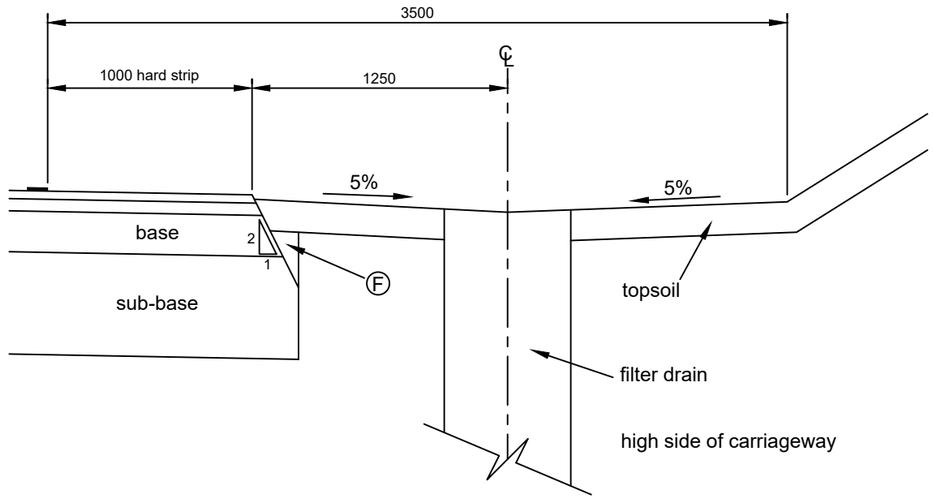
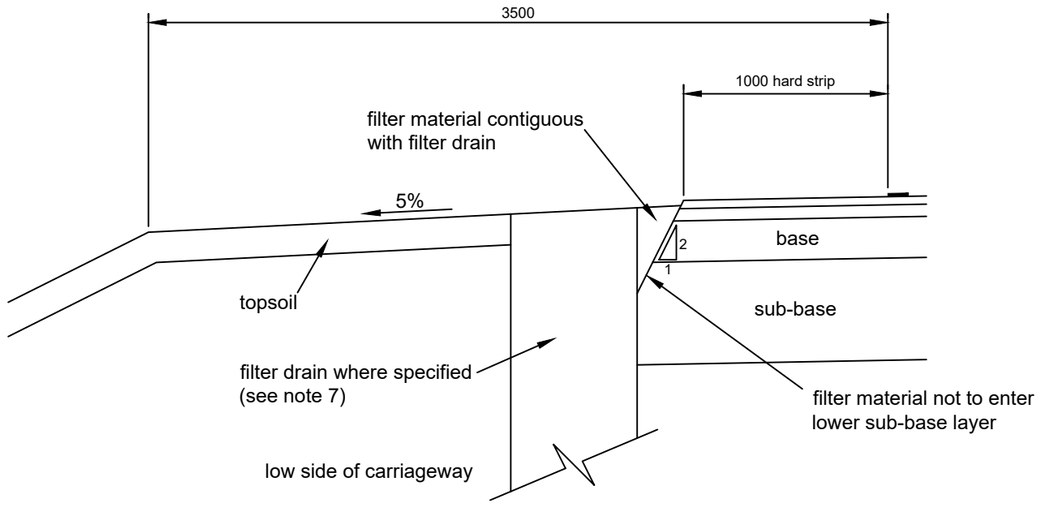
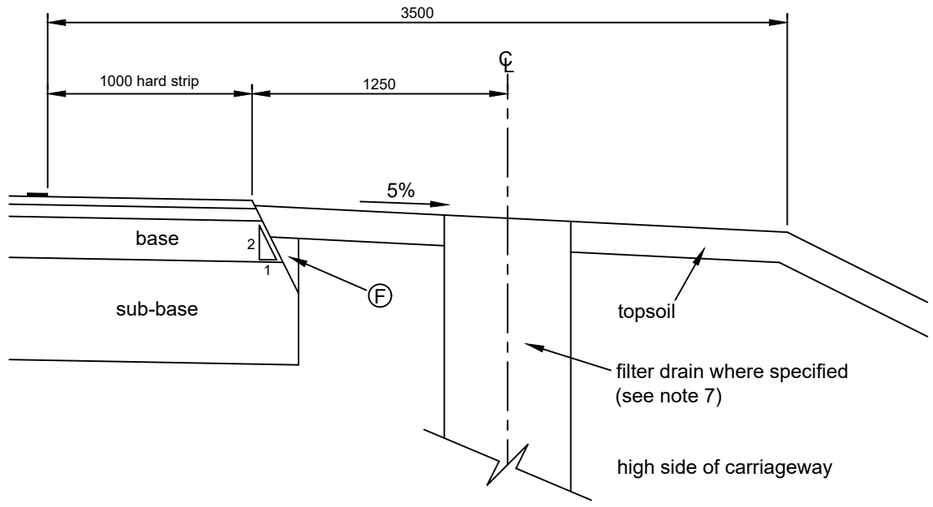




EDGE DETAIL FOR FILTER DRAINS IN CUTTING





EDGE DETAIL FOR FILTER DRAINS ON EMBANKMENT

NOTES

1. Depth of topsoil shall be 150mm unless stated otherwise.
2. Ⓕ = Fill material on sub-base materials and base.
3. Refer to A 701.1 and A 701.2 for cross section details beyond the back of verge.
4. Refer to A 701.1 for details of embankments without filter drains.
5. Refer to F 702.1 and F 702.2 for filter drain details.
6. Refer to Appendix 5/1 for pipe and bedding alternatives.
7. Filter drains shall only be provided on embankment verges where the pipes can be located within the existing ground beneath the embankment. In other cases, filter drains shall be located at the foot of the embankment. Refer to A 701.1 and A 701.2 for details.
8. For sub-base details and the position of the Earthworks Outline, refer to A 701.3.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: CARRIAGEWAYS WITHOUT CONCRETE KERBING

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 701.2	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	FEB 2017

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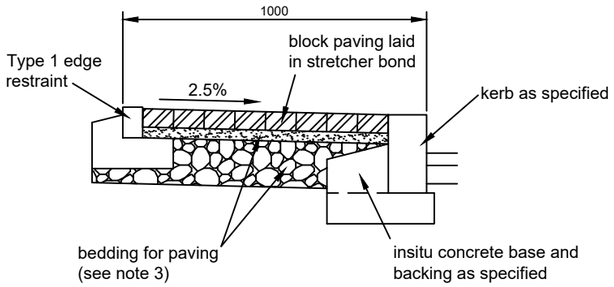
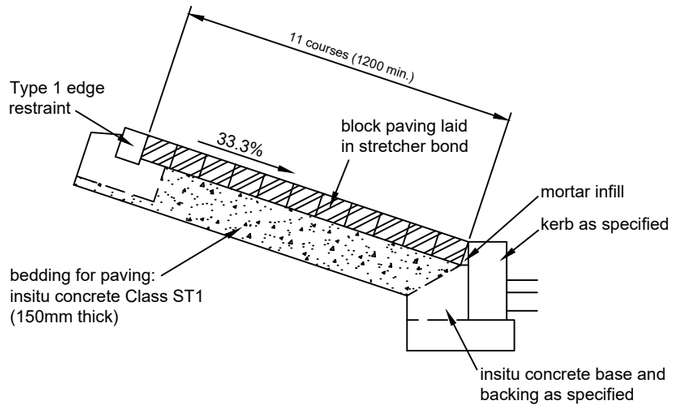
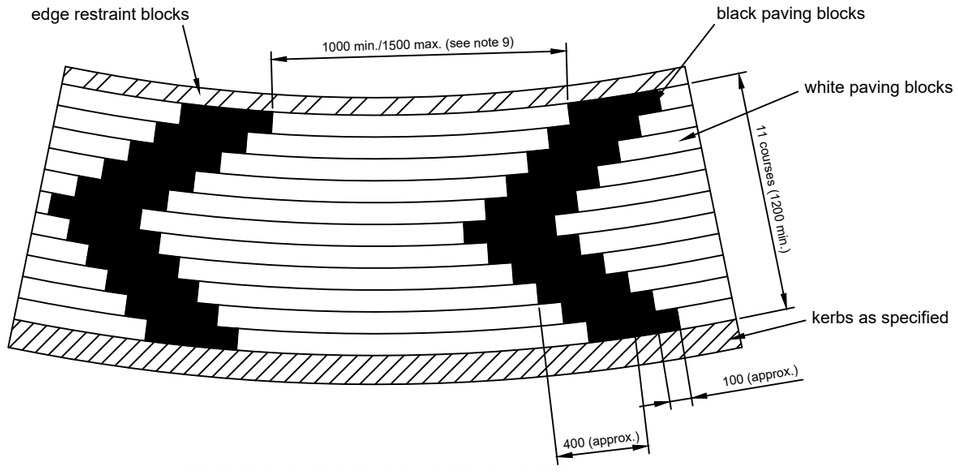


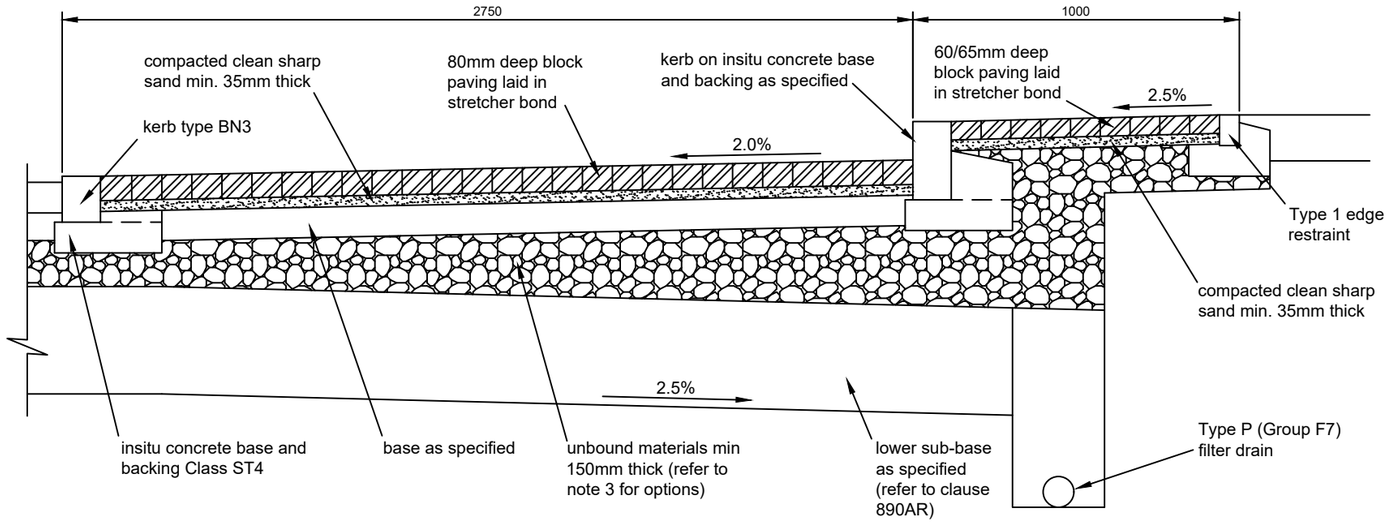
TYPE 1 ROUNDABOUT ISLAND



TYPE 3 ROUNDABOUT ISLAND (WITH CHEVRON BLOCK PAVING)



TYPE 3 ROUNDABOUT ISLAND (CHEVRON DETAILS)



TYPE 2 ROUNDABOUT ISLAND (INCLUDING OVER-RUN AREA)

NOTES

1. Blocks, and the laying of blocks shall comply with S.H.W. Clause 1107.
2. Block dimensions shall be 200mm x 100mm x 60/65mm for Type 1 roundabout islands, and 200mm x 100mm x 80mm for Type 2 and 3 roundabout islands.
3. Block paving for Type 1 roundabout islands shall be bedded on compacted clean sharp sand 35mm thick underlaid with Type 1 Unbound Mixtures to S.H.W Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W Clause 804) or Type 3 (open graded) Unbound Mixtures to S.H.W Clause 805, 150mm thick.
4. Block paving for Type 3 roundabout islands shall be laid while the concrete bedding remains plastic (max. 6 hrs after batching).
5. 'Black' paving blocks shall have a black resin bonded finish. 'White' paving blocks shall have a white resin bonded reflective finish with applied solid glass beads.
6. Block paving shall be supported (on edges other than the kerbside edge) by edge restraint Types 1 or 2 (as shown on B 704.3), or by the edging for bituminous paving shown on B 702.1.
7. Refer to Appendix 11/1 for block paving details including edge restraint details.
8. Where blocks are laid in stretcher bond on curves, cut blocks shall be inserted where necessary so that joints on adjacent rows are no closer together than one quarter of a block length.
9. On Type 3 roundabout islands, chevrons shall be spaced equally. The number of chevrons will depend on the size of the roundabout, but the spacing between chevrons shall be no less than 1000mm and no greater than 1500mm.
10. Mortar shall comply with S.H.W. Clause 2402 designation (i).

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: EDGE OF PAVEMENT DETAILS	TITLE: PAVING ON ROUNDABOUT ISLANDS	DRAWN: RJP	CHECKED: NH	APPROVED: AC	ISSUE: 5
			DRAWING NUMBER: B 701.3	SHEET SIZE: A3	ISSUE DATE: MAY 2018	

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	OCT 2010
4	APR 2016

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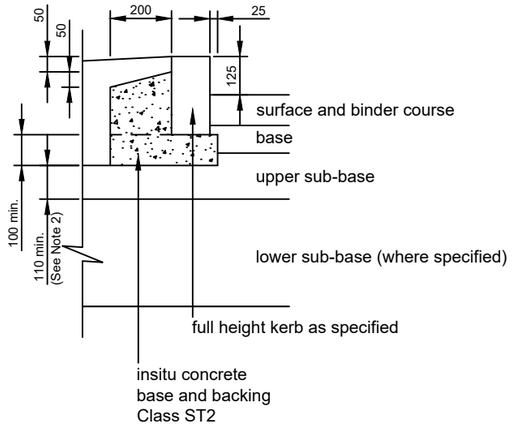
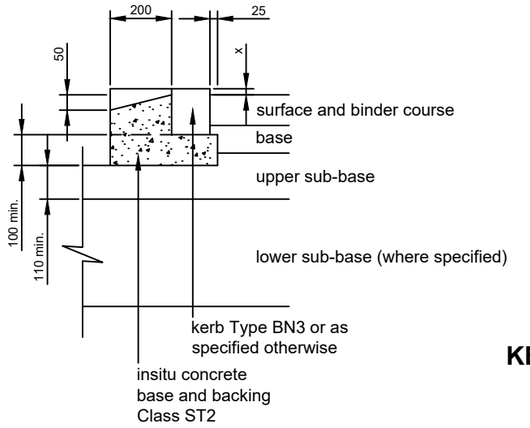
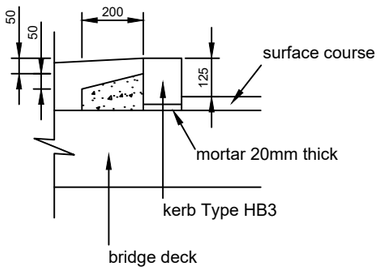


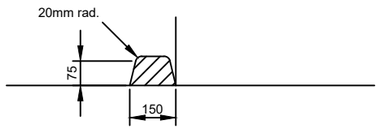
KERBING DETAIL: FULL HEIGHT KERBS



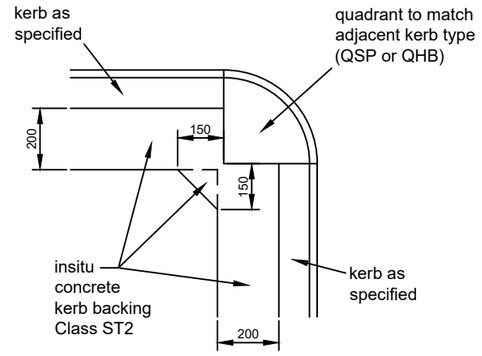
KERBING DETAIL: DROPPED KERBS



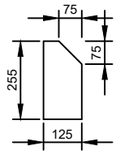
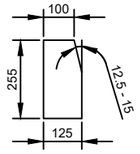
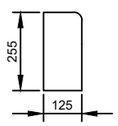
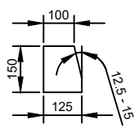
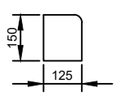
KERBING DETAIL: KERBS OVER BRIDGE DECKS

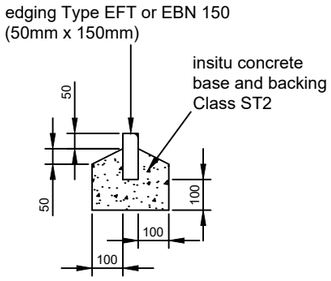


KERBING DETAIL: EXTRUDED ASPHALT KERBS

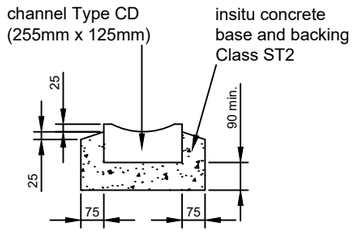


QUADRANT DETAIL

KERB TYPE	DESCRIPTION	DIMENSIONS
SP2	45° splayed 125mm x 255mm SP	
HB2	half battered 125mm x 255mm HB	
BN2	bullnosed 125mm x 255mm BN	
HB3	half battered 125mm x 150mm HB	
BN3	bullnosed 125mm x 150mm BN	



EDGING DETAIL



CHANNEL DETAIL: TYPE G

SPECIAL KERBS & CODES	
DROPPER KERBS:	TRANSITION KERBS:
HB2 ⟶ BN3 = DL1 (125mm x 255mm/150mm left hand DL1)	HB2 ⟶ SP2 = TL1 (125mm x 255mm left hand TL1)
BN3 ⟶ HB2 = DR1 (125mm x 255mm/150mm right hand DR1)	SP2 ⟶ HB2 = TR1 (125mm x 255mm right hand TR1)
SP2 ⟶ BN3 = DL2 (125mm x 255mm/150mm left hand DL2)	HB2 ⟶ BN2 = TL2 (125mm x 255mm left hand TL2)
BN3 ⟶ SP2 = DR2 (125mm x 255mm/150mm right hand DR2)	BN2 ⟶ HB2 = TR2 (125mm x 255mm right hand TR2)
ANGLES:	QUADRANTS:
HBIA/BNIA = (125mm x 225mm internal angle)	QSP/QHB = (455mm/305mm x 255mm QSP/QHB)
MISCELLANEOUS KERBS:	
WFK = 'ACO Wildlife Kerb' or similar approved (HB2 Profile)	

NOTES

1. All angular dimensions are in degrees.
2. The kerb base shall sit directly on the upper sub-base at either its design level or lower. The minimum depth of kerb base shall be 100mm and the minimum thickness of the upper sub-base below kerb base shall be 110mm or 150mm where no lower sub-base layer is specified.
3. All vertical faces on kerb base and backing shall be formed with shuttering.
4. Kerbs shall be backed up while the kerb base remains plastic (max. 6hrs after batching).
5. Mortar shall comply with S.H.W. Clause 2404 designation (i).
6. Refer to Appendix 11/1 or scheme specific drawings for the kerbing schedule.
7. Kerb reference numbers are defined in BS 7263-1: 2001 and BS 7263-3: 2001.
8. Quadrants shall be specified by type, section radius and depth (e.g. QHB 305/255).
9. Dimension 'x' on the Dropped Kerb detail shall be 25mm generally, and 6mm or less on pedestrian and cycle crossings.
10. For kerbline radii not exceeding 12m, appropriate curved kerbs shall be used.
11. For kerbline radii exceeding 12m but not exceeding 20m, 610mm long straight kerbs shall be used.
12. Bond coat to clause 920 shall be applied to the carriageway surface in accordance with BS 434: Part 2 prior to the laying of extruded asphalt kerbing.
13. Refer to MCHW HCDs F 15 and F 16 for Channel Detail Types 'A' to 'F'.
14. Kerbs shall not be cut to a length less than 300mm, in accordance with BS 7533-6:1999.
15. The maximum gap between kerbs shall be 3mm. Any gap wider than 3mm shall be flash pointed with cement mortar.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: KERBS, EDGES & CHANNELS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	6

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 702.1	A3	FEB 2021

PREVIOUS ISSUES

1	FEB 2005	5	MAY 2018
2	MAY 2010		
3	APR 2016		
4	FEB 2017		

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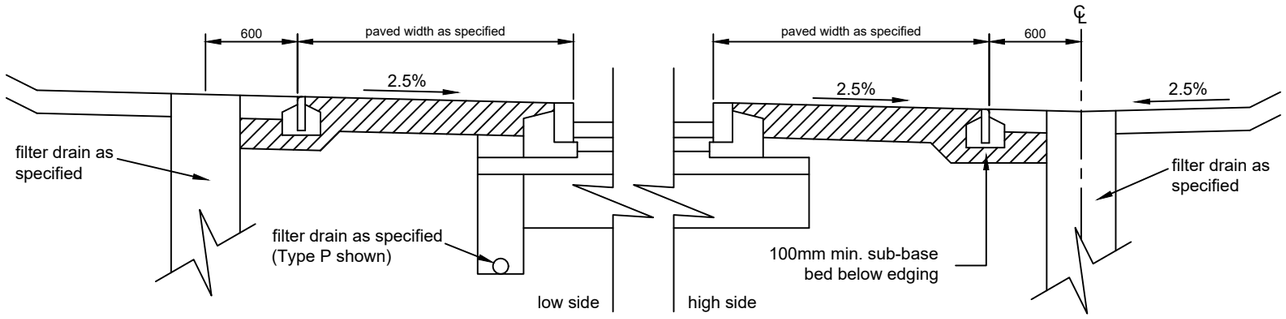
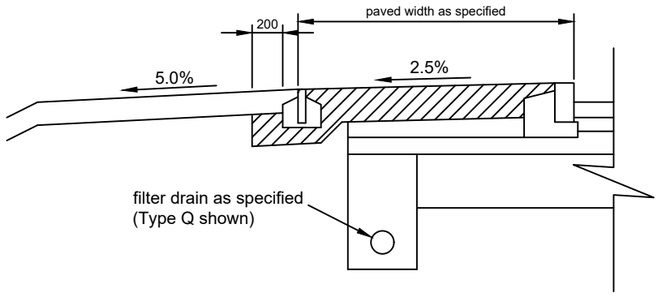
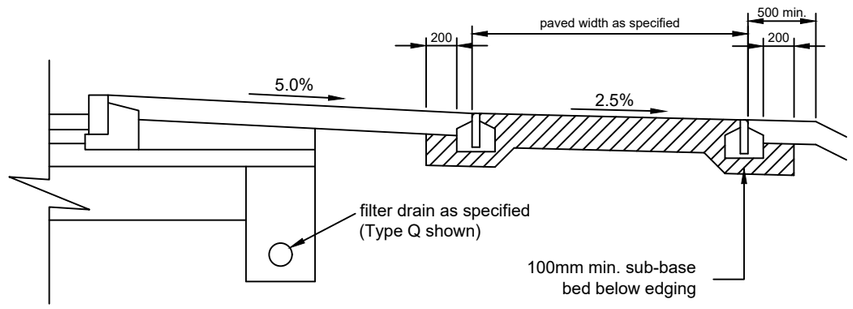


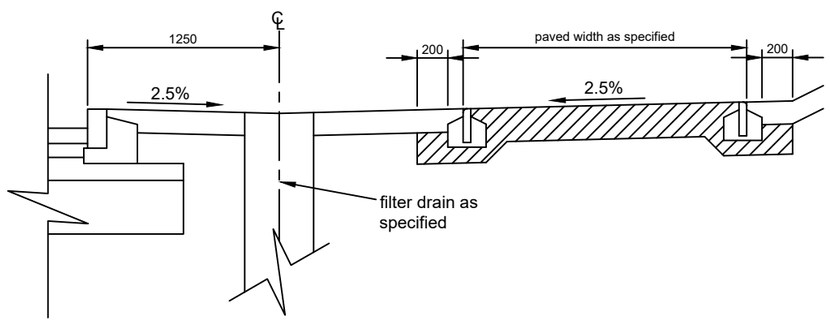
PAVED AREA ADJACENT TO CARRIAGEWAY IN CUTTING



PAVED AREA ADJACENT TO CARRIAGEWAY ON EMBANKMENT



PAVED AREA AT BACK OF VERGE ON EMBANKMENT



PAVED AREA AT BACK OF VERGE IN CUTTING

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

KEY

footway/cycleway construction
(refer to table below)

CONSTRUCTION FOR BITUMINOUS FOOTWAYS, CYCLEWAYS AND COMBINED FOOTWAYS/CYCLEWAYS

Construction Type	Thickness	Specification	Notes
Type 1: (footways only)	20mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	To be used on untrafficked footways only, where vehicle loading is not possible.
	50mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	100mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type 2: (footways and cycleways)	20mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	To be used on footways and cycleways trafficked only by light vehicles and where there is no risk of heavy vehicle loading.
	50mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	150mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type 3: (footways and cycleways)	20mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	To be used on footways and cycleways occasionally trafficked by heavy vehicles.
	50mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	225mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type 4: (footways and cycleways)	25mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	To be used on footways and cycleways frequently trafficked by heavy vehicles.
	90mm	Base: AC32 dense base 100/150 (160/220 base may be used in winter when hand laying)	
	365mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	

NOTES

1. The material specifications for 55/6F surf., 45/6F surf. and 45/10F surf. are given in W.C.C. County Road Construction Strategy. The material specification for 55/10F surf. is given in PD 6691, Table C2A.
2. Footways and cycleways crossing accesses shall be constructed in accordance with the relevant access construction requirements of B 704.2.
3. Machine laying of bituminous layers is the default option. Except for circumstances where it is not possible, cycleways and combined footways/cycleways shall be machine laid. Permission to hand lay must be sought from the Overseeing Organisation.
4. An EBN edging should be used when a soft verge is adjacent to the footway/cycleway.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: FOOTWAY & CYCLEWAY CONSTRUCTION (BITUMINOUS)

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	7

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.1	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005	5	APR 2016
2	MAY 2010	6	FEB 2017
3	OCT 2010		
4	FEB 2013		

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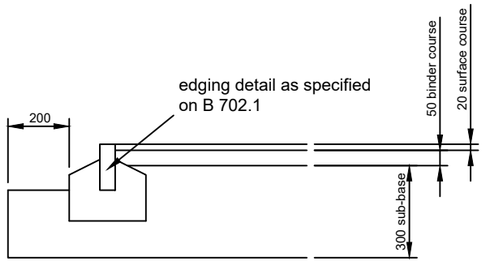
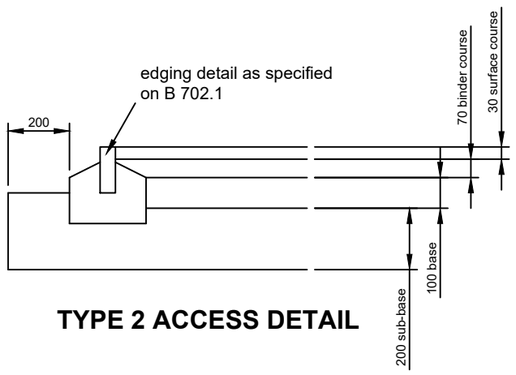
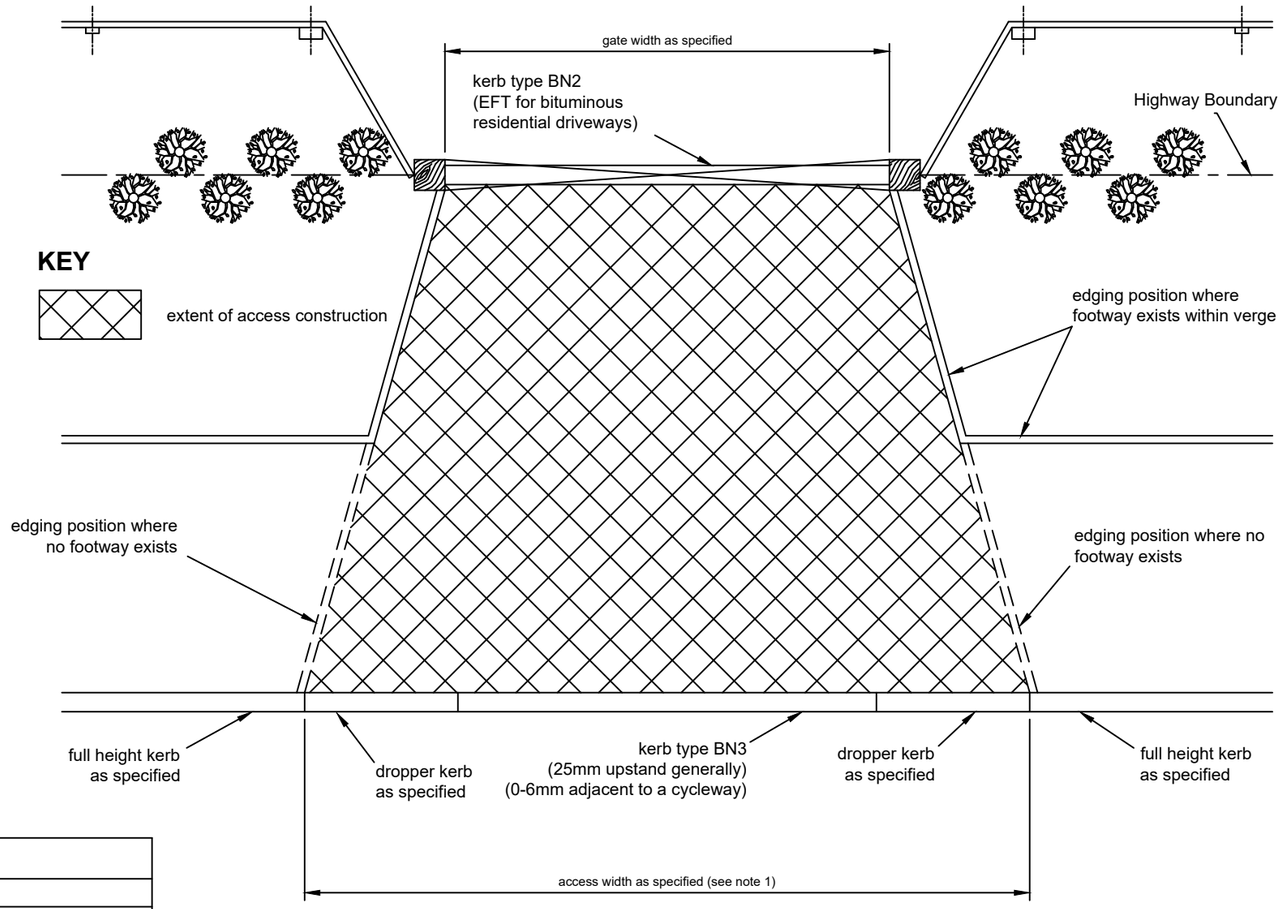


TYPE 1 ACCESS DETAIL



TYPE 2 ACCESS DETAIL



ACCESS LAYOUT

ACCESS CONSTRUCTION

Construction Type	Thickness	Specification	Notes
Type 1	20mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	For residential use
	50mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	300mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type 2	30mm	Surface Course: HRA 55/6F surf 100/150 (HRA 45/6F 160/220 if hand laid)	For industrial use
	70mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	100mm	Base: AC32 dense base 100/150 (160/220 base may be used in winter when hand laying)	
	200mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	

NOTES

1. The access width dimension shall be such that it may be constructed using a whole number of uncut dropper and bullnose kerbs adjacent to the carriageway.
2. The longitudinal vertical alignment of the access centerline shall be:
   A. a straight upward or downward gradient where the slope between carriageway channel and foot of gate posts is 5% or less.
   B. a straight upward or downward gradient at 5% between carriageway channel and a point 3m in from the kerb, followed by a steeper gradient (not exceeding 10%) to the foot of gate posts where the average slope exceeds 5%.
3. Refer to Appendix 11/1 for edging upstand specification. If no upstand dimension is specified, the surface course shall be laid flush with the top of edging.
4. Filter drains beneath access construction shall be Type Q (Group F8). Refer to F 702.2 for details.
5. Bullnose kerbs laid between gateposts, shall be positioned so that the bullnose edge is facing the field.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: ACCESS CONSTRUCTION

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	8

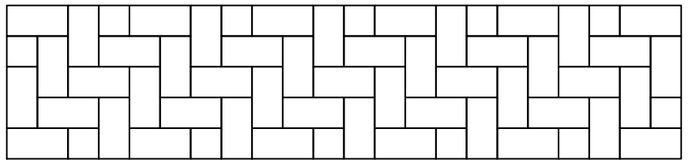
DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.2	A3	FEB 2021

