

Rehabilitation of an old paper mill to give it a new life as an interpretation center.

Rehabilitation of Cal Xerta Mill

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 Cal Xerta, Camí de Baix, 32, Sant Pere de Riudebitlles, Alt Penedès, Catalunya, Spain

Objectives Rehabilitation of Cal Xerta Mill as an interpretation center on the traditional paper industry.

Property Ajuntament de Sant Pere de Riudebitlles

Designer Taller 9s Arquitectes:
Oriol Cusidó and Irene Marzo

Date Master Plan: 2013; Phase I: 2016; Phase II: 2017;
Phase III: 2019.



Background to the intervention

An old paper mill that cut off perpendicularly the descent of the Camí del Baix, creating an important gorge on the way down to the Bitlles river and the passage to l'Altra Banda. Together with four others (Font mill, Cardús mill, Cal Ton del Pere and Cal Ròmul), it formed a group of urban mills in the middle of the village, which also offered a very characteristic façade overlooking the river. Its driving force, water, came from the Rec de la Vila. The building had been generated by the addition of various constructions from different periods, but following the typical form of a paper mill, with several floors in which the presence of numerous windows on the upper floors stands out, to function as a paper dryer.

The Master Plan was developed in 2013 (promoted by the Diputació de Barcelona. The Master Plan defined several phases of intervention that resulted in several architectural projects:

- Phase 1. Structural consolidation and new roof (completion 05.2016)
- Phase 2. Interior adaptation of first floor and workshops + façades (completion 06.2017)
- Phase 3. Square and riverbed (completion 01.2019)

Description of the building

Rehabilitation of an 18th century paper mill, located on the bed of the river Bitlles, in the context of a landscape of great natural and cultural interest. It consists of an older part and a brick addition from the mid-twentieth century, as well as two floors of workshops for the production of handmade paper, with its machinery. It combines wooden beam ceilings in the older part

with concrete beam ceilings affected by aluminosis. The building threatened ruin and was in urgent need of comprehensive rehabilitation.

Gross floor area: 795 m2 + 150 m2 (urbanization)



Fig.1: View of the rehabilitated complex.

The diagnosis of the building (values and state)

Previous to the interventions, the upper floors, dating from the contemporary period, were demolished. With the demolition, a reinforced concrete slab was created to allow the passage over it and to generate a viewpoint over the river. Below the street level, in the area of the riverbed, old installations were still preserved, where the remains of a small wooden wheel can be seen, as well as other elements, although the specific state was unknown, as access was not possible due to the large amount of demolition debris and the dangerous general state of the site, in that moment. A high part of the building was preserved, once the passage of the Baix road towards the center of the Vila is passed. Three floors were preserved in this sector.



Fig.2: View of the existing conditions prior to the intervention.

Rehabilitation works

Revive. The intervention in the Cal Xerta mill aims to prevent the definitive loss of an old paper mill that was in disuse and in an advanced state of ruin, with the intention of locating in the future a center of interpretation of paper, a traditional activity linked to the valley of the river Bitlles. The first phases of the intervention have served to consolidate the building, rehabilitate the façades, and adapt the first floor and the old workshops. The structural consolidation has made it possible to create a new vertical communications core, nonexistent until then, in order to communicate all the floors and make the future museum tour possible. The project is based on a minimalist approach to make the most of the qualities of the pre-existence and maximize them from the point of view of safety, habitability, and energy efficiency.



Fig.3: View of main entrance from the upper plaza.



Fig.4: View of one of the side façades, and neighboring buildings.

Outside, the different treatment of the façades explains the growth of the building throughout its history. The oldest part of the mill is covered on the outside with an ecological coating based on lime and cork, which allows the interior walls to be exposed. On the other hand, the most recent part of the building, dating from the mid-20th century, is left bare on the outside to be insulated on the inside. A new unitary roof, which is free-standing, connects all the different periods. The existing openings, with new joinery, are combined with the new openings, which are adapted to the existing openings, resulting from the demolition of part of the complex. Thus, in the workshop area, a new showcase recognizes a gap in the stone wall and allows the old machinery to be shown.

Inside, the duality expressed on the exterior of the building is strengthened. The spaces of the newer body are resolved with joist and vault ceilings that replace the old ones, damaged by aluminosis, while in the old part of the building the wooden beams are preserved. The new slab sections that solve the need to level the floors are expressed with solid concrete slabs. The technical ceilings, the new elevator core, the staircases, the wooden service cores... hybridize with the historical spaces and the patina of time as superimposed objects that respect the traditional configuration of the building and dialogue from a new contemporary language with the existing traces and wounds.



Fig.5: View of a room in the renovated interiors.

In the workshops area the interventions are more punctual and specific: a minimal railing, a new ramp to overcome an isolated step, new lighting ... and seek to ensure the safety of the visit without damaging the expression of the memory of the place. The facings are consolidated as they are, without

Assessment of the results

polishing or scratching, showing the passage of time and the transformations throughout the history of the factory building. The machinery is preserved just as it was found, elements that are already an inseparable part of the very definition of the architectural space.



Fig.6: View of the restored machinery rooms.

A new square covers the old workshops, an urban space that remained unresolved, resulting from a previous demolition, which becomes a privileged viewpoint over the river and the productive landscape, the culmination of the future museum tour.

The project is part of a local strategy for the urban revitalization of the old town and the river with objectives of cultural and socioeconomic revitalization. The town and the river have a great tradition in the paper industry for centuries, which is still alive today.

References

Published in ON Diseño, Archdaily, Architizer, Floornature, Divisare, among others.

<https://patrimonicultural.diba.cat/element/cal-xerta>



Fig.7: View of the upper plaza, the rehabilitated building, and cityscape.



Photos of the completed intervention



Fig.8: View of the the rehabilitated complex blending with the historical city and landscape.



Fig.9: View of the the rehabilitated complex from the lowest part of its site.



Fig.10: View of a passage that runs through the rehabilitated building.



Fig.11: Detail of a mirrored window on the outside façade of the building.



Fig.12: View of a rehabilitated space of transition on the inside of the building.



Fig.13: View of a rehabilitated multipurpose room.



Fig.14-16: Views of various renovated interior spaces of the Cal Xerta Complex, and the dialogue of new and old material.



Fig.17-20: Views of restored machine rooms.

