



TECHNICAL MANUAL

VERSION 11

14: DRIVEWAYS AND PAVING

14.

Driveways and Paving

Contents

Functional Requirements

14.1 Driveways and Paving

Limitations of Functional Requirements

1. This guidance for drives and external pathways only applies to a drive and pathway that leads to the principal entrance to the visitable dwelling/building from the highway.
2. These Functional Requirements do not and will not apply to create any policy liability for any remedial works carried out by the contractor or otherwise, nor to any materials used in those remedial works.
3. The guidance provided in this Section, is guidance that provides a suggested solution to meeting the Functional Requirements. If an alternative solution is selected, then this must still meet the Functional Requirements.

Workmanship

1. All workmanship must be within the tolerance requirements set out in this Technical Manual.
2. All work is to be carried out by a technically competent person in a workmanlike manner.
3. Concreting shall not take place during cold weather periods where the working temperature is below 2°C or where ground conditions are frozen.

Materials

1. All materials should be stored, installed and protected correctly in a manner that will not cause damage or deterioration of the product.
2. All materials, products and building systems shall be appropriately tested and approved for their intended purpose.
3. All load bearing structural elements providing support to the Home will have a service life of not less than 60 years, unless specifically agreed otherwise with us. All other parts of the Home will have a lesser durability and need planned maintenance, repair or replacement during that reduced.
4. Timber used in paths must meet our requirements for decking and should be adequately treated or finished to resist insect attacks and be suitable for the position used within the structure. All timber treatment should be in accordance with relevant British standards and Codes of Practice.
5. All materials should be suitable for the relative exposure of the building in accordance with the relevant British Standards.
6. Reclaimed materials may only be reused with the prior agreement with the Warranty Surveyor. Independent certification and/or testing of the suitability may be required.

Design

1. External vehicular and pedestrian access routes to the principal entrance shall be designed and constructed so that they:
 - a. Permit safe and convenient access from the highway;
 - b. Are of sufficient width;
 - c. Are durable;
 - d. Reasonably level and consistent with adjacent features;
 - e. Suitably drained to prevent water logging of the ground near the building.
2. Structural elements outside the parameters of Building Regulations must be supported by structural calculations provided by a suitably qualified expert.
3. Damp proofing works should prevent any external moisture passing into the internal environment of the building.

14.

Driveways and Paving

14.1

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Limitations of the Technical Manual Functional Requirements

This guidance for drives and external pathways only applies to a drive and pathway that leads to the principal entrance to the visitable dwelling/building from the highway.

Provision of information

A full set of design drawings and specifications shall be made available to the Warranty Provider and all other interested parties prior to the associated works starting on site. This may include:

- Details and specifications of the proposed layouts.
- Details indicating proposed drainage provision of those areas.

The Warranty Surveyor, at their discretion, may also request supporting information that demonstrates suitability for use of any materials or systems contained within the above.

Driveway construction

A suitable sub-base that is capable of supporting the finished surface material should be provided. Suitable sub-base material is considered as:

- Weak mix concrete ST1 (site mixed acceptable).
- Well graded crushed stone or recycled concrete (minimum aggregate size 75mm).

The minimum thickness of sub-bases are indicated in the below table.

Use of surface	Min sub-base thickness	Comments
Pathway	75mm	
Driveway (light duty)	100mm	Light domestic traffic
Driveway (medium duty)	150mm	Suitable for carrying small lorries e.g. refuse, vehicles, or fuel delivery

Crushed stone or recycled aggregate sub-bases should be well compacted to adequately support the pathway or drive (see the table below). Where the ground below the sub-base is weak or soft (typically <10% CBR), the sub-base should be designed by an Engineer.

Suitable compaction of sub-bases

Compactor type	Compactor size	Minimum number of passes	
		100mm sub-base	150mm sub-base
Vibrating plate	1400-1800kg/m ² 1800-2000kg/m ² >2000kg/m ²	8	Unsuitable
		5	8
		3	6
Vibrator roller	700-1300kg/m width 1300-1800kg/m width 1800-2300kg/m width	16	Unsuitable
		6	16
		4	6
Engine driven vibro-tamper	<65kg 65-75kg >75kg	5	8
		3	6
		2	4

