

La Mina, an extreme neighborhood in Barcelona.

Improving the accessibility, installations, equipment, and the building envelope.

Type of intervention

Restoration Rehabilitation / Renovation

Concerned elements on the intervention project

- 1. Foundations and underground structures
- 2. Vertical structures
- 3. Horizontal structures and vertical connections
- 4. Roof and terraces
- 5. Façade and building envelope
- 6. Finishes and completion elements
- 7. Integrate services
- 8. General strategies for building recovery

Site Barrio La Mina, Sant Adrià del Besós, Catalunya, Spain

Objectives To improve the access and accessibility of residential buildings as well as the facilities, installations and equipment, and performance of the building envelope.

Property Private

Designer Chief Architects: César Díaz & Emili Homías

Date 2003-2005



Background to the intervention

In the 1960s, Spain experienced a notable demographic increase in the cities due to the large rural-urban migration. As so many people settled in the cities, they were forced to grow and many of these cities were unable to meet the demand. Such is the case of Barcelona where, as there was insufficient housing supply, the new inhabitants were housed in slums. To address the situation, large blocks of apartments were soon built on the perimeter of the city. Thus, from 1968 thru 1974, La Mina arose, located in the municipality of Sant Adrià del Besós, adjacent to Barcelona and in contact with the city limits. Due to this origin, a stigma is generated around the neighborhood and the people who inhabit it, and for many years it became a marginal and conflictive neighborhood in the eyes of the citizens.



Fig.1: Slums of neighborhoods such as Campo de Bota and Pequín.

The construction systems used for these first residential buildings are different from what would be expected. Apart from using conventional techniques such as reinforced concrete porticos, some blocks, those that form part of La Mina Nueva, are built with formwork-tunnels, also made of

reinforced concrete. This is an innovative technique, for the time, which is intended to provide a solution to the problem of the excessive demand for housing. The formwork-tunnel consists of the execution of large pieces that are concreted on site. The formwork gives the shape to these elements, each one of them contains the slab and the walls that support it and when concreted at the same time, all these parts are united monolithically. This technique makes the flexibility of the floor plan layout difficult, since it depends on the location of these load-bearing walls. In any case, the use of this new technique, in this context, was useful and effective.



Fig.2: First inhabitants of La Mina.

In any case, the passage of time, poor maintenance and low incomes in the neighbors affected the state of several parts of the buildings. After all these years of disregard for the buildings, several rehabilitation actions are proposed in order to bring them up to current standards, including improvements in accessibility on the first floor and the provision of elevators.

Description of the building

The neighborhood is composed of several types of buildings grouped in two areas: the Old Mine and the New Mine. All of them are large isolated blocks of varying heights. Some 45% of these blocks are built using the formwork-tunnel method, which is not very common; the rest have an porticoed structure. They usually have a prefabricated concrete envelope and, some of them, with an exterior cladding of metallic sheeting. The blocks are very dense in housing, leaving little space even for the accesses. Some may have a passageway on the first floor and, as for the dwellings, they all have a similar layout.



Fig.3: Linear building characteristic of La Mina Nueva.