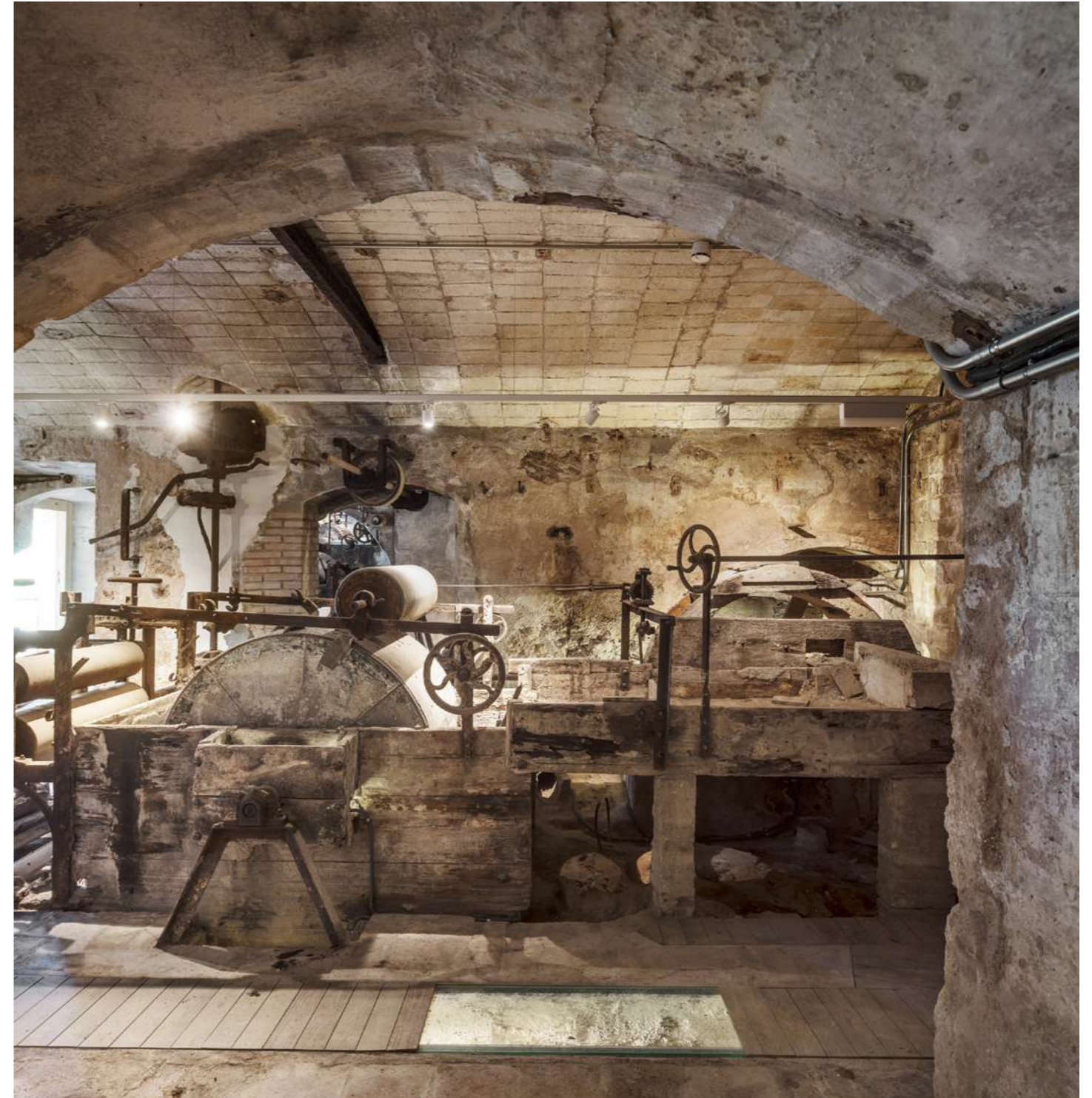


Fig.21-22: Views of restored machine rooms.

