Terraces are structural elements exposed to outside weather and subject to structural movement, humidity and temperature changes that can be abrupt.

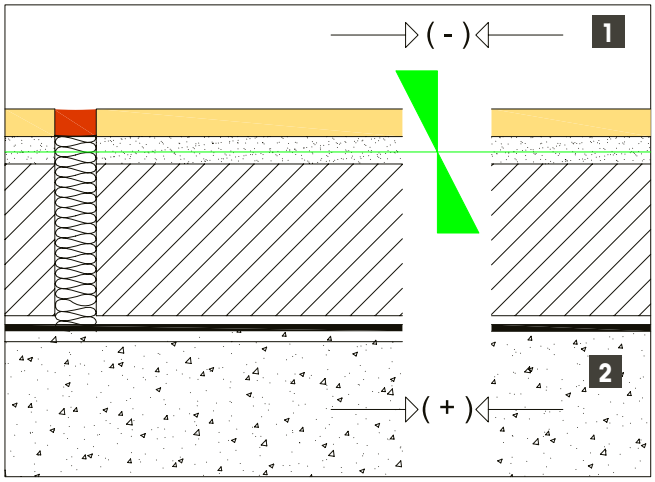


Fig. 1 **1** less movement **2** greater movement

Each material used in the construction has a different expansion coefficient, which causes there to be movements that can create tension.

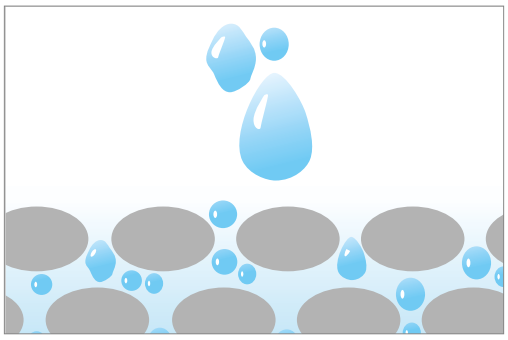
For example, a 10-foot-long terrace with a heat impact of 50°C (a night thunderstorm on a terrace that has been in the full sun in summer, can have this change in temperature) will be subject to a movement difference between the ceramic surface and the grip base of 4 or 5 mm.

A well-executed terrace, paved with porcelain tiles using mortar, waterproofing, tile adhesives and special exterior grouts withstands the test of time even in extreme climates.

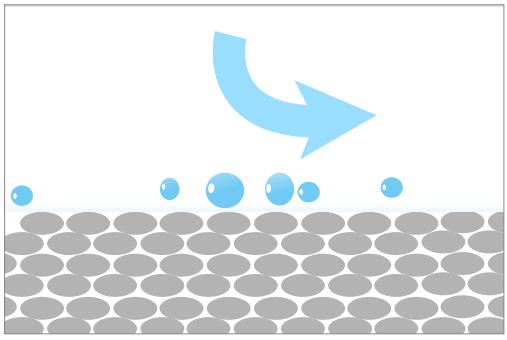
In order to obtain a **flooring that is resistant to frost** and **thermal impact,** it is necessary to consider four basic aspects of outdoor construction:

A - Use a porcelain tile that meets the **frost regulations.**
B - Carry out proper **water drainage**
C – Respect the **expansion joints**
D – Use a **fixing and grouting materials** specialy for outdoors

A - THE ANTI-FROST TILE



Other ceramic paving tiles: the low compaction of the mass allows the penetration of water into the pores and capillaries, which, upon freezing, may damage the tile.



Rosa Gres porcelain tile: the extreme density of porcelain tile prevents water from penetrating the tile through any of its sides.

This meets the ISO 10545-12 standard developed by ISO (International Organisation for Standardisation). The standard covers the test method for determining the behaviour of a ceramic tile when subjected to 100 cycles of freezing / thawing.The test consists of immersing the ceramic tile in water, subjecting it to freeze / thaw between -5° C to +5°C.

Resistance to freeze / thaw is an essential parameter for assessing the durability of a tile designed for outdoor areas.

