



Preliminary Methodological Indications for the Restoration of Ancient Buildings: The Protocol Implemented in the So-Called *Dépendence* of the Villa of the Sette Bassi in Rome

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52.1 Introduction

The most recent guidelines for a correct methodology in architectural restoration highlight the need for acquiring preliminary in-depth knowledge of the building to be restored prior to any conservation operation¹. The investigation methods are to include direct and/or indirect surveying and mapping of the surfaces. If this activity is carried out with a full understanding of the ancient building techniques and of the spatial and architectural conceptions of the various historical periods, correct interpretation of the results will lead to the drafting of a crack map and thus to an understanding of the resistant structure and of how it has evolved over time. Ultimately, the actual restoration work must be preceded by a sort of virtual redesign that takes into consideration every aspect and every period of the building. In the light of the artistic and historical documentation, it must also take into account its uniqueness.

Where a cognitive procedure of this kind is lacking, it is indeed possible to detect errors, oversights and evident examples of misunderstandings, which are all the more serious if they are legitimised and given permanent form by the restoration work. As well as its conservation aspects, restora-

tion often entails more or less appropriate additions based on an interpretation, which may be well researched, but also at times, false. A glaring example of this can be seen in the restoration project, which is already approved but fortunately not executive, for the roof of the octagonal vestibule of the Small Baths at Hadrian's Villa. Here, the original dome, most of which has collapsed, is reconstructed on a wooden and steel frame with cladding in lead sheeting, which is incongruously provided with an originally non-existent oculus and even with an anachronistic lantern.

A methodological approach that considers comprehensive preliminary documentation across the board to be essential groundwork for any consolidation and restoration project is currently under way on the so-called *Dépendence* of the Villa of the Sette Bassi in Rome, Italy. It constitutes an excellent testing ground for perfecting and assessing a coded operating protocol.

The Villa of the Sette Bassi has always been considered one of the most important Roman Empire complexes on the outskirts of Rome, but it is in such a precarious state of conservation that access is forbidden even for study purposes. The surrounding area is one of the most important archaeological settings in suburban Rome. Monumental aqueducts have given its landscape a very distinctive look, and they encouraged the creation of a large number of residential complexes that are quite extraordinary in terms of their size, originality and daring architectural solutions. These include the Villa dei Quintili, one of the most monumental and intriguing archaeological remains in the area. Just a short way from the building considered here, it has been the subject of challenging excavation and restoration campaigns, and it is an extremely successful example of an approach

¹For an overview about this topic, see [1–3].

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Fig. 52.1 Rome, Villa of the Sette Bassi, aka *Dépendence*; the aqueduct can be seen in the background

involving study, consolidation and recovery with a view to musealisation.

Based on our current state of knowledge, the Villa of the Sette Bassi consists of three main blocks, which are probably not entirely contemporary, arranged around large open spaces surrounded by continuous walls². The total area is estimated to be about 10 hectares. A branch leading from the Anio Novus aqueduct provided the complex with water. The current level of the countryside only occasionally corresponds to what it was in antiquity, and indeed the structures are generally buried at least up to the level of the first floor above ground. The parts above the current ground level are almost all partially collapsed or totally unstable, in a situation of continuous deterioration that is still under way.

When faced with such a compromised situation, and on such a huge scale, the Soprintendenza Archeologica di Roma found itself obliged to concentrate its efforts, resources and work on a limited portion of the complex, known as the “*Dépendence*” (Fig. 52.1), of uncertain function, apparently detached from the main complex.

The way the work site was designed and setup took into consideration a desirable even though only gradual extension of the restoration works to the entire complex. It was thus seen as a way of understanding the structures, the construction processes and the state of decay and potential measures to limit it. External specialists were therefore called in to draw up strategies that would be useful, on the one hand, for the actual restoration of the remains and, on the other, for drafting a protocol based on the distinctive characteristics of all the structures in the archaeological area.