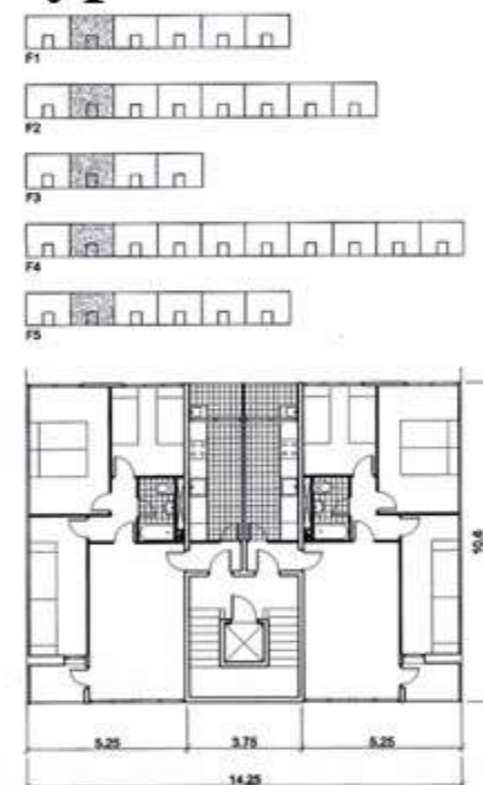
type B block



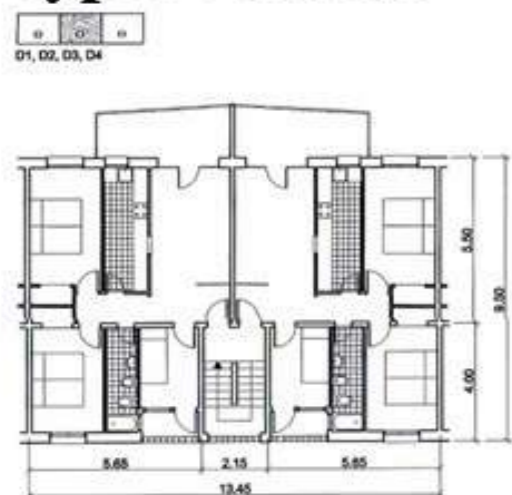
type C block



type F block



type D block



type E block

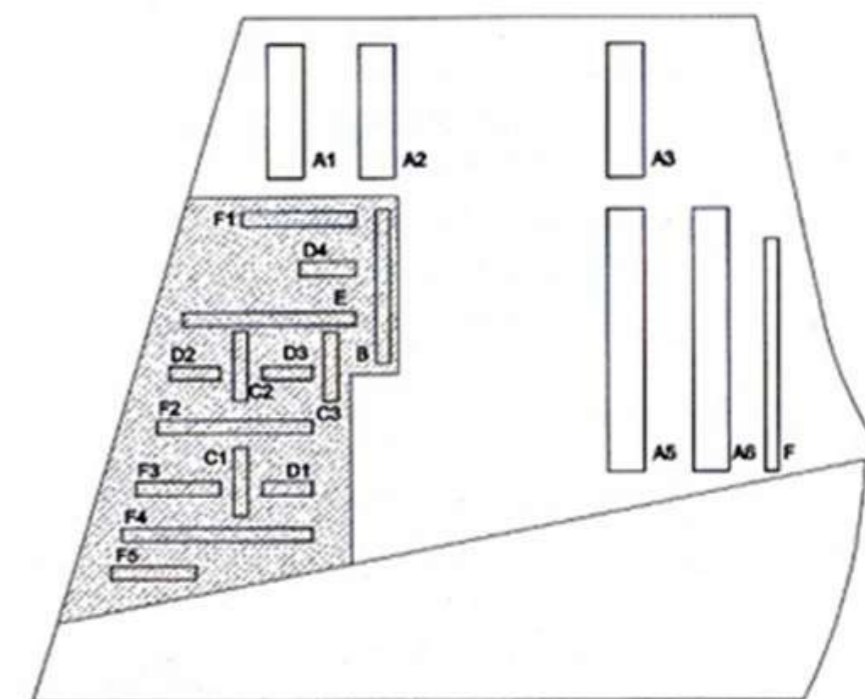
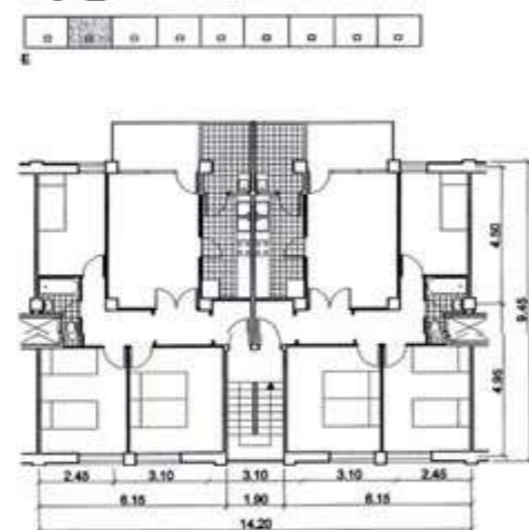


Fig.4: Typologies of the different buildings at La Mina Vieja.

