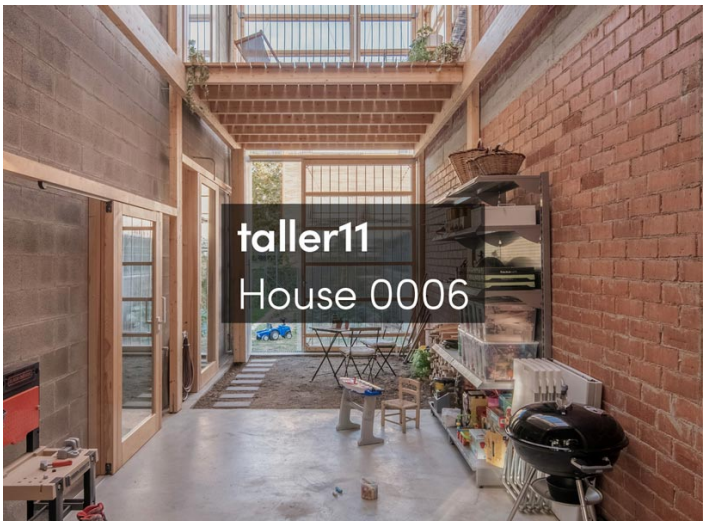

HOUSE 0006: MULTI-PURPOSE SPACES PROGRAM

Posted on September 15, 2023 by martabuges

Categories: Energy and sustainability, Middle Density, Project, taller11, Urban Paradigms

Tags: Alternative Domesticity, Circulation, Comfort, Context, Energy saving, Façade orientation, Flexibility, Insulation, Lightweight Materials, Local techniques, Low budget, Performative Envelope, Private housing, Project, Spain, Sustainability, Texture, Thermal inertia, Transparency, Volume

ISSN : 2575-5374

The project arose from the combination of the site conditions (a plot located in a residential fabric with houses between party walls, with existing constructions on just one side) and the program (a couple with two daughters who wanted two or three bedrooms plus multipurpose spaces). There was the additional challenge of working with a tight initial budget. Given these condition, along with the clients' demand for multi-purpose spaces in the house, the required living area was pre-dimensioned: the result fell well below the maximum permitted floor area (approximately 150 m2, as opposed to 270 m2 possible according to the building code, excluding the attic).

The design proposes to set back the interior space from the south-west party wall, maintaining the

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maximum permitted volume. This frees up a strip that has a favorable orientation, which functions as an intermediate space that improves living conditions in the interior. This gesture minimizes the climatized surface area to what is strictly necessary, reducing the cost of construction and offering a space with differentiated characteristics and uses with (variable) comfort at a low price.

ISSN : 2575-5374

This intermediate space is resolved using lightweight construction (transparency, absorption, fast response), whereas the interior spaces are based on wet construction (thermal inertia, stability, slow response). The interior enclosures and the staircase are also lightweight, facilitating future modifications, unifying the spatial perception of the whole and making the surfaces in contact with users friendlier to the touch.

ISSN : 2575-5374

Construction solutions that provide thermal inertia are incorporated to increase the accumulation of passively captured energy through the intermediate space. For economic reasons, in response to the local construction tradition, and to ensure the speed of execution, the structure of the interior spaces is resolved with mortar block masonry and the cavities are filled with compacted earth from the excavation. This results in a low-cost construction system with high thermal inertia and good hygrothermal performance, which also reduces construction waste. The wall that separates the two spaces in the house is not insulated and acts as an accumulator of incident solar radiation, which is