Plans & Drawings

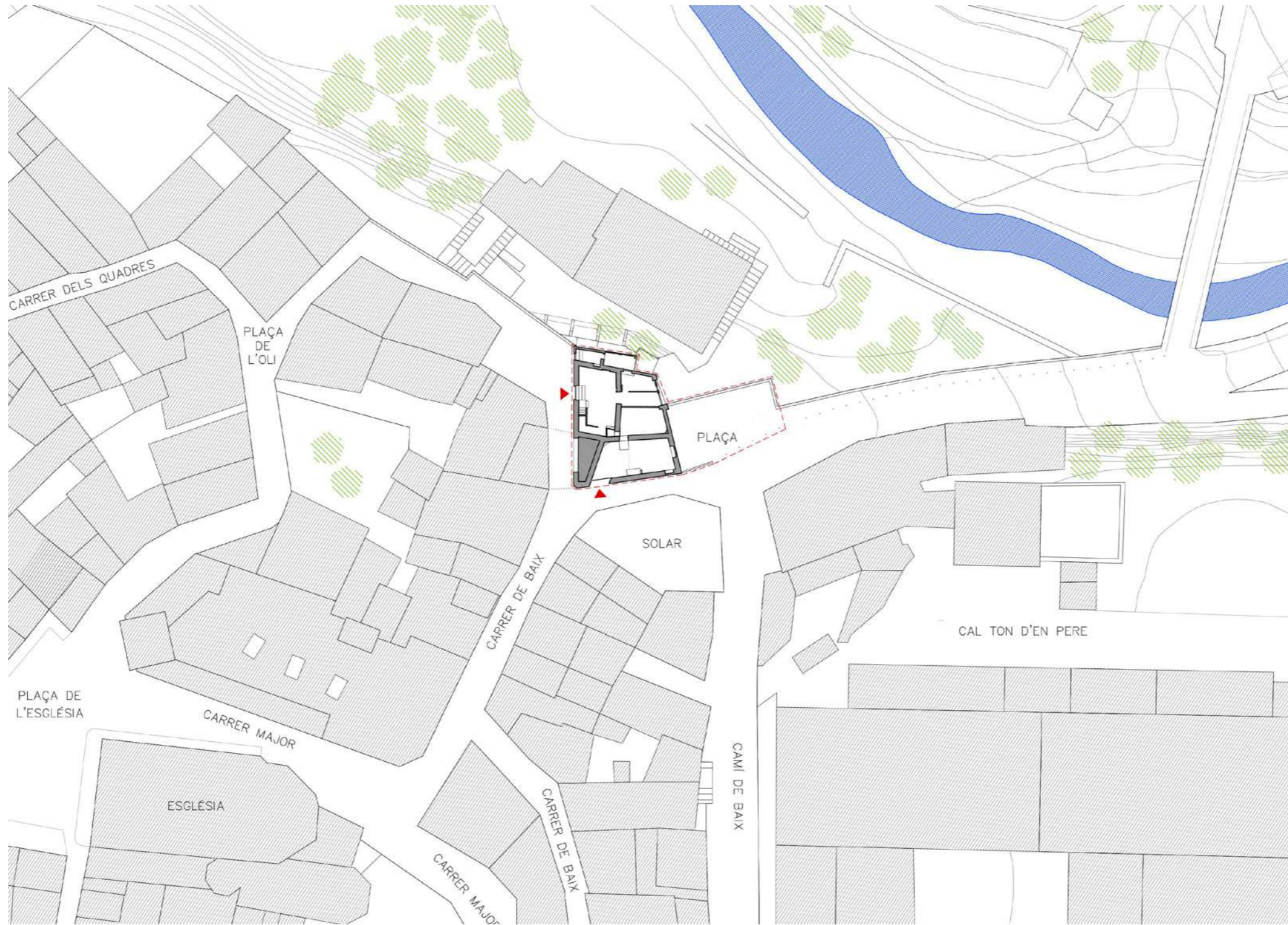
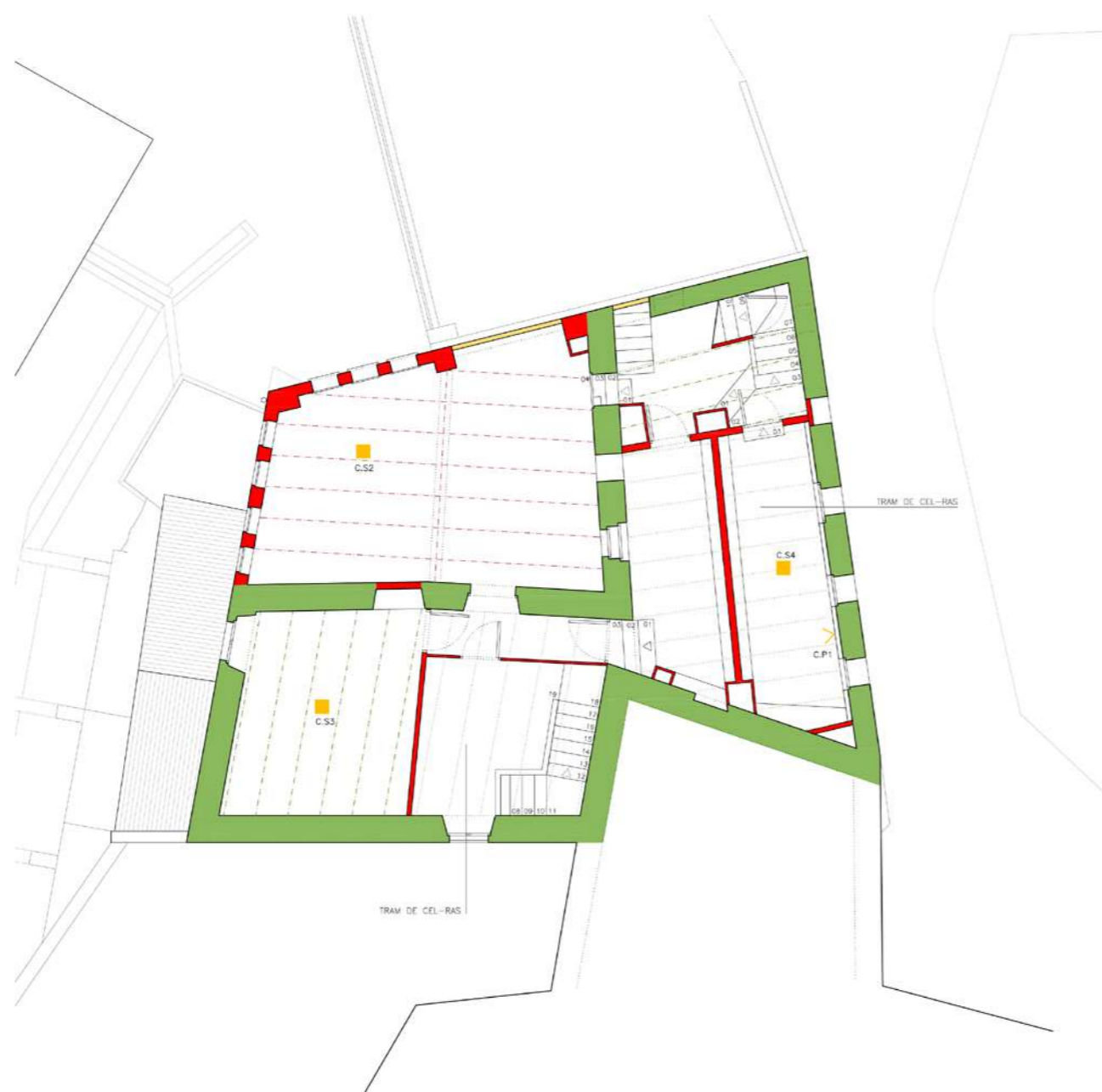
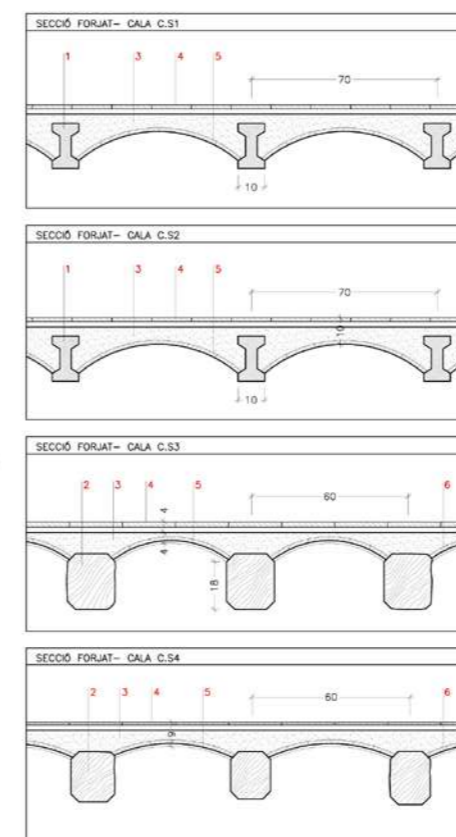


Fig.23: Site plan.