The diagnosis of the building (values and state)

The passage of time and the notable lack of maintenance have significantly affected these housing blocks. It was necessary to analyze several aspects of the buildings in a technical diagnosis study carried out by the Polytechnic University of Catalonia, such as: installations, structure, envelopes, accesses, etc.

Broadly speaking, it was detected that there were deteriorated and poorly located installations, parts of the reinforced concrete were carbonated or with exposed reinforcement, surfaces and spaces with a high degree of wear and grime, and problems in terms of access and accessibility. The latter is the focus of much of the rehabilitation effort and is seen as a priority.

In the taller blocks of La Mina Nueva, the first floors of the buildings and the accesses to the vertical communication cores were remodeled. Originally, there was a corridor on the first floor that connected with the stairwells, which had been subdivided for safety reasons, creating an access for each of the two stairwells. This first old intervention had not been sufficient and there was still disaffection on the part of the neighbors as there was no collective appropriation by the neighbors of the accesses, which is why a rearrangement of the first floor was needed.

On the other hand, regarding accessibility, most of the residential blocks of the Mina Vieja did not have elevators, because at the time of construction it was not mandatory to place them. This, of course, made it difficult for all residents to reach their homes.

As values, we can highlight the efficiency of the concrete structures (both conventional and formwork-tunnel). Most of them did not require reinforcement or major intervention. In addition, the blocks as a whole complied with various

requirements and regulations, despite the fact that many of them predated them. Such is the case of the thermal and acoustic capacities which, even if they have undergone a small intervention in some cases, were not far from the requirements in force today.

Restoration and rehabilitation works

Of all the rehabilitation actions carried out, we will focus here on those related to improving accessibility, as this is a very typical and necessary rehabilitation intervention in large housing estates. Thus, we will center on access improvements (remodeling of the first floors) and the provision of elevators.

First of all, it is important to talk about the rearrangement of the first floors. In order to solve the problem of the large number of dwellings that each access has to serve (one for every 80), accesses from the street are added. As a result, the building has one for every 40 dwellings, thus seeking greater neighborhood involvement in the care of these common spaces. This intervention implies the purchase by the administration of premises on the first floor in order to generate the new accesses from there.

The remodeling of the first floors, in addition to being a functional solution, is used to rationalize the existing installations and to reinforce the roof slabs of the first floor patios, which were made of ceramic slabs, and to improve their watertightness.

Meanwhile, in order to solve the problem of accessibility, most of the buildings in the Mina Vieja did not have elevators. In all of them, elevators are added from the outside, with new volumes that give access to the original stairwell of the buildings. This exterior structure was built in 3 construction

phases, the first phase with a structure of in-situ concrete frames and phases 2 and 3 with metal profiles. The enclosures are made of prefabricated concrete panels bolted together.

Although there are several phases, it is intended that the image of the new elevators be uniform, in addition to modernizing the general image of the neighborhood.

Assessment of the results

First of all, with the above analysis and subsequent implementation of the proposal, it is concluded that the costs of continued maintenance over time are lower than those of a one-time intervention such as this one.

On the other hand, thanks to this set of interventions in the neighborhood of La Mina, a direct improvement in the quality of life of the residents of the area is achieved. Unlike many other proposals in the area that have ended up falling on deaf ears, this rehabilitation arises from an extensive prior analysis in order to prioritize which are the most urgent interventions and, therefore, how to obtain the greatest efficiency of the budget. Maybe the change that La Mina neighborhood needs goes beyond the installation of new elevators, but in the current context, it seems to be the most effective and necessary.

References

Díaz, C.; Cornado, C.; Vima-Grau, S. La adición de nuevos ascensores en conjuntos residenciales modernos del Área Metropolitana de Barcelona. In Proceedings of the Euro-American Congress on Construction Pathology, Rehabilitation Technology and Heritage Management, Universidad de Cantabria, Barcelona, Spain, 24 March 2020; pp. 2855–2862.