PREVIOUS ISSUES

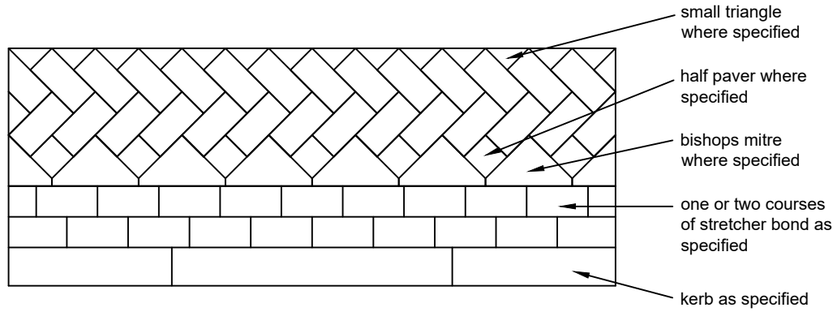
1	FEB 2005	5	APR 2016
2	MAY 2010	6	FEB 2017
3	OCT 2010	7	MAY 2018
4	FEB 2014		

0mm 50mm 100mm 150mm 200mm

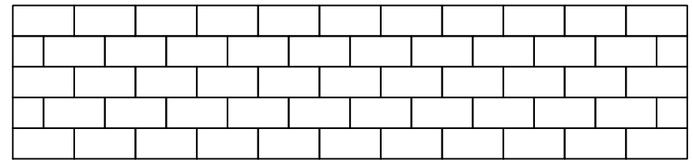
APPROVED LAYING PATTERNS



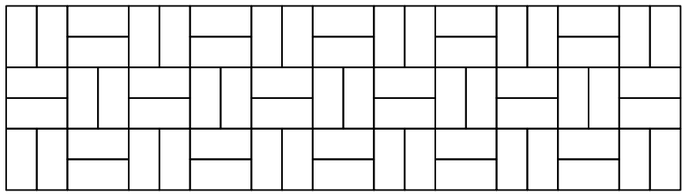
SQUARE HERRINGBONE



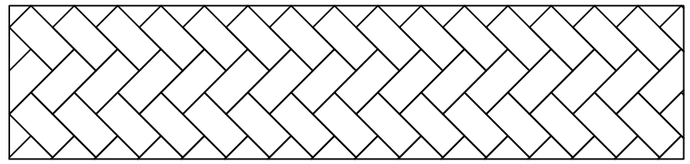
KERBSIDE EDGE DETAILS



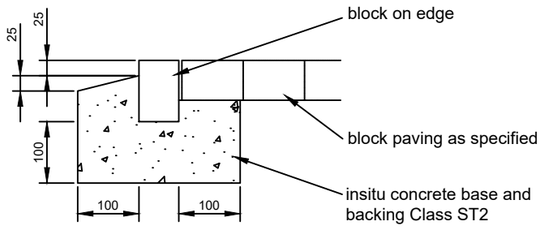
STRETCHER



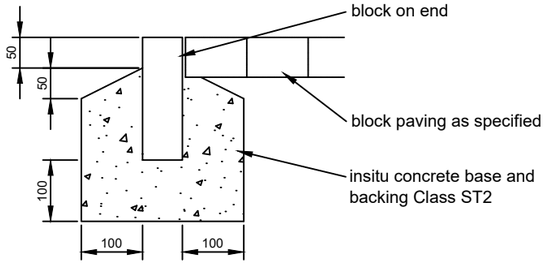
BASKET WEAVE



45° HERRINGBONE



TYPE 1 EDGE RESTRAINT



TYPE 2 EDGE RESTRAINT

NOTES

1. Blocks, and the laying of blocks shall comply with S.H.W. Clause 1107.
2. Blocks dimensions shall be 200mm x 100mm x 80/65/60mm.
3. For foundation details refer to B704.5.
4. Block paving shall be supported (on edges other than the kerbside edge) by edge restraint Type 1 or Type 2, or by the edging for bituminous paving shown on B 702.1.
5. Refer to Appendix 11/1 for block paving details including edge restraint details.
6. Where blocks are laid in stretcher bond on curves, cut blocks shall be inserted where necessary so that joints on adjacent rows are no closer together than one quarter of a block length.
7. Stretcher bond and basket weave shall not be used on areas subject to vehicular traffic.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: BLOCK PAVING: LAYING PATTERNS & EDGE RESTRAINTS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.3	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016

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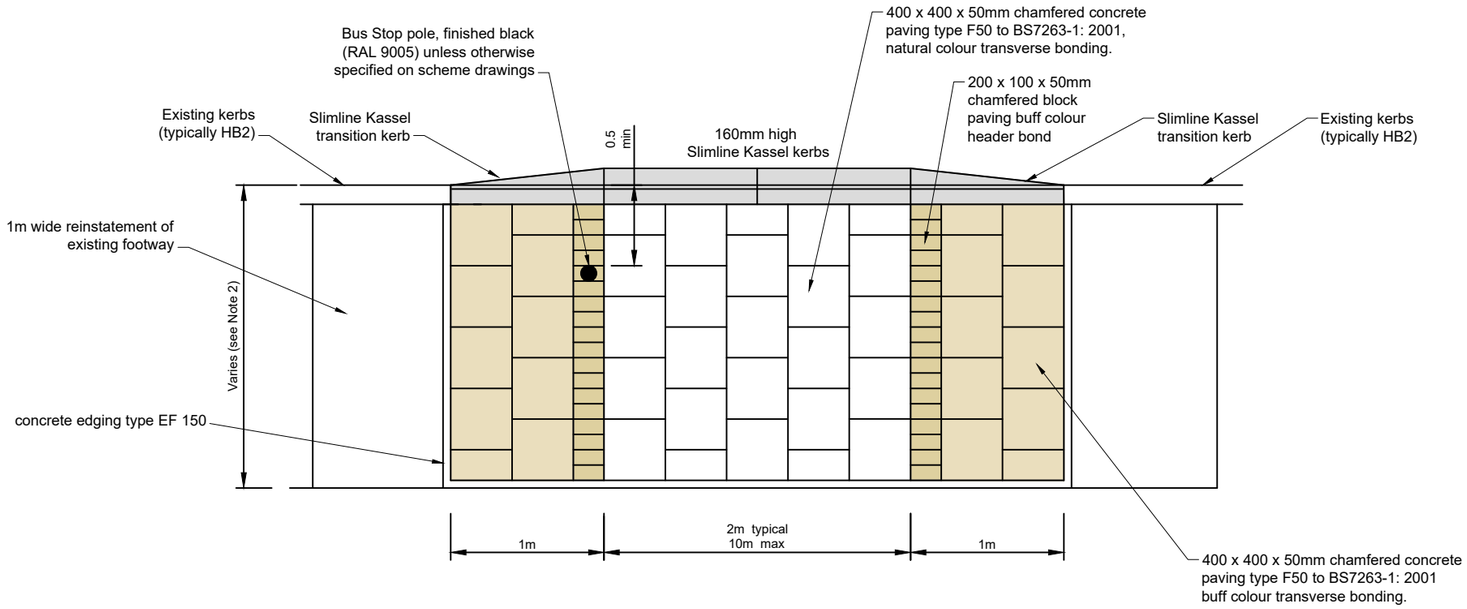
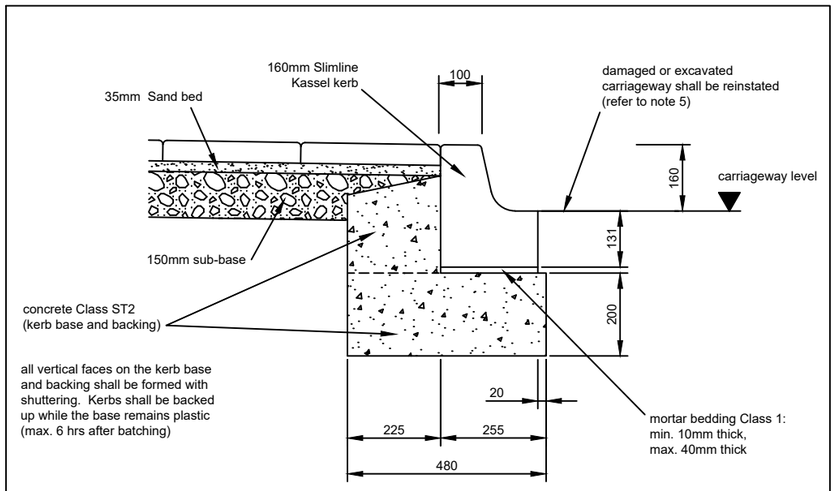
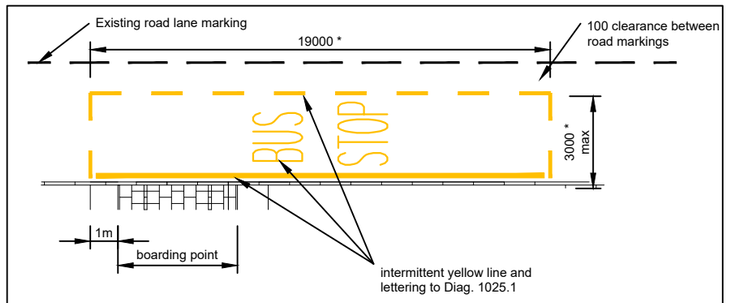


PAVING DETAIL FOR BOARDING POINT WITH "SLIMLINE KASSEL" KERBS



EDGE DETAIL FOR BOARDING POINT WITH "SLIMLINE KASSEL" KERBS



* Unless otherwise shown on the detail drawings

Note:
Width of bus bay to be 3m or lane marking (whichever is the least)

ROAD MARKING DETAIL FOR BUS BAY

NOTES

1. Refer to B 702.1 for edge detail with HB2 type kerbs.
2. Where the footway width exceeds 4m, the maximum width of the boarding point shall be 3m. Where the footway width does not exceed 4m, the boarding point width shall be as the footway width. The back edge of the boarding point shall tie in with existing footway levels. Edging kerbs shall be laid along the back edge of the paving area unless the footway boundary is formed by a wall or other structure.
3. Paving flags shall be bedded on Type 1 Unbound Mixtures to S.H.W Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 8 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805, 150mm thick (lower layer), and sand 35mm thick (top layer).
4. Road marking material shall be yellow thermoplastic screed with applied solid glass beads.
5. Damaged or excavated carriageway along the line of new kerbs shall be reinstated in accordance with the longitudinal jointing details shown on B 705.1.
6. The maximum length and width of the bus bay shall be 19m and 3m respectively.
7. Carriageway reinstatement shall be in accordance with the longitudinal construction joint detail shown on B 705.1.
8. Sign to Diag. 974 to be erected on bus stop pole in conjunction with the prohibition of stopping marking. Wording to be agreed with the Overseeing Organisation.
9. Blocks/Flags should not be cut to less than 1/3 of the original size. Neighbouring Block/Flag may need to be cut to achieve this.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: BUS BOARDING POINT (QUALITY BUS CORRIDOR) WITH KASSEL KERBS

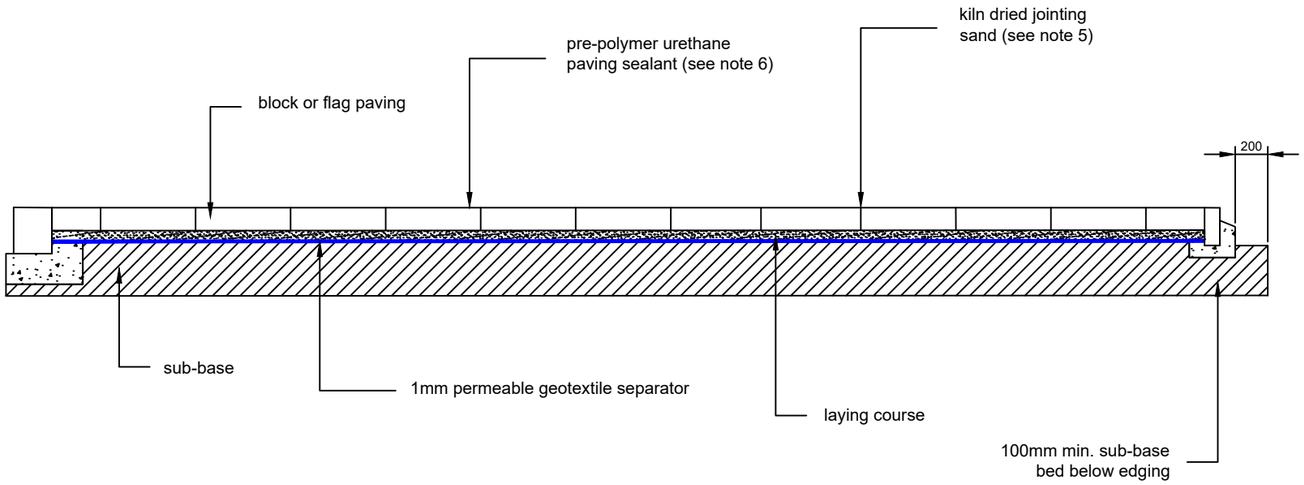
DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	6

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.4	A3	FEB 2021

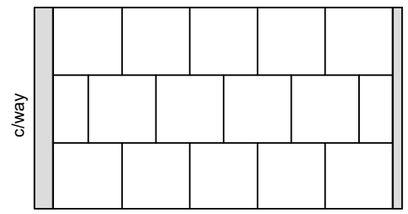
PREVIOUS ISSUES

1	FEB 2005	5	MAY 2018
2	MAY 2010		
3	JULY 2012		
4	APR 2016		

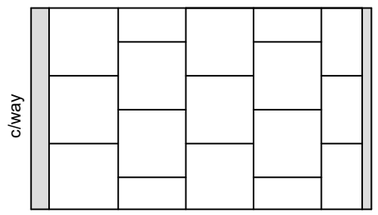
0mm 50mm 100mm 150mm 200mm



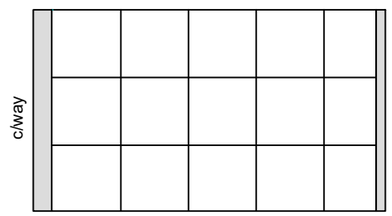
TYPICAL SECTION



Transverse Stretcher Bond



Longitudinal Stretcher Bond



Stack Bond

APPROVED FLAG PAVING PATTERNS

BLOCK/FLAG PAVING MUST NOT BE USED IN THE CARRIAGEWAY

CONSTRUCTION FOR PAVED FOOTWAYS, CYCLEWAYS AND COMBINED FOOTWAYS/CYCLEWAYS

Construction Type	Thickness	Specification	Notes
Type A: (footways only)	Varies	Block or flag pavers as specified on scheme specific drawings	To be used on untrafficked footways only, where vehicle loading is not possible.
	30mm	Laying Course: Bedding sand (kiln dried and compacted) to BS 7533-3:2005	
	100mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type B: (footways and cycleways)	Varies	Block or flag pavers as specified on scheme specific drawings	To be used on footways and cycleways trafficked very occasionally by light vehicles and where there is no risk of heavy vehicle loading.
	30mm	Laying Course: Rigid mortar to BS 7533-3:2005	
	200mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	
Type C: (footways and cycleways)	Varies	Block or flag pavers as specified on scheme specific drawings	To be used on footways and cycleways trafficked very occasionally by heavy vehicles.
	30mm	Laying Course: Rigid mortar to BS 7533-3:2005	
	70mm	Binder Course: AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)	
	150mm	Sub-base: Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805	

NOTES

1. For kerbs and edgings details, refer to WCC HCD B 702.1.
2. For footway/cycleway construction drainage details, refer to WCC HCD B 704.1.
3. For block paving laying patterns, refer to WCC HCD B 704.3
4. For acceptable flag paving sizes, refer to British Standard sizes detailed in BS EN1339:2003.
5. Joints shall be filled in dry conditions and when paving is completely dry to within 2mm of the paving surface.
6. The pre-polymer urethane paving sealant shall be a jointing sand stabiliser that is suitable for the installed paving units and be applied as per the manufacturers specification. The proposed sealant must be approved by the Overseeing Organisation prior to its application.
7. Blocks/Flags should not be cut to less than 1/3 of the original size.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: FOOTWAY & CYCLEWAY CONSTRUCTION (BLOCK & FLAG PAVING)

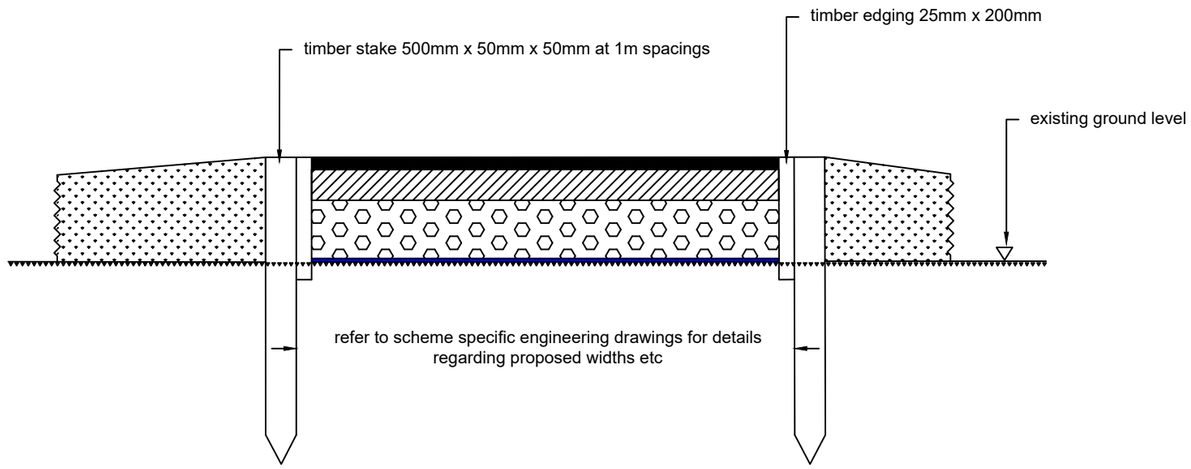
DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	3

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.5	A3	MAY 2018

PREVIOUS ISSUES

1	APR 2016
2	FEB 2017

0mm 50mm 100mm 150mm 200mm



KEY

- geotextile membrane (see note 1)
- surface course: 20mm HRA 55/6F surf 100/150 (HRA 45/6F 160/220 when hand laying)
- binder course: 50mm AC20 dense bin 100/150 (160/220 binder may be used in winter when hand laying)
- 75mm cellular confinement system (geoweb or similar) with stone (4-20mm clean stone) (see note 2)
- topsoil and grass seed on existing ground to be hand laid in the vicinity of trees

PERCENTAGES PASSING OF 4-20MM CLEAN ANGULAR STONE

Sieve Size (mm)	Percentage Passing
40	100
31.5	98-100
20	90-99
10	25-70
4	0-15
2	0-5
1	-

NOTES

1. Geotextile membrane to be a permeable non-woven 1mm thick separator, to be agreed with the Overseeing Organisation in advance.
2. Cellular confinement system to be installed as per manufacturer's specifications. The system is to be filled with 4-20mm clean angular stone to BS EN 1342 or BS EN 12620 (see the adjacent table).
3. Where timber edgings/boards/stakes are to be used, a non-invasive services investigation and scan to be carried out to avoid damage to underground services.
4. This Detail was produced in relation to constructing sections of footway/cycleway over tree and hedge roots with the aim of protecting them. However, in particularly Urban areas, where utilities may be present, the Designer is advised to obtain and check utilities records (as per note 3). Consideration must be given to future maintenance access by Statutory Undertakers and potential installation of new utilities and related reinstatements.
5. If the Designer believes utilities will be an issue (as per note 4), it is advised that they discuss this with WCC Network Management, to determine if any protection notices can be applied to the proposed footway/cycleway, to either prevent excavation by Statutory Undertakers or to require full width reinstatements in accordance with this HCD and agreement of the Overseeing Organisation, when excavations are unavoidable.
6. Any groundwork preparation within the vicinity of tree roots should be restricted to the removal of loose topsoil/humus layer. Only the very top layer of organic matter (surface vegetation, leaves, litter etc.) should be removed prior to the laying of the Geotextile membrane by hand dig methods only.
7. All timber should be pressure treated in advance with preservatives.
8. Any voids in the ground should be filled with inert sharp sand or any similar inert granular material. Building sand not to be used.
9. The ground should not be compacted or overdriven.
10. If any roots protrude when the organic material has been removed, the area needs to be made up using inert sand/granular material.
11. A method statement should be provided by the Contractor and agreed with the Overseeing Organisation before commencement of works.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: FOOTWAY & CYCLEWAY CONSTRUCTION (NO DIG OPTION)

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	2

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 704.6	A3	FEB 2021

PREVIOUS ISSUES

1	MAY 2018		

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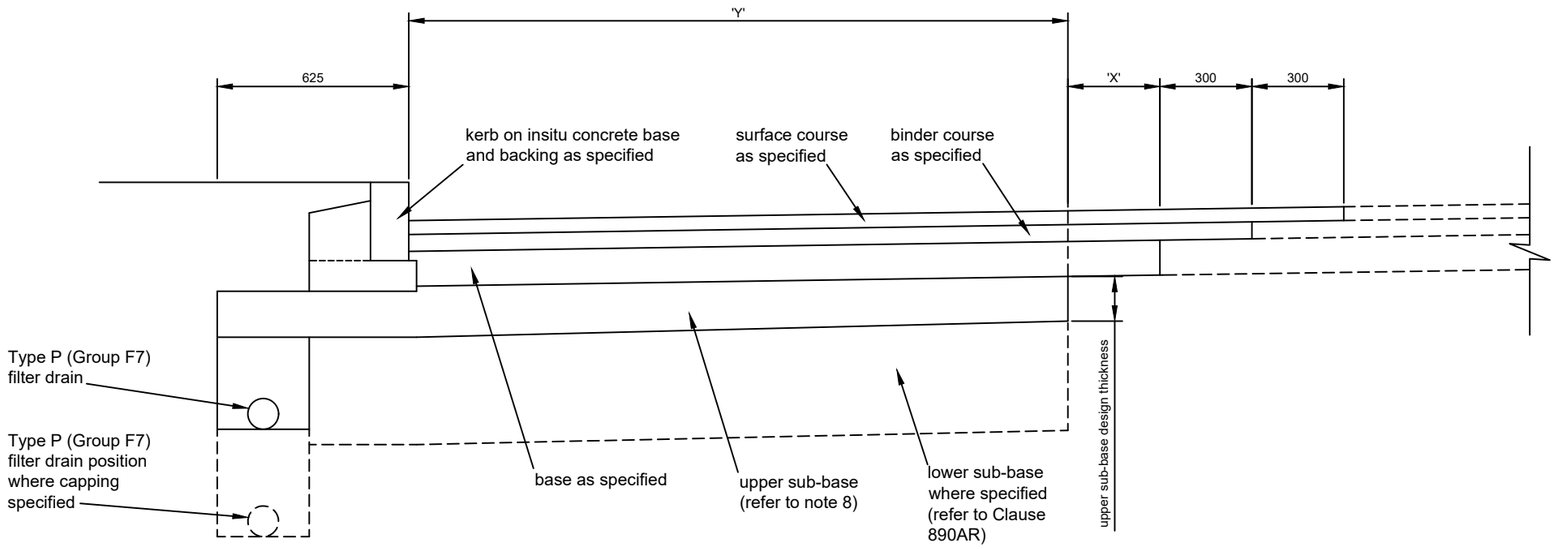
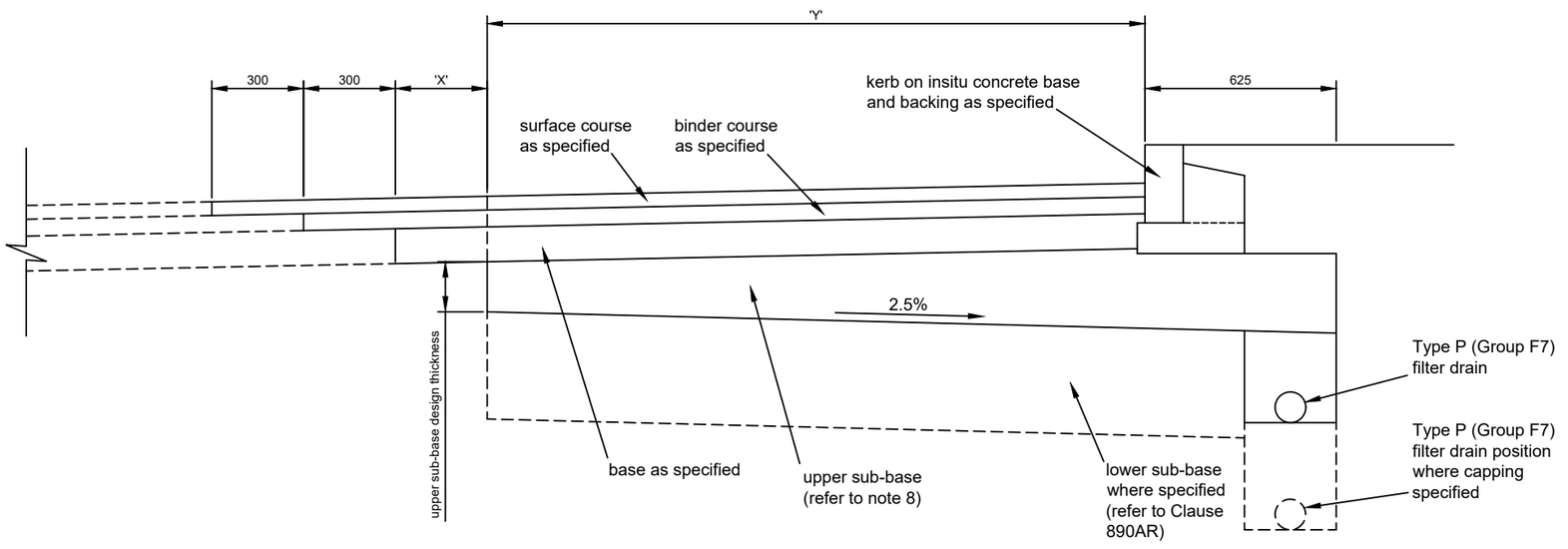


STRIP WIDENING SECTION THROUGH LOW SIDE OF CARRIAGEWAY



STRIP WIDENING SECTION THROUGH HIGH SIDE OF CARRIAGEWAY

NOTES

1. 45/6, 45/10, and 55/10F Rolled Asphalt surface courses shall be as specified in the contract, or where no contract specification applies, in accordance with W.C.C. County Road Construction Strategy. All regulating material shall comply with S.H.W. Series 900.
2. Longitudinal joints in the surface course shall be saw cut.
3. Sub-base and granular fill material shall not be laid directly onto existing bituminous materials. Affected bituminous layers shall be excavated and the resultant void filled with the appropriate free draining granular material.
4. Bond coat to clause 920 shall be applied to all previously trafficked surfaces which are to be overlayed.
5. Dimension 'X' (the cut-back distance from the existing carriageway edge into existing carriageway material) shall be determined by the Overseeing Organisation following an inspection of the condition of existing carriageway materials. For the purpose of tender pricing, always assume 500mm.
6. Dimension 'Y' (the width of new full construction) shall be determined in accordance with the principles outlined in note 5, but shall be no less than 375mm. Where narrow sections of widening occur to the extent that bitminous materials could not be adequately compacted, either cement bound material (approved in advance by the Overseeing Organisation) or insitu concrete Class ST3 shall be used in lieu of bituminous binder course and/or base material, up to a maximum width of 1.5m.
7. Type P (Group F7) filter drains are shown for schematic purposes only. Refer to Appendix 5/1 and scheme specific drawings for filter drain details.
8. Upper sub-base shall be Type 1 Unbound Mixtures to S.H.W. Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W. Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W. Clause 805.
9. Longitudinal surface course joints should normally be located at the centre of the lane or at the lane edge marking.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: EDGE OF PAVEMENT DETAILS	TITLE: STRIP WIDENING & LONGITUDINAL JOINTING DETAILS	DRAWN: RJP	CHECKED: NH	APPROVED: AC	ISSUE: 5
			DRAWING NUMBER: B 705.1	SHEET SIZE: A3	ISSUE DATE: FEB 2021	

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	MAY 2018

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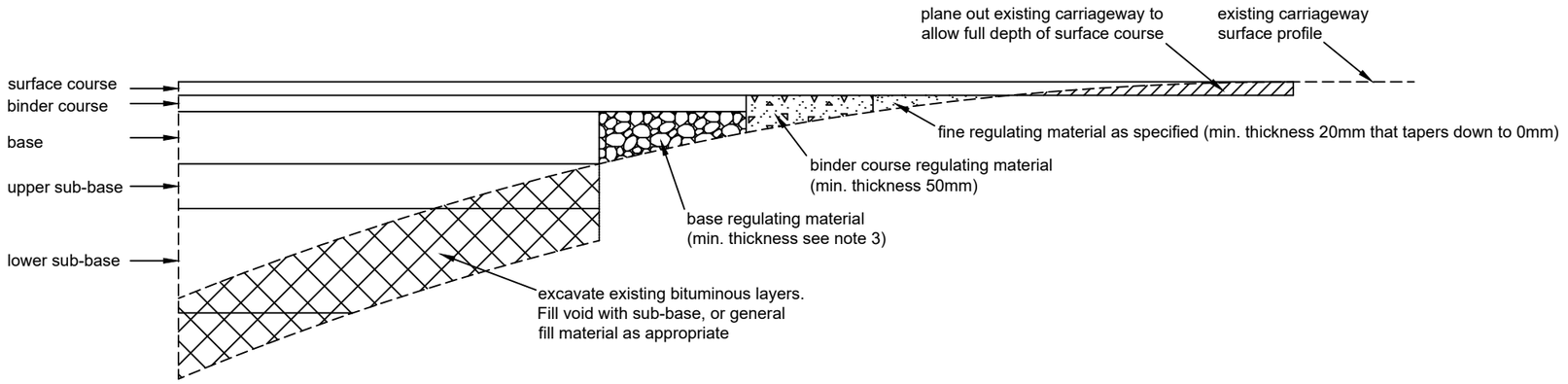
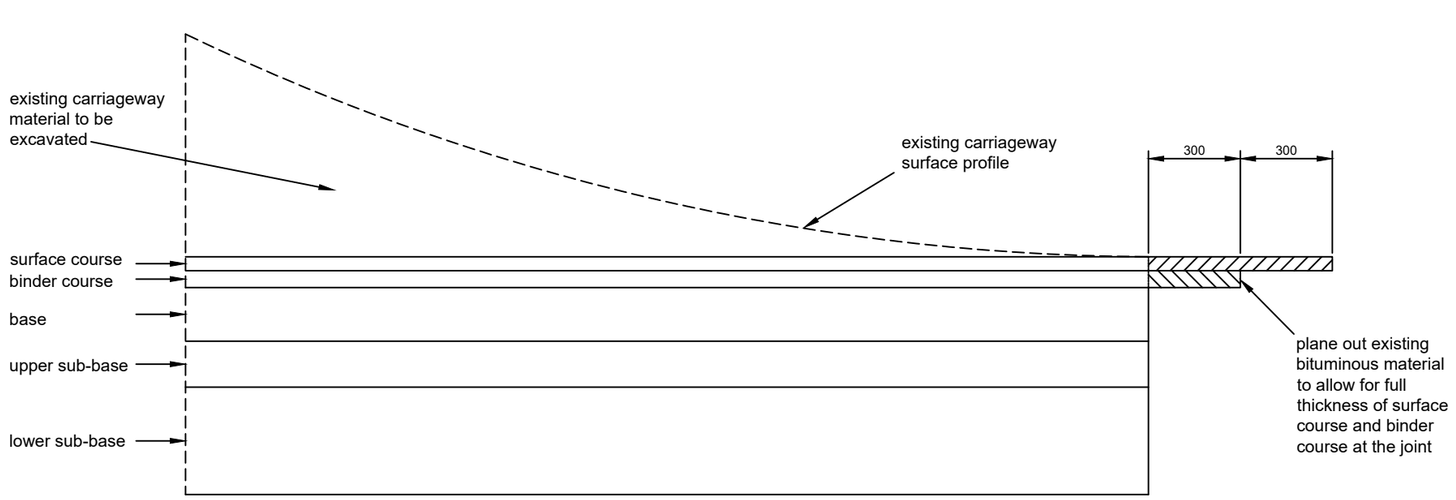