The fact-finding process was drafted and applied in five main stages:

1. Preliminary historical, topographical, iconographic and archive investigations
2. Survey, direct where possible or, if indirect, complete with comprehensive autoptic verification on site, including all two-dimensional projections needed to obtain a three-dimensional volumetric model. Map of lesions and instabilities
3. Identification and analysis of the construction process, of any changes during the construction stage or stages, and a virtual reconstruction of the missing elements and sectors
4. Elaboration of a three-dimensional reconstructive model based on a critical summary of the survey and technical analysis data and on data from the historical-artistic study
5. Interpretation, with a view to restoration, of all the data deriving from a comparison between the three-dimensional model and specific information deduced from the crack map

Preliminary Historical, Topographical, Iconographic and Archive Investigations

The investigations were adapted to the particular characteristics of the building, with a view to reconstructing the original setting in antiquity. Studies of this type proved to be extremely challenging when, as in this particular case, use of the area for farming has led to decisive modifications both to the ancient structures and to the morphology of the land, which has been altered both by excavation and by filling with

²For an exhaustive study of remains, see [4].

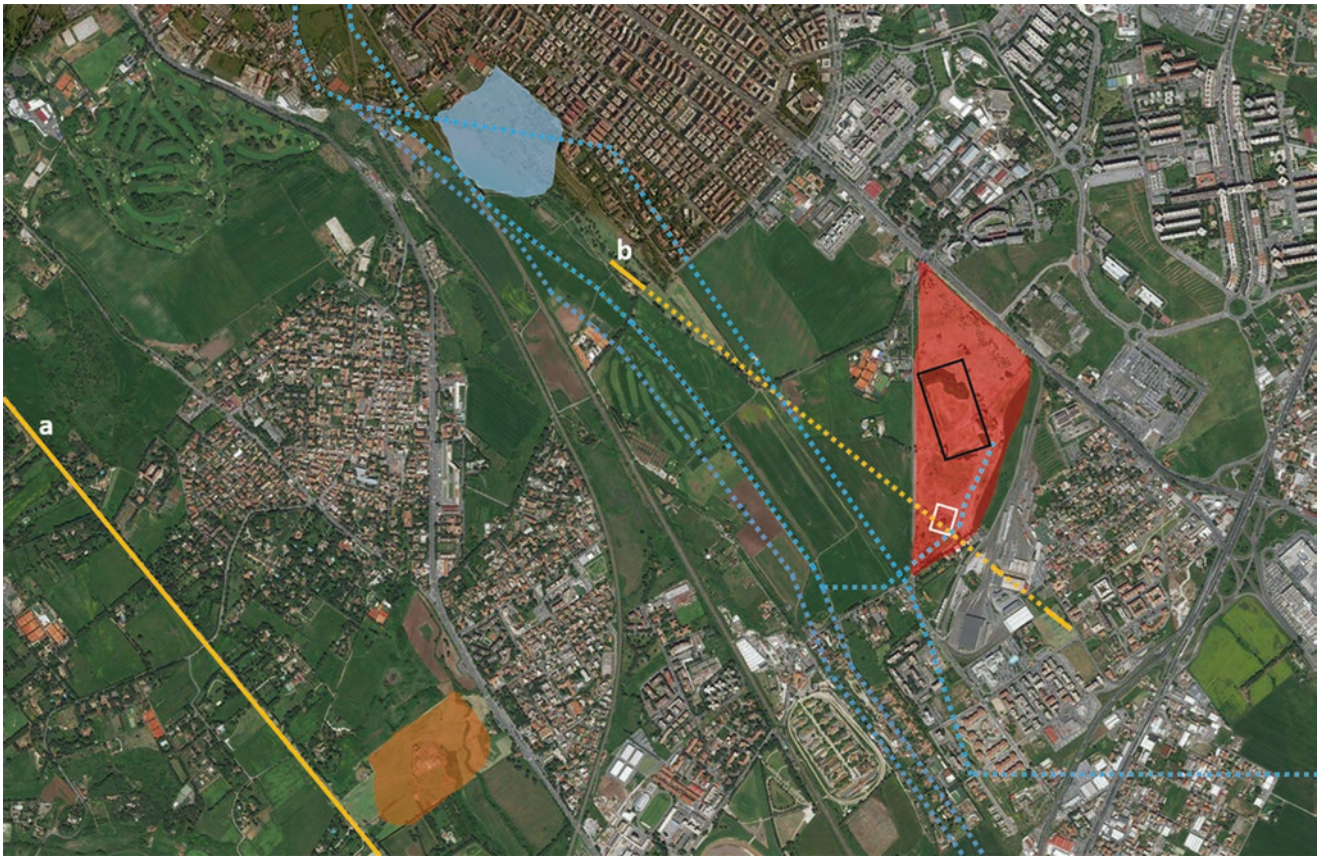


Fig. 52.2 Aerial photo of the area (from Bing Maps) showing the archaeological site in its context. The dotted blue lines show the aqueducts and the yellow lines (a) the Via Appia and (b) the Via Latina. The coloured areas show the Villa delle Vignacce (grey), the Villa of the