Díaz C., Cornadó C. (2021) Rehabilitation Operations in Residential Buildings in La Mina Neighborhood (S. Adrià del Besòs, Barcelona). In: Delgado J. (eds) Case Studies in Building Rehabilitation. Building Pathology and Rehabilitation, vol 13. Springer, Cham. https://doi.org/10.1007/978-3-030-49202-1_4

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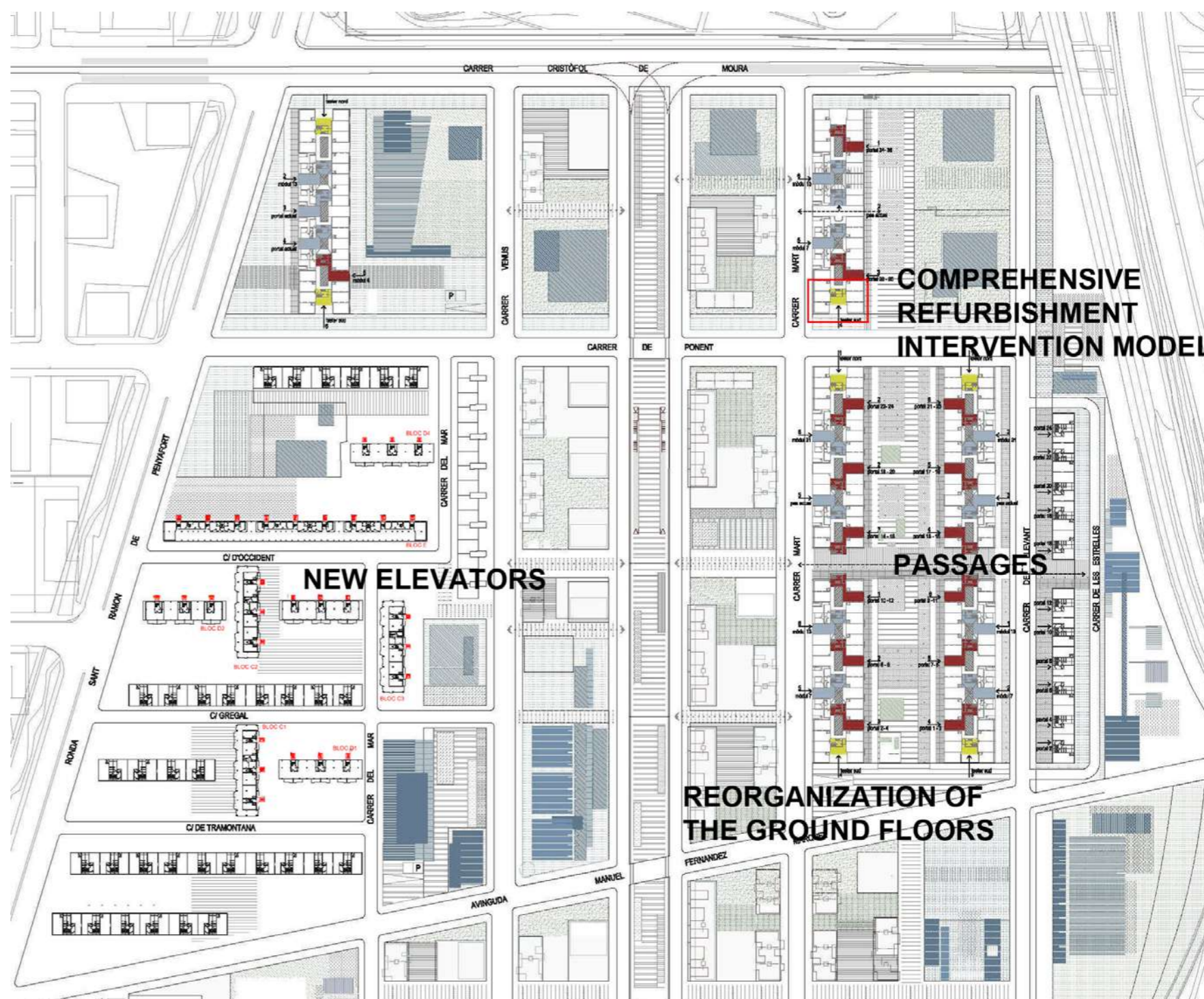


Fig.5: Rehabilitation actions carried out.

