



# **The 7 Most Endangered 2013**

Programme run by **Europa Nostra**,  
the Voice of Cultural Heritage in Europe,  
in partnership with the **European Investment Bank  
Institute**

## **Monastero di San Benedetto Po in Polirone, Italy**

### **Technical Report**

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## 1. Overview

This report proposes an action programme for the monastery of San Benedetto Po subsequent to the earthquake damage of May 2012. It proposes making the buildings safe, of which some works have already been done, such as strengthening the structures against possible future seismic activity and restoring the damaged works of art mainly stucco and frescoes.

At the time of the visit in September 2013, the causes and effects of the damage surrounding one cloister (San Simeone – first floor head-quarters of Polironiano Museum) had been carefully explored, identified, categorised, remedies proposed and completed with the help of expert external consultants.

At that time no complete detailed plan yet existed for the remaining works required in each area nor of their costs. In July 2014 a detailed breakdown of these costs and the future costs was received, in which the estimated total amount required is €6.3 million, of which €1.8 million are reported to have been financed.

With regard to the Parish works, an estimate has also just been received, which estimates the Parish costs at a modest €350 000.

These cost estimates may well change, and most probably rise, as a result of unforeseen problems that arise inevitably during restoration works.

## 2. Location and Purpose

<b>Location</b>	Benedictine Monastery of San Benedetto Po, 79, via Enrico Ferri, 46027 San Benedetto Po, Italy
<b>GPS</b>	45° 03' 33,33" N – 10° 91' 66,67" E
<b>Purpose</b>	To make the building structures safe; to increase the resistance of the structures to future earthquakes in accordance with the current seismic regulations overseen by the State designated Superintendent of Works ( <i>Soprintendenza</i> ) for the area and to restore the art works.

## 3. Context

The municipality of San Benedetto Po is located on an island between the Po and the Lirone rivers south east of Mantua in the Po valley. The municipality (population 7 700) resembles many such sparsely populated areas in rural Italy where the population has diminished considerably since the end of the Second World War. The quiet, friendly little town bearing the same name is, however, exceptional in that the centre of the town is completely dominated by the palace-like buildings (15 – 26m high) of its beautiful Benedictine Monastery (shown at Appendix 2).



Over the period since the year 2000 a number of the monastery buildings and frescoes had been substantially restored to a high standard, but this work was brought to an abrupt halt by the most unfortunate earthquakes of 20<sup>th</sup> and 29<sup>th</sup> May 2012. These caused extensive damage to both the structures of the buildings and especially to the beautiful stucco and fresco artworks of some of the ceilings and walls.

The various buildings that comprise the Monastery of San Benedetto Po (Shown at Appendix 3) are to a large extent closely interconnected and yet the works are the responsibility of three separate authorities. These are:-

- ☐ **State Authorities** - External damage with risk to the public
- ☐ **Parish of San Benedetto Po** - Internal damage to the Basilica and Oratory
- ☐ **Municipality of San Benedetto Po** - Internal damage to the remaining buildings.

There are areas of mixed use within the monastery complex, for example:-

- **Municipality of San Benedetto Po** houses within its buildings:-
  - o Municipal Civic Hall (West Wing - Secular Cloister),
  - o Rooms for local associations (South Wing - Secular Cloister),
  - o San Benedetto Po Post Office (East Wing - Secular Cloister).
  - o Civic library on the ground floor (Library – San Simeone Cloister),
  - o Parish nuns occupy part of the ground floor (West Wing - San Simeone Cloister)

**The Florian Tower** of the demolished church of St. Florian lies outside the monastery complex some 100m to the south east of the south eastern corner of the complex. An external pinnacle was removed subsequent to the earthquakes, which requires reinstating presumably by the State. Internal works that may be needed are presumed to be the responsibility of the Municipality.

#### **4. Description**

An excellent description of the damage to the buildings and art works subsequent to the earthquakes of May 2012 was submitted to Europa Nostra in the original Nomination Form for the monastery (Shown at Appendix 4).

In addition reports in Italian (one for the Municipal part and one for the Parish part) set out possible methods for repairing the various types of damage. However only as full structural surveys are carried out, will it be possible for the civil/structural engineer responsible to define the preferred solution to each problem.

#### **5. Technical Aspects**

Following the site visit of 9<sup>th</sup> & 10<sup>th</sup> September 2013, some observations were made with regard to Structural Damage:-



- **San Simeone Cloister:-**

- Roof Structure above the first floor is of wooden rafters and tie beams. During the rocking of the walls caused by the earthquake, these beams became detached and acted as hammers causing further damage to the masonry at each end of the beams. Therefore, the reinforcement of these walls can be considered an advisable solution, but it is not strictly compulsory.

It is a pity that in some places owing to water infiltration, there not being an impermeable membrane beneath the terra cotta tiles, the masonry to which the beams are attached had become unsound.

- North and West wings during the surveys, it was found that the central longitudinal walls on the first floor were not perfectly aligned vertically above those of the ground floor. This was particularly marked in the North wing and is a point of potential weakness which will need to be assessed for the resistance of these structures to future earthquake events. It should be emphasised that this situation has existed since the time of the renovation of the Monastery (1500) and that no particular problems have occurred since that date.

- First floor this building has been much altered over the years to suit the requirements of various occupiers. Thus, over time, previous arches and doorways along the walls have been filled in and hidden and new ones created. Cracks and fissures have appeared around the open arches but also around the earlier arches revealing their presence. As with all ancient buildings, many changes have been made to the structure and masonry, and during the earthquake many constructive joints have suffered cracks to their plaster coatings. A comprehensive stratigraphic study has revealed the nature and the causes of this damage.

- **Basilica (Internal - 70m long x 36 m wide & 15,5m to 26m high):-**

- Structure as for the San Simeone Cloister is of wooden rafters and tie beams, however some years ago an impermeable membrane was laid beneath the terra cotta tiles to prevent water infiltration and as a consequence the roof structure seems to have remained intact.