Quintili (orange) and the Villa of the Sette Bassi (red). In the Villa of the Sette Bassi, the black rectangle shows the area of three main blocks, the white rectangle shows the Dépendence

earth as a result of changing needs. The presence of an important road, the Via Latina, in the immediate vicinity encouraged the reuse of the ruins, which bear the signs of their transformation over time for different purposes. As a result, the investigation clearly defined the route taken by the Via Latina close to the site, the identification of ruins from a similar period in the immediate vicinity and the identification and location of any other infrastructures, such as aqueducts and cisterns. At the same time, the study looked for and found support in the historical, iconographic and bibliographic archives, which helped complete the data concerning the various periods in the life of the complex (Fig. 52.2).

Survey, Direct where Possible or, if Indirect, Complete with Comprehensive Autoptic Verification on Site, Including all Two-Dimensional Projections Needed to Obtain a Three-Dimensional Volumetric Model: Map of Lesions and Instabilities

The building is partially below ground, and it has been possible to carry out preliminary excavations only in some sec-

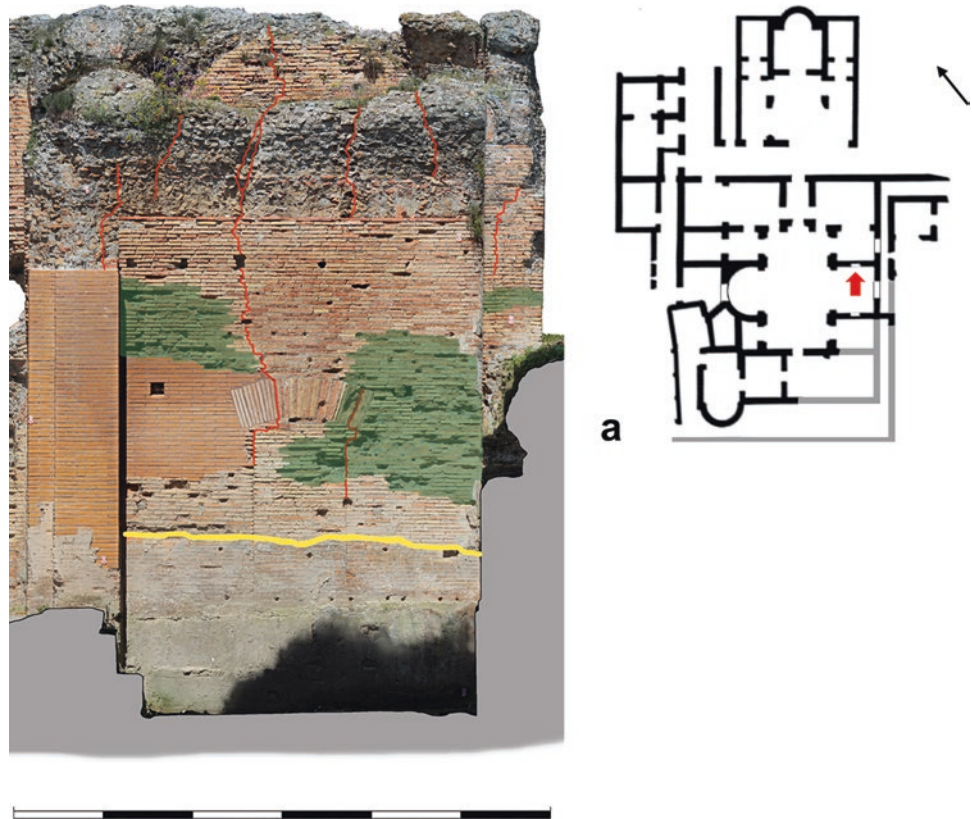
tors and only at different times, so as not to endanger the already precarious stability of the remaining masonry. Localised restoration of the curtain walls was carried out only where absolutely necessary in order to avoid further collapses or instability. The layout plan was therefore drafted using a direct survey based on an external polygon recorded using a total station, in order to remain constantly up to date where the excavation revealed the masonry below. Once obtained, the layout plan was inserted in a previously elaborated vectorised topographical map of the area, placing the ruins in their precise context.