TYPICAL LONGITUDINAL SECTION THROUGH TRANSVERSE JOINT BETWEEN EXISTING CARRIAGEWAY AND NEW CARRIAGEWAY ON FILL



TYPICAL LONGITUDINAL SECTION THROUGH TRANSVERSE JOINT BETWEEN EXISTING CARRIAGEWAY AND NEW CARRIAGEWAY IN CUTTING

NOTES

1. 45/6, 45/10, and 55/10F Rolled Asphalt surface courses shall be as specified in the contract, or where no contract specification applies, in accordance with W.C.C. County Road Construction Strategy. All regulating material shall comply with S.H.W. Series 900.
2. Transverse joints in the surface course shall be saw cut.
3. The minimum laying thicknesses should be in accordance with BS 594987.
4. The remaining void beneath the surface course shall be made up with surface course regulating material just prior to the laying of the full thickness surface course.
5. Sub-base and granular fill material shall not be laid directly onto existing bituminous materials. Affected bituminous layers shall be excavated and the resultant void filled with the appropriate free draining granular material.
6. Bond coat to clause 920 shall be applied to all trafficked surfaces which are to be overlaid.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: EDGE OF PAVEMENT DETAILS	TITLE: OVERLAY & TRANSVERSE JOINTING DETAILS	DRAWN: RJP	CHECKED: NH	APPROVED: AC	ISSUE: 5
			DRAWING NUMBER: B 705.2	SHEET SIZE: A3	ISSUE DATE: MAY 2018	

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	OCT 2010
4	APR 2016

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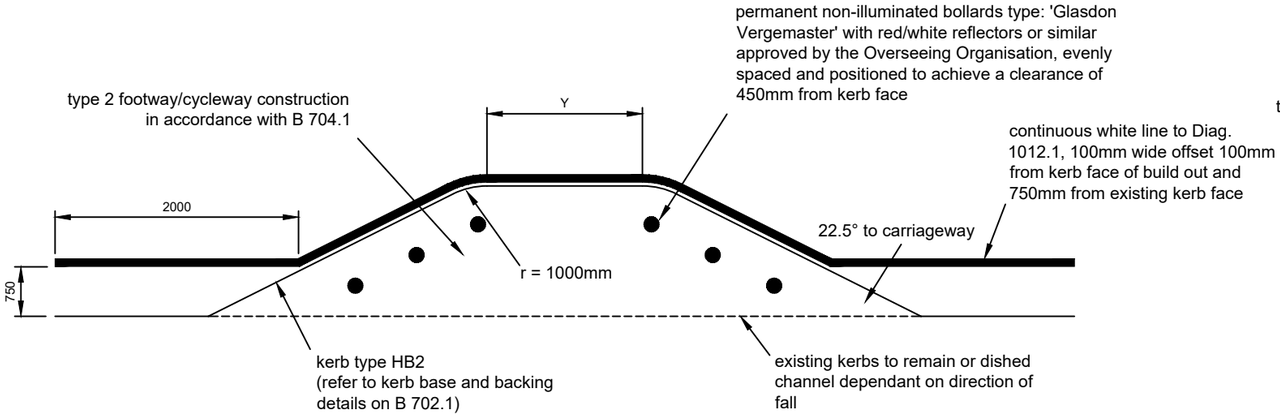
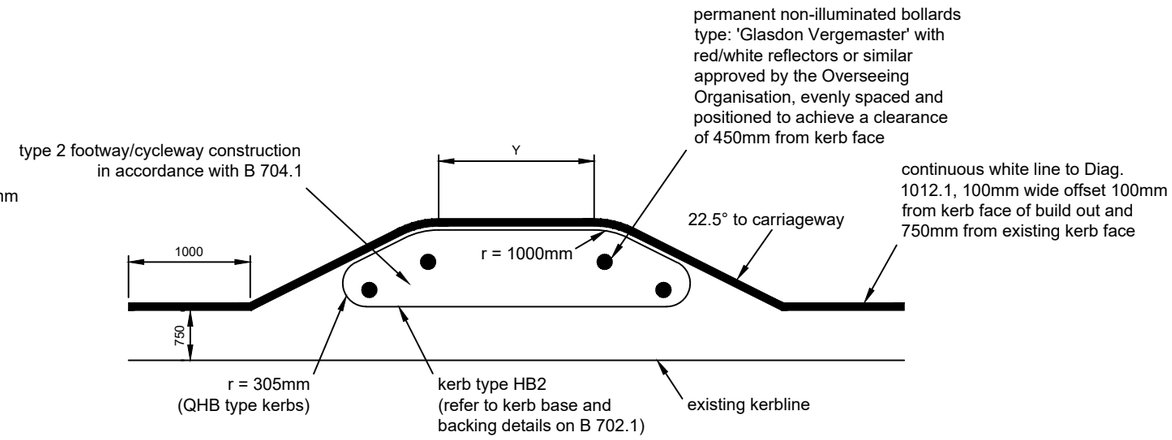


TYPE 1 BUILD OUT



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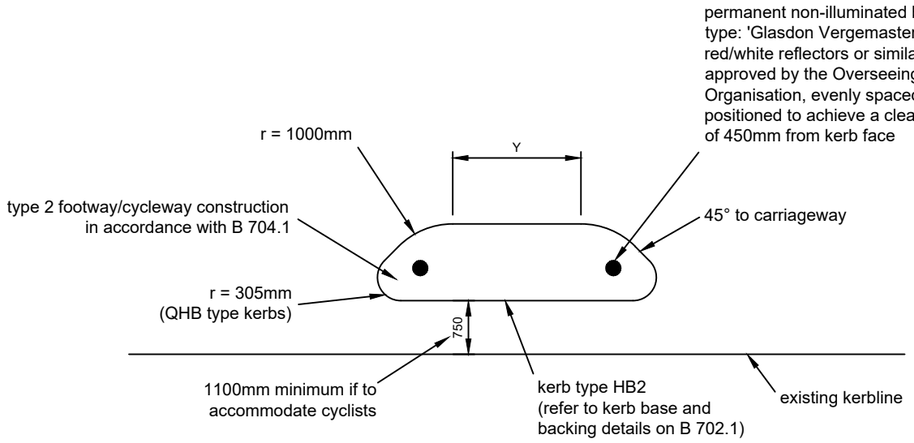
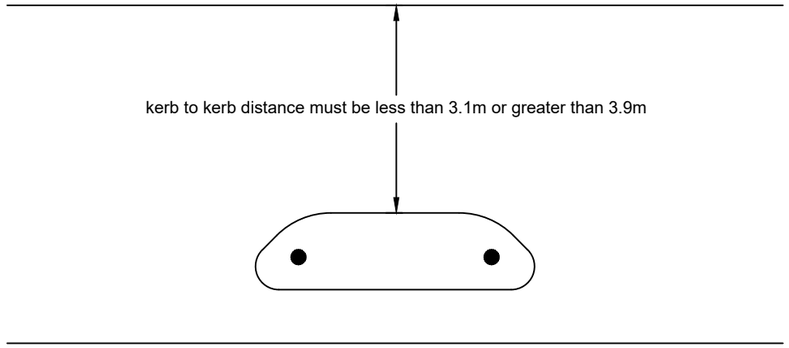


TYPE 3 BUILD OUT



MINIMUM CARRIAGEWAY WIDTH

NOTES

1. Road markings shall comprise white thermoplastic screed with applied solid glass beads.
2. The surface profile of Build Outs shall match the profile of the existing carriageway.
3. Dimension 'Y' must not exceed 3.8m.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: BUILD OUTS FOR ROAD NARROWINGS & CHICANES

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	3

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 706.1	A3	MAY 2018

PREVIOUS ISSUES

1	APR 2016
2	FEB 2017

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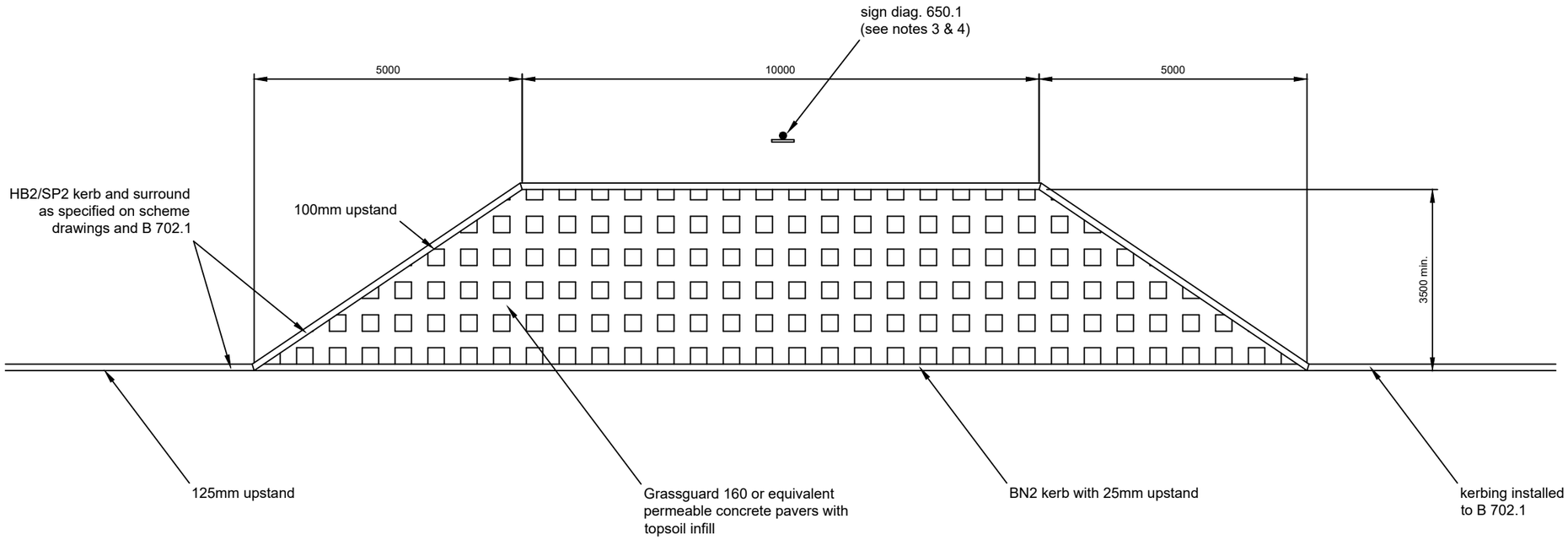


TYPICAL PLAN

SignLoad Professional 3.40
Design undertaken by: Warwickshire County Council

Project: Maintenance

Sign reference: 650.1 Date: 03-05-2018

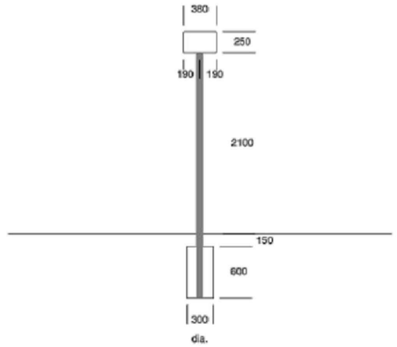
Sign width:	380 mm
Sign height:	250 mm
Sign area:	0.10 m²
Mounting height (to lower edge):	2100 mm
Basic wind pressure:	1000 N/m²
BS EN 12899-1:2007 classes:	WL5, PL3, TDB5, TDT4, PAF1
Passively safe to BS EN 12767:2007	
Aerodynamic force coefficient:	1.3

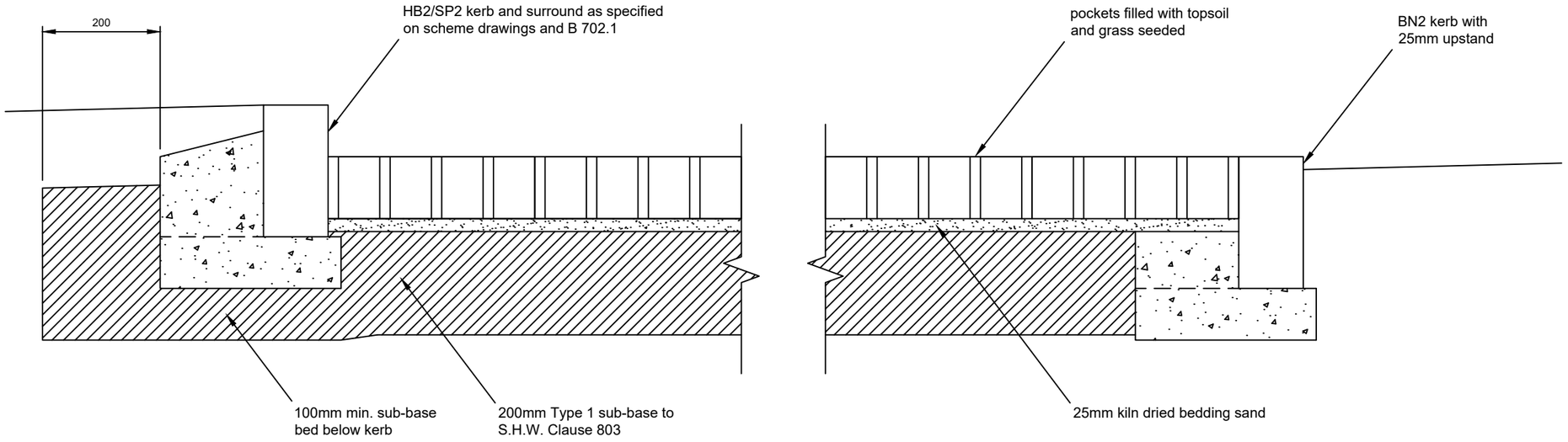
For the above sign, a satisfactory structure is:

Number of supports:	1
Support type:	Steel circular section S275
Support section:	76.1mm O.D. 3.2mm thick
Support length:	3100 mm

Planted foundation to BD 94/07:

Soil type:	poor or unknown
Depth of soft fill above footing:	150 mm
Height of footing:	600 mm (excluding cover)
Diameter of footing:	300 mm





TYPICAL CROSS SECTION

DIAG. 650.1

NOTES

1. Permeable paving to be Marshalls Grassgaurd 160 unless approved in advance by the Overseeing Organisation.
2. Topsoil should be filled up to 12mm from the top of the block.
3. Requirement for sign diag. 650.1 'No stopping at any time except authorised vehicles', to be confirmed with the Overseeing Organisation. A Traffic Order may be required.
4. Specification for sign diag. 650.1 to be confirmed by the Overseeing Organisation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

DIMENSIONS			FACE DETAILS			
	650.1	642	Colours		650.1	642
Width	380 mm	40 mm		Background	Yellow	Blue
Height	250 mm	40 mm		Border	Black	Red
Area	0.10 m²	-		Lettering	Black	-
'x' - Height	20 mm	-		Symbol	642	-

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: EDGE OF PAVEMENT DETAILS

TITLE: MAINTENANCE BAY (WITH PERMEABLE CONCRETE PAVERS)

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	DM	2

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
B 707.1	A3	FEB 2021

PREVIOUS ISSUES: 1 MAY 2018

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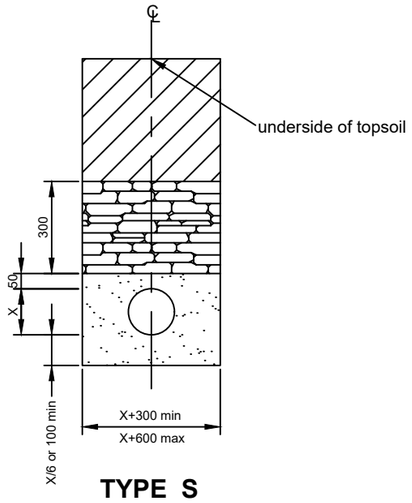
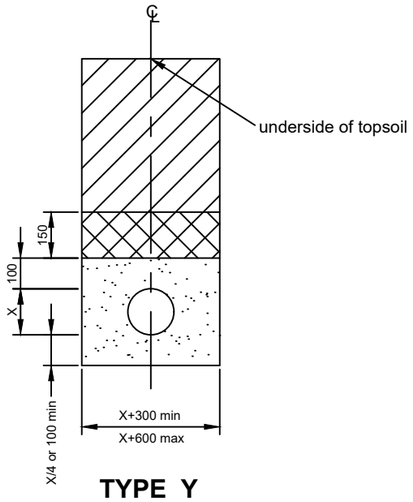
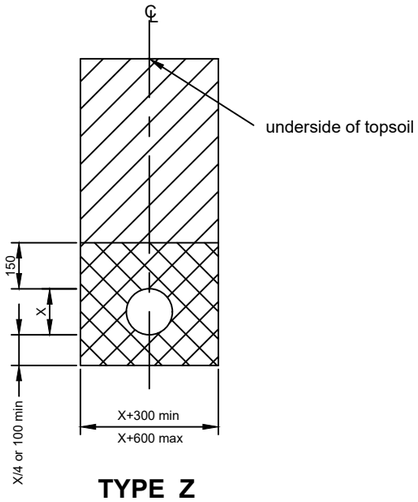


TYPE S



TYPE Y



TYPE Z

KEY

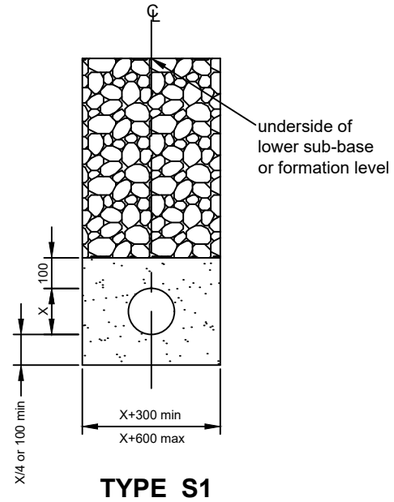
granular material to S.H.W. Clause 503.3(i)

concrete to S.H.W. Clause 503.3(iii)

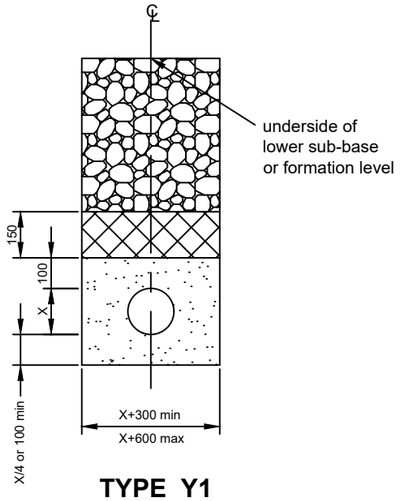
granular material Type 1 sub-base to S.H.W. Clause 803 compacted in accordance with Clause 612, table 6/4 method 6

Class 8 material to S.H.W. Clause 503.3(iv)

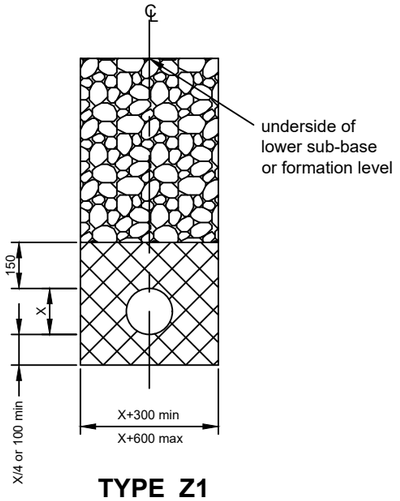
general fill material to S.H.W. Clause 505.2



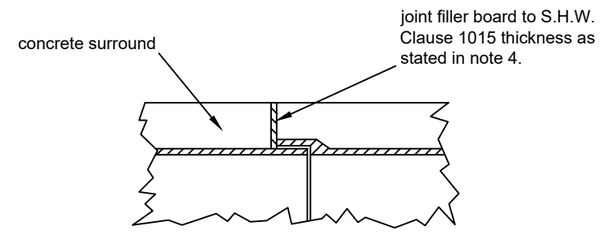
TYPE S1



TYPE Y1



TYPE Z1



JOINT DETAIL FOR PIPE SURROUND ON TYPE Z AND Z1 DRAINS

NOTES

1. Refer to Appendix 5/1 for pipe and bedding alternatives.
2. Dimension 'X' denotes the external diameter of the pipe.
3. The joint detail for pipe surround on Type Z and Z1 drains is for flexible joints only.
4. For pipes with a nominal diameter below 450mm, the thickness of compressible joint filler board shall be 18mm. For pipes with a nominal diameter of 450mm or greater, but not exceeding 1200mm, the thicknes of joint filler board shall be 36mm. For pipes exceeding 1200mm nominal diameter, the thickness of joint filler board shall be 54mm.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: SURFACE WATER DRAINS: BEDDING & TRENCH DETAILS

DRAWN	CHECKED	APPROVED	ISSUE
SS	RJP	AC	3

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 701.1	A3	APR 2016

PREVIOUS ISSUES

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2	MAY 2010

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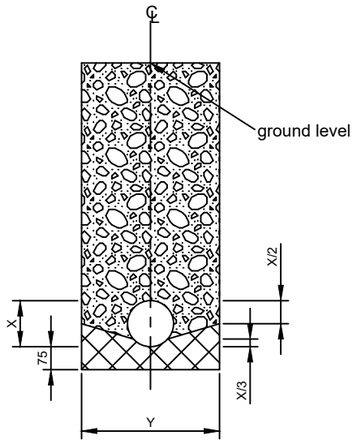
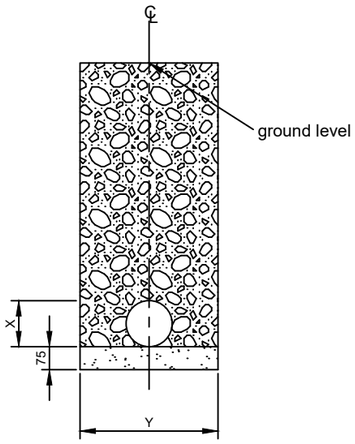
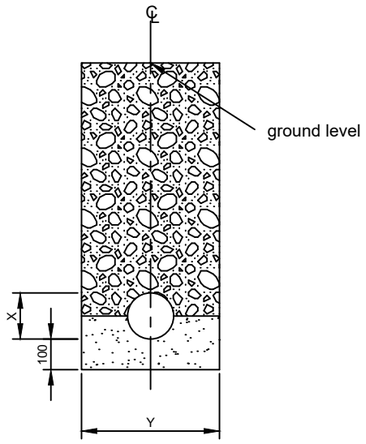


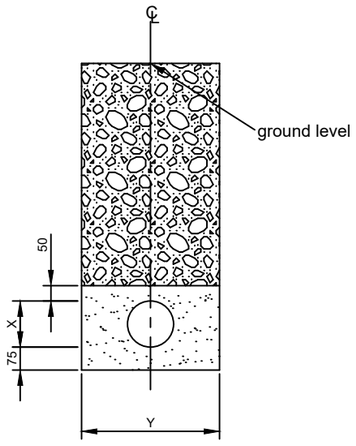
TYPE G



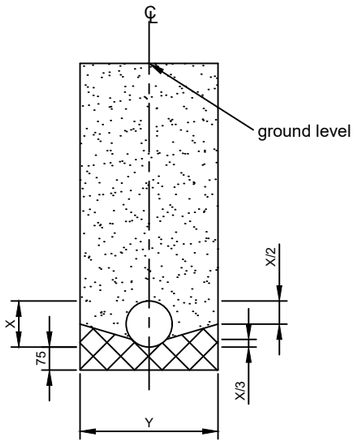
TYPE H



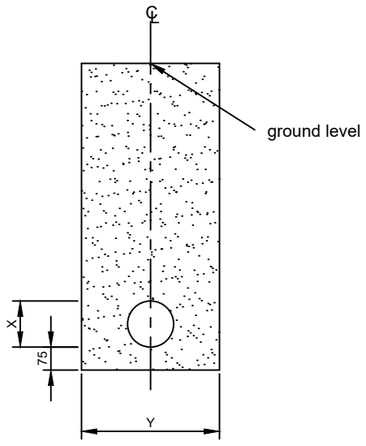
TYPE H1



TYPE I



TYPE J



TYPE K

KEY

Type A or C filter material to S.H.W. Clause 505 or granular material to S.H.W. Clause 503.3(i)

Type B filter material to S.H.W. Clause 505.5 table 5/5

concrete to S.H.W. Clause 503.3(iii)

NOTES

1. Refer to Appendix 5/1 for pipe and bedding alternatives.
2. Dimension 'X' denotes the external diameter of the pipe.
3. Pipes shall comply with the requirements for filter drain pipes in S.H.W. table 5/1.
4. Pipes shall be laid with the slots or perforations facing upwards.
5. Minimum drain width Y = X+300 for drains not exceeding 1.5m cover below finished ground level. Y = X+450 for drains exceeding 1.5m cover below finished ground level.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: FILTER DRAINS: BEDDING & TRENCH DETAILS SHEET 1

DRAWN	CHECKED	APPROVED	ISSUE
SS	RJP	AC	3

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 702.1	A3	APR 2016

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010

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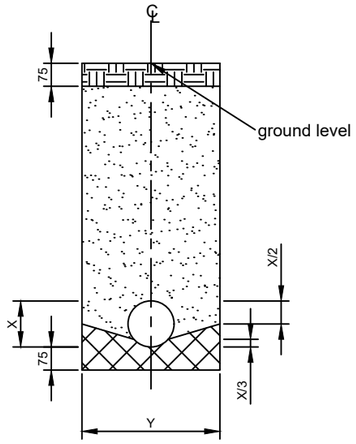
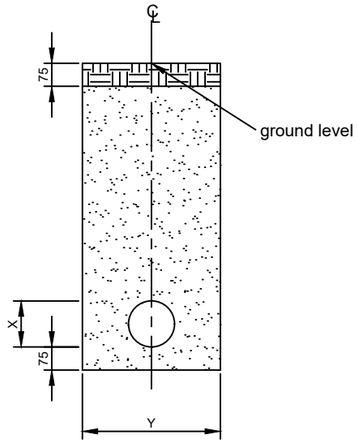
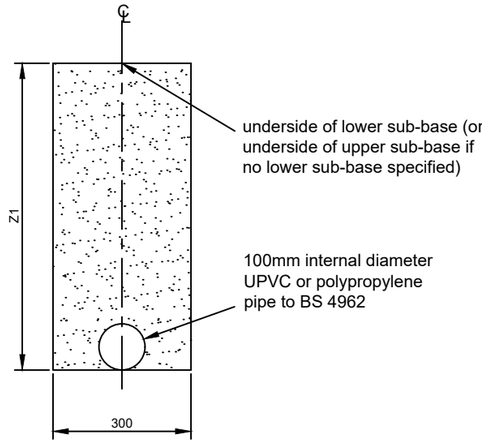


TYPE L



TYPE M



TYPE P
(GROUP F7)

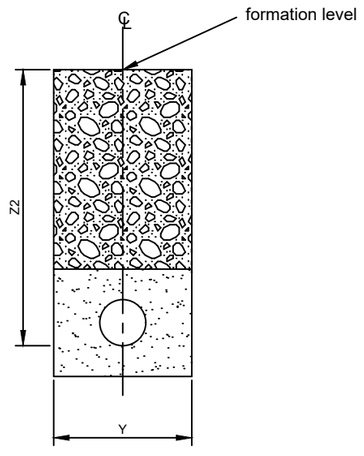
KEY

Type A or C filter material to S.H.W. Clause 505 or granular material to S.H.W. Clause 503.3(i)

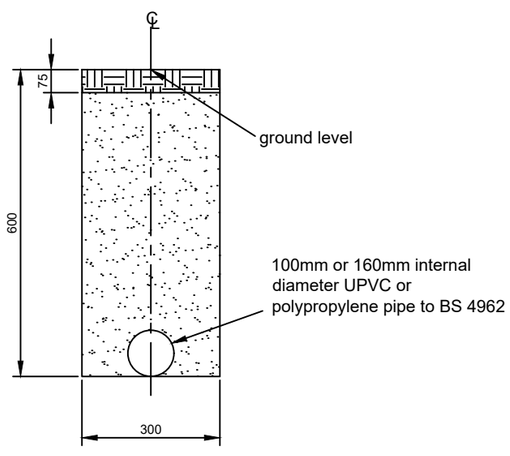
Type B filter material to S.H.W. Clause 505.5 table 5/5

concrete to S.H.W. Clause 503.3(iii)

turf or seeded topsoil in accordance with Appendix 5/1



TYPE Q
(GROUP F8)



TYPE R
(GROUP F9A/F9B)

NOTES

1. Refer to Appendix 5/1 for pipe and bedding alternatives.
2. Dimension 'X' denotes the external diameter of the pipe.
3. Pipes shall comply with the requirements for filter drain pipes in S.H.W. table 5/1.
4. Pipes shall be laid with the slots or perforations facing upwards.
5. Minimum drain width Y = X+300 for drains not exceeding 1.5m cover below finished ground level. Y = X+450 for drains exceeding 1.5m cover below finished ground level.
6. Depth of Type P filter drain Z1 = lower sub-base layer thickness+300mm. Where no lower sub-base layer is specified Z1 = 300mm.
7. Depth of Type Q filter drain Z2 = lower sub-base layer thickness+(X+50)mm, or 600mm whichever is the greater. Where no lower sub-base layer is specified Z2 = 600mm.
8. Group F9B filter drains are the same as Group F9A (shown), except that the filter material shall continue up to ground level.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: FILTER DRAINS: BEDDING & TRENCH DETAILS SHEET 2

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 702.2	A3	MAY 2018

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 APR 2016

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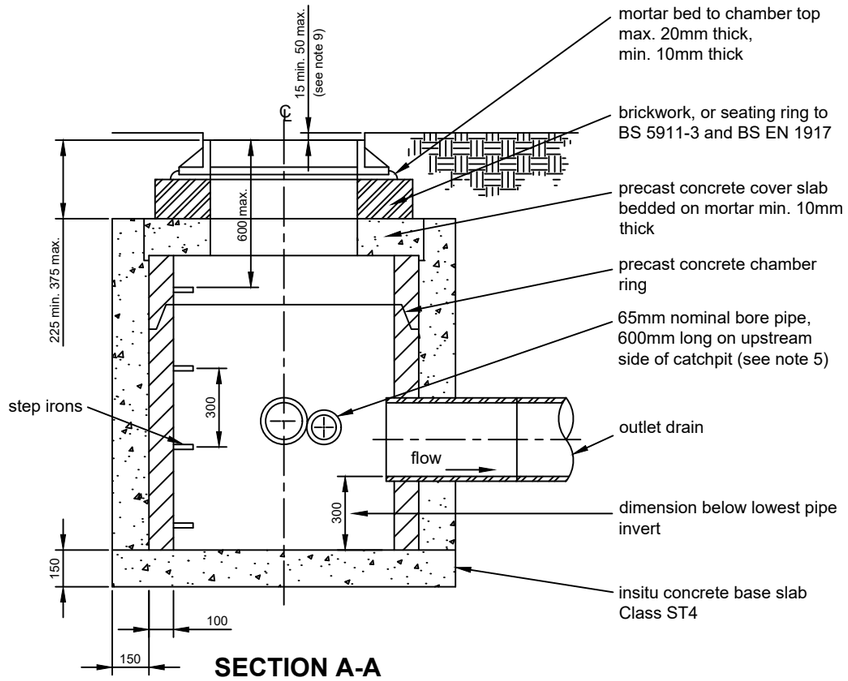
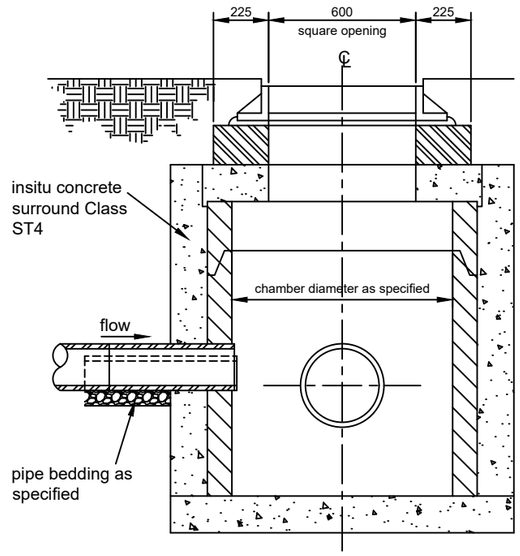
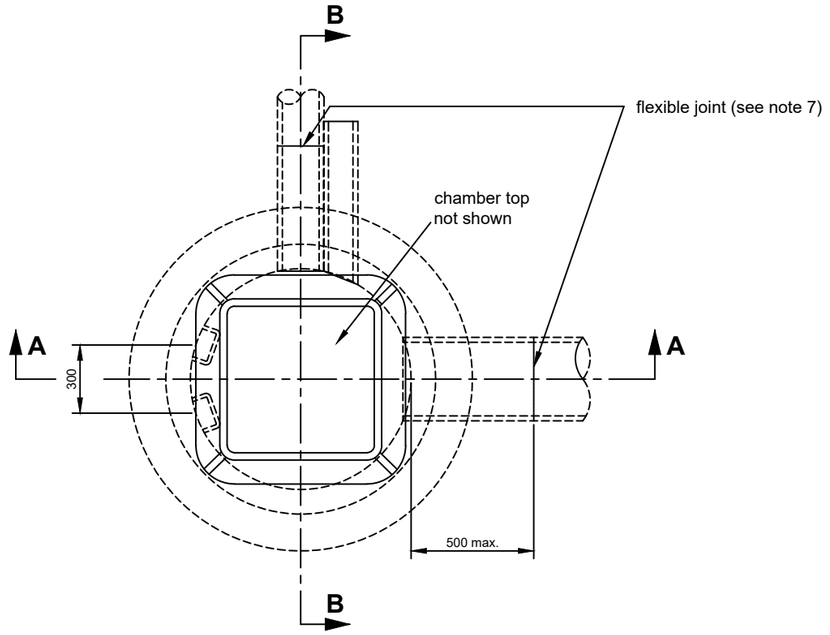


SECTION A-A



SECTION B-B



PLAN

Catchpit Type	Chamber Diameter (mm)	Base Slab Diameter (mm)
A	900	1400
B	1050	1550
C	1200	1700
D	1350	1850
E	1500	2000

NOTES

1. Precast concrete shall comply with the requirements of BS 59113 and BS EN 1917.
2. Refer to the scheme specific drawings, Appendix 5/1 and the drainage schedule for invert level, cover level and branch connection details.
3. Mortar shall be designation (i) to S.H.W. Clause 2404.
4. Pipes shall be grouted into catchpits with mortar.
5. 65mm diameter pipes 600mm long shall be built into catchpits to drain the sump of trenches on upstream connections. Pipes shall be positioned above any concrete filter drain beds.
6. Positioning of chamber access lids and step irons to be agreed with Overseeing Organisation.
7. Flexible joints adjacent to pipe connections shall comply with S.H.W. Clause 507.15.
8. Precast concrete catchpit rings shall be of a type manufactured to comprise sulphate resisting cement to BS 4027: 1996.
9. The chamber top shall be set as dimensioned below the adjacent:
   a. hard shoulder or hardstrip (for verges or central reserves on carriageways without concrete kerbing; and
   b. finished ground level in all other off carriageway locations.