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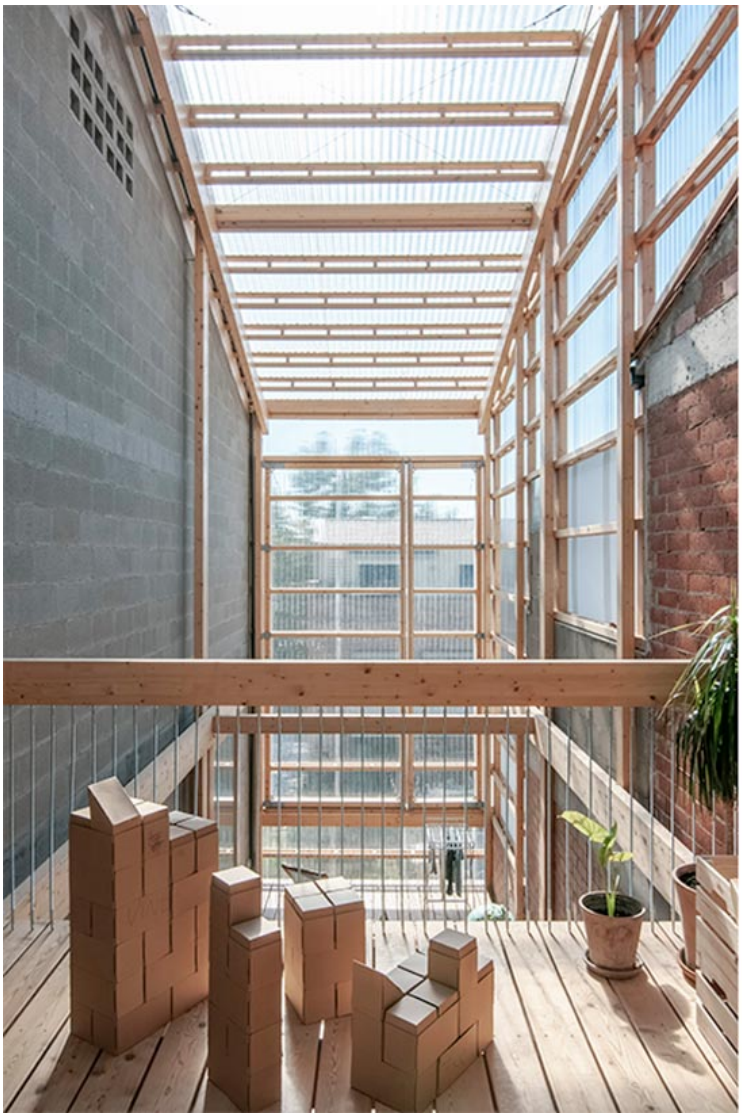
released it into the interior at night. The thickness has been calculated specifically for this function, ensuring that it compensates for energy losses.



The performance of the outdoor heat pump is improved by exchanging air from the intermediate space, which has a more favorable temperature than the outside, while also renewing the air in the interior space, reducing losses. In addition to this strategy, there are large openings on the SE façade, for cross-ventilation. There is also a thick insulation layer using wood fiber panels not only on the façades and roof but also on the NE party wall. The only air-conditioning system in the house is a

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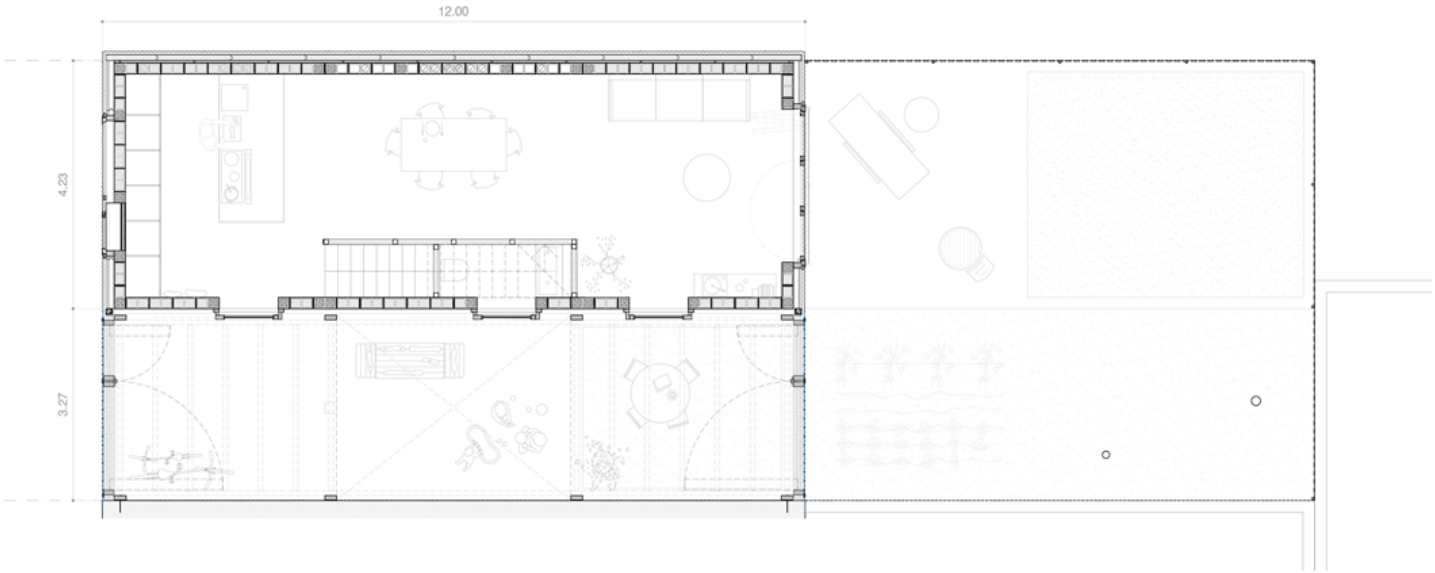
20 cm active concrete floor slab on the ground floor, which transmits heat through the mass of the floor slabs (formed by concrete joists and vaults) and the staircase (which can be divided into sections) into the upper spaces.



