

CHIESA E MONASTERO DI SANTA CHIARA

COMUNE DI ACQUAPENDENTE (VT)

RESTAURO E CONSOLIDAMENTO DELLA CHIESA
E DI UNA PORZIONE DEL MONASTERO DI SANTA CHIARA
DANNEGGIATI DAGLI EVENTI SISMICI DEL 30/05/2016 E SUCCESSIVI



PROGETTO PRELIMINARE

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PREMISE

The monumental complex constitutes of the “Monastery of Saint Clare”, property of the entity Monastery of Saint Clare destined to the enclosure, and the Church of Saint Clare, property of FEC “*Building Fund of the Ministry of Home Affairs*”, at Via Malintoppa n. 8 and n. 12, in the Local Council of Acquapendente (VT).

The complex has been damaged by earthquake shocks since May 2016 and following.

A first seismic shock took place on 30 May 2016 and has caused lesions to some buildings of the Monastery, such that the local authorities emitted an order of inaccessibility to some parts of the building (Ordinanza comunale 97/2016, Comune di Acquapendente, of 10 June 2016).

The zones that cannot be acceded to are the Church, the enclosure Choir and the dormitory of the Novitiate.

The successive earthquake of 24 August at Amatrice and the seismic shocks that followed, especially that of the 26 October and of the 30 October have aggravated the situation, provoking other lesions besides enlarging the others previously formed.

REPORT

HISTORICAL ARTISTIC REPORT

Towards north-west of the urban centre of Acquapendente, on the hill once called “Poggio del Massaro”, is situated the monastery of cloistered nuns of Saint Clare. On this hill was constructed, probably, an ancient fortress for the defense of the city. For this, the locality was also called “The Cittadella”.

On 27 May 1333, the Pontifical authority granted to the Provincial Father of the Conventual Minors, fra’ Thomas of Acquapendente, the faculty to construct the monastery on the mentioned hill; he made use, thus, of the existing fortress to designate it as place for the community of the Poor Clares. The monastery was constructed at the expense of fra’ Tommaso, with the voluntary contribution of the citizens of Acquapendente, and was destined as house for the religious community of the Poor Clares.

The entire complex presents a Medieval architectural approach, at least initially, which can still be noticed in some walls of the actual monastic nucleus which presents row modules datable to the XIV century.

In fact, when analyzing the walls of the constructions still to date, that had to construct the “Citadel” and in which then the Poor Clares moved in, we see that only the walls of north-west and the circular tower, that sides this curtain “called of the nuns”, present real characteristics of fortification, having also been part of the defense perimeter of the walls and are chronologically datable to the second half of the XV century. The defense walls at the south-east side , which separate the orchards of Via Malintoppa, then, are not made of squared stones in isometric rows and they englobe pre-existing houses of medieval times, with evident blocking of apertures.

At the end of the 1700 (beginning of the 1800) the Napoleonic troops in transit through Acquapendente sent off the cloistered nuns to have the monastery as their barracks; only in the 1815 did the Poor Clares mange to come back to the Monastery.

In 1870 the immovable goods of the monastery, like those of other religious entities, were confiscated by the Italian State, which in 1901 surrendered them to the Local Council of Acquapendente; in 1903 five surviving nuns of the community of the Poor Clares bought back the property,

the Local Council of Acquapendente, of the monastery complex.

Then, successively, with Decree of the Republic of the 18 June 1952 "juridic personality" was recognized for the monastic entity.

After the extraordinary works of the restoration of the facade, and the inside of the church dedicated to Saint Clare, on the 9 November 1970 the building was reopened to the cult, with the gabled and plastered facade, seemingly modern, and contrasting with the Convent still typically medieval.

Notwithstanding, the various devastations that Acquapendente had to suffer in the course of centuries, not least the bombardments of World War II (1944), necessitated heavy restorations and reconstructions in order to repair the damages that however, did not transform the original setup, even though, by word of mouth, we get to know that the vault of the Church was constructed only in 1912, to substitute the wooden structure which then was painted in 1923 by the famous painter Consoli, hailing from Acquapendente.

ILLUSTRATIVE TECHNICAL REPORT

In general, the state in which the structures of the portion of the complex which is inaccessible present themselves can be so summarized:

- discrete as regards the vertical structures;
- bad for the horizontal structures;
- very bad for the covering structures;

We have a planimetric form of an elongated rectangle, a quite irregular plan distribution and elevation, a disposition of the openings that is not always regular.

Vertical Structures

The portion of the monastery that is subject to intervention, comprising the Church, presents walls made in blocks of stone mostly squared, of irregular dimensions, placed in rows with a fine layer of drawn mortar.

Even though the actual full reckoning of the wall texture would be possible only by bringing it fully in sight on the sides to observe and detect the eventual presence of irregularities in it, one could reasonably suppose that its continuity is not always uniform because of partial reconstructions of peculiar volumes given the presence of external elements, such as wooden beams, chimneys and drains, besides niches and openings for doors and windows.

The structure of this portion is constituted by a knit of walls that identify more venues with irregular texture and discontinued alignment, at times inclined or with irregular and variable wall thicknesses even inside these same rooms.

In the wall texture, the single walls should be correlated, corresponding to the intersections, for the transfer of the horizontal force of traction and compression, the vertical force of sliding and the weak force of bending of the floors. This objective follows if numerous coverings are placed beside the area of correlation. This situation, in our case, is not always present and to which there need to be found a remedy through the use of ... ***terminology becoming ever more technical for a proper translation...please go to page 8!!!***

I caratteri fondamentali della maglia muraria sono costituiti dall'interasse verticale tra le strutture di orizzontamento, che stabilisce l'altezza dei pannelli murari, dall'interasse fra le stesse e dallo spessore.

A vantaggio della stabilità, si nota che, in gran parte, lo spessore delle pareti è rilevante rispetto all'interasse, per cui si ha una rigidezza scatolare in senso planimetrico, la quale concorre a limitare la deformabilità nel piano orizzontale nonostante gli orizzontamenti risultino deformabili a lastra e siano debolmente ancorati nelle connessioni.

Orizzontamenti

Sotto il profilo tipologico sono presenti travi in legno ed assito in legno; travi in legno con soprastante travetti e laterizi; volte in elementi di laterizio disposti a foglio.

Sotto il comportamento sismico gli orizzontamenti sono impegnati soprattutto in regime di piastra, con azioni parallele alle correlazioni, tendenti a produrre deformazioni di scorrimento e sforzi di trazione e compressione, mentre quelle ortogonali alle correlazioni che producono sfilamenti o distacchi.

La rigidezza a lastra è mediocre per le strutture con orditure lignee, in quanto la resistenza nel funzionamento a lastra degli orditi monodirezionali è apprezzabile soltanto nella direzione della tessitura, mentre in senso trasversale la resistenza è pressoché nulla.

Le volte a botte e a cupola in foglio, inferiormente intonacate, che costituiscono il controsoffitto della chiesa, dell'abside e del coro, oltre a quella della cantoria (non ispezionabile), sono, in caso di azioni sismiche, in condizioni di precarietà per via dell'assenza di vincoli (quali la presenza di centinatura sull'estradosso) capaci di garantire la stabilità di forma della volta.

Copertura

La copertura ha una tipologia tipica dell'impianto originario a tetto con ordito in legno e impalcato in pianelle laterizie, così come negli sporti di gronda, talvolta impostate su capriate in legno.

