
British Standard Code of practice for
Installation of sheet and tile flooring

Installation des revêtements de sol en feuilles et plaques — Code de bonne pratique

Leitfaden für das Verlegen von Bodenplatten und -fliesen

Foreword

This British Standard has been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Committee. It is a revision of CP 203 : Part 2 : 1972, which is withdrawn. CP 203 : Part 2 was a metric version, giving values in SI units, of CP 203 : 1969. That code of practice was first published in April 1951 and revised in November 1961 and February 1969. It too is now withdrawn.

In this edition particular attention is paid to the surface finish of concrete and screed bases to receive thin flooring and three alternative classes of surface regularity are given. Additional information on dryness and other compliance testing of screeds and concrete bases is given. The recommendations on maintenance are omitted as they are now covered by BS 6263 : Part 2.

Attention is drawn to the regulations governing the use of adhesives containing solvents with a low flash point.

Specialist floorings, e.g. conductive and antistatic floorings, are outside the scope of this standard and advice on laying these materials should be sought from the manufacturer.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Section one. General

1 Scope

This British Standard gives recommendations for the installation of the following flooring on both new and existing floor constructions.

- (a) Cork tiles.
- (b) Linoleum sheet and tiles and cork carpet.
- (c) Rubber sheet and tiles.
- (d) Thermoplastics and semi-flexible PVC tiles.
- (e) Flexible PVC sheet and tiles.
- (f) Backed flexible PVC sheet and tiles.

The recommendations of the standard are confined to the installation of these materials inside buildings. Specialist floorings such as conductive and antistatic floorings are not included.

The standard includes recommendations for screeds and underlays and those aspects of floor construction which will affect the performance of the flooring.

NOTE 1. The figures in square brackets refer to the publications cited in appendix D.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply. Definitions of terms given in BS 6100 : Parts 1 and 6, other than those of the terms given below, also apply.

2.1 screed. Layer of well compacted material, commonly a mixture of cement and aggregate, applied in-situ to a concrete base at the appropriate thickness given in this code and suitably finished to receive the flooring to be applied and to enable the flooring to be laid to a designated level.

2.2 fine concrete screed. Screed consisting of concrete containing coarse aggregate of maximum size 10 mm.

2.3 flooring. Uppermost fixed layer of a floor which is designed to provide a wearing surface.

2.4 fabricated underlay. Manufactured board made from wood, wood particles or wood fibres in sheet form usually laid over solid timber floors to provide a suitable surface to receive the specified flooring.

2.5 in-situ underlay. Layer of compacted material, applied in-situ to a sound base or screed where there is the need to raise the level of the floor surface or to level a floor that is out of true where a conventional sand/cement screed is considered to be unsuitable due to thickness or other limitations.

2.6 smoothing underlayment. Thin layer of compacted material, applied in-situ to a sound base, screed or underlay to provide a smooth finish prior to laying the flooring.

2.7 soundness (of screed). Property which is required of a screed material as laid to withstand the crushing effects of the imposed loads and traffic in service.

NOTE. Soundness is therefore a function of many factors such as good mixing, compaction and curing of the screed.

3 Exchange of information

There should be consultation, preferably early in the design stage, between all parties concerned with the installation. Information to be exchanged should include whichever of the following are applicable.

(a) *Project.* Identification of name and location of projects and personnel involved in pre-contract negotiations.

(b) *Design.* Flooring layout, and specification, based on building type and occupational uses, e.g.:

- (1) type and density of foot or wheeled traffic;
- (2) resilience characteristics;
- (3) acoustic absorption levels;
- (4) particulars of wet, corrosive or potentially abrasive conditions.

(c) *Floor details.* The completed drawings/specification should provide comprehensive information on:

- (1) whether upper or ground floor;
- (2) whether ground-supported or suspended construction;
- (3) particulars of any floor warming installation;
- (4) concrete base or screed curing and drying time required before laying flooring;
- (5) screed or base with finished floor level, permissible departure from datum and class of surface regularity required;
- (6) type of damp-proof membrane and position within floor construction;
- (7) choice of underlay, underlayments and adhesives or special requirements, e.g. seam welding.