Rosa Gres porcelain tiles comply with the ISO 10545-12 standard for frost

B - WATER EVACUATION

It is important to drain the water properly to give a natural exit to rain water and to prevent puddles. We recommend the following:

1 There must be a minimum slope of 1.5 to 3%

2 Place the channels and drains needed. (See p. 34)

3 Waterproof and drain the flooring correctly to prevent ground water rising due to capillarity, with the possible migration of salts to the surface.

4 Create the movement joints properly and seal them with an impermeable polyurethane mastic, such as **SELLALASTIC.**

5 Grout the tiles with a flexible waterproof CG2 class mortar, such as **EUROCOLOR FLEX**.

6 Maintenance: ensure that drains are clean and the joints are in good condition.

Make load bearing walls to make the slopes

Terrace with the finished slopes before placing the tiles

Terrace made with *Mistery Blue Stone* 48.8 x79.2, where the slope is seen to the right.

C - JOINTS

PERIMETRAL EXPANSION JOINT

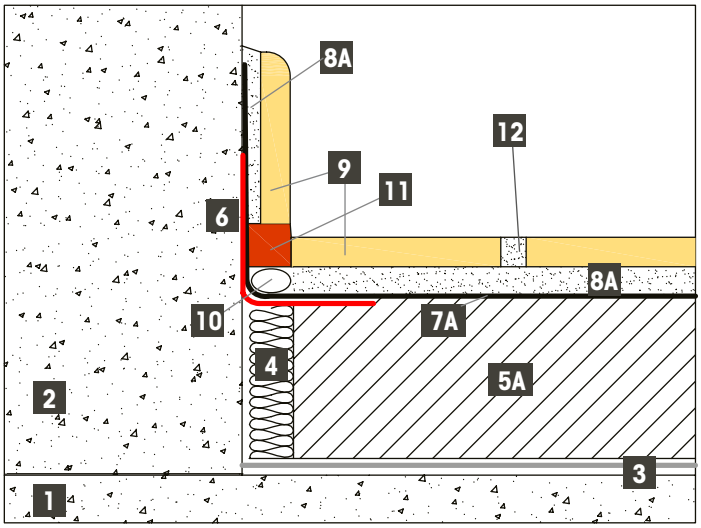


Fig. 2 **Option A** with elastic cementitious waterproofing such as **HIDROELASTIC** (recommended).

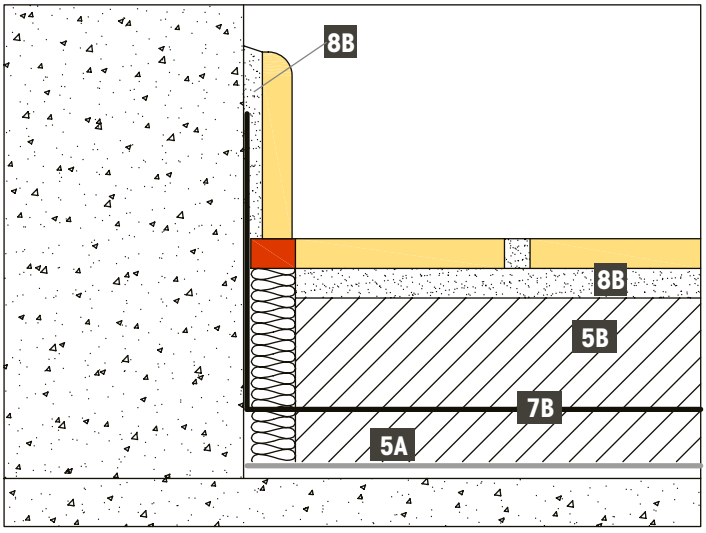


Fig. 3 **Option B** conventional with a waterproofing sheet such as asphalt or similar.

Make the entire perimeter of the terrace separate to the side walls of the building, in order to achieve independence of movement between the two.

1 Supporting structure (concrete)

2 Perimeter fence (concrete or site wall)

3 Seal layer

4 Expanded polystyrene type filler, porexpan

5A Mortar screed for the slopes, such as **RECRECEM PRE-MIX**

5B Mortar compression layer, such as **RECRECEM PRE-MIX**

6 Self-adhesive sealing band, such as **FIX-BANDA**

7A Elastic cementitious waterproofing membrane, such as **HIDROELASTIC**

7B Waterproofing sheet, such as asphalt material or similar.