Questa tipologia presenta una modesta rigidezza nel piano, ma non determina, in genere, situazioni pericolose, a meno che le travi non siano

disposte lungo la pendenza della copertura stessa, e non siano efficacemente ancorate per evitare spinte sulle murature (vedi il caso del coro claustrale nell'allegata documentazione fotografica). Inoltre, in ragione alla vetustà e al degrado degli elementi in legno, oltre alla presenza di sconnessione tra gli elementi, sono presenti problemi di stabilità ai carichi verticali. In aggiunta al più grave difetto che le capriate producono concentrazioni di sforzo puntuale che determinano la compromissione locale delle murature.

Non si riscontra la presenza catene metalliche a collegamento delle murature, atte ad assolvere gli sforzi di trazione, le quali dovranno essere valutate e ideate in fase di progetto.

Description of the Damages

This brief description of the damages is necessary to give an idea of the situation of the monastery building, and it is being compiled after an onsite visit of some parts of the building that form the complex being studied, done to evaluate the real situation of the building.

There have been observed numerous internal lesions on the walls, on the paving, on the horizontal structures, evidently given by the individual movements of the walls, floors and roofs caused by the seismic action, notwithstanding that the great majority of them does not seem to have compromised the static qualities of the building.

Even though some parts show, unfortunately, signs of significant lesions that highlight detachment from the various walls of the same building and between adjacent bodies, often constructed with different techniques and in different periods.

Particularly, the main portion, that which overlooks Via Malintoppa, highlights an overturning mechanism, well underlined by the crevices visible in the corridor and in the cells of the overlying Novitiate.

Besides, the external part of the same Novitiate, overlooking north-east, seems to have suffered diagonal lesions on the walls of the corridor; such lesions would seem to be caused by the excessive height of the wall that lacks any horizontal connection. This part of the building requires urgent intervention because it is to be considered at risk in case of new seismic phenomena.

The portion of the Church is that which apparently seems to be less damaged, although it bears a transversal lesion midway in the church, rightly at the center of the decoration of the existing barrel vault , given to the rotation of the shutters.

Besides, on going to analyze more closely, it presents, in the space under the roof, between the vault and the wooden covering, evident lesions on the topmost part of the walls and the displacement of some beams from the covering, provoked by the action of the seismic events (see the photographic documentation). Such situations should be sorted out with urgency, in order to avoid further possible damage to the stability and functionality of the same covering, which today is precarious.

Even some part adjacent to the church show significant criticalities, in fact on the wall of the back of the church, where there is the organ of wooden structure constructed on a wooden platform lying on beams hanging out from the wall, there is an opening at the first floor of the Monastery, where there is the proper choir balcony, of which the topmost arch presents an important apical lesion – which zone is immediately above the parlor. Such lesion results understandably from the presence of the great opening, being this the weakest point of the entire back wall, without the presence of a horizontal support.

Besides, the space of the choir, with overhead a vault with lowered “sails”, shows evident lesions that start from the summit of the internal angles of the place and run through part of the same vault because of the deformation of the level; in order to evaluate more precisely the damages of the vault and eventually of the covering overlying it one needs to go into the attic which in this part is not accessible. It is necessary, therefore, to better inspect the vault after having removed part of its covering.

The enclosure choir, place behind the main altar is also made on a building that is different from that of the church, and it shows also lesions that are not secondary both at the conjunction with the wall of the altar, as well as, mostly on the opposite side where there is a big window, where at its top there are various signs of detachment from the overlying vault. In this “High Choir” there are present transversal lesions midway in the room both on the wall and on the same level of the vault. Even in this case, the damages is caused by the rotation of the shutters of the barrel vault.

- Internal installations: Redoing of the various internal installations according to the current safety norms.
- Historical and Artistic works of art: restoration and consolidation of the existent situations.

All this as highlighted in the plans and photographic documentation of the current state and preliminary estimate of the works necessary.

Finally in importance, but not in the urgency to intervene, there have been noticed rain water infiltrations in the hemispheric covering of the place used as confessional, next to the sacristy, besides that other places in the attic, to which is necessary provide a remedy to avoid further damages and degradation of the plaster on the walls.

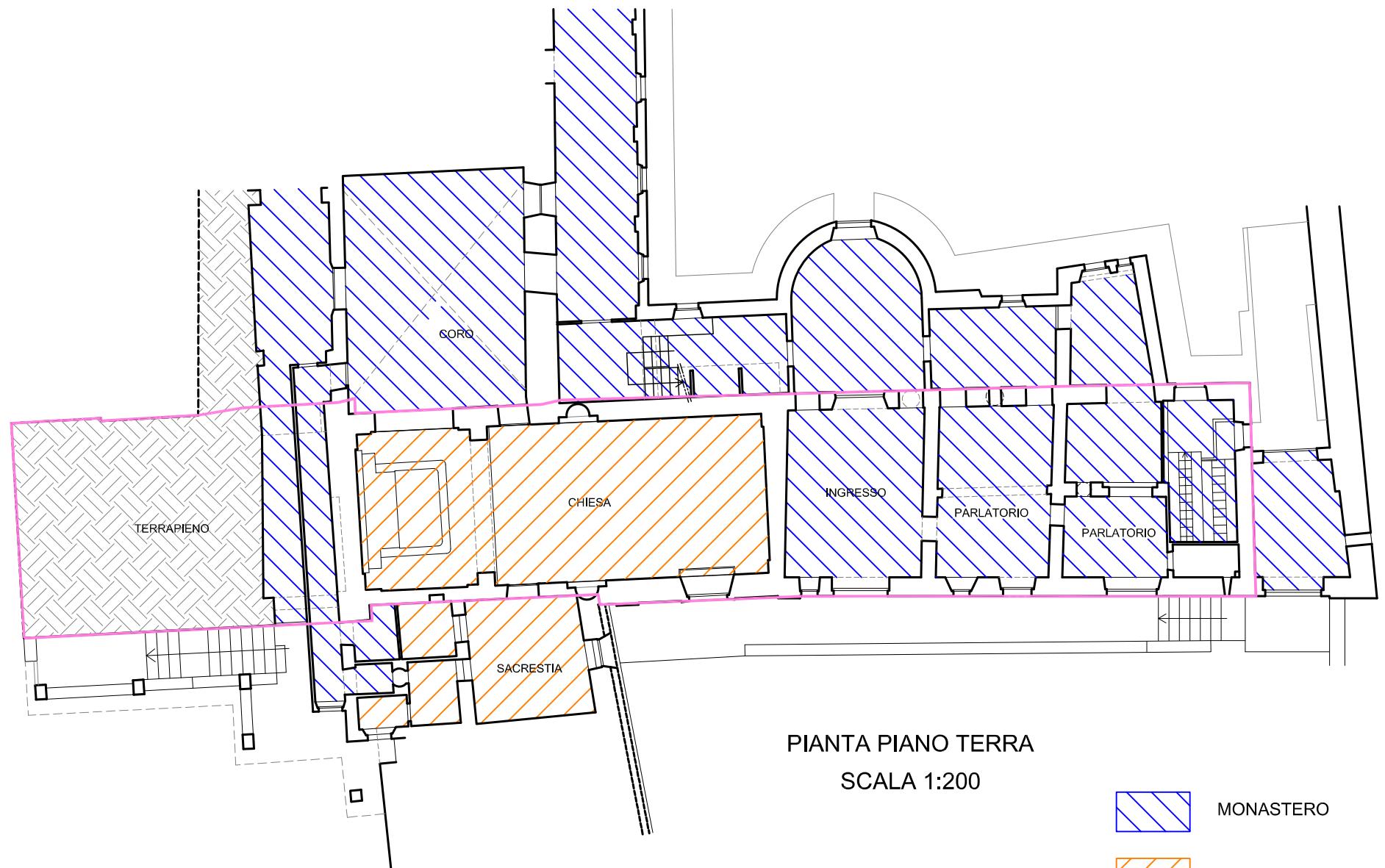
Such preliminary observations are to indicate how, next to other signs left by action of the seismic events, there are highlighted structural weaknesses in some parts of the buildings, that need to be corrected with specifically directed intervention, to render the building more stable and secure in case of any new seismic event.