(d) *Associated details.* Abutments, skirtings, services embedding or sleeving, separating strips, pattern or border details and junction with other adjacent flooring.

(e) *Contract conditions.* Programme for commencement and completion of work including any specific requirement for sequenced completion.

(f) *Special attendance.* Access, unloading, hoisting and storage facilities, heat, light and power and any additional items considered necessary to expedite the work.

(g) *Testing.* Details of any compliance testing of the base, screed or flooring.

(h) *Maintenance.* Clear written instructions on the recommended maintenance methods appropriate for the various floorings should be provided for the occupier (see BS 6263 : Part 2).

Section two. Materials

4 Damp-proofing materials

Damp-proofing materials should be selected and laid in accordance with the recommendations of CP 102.

5 Concrete bases and screeds

5.1 Cement

The cement should be one of the following.

- (a) Portland cement complying with BS 12.
- (b) Portland blastfurnace cement complying with BS 146.
- (c) Sulphate resisting Portland cement complying with BS 4027.
- (d) High alumina cement complying with BS 915.

NOTE 1. High alumina cement should not be used in concrete for structural purposes.

- (e) Portland pulverized-fuel ash cement complying with BS 6588.

NOTE 2. There is insufficient experience at the present time to recommend the use of pulverized-fuel ash cement for screeds and the material should therefore be used for bases only.

5.2 Aggregate

5.2.1 Aggregate for concrete bases should be one of the following.

- (a) Aggregate complying with BS 882.
- (b) Aggregates of other types including those complying with BS 877 and BS 3797, provided that such materials are suitable having regard to the strength, density, shrinkage, durability and surface finish of the base.

5.2.2 Aggregate for fine concrete screeds should be one of the following.

- (a) Aggregate complying with BS 882 using coarse aggregate of 10 mm single size in accordance with table 4 of BS 882 : 1983 and fine aggregate in accordance with 5.2.3.
- (b) Aggregates of size in accordance with 5.2.2(a) but of other types including those complying with BS 877 and BS 3797, provided that such materials are suitable having regard to the strength, density, shrinkage, durability and surface finish of the screed.

5.2.3 Aggregate for cement and sand screeds should be fine aggregate complying with grading limit M of table 5 of BS 882 : 1983 but with not more than 10 % passing sieve size 150 µm.

5.2.4 In addition to compliance with the appropriate recommendations of 5.2.1 to 5.2.3, the aggregate should not contain any deleterious material in sufficient quantity to affect adversely the surface finish of a directly finished base or screed. For example, coal and iron pyrites in the aggregate can cause 'pop-outs' which lead to pimpling of sheet and tile flooring.

5.3 Reinforcement

Where light reinforcement is required in a screed it should consist of steel fabric complying with reference D49 or D98 in BS 4483.

Heavier reinforcement may be used in screeds constructed for structural purposes.

5.4 Admixtures

Admixtures should comply with the appropriate Part of BS 5075. Their use is discussed in 12.12.

5.5 Water

Water used for mixing bases and screeds should comply with the recommendations given in appendix A of BS 3148 : 1980.

6 Underlays

6.1 General

Guidance on the selection and use of underlays appropriate to the various floorings and bases is given in clauses 16 and 17.

6.2 Fabricated underlays

Fabricated underlays should be selected from the following.

- (a) Plywood complying with BS 1455.
- (b) Wood chipboard complying with BS 5669 (see 16.3). The board should not have any surface treatment which might affect adhesion.
- (c) Hardboard complying with BS 1142 : Part 2.

6.3 In-situ underlays

In-situ underlays should be selected from the following.

- (a) Mastic asphalt complying with grade 1 of BS 1076.
- (b) Cementitious underlay consisting of a specially formulated blend of cement and binder and both fine and coarse aggregates. The binder is commonly a natural rubber or synthetic polymer dispersion.