Preparation of ground

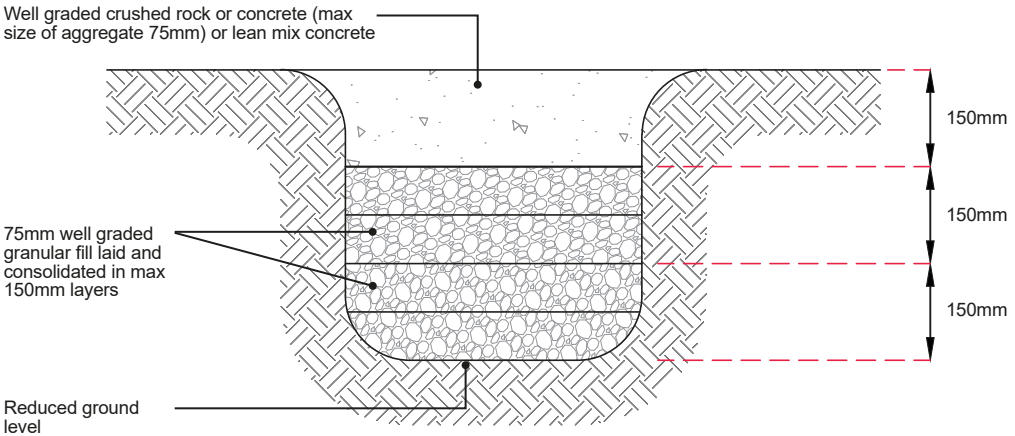
The area to be surfaced should be prepared by stripping away all vegetation and organic material. Land drainage should be considered for ground that is saturated.

Excavation trenches e.g. service trenches, should be backfilled with granular type material to the required level. The backfill should be compacted in layers no greater than 150mm, and the fill material should at least have the same bearing capacity as the adjacent ground.

Retaining walls

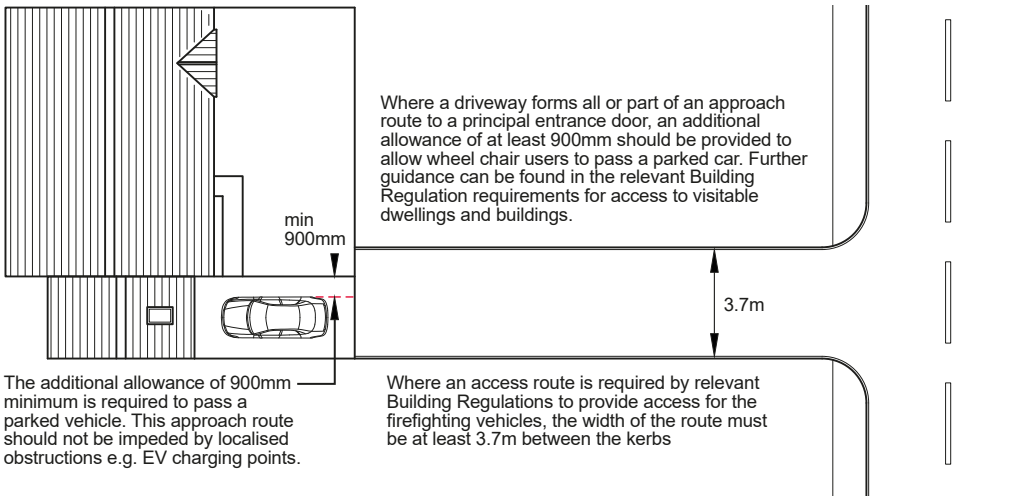
Retaining walls are outside the scope of this guidance, however where a retaining wall provides support to the structure or the primary entrance to the property they should be designed by an Engineer.

Backfilling of trenches



Access requirements

The construction of the driveway must be suitable and durable enough to take additional loadings where required