Summary description of the proposed interventions in this preliminary project

The proposed interventions in this preliminary project by far and large can be summarized as follows:

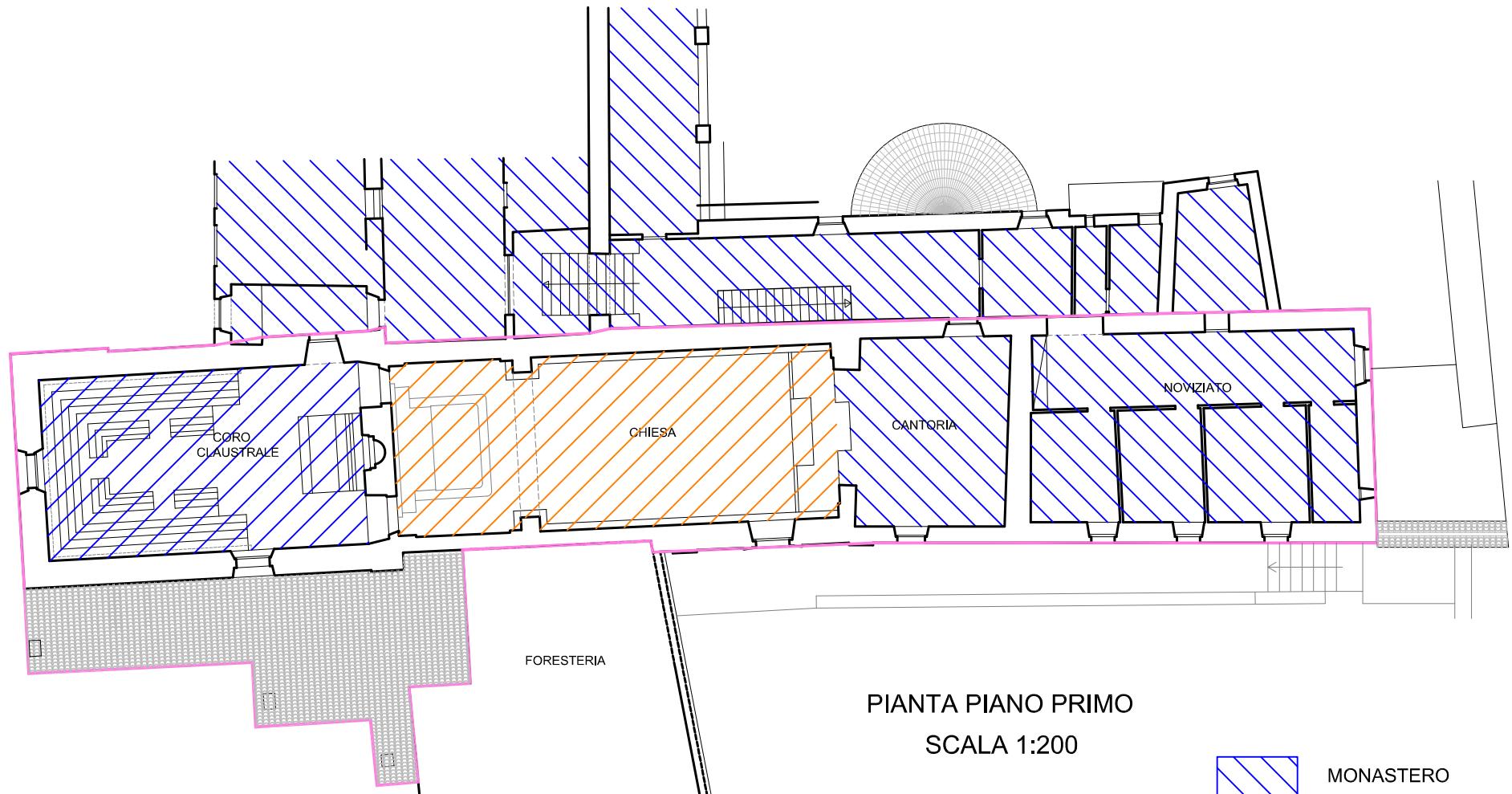
- Covering: disassembling and redoing of the roofing with wooden supporting structures and eventual replacement of the covering layer with recycled material. On this occasion a steel circle is put to absorb the seismic action on the floor, besides making a proper conjunction between the walls and the very same roofing. By acting to eliminate the concentration of punctual force which the roof trusses determine in the area of the walls. Installation of anti falling railings, on the roofing, according to the current safety laws.
- Horizontal structures: redoing and/or consolidation of the wooden flooring; consolidation of the vault by means of composite material; Steel circling of the wooden flooring and the vaults, including the drillings on the perimetric walls. Eventual redoing of under flooring and flooring.
- Walls: consolidation of the walss by means of armed perforation, and other techniques, not less steel circling; laying and redoing of plastering at the junction of the external walls on the facade; demolition and redoing of the internal partitions; retouching and/or redoing of the internal and external plastering.