ANALISI CONSTRUCTIU P1

SOSTRES (EMBIGATS)	
---	BIGUES DE FORMIGÓ
---	BIGUES METAL·LIQUES
---	BIGUES DE FUSTA
ELEMENTS VERTICALS	
■	PARETS DE MAÇONERIA PEDRA IRREGULAR
■	PARETS CERÀMIQUES TOTXANA O CERO
■	PARETS CERÀMIQUES MAÓ MASSIS
■	PARETS MIXTES (CONCREMAT DE PEDRA I CALÇ)
■	ELEMENTS DE FORMIGÓ ARMAT
CALES REALITZADES	
■	CALES EN PARAMENTS
■	CALES EN FORJATS (TRAVERSANT TOT EL GRUIX, INCLÒS CEL-RAS)
■	CALES EN FONAMENTS (FINS A BASE DE L'ELEMENT RESISTENT)
NOTA: LA DENOMINACIÓ DE LES CALES ES CORRESPON AMB LA DE LES FOTOGRAFIES	



1. BIGUETA DE FORMIGÓ
2. BIGA DE FUSTA
3. MATERIAL DE REOMPLERT
4. PAVIMENT DE RASILLA CERÀMICA
5. REVOLTÓ CERÀMIC

S E E P




Diputació Barcelona **Ajuntament de Sant Pere de Riudebitlles**

Títol del treball
PROJECTE EXECUTIU DE CAL XERTA
FASE 1. CONSOLIDACIÓ ESTRUCTURAL

Títol del plànol
ANTECEDENTS I PREEXISTÈNCIES
ESTRUCTURA
PLANTA I SOSTRE PLANTA PRIMERA

Data: JUNY 2014 Escala: 1:100 (DIN-A3) Nivell plànol: 18 Nivell cadastre: 17-19-ESTAT ACTUAL

El Nivell redactor: _____ Aprobació municipal: _____

Fig.24: First-floor existing Conditions, floor and ceiling structural plan.

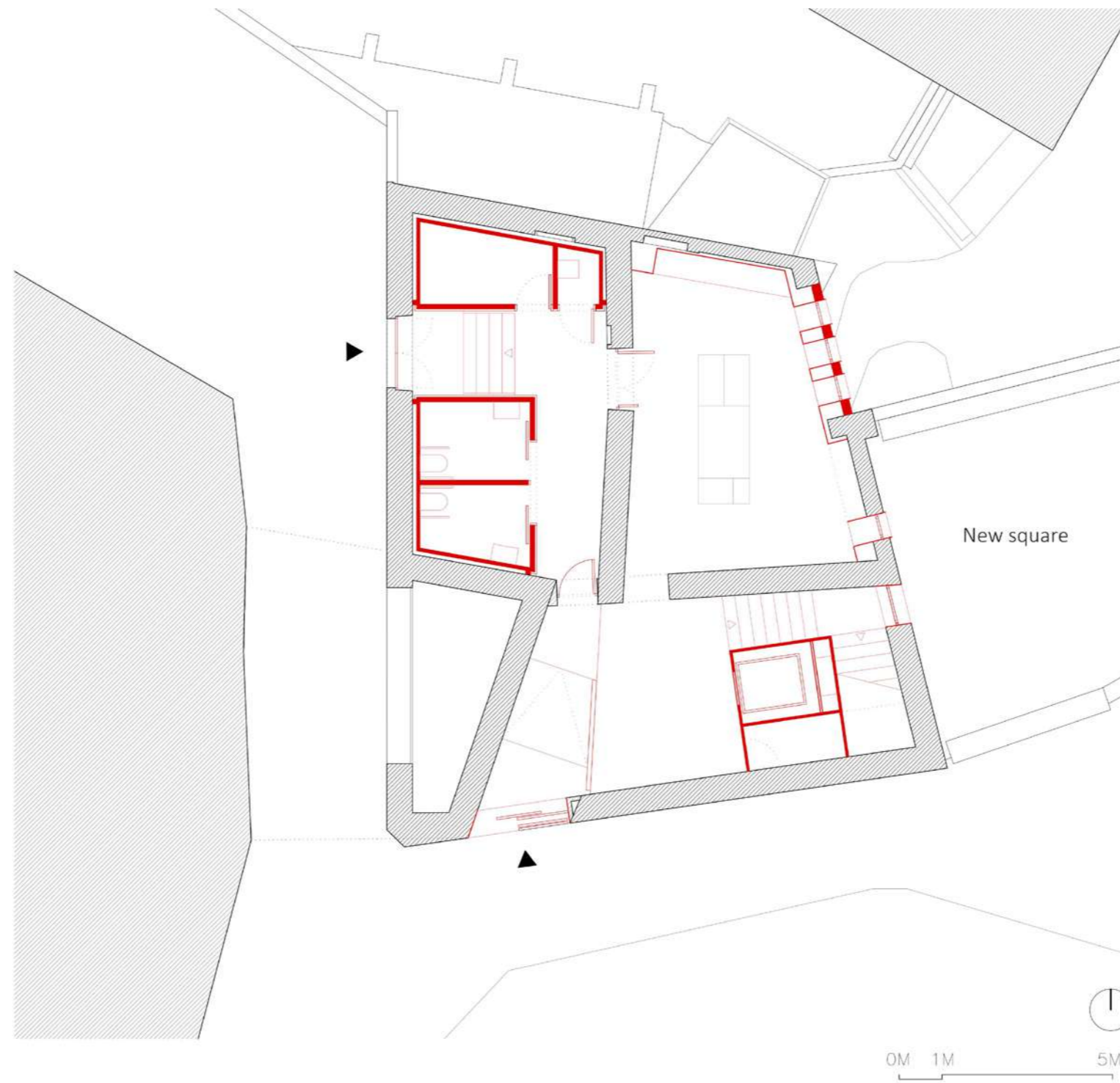


Fig.25: Ground-floor plan.