- Nave comprises a series of pillars on either side of the central part. These round pillars of Roman origin comprise rather narrow load carrying centres of Roman red brick cased in thick plaster. Some pillars behind the altar have already had to be underpinned by a series of micro-piles to a depth of 10m. However, apparently as a result of the earthquakes, one pillar about half way along the north side of the nave has sunk several centimetres with consequences to the arches at the top. These pillars along the nave, which have not been underpinned, appear to be a point of weakness which will need to be assessed for the resistance of the basilica to future earthquake events.

- **Ceilings and Walls :-**

- The ceiling frescoes in the Basilica, library and main staircase are particularly beautiful. The ceiling frescoes are attached to wooden vaulted structures above. The stability of the wooden structures needs to be verified and strengthened where necessary. The plaster of the frescoes needs pinning back to the wooden vault above from which parts of the plaster base of the



frescoes have become detached. The ceilings whether plain surfaces or with frescoes have a significant number of visible fissures and cracks as indeed do the walls. These have already been mapped and at a rough estimate some 70% would appear to be minor and 30% more serious.

- Restoration and seismic strengthening efforts on fake vaults and brick vaults in the Museum, Monumental Stairway, Library and Basilica are underway, and should be finished in 2014.

## **6. Implementation**

Implementation is made more complex by the fact that there are, as mentioned above, three promoters – the State, the Municipality and the Parish.

For those buildings requiring external repairs, it would seem essential that the external repairs be completed before internal repairs to the same buildings begin. The responsible State Authorities should be asked to provide firm commitments for the dates of starting and completion of these external works and for the timely provision of the necessary funds.

As was also mentioned earlier there are adjoining areas and areas of mixed use, which create interfaces between the three promoters. One of the most frequent causes of unforeseen, and sometimes substantial, delays and cost overruns in projects are due to “who does what” disputes over responsibilities and access at interfaces and therefore these responsibilities should be defined carefully and agreed precisely before tender documents are prepared. This applies to the mixed areas cited above but also to all walls (joint or adjoining), overlapping roofs or other structures separating the State, Municipality and Parish or other areas throughout the complex. The promoter has subsequently been stated that the areas of responsibility between the Municipality and the Parish are clearly defined.

The Municipality is making completion of the restoration of the museum and refectory a priority in order for them to reopen by the end of 2014. The renovation and seismic strengthening of the town hall is under way with re-opening foreseen for the end of 2014 early 2015. The rest of the complex is planned to follow over the years 2015 and 2016.

The Municipality of San Benedetto is undoubtedly going through a period of great difficulty. The Municipal offices were very badly damaged by the earthquakes and are uninhabitable. Consequently the Municipal offices are housed in containers for the present. Also the Municipality covers a rather large rural area with a low population density and is constrained in terms of staff and finance. It would be prudent therefore to establish a Project Implementation Unit led by an independent civil engineering consultant to oversee the works from beginning to end. In effect this is happening under civil engineering consultants led by Eng. Florindo Lanfredi and assistants and aided by the expert guidance of Eng. Nicola Berlucchi, an acknowledged expert in the restoration of large heritage buildings and palaces.

All proposed works have to be authorised by the Cultural Heritage Minister after careful review by the Superintendent of Brescia, Mantua and Cremona.



For the Municipality it is recommended that the project be conducted in phases:-

- |         |   |
|---------|---|
| Phase 1 | <u>Planning</u> <ul style="list-style-type: none"> <li>- Supervise, define and prepare estimates of quantities for the proposed works in each area.</li> <li>- Estimate in detail the overall project cost.</li> <li>- Provide a detailed proposal for the works to be carried out and of the estimated project cost.</li> </ul>  |
| Phase 2 | <u>Call for tenders for project works</u> <ul style="list-style-type: none"> <li>- Prepare tender documents for fixed price contracts</li> <li>- <b>N.B. According to Italian Law and professional experience, fixed price contracts are preferred.</b></li> <li>- Supervise the tendering procedure, technical and financial evaluation processes and selection of contractors</li> </ul>  |
| Phase 4 | <u>Project Works</u> <ul style="list-style-type: none"> <li>- Monitor the progress of works, the measurement of work done and authorize payment in accordance with the contracts.</li> <li>- Foresee potential delays and problems, take timely action to avoid or minimise delays and cost overruns.</li> <li>- Closely monitor expenditure against budget.</li> <li>- Assess and recommend solutions to claims.</li> <li>- Hold regular progress and coordination meetings with promoter.</li> <li>- Provide succinct periodic reports to promoter showing progress against programme and proposals for eliminating delays; expenditure against budget and proposals for eliminating cost over-runs; details of claims received and proposed action.</li> </ul> |
| Phase 5 | <u>Project Completion</u> <ul style="list-style-type: none"> <li>- Provide completion report summarising the works done, delays, claims and final overall outturn cost.</li> </ul>  |

## **7. Procurement**

The works carried out by the State and the Municipality must be tendered openly under the tendering procedures governed by European Union Directive, whereas the Church and therefore the Parish is considered to be a private entity and may tender as it considers best.

## **8. Environment, Sustainability and Social Aspects**

The project is of great importance to the central area of the small town of San Benedetto Po, since without the proposed works there is a strong risk that the monastery complex would slowly dilapidate, fall into disuse and disintegrate.





Sustainability is a concern. The maintenance costs of this large monastery complex must be significant and represent a heavy weight on a small Municipality. The financial contributors to the restoration are likely to take an interest in the maintenance of the buildings over the coming years. Therefore the Municipality should prepare a long term forecast of annual operating and maintenance costs and details of how these annual expenses will be covered. An additional investment now could reduce the long term maintenance costs for example by inserting impermeable membranes under the roof tiles whenever this is appropriate.

