

# Chapter 9.2

Drives, paths and landscaping

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# 9.2 Drives, paths and landscaping

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## SCOPE

This Chapter gives guidance on meeting the Technical Requirements and recommendations for private roads, shared private drives, private drives, car parking areas, paths and landscaping.

## DESIGN STANDARDS

### 9.2 - D1 Design shall meet the Technical Requirements

Design that follows the guidance below will be acceptable for private roads, drives, paths and landscaping.

In this Chapter “home” includes a house, bungalow, flat or maisonette. The “garden area” is the land within the curtilage up to 20m from the habitable parts of the home (i.e. not garages/outbuildings). This distance is measured from the external walls.

## PROVISION OF ACCESS

### 9.2 - D2 Adequate access shall be provided to and around the home

Access should include the provision of private roads, shared private drives, private drives, car parking areas and paths as appropriate.

Items to be taken into account include:

#### (a) private roads, shared private drives, private drives and car parking areas

Where a private road, shared private drive, private drive or car parking area is constructed to provide access to, or around, a home it should be constructed to carry the likely loads from vehicles using it.

Drives forming part of the approach to certain entrances should comply with relevant Building Regulations.

Drives should be designed to permit a motor car reasonable access to and from a garage or car parking area.

Foundations, constructions and drainage suitable for private roads, shared private drives, private drives and car parking areas are given in Appendix 9.2-A.

Private roads, shared private drives and private drives should have a maximum gradient of 1:6. Where the gradient is more than 1:10 and the gradient changes, suitable transition lengths should be provided to reduce the risk of vehicles grounding. See Appendix 9.2-A.

#### (b) paths

Every home should have a path or paths within the curtilage to provide pedestrian access to the main entrance and a secondary entrance where present.

A path to a secondary access door is not required where entry to the home can be gained directly from a garage.

A path to a secondary entrance of a mid-terrace home or ground floor flat is not required.

Paths to certain entrances should comply with relevant Building Regulations.

If a garage, carport or car parking area is provided within the curtilage, a path should be provided to it from the home. Where appropriate, a drive can be regarded as a path for the provision of all or part of this access.

Path widths should be not less than the following:

- within curtilage to main or any entrance designated by Building Regulations 900mm
- paths used for the removal of refuse to the collection point 900mm
- paths adjoining a home 700mm
- where path is 100mm or more from the wall of a home 600mm
- all other cases 600mm

Paths should have gradients not exceeding 1:6. On steeper sloping ground, steps may need to be introduced at intervals to ensure that the maximum gradient of the path is not exceeded.

Foundations and constructions suitable for paths are given in Appendix 9.2-A.

#### (c) steps

Steps should be in accordance with Sitework clause 9.2 - S7.

#### (d) handrails and guarding to paths and steps

Handrails and guarding should be provided in accordance with Sitework clause 9.2 - S7.

## FREESTANDING WALLS AND RETAINING STRUCTURES

### 9.2 - D3 Where provided, freestanding walls and retaining structures shall be adequate for their intended purpose

Items to be taken into account include:

#### (a) design

Freestanding walls should be designed in accordance with:

- BS EN 1996-1 Design of masonry structures, or
- BRE Good Building Guide 14.

All retaining structures, more than 600mm high, should be designed by an Engineer in accordance with Technical Requirement R5. Gabion and crib structures should not be used to provide support to homes, garages, roads, drives, car parking areas and drainage systems.

Retaining structures should be designed in accordance with:

- BS EN 1997-2 Geotechnical design: Ground investigation and testing
- BS EN 1992 Design of concrete structures
- BS EN 1996 Design of masonry structures

Where appropriate, brickwork and blockwork retaining walls may be designed in accordance with BRE Good Building Guide 27.

#### (b) guarding

Guarding should be provided where structures are retaining land more than 600mm high to which people have access.

Where steps and guarding are provided they should be designed in accordance with Sitework clause 9.2 - S7.

#### (c) planters

Where planters are provided they should be designed to adequately support the volume of retained soil and the plant species.

## GARDEN AREAS

### 9.2 - D4 Garden areas shall be stable

Items to be taken into account include:

#### (a) slopes

Unless the stability of new or existing slopes has been determined by an Engineer in accordance with Technical Requirement R5 the following maximum gradients apply:

- unsupported granular soil should be 5° less than its natural angle of repose
- unsupported cohesive soil should not exceed 9° (1:6).

