# [101] INSTALLATION SITE CONDITIONS & SUBFLOORS

**Gerflor recommends following Norms of each country, such as ASTM Norms, European Norms or British Standard Norms In countries that do not follow one of these standards or local norms, Gerflor provides the information below to be observed. This information comes from the Contract Flooring Association (CFA) - www.cfa.org.uk**

The appearance and performance of floor coverings are determined to a large extent by the quality of the prepared base or screed on which they are to be laid. Those responsible for the design and construction of the sub-floor must ensure that it meets the requirements for hardness, soundness, levels and surface regularities, dryness and other design parameters before flooring covering installation is commenced.
The quality of the installation also depends on attention being given to those other buildings products, work processes and the general conditions provided during installation which may in anyway be associated with, and therefore affect the finished flooring.
Any incompatibility in other trades or unsuitable conditions of work can restrict the ability of the fioorlayer to provide a neat, well adheed rand satisfactory, lasting, floor finish. Clear contractual arrangments at the beginning and effective communications between all parties will minimise contention and maximise customer satisfaction.
Whilst the need to provide the right conditions through specification is obviously of first importance, onl by careful consideration being given to ON SITE QUALITY CONTROL of these and other works, will the expected advantages be realised.

**REQUIRED ATTENDANCES**
- Facilities for the safe unloading and distribution of flooring and accessory materials.
- Provision of dry, clean, ventilated, waterproof, warm and secure storage area. Floorcoverings and associated materials such as chipboard to be unloaded with care and stored according to manufacturers' instructions. On multi-storey work storage facilities to be available on each floor as the work proceeds.
- Special storage to be available for flammable adhesives and any other substances are required by the requirements of current Fire, Safety at Work, COSHH or other relevant Regulations.
- Safe hoisting facilities and access to appropriate floor level.
- Good standard of electric lighting to work areas when required. Electric power, generally at 110 volts but often at 240 volts for floor sanding machines, to be made available for using power tools.

**SITE CONDITIONS**
Clear and clean work area. Each work area to be clear of all other trades and their materials. Floors to be clear of rubbish and initially swept clean or, preferably, vacuumed and with any surface contamination removed as directed by the manufacturers of the next product to be applied.

**DRYNESS OF THE BASE**
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 process is eliminated. Any excess water must be allowed to evaporate and the time for this must be taken into account at the planning stage. Estimated drying times are only very approximate but research has shown that under ideal conditions concrete 150mm thick may take up to two years to dry and power floating extends the time even further. Usually time schedules do not allow for engthy drying times and consideration needs to be given at the design stage to lthe use of sandwiched or surface damp proof membranes.
Before the application of the floor finish a cementitious base must be sufficiently dry. The moisture tests must be performed as per ASTM F2170-11 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes". Substrate moisture levels shall not exceed, for concrete slab with an effective moisture vapor barrier, 5-lbs / 80% RH and for concrete slab with radiant heating system 3-lbs / 75% RH.

**SUB-FLOOR SURFACES**
Floor screeds and other in-situ floor bases, e.g. timber, need to have a surface regularity which complies with the requirements of BS8203 and BS8204 or other relevant Standards.
Directly finished concrete bases may not comply with the required tolerances nor the smoothness needed to receive a floor finish. Furthermore, floated finishes may provide a surface too dense to allow the flooring adhesive to make a satisfactory bond.
Those responsible for the design and construction of the sub-floor may need to consider preparatory work to the sub-floor surface before instructing the flooring contractors to commence work.

**PROTECTION OF FLOOR SCREEDS**
Floor screeds must be protected as soon after laying as possible, against damage and contamination of the surface by other trades. Foot traffic from all trades causes considerable surface abrasion and contamination. The effects on the flooring application are numerous.
1. Poor adhesion of the flooring over weak patches caused by wear of the screed surface.
2. Weakly adhered aggregate can be pulled out when spreading the flooring adhesive, resulting in small bumps appearing in the flooring after it has bedded down.
3. Concreters and bricklayers working on the screed surface and failing adequately to clean off concrete and mortar, resulting in surface irregularity.
4. Plaster and paint being dropped onto the screed giving a weak surface causing loss of adhesion and lifting of the flooring. Do not use solvent-based products for removing paint, oil or other contaminants.