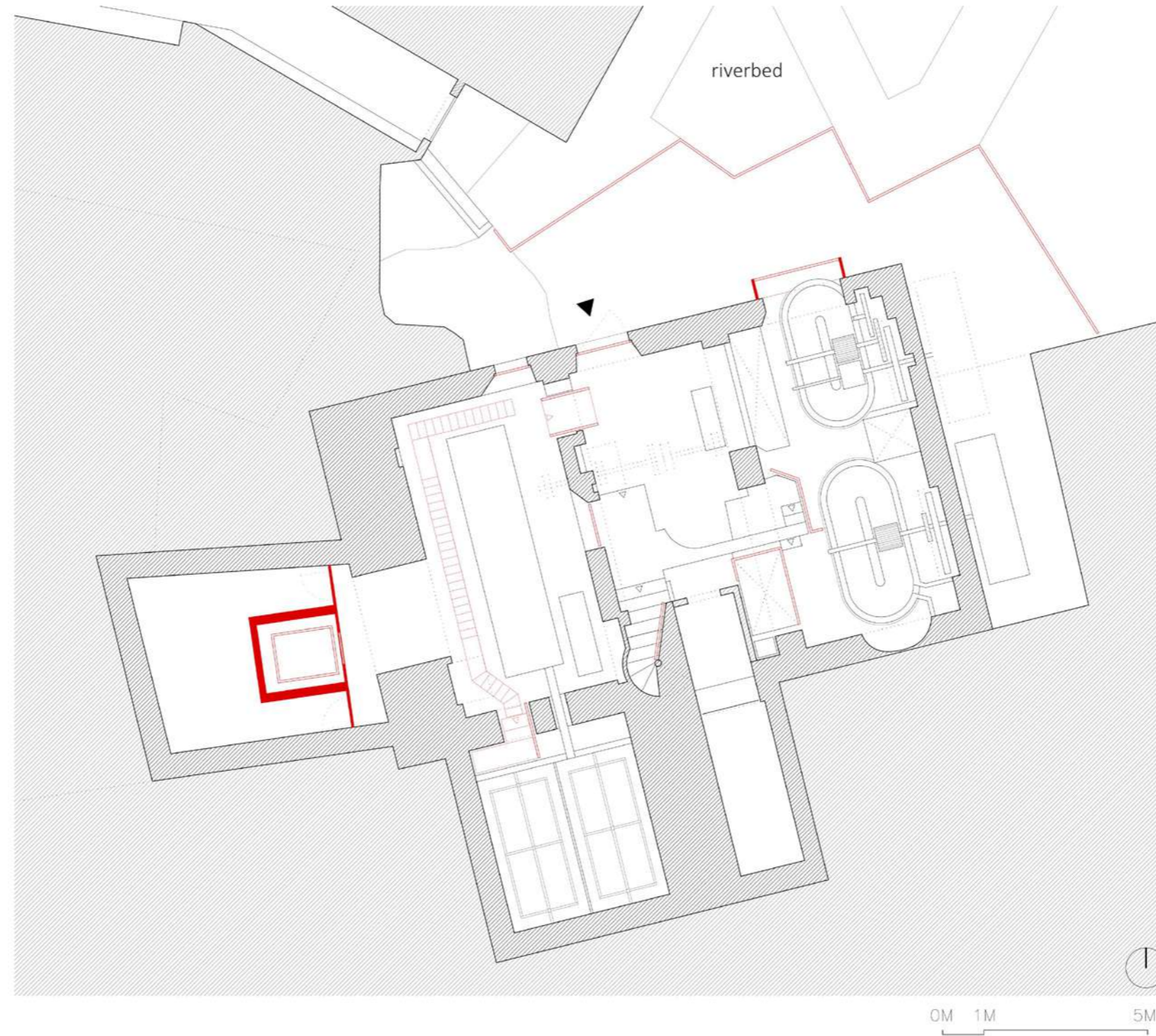


Fig.26: Workshops floorplan.