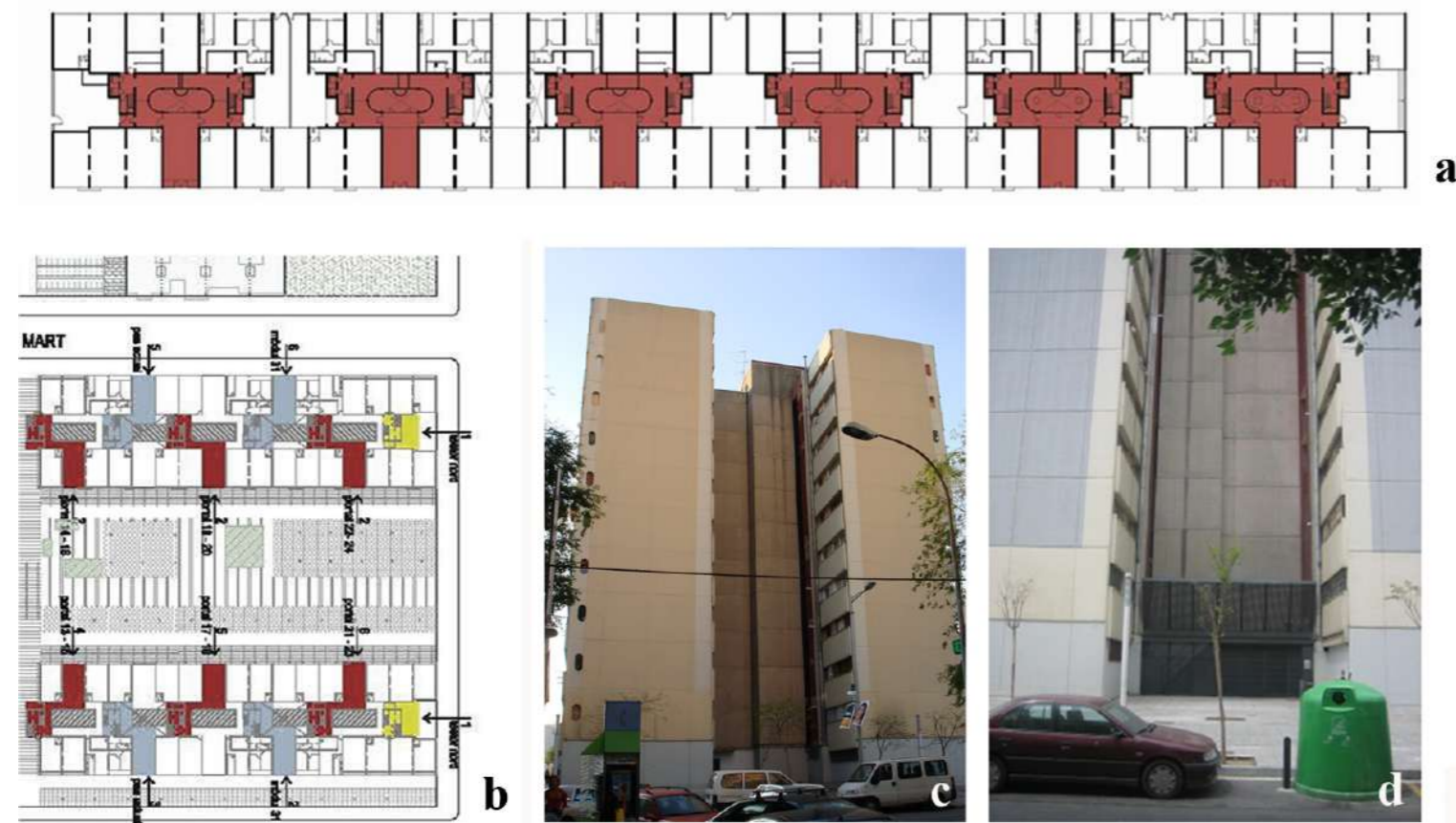


Fig.6: Incorporation of new accesses, rearrangement of first floor. a) and c) original. b) and d) with work completed.



Fig.7: Condition of the facilities prior to the intervention.