The Monastery provides some employment in the museum which has been given first priority for restoration and is already open again. It also organises a number of events throughout the year to attract visitors. The social benefits of the Monastery, in terms of employment creation, are however likely to remain limited.

## **9. Use, Market and Demand**

It will be a particular challenge for the Municipality to find uses for these large building volumes and to heat them economically even if they were to be thermally insulated.

The Polironiano Anthropological Museum was established in 1977 and is one of the largest ethnographic museums of Italy. With over 13,000 items, of which only a small part are on display, the museum is an important historical document, and outlines the tangible and intangible characteristics of the popular culture of the Po Valley. The current exhibition opened in 2009. The first rooms (from 1 to 15) are dedicated to the popular culture and rural society, the following rooms (16 – 24) are dedicated to magic, folk religion, local legends and artistic expression of popular culture. In the basement of the monastic refectory and infirmary is the archaeological section of the museum displaying articles discovered during excavations and also a rich collection of Po Valley farm carts. There is no doubt that the museum is a valuable repository of Po valley archeology and ethnography. The current display is however largely static and relatively small providing just a few hours of interest for the average visitor without a special interest in archaeology and anthropology. The depository holds many examples of historical agricultural and domestic instruments, which, if cleaned, repaired and made to work interactively would help attract a wider audience.

Several years ago a private promoter started to develop the first floor of the Old Infirmary as bedrooms for a 4 star hotel, including a bar and reception facilities on the ground floor. It failed, probably because of insufficient demand but also because the bedrooms are very big with high ceilings and with small unattractive bathrooms. With its subsequent management, the hotel was converted into a hostel recognized by Regione Lombardia, becoming a point of reference at the provincial level for congress tourism. Unfortunately, this activity was lost due to the earthquake. In any case if the accommodation facility were to be reopened, it would be unlikely to be economic owing to large heating and housekeeping expenses.

Some clearly believe that because the Monastery is unique in the region, and one of the best remaining examples of a Benedictine Monastery (Cluny Monastery does not exist anymore) and because Polirone has recently celebrated its first millennial anniversary that San Benedetto has a significant potential for



tourism. It is also true that the river Po, the longest in Italy, offers the possibility for travel to San Benedetto from Mantua by boat, which includes an impressive trip through the medieval river locks of Governolo. Also cycling tracks are opening in many areas surrounding the course of the Po.

However the town of San Benedetto Po has few attractions apart from the Monastery. It has several shops and several small café/restaurants catering mostly to local needs and several small bed and breakfast businesses within the town and in the countryside at some distance from the town. It is difficult for San Benedetto Po (0 hotels, 7 bed and breakfasts and 12 restaurants) to compete as a tourist destination with attractions such as the beautiful walled city of Mantua at 24 km (13 hotels, 42 bed and breakfasts and 50 restaurants) or the Arena of Verona at 52 km, neither of which is that far away by motorway. It can realistically only hope for limited numbers of tourists.

The prospects of revenue to cover fully or even make a sizeable contribution to the operating and maintenance costs of the Monastery complex must be regarded as very limited.

## **10. Investment Cost and financing requirements**

Details of the Municipal project cost received on 4th July 2014 are shown at Appendix 5 and include quantities and unit prices as well as a reference indicating the site of each works. The total estimated cost is €6,30m, of which €1,80m are reported to be financed and partially finished and €4,50m remain to be financed.

Details of the Parish project cost received on 9<sup>th</sup> July 2014 are shown at Appendix 6. The cost of the works for the Basilica and Oratory are estimated at €350 000, however no details are given as to how the sums shown at Appendix 6 were arrived at and therefore it is not possible to comment on them.

## **11. Financing possibilities**

The Municipality is faced with a Herculean task to find the funds to restore the monastery interiors affected by the earthquakes of 2012. On the other hand the municipal authorities are immensely motivated and work hard raise the necessary funds, both from public and private sources.

For the Italian State to participate in financing interior works an earthquake must reach 6,0 on the Richter Scale; unfortunately, from the funding point of view, the strongest of the earthquakes of May 2012 reached only 5,9 on the Richter Scale. In this case the State limits itself to funding the works for making safe external perimeter structures that endanger the public on footpaths and roads.

With regard to the prospect of EU structural funds, one should note that the Lombardy Region that administers the EU funds for the region has fully committed all such funds until the end of 2013 and that funds for the period 2014 to 2020 should become available in 2015.

Finally the Italian law of ‘Contract Stability’ prevents the Municipality from engaging professionals to develop projects unless funds to cover the professional fees are already available. As a consequence the outstanding works of restoration are awaiting funding for the surveys, planning and project definition and





especially regarding the Infirmary, which is the most expensive intervention due to the extensive damage that has occurred.

## **12. Summary and Conclusion: Proposed action programme and recommendations**

The measures proposed for making safe and increasing the resistance of the building structures to seismic events and for the restoration of the most valuable art works within the Monastery of San Benedetto Po are without doubt urgent and justified. The management of this situation by the Municipality of San Benedetto Po subsequent to the earthquakes can be regarded as one of the most effective in the area. They were the first to reopen part of the Museum and the Refectory.

The remote situation of this rural town with few attractions for tourists makes it difficult to attract tourists, the majority of whom seem likely to be limited to day trippers and students. Thus its revenue earning capacity is severely limited.

The annual maintenance of such a large complex of buildings in such a small Municipality (Population 7.700) is clearly beyond its financial capacity.

### **Conclusions**

1. The structural works needed to make all the buildings safe and to increase their resistance to seismic events will require the assistance of an experienced civil engineer.
2. The implementation phases set out above are intended to lead to the completion of the specified works as near as possible on time and on cost and to give financial contributors confidence in the sound and efficient use of their finance.
3. The need to cover the annual maintenance and operating costs requires a long term forecast of both these annual costs and the annual revenues and a finance plan indicating how the expected annual shortfalls may be covered.