   Where catchpits are to constructed within the carriageway, the chamber top shall be set flush with the carriageway surface.
10. Catchpits in new carriageway shall be raised to finished road level following completion of binder course laying and prior to commencement of surface course laying, as prescribed by BS 594987:2007 clause 6.9.
11. Brickwork shall be English bond and comprise Class B clay engineering bricks to BS EN 722-3: 1998 and BS EN 722-7: 1998, bedded on mortar. Brickwork shall comply with S.H.W. Clauses 2406 and 2412.
12. This detail applies only to those catchpits where the distance between cover level and catchpit invert level does not exceed 2.0m.
13. Chamber cover and frame to be ductile iron Class D400, non-rocking to BS EN124:2015 and CD 534.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: PRECAST CONCRETE CATCHPITS: TYPE A, B, C, D & E

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	6

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 703.1	A3	FEB 2021

PREVIOUS ISSUES

1	FEB 2005	5	MAY 2018
2	MAY 2010		
3	OCT 2010		
4	APR 2016		

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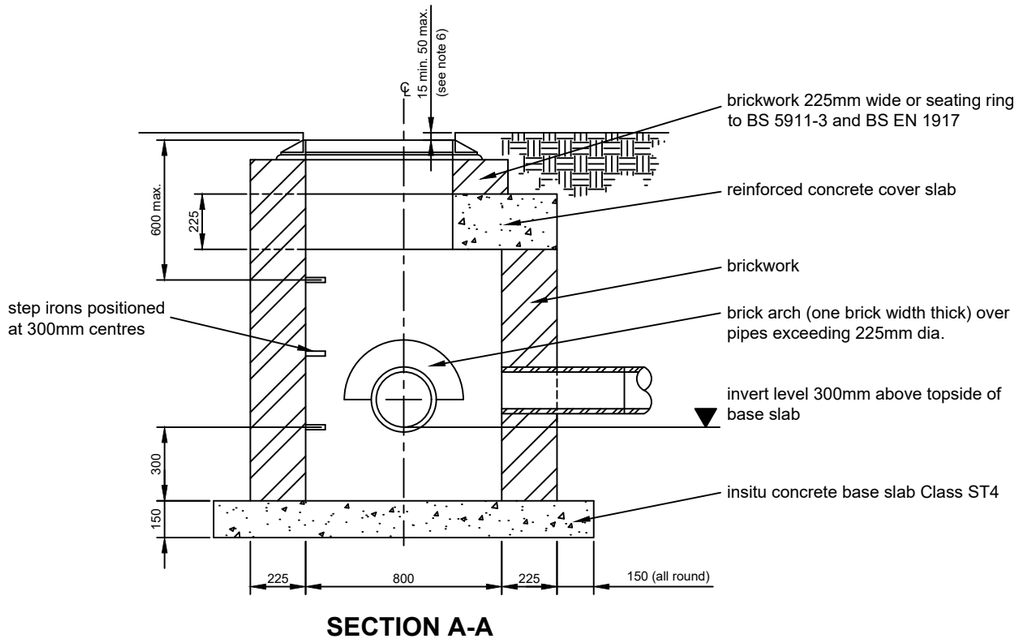
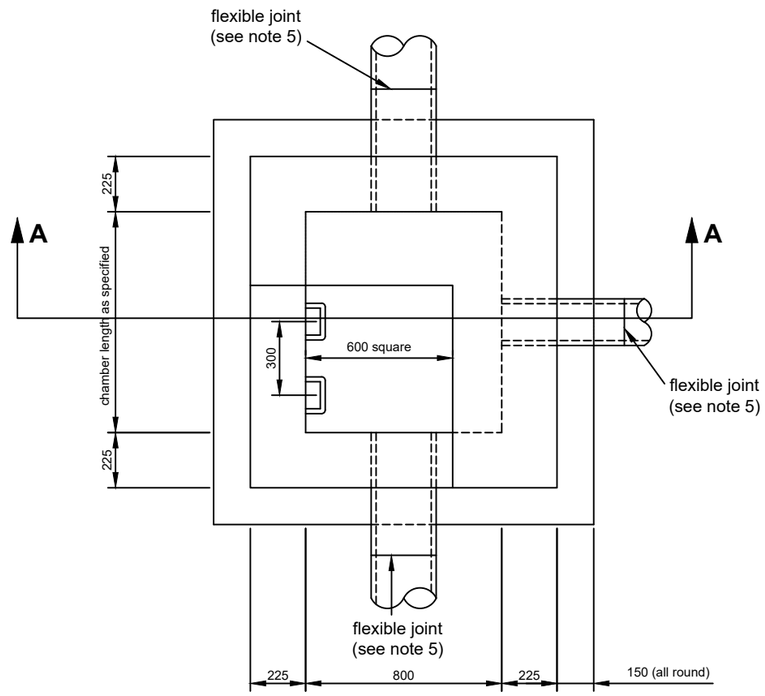
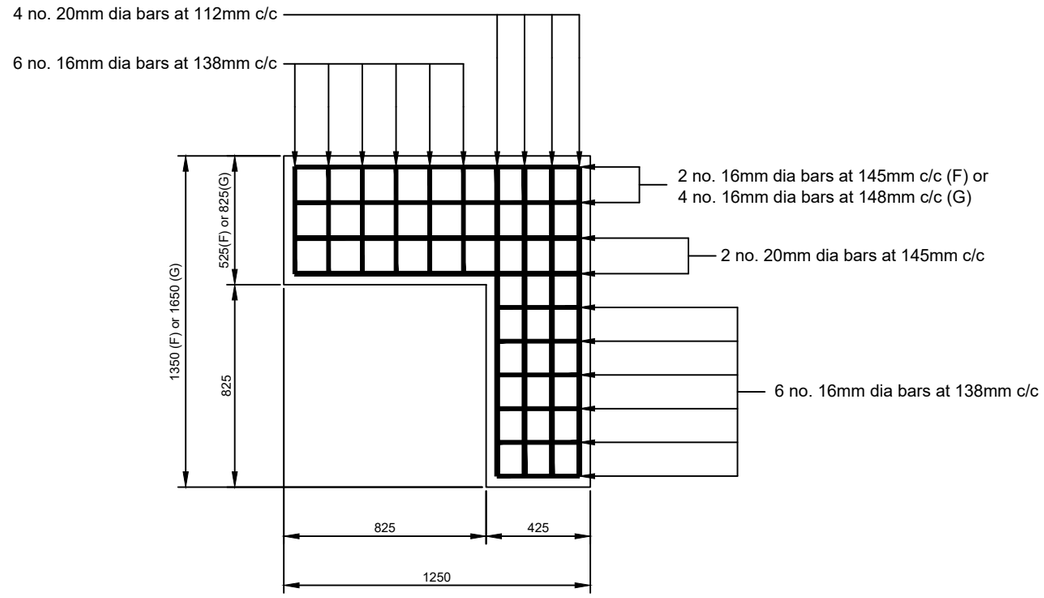


SECTION A-A



PLAN



COVER SLAB AND REINFORCEMENT DETAIL

Catchpit Type	Chamber Length (mm)	Chamber Depth (mm)
F	900	not exceeding 1500
G	1200	1500 - 2500

NOTES

1. Refer to the scheme specific drawings, Appendix 5/1 and the drainage schedule for invert level, cover level and branch connection details.
2. Mortar shall be designation (i) to S.H.W. Clause 2404.
3. Pipes shall be grouted into catchpits with mortar.
4. Both chamber top and step irons shall be positioned so that access will allow persons to face oncoming traffic.
5. Flexible joints adjacent to pipe connections shall comply with S.H.W. Clause 507.15.
6. The chamber top shall be set as dimensioned below the adjacent:
   a. hard shoulder or hardstrip (for verges or central reserves on carriageways without concrete kerbing; and
   b. finished ground level in all other locations.

   Where catchpits are to constructed within the carriageway, the chamber top shall be set flush with the carriageway surface.
7. Catchpits in new carriageway shall be raised to finished road level following completion of binder course laying and prior to commencement of surface course laying, as prescribed by BS 4987: Part 2 Clause 5.8.
8. Brickwork shall be English bond and comprise Class B clay engineering bricks to BS EN 771-1:2003, bedded on mortar. Brickwork shall comply with S.H.W. Clauses 2406 and 2412.
9. This detail applies only to those catchpits where the distance between cover level and catchpit invert level does not exceed 2.5m.
10. On reinforced concrete cover slabs:
    a. reinforcement shall be positioned in the tension zone (bottom of slab) only;
    b. concrete shall be grade 40/20, minimum cement content = 325kg/m³, maximum water/cement ratio = 0.5;
    c. reinforcement cover shall be 45mm;
    d. reinforcement steel bars shall be grade 460 to BS 4449: 2005+A2:2009; and
    e. reinforcement steel bars shall be hooked at the ends in accordance with BS 8666:2005 and BS EN ISO 4066:2000.
11. Chamber cover and frame to be ductile iron Class D400, non-rocking to BS EN124:2015 and CD 534.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: BRICK CATCHPITS: TYPE F & G

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	6

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 703.2	A3	FEB 2021

PREVIOUS ISSUES

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2	MAY 2010		
3	APR 2016		
4	FEB 2017		

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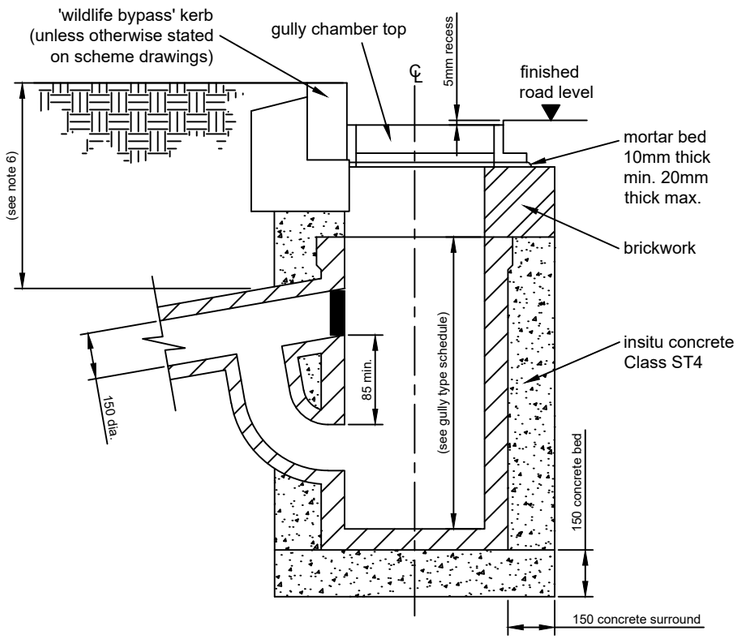
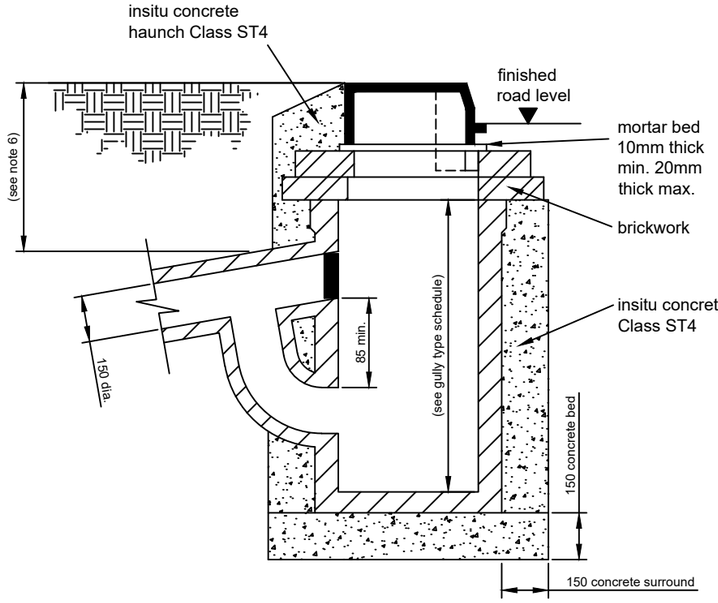
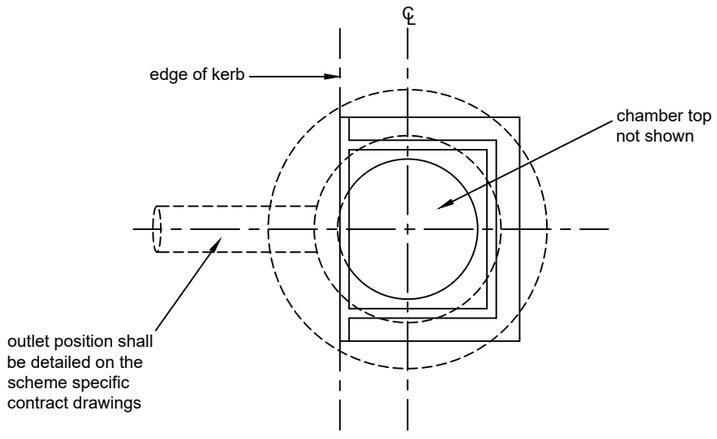


PRE-CAST CONCRETE CHANNEL GULLY

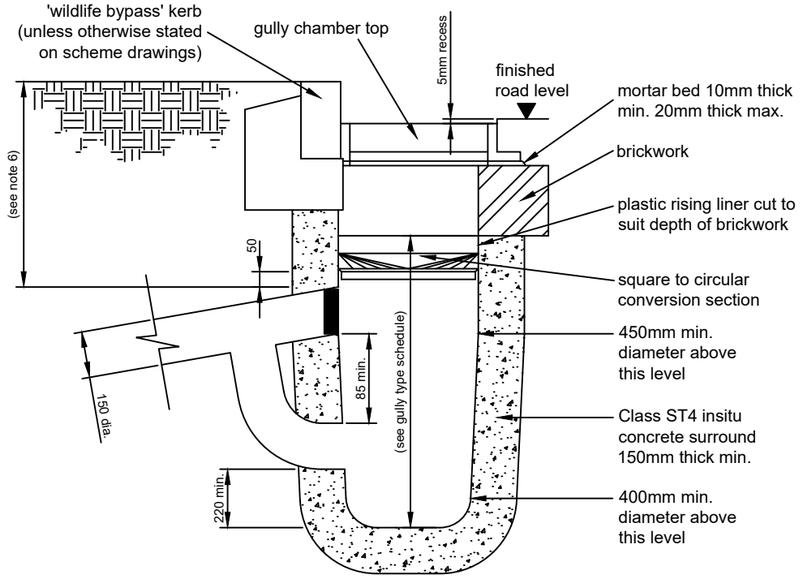


PRE-CAST CONCRETE KERB INLET GULLY

GULLY TYPE	1	2A	2B
INTERNAL DIAMETER (mm)	450	375	375
DEPTH OF GULLY POT (mm)	900	750	900



PLAN



PLASTIC GULLY WITH INSITU-CAST CONRETE SURROUND

NOTES

1. Channel gully chamber top shall be grade D400 (BS EN 124). Kerb inlet gully chamber top shall be grade GK-165 unless otherwise specified in the contract documents.
2. Precast concrete gullies shall comply with BS 5911:2002/2004.
3. Channel gullies shall be raised to finished road level following completion of binder course laying and prior to commencement of surface course laying, as prescribed by BS 594987:2007 clause 6.9.
4. Brickwork shall be English bond and comprise Class B clay engineering bricks to BS EN 771-1:2003, bedded on mortar. Brickwork shall comply with S.H.W. Clauses 2406 and 2412. Brickwork may require corbelling depending on the type of pot and frame.
5. Mortar shall comply with S.H.W. Clause 2404 designation (i).
6. The minimum depth from the top of kerb (on channel gullies) or over level (on kerb inlet gullies) to the soffit level of the gully outlet shall be 750mm when the connecting pipe is below carriageway (or hardshoulder), and 600mm elsewhere.
7. The stoppers on trapped insitu cast gullies shall comply with the requirements of BS 5911:2002/2004.
8. Gully connections under carriageway shall comply with the requirements of either Pipe Group S7 or S8 depending on depth of cover. Gully connections within 4m of the carriageway shall comply with the requirements of Pipe Group S2. Gully connections in all other locations shall comply with the requirements of Pipe Group S3. Refer to Notes for Guidance Annex 1, or Appendix 5/1 for pipe group details.
9. Refer to the schedule below for gully types.
10. Plastic gullies with insitu-cast concrete surrounds may be used for channel gullies (as shown), or for kerb inlet gullies, at the discretion of the Overseeing Organisation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: DRAINAGE	TITLE: GULLIES: TYPE 1, 2A & 2B	DRAWN: RJP	CHECKED: NH	APPROVED: AC
			DRAWING NUMBER: F 704.1	SHEET SIZE: A3	ISSUE DATE: MAY 2018

ISSUE: 5

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	FEB 2017

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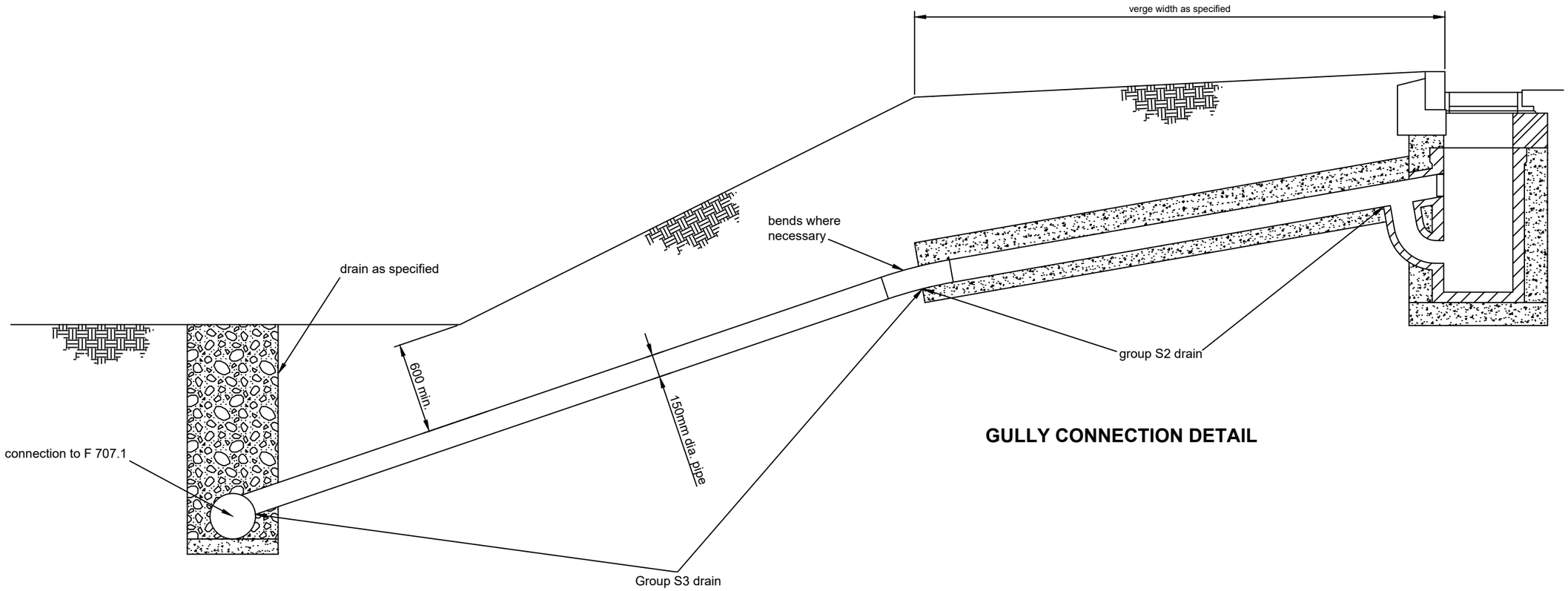
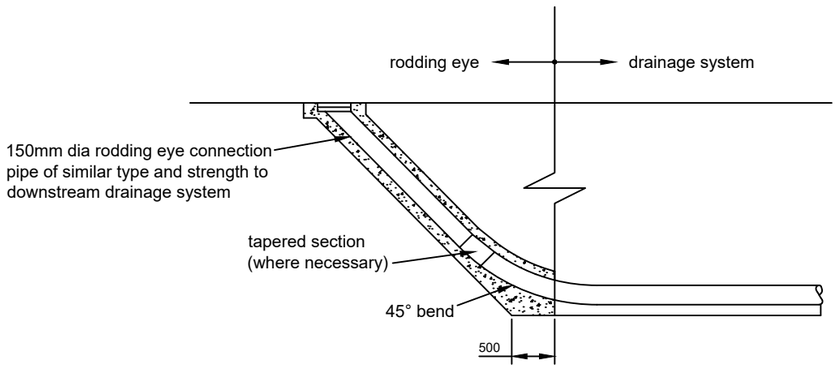
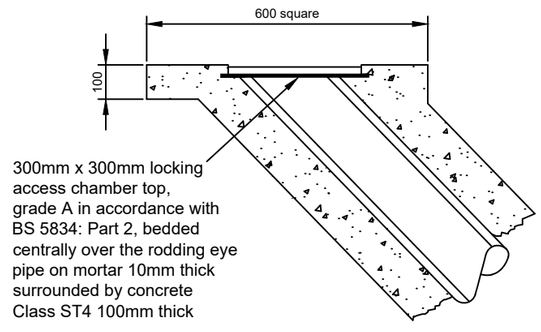


GULLY CONNECTION DETAIL



RODDING EYE DETAIL



RODDING EYE COVER DETAIL

NOTES

1. Where gullies discharge into an open ditch, a Type 3 headwall shall be constructed at the outfall. Refer to F 705.1 for details.
2. Mortar shall comply with S.H.W. Clause 2404 designation (i).

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: DRAINAGE	TITLE: GULLY CONNECTIONS & RODDING EYES	DRAWN: RJP	CHECKED: NH	APPROVED: AC	ISSUE: 5
			DRAWING NUMBER: F 704.2	SHEET SIZE: A3	ISSUE DATE: MAY 2018	

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 APR 2016

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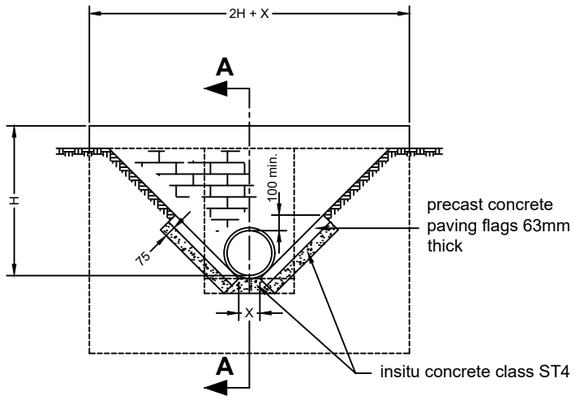
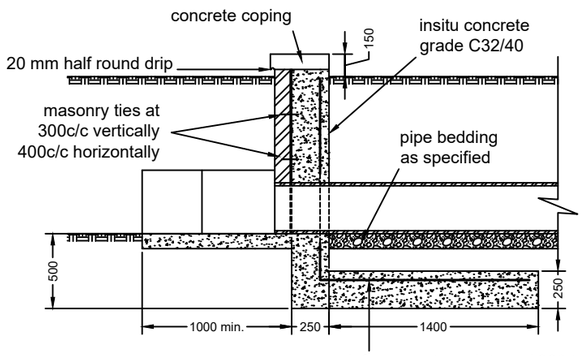
TYPE 1 - INLET HEADWALL

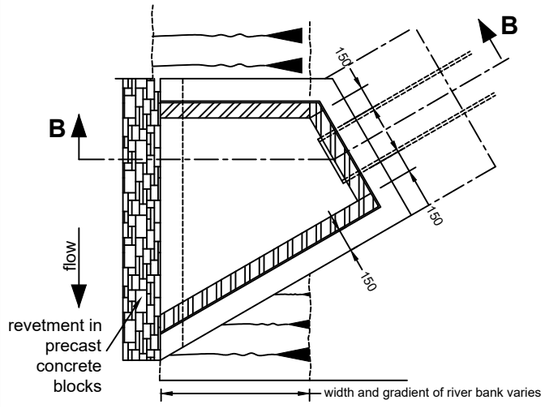


ELEVATION

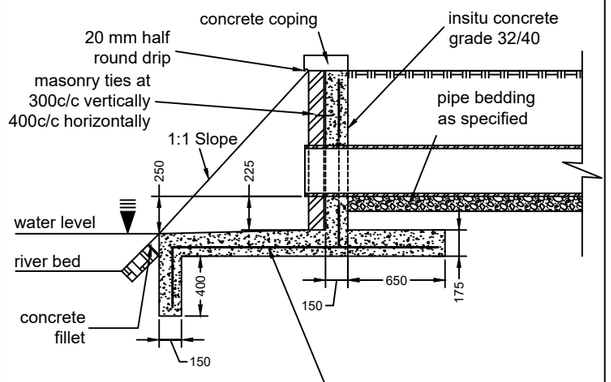


SECTION A-A

TYPE 2 - OUTLET HEADWALL

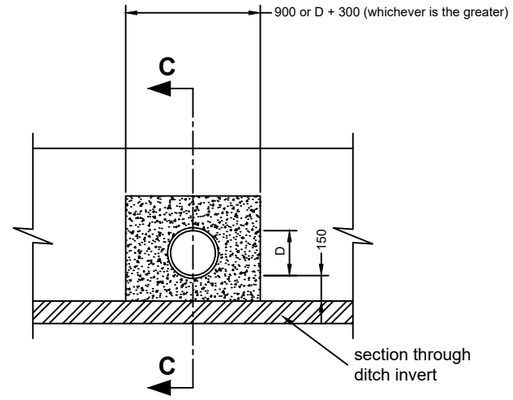


PLAN

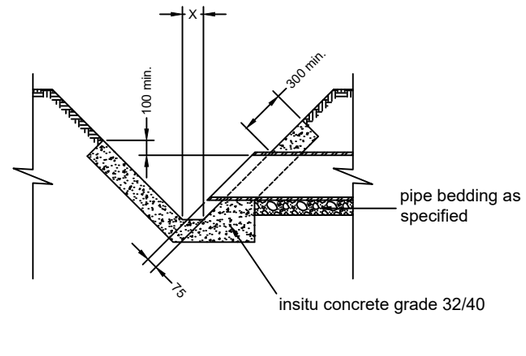


SECTION B-B

TYPE 3 - INTERMEDIATE HEADWALL

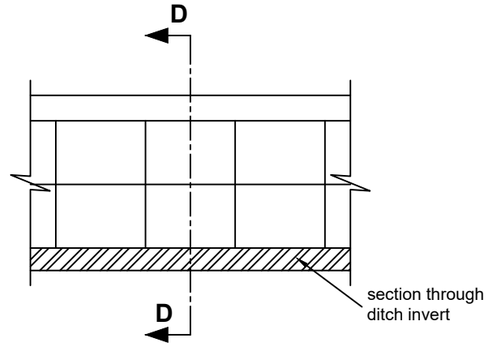


ELEVATION

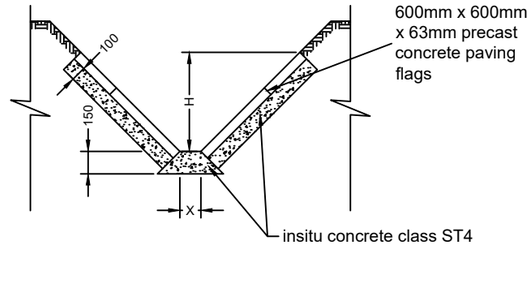


SECTION C-C

DITCH LINING DETAIL



ELEVATION



SECTION D-D

NOTES

1. Headwall dimensions:
   a. H = height of headwall from outfall invert level to top of parapet;
   b. X = width of ditch invert; and
   c. D = internal diameter of pipe.
2. The maximum height 'H' is 1200mm for Type 1 and 2 Headwalls.
3. Refer to drainage schedule in Appendix 5/1 or scheme specific contract drawings for pipe diameter and ditch side slope gradient.
4. Concrete finishes shall comply with S.H.W. Clause 2602
5. Brickwork shall be English bond and comprise Class B clay engineering bricks to BS EN 771-1:2011, bedded on mortar.
6. Brickwork shall comply with S.H.W. Clauses 2406 and 2412.
7. Mortar shall comply with S.H.W. Clause 2404 designation (i).
8. The nearest pipe joint on pipes where diameter 'D' is greater than 375mm shall be no more than 1m from the outer face of the headwall.
9. Refer to drainage schedule in Appendix 5/1 or scheme specific contract drawings for pipe diameter and ditch side slope gradient.
10. Precast concrete paving flags shall comply with BS EN 1339:2003.
11. On Type 2 headwalls, the angle between outfall pipe and direction of flow on the watercourse shall be 45° unless otherwise directed by the Overseeing Organisation.
12. The Environment Agency's approval is required where Type 2 headwalls discharge into natural watercourses.
13. All pipe sections built into headwalls shall be either vitrified clay or concrete. Refer to Table 1 in Notes for Guidance Annex 1 for details of acceptable pipe materials.