8A Special thin coating flexible tile adhesive to glue onto the waterproofing membrane, such as **TECNOCOL FLEX** (C2 T S1)

8B Flexible thin coating tile adhesive to glue tiles outside, such as **TECNOFLEX** (C2 TE S1)

9 **ROSA GRES** porcelain tile anf plinth.

10 Bottom of the expansion joint, such as **SELLALASTIC FOAM**

11 Polyurethane elastic putty, such as **SELLALASTIC**

12 Mortar for the construction joints, such as **EUROCOLOR FLEX** (CG2 W Ar)

EXPANSION JOINTS

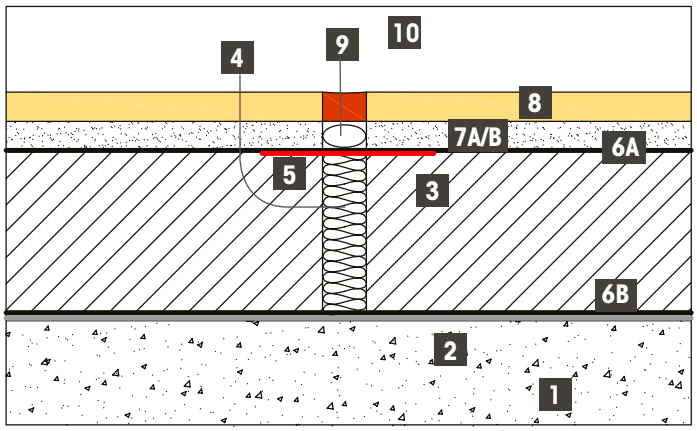


Fig. 4

DESIGN OF THE SURFACES

The layout of expansion joints depends on the size and the floor layout of the coating surfaces

Joints must be made every 16-25 m^2

Slab sectors should be shaped as squarely as possible

The width of the expansion joints must be a minimum of 10 mm

The width of the expansion joints must always be greater than their depth

Expansion joints should be sealed with elastic mastic, such as **SELLALASTIC**

Create expansion joints every 3-5 metres.They must be flexible, waterproof, well glued and must reach up to sliding surface.

We should also:

- Respect the building's structural joints.
- Avoid surface areas larger than 25 m^2 or 5 linear metres without releasing tensions.

1 Supporting structure (concrete).

2 Seal layer (plastic sheet or similar)

3 Mortar screed, such as **RECRECEM PRE-MIX**

4 Expanded polystyrene type filler, porexpan.

5 Self-adhesive sealing band, such as **FIX-BANDA**

6A Elastic cementitious waterproofing membrane, such as **HIDROELASTIC**

6B Waterproofing sheet, such as asphalt material or similar.

7A Special thin coating flexible tile adhesive to glue onto the waterproofing membrane, such as **TECNOCOL FLEX** (C2 T S1)

7B Flexible thin coating tile adhesive to glue tiles outside, such as **TECNOFLEX** (C2 TE S1)

8 **ROSA GRES** porcelain tile

9 Bottom of the expansion joint, such as **SELLALASTIC FOAM**

10 Polyurethane elastic putty, such as **SELLALASTIC**

SLIDING LAYER

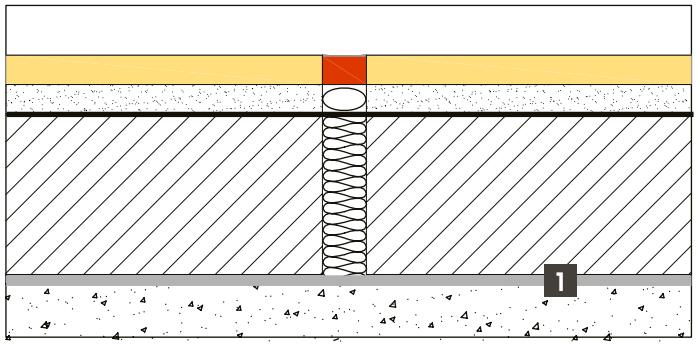


Fig. 5

It is advisable to place a sliding layer between the screed mortar and the floor slab when temperature changes are anticipated. In this case, the sliding layer is made using a plastic sheet or similar.