6.4 Smoothing underlayments

Smoothing underlayments should be selected from the following.

- (a) Cementitious underlayment consisting of a specially formulated blend of cement, binder and fine aggregate. The binder is commonly a natural rubber or synthetic polymer dispersion.
- (b) Powder/water mixes based on casein/cement or polymer/cement.
- (c) Epoxide and other resin compounds.

7 Flooring materials

7.1 Cork tiles (pressed aggregated cork)

Cork tiles should be uniform in dimension. They should be free from warp or wind and have clean, square cut or tongued and grooved edges truly squared to each other. The tile edges should be firm and unclipped and the wearing surfaces smooth.

Cork tiles are normally described according to their density and thickness as follows.

Density

Domestic	385 kg/m ³ to 445 kg/m ³
Heavy domestic	450 kg/m ³ to 495 kg/m ³
Contract	450 kg/m ³ to 495 kg/m ³
Heavy contract	over 500 kg/m ³

Thickness

Domestic	minimum 3 mm
Heavy domestic	minimum 3 mm
Contract	minimum 4.8 mm
Heavy contract	6.3 mm to 8 mm

7.2 Linoleum and cork carpet

Linoleum sheet and tiles and cork carpet should comply with BS 810.

7.3 Rubber flooring

Rubber flooring should be one of the following.

- (a) Rubber sheet and tiles complying with BS 1711. This includes natural or synthetic rubber or a mixture of these materials in conjunction with other suitable compounding materials.
- (b) Rubber flooring suitable for mechanical fixing, e.g. with a backing in the form of dovetailed grooves.
- (c) Sponge backed rubber sheet. There is no British Standard for composite rubber flooring such as sponge backed rubber. The rubber forming the wearing surface in such composite materials should comply with BS 1711.

7.4 Thermoplastics tiles

Thermoplastics tiles should comply with BS 2592. This includes those described as vinylized or PVC modified thermoplastics tiles.

7.5 Semi-flexible PVC tiles

Semi-flexible PVC tiles should comply with BS 3260.

7.6 Flexible PVC

Flexible PVC sheet and tiles should be one of the following.

- (a) Unbacked flexible PVC sheet and tiles complying with type A of BS 3261 : Part 1.
- (b) Unbacked flexible PVC tiles complying with type B of BS 3261 : Part 1.
- (c) Heterogeneous PVC sheet and tiles. Unbacked floorings consisting of two or more laminae which vary substantially in composition and/or colour.

7.7 Backed flexible PVC

Backed flexible PVC sheet should be one of the following.

- (a) Needleloom felt backed sheet, complying with BS 5085 : Part 1.
- (b) Cellular PVC backed sheet complying with BS 5085 : Part 2.
- (c) Woven fabric backed sheet.
- (d) Cork composition backed sheet.

8 Adhesives

The types of adhesive suitable for laying flooring materials are classified in BS 5442 : Part 1. The choice of adhesive will be influenced by the flooring material, the nature of the sub-floor and the underlay, if any, and service conditions.

If the flooring is being applied over mastic asphalt or other non-absorbent surface, special attention should be paid to the choice of adhesive or a suitable smoothing underlayment should be used to provide some absorbency.

NOTE. None of the adhesives can be considered effective as a damp-proof membrane.

Section three. Design

9 Selection of flooring materials

9.1 General

The flooring materials covered by this code are available in a range of types and thicknesses and the type and thickness to be used should be selected after consideration of the building type and occupational use.

The technical aspects described in 9.2 to 9.10 should be considered.

The properties of a flooring may be adversely affected by the use of the wrong type of sub-floor and the incorrect choice and application of adhesive.

9.2 Wear resistance

Wear resistance is not a property which can be meaningfully measured in the laboratory and it is therefore not possible to specify the wear resistance of a material in the same way as, for instance, density. The useful life of the floor is usually dependent upon such factors as thickness of wear layer, traffic and maintenance. Careful selection of materials is necessary where pedestrians are likely to turn, e.g. at the foot of stairs, near counters and at openings such as doorways. Wear is likely to be highest where abrasive grit can be carried on to the flooring by footwear. It may be reduced by ensuring that, where doorways open on to dirty areas, matting extends over a large enough area for pedestrians to take several steps before reaching the flooring.