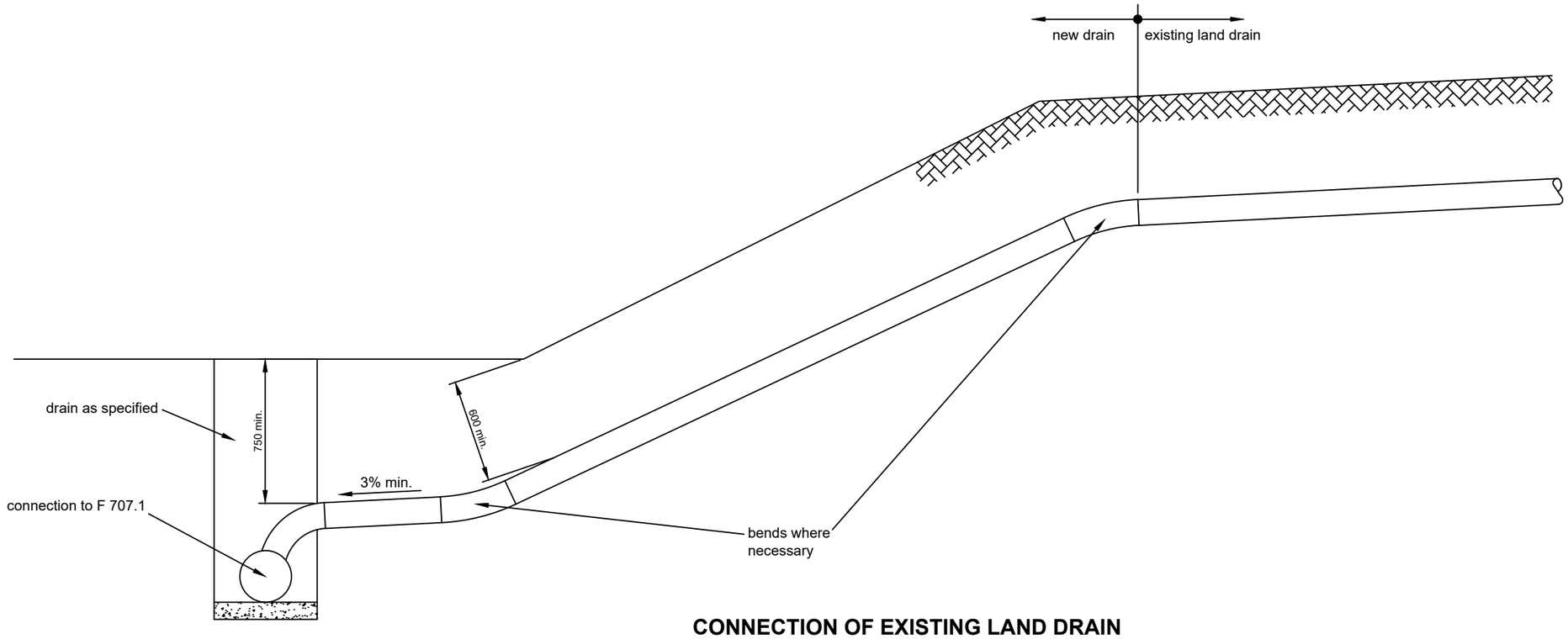
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

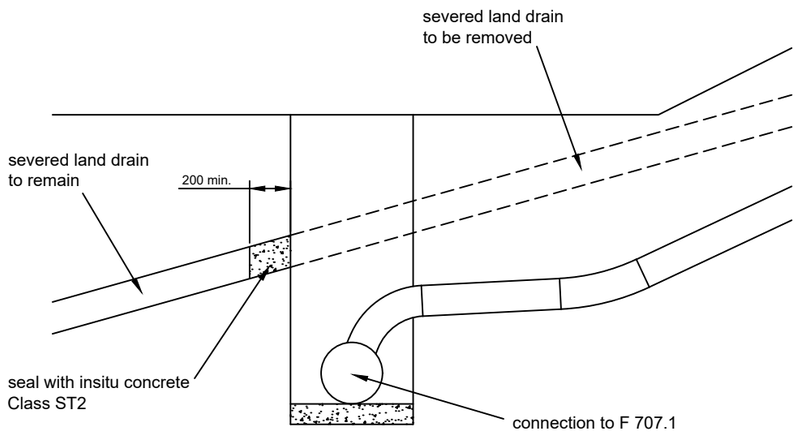
HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: DRAINAGE	TITLE: HEADWALLS: TYPE 1, 2 & 3 WITH DITCH LINING DETAIL	DRAWN: SS	CHECKED: RJP	APPROVED: AC
			DRAWING NUMBER: F 705.1	SHEET SIZE: A3	ISSUE: 4 / ISSUE DATE: APR 2016

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 APR 2014

0mm 50mm 100mm 150mm 200mm



CONNECTION OF EXISTING LAND DRAIN TO NEW FILTER DRAIN



DETAIL SHOWING LAND DRAIN SEALED DOWNSTREAM OF FILTER DRAIN

NOTES

1. Jointed perforated or slotted pipes (UPVC, concrete or vitrified clay) may be used as an alternative.
2. Pipe haunches and surrounds shall comply with S.H.W. Clause 503.3 (v).
3. The internal diameter of new pipes downstream of the connection point shall be no less than the internal diameter of the existing land drain.
4. Pipes shall be laid with open joints and bedded on the bottom of the trench. Backfill shall be Class 1, 2A, 2B or 2C material in accordance with S.H.W. Table 6/1 overlaid with topsoil as specified.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: CONNECTION OF PERMANENTLY SEVERED LAND DRAINS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 706.1	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016

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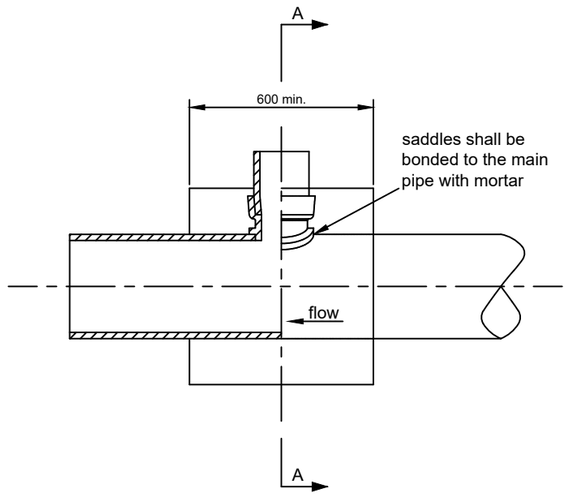
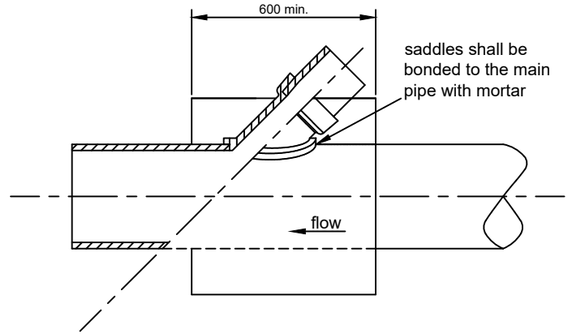
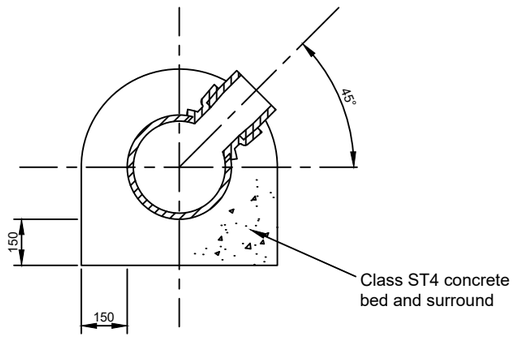


ELEVATION/SECTION (SQUARE SADDLE)



ELEVATION/SECTION (45° OBLIQUE SADDLE)

Permitted Connections	
Minor Pipe Dia. (mm)	Min. Main Pipe Dia. (mm)
100	150
150	225
225	300
300	375



SECTION A-A

NOTES

1. Mortar shall comply with S.H.W. Clause 2404 designation (i).
2. Pipe connections shall be inspected by the Overseeing Organisation prior to the placing of concrete saddles.
3. On connections where the main pipe is of a vitrified clay type not exceeding 225mm diameter, a length of pipe shall be cut out and replaced by a manufactured 'sleeve' type junction. The sleeve couplings, with their central register removed, shall be used to form a slip ring to enable the junction to be jointed to the main pipe.
4. Junction pipes should be of the type and class of material as the main pipe.
5. Junction pipes not immediately connected should be sealed in accordance with SHW Clause 508.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: DRAINAGE

TITLE: CONCRETE PIPE SADDLES

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
F 707.1	A3	MAY 2018

PREVIOUS ISSUES

1 FEB 2005
2 MAY 2010
3 APR 2016

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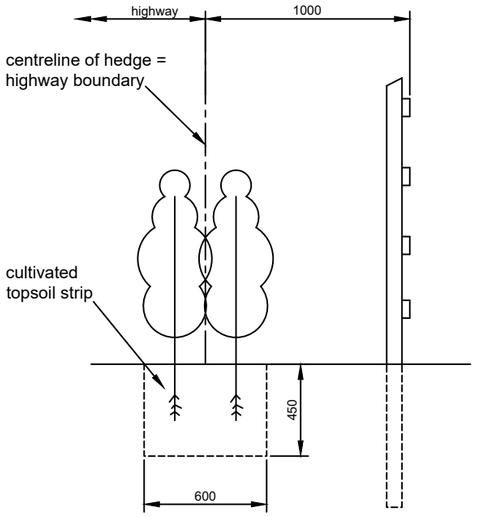
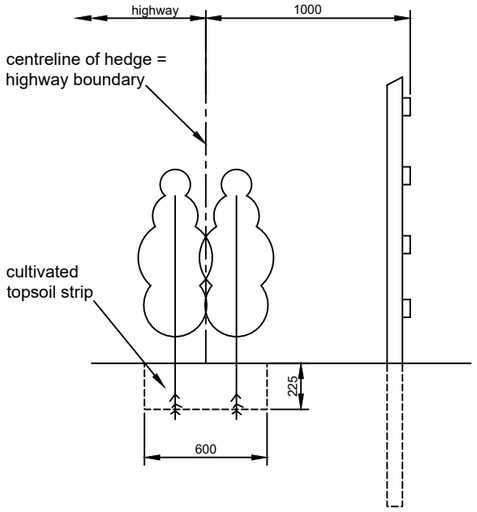
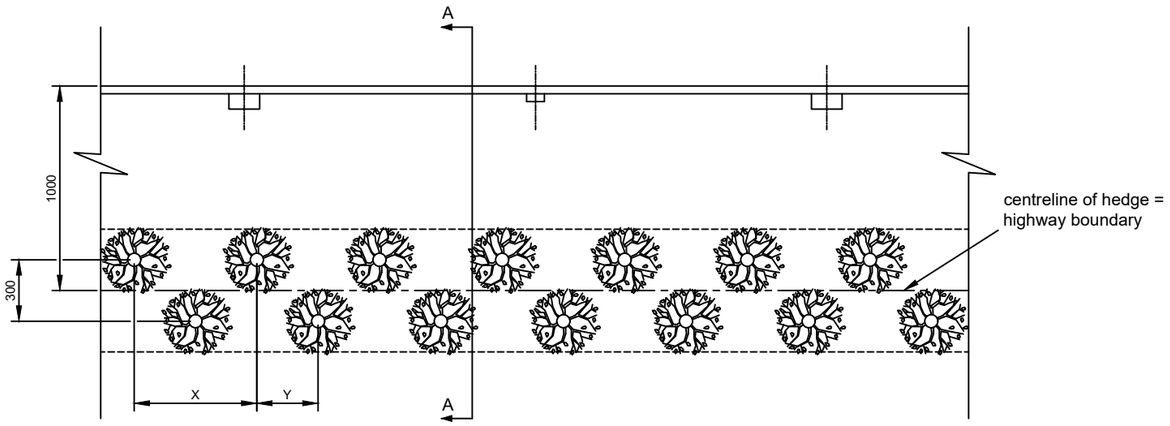


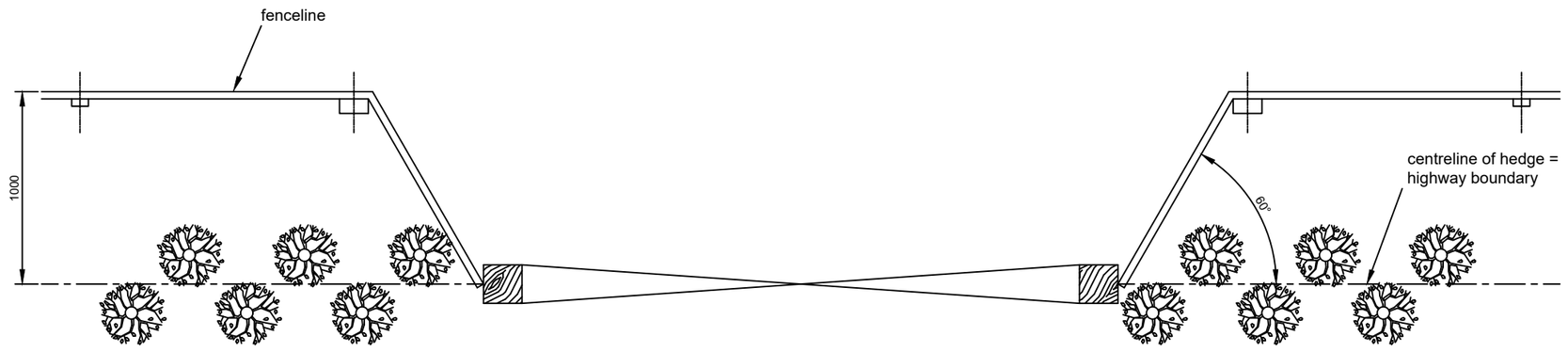
SECTION A-A
(DISTURBED GROUND)



SECTION A-A
(UNDISTURBED GROUND)



BOUNDARY HEDGE
PLANTING DETAILS



BOUNDARY HEDGE
DETAIL AT FIELD GATE

NOTES

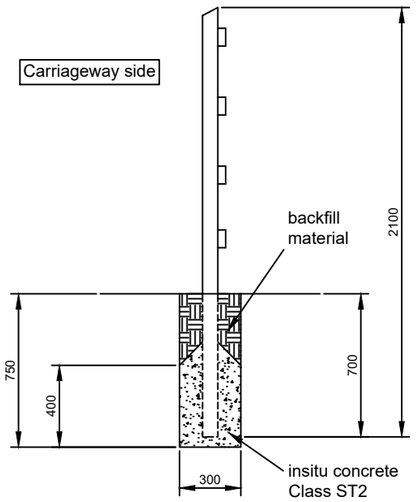
1. Dimension 'X' shall be 600mm and dimension 'Y' shall be 300mm unless specified otherwise by the Overseeing Organisation.
2. The cultivated topsoil strip shall be maintained free from weeds for a period of 3 years following completion of hedge planting.
3. In rural areas, hedge plant species shall be selected from those listed in the 'Warwickshire Landscape Guidelines' document for the particular geographic region that the hedge is to be planted. Copies of these documents are available for inspection upon request.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

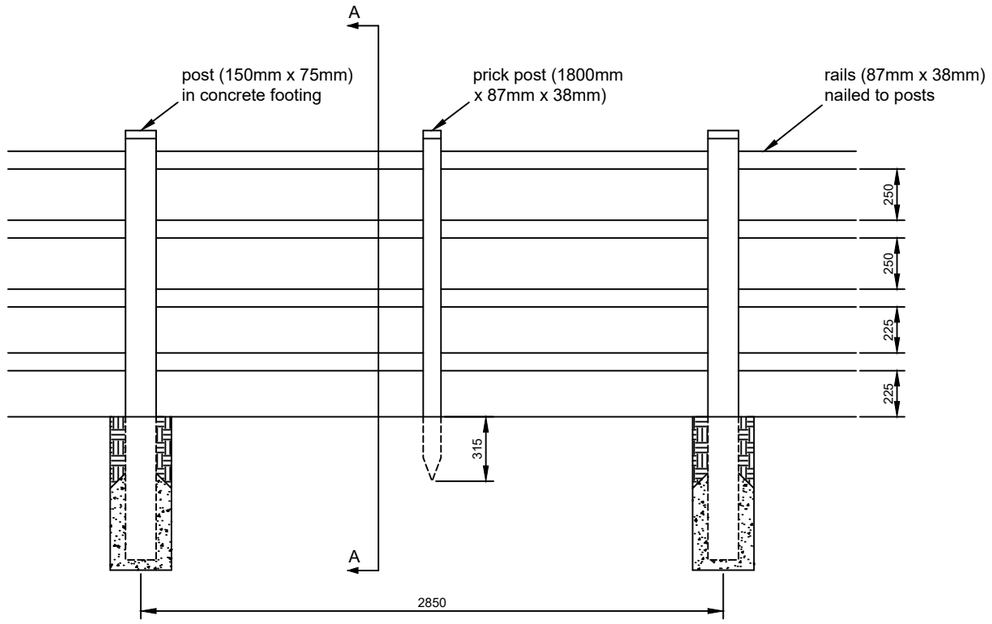
Warwickshire County Council	HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: FENCES, STILES AND GATES	TITLE: BOUNDARY HEDGE	DRAWN: SS	CHECKED: RJP	APPROVED: AC	ISSUE: 3
				DRAWING NUMBER: H 701.1	SHEET SIZE: A3	ISSUE DATE: APR 2016	

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010

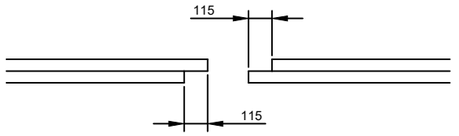
0mm 50mm 100mm 150mm 200mm



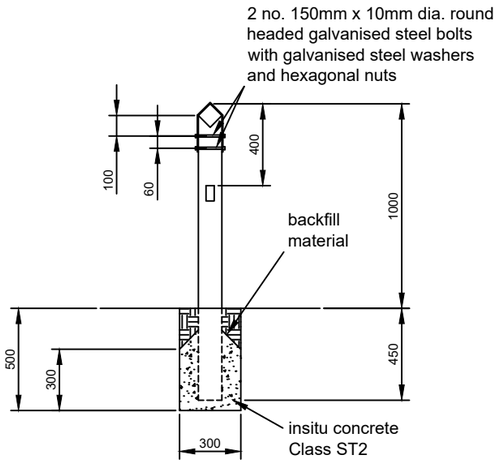
SECTION A-A



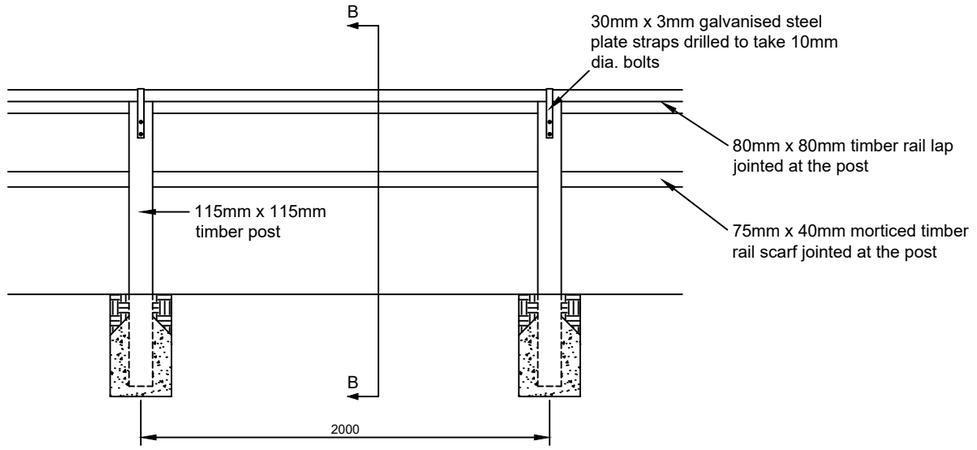
TIMBER POST AND FOUR RAIL FENCE



DETAIL OF SAWN LAP JOINT FOR TIMBER TOP RAIL



SECTION B-B



TIMBER POST AND TWO RAIL FENCE

NOTES

1. Fencing shall comply with S.H.W. Series 300 and BS 1722-7: 2006, except where contradicted by this construction detail.
2. Excavations for post footings shall have vertical sides, unless specified otherwise by the Overseeing Organisation.
3. Backfill shall be Class 1, 2A, 2B or 2C material in accordance with S.H.W. Table 6/1 overlaid with topsoil as specified.
4. Timber shall comply with S.H.W. Clause 304.
5. Prick posts shall be driven.
6. Rails for timber post and four rail fences shall be nailed (two no. nails per joint) to the post face facing away from the carriageway. Nails shall be galvanised.
7. Details of additional fencing fixtures are given in Appendix 3/1.
8. A post and three rail 1.0m high timber fence may be used in lieu of a non-road restraint system metal post and rail fence, to protect structural assets.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: FENCES, STILES AND GATES

TITLE: FENCING: TIMBER POST AND RAIL

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
H 702.1	A3	FEB 2021

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	MAY 2018

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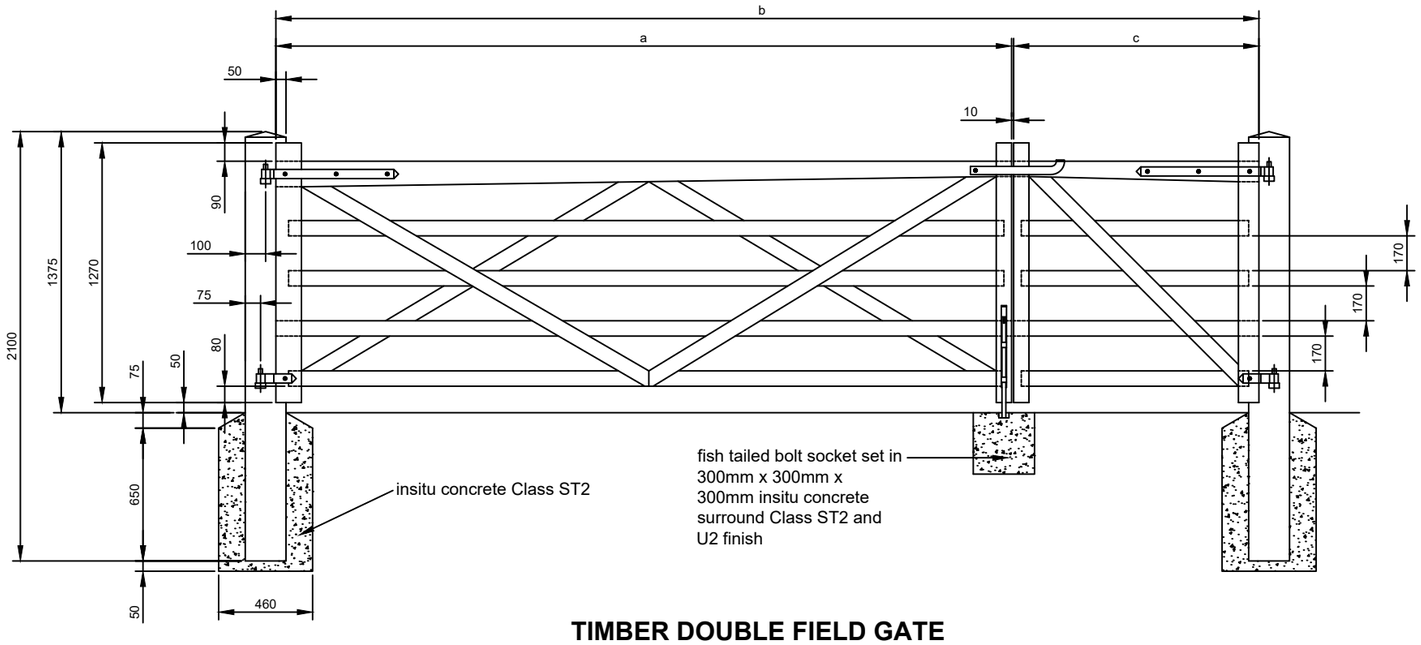
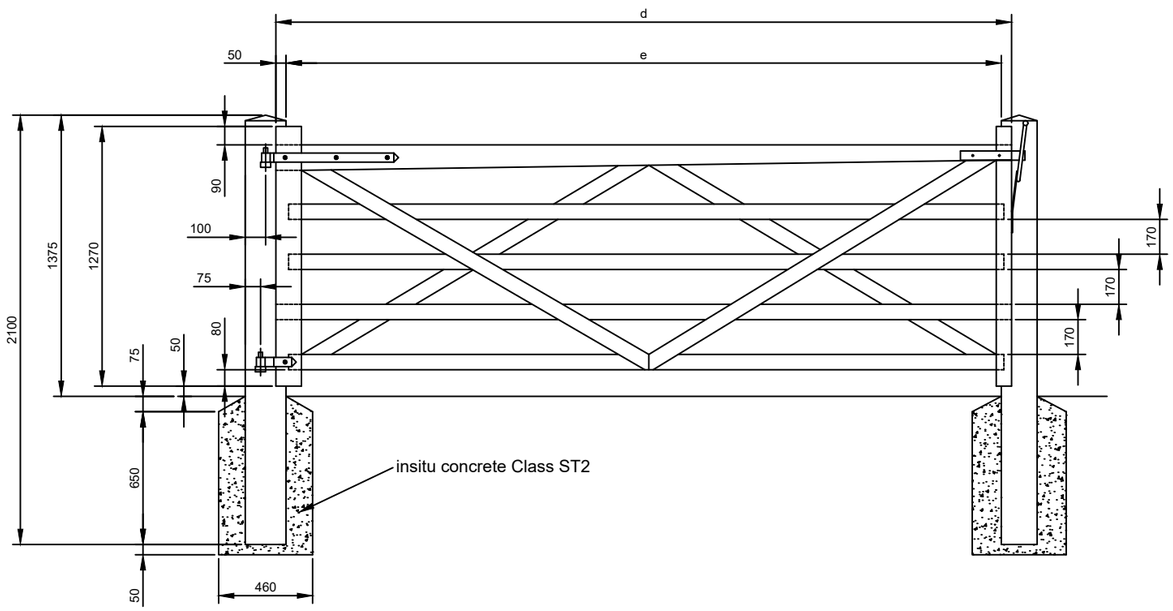


TIMBER DOUBLE FIELD GATE

TIMBER DOUBLE FIELD GATE		Note: b=(a+c+60)mm
GATE TYPE	DIMENSION 'a' (mm)	DIMENSION 'c' (mm)
1	3000	1200, 1625, or 3000
2	3600	1200, 1625, 3000, or 3600
3	4200	1200, 1625, 3000, 3600, or 4200



TIMBER SINGLE FIELD GATE

TIMBER SINGLE FIELD GATE		Note: d=(e+100)mm
GATE TYPE	DIMENSION 'd' (mm)	DIMENSION 'e' (mm)
1	3000	2900
2	3600	3500
3	4200	4100

DESCRIPTION OF TIMBER MATERIALS	DIMENSIONS (mm)
hanging post	200 x 200 x 2100 long
shutting post	175 x 175 x 2100 long
hanging stile	100 x 75 for gate Type 1 125 x 75 for gate Types 2 and 3
shutting stile	75 x 75
top rail	100 x 75 for gate Type 1 125 x 75 for gate Types 2 and 3 (all tapering to 75 x 75)
under rails	75 x 75
braces (housed in top rail)	75 x 75

NOTES

1. Gates shall comply with BS 3470: 1975 where appropriate, the relevant clauses of S.H.W. Series 300, and any additional requirements listed in Appendix 1/15 or 3/1.
2. All through tenons shall be pegged with 13mm dia. oak dowels.
3. On timber single field gates, hangings and fastenings shall comply with MCHW HCDs H30 and H31 respectively. On timber double field gates hangings and fastenings shall comply with MCHW HCDs H30 and H32 respectively.
4. Timber shall comply with S.H.W. Clause 304.
5. Gates shall be hung as shown for self closing gates with a self latching stop post. Refer to MCHW HCD H33 for details.
6. Gates shall orientated to open into the land owner's property.
7. Where dimension 'c' for the additional gate on timber double field gates is 3000mm or less, the hanging stile and top rail dimensions shall match those for Type 1 gates.
8. Drop bolts and catches on double field gates shall be galvanised in accordance with BS EN ISO 1461: 2009

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: FENCES, STILES AND GATES

TITLE: TIMBER FIELD GATES: TYPE 1, 2 & 3

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
H 703.1	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016

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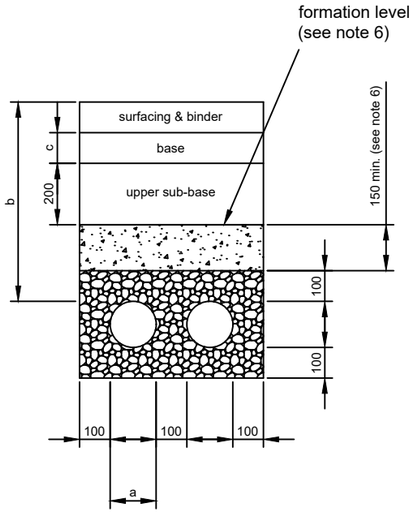
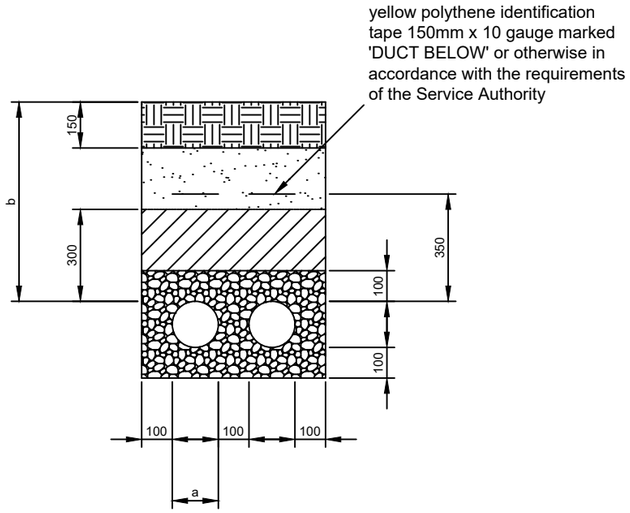
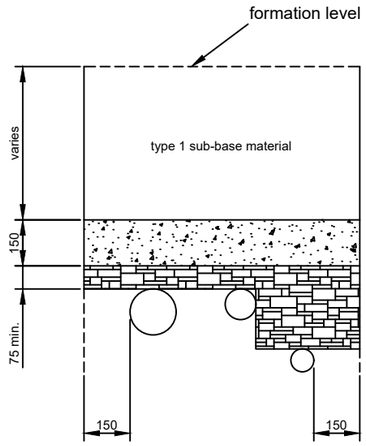


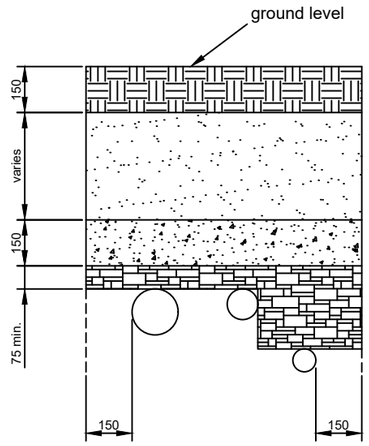
GROUP D1



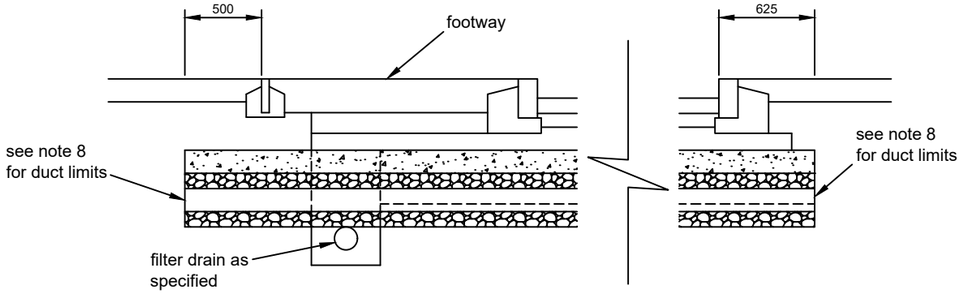
GROUP D2



SERVICE PROTECTION UNDER CARRIAGEWAY



SERVICE PROTECTION UNDER VERGE



SECTION ALONG SERVICE DUCT

KEY

- topsoil (where specified)
- general fill material to S.H.W. Clause 505.2
- Class 8 material to S.H.W. Clause 503.3(iv)
- concrete to S.H.W. Clause 503.3(iii)
- granular material to S.H.W. Clause 503.3(i)
- sand protection

NOTES

1. Ducts shall be manufactured from, UPVC or a suitable alternative material specified by the relevant Service Authority.
2. Refer to Appendix 5/2 for details of permissible alternative materials.
3. Dimension 'a' represents the external diameter of the duct.
4. Dimension 'b' represents the minimum cover requirement of the relevant Service Authority. Dimension 'b' shall be no less than 650mm in the carriageway or 450mm in the footway/verge.
5. Dimension 'c' represents the design thickness of base. Dimension 'c' shall be no less than 100mm.
6. Concrete protection on Group D1 ducts shall extend up to formation level and achieve a minimum thickness of 150mm.
7. Upper sub-base shall be Type 1 Unbound Mixtures to S.H.W Clause 803, Type 2 Unbound Mixtures (if they contain at least 80% bituminous planings) to S.H.W Clause 804 or Type 3 (open graded) Unbound Mixtures to S.H.W Clause 805.
8. Where no lower sub-base layer is specified, the upper surface of concrete protection on Group D1 ducts shall be flush with sub-formation level.
9. Group D1 ducts shall extend to the edge of capping layer where no filter drain is specified, otherwise 500mm beyond the filter drain or to the back of footway (where specified), whichever is the greater dimension.
10. Refer to MCHW HCD I1 for marker block details.
11. The minimum clearance between the outer surface of ducts and existing drains, service apparatus and the like shall be 100mm.
12. Refer to Appendix 5/2 and/or the scheme specific drawings for duct numbers, duct configurations, duct diameters and duct locations. The same principles shown in this detail for two-way ducts apply to multi-way duct configurations.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: UNDERGROUND CABLE DUCTS

TITLE: NEW SERVICE DUCTS & PROTECTION OF EXISTING SERVICES

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
I 701.1	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	FEB 2013
4	APR 2016