Any areas of the screed surface damaged due to lack of protection or any other reason MUST be repaired before the flooring contractor commences work, although this cannot be accepted as an equal alternative to screed protection.

**TEMPERATURE AND HUMIDITY OF ROOM**
BS8203 and BS8204 advise for the installation of MOST floorings, a work area temperature of 18°C be maintained throughout the installation of the flooring. They also advise that this temperature should be maintained for 24 hours prior to the installation, so that floorings can be kept in the room and brought to room temperature before installation.

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With fully flexible vinyls, flexibility is important to afford a good and safe installation. At low temperatures they will harden up, making them difficult to apply and with roll floorings, difficult to unroll (without cracking) or to achieve a satisfactory lay-flat condition.
It is essential with most floor coverings that they are laid in the same humidity conditions as would be expected to be prevalent in use.
Temporary heating equipment which may be used to warm buildings to achieve the required temperature will also increase the humidity to a markedly higher level than would normally be expected. The fitting of floor coverings in new building prior to the running of heating and/or humidification systems is a major cause of eventual dimensional stability problems and must therefore be avoided.

**FLOOR FITTINGS**
These are «fittings» placed within the floor screed which can considerably affect the quality of the flooring installation. They include:
Expansion joints
Service ducts and duct trays or covers
Drainage outlets
Matwells
It is important that where surface fittings are placed within the flooring base, or where construction arrangments affect the continuity of the flooring, consideration needs to be given to the selection of the right type of fitting to suit the flooring.
It is also necessary to ensure that the installation of such fittings is carried out in such a manner so as to allow neat and efficient placing of the flooring, for example, by selecting duct or drainage fittings in sizes to match a tiling module.

**CONSTRUCTION JOINTS**
It is sometimes wrongly supposed that a construction joint can be taken to the surface of the floor screed, a smoothing underlayer spread over the top to mask the joint and then the flooring laid across that.
There is no doubt that if this procedure is carried out, the flooring will fail. Treatment of a construction joint must allow for a metal upstand on each side of the joint, or similar propriety system which needs to be accurately fitted to finish sufficiently above the screed surface to allow for the thickness of the flooring, so that fitting can be carried out neatly and tightly.

**SERVICE DUCTS**
Access covers either individually or in continuous duct format, used in conjunction with flexible flooring must be installed in the screed allowing sufficient upstand for the thickness of flooring.
The cut edge of the flooring is vulnerable to traffic and the effects of water seeping into the underfloor, and steps should be taken to anchor it securely.
Screeding can rarely be carried out with sufficient precision to allow the edge to be left uniformly proud when the underfloor has cured. It is preferable to use a cover and frame modified to accept the flooring material.
This can have a clamping edge or an accurate upstand formed at the periphery of the frame giving a precise level for the screed. The flooring is fed over a clamping edge prior to being secured mechanically. Alternatively, an upstand, incorporating a vinyl insert to which the flooring is welded, may be used to form a completely flat, watertight joint.

**DRAINAGE OUTLETS**
Some floor areas, for example in commercial centres, hospitals, leisure facilities, production areas or laundries are subject to wetting far in excess of that produced by normal cleaning.
To clear this surface water efficiently, gratings are fitted in the floor, over channels, or point-drains. Non-corroding materials should be used.
To prevent water penetrating the screed at the vulnerable edge between the flooring and the outlet, the flooring should be clamped in place with a separate flange or cover strip. Alternatively, a grating with a PVC frame may be used to which the flooring can be seam welded.

**MATWELLS**
The fitting of matwells also poses a problem of level and finished screed height and due to their position they are probably the area in the building that receive the most traffic. It is important to ensure that flooring can be fitted neatly and tightly.
Matwells are often fitted with edges some 50mm to 75mm away from adjacent walls. Narrow strips of flooring fitted in this way start to lift within two or three years of service.
Matwell areas should either extend to the walls or sufficient space should be left to afford good adhesion of flooring.
In many cases, the doormat area is too small. The abrasive effect on the flooring caused by grit brought in on footwear demands a good run of mat to wipe shoes sufficiently clean.
The recommended size is 2.5 metres long over the whole width of entrance area, which allows for two steps with each foot. It is essential that doormats be regularly cleaned to be effective.