Fig.8: Design and execution of the refurbishment of the first floors at Mina Nueva.

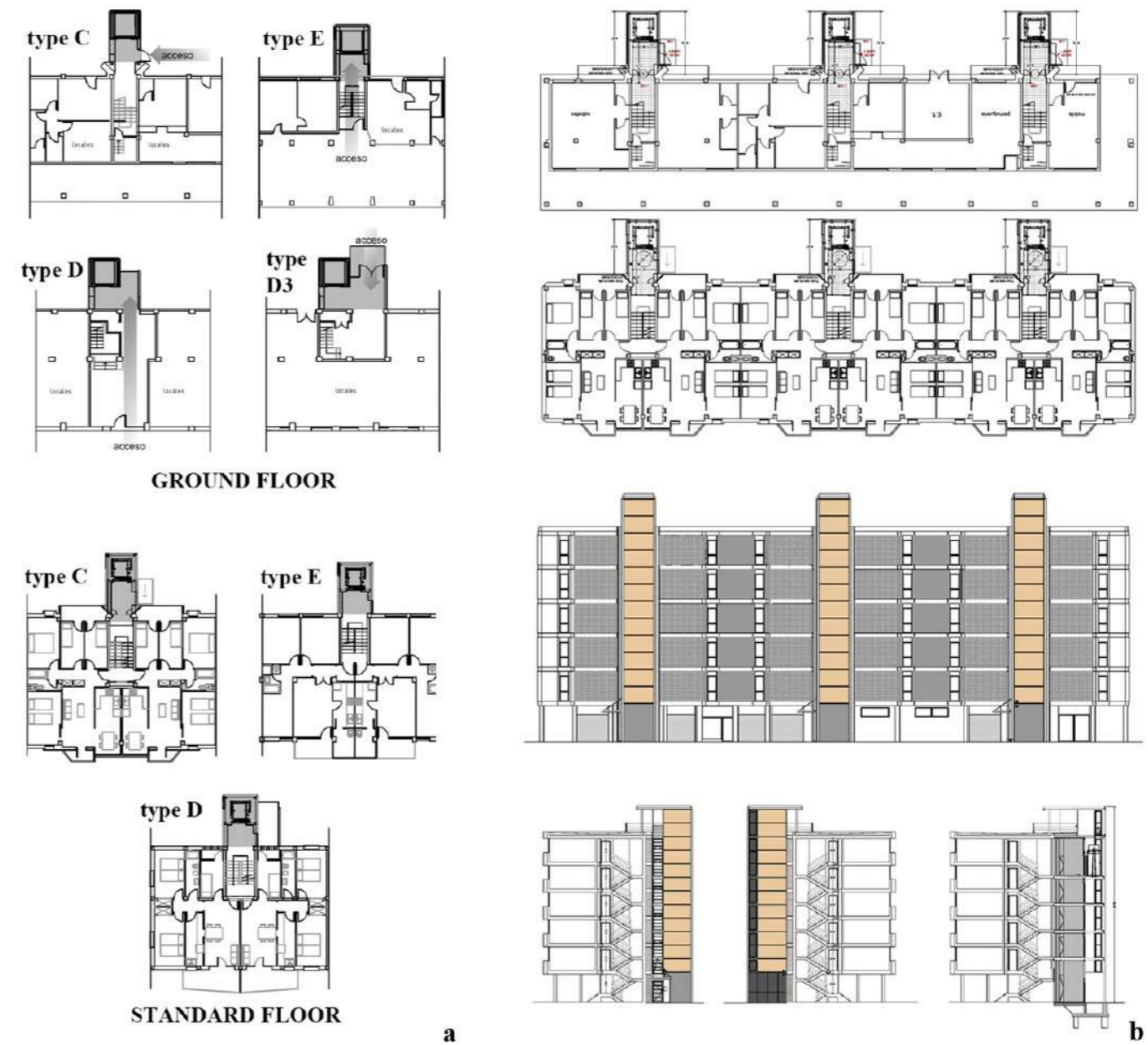


Fig.9: Addition of the structure to the different block types.