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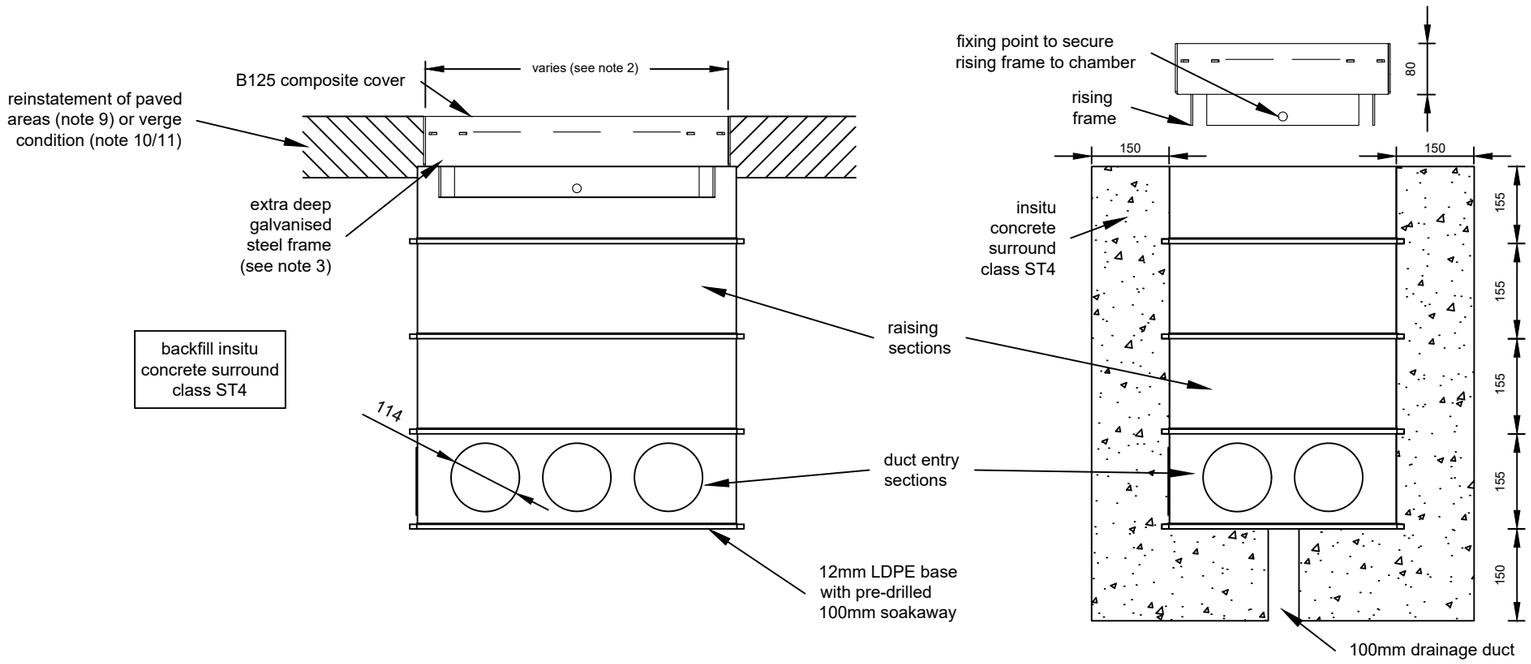
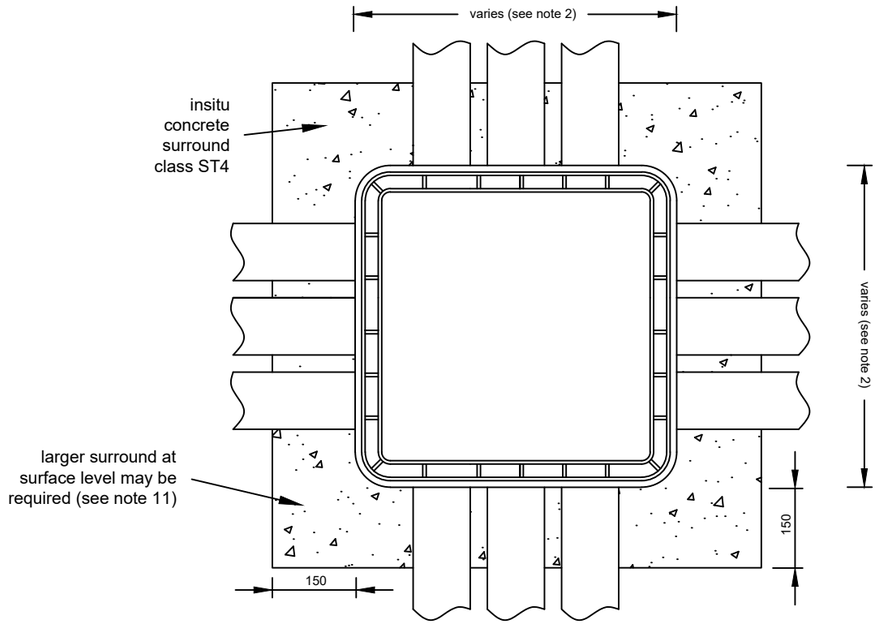


TYPICAL SECTION THROUGH ACCESS CHAMBER



PLAN VIEW SHOWING DUCTS ENTERING CHAMBER

NOTES

1. Units shall be NAL 'STAKKAbox' type unless approved in advance by the Overseeing Organisation.
2. Internal opening dimensions shall be 300mm x 300mm (Type 3), 450mm x 450mm (Type 2), 600mm x 450mm (Type 1) or 600mm x 600mm (Type 0) as specified on the scheme specific drawings.
3. The frame type shall be EN 124 B125 black antislip composite cover (SRV > 80). Frame shall be galvanised steel raising frame provide with 85 mm bedding depth for surrounding surface course to frame flange. The frame shall be fixed to the chamber wall with 4 x 8mm coach bolt.
4. All composite lids to be secured by fixing screws on completion.
5. Pre-formed ring sections may be added to achieve minimum duct cover as specified in key on scheme specific drawings.
6. Maximum chamber depth under ground to be 885mm (5 x 155mm + 110mm).
7. All empty access holes must be filled with matching plugs.
8. Sections shall NOT be cut out to accommodate additional ducts. Contact Overseeing Organisation for advice.
9. Refer to B 704.1 for details.
10. Insitu concrete to be continued to ground level in verge condition, with U2 finish.
11. For Traffic Signal installation in verge conditions: A shuttered surround to provide an infilled concrete (ST4) surround 300mm from frame to a depth of 200mm should be installed to all Duct Access Chambers with U4 finish.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: UNDERGROUND CABLE DUCTS

TITLE: ACCESS CHAMBERS FOR SERVICE DUCTS

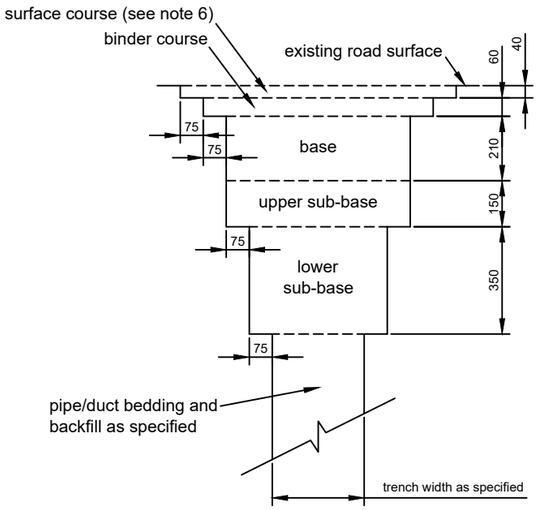
DRAWN	CHECKED	APPROVED	ISSUE
EB	RJP	DM	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
I 702.1	A3	FEB 2021

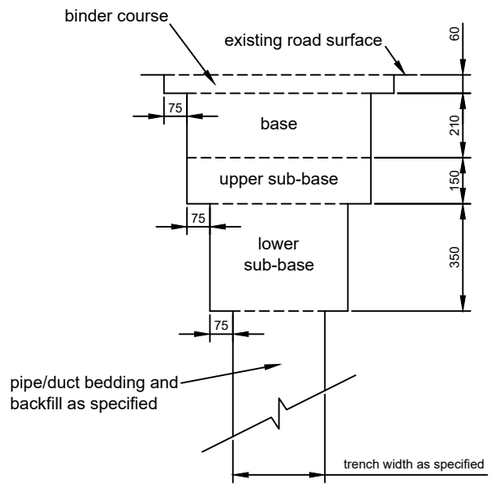
PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	MAY 2018

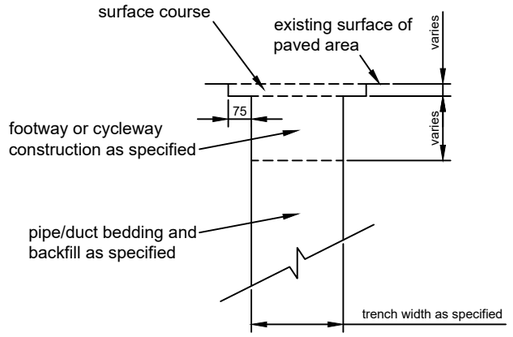
0mm 50mm 100mm 150mm 200mm



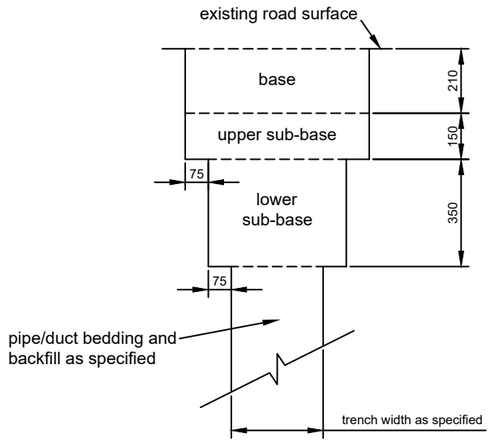
TYPE 1 DETAIL



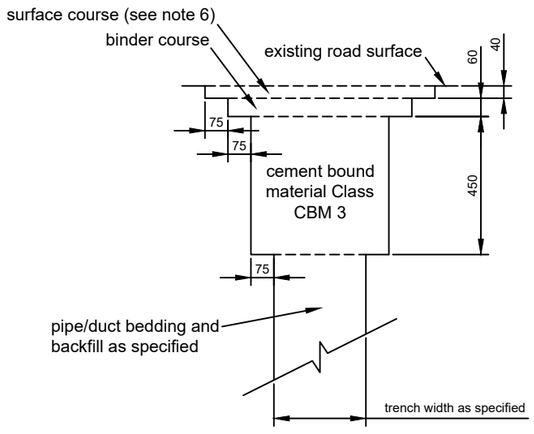
TYPE 2 DETAIL



TYPE 5 DETAIL
(PAVED AREAS)



TYPE 3 DETAIL



TYPE 4 DETAIL

NOTES

1. Pavement materials shall be as specified in Appendix 7/1, or where no contract specification applies, in accordance with W.C.C. County Road Construction Strategy.
2. Longitudinal joints in the surface course shall be saw cut.
3. In narrow trenches where bituminous materials cannot be adequately compacted, cement bound material (Class CBM 3) shall be used in lieu of granular sub-base, bituminous base and binder course material as appropriate.
4. For measurement purposes, the trench width shall be the minimum permitted for the specified type of drain, duct or other service.
5. Where applicable, alterations to the thickness of materials will be detailed in Appendix 7/2.
6. Where hot rolled asphalt surface courses are specified, the thickness of surface course may be increased up to a maximum of 50mm. In this instance, the thickness of binder course will be reduced to 50mm.

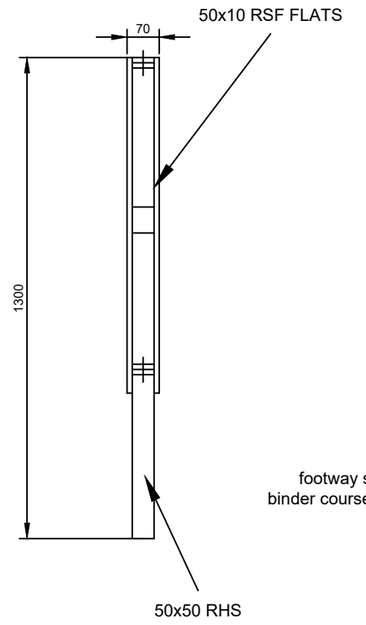
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

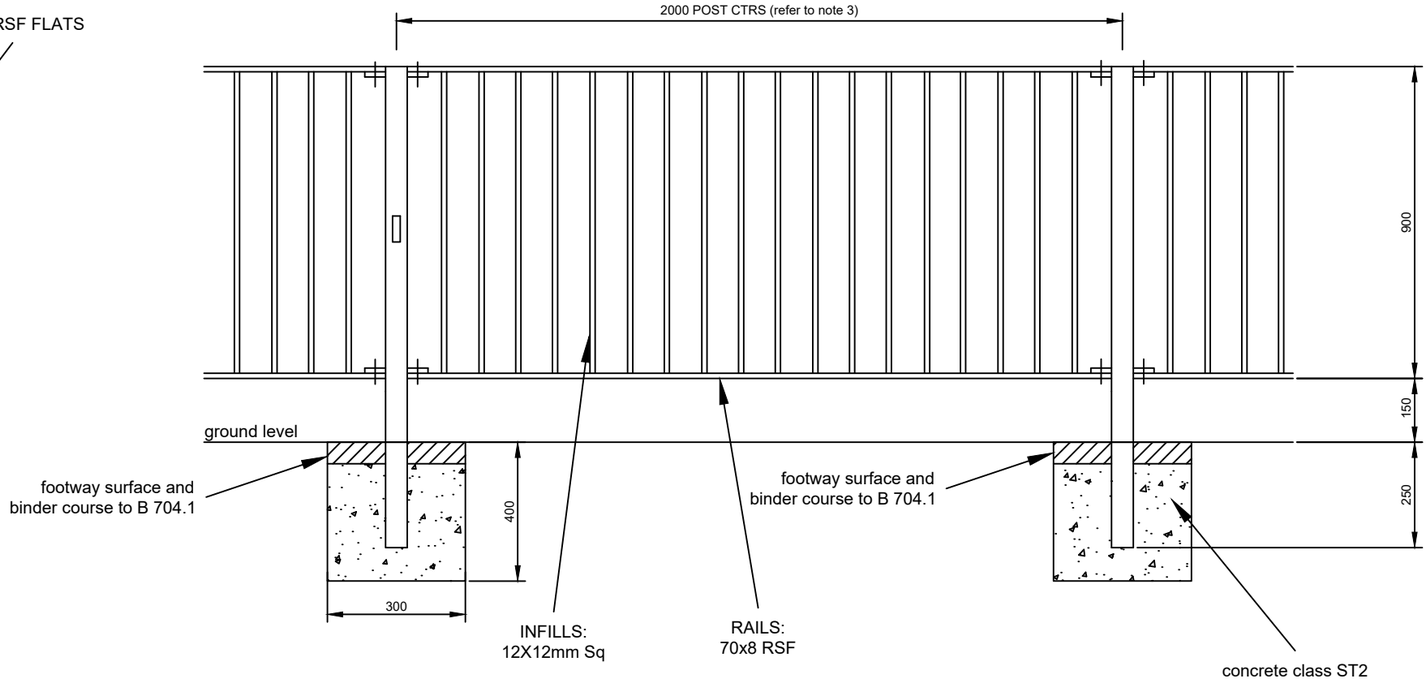
Warwickshire County Council

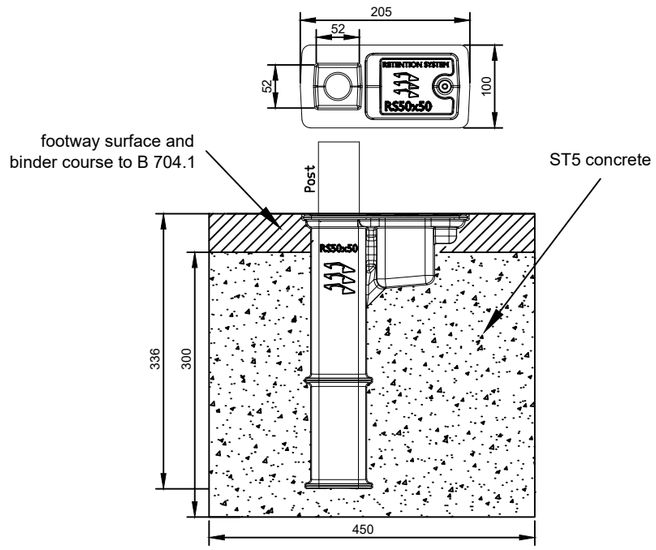
HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TRENCH REINSTATEMENT IN CARRIAGEWAYS & PAVED AREAS	DRAWN: SS	CHECKED: RJP	APPROVED: AC	ISSUE: 3
			DRAWING NUMBER: K 701.1	SHEET SIZE: A3	ISSUE DATE: APR 2016	

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010

0mm 50mm 100mm 150mm 200mm







RS 50X50 SOCKETED OPTION

TYPE 1 PEDESTRIAN GUARDRAIL LAYOUT

TYPE	PANEL	PANEL LAYOUT	OPTIMUM SIGHT ANGLE	USAGE
1	standard	as shown	not applicable	general
2	V2		2.5° - 5.0°	for use on straight roads with moderate to high speeds
3	V4		5.0° - 14.0°	for us on straight roads with low to moderate speeds and curves
4	V8		exceeding 14.0°	for use on curves with a 15m radius or less

STANDARD TYPES

NOTES

1. Guardrailing to be Alpha Rail Ltd. 'Optirail' or similar approved.
2. Pedestrian guardrails shall be of steel manufacture and have a hot dip galvanised black finish (RAL 9005).
3. Shorter panels may be used subject to approval from the Overseeing Organisation.
4. Infilling panels (not 'Optirail') shall consist of vertical bars.
5. Pedestrian guardrail shall be set back from the kerb face 450mm (min.) 600mm (max.).
6. V2, V4 and V8 panels refer to the range of 'Optirail' panel alternatives.
7. The need for non-standard parts to overcome tight horizontal radii or steep vertical gradients shall be determined from the scheme specific drawings.
8. The posts and panels shall be separate units.
9. Where pedestrian guardrail is to be fixed to the top of a concrete wall to act as a parapet, anchorage and fixing details will be shown on scheme specific drawings.
10. For maintenance reasons RS 50x50 sockets may be required. This will be at the discretion of the Overseeing Organisation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: PEDESTRIAN GUARDRAILS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 702.1	A3	MAY 2018

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016

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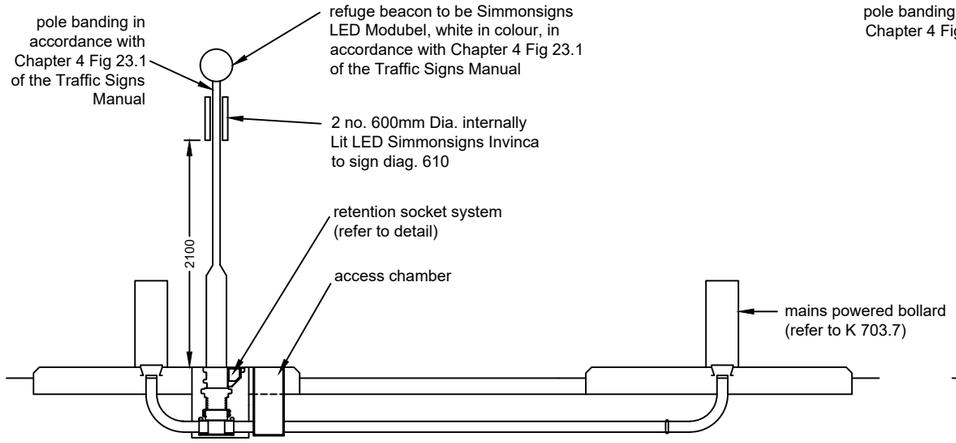
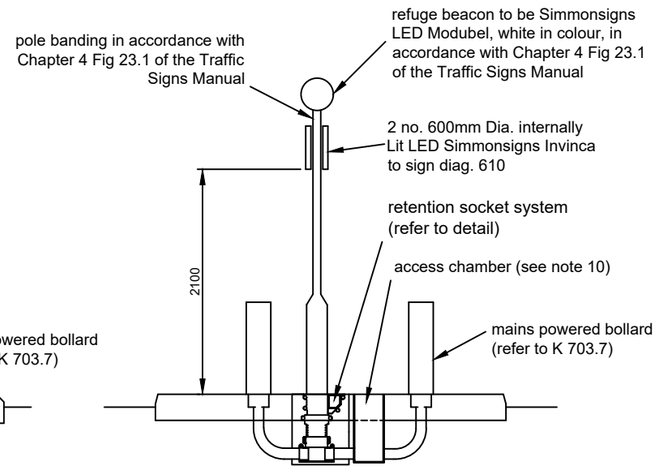
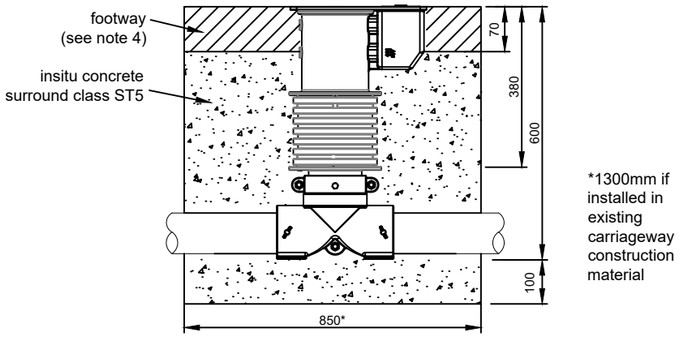
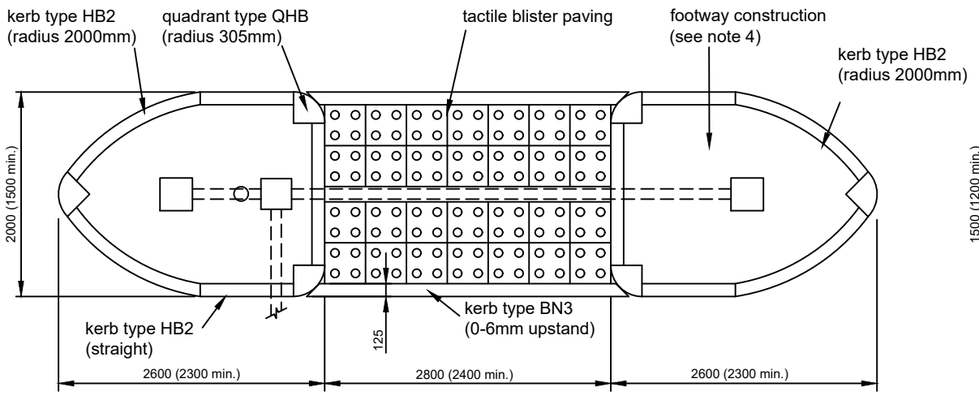


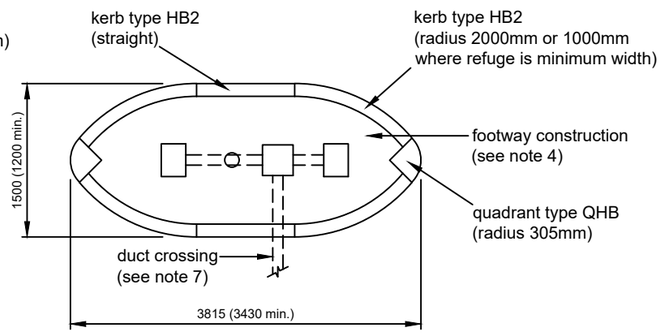




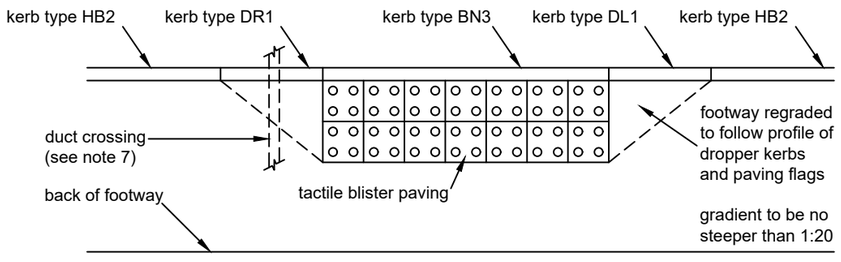
RS140 RETENTION SOCKET SYSTEM WITH TEE BASE OR SIMILAR APPROVED



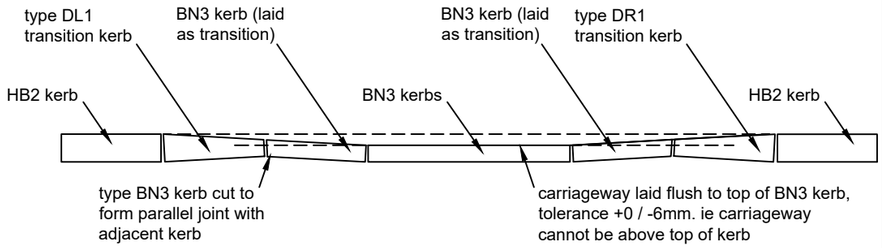
PEDESTRIAN REFUGE WITH MAINS POWERED BOLLARDS AND SIGNS



REFUGE WITH MAINS POWERED BOLLARDS AND SIGNS



PEDESTRIAN REFUGE WITH MAINS POWERED BOLLARDS AND SIGNS



KERB DETAILS TO ACHIEVE GRADIENT OF 1:11 OR FLATTER

NOTES

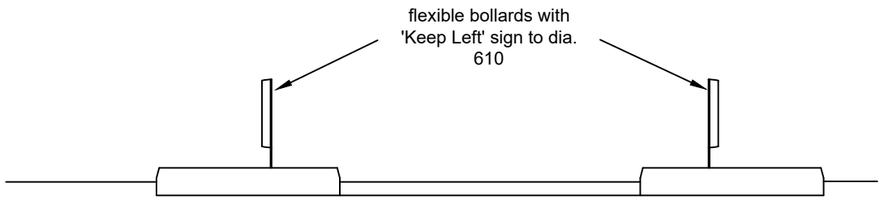
1. Refer to B 702.1 for kerbing details.
2. Dropper kerb Types DR1 and DL1 shall be cut to form a vertical joint with adjacent Type HB2 kerbs.
3. Type BN3 kerbs shall be laid with a maximum upstand of 6mm above carriageway.
4. Refuge islands shall be of Type 1 footway construction. Refer to B 704.1 for details.
5. Tactile blister paving shall be buff in colour, unless stated otherwise, and shall comprise 400mm x 400mm x 50mm precast concrete paving bedded on 25mm moist sand/cement mortar (3:1), joints filled with 4:1 mix to within 2mm of the paving surface. Paving shall be Type A as defined in Fig. 2 of the Department of Transport's 'Guidance on the use of Tactile Paving Surfaces'.
6. Alternative proposals to the pole mounting system shown on this detail shall be approved in advance by the Overseeing Organisation.
7. Duct crossing shall comprise 1 No. 100mm internal diameter high density polyethylene, smooth single wall orange service duct, across carriageway in concrete surround with drawcord (minimum cover 600mm). Refer to I 701.1, Notes for Guidance Annex 1 and Appendix 5/2 for duct group details.
8. For details on mains powered bollards see drawing K 703.7
9. Pedestrian refuges narrower than 2000mm shall only be provided in locations where the full 2000mm cannot be achieved.
10. Access chamber units shall be NAL 300x300mm STAKKAbox unless approved in advance by the Overseeing Organisation. Refer to I 702.1 for details.
11. The frame type shall be EN 124 B125 black anti-slip composite cover. Frame shall be galvanised steel raising frame provide with 85mm bedding depth for surrounding surface course to frame flange. Additionally the frame shall be fixed to the chamber wall with 4 x 8mm coach bolt.
12. Composite lids to be secured by fixing screws on completion.

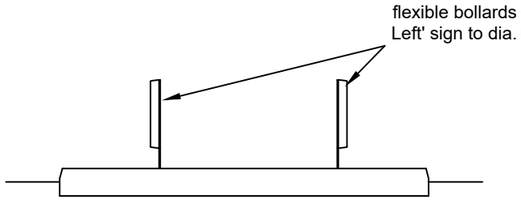
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

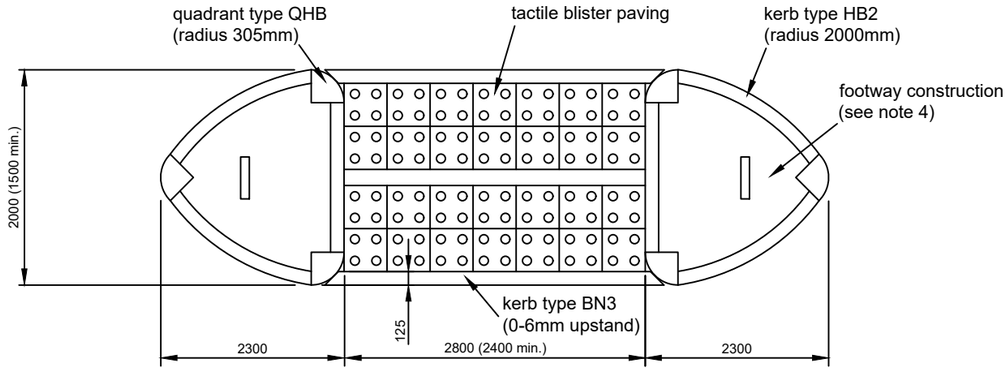
Warwickshire County Council	HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TYPE 1 REFUGES & PEDESTRIAN REFUGES: WITH MAINS POWERED BOLLARDS & SIGNS	DRAWN: SL	CHECKED: RJP	APPROVED: AC	ISSUE: 4
				DRAWING NUMBER: K 703.1	SHEET SIZE: A3	ISSUE DATE: APR 2016	

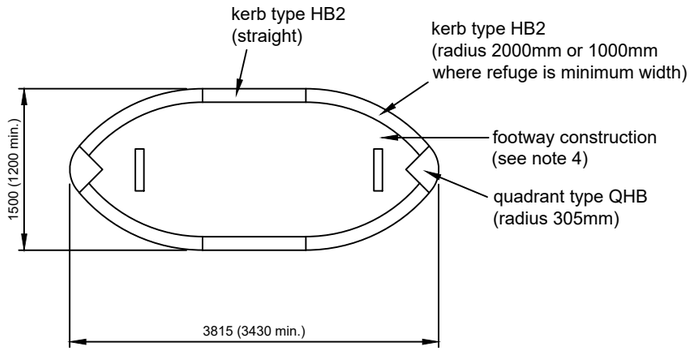
PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 OCT 2010

0mm 50mm 100mm 150mm 200mm

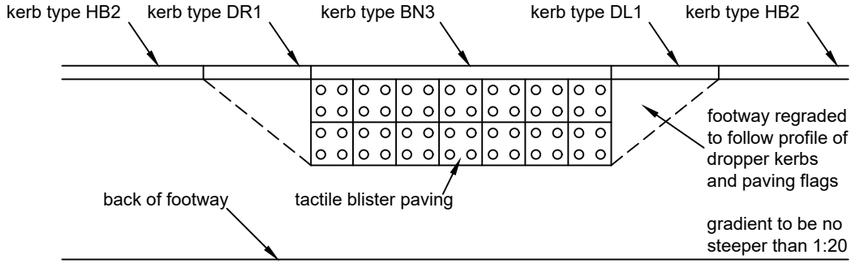




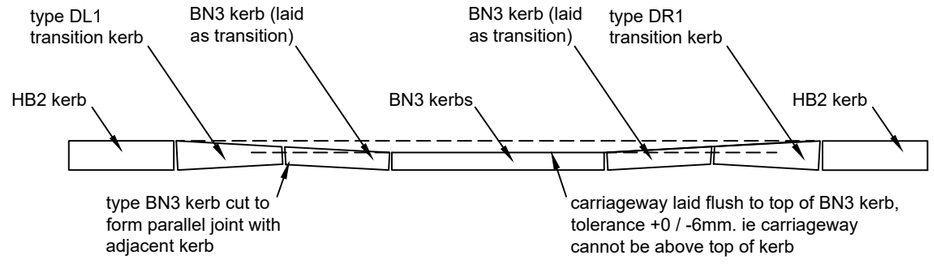




REFUGE WITH FLEXIBLE SOLAR BOLLARDS



PEDESTRIAN REFUGE WITH FLEXIBLE SOLAR BOLLARDS



KERB DETAILS TO ACHIEVE GRADIENT OF 1:11 OR FLATTER

NOTES

1. Refer to B 702.1 for kerbing details.
2. Dropper kerb types DR1 and DL1 shall be cut to form a vertical joint with adjacent type HB2 kerbs.
3. Type BN3 kerbs shall be laid with a maximum upstand of 0-6mm above carriageway.
4. Refuge islands shall be of Type 1 footway construction. Refer to B 704.1 for details.
5. Tactile blister paving shall be red at controlled crossings, otherwise buff in colour. Tactile blister paving shall comprise 400mm x 400mm x 50mm precast concrete paving bedded on 25mm moist sand/cement mortar (3:1), joints filled with 4:1 mix to within 2mm of the paving surface. Paving shall be Type A as defined in Fig. 2 of the Department of Transport's 'Guidance on the use of Tactile Paving Surfaces'.
6. For details on flexible bollards see drawing K 703.6
7. Pedestrian refuges narrower than 2000mm shall only be provided in locations where the full 2000mm cannot be achieved.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: TYPE 2 REFUGES & PEDESTRIAN REFUGES: WITH FLEXIBLE SOLAR BOLLARDS

DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 703.2	A3	MAY 2018

PREVIOUS ISSUES	
1	FEB 2005
2	MAY 2010
3	OCT 2010
4	APR 2016

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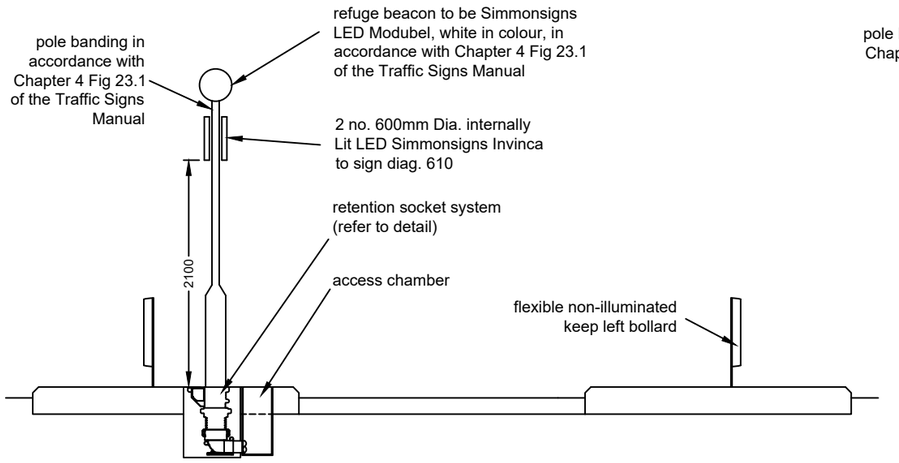
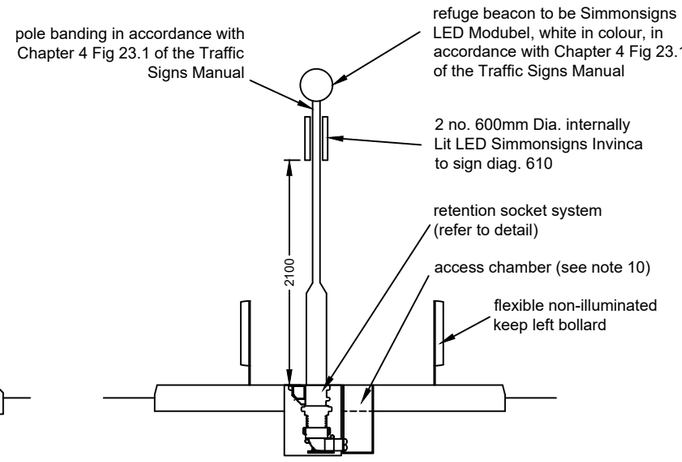
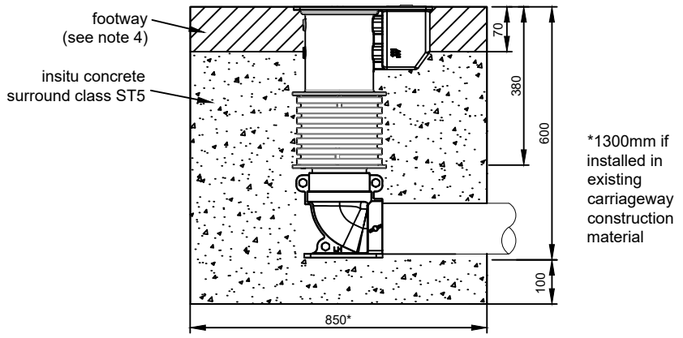
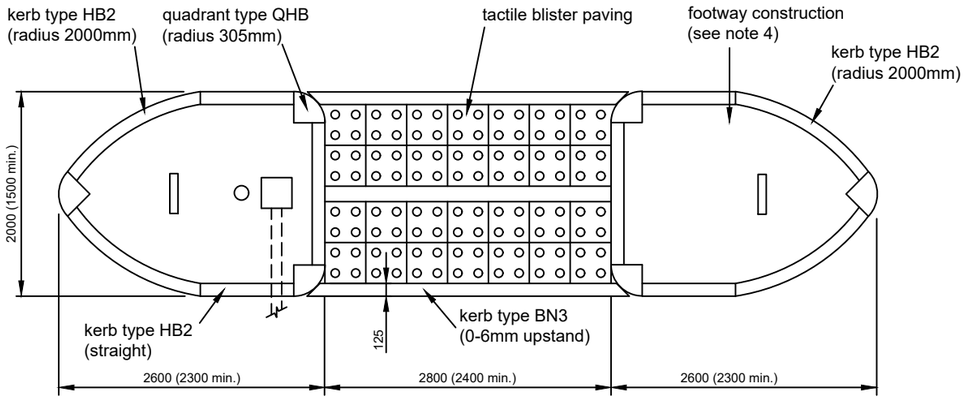
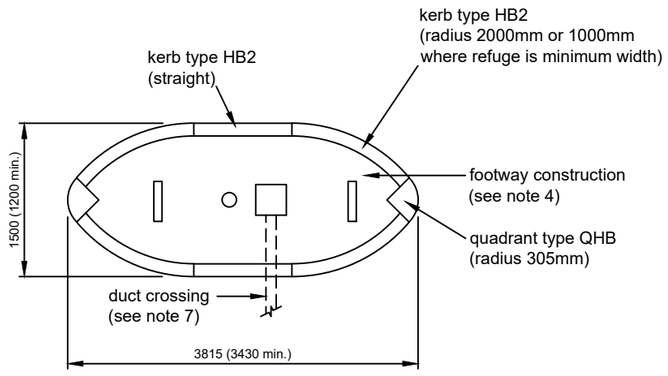




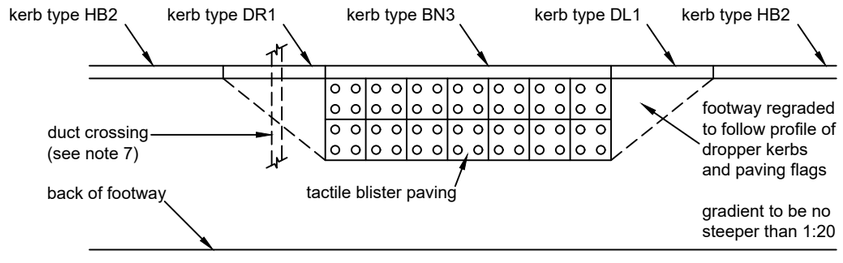


RS140 RETENTION SOCKET SYSTEM WITH DUCKFOOT BEND OR SIMILAR APPROVED

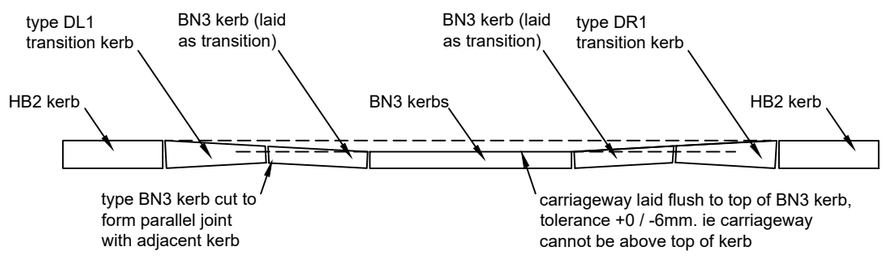




REFUGE WITH FLEXIBLE SIGNAGE AND BEACON



PEDESTRIAN REFUGE WITH FLEXIBLE SIGNAGE AND BEACON



KERB DETAILS TO ACHIEVE GRADIENT OF 1:11 OR FLATTER

NOTES

1. Refer to B 702.1 for kerbing details.
2. Dropper kerb types DR1 and DL1 shall be cut to form a vertical joint with adjacent type HB2 kerbs.
3. Type BN3 kerbs shall be laid with a maximum upstand of 6mm above carriageway.
4. Refuge islands shall be of Type 1 footway construction. Refer to B 704.1 for details.
5. Tactile blister paving shall be buff in colour, unless stated otherwise, and shall comprise 400mm x 400mm x 50mm precast concrete paving bedded on 25mm moist sand/cement mortar (3:1), joints filled with 4:1 mix to within 2mm of the paving surface. Paving shall be Type A as defined in Fig. 2 of the Department of Transport's 'Guidance on the use of Tactile Paving Surfaces'.
6. Alternative proposals to the pole mounting system shown on this detail shall be approved in advance by the overseeing organisation.
7. Duct crossing shall comprise 1 No. 100mm internal diameter high density polyethylene, smooth single wall orange service duct, across carriageway in concrete surround with drawcord (minimum cover 600mm). Refer to I701.1. Notes for Guidance Annex 1 and Appendix 5/2 for duct group details.
8. For details on flexible bollards see drawing K 703.6
9. Pedestrian refuges narrower than 2000mm shall only be provided in locations where the full 2000mm cannot be achieved.
10. Access chamber units shall be NAL 300x300mm STAKKAbox unless approved in advance by the Overseeing Organisation. Refer to I 702.1 for details.
11. The frame type shall be EN 124 B125 black anti-slip composite cover. Frame shall be galvanised steel raising frame provide with 85mm bedding depth for surrounding surface course to frame flange. Additional the frame shall be fixed to the chamber wall with 4 x 8mm coach bolt.
12. Composite lids to be secured by fixing screws on completion.

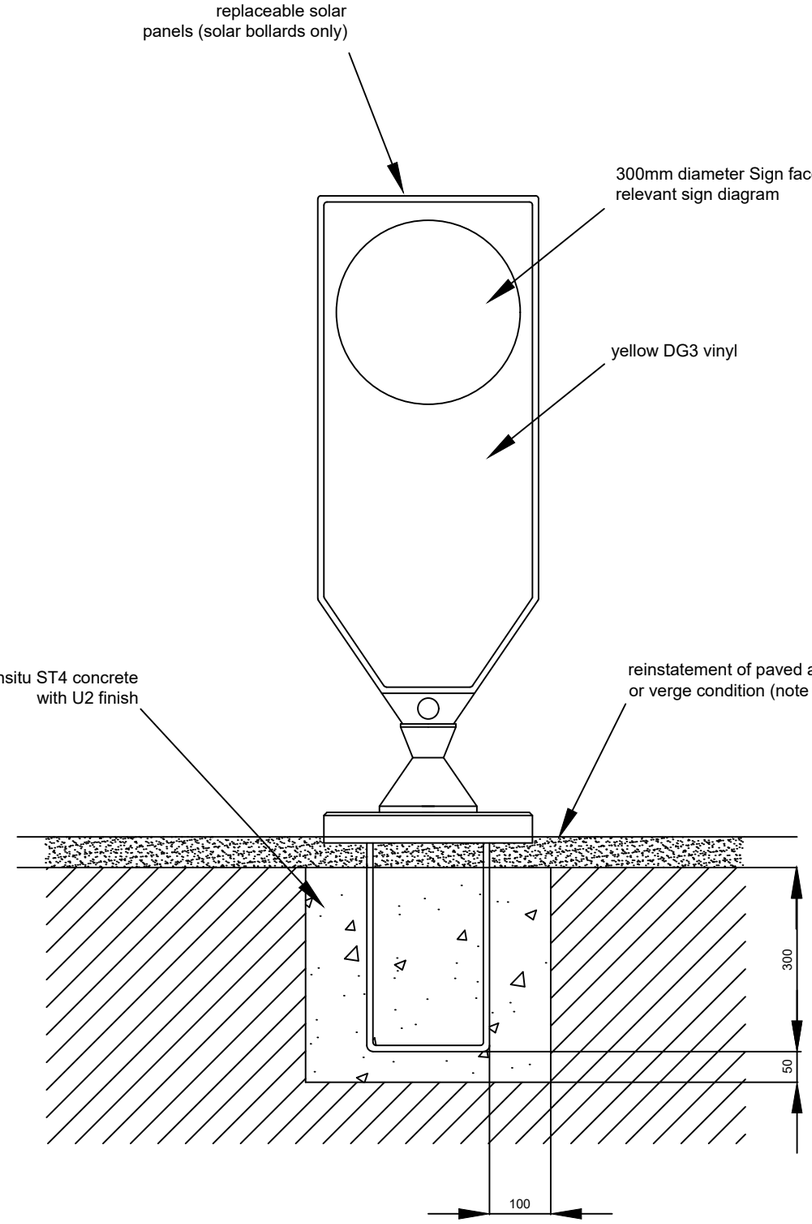
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

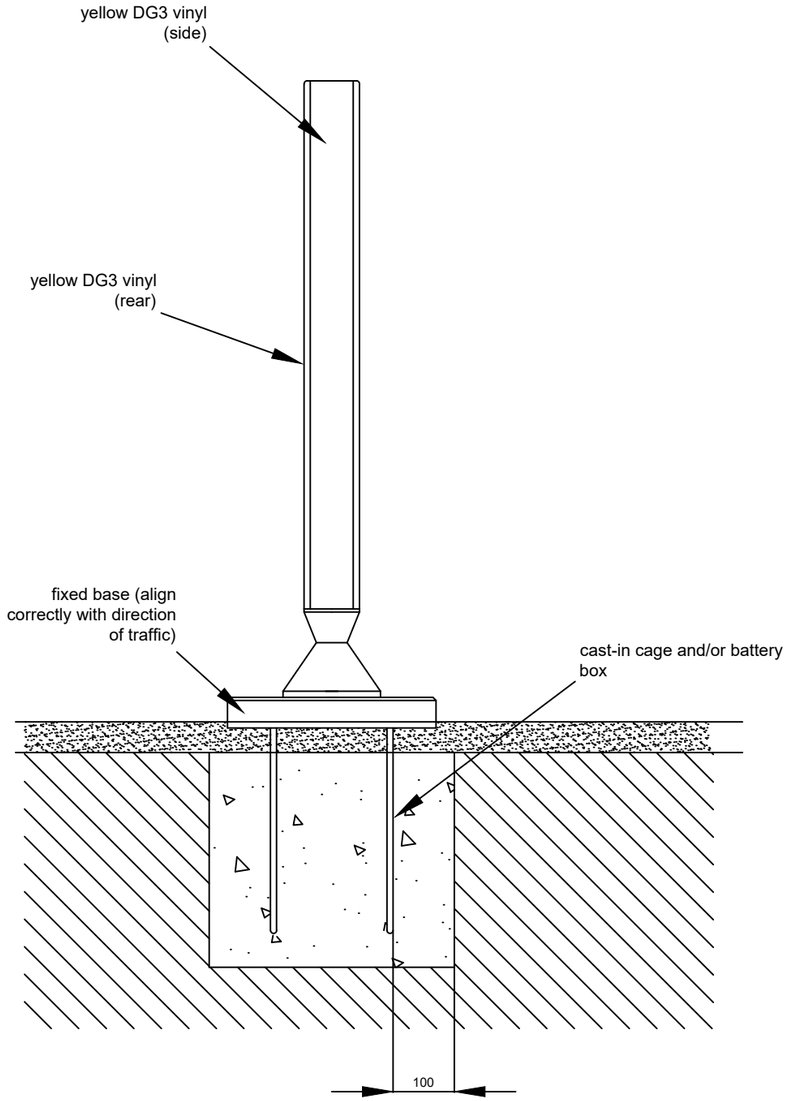
Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TYPE 3 REFUGES & PEDESTRIAN REFUGES: WITH FLEXIBLE BOLLARDS & MAINS POWERED SIGNS	DRAWN: SL	CHECKED: RJP	APPROVED: AC	ISSUE: 4
			DRAWING NUMBER: K 703.4	SHEET SIZE: A3	ISSUE DATE: APR 2016	

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 OCT 2010

0mm 50mm 100mm 150mm 200mm





APPROVED SUPPLIERS (see note 4)

Solar bollards
Pudsey Diamond - Solaboll

Reflective bollards
Pudsey Diamond - Visaboll - with ground cage
Simmonsigns Ltd. - Weebol - with rebated base

NOTES

1. All bollards to conform to BS EN 12767 and BS 84423.
2. All bollards to have front, rear and side reflective material.
3. All solar bollards to have 5 year minimum battery guarantee.
4. Type of bollard to be discussed and agreed with Warwickshire County Council Street Lighting Section prior to installation (see guidance below).

Examples of locations which require illuminated type -
- i) Refuges where no other equipment is installed.
- ii) Splitter islands at roundabouts (not plain face type).

Examples of locations which can be non-illuminated type -
- i) Refuges with traffic signals poles installed.
- ii) Refuges where there is a refuge beacon installed and a lit keep left arrow (diag 610) is attached to the beacon post.
- iii) All plain face type bollards.

5. Refer to B 704.1 for details.
6. Insitu concrete to be continued to ground level in verge condition, with U2 finish.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: BOLLARDS: SOLAR AND UNLIT

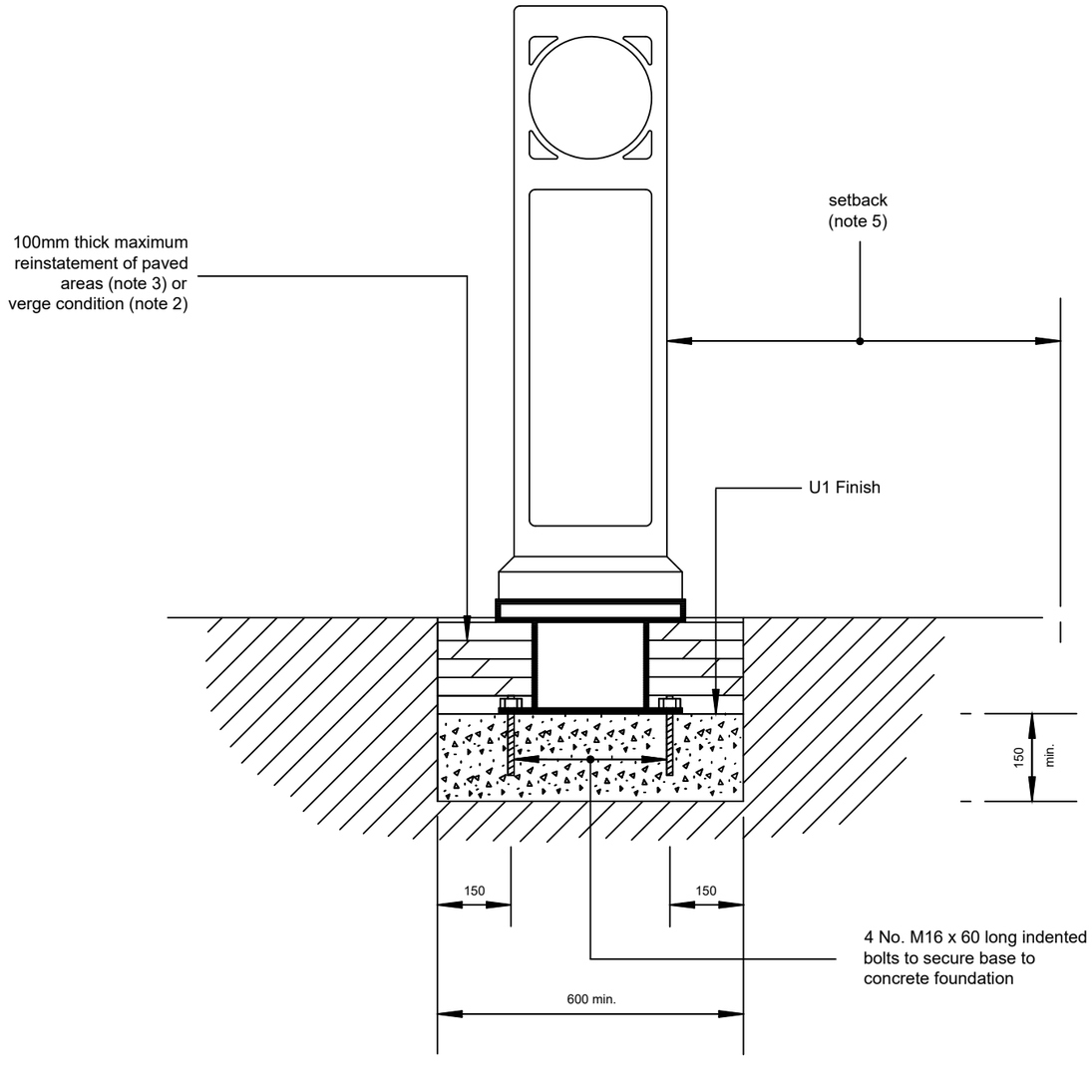
DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	5

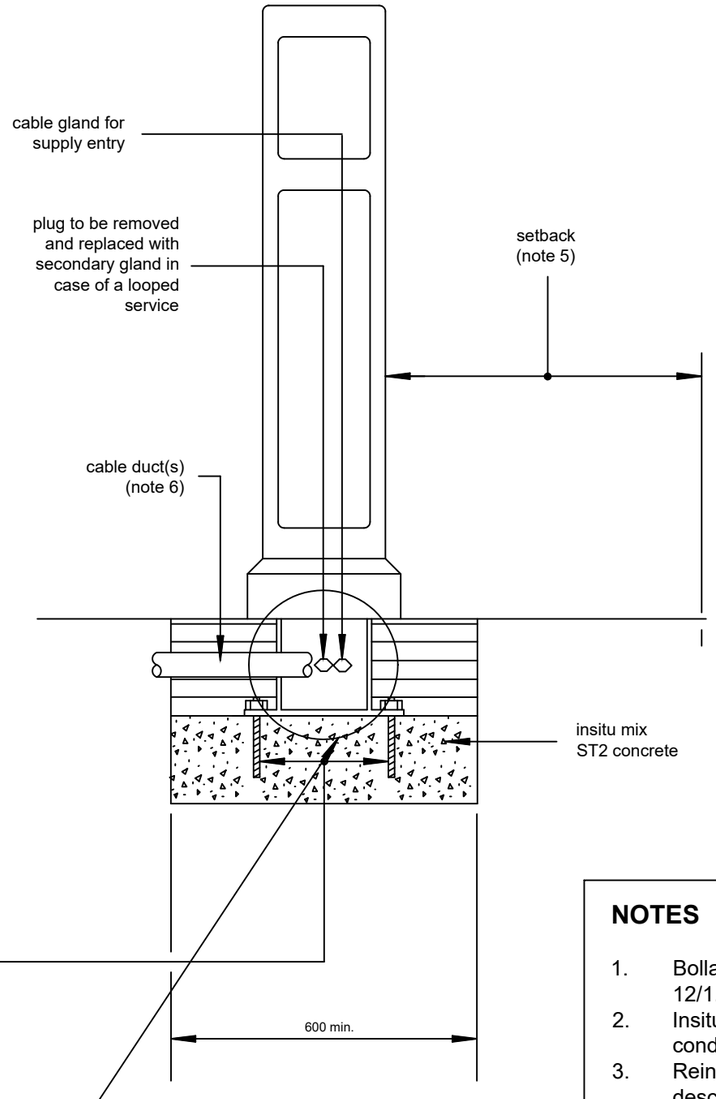
DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 703.6	A3	FEB 2021

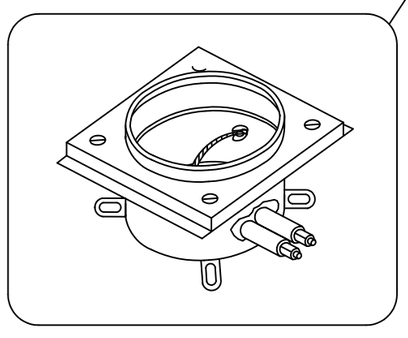
PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016
4	MAY 2018

0mm 50mm 100mm 150mm 200mm







APPROVED SUPPLIERS (see note 8)

300mm type:
Simmonsigns - Global LED baselight fitted with Simbol shell with 230V incoming supply.

600mm type:
Simmonsigns - Global LED base light fitted with Contour shell with 230V incoming supply.

NOTES

1. Bollard shell type and details are specified in Appendix 12/1.
2. Insitu concrete to be continued to ground level in verge condition, Finish U2.
3. Reinstatement of footways and paved areas are described in Appendix 7/2.
4. Identification markings are to be a 65mm high black number on a yellow background fixed to the rear of the shell.
5. A minimum setback of 500mm is required from bollard face to traffic face of kerb in all directions unless agreed with the Overseeing Organisation.
6. Cable duct or ducts to terminate as close to the cable entry point as is practicable. Exposed cable to be laid on a sand bed and surround.
7. Shells to be bolted to base light.
8. Type of bollard to be discussed and agreed with Warwickshire County Council Street Lighting Section prior to installation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: BOLLARDS: MAINS POWERED

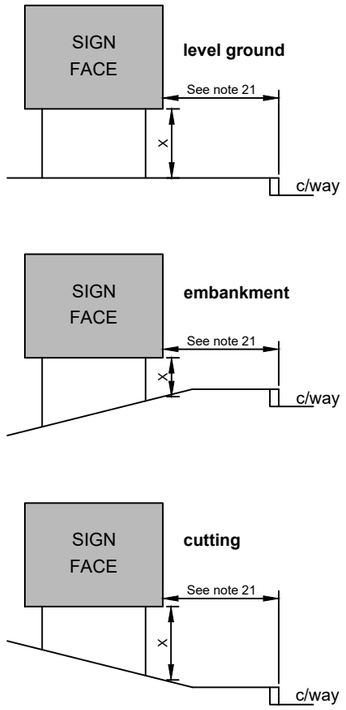
DRAWN	CHECKED	APPROVED	ISSUE
RJP	NH	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 703.7	A3	FEB 2021

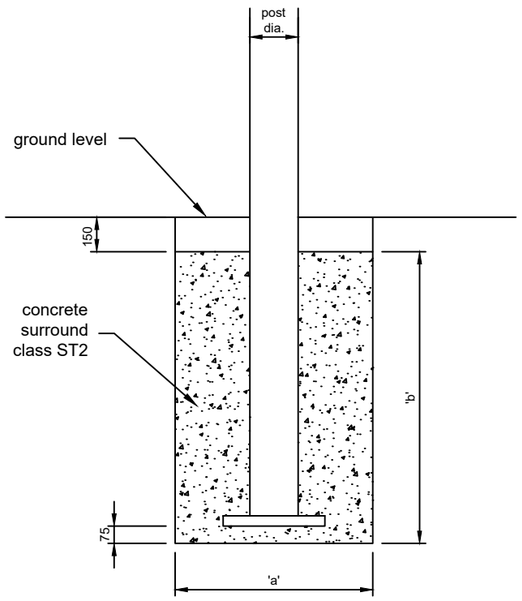
PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	APR 2016

0mm 50mm 100mm 150mm 200mm

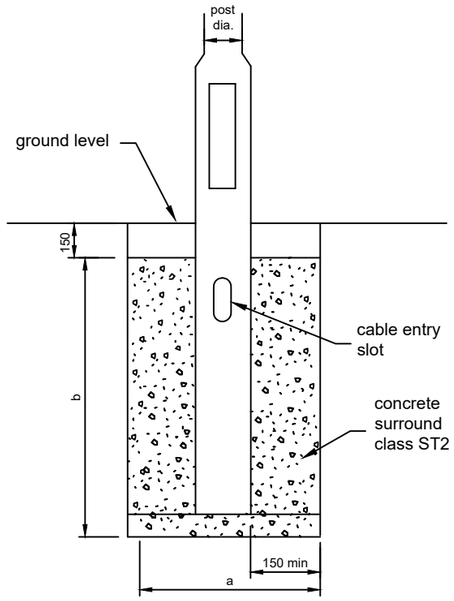


MOUNTING OF LARGER SIGNS



BASE DETAIL FOR TUBULAR STEEL POST

Base dimensions 'a' & 'b' as specified. Surface to be reinstated to match surrounding ground (dimension 'a' may be circular or square).

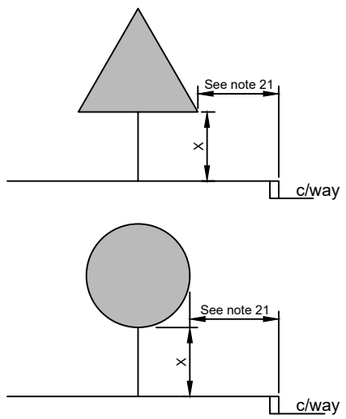


BASE DETAIL FOR TUBULAR STEEL POST WITH WIDE BASE FOR LIGHTING CONNECTION

PLANTING DEPTH AND BASE DETAILS

Post dia	Dimension 'a'	Dimension 'b'	
76	350	525	small base
76	1000	700	large base
89	1200	700	
114	1400	900	

Blanking or cover plates 16 swg aluminium for either steel or aluminium substrates



MOUNTING OF SMALLER SIGNS

POST AND FOOTING DETAIL

NOTES

1. Mounting heights ('X') shall be as per the scheme's traffic signs schedule.
2. Signs shall be manufactured to: the current parts of BS EN 12899:2007 and BS EN 12899-1:2007, 'The Traffic Signs Regulations and General Directions', and 'The Traffic Signs Manual'.
3. Sign faces shall be manufactured from 3.0mm thick sheet aluminium unless stated otherwise.
4. Stiffening or framing shall be off aluminium angle or channel to BS 873 : Part 6, 1983.
5. All signs shall be single sided unless scheduled otherwise.
6. Stiffening or framing shall be of aluminium angle or channel to BS EN 12899-1: 2007.
7. Non-reflective signs shall be screen printed onto a suitable non-reflective material approved in advance by the Overseeing Organisation.
8. Reflective signs Class 1 and 2 shall be as defined in BS EN 12899-1: 2007.
9. Internally illuminated bollards shall be of a suitable type approved in advance by the overseeing organisation.
10. Externally lit signs to be Simmonsigns LUA LED type or LUB Mk-T 2 x 11w PLL or similar approved.
11. All external lighting units shall be fitted with photo-electric control of a type approved in advance by the Overseeing Organisation except units on 'Keep Left' (Diag. 610) and 'Turn Left' (Diag. 609) signs, which must be continuously energised.
12. External lighting units that are to be in accordance with the Traffic Signs Manual: Chapter 11, Appendix VI, Table 1 shall be approved in advance by the Overseeing Organisation and fitted with power factor correction to not less than 0.85 LAG.
13. All necessary stub posts, conduits and fixings shall be supplied.
14. Where required, cover or blanking plates shall be fixed with 5mm dia. stainless steel bolts, washers and nuts, with a 5mm thick by 12mm dia. plastic distance piece between the sign face and plate.
15. Door opening 425 x 100 minimum. (Lit signs only)
16. Hole to be formed in concrete to line up with cable entry slot of column. (Lit signs only)
17. Except where otherwise stated in Appendix 13/1 doors to base compartment shall face away from oncoming traffic. (Lit signs only)
18. Identification markings are to be a 65mm high black number on a yellow background fixed to the post below the sign plate. (Lit signs only)
19. Post and Footing Notes:
    Non-passive standard posts and foundations
    Planting depth, outside diameter of post, and footing dimensions 'a' and 'b' shall be as specified on the traffic signs schedule. Dimension 'a' may be either circular or square.
    The void above the upper surface of the footing shall be backfilled or reinstated to match existing conditions.The surface finish for posts shall be as scheduled.
    Passive posts and foundations
    All posts and foundations for passive posts shall be as scheduled.
20. Butting clamps **MUST** be used on all multi-panel signs. Butting clamps must be fitted at the ends of each sign and also one between each set of posts.
21. Signs should be set at least 450mm from the edge of the carriageway. This should be increased to 600mm where there is a severe camber or crossfall and where signs are mounted on the central reserve of dual carriageways. On high-speed dual carriageway roads the clearance should be at least 1200mm and where there is a hardened verge the nearest edge of the sign should be not less than 600mm behind the edge of the hardening.
22. Posts located on a cycleway should be provided with a white visibility band 150mm deep at a height of between 1400-1600mm above ground.