1 Sliding layer (plastic sheet or similar) Seal layer (plastic sheet or similar)

TERRACE FINISHES

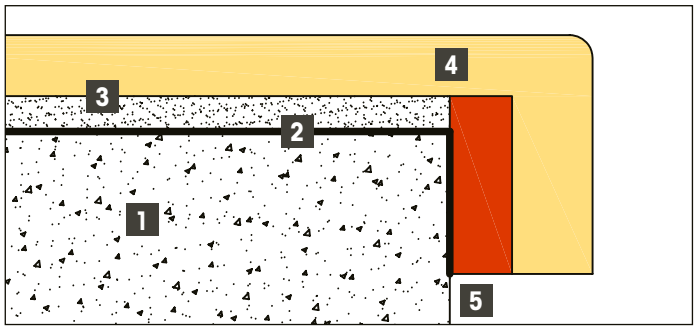


Fig. 6

The edges of the pieces should not be glued to the structure on terraces in order to avoid breakage of the tile caused by the expansion of the concrete.

1 Concrete or screed mortar

2 Waterproofing membrane, such as **HIDROELASTIC**

3 Fine layer adhesive cement such as **TECNOCOL FLEX** (C2 T S1), special to fix on waterproofing menbrane

4 **ROSA GRES** trim pieces

5 Polyurethane elastic putty, such as **SELLALASTIC**

The **Structural joints** of the floor slab must be respected, as the terrace is the area where most movement is produced.