**SUB FLOORS**
**SAND/CEMENT SCREEDS AND CONCRETE SUBFLOORS**
The quality of the finished floor will only be as good as the sub-floor over which it has been laid. All flooring materials require a smooth, hard, clean and even surface for satisfactory adhesive bond and resistance to wear, if good application and long-term durability are to be achieved.
Sub-floors next to the ground should be protected against rising moisture and moisture vapour from the ground to the upper surface of the floor.
Various methods and materials of damp proofing solid floors are described in BS8204 and BRE Digest 54.
Concrete sub-floors and sand/cement screeds should be applied in accordance with BS8204, which also gives guidance on compliance and testing acceptance. Ordinary cement concretes and screeds should be cured by covering with waterproof sheeting for at least seven days. Following this period, protection from surface damage, wear and contamination is advisable.
Suitable protection should also reduce rapid evaporation, which may cause curling and subsequent hollowness and lipping. Curing of proprietary, rapid drying and early drying screeds should be as recommended by the manufacturer.
Where surface treatments have been used, the surface should be mechanically upbraided to ensure a clean, uncontaminated surface.
Problems have been experienced in recent years with the widespread failure of screeds in areas subjected to high point loads or heavy trafficking. This can be due to weak screeds and/or excessively high loads from certain equipment, etc.
It is therefore important to ensure that the screed is sufficiently sound to support the anticipated loads. The soundness value of bonded and unbonded screeds, when tested by the BRE Screed Tester, should not exceed the specified figure.

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Due to the quantity of water used in mixing and placing of concrete and screeds, a drying out time in the region of approximately one day per mm (one month per 25mm) is considered necessary for thicknesses up to 50mm. This will be considerably longer in cold or damp conditions.
Where the DPM is placed beneath the concrete slab rather than between the slab and screeds, then the combined thickness must be considered. In this case the drying period required will be at least 12 months before the sub-floor is dry enough to receive floorcoverings.
Drying times of proprietary screeds should be obtained from the manufacturer. Methods for testing for dampness are given in British Standards Codes of Practice.
Proprietary screeds may either incorporate resin or other additives with the normal Portland cement and sand screed mix or be supplied as a special cement or synthetic binder to be mixed with sand or graded aggregates.
Manufacturers claim good workability, lower shrinkage, faster setting and drying times and higher strengths than with conventional cement and sand screeds.

**POWER FLOATED CONCRETE (POWER TROWELED)**
For direct application of floorcovering
A concrete floor slab can be brought to a smooth finish for direct application of a floor finish by power trowelling. This is done in two stages:
1. Power floating the stiffened concrete to even out any slight irregularities.
2. Final power trowelling to close the surface, making it smooth and dense.
This may be preceded by vacuum de-watering.
Concrete based slabs which are to receive in-situ flooring or screeds should have a characteristic compressive strength of 30 N per sq. mm with a minimum cement content of 275 kg per cum.
BS8204, part one gives guidance on concrete bases to receive in-situ floorings.
The thickness of the base slab should be determined by the loading conditions and foslabs on the ground by the load carrying r capacity of the ground. Minimum thickness of a slab on the ground should be 100mm.
A damp proof membrane should be placed below the slab if the slab is laid direct to the ground.
The power trowelling of the concrete floor slab has a large influence on the choice of adhesive used for fixing floor coverings. Care needs to be exercised in ensuring that the flooring material and the concrete surface will give adequate absorption/escape of water and solvent vapours to enable sufficient adhesion to both surfaces.
The final finish of the power floated surface will also influence adhesion. A mirrored power trowelled finish may be good to look at but it may prove difficult to get adequate bonding of the adhesive to that surface.
The disadvantage of power floated concrete for direct application of floorcoverings is that it can be difficult to achieve a satisfactory finish and maintain it during the construction period and the drying time of the concrete slab will be considerably extended by the dense surface finish.