#### (b) retaining structures

Where it is necessary to provide retaining structures to ensure the stability of the ground they should be designed in accordance with Clause D3.

### 9.2 - D5 Garden areas within 3m of the habitable part of the home shall not be waterlogged

Waterlogging of garden areas within 3m of the habitable part of the home should be prevented by drainage or other suitable means.

### 9.2 - D6 Reasonable access shall be provided to garden areas

Access by steps or other suitable means should be provided to garden areas where appropriate. Access is not required to small isolated garden areas such as narrow strips of land at the top or bottom of retaining walls.

### 9.2 - D7 Patios and decking shall be suitable for their purpose

Items to be taken into account include:

#### (a) patios

Foundations and constructions suitable for patios are given in Appendix 9.2-A.

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## (b) timber decking

Timber used in the construction of decking should either be naturally durable or treated with preservative. See Chapter 2.3 'Timber preservation (natural solid timber)' (each section).

Decking and its support more than 600mm above ground level should be in accordance with guidance published by the Timber Decking Association or designed by an Engineer in accordance with Technical Requirement R5.

## LANDSCAPING

### 9.2 - D8 Possible future damage to the home caused by planting shall be minimised

Where trees or shrubs have been removed, are to be retained or are to be planted by the builder, precautions should be taken to reduce the risk of future damage to homes and services. These include:

- allowing sufficient space to preserve root systems
- allowing for root spread and water depletion, especially on clay soils
- allowing for the effects of water uptake where trees have been removed, especially on clay soils
- allowing for the future effects of tree and root growth
- providing foundation depths sufficient to allow for existing and new trees.

Guidance is given in Chapter 4.2 'Building near trees' and BS 5837.

## PROVISION OF INFORMATION

### 9.2 - D9 Designs and specifications shall be produced in a clearly understandable format and include all relevant information

All works relating to drives, paths and landscaping should be fully specified.

### 9.2 - D10 All relevant information shall be distributed to appropriate personnel

Ensure that relevant design and specification information is issued to site supervisors and relevant specialist subcontractors and/or suppliers.

## MATERIALS STANDARDS

### 9.2 - M1 All materials shall:

- (a) meet the Technical Requirements
- (b) take account of the design

Materials that comply with the design and the guidance below will be acceptable for drives, paths and landscaping.

Materials for drives, paths and landscaping should comply with all relevant standards, including those listed below. Where no standard exists, Technical Requirement R3 applies (see Chapter 1.1 'Introduction to the Standards and Technical Requirements').

References to British Standards and Codes of Practice include those made under the Construction Products Directive (89/106/EEC) and, in particular, appropriate European Technical Specifications approved by a European Committee for Standardisation (CEN).

## CONCRETE

### 9.2 - M2 Concrete shall be of a mix design which will:

- (a) achieve sufficient strength for its purpose
- (b) be sufficiently durable to remain unaffected by chemical or frost action

For guidance on the specification and use of concrete, reference should be made to Chapter 2.1 'Concrete and its reinforcement' (Design) and Appendix 9.2-A.

## ALL MATERIALS

### 9.2 - M3 All materials shall be suitable for their intended use

Items to be taken into account include:

#### (a) asphalts and macadam

Hot rolled and mastic asphalts and macadam should comply with relevant standards, including:

- BS 594 Hot rolled asphalt for roads and other paved areas
- BS 1447 Specification for mastic asphalt (limestone fine aggregate) for roads, footways and pavings in building
- BS 4987 Coated macadam for roads and other paved areas.

#### (b) sub-base material and aggregates

Sub-base for different road types should be Type 1 to clause 803 Table 8/2, MCHWI Series 800.

Aggregates used in asphalt and macadam mixtures and unbound aggregate (graded 15/20 mm gravel) for surfacing should comply with relevant standards, including:

- BS EN 13043 Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas
- PD 6682 Part 2 - Guidance on the use of BS EN 13043
- BS EN 13242 Aggregates for unbound and hydraulically bound materials
- PD 6682 Part 6 - Guidance on the use of BS EN 13242.

#### (c) blocks, slabs and pavers

Blocks, slabs, pavers, edgings, etc should comply with relevant standards, including:

- BS EN 771 Specification for masonry units
- BS 6677 Part 1 : Clay and calcium silicate pavers for flexible pavements : Specification for pavers
- BS 6717 Precast, unreinforced concrete paving blocks - Requirements and test methods
- BS 7263 Precast concrete flags, kerbs, channels, edgings and quadrants
- BS 7533 Pavements constructed with clay natural stone or concrete pavers.