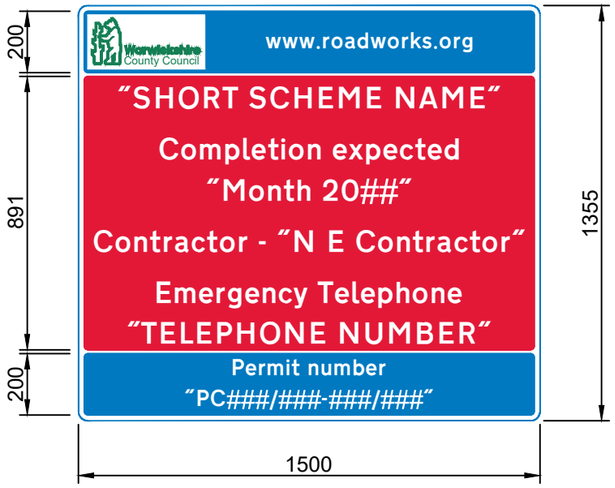
ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

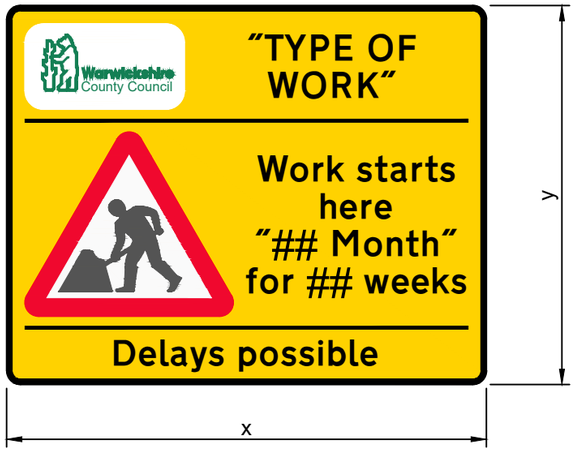
HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TRAFFIC SIGNS: FABRICATION & MOUNTING DETAILS	DRAWN: RJP	CHECKED: NH	APPROVED: AC	ISSUE: 4
			DRAWING NUMBER: K 704.1	SHEET SIZE: A3	ISSUE DATE: MAY 2018	

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010
3 APR 2016

0mm 50mm 100mm 150mm 200mm



SIGN BOARD TYPE A
(PEDESTRIAN SCHEME INFORMATION BOARD)



SIGN BOARD TYPE B
(ADVANCED WARNING SIGN)

SIGN BOARD TYPE C
(END OF WORKS SIGN)

SIGN BOARD TYPE D
(END OF WORKS HELPLINE SIGN)

SIGN BOARD SIZES		
SPEED LIMIT ON ROAD WHERE SIGN IS TO BE ERECTED	TYPE B	TYPE D
Up to 30 mph	x = 1565mm y = 1235mm	x = 600mm y = 600mm
40 mph and over	x = 1718mm y = 1316mm	x = 900mm y = 900mm

SIGN BOARD MOUNTING METHODS				
SPEED LIMIT ON ROAD WHERE SIGN IS TO BE ERECTED	TYPE A	TYPE B	TYPE C	TYPE D
Up to 40mph	Steel Posts*	Steel Posts*	Steel Posts*	Square A-Frame
50 mph and over	Quick-Fit Frame	Quick-Fit Frame	Quick-Fit Frame	Square A-Frame

*Quick-Fit Frames may be used with prior permission from the Overseeing Organisation

SIGN TEXT X-HEIGHT					
SPEED LIMIT ON ROAD WHERE SIGN IS TO BE ERECTED	SIGN A (RED)	SIGN A (BLUE)	SIGN B	SIGN C	SIGN D
Up to 30 mph	50mm	35mm	60mm	100mm	50mm
40 mph and over	50mm	35mm	75mm	100mm	75mm

NOTES

1. Sign board faces shall be manufactured from a material approved in advance by the Overseeing Organisation. Corners shall be rounded off in accordance with the TSRGD.
2. The size of the Warwickshire County Council logos shall be sized such that they match approximately, the proportions of the sign faces shown on this detail.
3. The height of the triangular warning sign on sign boards Type B and C shall be 600mm.
4. Colour and picture image for the triangular warning sign (Diag. 7001) and 'End' lettering shall be in accordance with the TSRGD.
5. The Warwickshire County Council logos shall be green in colour to RGB 'R20 G127 B84'. The logo background shall be white in colour to RGB 'R241 G242 B234'.
6. Colour, text style, text size, and picture image details for the Warwickshire County Council logo will be supplied by the Overseeing Organisation upon request.
7. The text style for lettering other than that which forms part of a logo shall be as per the TSRGD.
8. The background to sign board Type A shall be red in colour to RGB 'R227 G24 B55' and blue in colour to RGB 'R0 G121 B193'. The background to sign board Types B and C shall be yellow in colour to RGB 'R255 G210 B0'.
9. Lettering other than that which forms part of a logo on sign board Type A shall be white in colour to RGB 'R241 G242 B234'. Lettering other than that which forms part of a logo on sign board Types B and C shall be black in colour to RGB 'R47 G47 B48'.
10. The x-height for 'End' lettering on sign board Type C shall be 80mm. The x-height for other lettering on this sign board shall be 100mm.
11. Signs shall be mounted at a height of 1.0m where visibility criteria can be satisfied and where no of a footway is obstructed. All other boards shall be mounted at a height of 2.1m (footway) or 2.3m (cycleway).
12. Post mounted boards shall be mounted on 2 no. posts (88.9mm O.D. 5mm thick S275 steel circular sections) with 850mm spacing, planted at a depth of 1050mm. Refer to K 704.1 for sign footing details. Footing dimensions 'a' and 'b' shall be 500mm and 975mm respectively. Fixing to be by 3 no. 3mm small aluminium channels. All posts shall be supplied with end caps, base plates and all other necessary fittings.
13. 'Type of Work' text on sign board Type B shall be approved in advance by the overseeing organisation.
14. Descriptions or dates which may change over the course of the construction period, shall be displayed in lettering which can be removed and replaced without damaging the remainder of the sign board.
15. It is the Contractor's responsibility to update descriptions or dates during the construction period if they change. All alterations must be approved in advance by the Overseeing Organisation.
16. On sign board Type B 'Delays possible' may be varied to 'Use alternative route' or 'Delays likely' as appropriate.
17. On sign board Type B, example acceptable start date formats are: '31 January', 'January' or 'Spring'. 'weeks' may be amended to 'months'.
18. A sign board of Type A must be placed at every disconnected roadworks site. It should be positioned so that is can be read by passing pedestrians, unless otherwise instructed by the Overseeing Organisation.
19. Exact positioning of signs to be agreed in advance with the Overseeing Organisation.
20. Signs to be removed at a time notified by the Overseeing Organisation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: SIGN BOARD DETAILS: TYPE A, B, C & D

DRAWN	CHECKED	APPROVED	ISSUE
RJP	CDT	AC	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 705.1	A3	APR 2016

PREVIOUS ISSUES

1	FEB 2005
2	MAY 2010
3	FEB 2014

0mm 50mm 100mm 150mm 200mm

SIGN BOARD TYPE E
(MAJOR SCHEME INFORMATION BOARD)

SIGN BOARD MOUNTING METHODS	
SPEED LIMIT ON ROAD WHERE SIGN IS TO BE ERECTED	TYPE E
Up to 40mph	As shown on adjacent design
50 mph and over	To be provided by the Overseeing Organisation

SignLoad Professional [BS EN 12899-1:2007] 3.21
Design undertaken by: Warwickshire County Council

Project: HCD

Sign reference: Type E — Date: 08-02-2016

Sign width:	2500 mm
Sign height:	2150 mm
Sign area:	5.38 m²
Mounting height (to lower edge):	2300 mm
Basic wind pressure:	1000 N/m²
BS EN 12899-1:2007 classes:	WL5, PL3, TDB4, PAF1
Aerodynamic force coefficient:	1.27

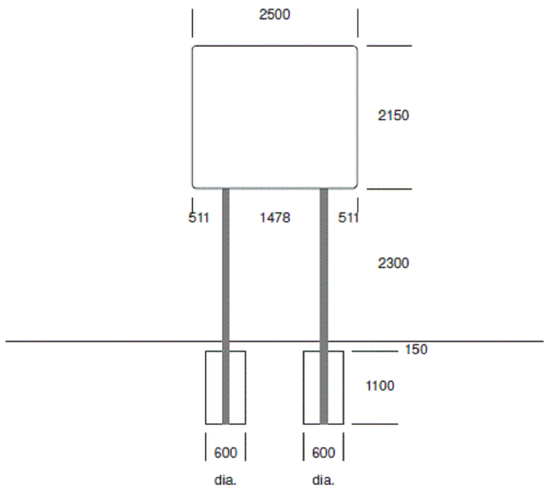
For the above sign, a satisfactory structure is:

Number of supports:	2
Support type:	Steel rectangular section S275
Support section:	100mm square 6.3mm thick
Support length:	5700 mm

Planted foundations to BD 94/07:

Soil type:	poor or unknown
Depth of soft fill above footing:	150 mm
Height of footing:	1100 mm (excluding cover)
Diameter of each footing:	600 mm

Substrate: Aluminium 11g (3mm)
Blackburns Large channel section suitable at 925 mm centres.
3 channels needed.



UP TO 40MPH DESIGN

NOTES

1. Relevant to major construction or improvement schemes, this sign should be located on the near side verge in advance of the works area and other temporary signage, provided that there is no conflict with other signs or with junctions and no undue driver distraction will result. Exact positioning of signs to be agreed in advance with the Overseeing Organisation.
2. Sign board corners shall be rounded off in accordance with the TSRGD.
3. The size of the Warwickshire County Council logos shall be sized such that they match approximately, the proportions of the sign faces shown on this detail.
4. The Warwickshire County Council logos shall be green in colour to RGB 'R20 G127 B84'. The logo background shall be white in colour to RGB 'R241 G242 B234'.
5. Colour, text style, text size, and picture image details for the Warwickshire County Council logo will be supplied by the Overseeing Organisation upon request.
6. The text style for lettering other than that which forms part of a logo shall be as per the TSRGD.
7. The background to sign board Type E shall be blue in colour to RGB 'R0 G121 B193'. Lettering other than that which forms part of a logo shall be white in colour to RGB 'R241 G242 B234'.
8. The x-height for the lettering shall be 100mm and 50mm as shown on this drawing.
9. Signs shall be mounted at a height of 1.0m where visibility criteria can be satisfied and where no of a footway is obstructed. All other boards shall be mounted at a height of 2.1m (footway) or 2.3m (cycleway).
10. 'Road Number & Name', 'Scheme Name' and the scheme website text on sign board shall be approved in advance by the overseeing organisation.
11. Descriptions or dates which may change over the course of the construction period, shall be displayed in lettering which can be removed and replaced without damaging the remainder of the sign board.
12. It is the Contractor's responsibility to update descriptions or dates during the construction period if they change. All alterations must be approved in advance by the Overseeing Organisation.
13. Example acceptable opening date formats are: 'January 2016' 'Spring 2016'.
19. Signs to be removed at a time notified by the Overseeing Organisation.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

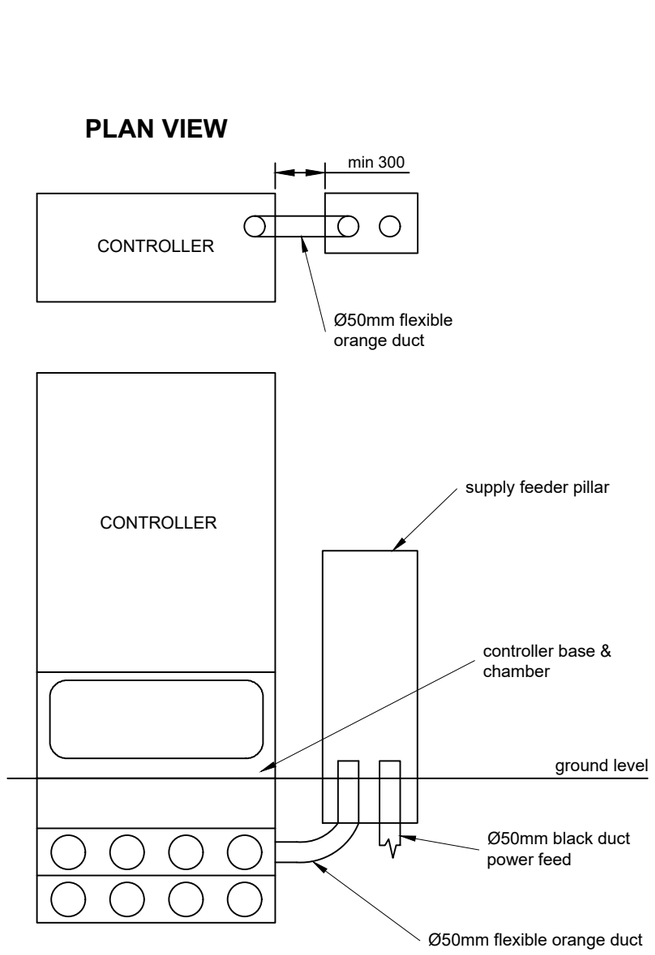
TITLE: SIGN BOARD DETAILS: TYPE E MAJOR SCHEME INFORMATION BOARD

DRAWN	CHECKED	APPROVED	ISSUE
RJP	CDT	AC	3

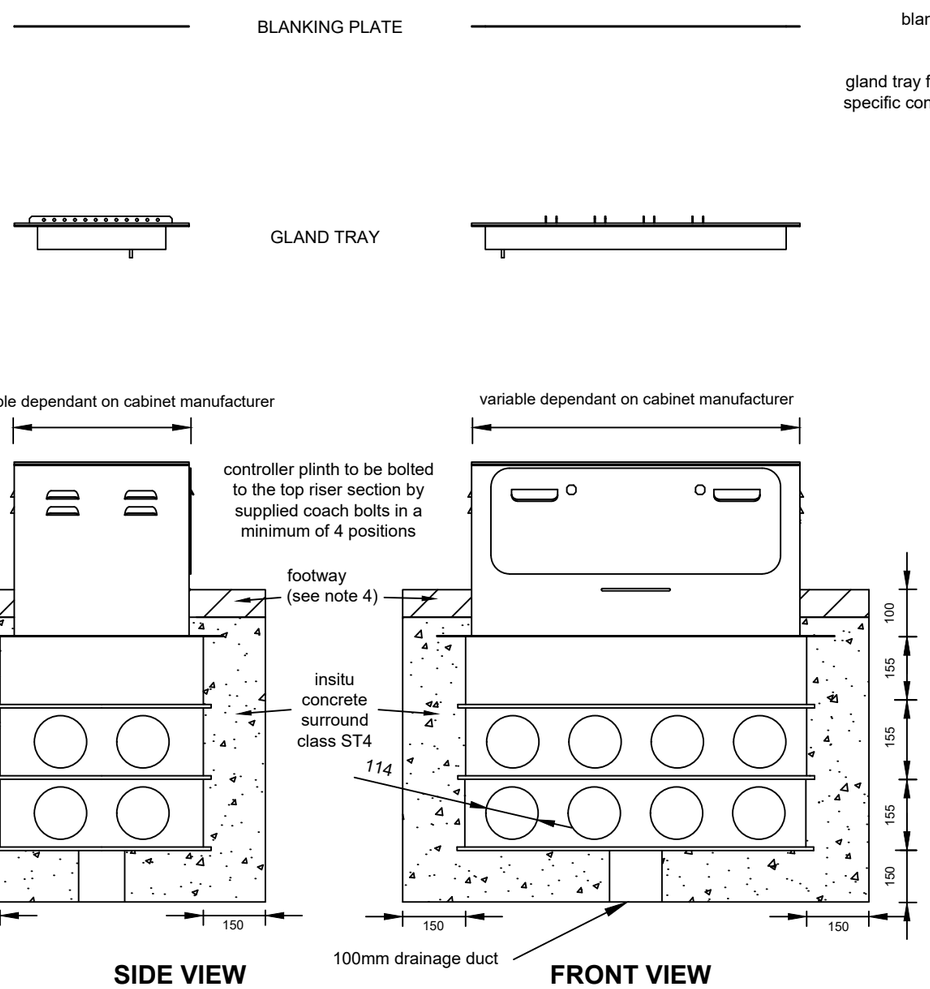
DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 705.2	A3	APR 2016

PREVIOUS ISSUES
1 FEB 2005
2 MAY 2010

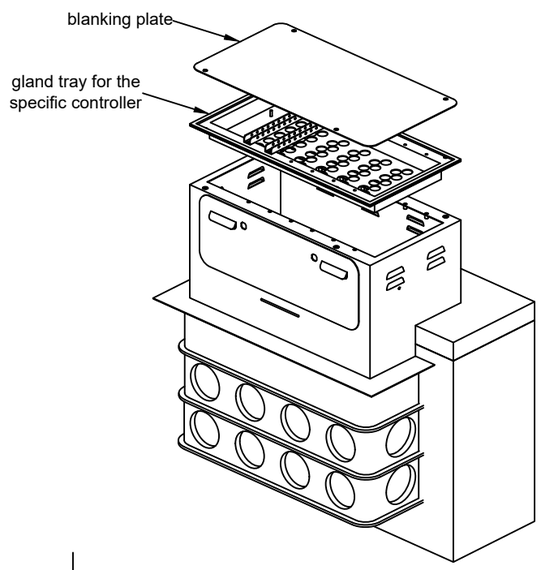
0mm 50mm 100mm 150mm 200mm



CONTROLLER WITH CONTROLLER BASE AND SUPPLY PILLAR



CONTROLLER BASE INSTALLATION DETAILS



NOTES

1. Controller base shall be NAL type unless approved in advance by the Overseeing Organisation.
2. Controller base to suit Controller to be installed.
3. Controller Cabinet Plinth should be manufactured from 2mm utility grade 1.4003 Stainless steel polyester powder coated black.
4. Refer to B 704.1 for details.
5. The number of ducts shown is schematic. The actual number of connecting ducts into the Controller will be based on the cable design provided by the Traffic Signal Company plus 25% spare capacity. The minimum number of connecting ducts will be 4x 100mm (front) and 1x50mm (feeder pillar).

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council

HIGHWAY CONSTRUCTION DETAILS (HCD-700)

SECTION: MISCELLANEOUS

TITLE: TRAFFIC SIGNALS: CONTROLLER WITH CONTROLLER BASE

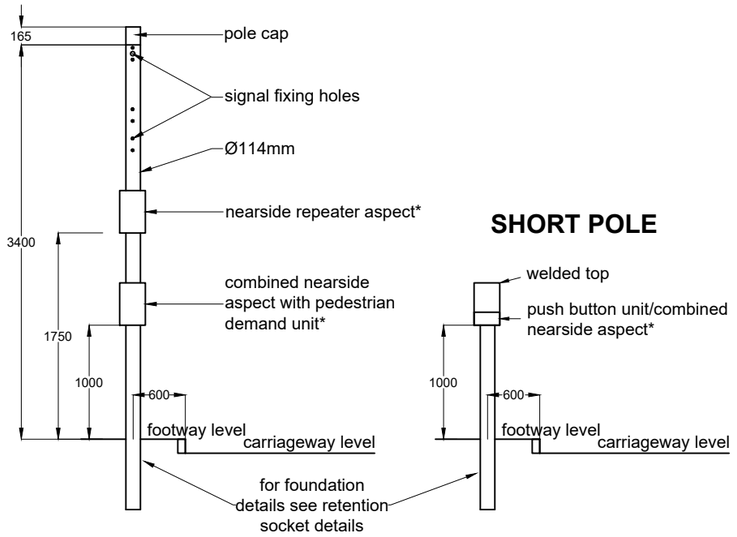
DRAWN	CHECKED	APPROVED	ISSUE
EB	RJP	DM	4

DRAWING NUMBER	SHEET SIZE	ISSUE DATE
K 706.1	A3	FEB 2021

PREVIOUS ISSUES

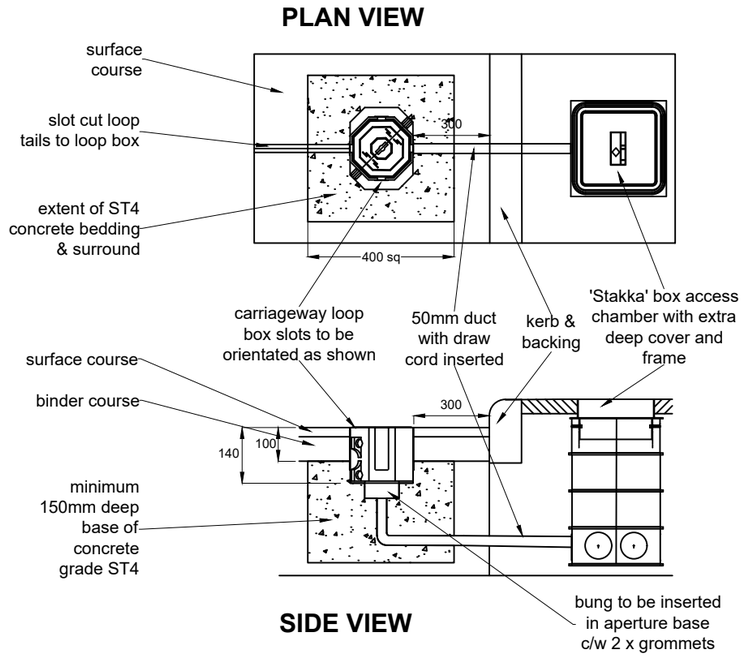
1	FEB 2005
2	MAY 2010
3	APR 2016

0mm 50mm 100mm 150mm 200mm



*as specified on scheme specific drawings - unit(s) shall face pedestrian waiting area at an angle of 25° - 30° in from parallel to the carriageway

SIGNAL POLE INSTALLATION

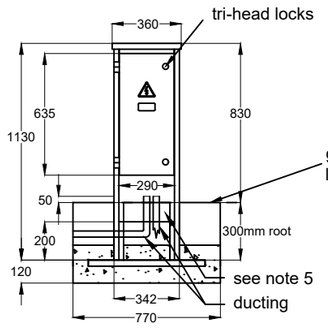


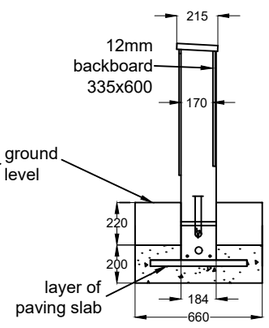
CARRIAGEWAY LOOP BOX INSTALLATION

1. 2 No. temporary signs to be supplied and installed
2. 2 No. medium channels required
3. Contractor to provide clips to match diameter of post/column
4. Exact locations to be agreed on site with the Overseeing Organisation
5. Signs and temporary posts to be removed 3 months after completion by the Contractor

Permitted variants:
a. 'NEW TRAFFIC SIGNALS'
b. 'SIGNAL TIMINGS CHANGED'
c. 'SIGNAL PRIORITIES CHANGED'

TEMPORARY SIGNS

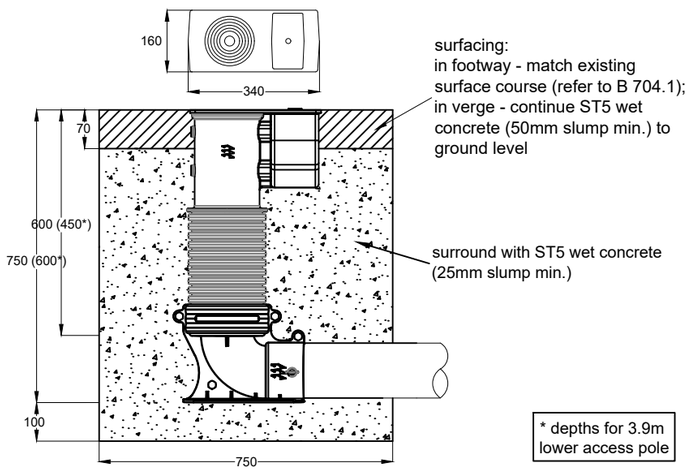




1. Excavate hole as required:
   a) Length: Pillar width + 300mm (= 770mm)
   b) Width: Pillar depth + 300mm (= 660mm)
   c) Depth: Pillar root depth + 120mm
2. Use layer of paving slabs as foundation as required
3. Place Pillar onto the foundation supports
4. Install draw string and 50mm swept bend ducting:
   a) DNO supply in BLACK ducting
   b) Traffic signal and MEC supplies in ORANGE ducting
5. Backfill with pea shingle min 150mm
6. Make good surrounds as required
7. Some ground conditions may require root extensions
8. Some ground conditions & rural locations may require rag feet fitted to the base of the root
9. Feeder Pillar '2300BL' (tri head, galvanised and painted black) Pudsey Diamond or equivalent type approved by the Overseeing Organisation

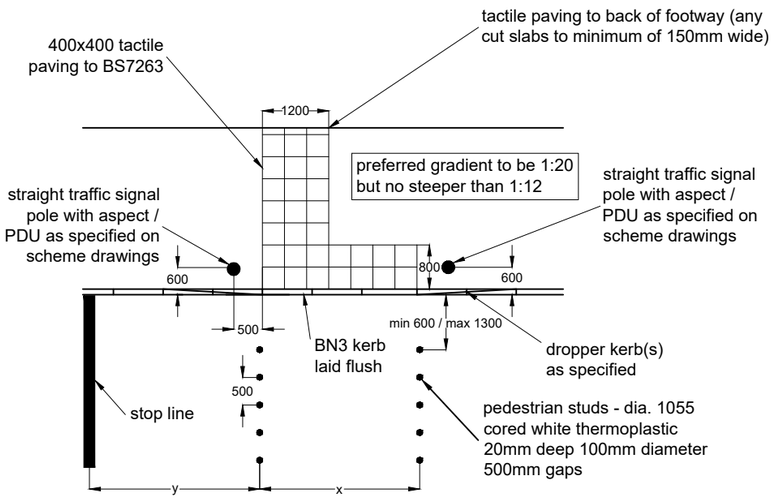
FEEDER PILLAR INSTALLATION

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.



1. Concrete shall be adequately compacted to ensure removal of voids around ducts and retention socket
2. Surround concrete and concrete required in verge conditions shall be placed while base concrete is still plastic and within 6 hours of batching. Where this is not possible, a minimum of 8 no 12mm dia. steel rebar dowels shall be provided around the perimeter of the socket, equally spaced and with a minimum embedment length of 200mm into each concrete layer
3. Socket to be adequately ballasted and supported to ensure stability while the concrete is still plastic

NAL RS115 RETENTION SOCKET SYSTEM WITH DUCKFOOT BEND OR EQUIVALENT TYPE APPROVED

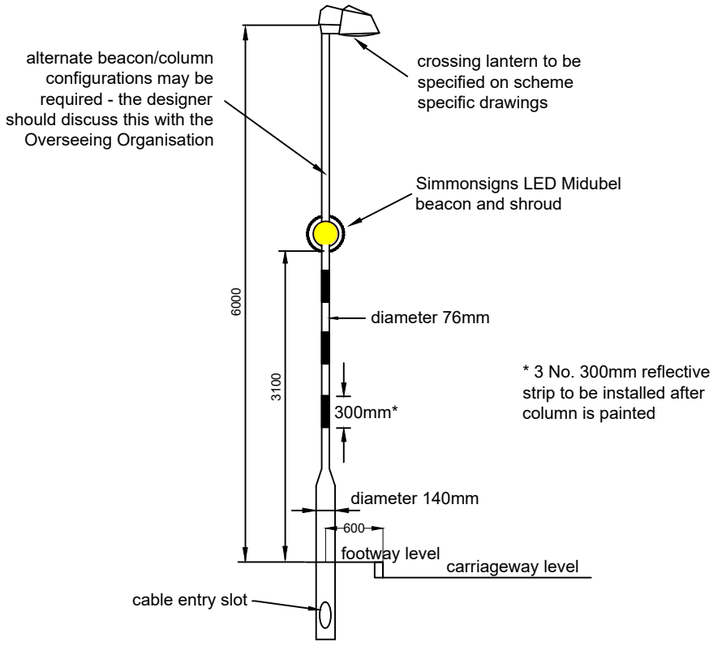


x = 2800mm (4000mm) desirable; 2400mm (3200mm) minimum for Puffin (Toucan);
y = 3000mm without ASL; 2000mm with ASL;

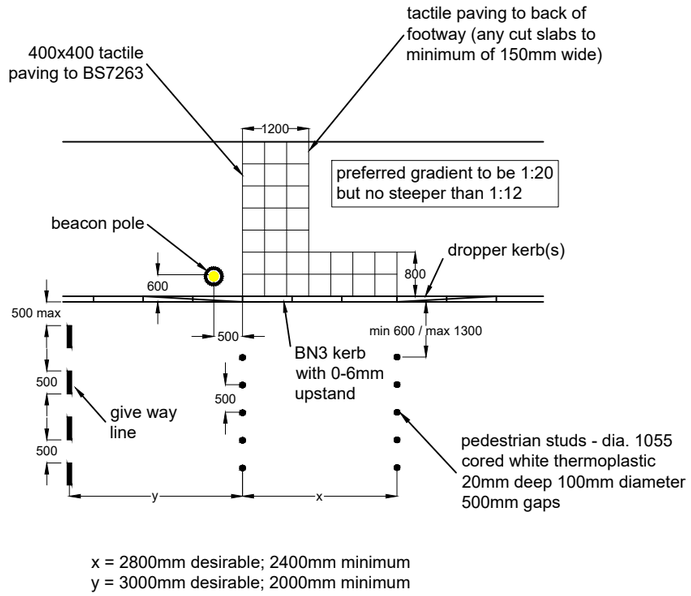
TACTILE PAVING AND POLE DETAILS

Warwickshire County Council	HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TRAFFIC SIGNALS: STANDARD DETAILS	DRAWN: EB	CHECKED: RJP	APPROVED: DM	ISSUE: 3
				DRAWING NUMBER: K 706.2	SHEET SIZE: A3	ISSUE DATE: FEB 2021	PREVIOUS ISSUES: 1 APR 2016, 2 MAY 2018

0mm 50mm 100mm 150mm 200mm



BEACON WRAPPED AROUND COLUMN



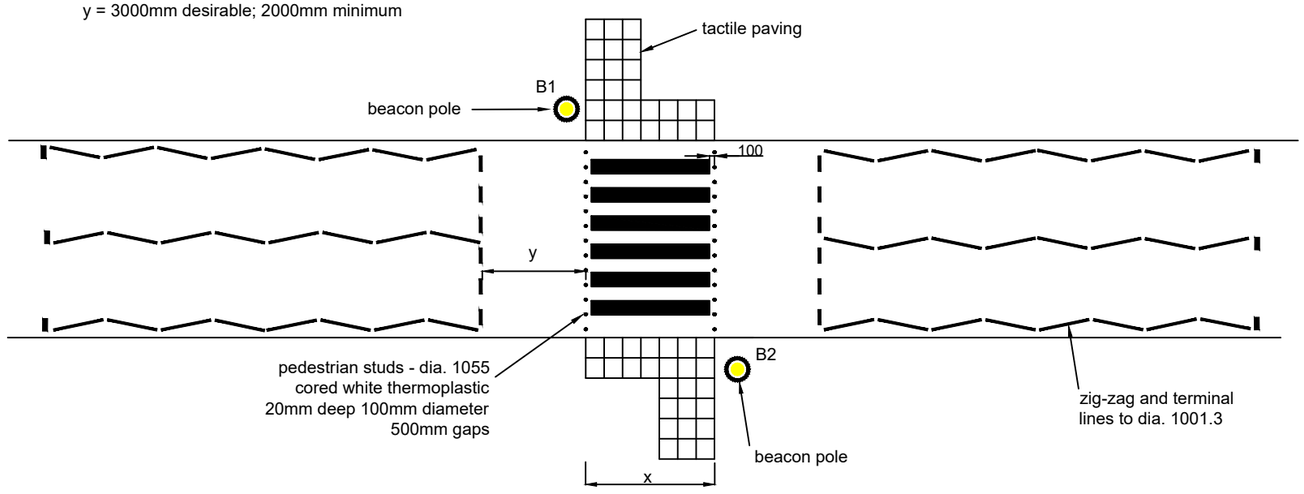
x = 2800mm desirable; 2400mm minimum
y = 3000mm desirable; 2000mm minimum

TACTILE PAVING AND POLE DETAILS

1. 2 No. temporary signs to be supplied and installed
2. 2 No. medium channels required
3. Contractor to provide clips to match the diameter of the post/column
4. Exact locations to be agreed on site with the Overseeing Organisation
5. Signs to be covered until crossing completed
6. Signs and temporary posts to be removed 3 months after completion by the Contractor

TEMPORARY SIGNS

x = 2800mm desirable; 2400mm minimum
y = 3000mm desirable; 2000mm minimum



ZEBRA CROSSING DIMENSIONAL DETAILS

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. DO NOT SCALE FROM THIS DRAWING.

Warwickshire County Council	HIGHWAY CONSTRUCTION DETAILS (HCD-700)	SECTION: MISCELLANEOUS	TITLE: TRAFFIC SIGNALS: ZEBRA CROSSINGS	DRAWN: RJP	CHECKED: DM	APPROVED: AC	ISSUE: 2	PREVIOUS ISSUES: 1 APR 2016
				DRAWING NUMBER: K 706.3	SHEET SIZE: A3	ISSUE DATE: MAY 2018		

0mm 50mm 100mm 150mm 200mm