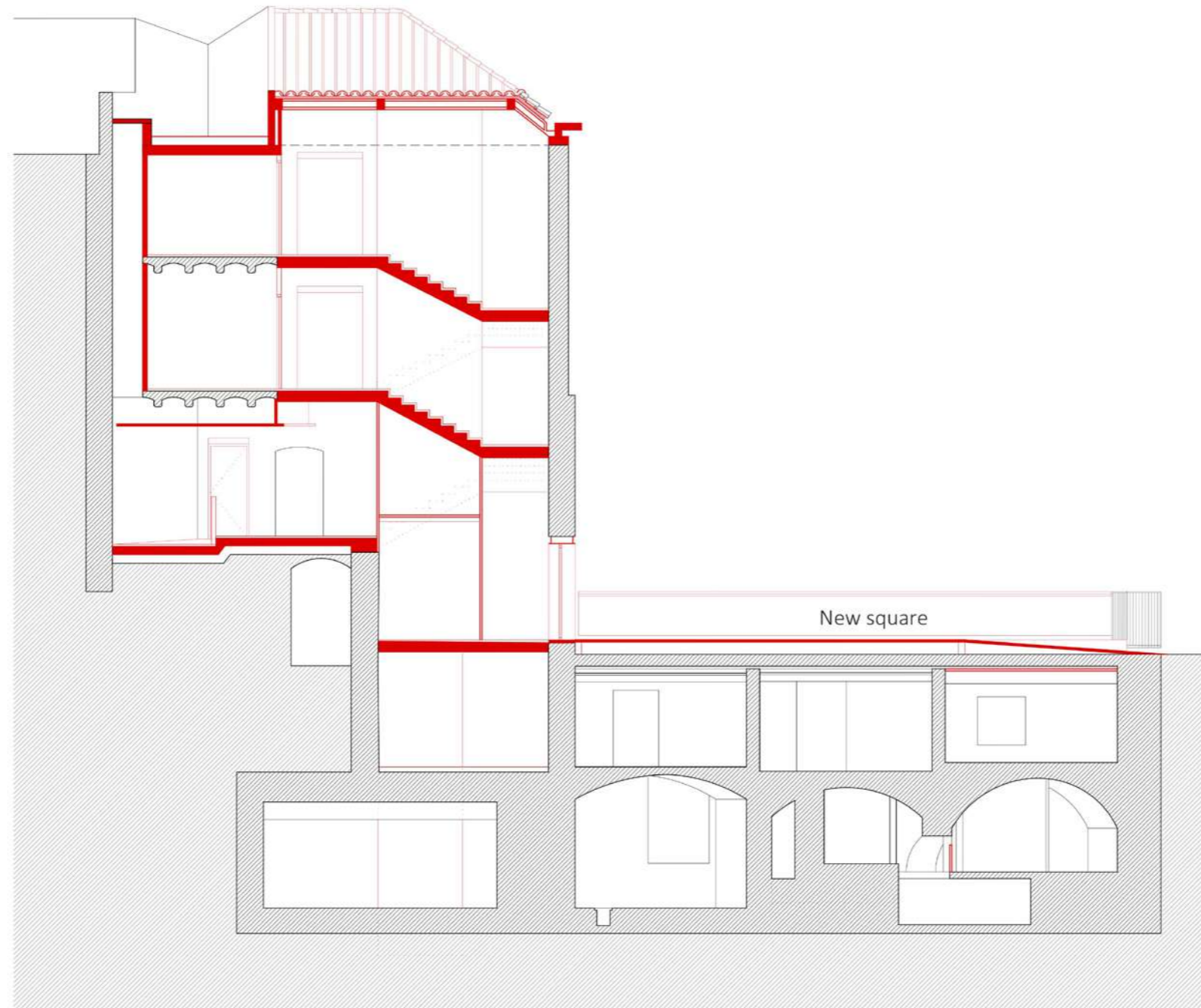


Fig.27: Section plan showing the new set of stairs and square.

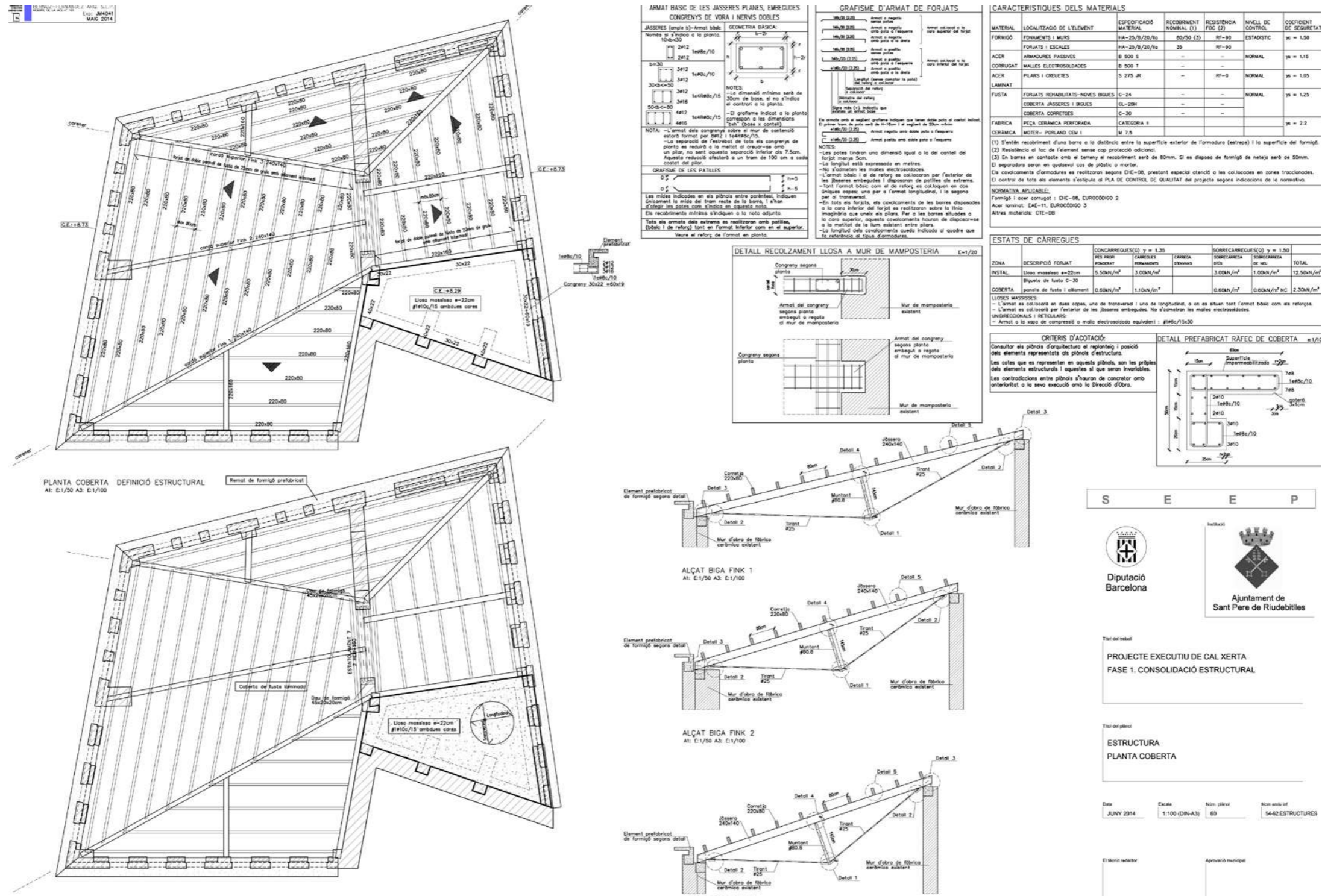


Fig.28: Structural roof plans and details.