Transversal and longitudinally perspective sections were obtained using image rectification, completing the result with autoptic verification made possible by the presence of temporary scaffolding (Fig. 52.3). At the same time, a meticulous analysis of the wall and floor coverings, distinguishing between periods of use of the complex, made it possible to acquire further information for piecing together the overall picture. The critical summary of the data thus obtained made it possible to determine both the probable volume of the construction and the specific use of the complex: a bath complex with auxiliary rooms of average size but with architectural fittings of high quality.



Fig. 52.3 Rome, Villa of the Sette Bassi, aka Dépendence. Transversal section of the building

Fig. 52.4 Quadrangular pool of the frigidarium, map of the cracks, detail. (a) Location map. In red, lesions more than 5 mm wide; in transparent green, sectors with severe damage to the surfaces of the curtain wall. The yellow line indicates the ground level at the start of works



Particular attention was also paid to mapping the cracks and damage to the surfaces of the curtain wall (Fig. 52.4), with a view to planning targeted conservative restoration based also on the particularities of the materials used. Also, the different levels of earth fills were recorded, some of them very persistent in time, which have modified and greatly affected the current appearance of the wall surfaces, in some cases making them hard to interpret.

Identification and Analysis of the Construction Process, of any Changes during the Construction Stage or Stages, and a Virtual Reconstruction of the Missing Elements and Sectors

Despite the difficulty of obtaining even only a partial overview of the building, since it was possible to reach the foun-

datations of the walls only sporadically, an analysis of the structures, coupled with an in-depth knowledge of the building techniques applied to this type of building, made it possible to identify earlier structures and building stages. This helped towards a proper interpretation of the design and construction process. The drafting of the original project had to take into consideration a series of existing constructions, adequately managed with regard to the functional requirements of the complex. A long wall in two segments, at right angles to each other, was used partly as a perimeter on the Via Latina side, and partly as a load-bearing wall in the area of the secondary services and staircases. Another wall running mainly north-south, the presence of which led to the problems of discontinuous settlement of the masonry above, was levelled. A chamber sepulchre in opus quadratum from the Republican period, with modifications from the early Roman Empire in opus reticulatum and layers of bricks and tiles, turned into a water reservoir in the services area. Even



Fig. 52.5 Frigidarium, southeast wall of the quadrangular bath, exterior. The new use to which this sector of the building was put modified the layout of the rooms and transit areas, levelling the masonry flush with the wall on the eastern side in the room next to the bath (in red) and closing the services corridor with a brick infill interspersed with very thick layers of mortar (in grey). The entire surface was then clad with

though it was oriented differently, its peripheral position meant it could be used via limited connections to the adjacent facilities. The decision to make the floor level in the central body of the bath building different from that of the surrounding rooms, with connecting steps, proved to be decisive. The actual bath complex used the original floor level for the services, raising the main body by about 1.5 m using *suspensurae* or infills. All the peripheral rooms, on the other hand, including the monumental pavilion to the north, maintained their original floor level. Globally, the original design formed a continuous unit, with a very uniform building technique. This used walls in conglomerate of pozzolanic lime and curtain walls in brick vaulted ceilings often with a brick intrados and walls clad in marble or plaster and marble or mosaic floors. There are extremely few errors or afterthoughts, but one is important: the frigidarium, a key intersection in the composition of the baths complex, was to have had eight columns or pilasters to support the vaulted ceiling, but these were never built. Immediately after, or possibly even during construction, the complex was considerably altered, and open-air corridors and rooms were covered over with vaulted roofs, welding together the outer premises and the central body into a mutually and strongly interconnected structure. There was clearly an attempt to prevent and overcome instability and damage to the walls, including by filling in niches and windows, and dividing up large rooms with walls that were not simply placed against, but inserted into the original wall by creating a slot within it. In Late Antiquity,