**BONDED SCREEDS**
Cement and sand screeds can be bonded to a concrete base. The base should be suitably prepared to expose the aggregate in the concrete, eg by scabbling, followed by cleaning, to obtain good adhesion.
The bonding grout may be a cement slurry or a proprietary bonding agent. The thickness of a normal cement and sand screed bonded to a prepared concrete base should not be less than 25mm so the specified nominal thickness should normally be 40mm to ensure the minimum of 25mm is achieved as recommended in BS8204 Part 1.
Modified or special proprietary screed may be designed to be laid thinner than 25mm.

**UNBONDED SCREEDS**
Cement and sand or fine concrete screeds can be laid unbonded, normally over a separating layer, e.g. a polythene sheet, bituminous compounds or a damp proof, and should be at least 50mm thick. The likelihood of curling or lipping is increased if the unbonded screed is left uncovered for any length of time. A drying period of at least two months can be expected.

**FLOATING SCREEDS**
These are laid on insulating boards or quilts for thermal and acoustic reasons. The specification will be by composition as soundness testing is not applicable.
As with unbonded screeds, curling and lipping may occur if left uncovered. The thickness of floating screeds should be at least 75mm in commercial locations, however in lightly loaded domestic locations etc, a minimum thickness of 65mm is usually acceptable. The screeds should preferably be of fine concrete as described in BS8204: Part 1.

**ANHYDRITE/GYPSUM SUBFLOORS**
These are alternatives to sand/cement screeds, both being based on calcium sulphate as the binding agent instead of Portland cement.
They are similar to the more familiar gypsum plaster, anhydrite being an industrial by-product, whilst gypsum is a naturally occurring mineral. They are all proprietary products.
Both anhydrite and gypsum-based screeds are usually pump applied by factory, trained and licensed personnel and are thus more likely to be met on large floor areas of new build or refurbishment. Claimed advantages over sand/cement screeds are that they are single component, free-flowing, self-levelling and particularly quick-setting.
They can be laid as bonded, unbonded or floating screeds, at thicknesses down to 30mm.
Screeds based on calcium sulphate can lose strength if they become damp, so in most cases it is not appropriate to install a surface damp proof membrane on them.
Suppliers need to be aware that manufacturers differ with regard to their recommendations and it is essential that clear directions are given to the installer.
Furthermore, there is currently no recognised British Standard method for testing the moisture in calcium sulphate based screeds and manufacturers tend to recommend the Gas Bottle Carbide method.
Unfortunately there is no correlation between relative humidity percentage obtained by using a hygrometer and moisture content percentage using the Carbide Method.

Nonetheless, floorcoverings must not be bonded to these products until those responsible for the design and construction of the subfloor have ensured that the Relative Humidity is 75% or less and that the manufacturers recommendations concerning whether or not to use primers have been specified and followed.
The screed must be laid over a DPM, the surface ground and the dust removed by vacuuming before any primers are applied.
In the presence of moisture, cement and calcium sulphate react to form ettringite, a weak/powdery product. Applying cement based smoothing compounds direct to anhydrite or gypsum screeds will result therefore in subsequent failure of the floor covering installation.
When anhydrite or gypsum floors are to be levelled or repaired, smoothing compounds must only be applied over priming systems recommended by the manufacturer, to floors that will never become damp.

**MASTIC ASPHALT**
Asphalt is a naturally-occurring or man-made mixture of bitumen, a waterproof non-crystalline and semi-solid or viscous mixture of hydrocarbons, and an inert mineral aggregate, eg limestone. Mastic asphalt is the term used for the material as used in the construction industry.
The British Standard's definition of mastic asphalt are: A type of asphalt composed of a suitably graded mineral matter and asphaltic cement in such proportions as to form a cohesive, voidless, permeable mass, solid or semi-solid under normal temperature conditions, but sufficiently fluid when brought to a suitable temperature to be spread by means of hand float without compaction.