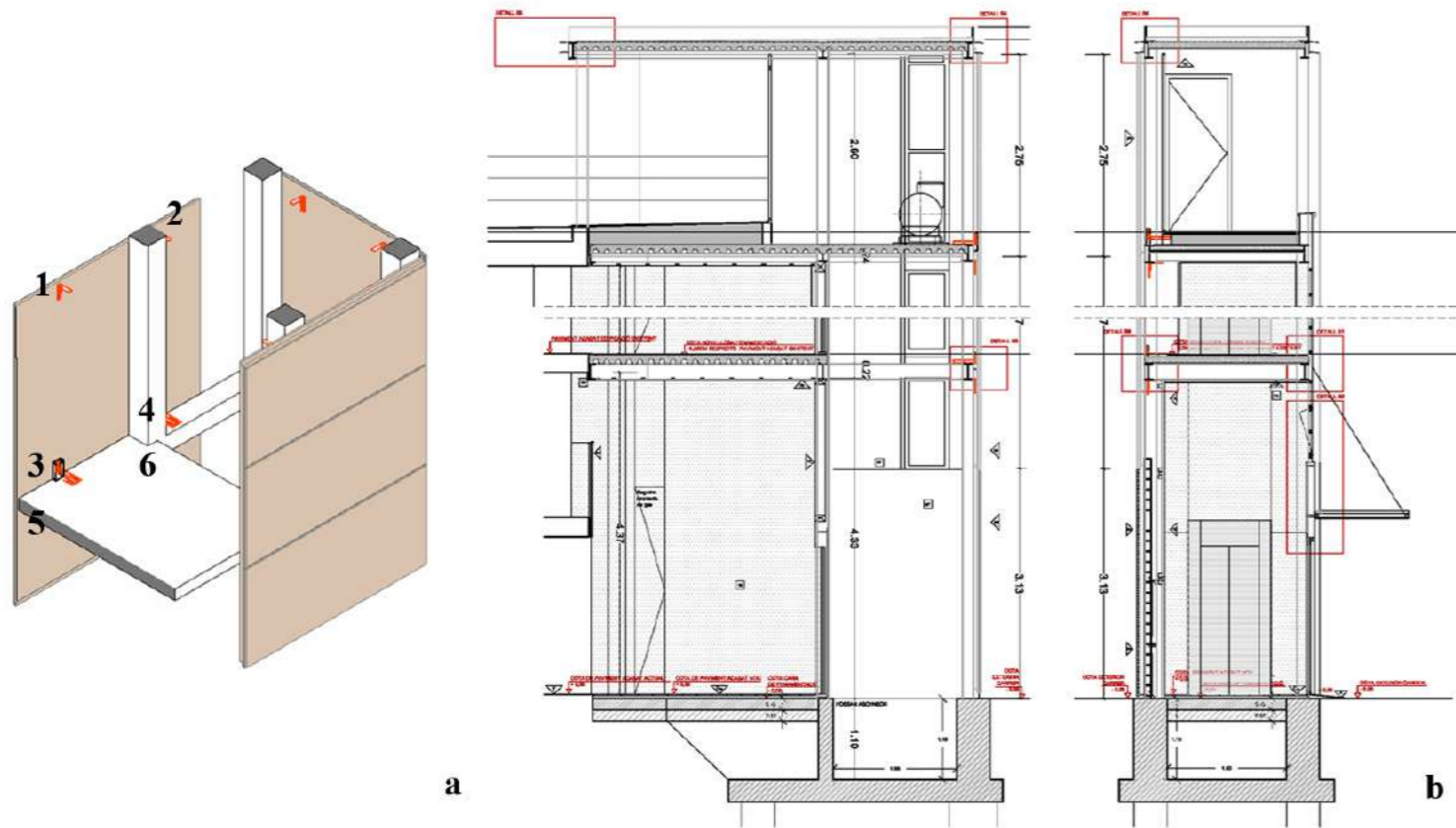


Fig.10: Detail of the joint between the new element and the existing floor slab.



Fig.11: Addition of the exterior structure containing the elevators.



Fig.12: Installation of the external enclosure of the elevators.



Fig.13: Interior of the elevator modules.



Fig.14: Exterior image of the elevator modules.