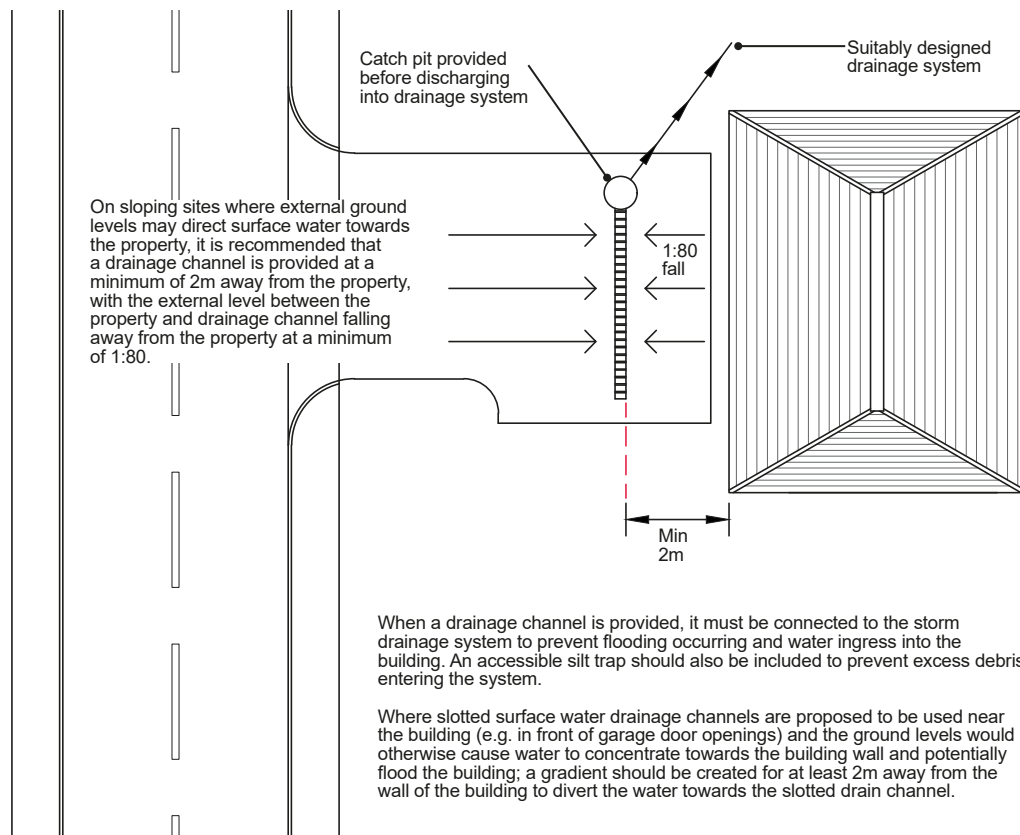


Sloping sites towards a property

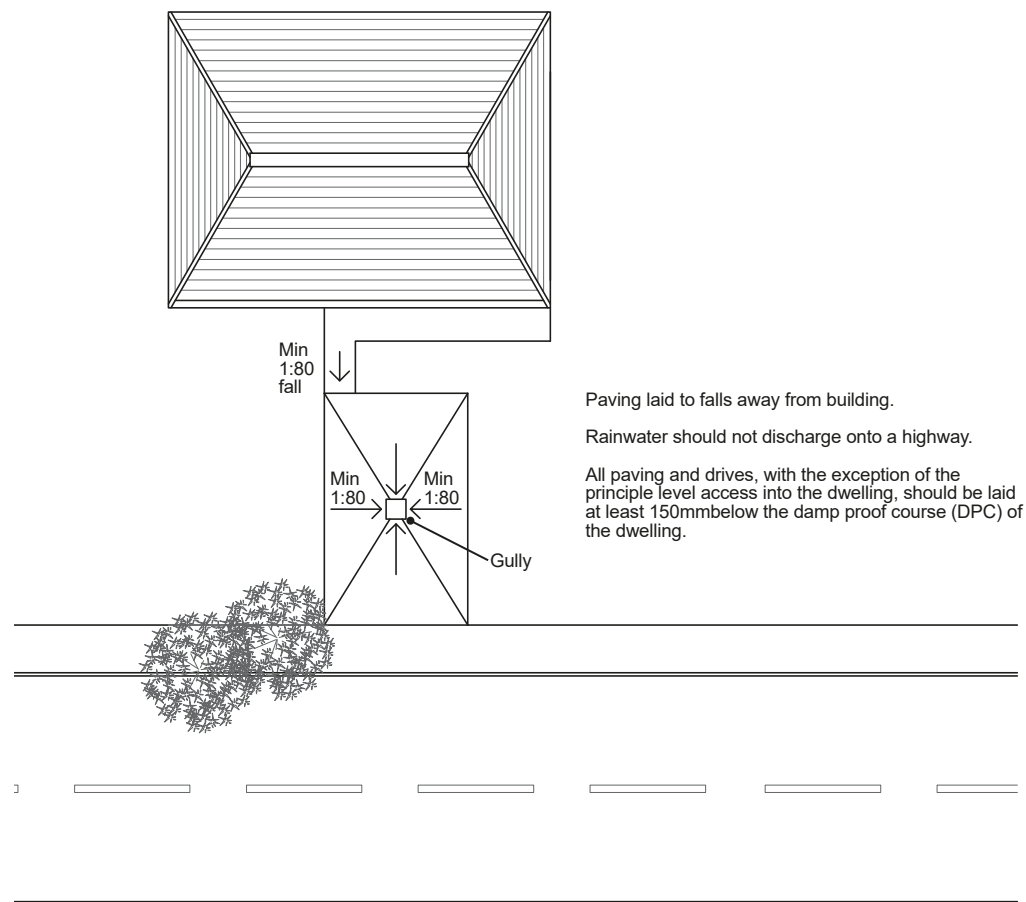
All paving and drives, with the exception of the principle level access into the dwelling, should be laid at least 150mm below the damp proof course (DPC) of the dwelling.