#### (d) materials for freestanding walls

Materials in accordance with BRE Good Building Guide 14 'Building brick or blockwork freestanding walls' will be acceptable.

#### (e) materials for retaining walls

Materials in accordance with BRE Good Building Guide 27 'Building brickwork or blockwork retaining walls' will be acceptable.

#### (f) timber decking

Materials in accordance with guidance published by the Timber Decking Association will be acceptable.

#### (g) topsoil

Topsoil quality should be such that it will not present a hazard to users of the garden area. BS 3882 and the Contaminated Land Exposure Assessment (CLEA) guidelines provide advice on determining the suitability of topsoil.

## SITWORK STANDARDS

### 9.2 - S1 All sitework shall:

- (a) meet the Technical Requirements
- (b) take account of the design
- (c) follow established good practice and workmanship

Sitework that complies with the design and the guidance below will be acceptable for private roads, drives, paths and landscaping.

## GROUND STABILITY

### 9.2 - S2 Precautions shall be taken on sloping sites to ensure stability of the ground

Where the ground may become surcharged during construction, precautions should be taken to ensure stability.

Retaining structures that give support to the foundations of a home should be completed before work starts on the construction of the foundations of the home. The use of gabion and crib structures to retain ground that gives support to homes, garages, roads, drives, and drainage systems is not acceptable to NHBC.

## FOUNDATIONS AND CONSTRUCTION

### 9.2 - S3 Foundations and construction for private roads, shared private drives, private drives, car parking and paths shall be appropriate for their use

Items to be taken into account include:

#### (a) specification

Appendix 9.2-A gives details of suitable constructions for private roads, shared private drives, private drives, car parking, paths and patios.

#### (b) protection of drains and services

Where underground drainage or services are below a private road, shared private drive, private drive, car parking area, path, or patio they should be protected against damage as described in Chapter 5.3 'Drainage below ground' (Design and Sitework).

#### (c) drainage

All private roads, shared private drives, private drives, car parking areas, should have adequate drainage and disposal. See Appendix 9.2-A.

Paths and patios abutting the home should generally be at least 150mm below the dpc and be laid to fall away from the home unless a channel or other suitable means of collection and disposal is provided.

#### (d) ground levels

Finished ground levels should be compatible with:

- dpc levels
- cover levels of drainage access points

- depth of underground services (gas, electricity, water, drains)
- drive and path levels.

#### (e) timber decking

Decking should be constructed in accordance with the design or guidance published by the Timber Decking Association.

#### (f) patios

Foundations and constructions suitable for patios are given in Appendix 9.2-A.

## FREESTANDING WALLS AND RETAINING STRUCTURES

### 9.2 - S4 Freestanding walls and retaining structures shall be adequate for their intended purpose

Items to be taken into account include:

#### (a) construction

Freestanding walls should be constructed in accordance with the design or BRE Good Building Guide 14.

Retaining structures should be constructed in accordance with the design or BRE Good Building Guide 27.

#### (b) guarding

Guarding should be provided to retaining walls more than 600mm high in accordance with Clause S7(a).

## GARDEN AREAS

(up to 20m from the habitable parts of the home)

### 9.2 - S5 Garden areas shall be free from obstructions beneath the surface

Old foundations, concrete bases and similar obstructions occurring within 300mm of the finished ground surface should be removed.

### 9.2 - S6 Garden areas shall be adequately prepared for cultivation

Construction rubbish and debris should be removed from garden and other areas around the home.

The ground around the home can be compacted by machinery and storage of materials during construction as well as when topsoil is being replaced and this can affect the structure of the soil and its draining capability. Where this occurs within 3m of the home appropriate action should be taken to suitably restore the drainage characteristics of the soil.

Any ground disturbed during construction should be re-graded to conform to the general shape of the adjacent ground.

Subsoil should not be placed over topsoil and any topsoil disturbed should be reinstated. Garden areas should be

provided with topsoil to a thickness of not less than 100mm. The topsoil should not contain contaminants which are likely to present a hazard to users of the garden area.

### 9.2 - S7 Retaining structures and steps shall be adequately guarded and allow safe use

Items to be taken into account include:

#### (a) guarding and handrails

Guarding should be provided where:

- structures are retaining land more than 600mm high to which people have access, or
- a path is adjacent to a vertical difference in level of more than 600mm, or
- the ground adjacent to the path falls away at an angle of more than 30° from the horizontal, or
- the total rise of a flight of steps exceeds 600mm. A handrail should be provided.