In some circumstances, e.g. in hospitals, the flooring may be traversed by light trolleys and trucks. Where these are moved manually there should be no particular wear problems so long as they are fitted with wheels which move freely in any direction without skidding and hand trucks have pneumatic tyres. If heavy powered trucks or equipment fitted with small hard castors are to be used, the designer should consult the flooring manufacturer and ensure that the sub-floor, underlay and underlayment, if any, are of adequate strength.

9.3 Indentation

Flooring materials subjected to high pressures are liable to suffer indentation which may become unsightly. The pressures can be high and of short duration, e.g. those imposed by footwear with heels of small contact area or with sharp metal studs in soles and heels. These may be more damaging than much lower pressures applied over a long period, e.g. loads imposed by furniture. The effects of the latter type of loading can be minimized by the use of suitable non-staining feet or cups which act as load spreaders. Textured or patterned surfaces tend to make indentations less conspicuous.

9.4 Resistance to moisture

Moisture may reach the flooring from three main sources, i.e.

- ground water
- construction water
- surface water

The effect of ground moisture can be eliminated by adopting a suitable construction (see clause 11).

Construction water presents most problems. If it is not reduced to a suitable level, as defined in 11.3, effects on the flooring will be similar to those produced by dampness rising from a wet site.

Surface water arises from the conditions of use of the area, e.g. water carried on footwear into entrance halls and spillage in bathrooms and kitchens. If it is known that contact with water is likely to be excessive, those materials suitable for seam sealing (welding) should be considered. It is not normal practice for tiles smaller than 500 mm x 500 mm to be welded.

9.5 Colour fastness

All the materials covered by this British Standard may undergo shade changes when exposed to sunlight. This may require special consideration in areas of high sunlight intensity.

9.6 Staining

Flooring materials vary widely in their resistance to staining which can be caused by migration from the sub-floor or adhesive, surface contamination, use of unsuitable maintenance materials and other factors.

Main areas of staining are likely to be adjacent to areas laid with bituminous compounds, areas where rubber goods are in constant contact with flooring and where spillages are likely to be a permanent feature, e.g. hairdressing salons and laboratories. In these instances choice of material and colour will play an important part in minimizing the effect of staining.

9.7 Acoustics

None of the flooring materials covered by this code is likely to absorb airborne sound appreciably but many of them can make an important contribution to the reduction of impact sound transmission. The comparative effects of the materials may be judged by reference to their behaviour on a concrete slab 150 mm thick when tested by the methods described in BS 2750 : Parts 6, 7 and 8.

9.8 Slip resistance

Most floorings provide adequate slip resistance under normal conditions providing they are kept dry and properly maintained. Where slipping is likely to be a problem, e.g. on ramps or in wet areas, consideration should be given to the use of flooring specifically designed for this purpose. Such floorings will have a special surface which may contain cork granules or mineral aggregate and additionally may be textured.

The attention of the designer is directed to clause 4 of BS 6263 : Part 2 : 1982, which highlights the advantages of using one type of maintenance material for different types of flooring in a building as a means of minimizing variations of slip resistance.

9.9 Flexibility

The materials covered by this code are suitable for use on suspended timber floors except for thermoplastics tiles for which a completely rigid sub floor is required.

9.10 Thermal properties

The improvement in thermal insulation that a flooring adds to the overall performance of the floor construction is marginal. However, there is a distinct effect on the comfort of the user, and the higher the thermal resistance barrier the warmer the floor feels to the touch. Reference should be made to the manufacturer's literature when underfloor heating is included in the design of the building.



10 Suitability of materials

10.1 Cork tiles

The main attributes of cork tiles are warmth and quietness under foot, good slip resistance and natural appearance. They are not suitable for use over underfloor heating because of their thermal insulation properties. Cork tiles for use in areas of high traffic density should be of minimum thickness 8 mm and minimum density 500 kg/m³.