### **Recommendation**

A feasibility study should be carried out to forecast the annual revenues from all the Municipality's promotional activities with regard to the Monastery. The study should include a forecast of the annual maintenance and operating costs such that the size of the likely annual deficit can be estimated and proposals made for covering any deficit for example through access to regional and national funding sources.



## Appendix 1

### References and Documents

- Nomination form to Europa Nostra “7 most endangered...”- 15<sup>th</sup> March 2013
- EIB Institute Pre-Mission Questionnaire - 17th July 2013
- Response to Pre-Mission questionnaire - 20th August 2013
- Riparazione, Miglioramento Sismico – Chiostre di San Simeone - 8th August 2013
- Relazione Tecnico-Descrittiva degli Interventi di Progetto – San Benedetto Abate - February 2013
- Relazione e Valutazione Sismica – San Benedetto Abate - February 2013

### Mission details 10<sup>th</sup> – 11<sup>th</sup> September 2013

<u>Europa Nostra:</u>	Rossana Bettinelli Ioanna Steriotou	Board Member – Europa Nostra Scientific Council – Europa Nostra
<u>EIB Institute:</u>	Richard Deeley	Consultant
10 <sup>th</sup> September	Maurizio Monoli Sabrina Filetti Roberto Cerreti Marco Giavazzi Landfredi Florindo Nicola Berlucchi Stefano De Vito Federica Guidetti	Cultural Director - Lombardy Referent Territory - Lombardy Director Territory - Mantova Mayor – San Benedetto Po Technical Office – San Benedetto Po Director – Restoration Works Structural Engineer – Restoration Works Conservator – Polironia Museum
11 <sup>th</sup> September:	Monsignor Manzoni Don Stefan Savoia Landfredi Florindo Nicola Berlucchi A.N.Other A.N.Other	Member – Diocese of Mantova Member – Diocese of Mantova Technical Office – San Benedetto Po Director – Restoration Works Member – Friends of the Basilica Parish Technician