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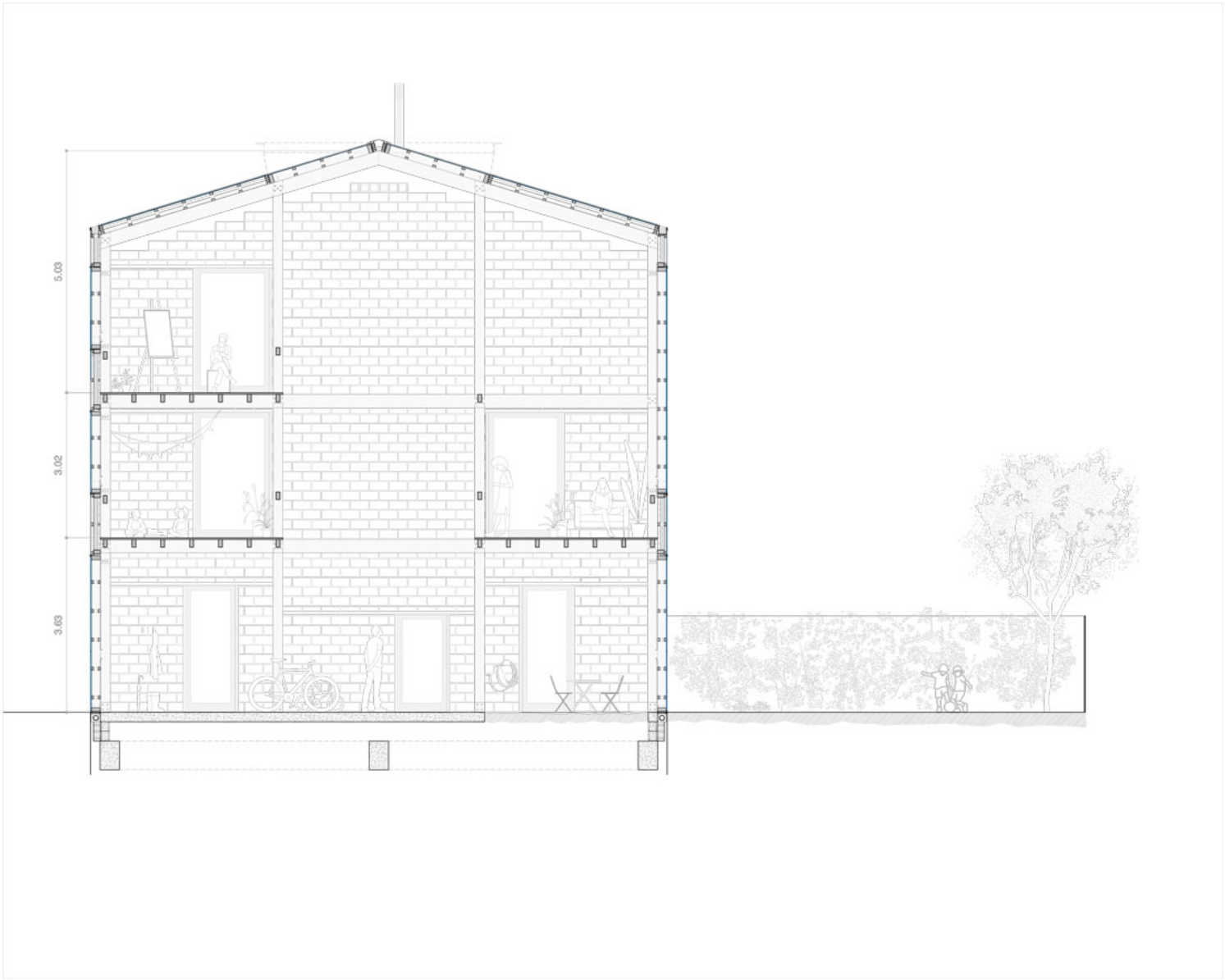

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