marble slabs. The sequence of operations is revealed by the discontinuities and dissimilarities between the building techniques as well as by the system of cladding adopted in the second phase, which used iron in place of bronze for the clamps used to anchor the slabs to the wall. A further stage appears to be suggested by a few remains of a thin layer of white plasterwork, which was applied after the slabs had been removed

the frigidarium was turned into a place of Christian worship, which led to the greatest modifications of the original structure. Most of the peripheral buildings were abandoned, leading to an alteration of the distribution systems, while the difference in floor levels was exploited to create a large number of burial sites. Tombs were also placed in the passageways above floor level, which in the end isolated the large central hall, which thus became the main centre of the place of worship. The alterations also affected the wall and floor coverings, often reusing marble slabs from the previous phase. The syntax of this evolutionary process is impressed on the surviving structures, which illustrate its fundamental stages even in small portions. A precious palimpsest of this can be seen in one of the walls in the southern sector, where the effects of these interventions are circumscribed in an exemplary manner (Fig. 52.5).

Elaboration of a Three-Dimensional Reconstructive Model Based on a Critical Summary of the Survey and Technical Analysis Data and on Data from the Historical-Artistic Study

The model reconstruction of the so-called *Dépendence* was made using an “open” CAD system, which makes it possible to include the modifications and transformations detected in the building. These were integrated, where possible, with

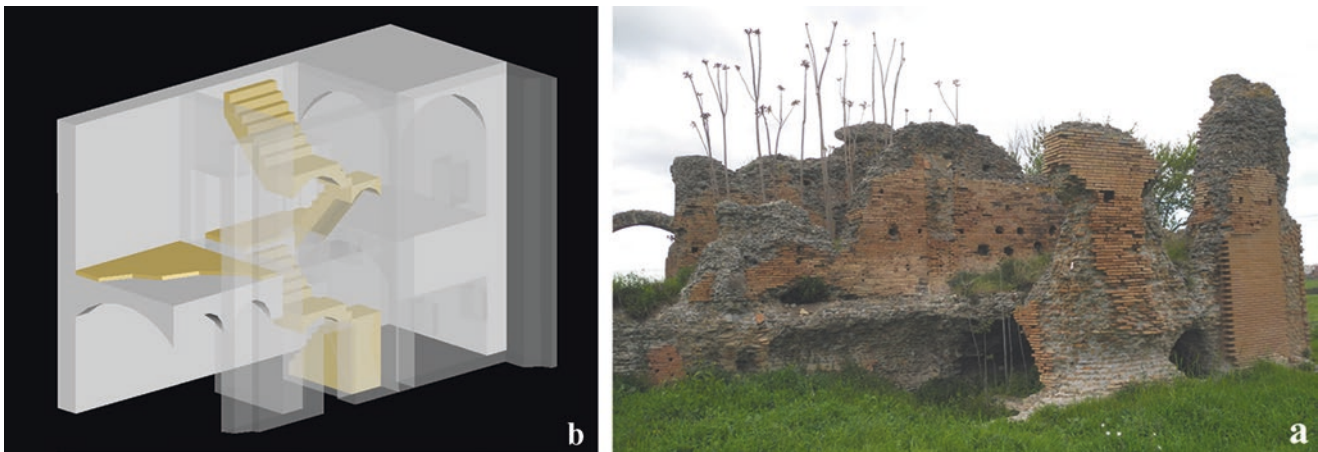


Fig. 52.6 3D model of the bath complex, detail of the stairwell; outer perimeter wall shown in semitransparency. The reconstruction (b) was made possible by an in-depth analysis of the remains that are still visi-

ble on site (a) coupled with archive images and information, with reference to the particular category of architecture

what can be deduced from period photographs and historical and archive documentation. The reconstruction of the pre-existing Republican era sepulchre proved to be particularly complex, as it was carried out in the negative, on the basis of the impressions left by the removal of the blocks from the opus caementicium and of the only partially excavated stairwell (Fig. 52.6). Furthermore, the means of inserting the walls of the second-stage service rooms in relation to the pre-existing ones required a very careful and particularly meticulous analysis of the architectural articulations of the complex.