PLANIMETRY

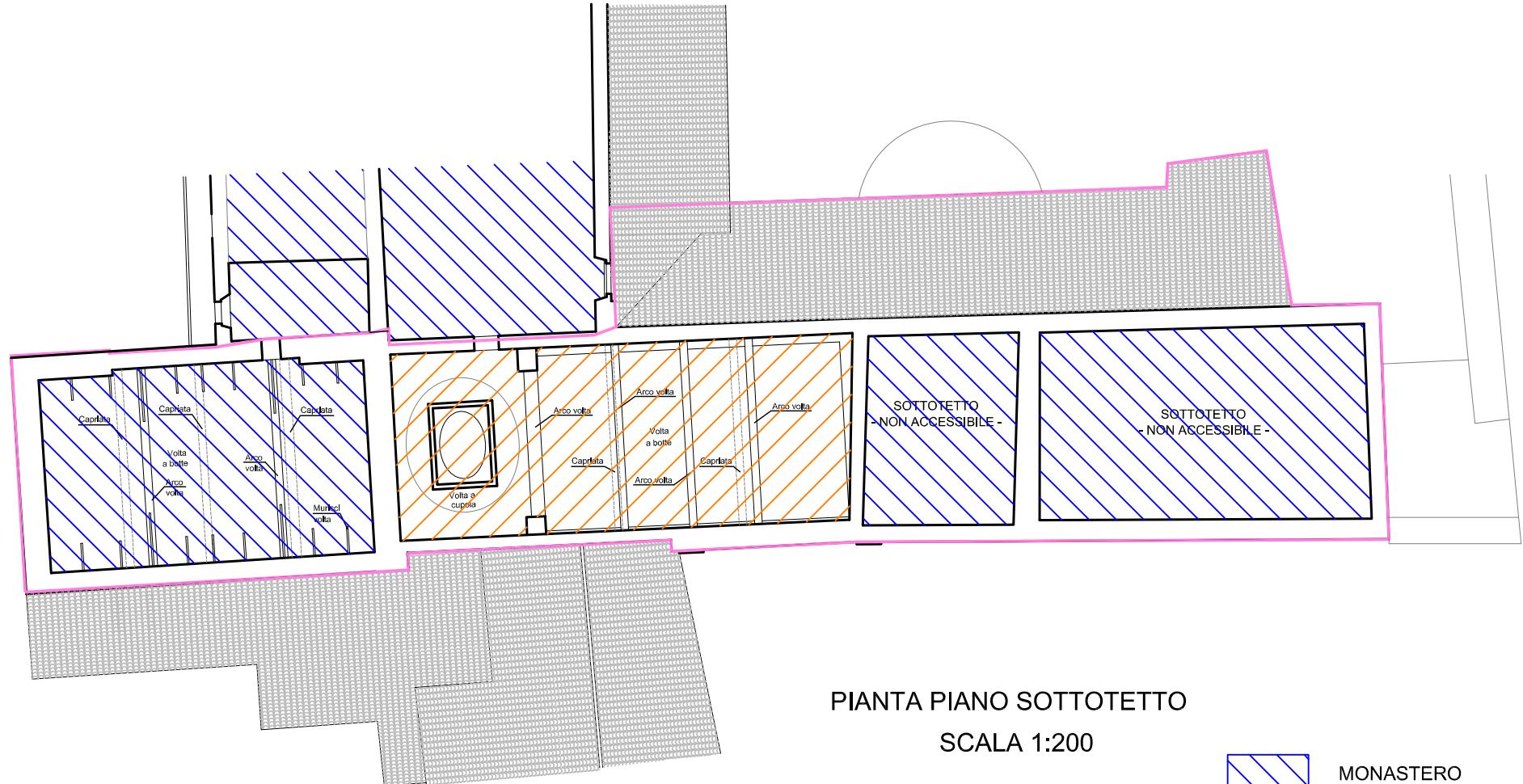


PIANTA PIANO TERRA
SCALA 1:200

-  MONASTERO
-  FEC
-  ZONE OGGETTO
DI INTERVENTO

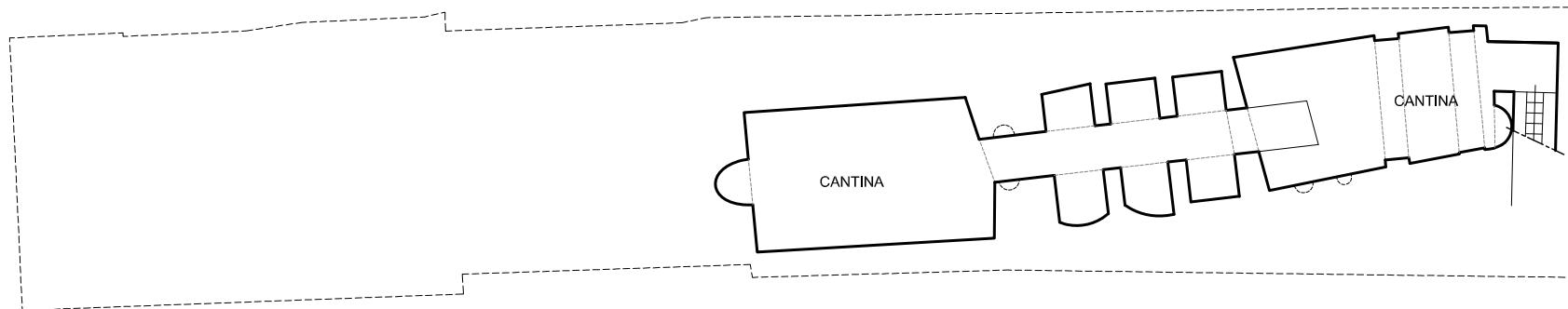


- MONASTERO
- FEC
- ZONE OGGETTO DI INTERVENTO



PIANTA PIANO SOTTOTETTO
SCALA 1:200

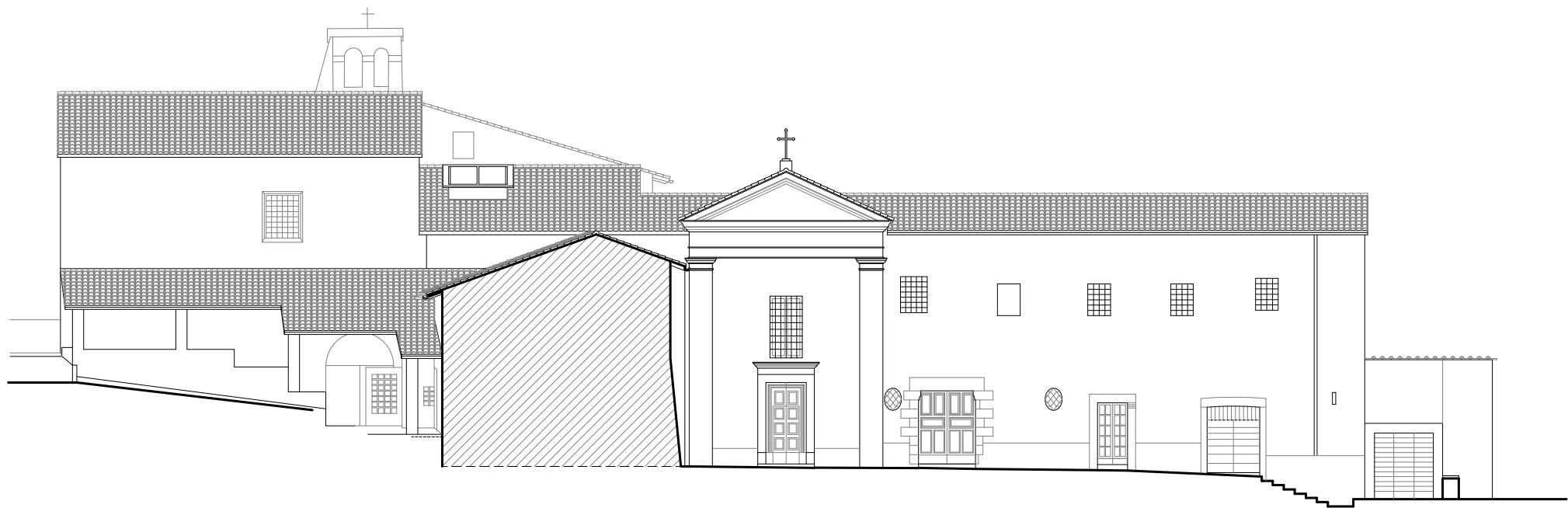
- MONASTERO
- FEC
- ZONE OGGETTO DI INTERVENTO