10.2 Cork carpet

Cork carpet has similar characteristics to cork tiles but not the same aesthetic appeal.

10.3 Linoleum sheet and tiles

Linoleum forms a quiet floor in use and is resistant to oils, fats and greases. Thicknesses over 3 mm should be used where heavy traffic is expected.

Linoleum can be seam sealed if required.

10.4 Rubber sheet and tiles

Rubber flooring is hard-wearing and quiet in use. Flooring made from natural rubber should not be used in situations where it may come into contact with fat, grease, oil or petrol, as these substances may cause swelling, softening or other deterioration. To meet such conditions, flooring made from various kinds of synthetic rubber is available.

10.5 Thermoplastics tiles

Thermoplastics tiles can be used in all normal situations, but consideration should be given to possible deterioration caused by grease or oil. PVC modified tiles have a better resistance to grease and oil and slightly increased flexibility which assists laying. They should be laid on a rigid sub-floor.

10.6 Semi-flexible PVC tiles

Semi-flexible PVC tiles have good resistance to grease and oil when compared with PVC modified thermoplastics tiles.

10.7 Flexible PVC sheet and tiles

Unbacked flexible PVC flooring complying with BS 3261 : Part 1 is also resistant to grease, oil and many chemicals, but is easily damaged by hot cinders or cigarette burns. It is slightly quieter and more comfortable to walk on than thermoplastics tiles or semi-flexible PVC tiles. Material complying with type A of BS 3261 : Part 1 can be

welded using a hot-air gun and welding rod and, therefore, is of particular use in an area where an unbroken surface is necessary. Tiles complying with type B of BS 3261 : Part 1 are less flexible but have improved resistance to cigarette burns.

10.8 Flexible PVC sheet with backing of cork composition or needled fibres

Both these backings provide good impact sound insulation. The joints of these materials can be seam welded.

10.9 Flexible PVC sheet with backing of flexible expanded material

This material has similar properties to unbacked flexible PVC sheet and gives resilience and good impact sound insulation. It can be hot air welded if required.

10.10 Heterogeneous PVC sheet and tiles

The properties of heterogeneous PVC flooring are similar to those of homogeneous flooring complying with type A of BS 3261 : Part 1.

11 Damp-proofing solid floors and eliminating construction moisture

11.1 Damp-proofing new construction

As the floorings covered by this British Standard, together with many adhesives and smoothing compounds used with them, may be adversely affected by moisture, new solid floors should be so constructed as to prevent any part of the floor being adversely affected by moisture or water vapour from the ground.

Suitable damp-proofing materials include polyethylene sheet, bitumen felt, pressure sensitive laminate, hot applied bitumen and cold applied liquid materials, and are used as sandwich membranes. Hot applied materials like mastic asphalt can be laid over the concrete floor. The properties and design data for these and other materials are given in CP 102. Integral waterproofers incorporated in the concrete or screed will not provide adequate damp protection for the floorings and will retard the drying out process.

11.2 Damp-proofing old construction

It should not be assumed that existing ground-supported concrete floors are adequately damp-proofed. Cold applied surface treatments specially formulated for this purpose are available but these do not necessarily guarantee success. Where conventional damp-proofing cannot be provided, those flooring materials, e.g. thermoplastics and semi-flexible PVC tiles, and adhesives which are more tolerant of dampness may be used provided that the level of dryness is as recommended in 11.3. It should be noted that, without a damp-proof membrane, the permanent dryness of the floor cannot be guaranteed and any substantial increase in moisture level may cause failure, even with these floorings.