Interpretation, with a View to Restoration, of all the Data Deriving from a Comparison between the Three-Dimensional Model and the Specific Information Deduced from the Crack Map

In the case of the so-called *Dépendence*, the crack map of all the exposed surfaces in relation to the structural problems identified using autoptical analyses and the creation of the 3D model made it possible to appreciate the relative state of conservation of the walls and their probable original extension. This suggested the formulation of a detailed but dynamic restoration project. Indeed, together with the primary need to proceed with the reinforcement and conservation of the structures that are currently above ground, there is also the possibility of continuing the excavation to free the submerged walls down to floor level, while necessarily ensuring the safety of the individual portions of walls, some up to seven metres in height. The implementation of a restoration project of this type will make it possible to restore the

greatest architectural consistency to the remains of the complex, reintroducing the optical axes and transit routes on the basis of data provided by the architectural analysis and by the reconstruction model. At the same time, it will be necessary to draft an adequate procedure for restoring the mosaic and marble floors, some of which date from the later periods of the building, but which are made with slabs from the earlier periods, and the preparations for the burials made in clearly limited areas of the complex.

It is important to bear in mind that the complexity of the diachronic timeframe, which basically goes from the first century BC to the fifth or sixth century AD, requires a restoration plan for consolidation and conservation based on an autoptic interpretation of the remaining structures. This must be carried out with absolute philological discipline and with in-depth knowledge of ancient construction methods and building techniques. The restoration needs to highlight the physical discontinuities brought about by alterations to the original building and faithfully show their position and morphology, making it possible to interpret them correctly. It is also true, however, that in such a complex context on such diverse levels, the decision to give priority to one stage of construction rather than to another must be based on well-informed and proper motivations (Fig. 52.7). Another excellent example of this is that of the remains of the burial facilities. While they are of fundamental importance both for understanding the anomalies in the layout of the corresponding bath sector and for the historic reconstruction of the topographical context, the possibility of leaving them open to view means the restoration project will have to adopt solutions that take into account the different physical and functional levels, without jeopardising the proper interpretation of the whole.