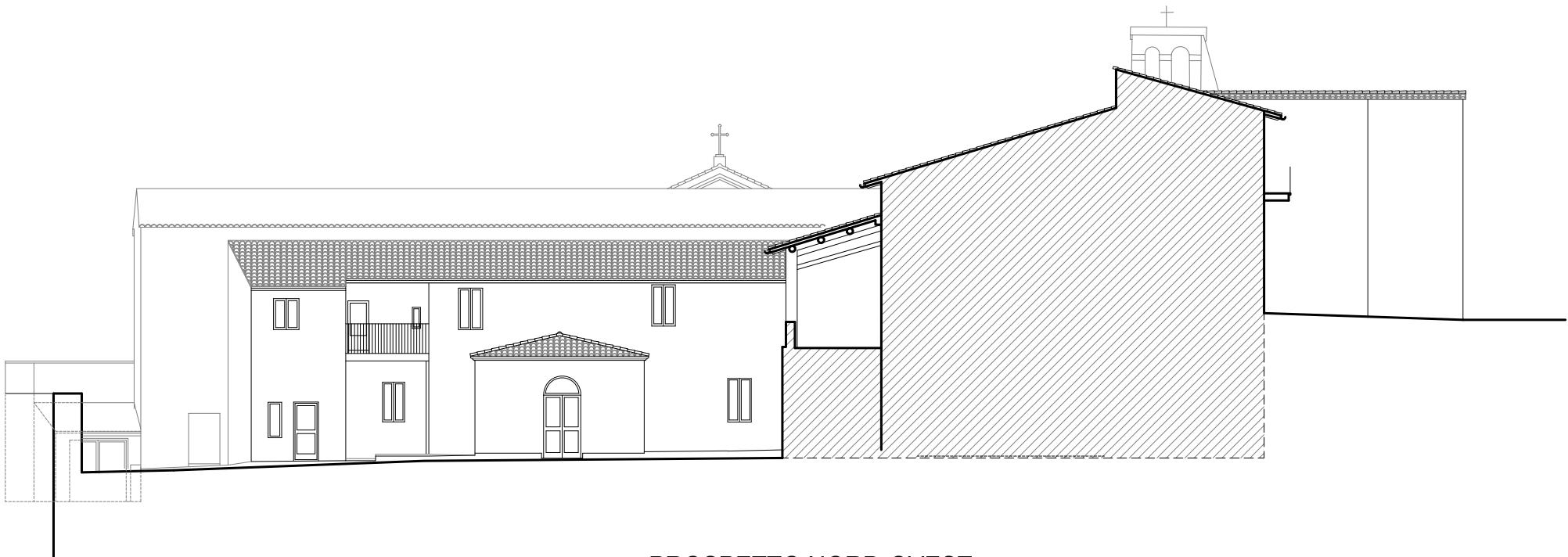
PIANTA PIANO INTERRATO

SCALA 1:200

- MONASTERO
- FEC
- ZONE OGGETTO
DI INTERVENTO

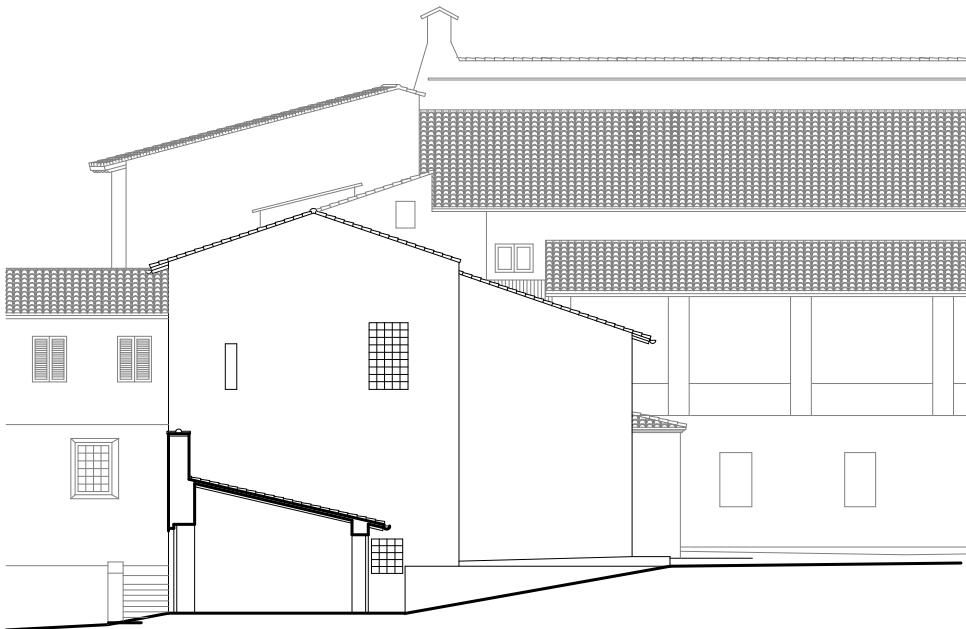


PROSPETTO SUD-EST
SCALA 1:200

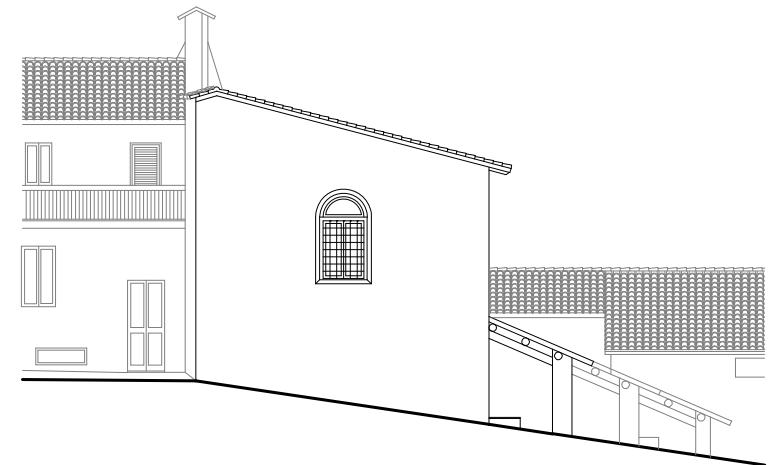


PROSPETTO NORD-OVEST

SCALA 1:200



PROSPETTO NORD-EST