11.3 Eliminating construction moisture

Before floorings are laid it is necessary not only to ensure that the floor is constructed to prevent moisture reaching them from the ground but also to ensure that sufficient of the water used in the construction is eliminated. Usually the flooring is fixed directly to the concrete base slab or on to a screed laid above this. In either case the amount of water used is more than that required for hydration of any cement used because extra is normally required to give adequate workability to the mix. It is essential that the excess water be allowed to evaporate and the time for this to happen should be taken into account at the planning stage. Estimated drying times are necessarily only very approximate as drying is influenced by ambient conditions, concrete quality, surface finish and thickness. Of these, thickness is most important. For the first 50 mm one day per mm should be allowed followed by an increasing time for each millimetre above this thickness. It is thus reasonable to expect a screed 50 mm thick laid on a membrane to be sufficiently dry in two months. However, concrete 150 mm thick may require as much as a year to dry from one face only. Where screeds are laid directly on to a concrete base, account should be taken of the extra drying time required for the base.

Whenever time schedules do not permit the extended drying times required for thick concrete bases, the method of construction described in 12.1(c) should be used.

The flooring should not be laid until a hygrometer test by the method described in A.1 gives a reading which indicates a relative humidity of 75 % or less.

Electrical methods of conductivity measurement (see A.2) provide a means of monitoring the progress of the drying out operation. However, the final assessment of dryness should be made using the hygrometer.

Chemical methods of assessing dryness are not recommended.

12 Concrete and screed bases

12.1 General

The appearance and performance of the floorings covered by this code are determined to a large extent by the quality of the prepared base or screed on which the various floorings are laid. The floor should be designed using one of the following four methods after paying due regard to the recommendations given in 11.3.

(a) A base slab direct finished by trowelling or grinding to obtain a finish suitable to receive the flooring.

A damp-proof membrane should be placed below the slab if the slab is laid directly on the ground.

(b) A cement and sand or fine concrete screed bonded to a prepared concrete base. A damp-proof membrane should be placed below the base slab if the slab is laid directly on the ground.

(c) An unbonded fine concrete or cement and sand screed thick enough to provide sufficient rigidity and to minimize the likely curling with the damp-proof membrane placed between the slab and the screed. This method of construction will allow the shortest possible drying time of the screed. Screeds laid over concrete bases which have been contaminated with oil or containing water proofing admixtures or where a damp-proof membrane is placed between screed and base should be considered as unbonded.

(d) A floating screed laid on a compressible insulating layer. This type of screed is only suitable for foot traffic and light loading.

Where any screed is of greater thickness than 50 mm, a fine concrete may be used.

Where proprietary screeds which dry more quickly than plain cement and sand screeds are used, they should be mixed and applied in accordance with the manufacturer's instructions.

12.2 Category of use

For both bonded and unbonded screeds the designer should select from table 1 the category of screed required taking into account the use to which the floor will be put.

Table 1. Category of use of floor		
Category (see 35.3.6)	Type of use	Examples of type and use
A	Areas expected to take very heavy traffic and/or where later disruption would be unacceptable.	Hospital operating theatres, X-ray rooms. Research rooms requiring microbe-free environment. Rooms where radioactive material is handled. Store rooms with heavy use. Telecommunications rooms.
B	Areas expected to take heavy traffic.	Areas of heavy trucking. Workshop areas.
C	Other areas subjected to mainly foot traffic and light use.	Areas where heavy trolleys are used. Public areas, corridors, main lift and lobby areas. Canteens and restaurants. Public rooms in residential accommodation. Classrooms, hospital wards.
		Light office use, consulting rooms, domestic housing.

12.3 Soundness of screeds

The soundness of bonded and unbonded screeds should be determined by the BRE screed tester (see 35.3.6 and appendix C). A well mixed and laid screed with mix proportions of cement to fine aggregate within the range

of $1:4^{+0.5}_{-1}$ by mass or fine concrete of mix proportions of cement to total aggregate within the range of $1:4^{+0.5}_{-1}$ by mass would normally be expected to meet the soundness requirements.

NOTE. The precise mix proportions are normally determined by the screed layer.

The BRE screed tester is unsuitable for determining the soundness of floating screeds, which should be determined in accordance with 35.3.2.