Appendix 2

**Photo of Monastery of San Benedetto Po**

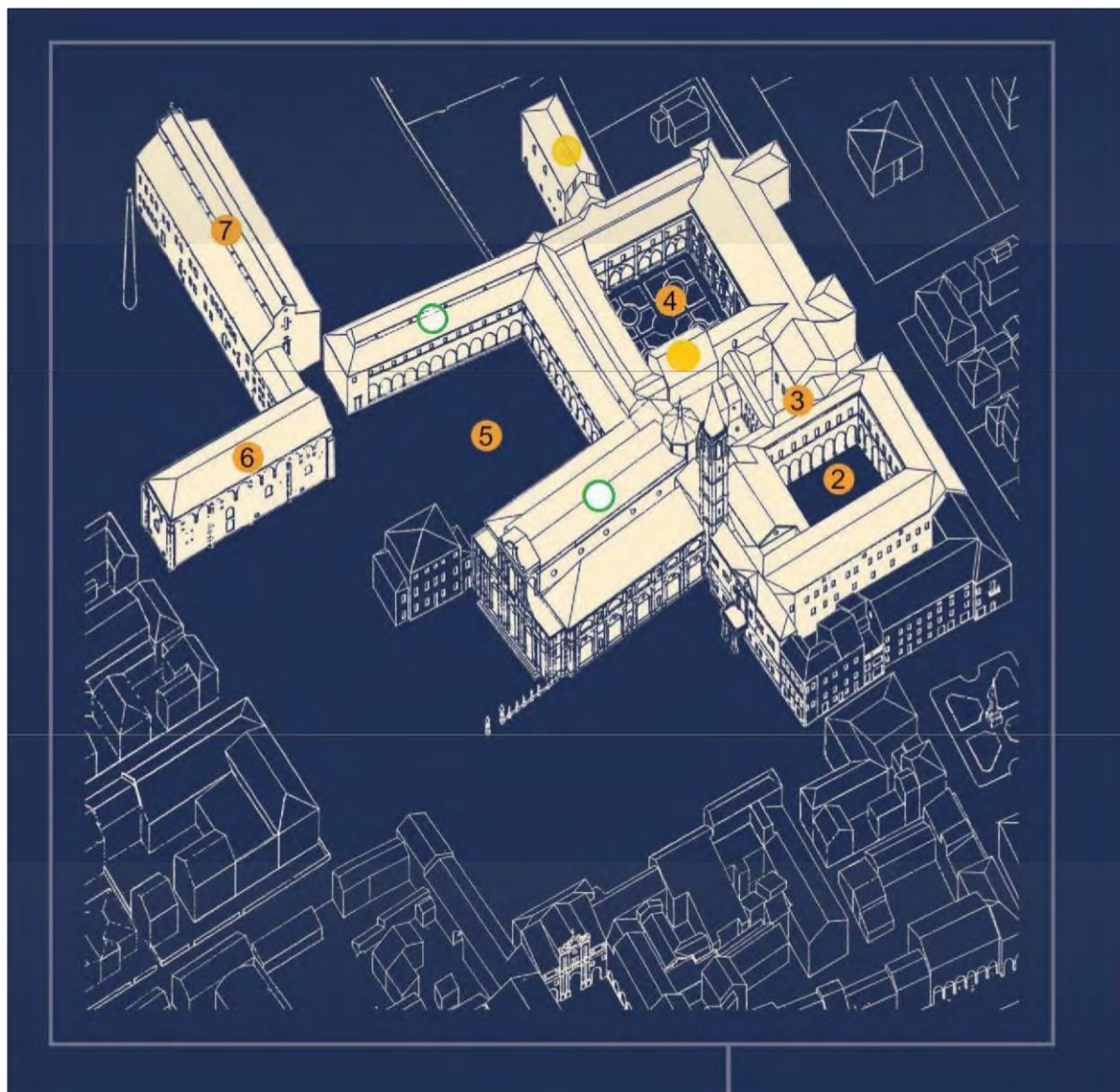






## Appendix 3.1

### Plan of Monastery of San Benedetto Po

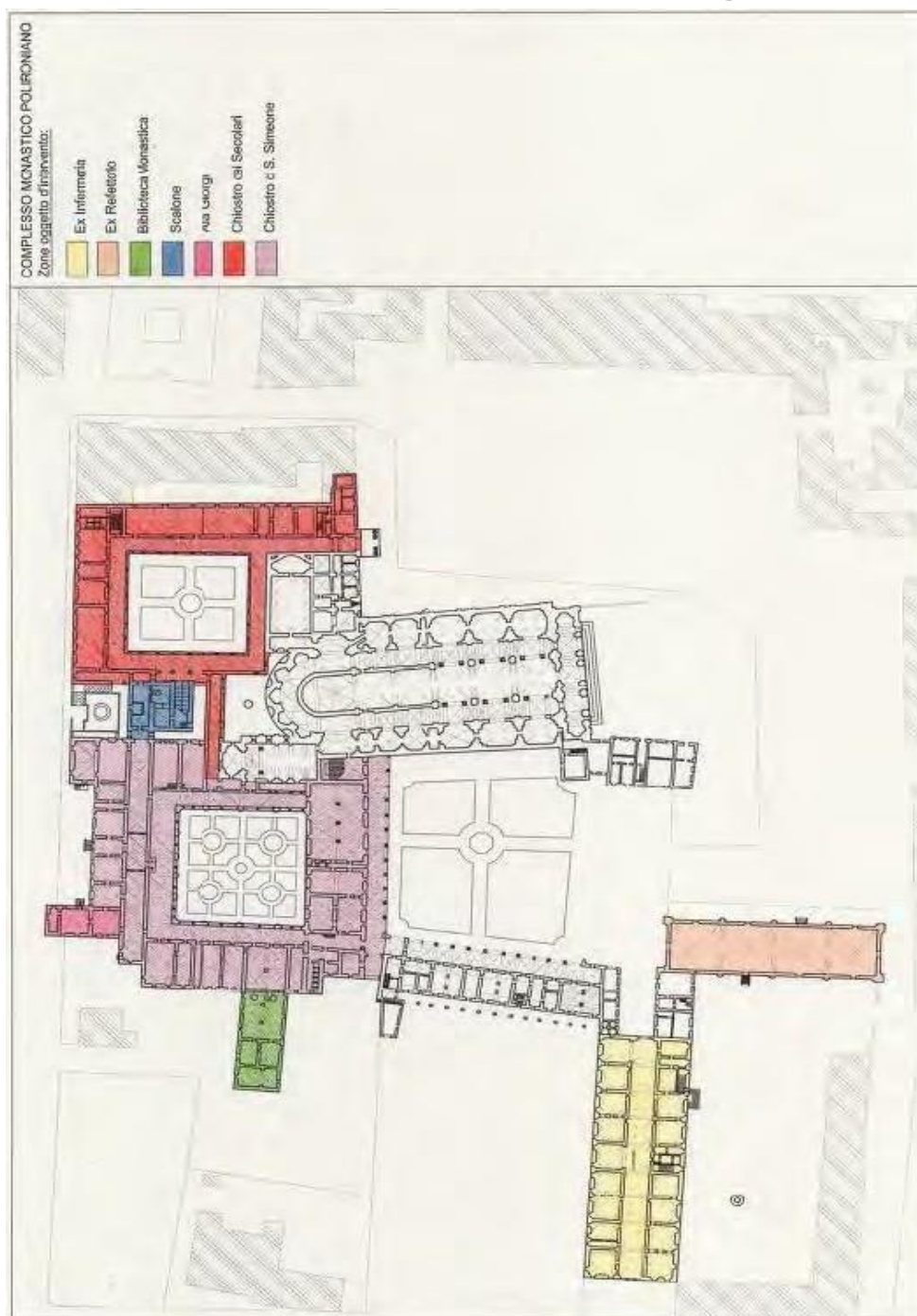


1. ABBEY CHURCH (owned by the Parish)
2. ABBOTS CLOISTER (1450) – ground floor: civic hall, post office, and location of four associations; upstairs: deposits of the Polironiano Museum
3. BARBERINI STAIRCASE (1674)
4. SAINT SIMEON CLOISTER – ground floor: the chapter hall, the music school, archives, offices; upstairs: Polironiano Museum
5. SAINT BENEDICT CLOISTER
6. REFECTORY (1478)
7. THE OLD INFIRMARY (second half of the sixteenth century)
8. PARISH ORATORY (owned by the Parish)
9. MONASTIC LIBRARY (1790)
10. SCRIPTORIUM (second half of the fifteenth century)



## Appendix 3.2

### Plan of the Municipal Buildings





Appendix 4.1

**The damage to the monastery complex caused by the earthquakes of 20th and 29th May 2012 are described below:**

BUILDING	TYPE OF INTERVENTION	DETERIORATION IN THE CASE OF NONINTERVENTION
Church	Cracks in the vaults and in the frescoed walls on the vaults, and on the walls of the aisles, on the nave, on the sacristy, on the ambulatory and on the transept and apse of the oratory of Santa Maria.	Posting of frescoes and stucco, fallen statues. <b>Everlasting inaccessibility of the building.</b>
Parish Oratory	Consolidation of the supporting structures and in particular of the vaults.	Collapse of some parts of the building. <b>Everlasting inaccessibility of the first floor of the building.</b>
Polironiano Museum	In the staircase leading to the first floor of the museum there are detached fragments of stucco statues at the four corners of the frame and also there are deep lesions in the corners and along the perimeter of contact between the ceiling and the wall structure behind it. Also in this case, the visible structure is supported by a wooden structure hardly visible but that, at the moment, it does not guarantee safety. The entrance to the museum presents the same type of instability of the cover, as well as the interior corridors where it is possible to see the signs of a strong dynamic deformation of the structure, probably due to heterogeneity of shares and bonds with the structures behind them. The oscillating movement caused the detachment at floor level and, above all, the trend of the roof, pushing, that is detached from the perimeter walls. The scriptorium of the XV century presents a large and worrying crack in the east wall. The west wing of the museum denotes instability localized in the top of the side wall of the corridor towards the cloister, where the walls stand out compared to the coverage of the adjacent rooms, an extensive system of lesions that tend to detach the ceiling from the walls represents a real danger to the delicate balance of these static structure. In the museum offices some cracks have been produced at the support of one of the beams that support the ceiling panels.	Collapse of the vault and of the east wall of the former scriptorium. Loosening of the connection between ties and wall structure in all corridors. <b>Everlasting inaccessibility of the building.</b>