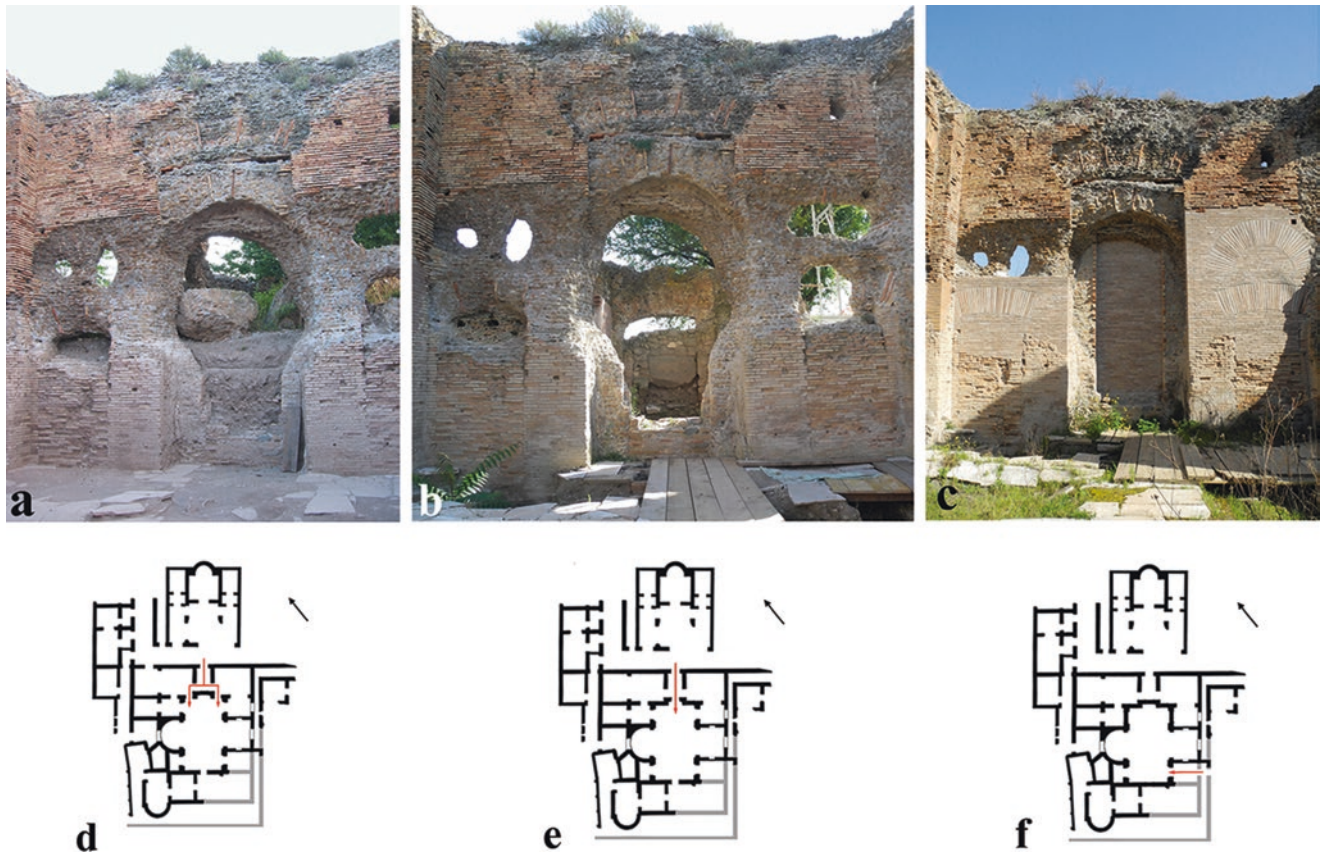


Fig. 52.7 *Frigidarium*, north-eastern wall, (a) during excavation; (b) after elimination of the earth materials, (c) during restoration. As shown by the detailed analysis of the masonry, the original design provided for a large central niche, flanked by two doors placed symmetrically on either side. (d) In the final configuration, however, the niche was turned into a door surmounted by a further relieving arch, while the two side doors were closed, altering the transit routes in this part of the building.

(e) At a later date, when the *frigidarium* was probably turned into an ecclesiastical building, the door was once again closed, and the access moved to the western wall. (f) In planning the restoration work, which is still under way, it will be probably decided to give priority to, and thus restore, the configuration as it was in the second phase, which was when the building was used for the longest time, respecting its original function as a bathing hall

The methodology applied and the results obtained by the preliminary study for the restoration of the so-called *Dépendence* offer an example that is being implemented to perfect an operational platform that can be used for the restoration. It should also be noted that the characteristics of a protocol of this type for preliminary investigations are truly transversal, meaning they can go beyond the particular historic period and the architectural conceptions of the individual case. The protocol does, however, require a whole series of skills, ranging from technical proficiency to carrying out complex survey operations and managing CAD programs through to an in-depth knowledge of building techniques and their cultural background. This means that the proposed procedure is necessarily challenging and expensive, and never

brief, but it has the potential to provide comprehensive documentation for an in-depth scientific study and for promoting the building and making it known to the public. But, above all, it guarantees a proper basis for an effective, meaningful and methodologically correct restoration.

References

1. Fancelli P. (1983) *Il progetto di conservazione*. Roma
2. Carbonara G. (1989) *L'intervento di restauro tra teoria, storia e tecnica*. In: *Notiziario ASSIRCCO XIII*, vol 3, p 85
3. Luca D. (ed) (2016) *Selinunte. Restauri dell'antico*. Roma
4. Lupu N. (1937) *La Villa dei Sette Bassi sulla via Latina*. In: *Ephemeris Dacoromana* 7, pp 117–188