12.4 Thickness of base slab

The thickness of the base slab should be determined by the loading conditions and for slabs on the ground by the load carrying capacity of the ground. The minimum thickness of a slab on the ground should be 100 mm.

12.5 Thickness of screed

The thickness of screeds should be as follows.

(a) *Bonded screed.* When a screed is laid on and bonded to a set and hardened base, which has been prepared to give a high degree of bond as described in 28.2 the minimum thickness at any point should be 25 mm. Because of the deviation in level of the base some variation in screed thickness has to be accepted and to achieve this minimum thickness a design thickness of up to 40 mm will normally be required.

In some circumstances the thickness of the screed may have to be increased above 40 mm but it should be noted that above this point there will be an increasing risk of loss of adhesion with the base.

If the degree of preparation detailed in 28.2 cannot be achieved then the screed should be considered as unbonded.

(b) *Unbonded screed.* When laid on a damp-proof membrane, a separating layer, a base that incorporates a waterproofer, a base that has been contaminated, e.g. with oil, or a base that for any reason cannot be prepared as described in 28.2, the thickness at any point should be not less than 50 mm.

(c) *Floating screed.* When laid on a compressible layer, e.g. insulating quilts or boards, the thickness of the screed at any point should be not less than 75 mm except for domestic and similar applications where light loading is to be expected for which a minimum thickness of 65 mm should be used. The screed should preferably be of fine concrete.

It is emphasized that a high risk of the screed curling exists with unbonded and floating screeds, which may lead to steps at joints due to differential movement. These steps may be eliminated by the incorporation in the screed of mesh reinforcement in accordance with 5.3 which should also pass through the screed joints. Where it is essential that

the risk of curling of an unbonded or floating screed is reduced, an overslab 100 mm thick or more should be used. This should be designed as a new floor. Where possible, falls in the floor should be formed in the base concrete so that an applied screed is of uniform thickness.

12.6 Pipes and trunking

The laying of conduits or pipes in a screed should be avoided, if possible, as cracks may occur over them. To minimize the effects of shrinkage cracking where it is essential that conduits and pipes are incorporated, a minimum of 25 mm thickness of screed containing reinforcement in accordance with 5.3 should be placed over the conduit or pipe. The reinforcement should be placed centrally in the depth of the screed over the conduit or pipe and extend for 250 mm on each side.

Where ducts or trunking more than 75 mm wide are to be incorporated in the screed they should preferably be laid with their top surface flush with the screed surface. Alternatively, where such ducts or trunking have to be buried in the screed below finished screed level, the surface should be brought to screed level with a material strong and resilient enough to carry the imposed loads.

The significant increase in depth of a bonded screed required to accommodate pipes and trunking within its thickness may lead to increased risk of hollowness.

12.7 Thickness of screeds on concrete stairs

The recommendations in 12.5(a) should be followed except that:

- (a) the minimum thickness of screed laid on stair treads should be 20 mm;
- (b) the thickness of screed on risers should be between 12 mm and 15 mm.

12.8 Bay sizes

12.8.1 Base slab. Ground-supported base slabs should be laid in strips of such width that the appropriate surface regularity given in table 2 can be achieved.

NOTE. It has been found that, for normal standards of construction, the maximum width of strip should be 4.5 m. Wider strip widths may be used where special experience in obtaining accurate floor levels with wide strips has been obtained.

Where transverse joints are used to control shrinkage cracking in unreinforced concrete, they should be not more than 6 m apart. For reinforced slabs joint spacing may be greater depending upon the weight of the reinforcement used. See Cement and Concrete Association publication 48.034 [1].

12.8.2 Bonded, unbonded and floating screeds. Screeds should be laid in as large an area as possible in one operation consistent with achieving the required levels to minimize the number of joints. These areas can be divided into strips 3 m to 4 m wide for convenience of laying.

NOTE. Screeds in large areas may crack at random intervals as they dry and shrink. These shrinkage cracks and any resulting minor curling at them are more easily dealt with than the more pronounced curling which may occur at vertical butt joints if screeds are laid in small bays.