## Appendix 4.2

<b>Former Refectory (1478)</b>	The ground floor of the building, covered by large vaults. The vault in the portion east of the hall has already previously been collapsed, an event that alarmed about the particular characteristics of these structures, in fact, they are made with a heavy double brick structure built after the building of the outer faces. The earthquake caused a crack pattern located mainly in the core of the vaults. Despite the injuries do not present characteristics of particular danger, it is necessary to consider that the static situation of times is problematic in itself. The present large lights and the heavy structures make them unstable. There are also some cracks on the wall painted by Antonio Allegri from Correggio.	Collapse of the vault and of the colour of the fresco painted by Correggio.
<b>Former Infirmary (second half of 1500)</b>	The ground floor has a crack pattern which is particularly pronounced with longitudinal lesions along the walls and vaults of the east. This precarious condition increases the consequences of the earthquake because the structure had already been critical. Also because of pre-existing landslides, on the first floor there are particularly serious injuries caused by the earthquake. The central gallery on the first floor, with a vertical development particularly strong, provides access to all of the hotel rooms. The vaults have a crack pattern that affects both the area of the center and both the key portions.	Collapse of the superior vault damaging also downstairs. <b>Everlasting inaccessibility of the building.</b>
<b>Municipal Library and former eighteenth century library</b>	The building, with two floors, hosts on the top floor, in the museum, the ancient monastic library, and on the ground the current library, now UNPRACTICABLE Outside there are some sub vertical lesions at some openings that have reduced the capacity of the masonry walls to work in a unified manner. In the former library serious damage to the decorative structure supported by a complex and very deteriorated wooden structure are found. The disruption affects both the room and both the front vestibule: the lesions on the walls affect the connection points of the building to the main building of the monastery, the lintel of the columns and some collisions.	Collapse of the vault made of reeds, already severely damaged, with loss of all the decorations.
<b>Cloister of the Seculars (1450)</b>	<u>Ground floor.</u> <u>Upper floor:</u> in the museum deposits there are injuries on the diagonal cross of the vaults of the corridor, with particular reference to the central area that has suffered most of the dynamic stresses, it can be seen also some vertical cracks that led to the isolation of the outer edge. In the south area some lesions are visible and they tend to isolate the longitudinal end walls from the roof.	Detachment of the vault from the walls with danger of collapse. Possibility of imminent collapse on public roads.



Appendix 5.1

		importi di appalto o a consuntivo	ribasso	importi netti a consuntivo o stima economica	copertura finanziaria	superficie			costo al mq	NOTE
						n. piani	sup.	tot.		
01.1	AVANCORPO NORD-EST (ALA GIORGI) - opere appaltate (in contenzioso) - opere già eseguite Ponteggi e puntellazioni interne e tranti esterni			€ 20.000,00	Fondi Protezione civile				(Euro/mq)	messe in sicurezza prime 72 ore
				€ 20.000,00						
01.2	AVANCORPO NORD-EST (ALA GIORGI) - opere appaltate (in contenzioso)	€ 216.477,44	81,67%	€ 176.688,89	Fondi FSUE	3,00	125,00	375,00	€ 471,17	compreso interrato
	Ponteggi e allestimenti esterni	€ 7.368,36		€ 6.014,06					€ 16,04	
	Intervento in copertura e cordolo	€ 71.667,90		€ 58.495,34					€ 155,99	
	Consolidamento murature e volte e inserimento catene	€ 67.410,17		€ 55.020,18					€ 146,72	
	Intonaci e tinteggiature interne e esterne, ripristino finiture	€ 70.031,01		€ 57.159,31					€ 152,42	
01.3	AVANCORPO NORD-EST (ALA GIORGI) - opere da eseguire stima			€ 25.000,00	Fondi da ripartire				€ 66,67	
	Restauro locali mancanti piano terra			€ 15.000,00					€ 40,00	
	Revisione impianti piano terra			€ 10.000,00					€ 26,67	
02	EX REE/TORIO - opere appaltate (in contenzioso)	€ 289.596,01		€ 236.368,26	Fondi FSUE	1,00	625,00	625,00	€ 378,19	escluso interrato
	Ponteggi e allestimenti interni	€ 28.585,92		€ 23.331,83					€ 37,33	
	Intervento in copertura e cordolo	€ 104.543,59		€ 85.328,48					€ 136,53	
	Consolidamento murature e volte	€ 91.766,50		€ 74.899,82					€ 119,84	
	Riparazione lesioni esterne con piattaforma	€ 12.700,00		€ 10.365,74					€ 16,59	
	Ricostruzione volta a crociera	€ 52.000,00		€ 42.442,40					€ 67,91	
03.1	SCALONE BARBERINI MESSA IN SICUREZZA - opere già eseguite			€ 50.000,00	Fondi FSUE	2,00	195,00	390,00	€ 128,21	assimilabile a 2 piani per altezza
	Ponteggi e puntellazioni interne			€ 50.000,00					€ 128,21	
03.2	SCALONE BARBERINI - opere in corso di appalto già finanziate	€ 141.259,67	85%	€ 120.070,72	Fondazione Cariplo	2,00	195,00	390,00	€ 307,87	presunto
	Ponteggi e allestimenti esterni	€ 10.447,73		€ 8.880,57					€ 22,77	
	Ponteggi e allestimenti interni - adeguamento	€ 20.000,00		€ 17.000,00					€ 43,59	
	Intervento in copertura e cordolo	€ 56.729,30		€ 48.219,91					€ 123,64	
	Consolidamento murature e volte	€ 28.782,38		€ 24.465,02					€ 62,73	
	Riparazione lesioni interne e restauro	€ 17.314,19		€ 14.717,06					€ 37,74	
	Riparazione lesioni esterne	€ 7.986,07		€ 6.788,16					€ 17,41	
04.1	EX BIBLIOTECA E ATRIO MESSA IN SICUREZZA - opere appaltate			€ 40.000,00	Donazione Rotary MN	2,00	315,00	630,00	€ 63,49	assimilabile a 2 piani per altezza
	puntellamento e ponteggi			€ 40.000,00						



