

**GRID PAPER**

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### Isosceles square vs scalene square

As an architect, I have always used grid paper, and I have always used it a lot. So much so that now, at my age, I have decided to write a text about this squared paper that has helped me so much in designing. I think it can help students of architecture to manage their projects. Some people see me as an architect who does everything in straight lines, orthogonally. Square-headed, some say. I blame it on the squared paper.

I was somewhat taken aback to see how graph paper is defined by Google in Spanish as "a tessellation of the plane with congruent squares" –what a thing to say! And if you read on, you would be even more astonished.

Some time ago I wrote a text titled "The Brain is Square". At the time a prestigious scientific journal had published a report with images of how the connections of the human brain were straight and orthogonal, like a printed circuit board.

A tool used by some architects is called a square. Because of the square, the squared brain and the squared head. The Spanish Royal Academy defines a square as "a template of wood, plastic or other material, in the shape of an isosceles right triangle, which is used in delineation". And the set square is defined as "a template of wood, plastic or other material, in the form of a scalene right triangle, used in drawing". The isosceles square and the scalene set square. And while they are fundamental tools for any architect – of yesteryear? – it makes no reference whatsoever to architecture.

Of course, if you ask a high school student or a student of architecture today what an isosceles right triangle or a scalene right triangle is, they will look at you with infinite astonishment. Square? Set square? Isosceles? Scalene?

### THE GRID AS AN INVENTION

I have searched for, but cannot find, a date when grid paper first appeared in history. Logically, it must have been with the printing press. I can imagine the architect Juan de Herrera making his own squared paper to draw the outlines of El Escorial. Imagine what he would have given to have been able to have our grid paper?

It seems that the inventor of grid paper was a certain Dr. Buxton in England in 1795. And one of the first to adopt commercial graph paper was Thomas Jefferson, who as well as being president of the United States was an architect, who drew up the plans for the Capitol of Virginia on specially engraved "graph paper", originally intended for silk weavers, ordered from Paris. Cartesian, of course.

## MY GRIDS

Yesterday I was drawing the floor plan of my latest project on grid paper: a small house in La Rioja, which is an 8 x 8m square divided into four 4 x 4m squares. And next to it, on the same squared paper, I drew the floor plan of the only work of mine currently under construction, a house on the outskirts of Madrid, Rotonda house. The floor plan is square, 12 x 12m, divided into nine 4 x 4m squares. How original, some might say! Indeed, in many of my projects I still have the square brain I mentioned in the first lines of this text.

And the Square of the Cathedral of Almería, Palmería, a project dating back to 1978 and later built in 2000, was simply an interpretation of the structural layout of the buttresses of the Cathedral wall that presides over the square following the 7.5 x 7.5m grid of those buttresses, where I placed the 24 palm trees, all identical and all taller than the Cathedral. The result was not only square, but also logical, almost obvious, and very beautiful.

And the Inca building, Mallorca, 1990, was no more than the application of a 6 x 6m square grid to a plot of land in the shape of an isosceles right-angled triangle. Where there was a building, there were pillars. Where there were no pillars, orange trees. Very simple. The result is spectacular. Logical, simple and very beautiful. With the beauty that derives from order.

And, for the record, another of my latest projects – not yet started – is also gridded. A large concrete box tucked among the rocks by the sea, on the beach of El Tecuán, in Jalisco, Mexico, is arranged on a 7 x 7 m grid. I am working on it in collaboration with a wonderful young Mexican architect, René Pérez Gómez. The concrete walls and the thick square pillars and beams are also made of concrete. The interior is reminiscent of a Roman thermal bath. All square, all well-ordered. Very impressive and very beautiful.

## FROM SQUARE TO ISOTROPIC CUBE

In physics, isotropy is the characteristic of some bodies whose physical properties do not depend on the direction in which they are examined.

The term isotropic can be applied to a three-dimensional space which has the same value when measured in different directions. In the case of a cube, in all three directions. If there were no gravity, a person inside a cubic space would float like an astronaut.

Never fear, I am not thinking of doing or proposing anything strange. But I am again considering that sunlight, in relation to the six faces of a cube, moves in such a way that it touches all of them alternately. Except, that is, for the one that lies on the ground. So if we cut out suitable holes in the faces of this cubic space, we will always be able to let the sunlight in. It will be a space that testifies to the movement of the sunlight, which is constantly on the move.

I have experimented with this isotropic cube mechanism in some of my works. Recently in a tomb in Venice, and on a project for a New York museum, in the Robert Olnick

Pavilion of the Magazzino, with the young architect Miguel Quismondo. And in the initial sketches for both projects I have used grid paper. Of course, for Turégano House, which was my first cubic rather than isotropic project, I also used grid paper.

## FINALE

In short, the right angle has been, is and will continue to be a very efficient architectural tool producing marvelous results. By applying it, we can continue to pursue Beauty, which is what we are aiming to achieve, in order to make people happier. Underlying all this is the inescapable law of gravity that makes things continue to fall at right angles to the flat ground on which we humans stand and live, and where we try to be happy.