The guarding should be at least 1100mm high, not readily climbable by children and a 100mm sphere should not be able to pass through any openings in the guarding.

#### (b) steps

Any steps should have a maximum rise of 220mm and a minimum going of 220mm.

## LANDSCAPING

### 9.2 - S8 Planting shall be completed in a manner appropriate for the site conditions and layout

If landscaping is specified, the work should be carried out and completed in a competent professional manner. Landscaping should meet with the guidance given in the Design section of this Chapter.

The NHBC recommendations on the protection and planting of trees should also be followed. See Chapter 4.2 'Building near trees' (each section).

## APPENDIX 9.2-A

**Table 1 Construction details of paved areas:**

The construction of private roads, shared private drives, private drives and car parking areas should be in accordance with the following or an equivalent alternative. (Thicknesses shown are in mm).

### Private road having frequent use by commercial vehicles

Construction (see Note 1)		Road type		
		Road (Bituminous Macadam)	Road (Block pavers)	Footpath (Bituminous Macadam)
Sub-base	Granular sub-base material Type 1 to clause 803 Table 8/2 MCHW1 Series 800 (see Note 2)	Table 2	150 (if CBR is 5% or less) (see Note 3) Table 2 (if CBR is greater than 5%)	225 (see Note 3)
Base (Road base)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group one mix)	100 (0/32mm size to clause 5.2)	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	N/A	N/A
Binder course (Base course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group two mix)	60 (0/20mm size to clause 6.5)	60 (0/20mm size to clause 6.5)	60 (0/20mm size to clause 6.5)
Surface course (wearing course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group three mix)	30 (0/10mm size to clause 7.4)	N/A	20 (0/6mm size to clause 7.5)
	Hot rolled asphalt to BS 594-1	40 (designation 30% 0/14)	N/A	N/A
	Mastic Asphalt to BS 1447	30 (Grade S - 40% 0/10mm size)	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	N/A	N/A
Bedding course	Sharp sand to BS 7533-3 category II of Annex D	N/A	50	N/A
Pavers	Block pavers To BS 6717 of Class markings W2, A2, and S3 (weathering, abrasion and slip/skid classes) (see Note 6)	N/A	80	N/A

#### Notes

- Names of pavement layers show both the European harmonised names and in brackets the names traditionally used in the UK.
- If a capping layer is specified then sub-base thickness can be reduced. DMRB Volume 7 Section 2 Part 2 HD 25/95 Foundations Chapter 3 Capping and Sub-base gives guidance on capping and sub-base thickness design based on CBR values and with and without a capping layer.
- Thickness is based on the provision of a geotextile membrane underneath the sub-base. If no geotextile membrane is provided see Table 2.
- Bond and tack coat should be provided for bituminous mixtures in accordance with BS 4987-2 or BS 594-2.
- Asphalt based materials can be used as partial replacement of full thickness of granular sub-base Type 1 material.
- When laid to either 90 or 45 degrees herringbone pattern then the edge perimeter to be laid with one single row of stretcher bond set parallel to the edge restraint. Where block pavers are laid abutting drainage channels, gully grates and the like, the upper surface of the block pavers shall be set between 3 and 6mm above the grating. Manufacturer's declared value markings W3 and S4 are acceptable if W3 is 1.0 kg/m<sup>2</sup> or less and S4 is 45 or more based on 'C scale unit' (with regard to abrasion, Class A2, no test result is greater than 23mm; and Class A1 = no performance determined).
- Use 38mm thickness of graded 15/20mm unbound aggregate to BS EN 13242 (gravel) well rolled and compacted.
- N/A = Not Applicable

**Shared parking and associated access areas having frequent use by commercial vehicles**

Construction (see Note 1)		Road type	
		Bituminous Macadam	Block pavers
Sub-base	Granular sub-base material Type 1 to clause 803 Table 8/2 MCHW1 Series 800 (see Note 2)	Table 2	Table 2
Base (Road base)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group one mix)	80 (0/32mm size to clause 5.2)	N/A
	Concrete designation (BS 8500-2 Table 7)	100 Grade GEN2 (see Note 4)	N/A
Binder course (Base course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group two mix)	60 (0/20mm size to clause 6.5)	N/A
Surface course (wearing course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group three mix)	30 (0/10mm size to clause 7.4)	N/A
	Hot rolled asphalt to BS 594-1	N/A	N/A
	Mastic Asphalt to BS 1447	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	N/A
Bedding course	Sharp sand to BS 7533-3 category II of Annex D	N/A	50
Pavers	Block pavers To BS 6717 of Class markings W2, A2, and S3 (weathering, abrasion and slip/skid classes) (see Note 6)	N/A	80