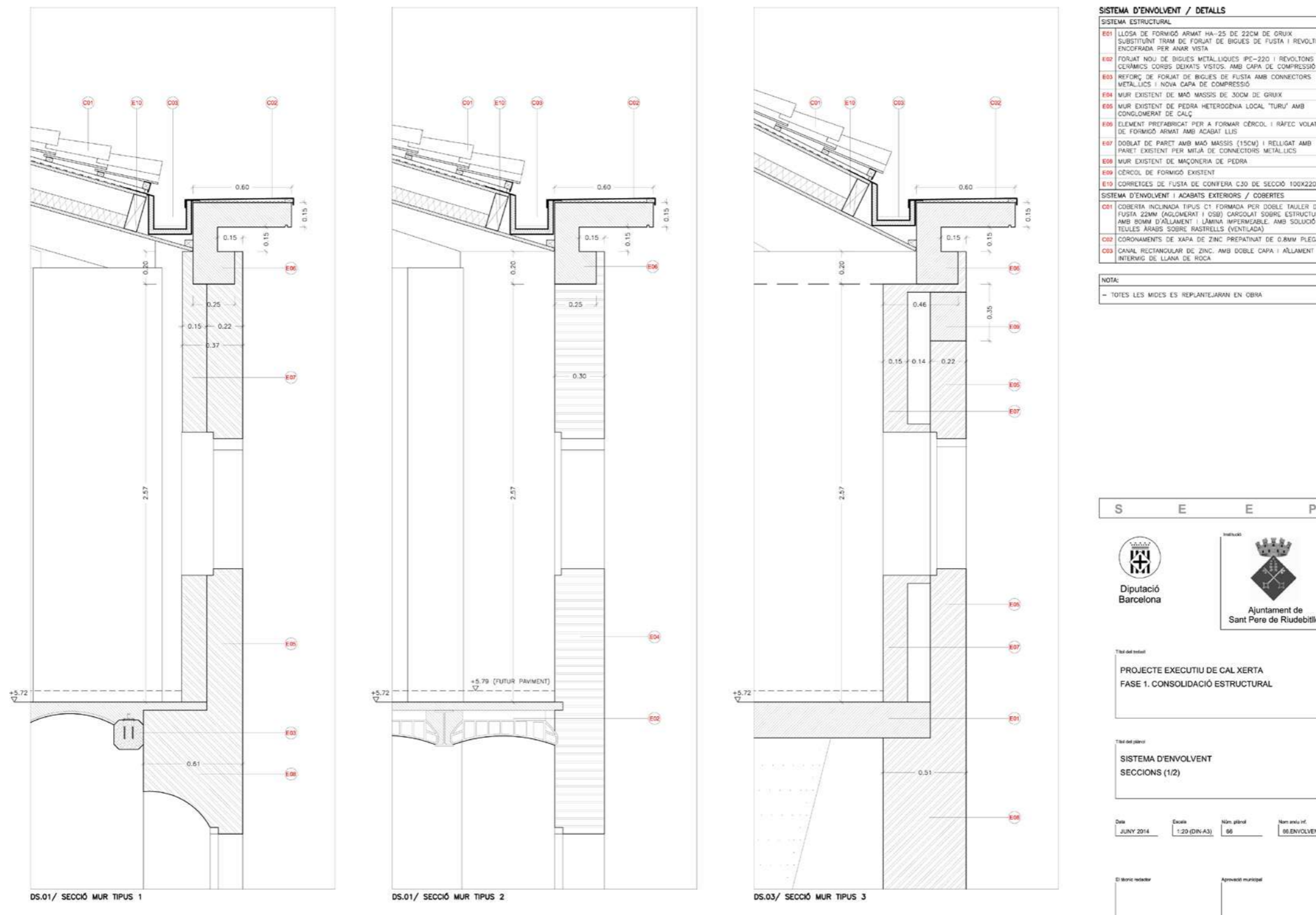
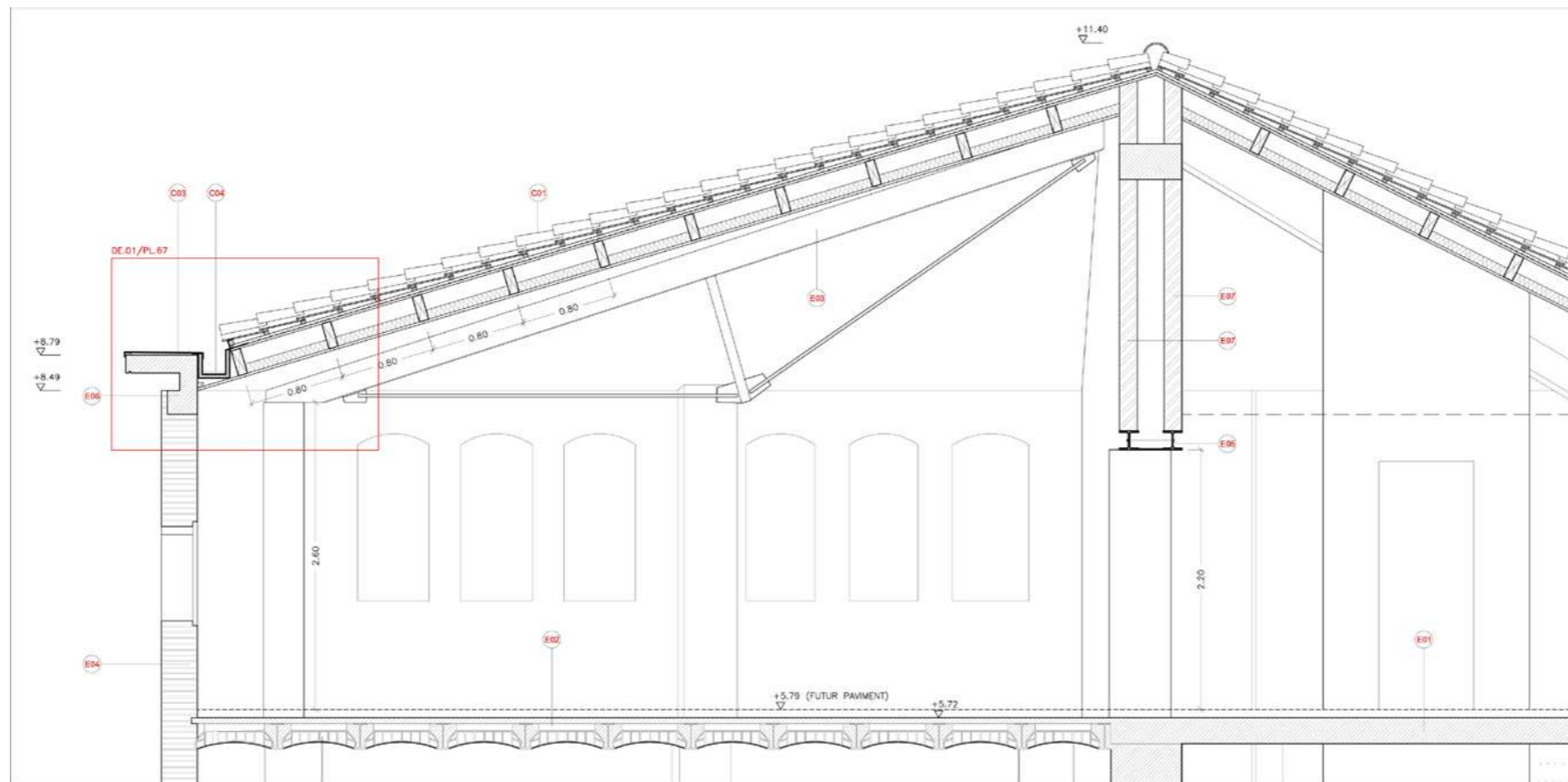


Fig.29: Various sections of the building envelope systems.