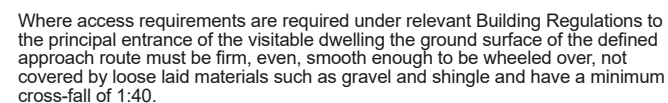
Laying of paths and drives

- Paths and driveways should be effectively drained to prevent ponding of water adjacent to the building.
- Paths and driveways should be laid to fall away from the building at a minimum of 1:80 and a maximum of 1:12.
- Rainwater should either discharge into a trapped gully or drain to garden land that is well drained.
- Gullies should be trapped when discharging to a soakaway or combined drainage system (the approval of the statutory sewerage undertaker may be required).



Drainage and gradients of access and paths





Drainage system covers in hard standing areas should line up neatly with the adjacent ground.

DRIVEWAYS AND PAVING

Minimum thickness of surfaces for drives and paths

Surface type	Material specifications	Minimum thickness ⁽¹⁾		British Standard
		Path	Drive	
Rolled asphalt	Coarse asphalt 10mm nominal size	60	60	BS 594
Macadam single course	40mm coated macadam	75	75	BS 4987
Macadam two course	Nominal 20mm coated base course	60	60	BS 4987
	Nominal 6mm wearing course	25	25	BS 4987
Block paving	Clay or calcium silicate	50	50	BS 6677
	Pre-cast concrete	60	60	BS 6717
Concrete	Designated mix	75	100 ⁽²⁾	
Pre-cast concrete paving	Dense concrete	50	n/a	BS 7263:1

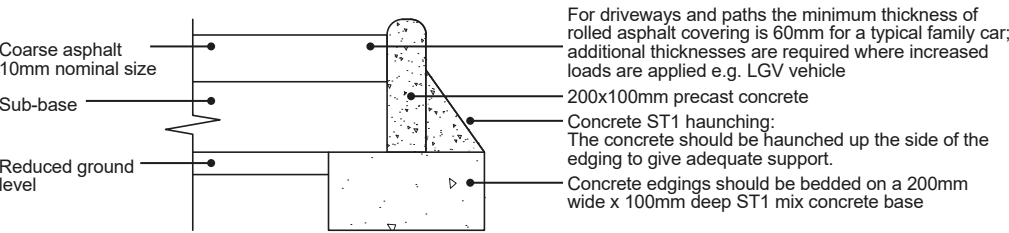
(1) Drive minimum thickness assumes standard loadings for a typical family car. Additional thicknesses are required where increased loads are applied e.g. LGV vehicles.
(2) Drives increased to 150mm on poor ground or clay.

Edgings

Edgings are to be provided to paths and driveways to prevent movement or displacement. Edgings should be laid to ensure that there are no excessive gaps and laid with smooth alignment along the top of the edging.

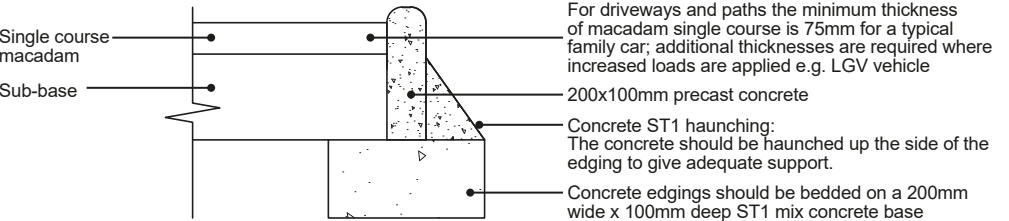
Asphalt

Ensure that sub-bases are dried and primed and that the surface is appropriately rolled with a vibratory roller to the required finish.