**Shared drives having infrequent use by commercial vehicles**

Construction (see Note 1)		Road type			
		Bituminous Macadam	Concrete	Block pavers	Gravel
Sub-base	Granular sub-base material Type 1 to clause 803 Table 8/2 MCHW1 Series 800 (see Note 2)	Table 2	Table 2	Table 2	Table 2
Base (Road base)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group one mix)	see Note 5	N/A	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	N/A	N/A	N/A
Binder course (Base course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group two mix)	80 (0/32mm size to clause 6.4) or (0/20mm size to clause 6.5)	N/A	N/A	N/A
Surface course (wearing course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group three mix)	30 (0/10mm size to clause 7.4)	N/A	N/A	see Note 7
	Hot rolled asphalt to BS 594-1	40 (designation 30% 0/14)	N/A	N/A	N/A
	Mastic Asphalt to BS 1447	30 (Grade S - 40% 0/10mm size)	N/A	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	150 Grade PAV2	N/A	N/A
Bedding course	Sharp sand to BS 7533-3 category II of Annex D	N/A	N/A	50	N/A
Pavers	Block pavers To BS 6717 of Class markings W2, A2, and S3 (weathering, abrasion and slip/skid classes) (see Note 6)	N/A	N/A	80	N/A

Table 1 continued

**Private drives and parking areas having use by cars and light vehicles**

Construction (see Note 1)		Road type			
		Bituminous Macadam	Concrete	Block pavers	Gravel
Sub-base	Granular sub-base material Type 1 to clause 803 Table 8/2 MCHW1 Series 800 (see Note 2)	Table 2	Table 2	Table 2	Table 2
Base (Road base)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group one mix)	N/A	N/A	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	N/A	N/A	N/A
Binder course (Base course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group two mix)	60 (0/20 mm size to clause 6.5)	N/A	N/A	N/A
Surface course (wearing course)	Dense Bituminous Macadam (100/150 Pen paving grade bitumen) with crushed rock aggregate to BS 4987 (Group three mix)	20 (0/6mm size to clause 7.5)	N/A	N/A	see Note 7
	Hot rolled asphalt to BS 594-1	N/A	N/A	N/A	N/A
	Mastic Asphalt to BS 1447	N/A	N/A	N/A	N/A
	Concrete designation (BS 8500-2 Table 7)	N/A	100 Grade PAV 1	N/A	N/A
Bedding course	Sharp sand to BS 7533-3 category II of Annex D	N/A	N/A	50	N/A
Pavers	Block pavers To BS 6717 of Class markings W2, A2, and S3 (weathering, abrasion and slip/skid classes) (see Note 6)	N/A	N/A	50	N/A

**Notes**

- Names of pavement layers show both the European harmonised names and in brackets the names traditionally used in the UK.
- If a capping layer is specified then sub-base thickness can be reduced. DMRB Volume 7 Section 2 Part 2 HD 25/95 Foundations Chapter 3 Capping and Sub-base gives guidance on capping and sub-base thickness design based on CBR values and with and without a capping layer.
- Thickness is based on the provision of a geotextile membrane underneath the sub-base. If no geotextile membrane is provided see Table 2.
- Bond and tack coat should be provided for bituminous mixtures in accordance with BS 4987-2 or BS 594-2.
- Asphalt based materials can be used as partial replacement of full thickness of granular sub-base Type 1 material.
- When laid to either 90 or 45 degrees herringbone pattern then the edge perimeter to be laid with one single row of stretcher bond set parallel to the edge restraint. Where block pavers are laid abutting drainage channels, gully grates and the like, the upper surface of the block pavers shall be set between 3 and 6mm above the grating. Manufacturer's declared value markings W3 and S4 are acceptable if W3 is 1.0 kg/m<sup>2</sup> or less and S4 is 45 or more based on 'C scale unit' (with regard to abrasion, Class A2, no test result is greater than 23mm; and Class A1 = no performance determined).
- Use 38mm thickness of graded 15/20mm unbound aggregate to BS EN 13242 (gravel) well rolled and compacted.
- N/A = Not Applicable