SC.1/ SECCIÓ CONSTRUCTIVA TIPUS

SISTEMA D'ENVOLVENT / DETALLS

SISTEMA ESTRUCTURAL

- E01 LLOSA DE FORMIGÓ ARMAT HA-25 DE 22CM DE GRUIX SUBSTITUÏNT TRAM DE FORJAT DE BIGUES DE FUSTA I REVOLTONS, ENCOFRADA PER ANAR VISTA AMB TAUERS FENOLICS (PRIMER OS)
- E02 FORJAT NOU DE BIGUES METAL·LIQUES (PE-220 I REVOLTONS CERÀMICS CONUS DECATS VISTOS AMB CAPA DE COMPRESSIÓ)
- E03 ENCAVALLADA MIXTA TRUS FINK DE FUSTA LAMINADA GL-28H I ELEMENTS METÀL·LICS D'ACER
- E04 MUR EXISTENT DE MAÓ MASSIS DE 30CM DE GRUIX
- E05 NOVA LLINDA METÀL·LICA (ESTINTOLAMENT 7) FORMAT PER DUES HEB-160 PER A FORMAR PAS DE PORTA
- E06 ELEMENT PREFABRICAT PER A FORMAR CÈRCOL I RAPEC VOLAT DE FORMIGÓ ARMAT AMB ACABAT LLIS
- E07 MASSISSAT DE PART CENTRAL AMB MAÓ MASSIS AMB CÈRCOL SUPERIOR DE FORMIGÓ ARMAT PER A RECOLZAMENT BIGUES

SISTEMA D'ENVOLVENT I ACABATS EXTERIORS / COBERTES

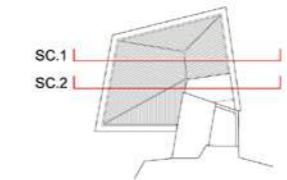
- C01 COBERTA INCLINADA TIPUS C1 FORMADA PER DOBLE TAUER DE FUSTA 22MM (AGLOMERAT I OSB) CARGOLAT SOBRE ESTRUCTURA AMB BOMM D'ALLAMENT I LÀMINA IMPERMEABLE AMB SOLUCIÓ DE TEULES ARABS SOBRE RASTRELLS (VENTILADA)
- C02 COBERTA PLANA TIPUS C2 DEL TIPUS INVERTIT AMB ACABAT DE DOBLE CAPA DE RASILLA CERÀMICA
- C03 CORONAMENTS DE XAPA DE ZINC PREPATINAT DE 0.8MM PLECADA
- C04 CANAL RECTANGULAR DE ZINC AMB DOBLE CAPA I ALLAMENT INTERMIG DE LLANA DE ROCA

SISTEMA D'ENVOLVENT I ACABATS EXTERIORS / MURS FAÇANA

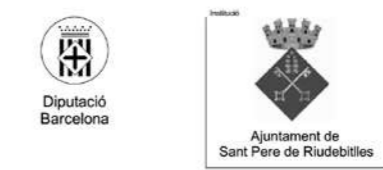
- F01 MUR DE FAÇANA TIPUS F1 DE DOBLE FULLA CERÀMICA DE 30CM. GERO EXTERIOR I TOTXANA INTERIOR. ALLAMENT DE LLANA DE ROCA (SOMM DE GRUIX). ACABAT ARREBOSSAT A L'EXTERIOR

NOTA:

- TOTES LES MIDES ES REPLANTEJARAN EN OBRA



S E E P



Títol del treball
PROJECTE EXECUTIU DE CAL XERTA
FASE 1. CONSOLIDACIÓ ESTRUCTURAL

Títol del plànol
SISTEMA D'ENVOLVENT
SECCIONS CONSTRUCTIVES

Data JUNY 2014 Escala 1:40 (DIN A3) Núm. plànol 66 Núm. obra / ref. 55 ENVOLVENT

El lloc on redactor Aprovació municipal

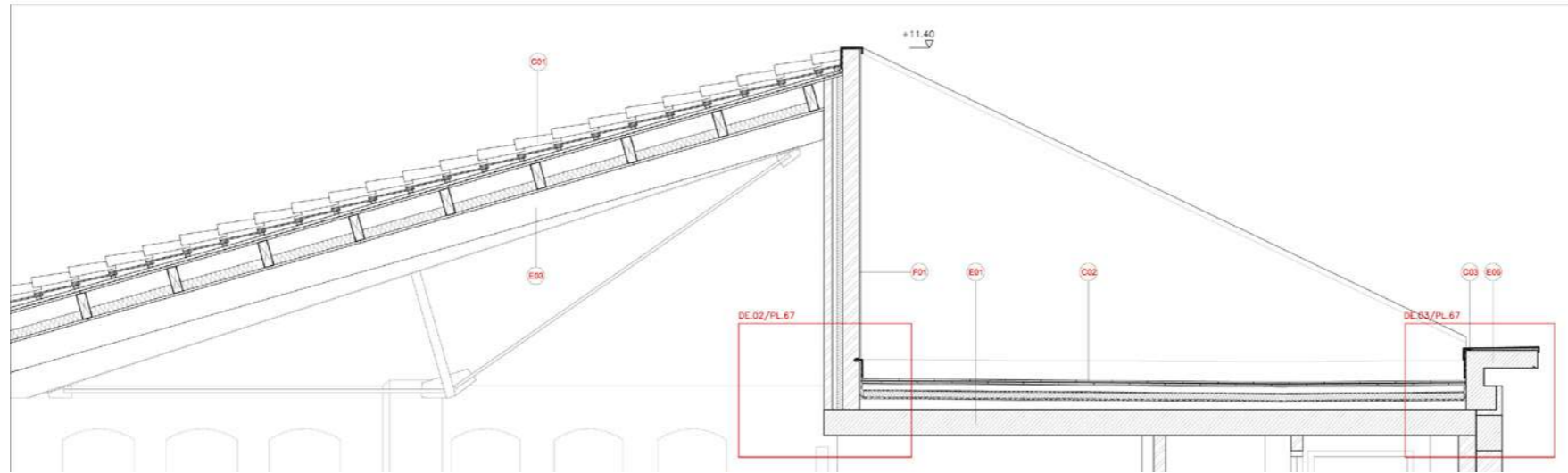


Fig.30: Constructive sections of the building envelope system.



Fig.31: Construction floorplan.