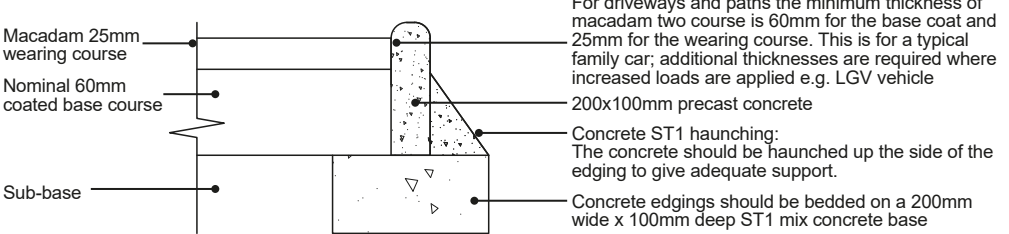
Single course macadam

Ensure that sub-bases are dried and primed and that the surface is appropriately rolled with a vibratory roller to the required finish.



Two course macadam

Ensure that sub-bases are dried and primed and that the surface is appropriately rolled with a vibratory roller to the required finish.

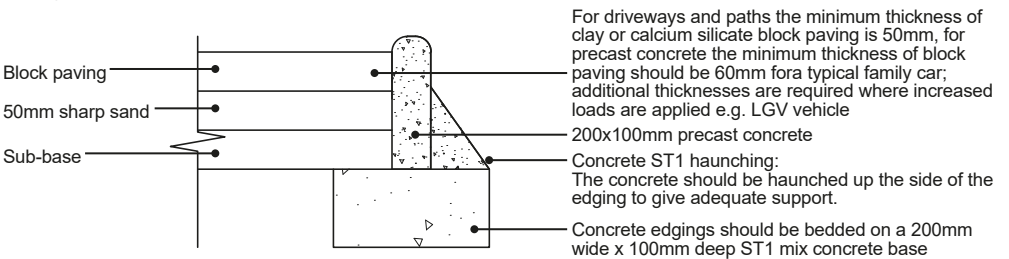


Block paving

- Block paving should be laid on a minimum of 50mm sharp sand, and gaps between blocks should not exceed 5mm.
- All joints should be filled with kiln-dried sand or similar.
- Blocks should be cut using a block splitter and the finished path or driveway should be compacted with a plate vibrator.
- Care should be taken to ensure that the surface of the paving is not damaged or scuffed.

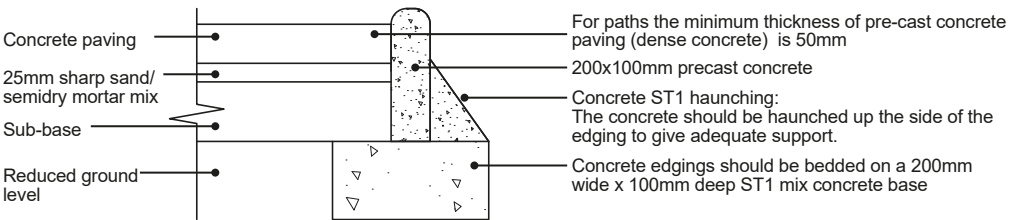
Porous block paving joints

Where paving is designed to allow ground water to drain through the joints, the gaps between blocks and the material within the joints should meet the initial design specification. The joint material should be sufficient to prevent blocking and prevent moss growth.