SCALA 1:200



PROSPETTO SUD-OVEST
SCALA 1:200

PHOTOGRAPHIC DOCUMENTATION

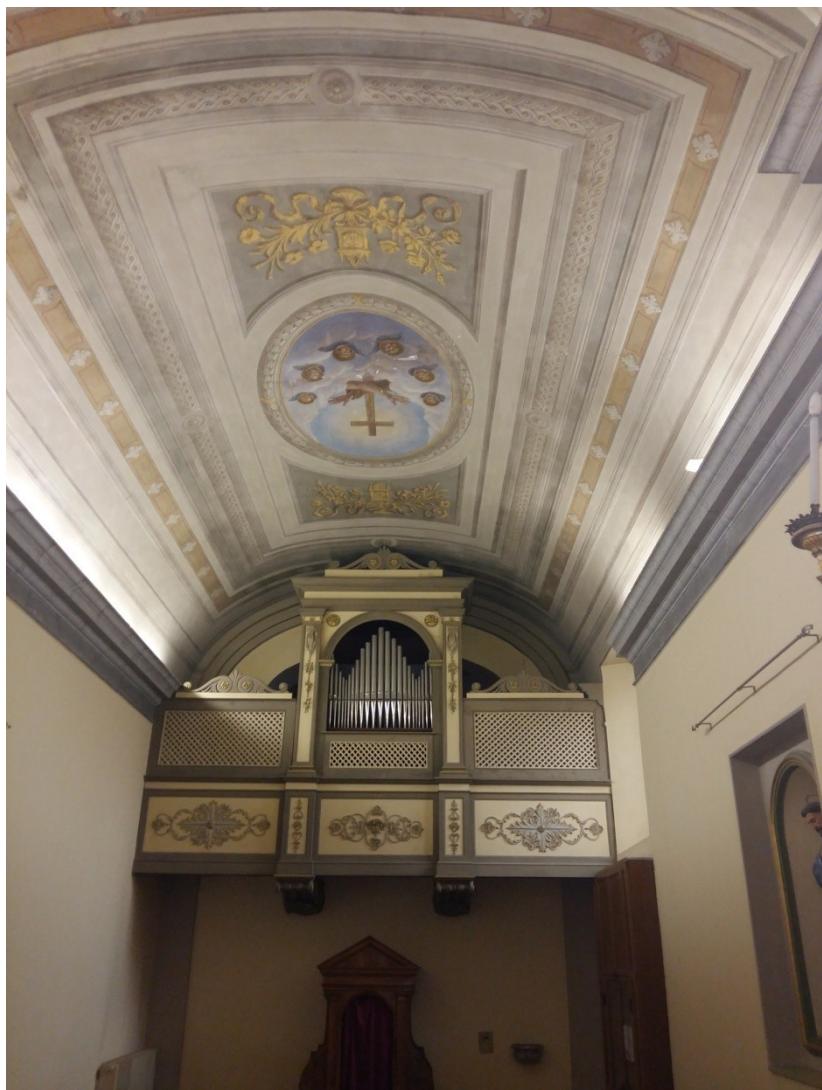
EXTERNAL VIEW

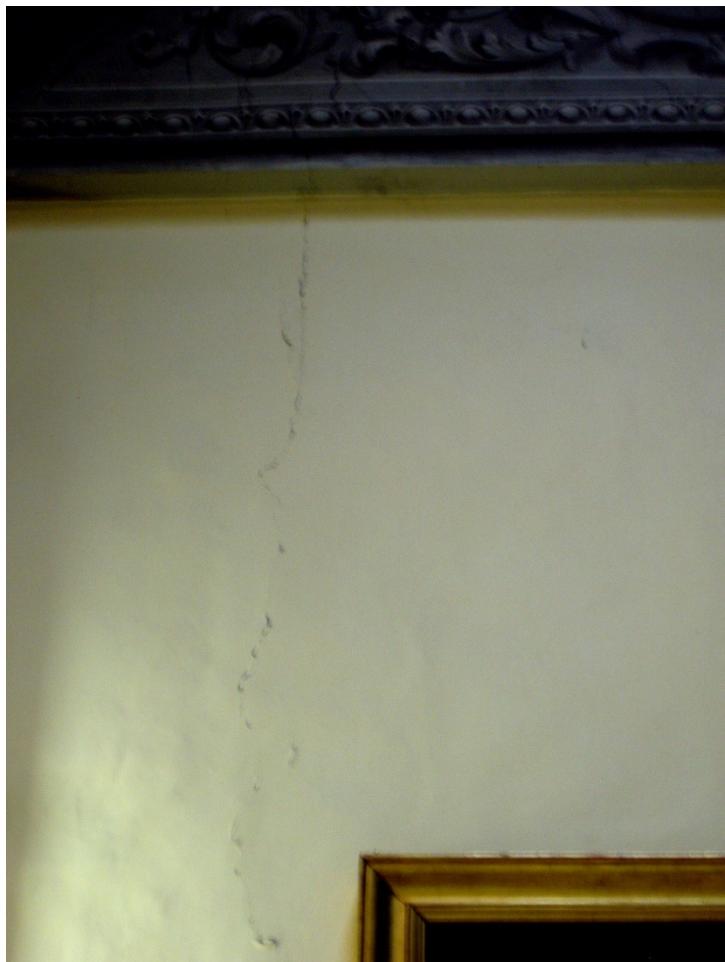




INTERNAL VIEW AND LESIONS

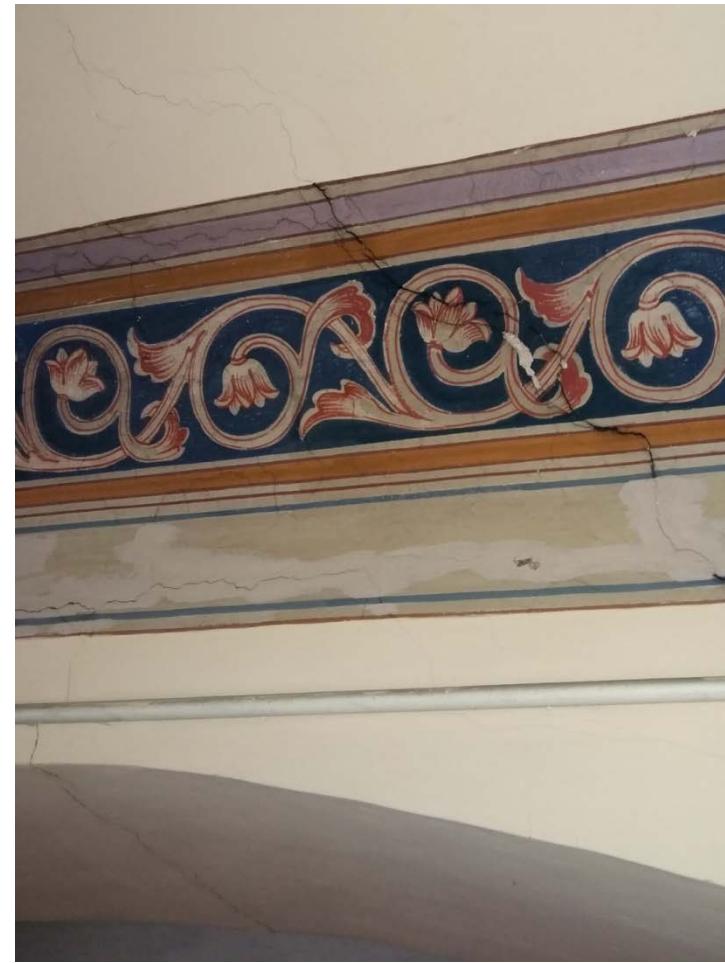
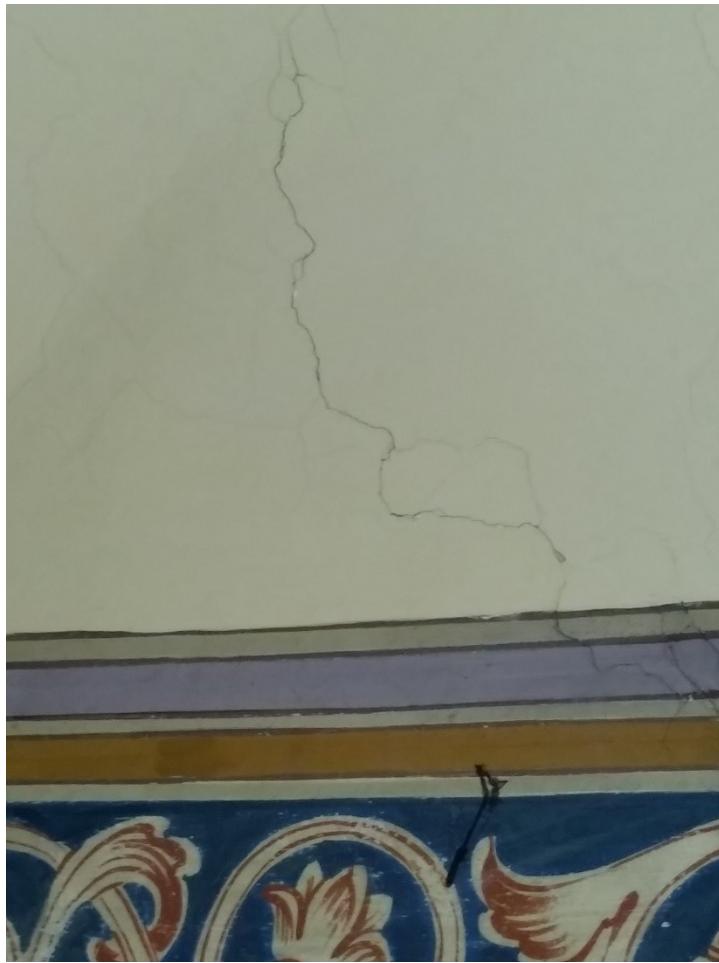
THE CHURCH