**MATERIALS USED IN MANUFACTURING ARE:**
Asphaltic cement, which consists of bitumen, lake asphalt, asphaltite or blends of these with one another or with flux oils.
Fine aggregate, either natural rock asphalt, limestone naturally impregnated with bitumen and mined or quarried in that form, or limestone which is crushed to a fine powder.
Coarse aggregate: either crushed stone (eg granite or limestone) or naturally occurring siliceous material, e.g. grit.
The mass of mastic asphalt varies according to proportions of its constituents. For practical purposes, the mass can be taken to a 2.4kg/$m^2$ per mm of thickness.
In addition to its proof against water, mastic asphalt is rot-proof and resistant to vermin attack.
It is a natural material and is odourless. Professionally designed and applied, it is capable of lasting more than half a century.
Blending of bitumens and the selection and grading of aggregate all require a high degree of technical expertise.
Mastic asphalt becomes malleable on heating. Easily applied, it is worked by hand float to any shape or configuration horizontally, vertically or on inclines.
Mastic asphalt is equally appropriate for industrial, commercial and domestic needs, and the composition can be adjusted to resist attack by chemicals and acids, and coloured finished provided.
A range of grades has been designed for specialised needs, for example, spark-free flooring, flooring for sports halls, for Post Office sorting halls - even one to counter transmission of skin conditions, for use in pit-head baths.
Its weatherproof qualities commend its application as flooring where a concrete base is laid on sub-soil, and also as an underlay for other floor finishes.

**CHIPBOARD**
Wood chipboard for contract flooring shall be moisture resistant.
Boards coated with wax, polyurethane or any other impervious seal should not be used for floors which are to be covered with a bonded floorcovering.
Where boards incorporating special treatments, e.g. for fire resistance, are to be used, the compatibility with both the adhesive and the floorcovering should be checked by consultation with the manufacturers prior to installation.

**STRUCTURAL CONSIDERATIONS**
Provision shall be made for floor loadings in accordance with BS6399 as appropriate to the occupancy of the building. Design shall be based on stress figures published by the Institute of Structural Engineers or on proof of performance provided by the manufacturer.
Floors subjected to heavy loading or abnormal concentrated loads should be designed by a corporate structural engineer or be tested in accordance with the procedure for prototype testing given in BS5268.

**BOARD LAYING**
Boards shall be laid with the long edges at right angles to the joists or battens. Short edges shall lie centrally on a joist, batten or noggin and shall not cantilever. Boards shall be laid with the cross joints staggered and all joints shall be tightly butted together.

**FASTENING**
The chipboard shall be fastened firmly to joists or battens with No 10 gauge annular grooved (ring-shanked) nails having flat heads (punched just below the surface) and a length of not less than 2.5 x thickness of the chipboard. Alternatively, No 8 gauge woodscrews (countersunk just below the surface) may be used.
Suitable self-tapping screws or rivets may be used to fix metal section supports. Spacing between fastenings shall not exceed 300mm along supports to board edges and shall not exceed 500mm for intermediate supports. No fastening shall be closer than 9mm from the edge of the panel.
All tongue and groove joints shall be glued with a PVA adhesive and the points closed firmly.

**PROVISION FOR EXPANSION**
An allowance shall be made for the possibility of expansion of the chipboard in the event that it may pick up moisture after laying and fixing in place.
An expansion gap (minimum 10mm) must be provided between the edges of the floor and the perimeter walls and at any solid upstand such as columns, hearths, etc.
This may be omitted for timber frame walls and lightweight partitions where the floor may continue beneath the framework.
Perimeter expansion gaps shall be covered by a skirting or other approved detail which allows the chipboard free lateral movement.
In long, narrow corridors, intermediate expansion gaps shall be provided at 10m intervals.

**ACCESS TRAPS**
Traps formed for services shall be close fitting and supported on all four edges to finish flush with the adjoining floor. They shall be fixed with brass countersunk screws in ring cups, unless otherwise detailed.