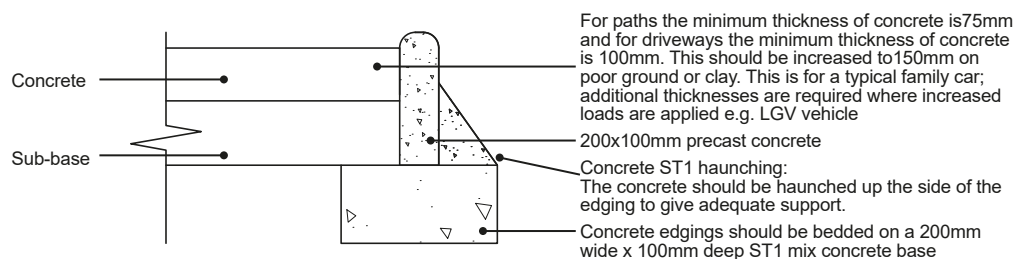
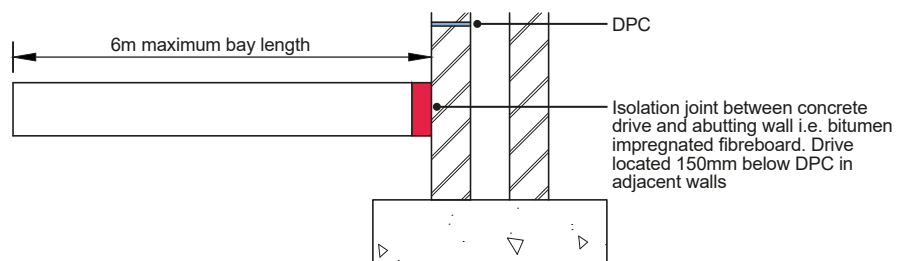
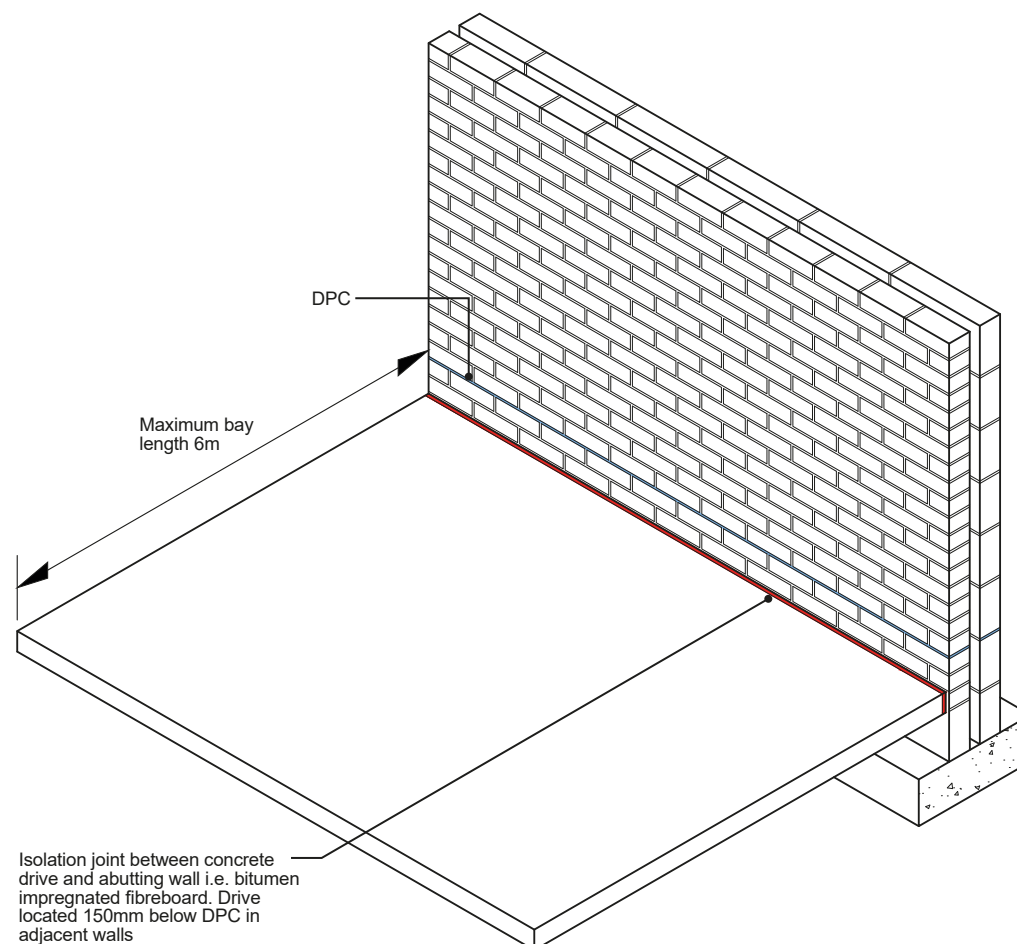
Concrete paving

- Paving slabs should be placed on a 25mm bed of sharp sand or semi-dry mortar mix (sand/cement mix ratio 3:1).
- Joints between slabs should be no greater than 4mm for straight edge paving slabs, and should be filled with kiln-dried sand.
- A neat consistent joint should be provided to rustic slabs.
- Slabs should be cut with a diamond blade cutter or similar to give a neat finish.



In-situ concrete

In-situ concrete should be laid in areas of 20m² maximum to allow for movement. Where abutting an adjacent structure, the concrete should be isolated using a flexible jointing material. Where the sub-base is well drained, it is recommended that the concrete is cast onto a damp proof membrane.

**Typical cast in-situ drive or path abutting the dwelling****Typical edging detail - In-situ concrete**

Limitations of guidance

The following guidance is applicable to timber decking that forms part of the principle entrance to the property.