Table 2 Minimum sub-base thickness for paved areas:

California Bearing Ratio (CBR) values	Minimum thickness (mm) of sub-base (Consolidated in accordance with MCHW Volume 1 clause 801, table 8/1).	
	Without Geotextile underneath	With Geotextile underneath
Less than 2%	N/A	300
2% - 3%	325	225
3% - 5%	250	150
5% - 7%	150	
7% - 20%	100	

**Notes**

The thickness of any required capping layer and the sub-base should be determined after investigations and on-site tests have been carried out relating to the California Bearing Ratio (CBR) value and frost susceptibility of the sub-grade. See table 2.

Where the tests indicate that the sub-grade is frost susceptible a suitable capping layer should be included below the sub-base, to a depth that will ensure that the construction will not be affected by frost heave.

## GENERAL

All works should be completed in accordance with:

- the design, and
- the ground remediation statement where applicable.

All vegetable matter should be removed from the area of the proposed works.

Formation levels should be set out in accordance with the design.

Only suitable fill material comprising clean, well consolidated crushed rock, hardcore, slag or concrete should be used to make up levels.

The sub-base should be mechanically consolidated in layers not exceeding 225mm.

### Construction of paved areas

All sub-base levels should have the same longitudinal gradient and cross-fall as the finished levels.

Private roads, shared private drives and car parking areas should have adequate falls, cross-falls and suitable drainage to ensure that surface water is disposed of.

Where it is intended to use porous or permeable surfaces as part or all of the rainwater drainage system reference should be made to CIRIA report C522 - Sustainable urban drainage systems - design manual for England and Wales.

Surfaces should not be laid flatter than 1:40 or have a camber of 1:40 if no fall is available to avoid "flat spots".

Surface water from private areas should not drain onto adopted areas.

Surfaces of private drives and paths should be laid to a minimum finished fall of 1:80 away from the home including a garage. Alternatively a channel or other suitable means of collection and disposal should be provided adjacent to the home.

Vertical alignment, finished levels, transition arrangements and gradients should be in accordance with the design.

Edge restraint or kerbing should have a profile and foundation which is suitable to form a permanent supporting edge for the expected vehicle loads using the road or drive.

Any soakaway should be located in open or garden areas at least 2m away from any paved area.

## HOUSE PATHS AND PATIOS

### Sub-base

The sub-base should comprise of a 100mm thickness of clean, well consolidated crushed rock, hardcore (max size 75mm), slag or concrete, the surface of which is blinded with 25mm of sand.

## Paving slabs

Paving slabs should be fully bedded in 25mm 1:4 cement : sand mortar or a suitable alternative.

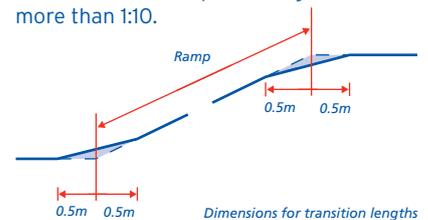
Where paving slabs are laid abutting drainage channels, gully grates and the like, the upper surface of the paving slab should be set approximately 5mm above the grating.

## Concrete

Concrete should be not less than 75mm thick and have a tamped or textured finish. The concrete mix should be suitable to give a durable and frost resistant surface, as described in Chapter 2.1 'Concrete and its reinforcement' (Design). Movement joints, not less than 10mm wide, should be provided across the full width of the path at not more than 4m centres. A movement joint is not required at the abutment with a wall unless the opposite edge of the concrete is also restrained.

## TRANSITION LENGTHS

Transition lengths should be incorporated into drives and ramps with a gradient of more than 1:10.



## Note

Maximum drive gradient is 1:6.

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Concrete	2, 3	<b>L</b>		Stability, ground	2
Concrete slabs, precast	2	Landscaping	2, 3	Steps	1
<b>D</b>		<b>M</b>		<b>T</b>	
Damage to buildings	2	Macadam	2	Timber decking	3
Drains	3	Materials	2	Trees	2, 3
Drives	1	<b>P</b>		<b>W</b>	
<b>F</b>		Paths	1	Walls	1, 2
Foundations	1, 3	Pavers	2, 3	Waterlogging	1
Freestanding walls	2	Patios	3	Widths - paths	1
		Planters	1		
		Private drives	1		
		Private roads	1		