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**UNDERFLOW SUPPORT**
Support for the chipboard flooring panels shall be provided in one of the following ways:
**Timber joists/metal section beams:** having a flange width not less than 50mm to allow for adjacent flooring boards, forming a butt joint, to be individually fixed to the support.
Their depth shall be appropriate to the span, Their spacing shall be appropriate to the thickness of the chipboard, having regard to the imposed loading. (See Structural considerations).
**Wood battens:** having a minimum section 36mm deep and 50mm wide fixed to a level rigid base or resting on an insulating quilt, with full support along their length, to provide a floating floor.
**Semi-rigid insulating underlay:** having a minimum thickness of 19mm, fully supported on a level rigid base to provide a floating floor. Suitable materials are expanded polystyrene ISO or SD/N grades to BS3837 or insulating board (softboard).

**VAPOUR CHECK**
In ground floors, an effective damp-proof membrane shall be incorporated in the construction. In addition, a vapour check shall be provided to the underside of the chipboard (1000 gauge polythene sheet or other approved vapour barrier) lapped 150mm at the joints and taped, then upturned 38mm around the perimeter of the floor.
**Storage and conditioning:**
When delivered to the site, boards shall be stored in a dry condition, piled flat on a level surface, clear of the floor, to avoid distortion. If delivered in polythene wrapping, the packs should not be broken open until the boards are required for laying.
Boards shall be 'conditioned' on site by loose-laying them individually or loose stacking them in the area where the floor is to be laid, for three days before fixing.
Boards should be fixed in temperature and humidity conditions approximating in those likely to be encountered during service.
Boards should not be laid in new buildings until all wet trades are completed and the building dried out. In no case should boards be laid with a moisture content above 15% or below 7%.
Failure to comply with moisture content recommendations and site condition requirements may result in shrinkage or expansion of the boards which will in turn distort the floorcovering.

**APPLYING SURFACE COVERINGS**
Floorcoverings should be laid in conditions approximating to those likely to be encountered in service. The moisture content of the chipboard, measured by an electrical resistance moisture meter, should be in accordance with the following table before floorcoverings are laid:

| Service conditions | Acceptable moisture content: |
|---|---|
| Full, continuous central heating (24 hours a day) | 7-9% |
| Intermittent central heating (day heating, night off) | 9-10% |
| Traditional heating (open hearth etc.) | 11-12% |
| Unheated | 13-15% |

When installing chipboard you should ensure that:
- The surfaces are clean and free from particles;
- There is no movement at the joints and that jointed surfaces are flush;
- All tongued and grooved joints are glued;
- No fastenings project above the surface of the boards

**PLYWOOD**
Plywood shall be of a grade Good One Side (GIS) Specification CSA 0121 Sanded.

1. Boards are tongued and grooved along long edges, size 2400mm x 1200mm, minimum thickness 15.55mm.
2. Lay boards with long edges at right angles to joists, short edges must have solid bearing on joists.
3. Fixing is to be carried out using annular-ring shanked lost head nails, of length 2.5 times the board thickness, at 300mm centred along all joists.
4. Joist centres up to 600mm: use 15.55mm boards. For 500mm spacing, use 18mm boards.
5. Since wood based products change dimension with changes in ambient humidity, the boards should be placed in position and allowed to condition prior to final fixing. All joints should be butted together.
6. With suspended timber at ground floor level, it is of vital importance that thorough ventilation beneath the floor is secured through the use of air bricks.

**NARROW TONGUED AND GROOVED BOARDS ('FLOORBOARDS')**
Even in new installations using the traditional tongued and grooved floorboards, it is unlikely that the surface finish will be suitable to receive the thinner floorcovering materials, such as sheet vinyls. These surfaces should be lined with plywood or hardboard before laying the floorcovering (see below).
Where this type of boarding is to be covered with a soft floorcovering, e.g. carpet on an underlay, then the boards should be free of bumps and projecting nailheads etc. Any gaps or depressions should be filled with a suitable filler.

**SPECIAL TREATMENTS**
It should be noted that certain treatments, either those applied on-site or those applied by the board manufacturer, may interfere with subsequent adhesive bonding operations. Such treatments would include moisture proofing, preservatives and fire retardants.