This guidance is limited to decking that is no more than 600mm above the adjacent ground level. For decked areas which are 600mm and greater above the external ground level the guidance within the 'Roof Terraces and Balconies' section should be followed.

Board fixing

- Fixing points at board ends shall be no closer than 25 mm to the board end and should always be pre-drilled to prevent splitting.
- On grooved boards the fixing point should always be at the bottom of a groove, flush with the surface of the wood.
- Screw heads should be countersunk level with the surface of the board.
- Pre drilling pilot holes will prevent splitting. Always drill pilot holes 2mm oversized when fixing hardwood boards.
- All metal fixings shall be made from corrosion-resistant materials, such as stainless steel, hot dipped, galvanised or other specialist coating. Before use, verify with the manufacturer that the fixings you have chosen are suitable for use with treated timber.
- Aluminium fasteners should not be used with treated wood. Prevent galvanic corrosion by using the same type of metal for both fixings and connectors.
- Screws should be at least two-and-a-half times the thickness of the board being fixed.
- All joist bearing points shall be secured by two screws positioned at the quarter points of the board i.e. 25% in from the side.
- Take care using high-pressure nail guns as they can damage timber.

Board spacing

When laying timber decking boards:

- Allow for a 5mm minimum to 8mm maximum gap between board lengths.
- Where the board abuts a post, allow a 5mm gap.
- Where board ends meet, allow a 3mm gap.

Timber decking

Only timber naturally resistant to decay, or which can be treated by an industrial process to give long-term protection from decay, shall be used.

Hardwoods: Only use species rated as durable or moderately durable.

Softwoods: Only use species/components with natural durability or which have been treated in accordance with BS EN 335 to a 'Use Class' standard appropriate to their use i.e. 'Use Class 4' treatment for posts and other structural components in direct ground or freshwater contact, or 'Use Class 3' treatment for all components out of direct ground contact subject to frequent wetting.

Please note:

- Whitewood should not be used for posts embedded in the ground or for other elements (joists) in the ground or other non-permeable surface e.g. concrete slab.
- All cross-cuts, notches or large boreholes shall be treated on site with a suitable preservative. For full guidance on wood preservation specification, contact the Wood Protection Association.

Timber grade (strength class): C16 minimum

The grade (strength class) of timber used for structural components such as posts, beams and joists shall be sufficient to cope with the loads placed upon it during its service life.

For decks below 600mm in height, the use of C16 timber is recommended.

Posts can be made from laminated sections, solid timber or round poles, and should have a load-bearing capability/size/spacing appropriate to the scale and end use of the structure. For extended life, the surface mounting of posts on precast piers or metal shoes is recommended.

Note:

- Do not exceed the recommended load and span for each strength class; for detailed recommendations, refer to span tables in TDA/TRADA Timber Decking: The Professionals' Manual.
- Use 'noggin'/blocking to strengthen frames where appropriate to prevent flexing.
- Timber moisture content at installation should be 20% maximum.

To minimise the effects of shrinkage, e.g. cupping, cracking, warping, etc. install timber as close as possible to the equilibrium moisture content of the site. For outdoor wood, moisture content varies from 19% in winter to 13% in summer in the UK. For best results, always install wood with moisture content lower than 20%. The stability of all wood used outdoors can be improved by the use of water-repellent treatments.

Fall

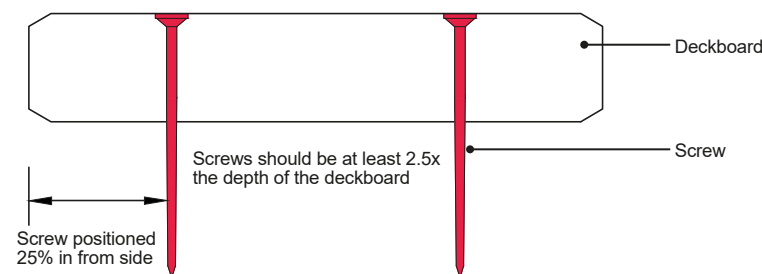
To aid drainage, build a gentle fall of 1:100 into the deck, away from any adjacent property. Grooved deck boards are designed to assist the drainage of surface water, so lay them in the direction of the fall.