[illegible]

## Appendix 5.3

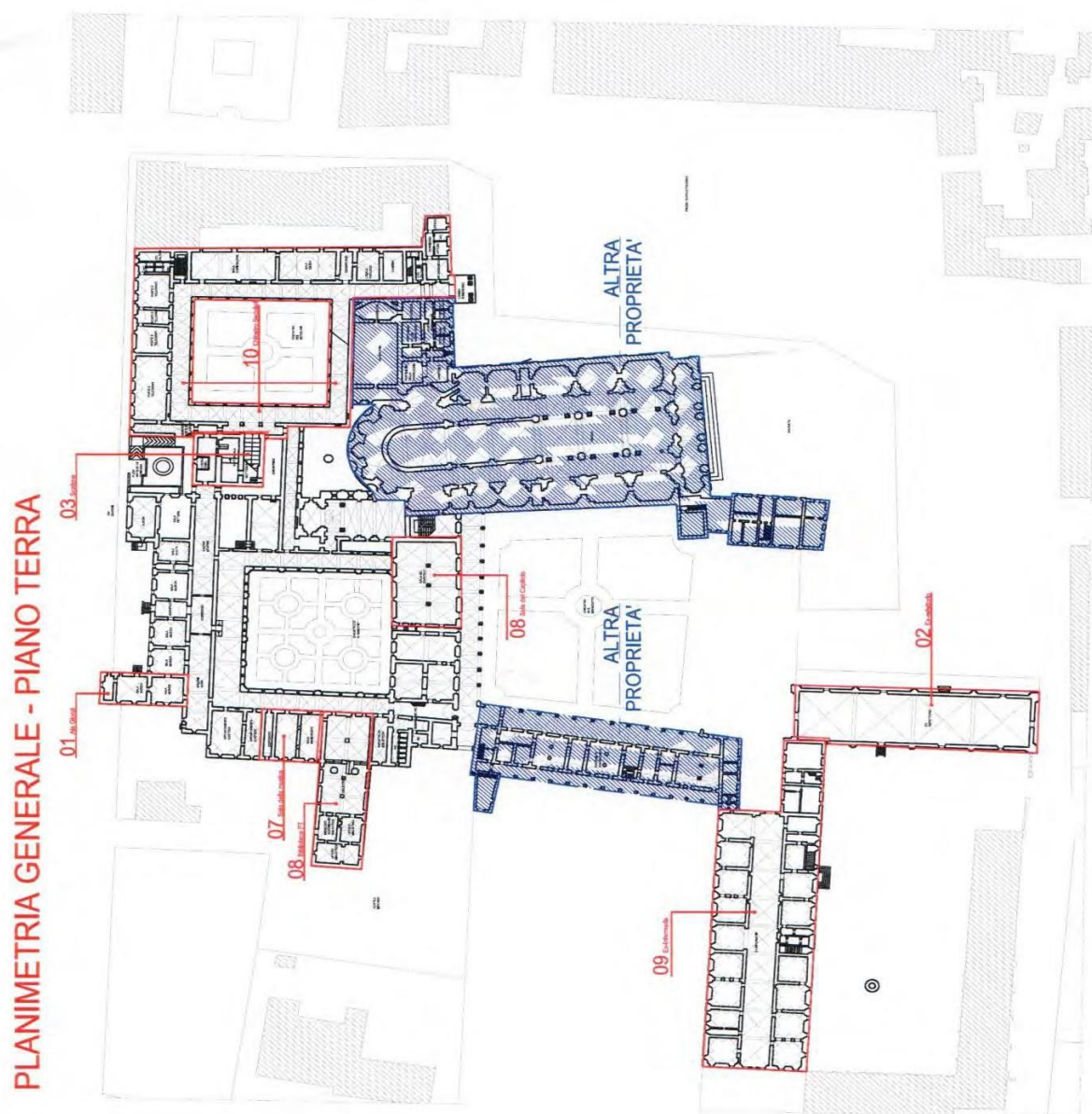
[illegible]