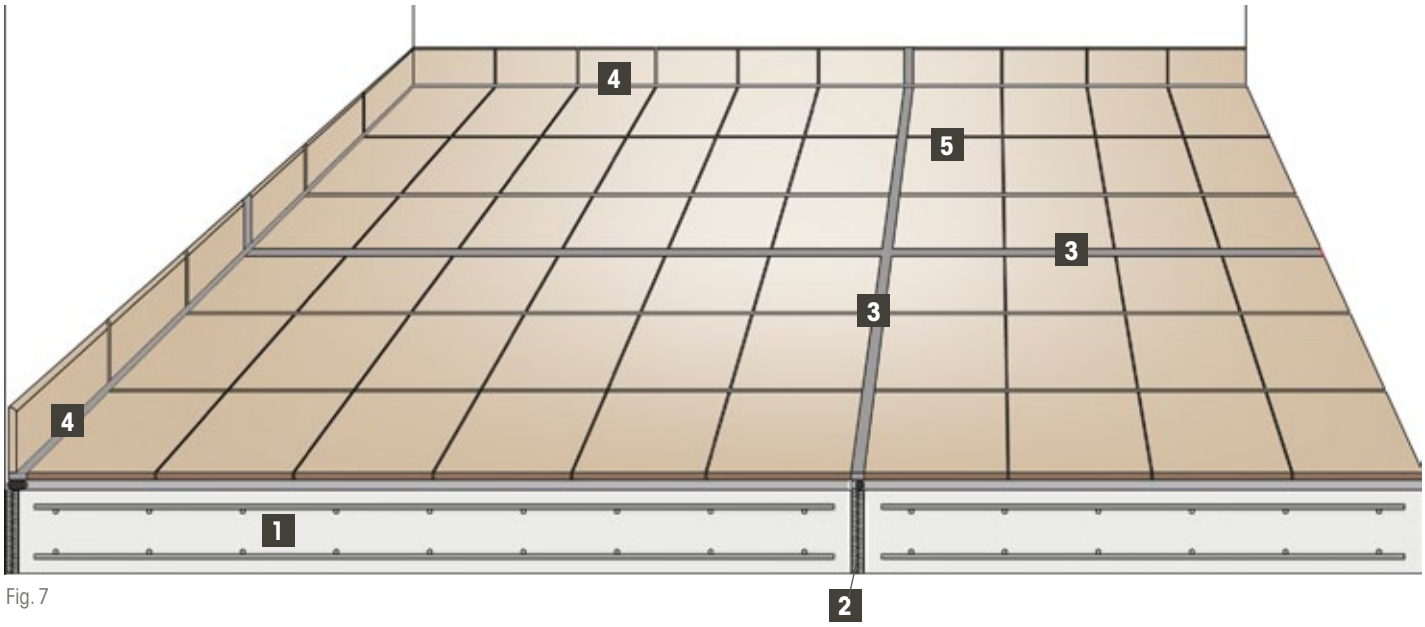


Fig. 7

1 Floor slab **2** Structural joint **3** Expansion joint **4** Perimeter joint **5** Tiles Joint

D - FIXING AND GROUTING MATERIAL

CHOICE OF TILE ADHESIVE

Use a tile adhesive according to the type of ceramic tile that has enough features for adhesion, flexibility and water resistance, which make it resistant to frost.

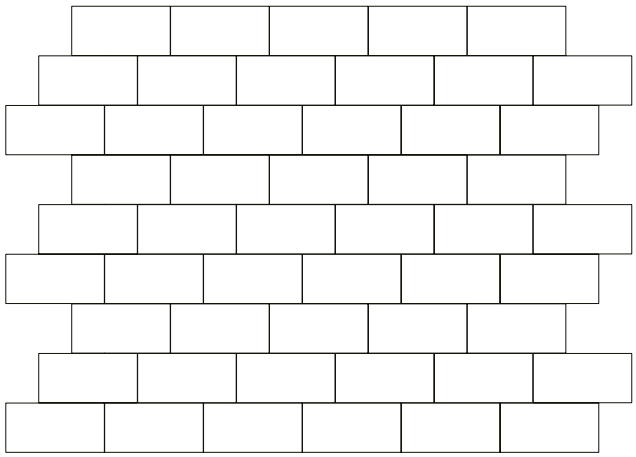
Porcelain tiles require a special adhesive cement for this type of tile, which also needs to be flexible to endure the temperature changes of an outdoor terrace. We will use **TECNOFLEX** (C2 TE S1) type cement glue or **TECNOCOL FLEX** type (C2 T S1) (if going on top of a waterproof membrane, such as **HIDROELASTIC**).

GROUTING MATERIAL

The material for grouting the joints should be the same, high adhesion to the ceramic tile and support, waterproof and basically high flexibility. We recommend a minimum joint of 2mm.

In this section we highly recommend the use of joints prepared for this of a CG2 W Ar class such as **EUROCOLOR FLEX.**

INSTALLING



This should always be undertaken in suitable weather conditions, ie:

- Temperatures between +5°C and +30°C
- Do not apply when there is a risk of night frost
- Take care of direct sun during hot periods
- Do not apply when raining

We recommend an on-site layout of the pieces before starting the installation.

When using rectangular formats, we recommend to install them with a continuous joint alignment. Should you wish to install a staggered or brick pattern we advise moving them by no more than a third of the tile's length.

Paste the porcelain tile only with cement adhesive that is flexible and suitable for outdoor porcelain tiles of a C2 TE S1 class such as **TECNOFLEX**.

Use the double-spread technique, and press or hit the piece to ensure minimum contact of 90%.

Carefully follow the manufacturer's directions (amount of water in the mixture, stirring time, useful life ...).

When installing with a thicker layer, a class C2 T S1 adhesive such as **TECNOFLEX CAPA GRUESA** must be used.

CLEANING AT THE END OF THE WORK

- After the placements have been finished, it is essential to remove all traces of grip and grouting material that may remain on the pieces, including surface screen. If not, the dirt will cling to these remains and it will be very difficult to remove with everyday cleaning.
- Do not use products that can damage the joints. If not the the excess grout will dirty the flooring even more.
- Do not use detergent with wax in its formulation, the daily dirt under it will will make it impossible to eliminate it.
- Do not clean with hard water because salts will be deposited on the flooring.
- The use of hot water in the cleaning greatly facilitates the process.

For more information, see pg. 32