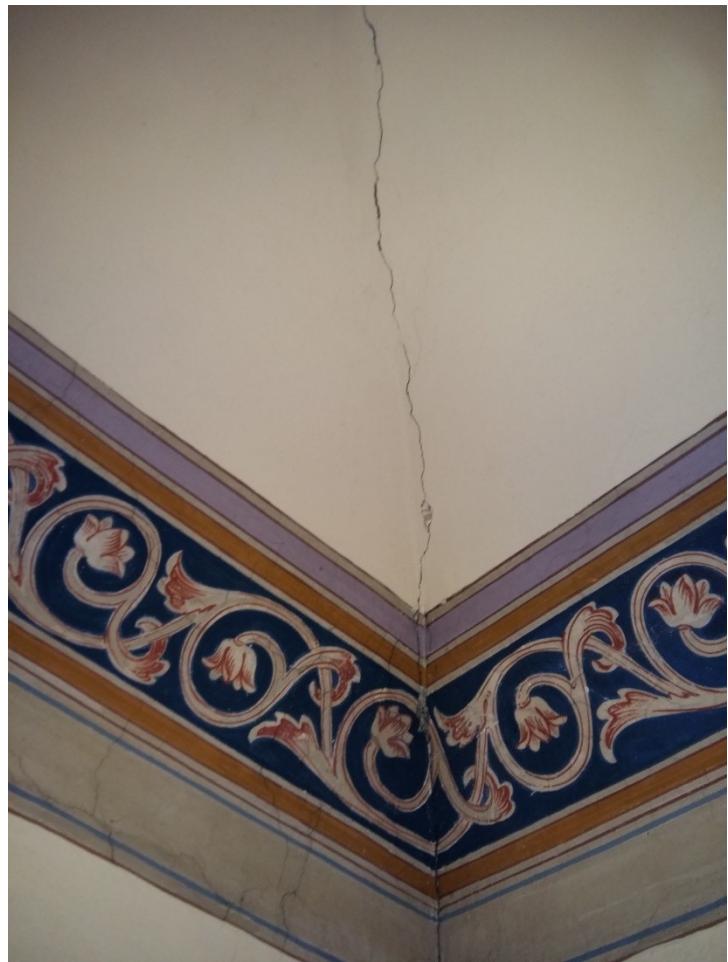




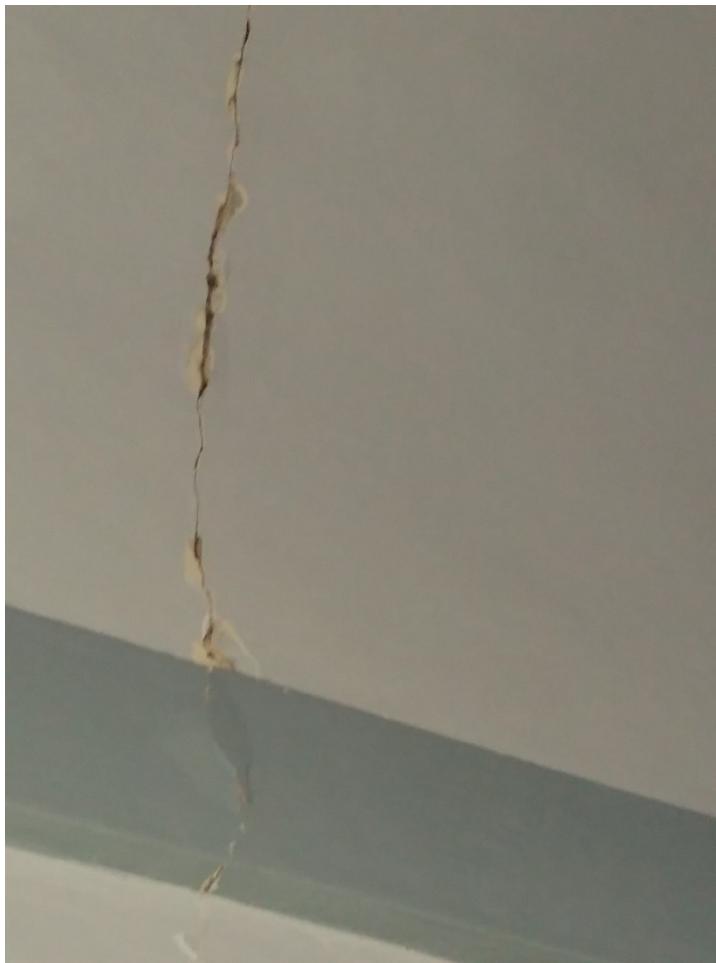


THE CHOIR





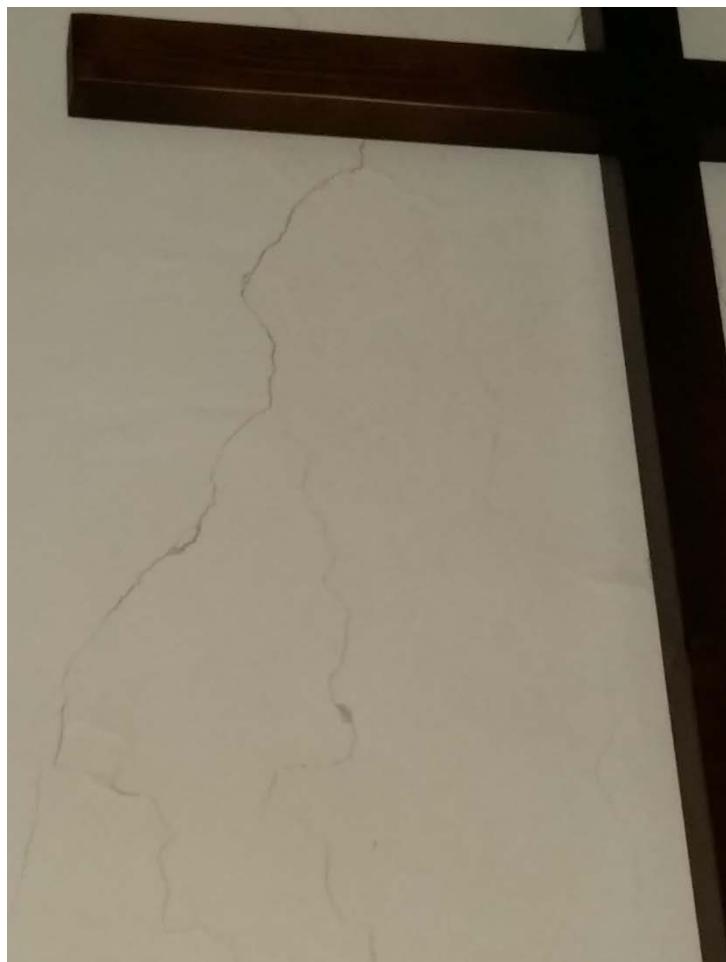
THE ENCLOSURE CHOIR

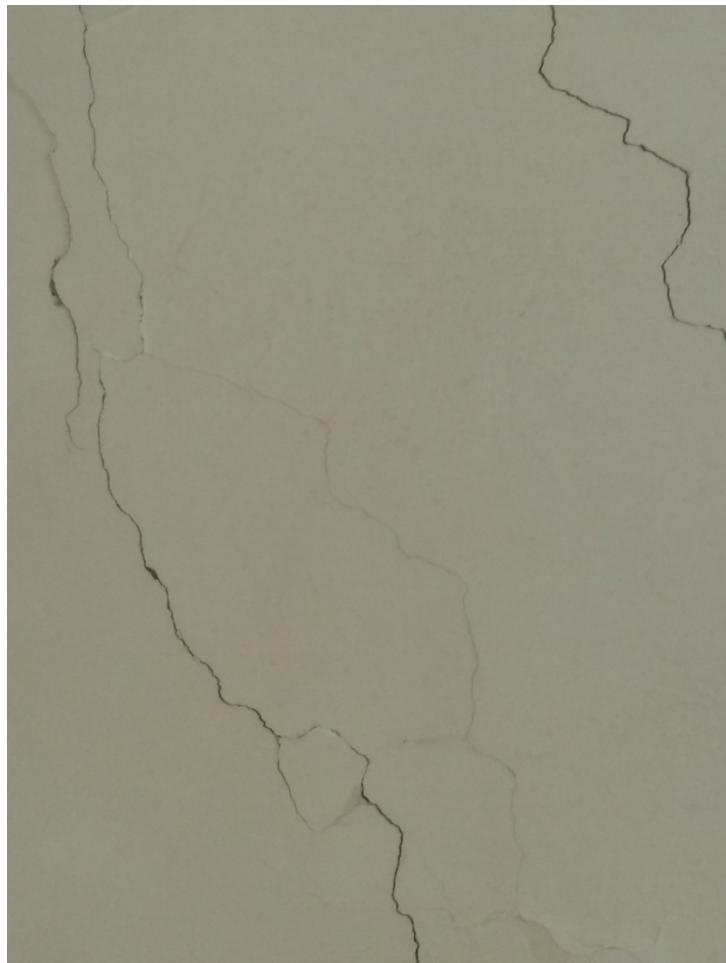




THE NOVITiate











GENERAL ESTIMATE OF WORKS

ESTIMATE OF WORKS BY MONASTERY

- Scaffolding for brick arches: Ponteggio modulare per puntellamento volte in muratura di mattoni: 20.000 €
- Scaffolding (internal/external) Ponteggi in elementi a cavalletti e giunto tubo, sia interni che esterni: 33.000 €
- Demolition of brick/tile flooring Demolizione di pavimenti, rivestimenti e massetti: 4.000 €
- Removal of present installations/fixtures Rimozione varie tra cui infissi, sanitari, ecc.: 3.000 €
- Disassembly of roofing Smontaggio totale della copertura (compreso manto di copertura): 29.000 €
- Demolition of wooden flooring Demolizione solai in legno: 3.500 €
- Demolition of attic materials Demolizione controsoffitti in ferro e laterizio, c.a. o legno e laterizio: 4.000 €
- Demolition of partitions Demolizione di tramezzature: 1.000 €
- Emptying and cleaning of vaults Volte: svuotamento e pulizia: 3.000 €
- Consolidation of vaults with composite material Consolidamento delle volte con materiale composito: 35.000 €
- Steel circling of structures Cerchiatura in acciaio dei solai in legno e delle volte, : 12.000 €
- Consolidation/Redoing of wooden flooringConsolidamento e rinforzo e/o nuova realizzazione dei solai in legno: 21.000 €
- Resurfacing of brick/stone flooring Rifacimento massetti, pavimentazioni e rivestimenti: 10.000 €
- Prepare perimetral walls in sommità per successiva cerchiatura in acciaio e nuova copertura: 23.000 €
- Steel circling of Roofing Cerchiatura in acciaio della copertura con UPN: 11.000 €
- Prepare roofing structure prior to waterproofing (struttura completa in legno, tavolato e quant'altro necessario a completare l'opera fino alla posa in opera della guaina impermeabilizzante): 115.000 €
- Cleaning and reassembly of previously cleaned recycled material and substitution of 60% damaged material

con sostituzione del 60% di quelli danneggiati:	22.000 €
- Install safety rails Dispositivi di sicurezza in copertura a prevenire le cadute dall'alto:	4.000 €