Level threshold

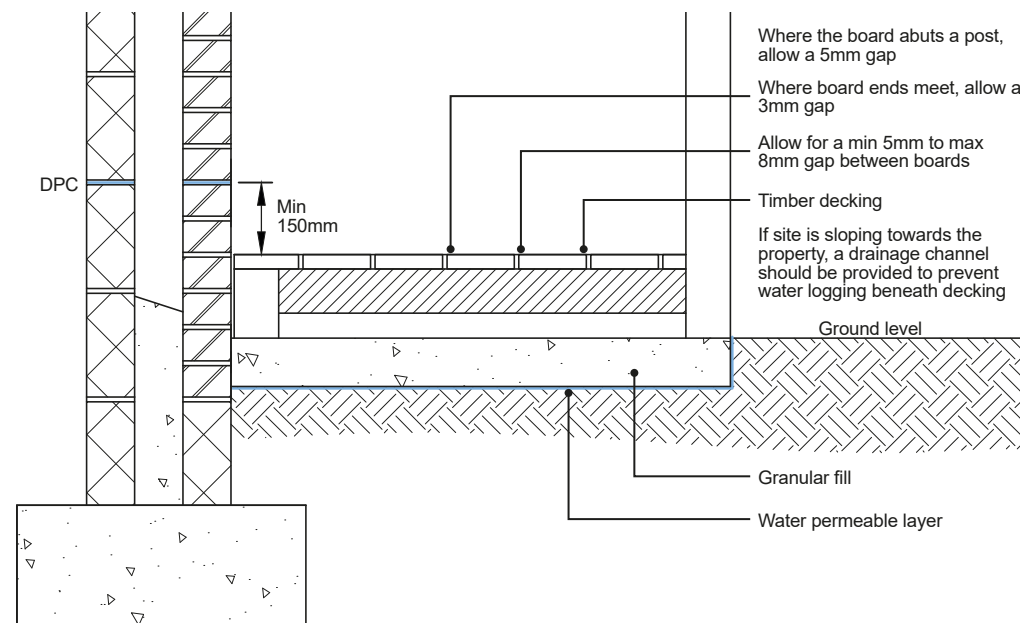
For further guidance on the formation of level thresholds please see the 'External Windows and Doors' section.

Preparation of ground

The area to be surfaced should be prepared by stripping away all vegetation and organic material. Land drainage should be considered for ground that is saturated.



Timber decking



Further specification references

- TDA/TRADA Timber Decking: The Professionals' Manual - second edition November 2006
- TDA Technical Bulletin TB 02: Statutory requirements
- TDA Technical Bulletin TB 04: Parapet design and construction
- TDA Technical Bulletin TB 08: Metal fixings
- TDA Code of Practice TDA/RD 08/01: Raised timber decks on new homes - desired service life 60 years
- Wood Protection Association: Timber Preservation Manual

British standards

The standards set out below all have a relevance to the creation of high-performance timber decks:

- BS EN 335-1 Use classes of wood and wood-based products against biological attack - Part 1: Classification of Use classes
- BS EN 335-2 Use classes of wood and wood-based products against biological attack - Part 2: Guide to the application of use classes to solid wood
- BS EN 335-3 Durability of wood and wood-based products - Definition of hazard classes of biological attack - Part 3: Application to wood-based panels
- BS EN 350-1 Durability of wood and wood-based products - Natural durability of solid wood - Part 1: Guide to the principles of testing and classification of the natural durability of wood
- BS EN 350-2 Durability of wood and wood-based products - Natural durability of solid wood - Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe
- BS EN 351-1 Durability of wood and wood-based products - Preservative-treated solid wood - Part 1: Classification of preservative penetration and retention
- BS EN 351-2 Durability of wood and wood-based products - Preservative-treated solid wood - Part 2: Guidance on sampling for the analysis of preservative-treated wood
- BS EN 460 Durability of wood and wood-based products - Natural durability of solid wood: Guide to the durability requirements for wood to be used in hazard classes
- BS EN 599-1 Durability of wood and wood-based products - Performance of wood preservatives as determined by biological tests - Part 1: Specification according to hazard class
- BS 8417 Preservation of timber - Recommendations. Guidance for specifiers on the treatment of timber drawing on relevant sections of BS EN standards
- BS 5756 Specification for visual strength grading of hardwood
- BS 6105 Specification for corrosion-resistant stainless steel fasteners
- BS 6399-1 Loading for buildings. Code of Practice for dead and imposed loads
- BS 7359 Nomenclature of commercial timbers, including sources of supply
- BS 5268-2 Structural use of timber. Code of Practice for permissible stress design, materials and workmanship
- BS 6180 Barriers in and about buildings - Code of Practice
- BS 6399-1 Loading for buildings. Code of Practice for dead and imposed loads

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