IMPORTO TOTALE	€	6,303,886.06
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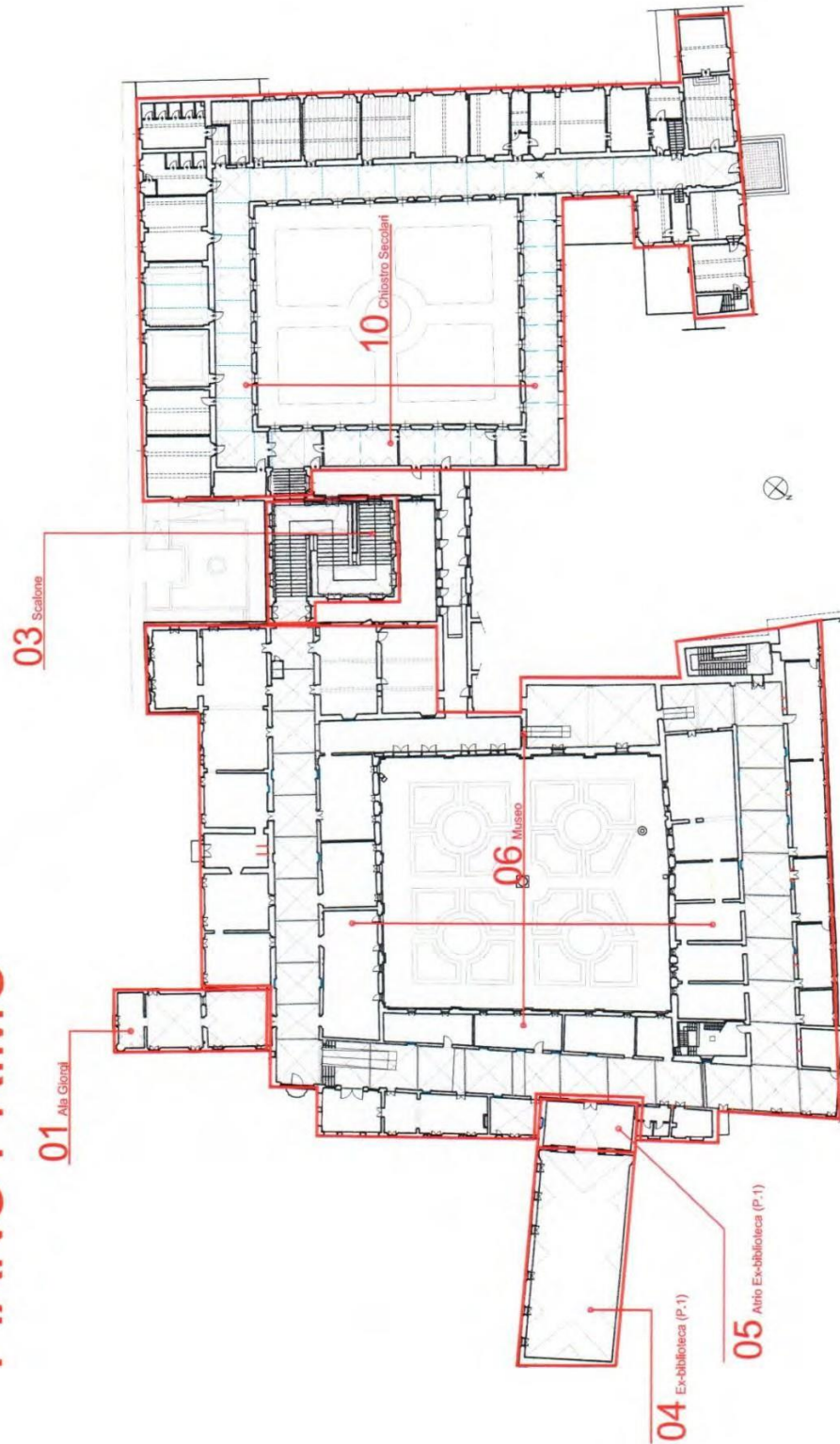
Interventi finanziati e parzialmente eseguiti	€	1.799.361,06
Interventi da finanziare	€	3.213.025,00
Interventi di finitura da finanziare	€	1.291.500,00

Costi al mq										
01	AVANCORPO NORD-EST (ALA GIORGI)	€	221.688,89			€	375,00	€	591,17	molto danneggiato prima del sisma
02	EX REFETTORIO	€	236.368,26			€	625,00	€	378,19	pochi interventi di restauro
03	SCALONE BARBERINI (MESSA IN SICUREZZA)	€	170.070,72			€	390,00	€	436,08	pochi interventi di restauro
04e05	EX BIBLIOTECA E ATRIO	€	267.283,27			€	630,00	€	424,26	pochi interventi di restauro
06	MUSEO	€	1.025.349,92			€	2.300,00	€	445,80	pochi interventi di restauro
07	SALA DELLA MUSICA	€	201.400,00			€	380,00	€	530,00	molto danneggiato come ala giorgi
08	BIBLIOTECA E SALA CAPITOLO	€	175.000,00			€	500,00	€	350,00	poco danneggiate
09	EX INFERMERIA	€	1.676.125,00			€	3.162,50	€	530,00	molto danneggiato come ala giorgi
10.1	CHIOSTRO SECOLARI	€	991.100,00			€	1.870,00	€	530,00	molto danneggiato come ala giorgi
10.2	CHIOSTRO SECOLARI FINITURE	€	1.791.500,00			€	1.845,00	€	700,00	molto danneggiato come ala giorgi





# PIANO PRIMO







## QUADRO ECONOMICO

### Deambulatorio

- ponteggio di servizio;
- intervento di miglioramento sismico e consolidamento delle decorazioni;
- restauro finale, e pulitura con agar;

Complessivamente € 58.000,00

### Tiburio

- ponteggio di servizio fino a 17 m di altezza in tubi Innocenti;
- intervento di miglioramento sismico e consolidamento delle decorazioni;
- restauro finale, e pulitura con agar;

Complessivamente € 90.000,00

### Sagrestia

- ponteggio di servizio ;
- intervento di miglioramento sismico e consolidamento delle decorazioni;
- restauro finale, e pulitura con agar;

Complessivamente € 60.000,00



## Appendix 6.2

### Transetto sinistro

- ponteggio di servizio;
- intervento di miglioramento sismico e consolidamento delle decorazioni;
- restauro finale, e pulitura con agar;

Complessivamente € 35.000,00

### Oratorio di Santa Maria

- restauro e miglioramento sismico dell'abside; € 6.000,00
- restauro mosaico Romanico del 1154; € 30.000,00

Interventi di restauro sommano € 279.000

Spese generali e IVA € 28.000

Spese tecniche € 28.000

Imprevisti € 15.000

**TOTALE GENERALE DELL' INTERVENTO € 350.000**