- New internal partitions Nuove tramezzature interne:	2.500 €
- Armed drilling, and other techniques to consolidate walls.....:	32.000 €
- Plastering of walls at junctions :	12.000 €
- Plastering of internal / external walls:	17.000 €
- Electricity installation:	25.000 €
- Water/bathrooms installation:	10.000 €
- Heating at entrance and parlor of monastery and Novitiate Dormitory	20.000 €
- Doors and Windows:	10.000 €

TOTAL COST OF WORKS BY MONASTERY **482.000 €**

ESTIMATE OF WORKS BY FEC

- Ponteggio modulare per puntellamento volte in muratura di mattoni: 30.000 €
- Ponteggi in elementi a cavalletti e giunto tubo, sia interni che esterni: 5.000 €
- Smontaggio totale della copertura (compreso manto di copertura): 10.000 €
- Volte: svuotamento e pulizia: 3.000 €
- Consolidamento delle volte con materiale composito: 40.000 €
- Cerchiatura in acciaio delle volte, compresa l'esecuzione dei perfori sulle murature perimetrali: 4.000 €
- Spianamento e ricostruzione muri perimetrali in sommità per successiva cerchiatura in acciaio e nuova copertura: 8.000 €
- Cerchiatura in acciaio della copertura con UPN: 4.000 €
- Rifacimento della copertura in legno lamellare (struttura completa in legno, tavolato e quant'altro necessario a completare l'opera fino alla posa in opera della guaina impermeabilizzante): 45.000 €
- Rimontaggio del manto di copertura mediante recupero degli elementi rimossi, preventivamente puliti, con sostituzione del 60% di quelli danneggiati: 8.000 €
- Dispositivi di sicurezza in copertura a prevenire le cadute dall'alto: 1.000 €
- Opere di consolidamento delle murature, perfori armati, scuci-cuci e incatenamenti o cerchiature: 8.000 €
- Stilatura e ripristino di struccatura dei giunti delle murature esterne: 3.000 €
- Ripresa e/o rifacimento di intonaci interni ed esterni: 10.000 €
- Opere di restauro dei beni artistici e architettonici: 60.000 €

TOTAL WORKS BY FEC

239.000 €

ECONOMIC FRAMEWORK FOR THE WORKS

Estimate of Works by Monastery: 482.000 €

Estimate of Works by FEC: 239.000 €

TOTAL ESTIMATED COST OF WORKS: 721.000 €

VAT and Technical Expenses including insurance and VAT: 170.000 €

TOTAL SUM OF ESTIMATED EXPENSE FOR WORKS 891.000 €