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**EXISTING TIMBER BASES (SUSPENDED)**
All existing floorcoverings and underlays should be removed and the original boarded floors brought up to a continuous, even and smooth surface by overlaying with 8mm plywood of exterior grade WBP. In certain situations, a 4mm exterior grade WBP plywood may be used. If this reduced thickness is employed, it is recommended that the advice of the floorcovering manufacturer be sought. The following procedure is advised:

1. Refix all loose boards, any worn or broken should be replaced. High spots should be sanded down. Slight hollows should be filled with a suitable smoothing compound, bad boards should be replaced.
2. Overlay with plywood sheets, leaving a gap of 1mm at all edges for expansion. Rx using divergent staples or ring shanked nails at 100mm spacing around the edge with a fixing line 12mm from the edge and at 150mm intervals throughout the entire area of each board.
3. In some situations, as a lower quality alternative to plywood, hardboard maybe used, not less than 3.2mm thick.
4. It should be noted that hardboard is subject to excessive expansion when in contact with moisture and needs to be conditioned before application. This is achieved by wetting with half a litre of water on the meshed side of the board and then stacking overnight before fixing. Once fixed boards must be allowed to dry fully before coverings are installed. Fixing of hardboard should be as for plywood.

**RAISED ACCESS FLOORS**
A raised access flooring system installed as a bare panel will normally be either a wood (particle board) finish or steel, but other finishes may be encountered; steel surfaces must have an anti-corrosion finish.
Alternatively, the floor panels may have a factory bonded finish such as PVC (vinyl), needle punch, carpet, laminates, rubber, etc, or may be engineered to accept a textile finish that incorporates a location system. Sheet or broadloom materials should be avoided since this system is designed to give easy access to underfloor services.

**PROTECTION**
Where raised access metal clad panels supplied with adequate corrosion protection which requires all parts of the platform floor system to be installed free of rust, corrosion, rot or any form of deterioration and to be suitably finished so as to prevent such deterioration in normal use, the problems of oxidation or rusting should not occur.
Raised access floors are often installed before other trades have completed their work and temporary protection must be installed over the panels to sufficiently protect the surface. This is essential for a satisfactory installation.
Where metal clad panels are supplied with inadequate corrosion protection, it appears that they may rust whether or not floorcoverings are installed. However, trapping moisture under floor finishes, which is unable to evaporate off and allow the panel to dry, does appear to accelerate the corrosion process.

**WATER TIGHTNESS:** Unfortunately, many raised panel floors are installed far too early in the construction process, due to inadequacies in the programme or progress, sometimes even before the building is watertight. Those supervising the construction process should ensure that this does not occur and must not leave the flooring contractor to resolve the problem.

**RESIDUAL CONSTRUCTION MOISTURE:** Installing floor coverings onto raised panel floors does not, in itself, require hygrometer readings to be taken, but retention of moisture in the structural slab and in the plenum (the space between the raised panel floor deck and the structural slab) is often a primary source of moisture which causes problems and which must be avoided.

**WET EXTRACTION AND SPILLAGE:** It is almost inevitable that during the life of a floorcovering, on raised panel floors, that wet spillage and wet extraction cleaning will occur. Where panels are adequately corrosion protected, problems should not occur.
However, it should be noted that wetting of the floorcovering may be deemed to be a contributory factor to any subsequent problems.

**ADHESIVES:** There has been considerable discussion in the industry regarding the use of adhesives in relation to the rusting of raised panel floors. The fact remains that where suitable adhesives are correctly applied to adequately protected panel floors the problem does not arise.
Tackifier adhesives should be carefully applied from a tray using a roller and the penetration of the tackifier between the edges of the panels must be avoided to prevent adjacent panels bonding together.
The film of tackifier should then be allowed to dry before the floor finish is installed. This will ensure that excess moisture is not trapped beneath the floor finish and will also avoid the possibility of a permanent bond. Under no circumstances should the tackifier adhesive be poured directly onto the floor.

**SUMMARY:**
Further detailed information regarding all aspects of Contract Floorcovering Installation can be obtained from the Contract Flooring Association 'CFA Guide to Contract Flooring'
www.cfa.org.uk