THE SCHOOL OF MATHEMATICS AT ROME'S UNIVERSITY CAMPUS

GIO PONTI,1935

Edited by Simona Salvo | Sapienza University of Rome

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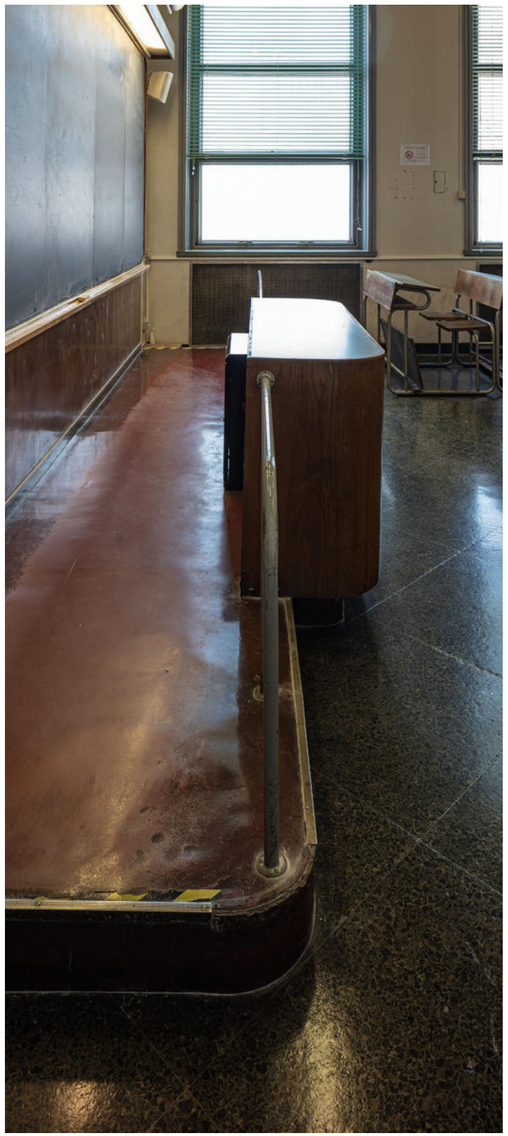

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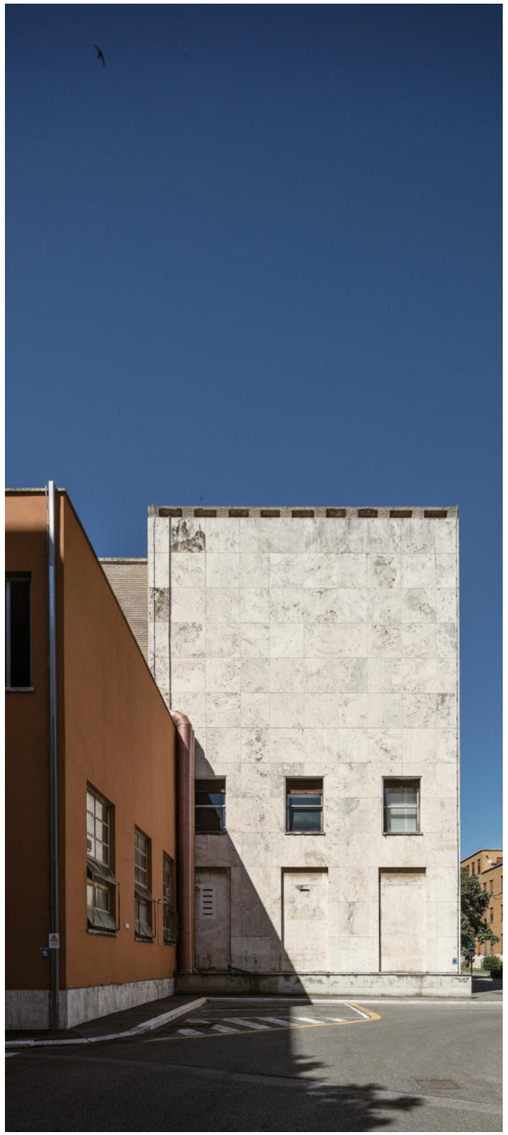

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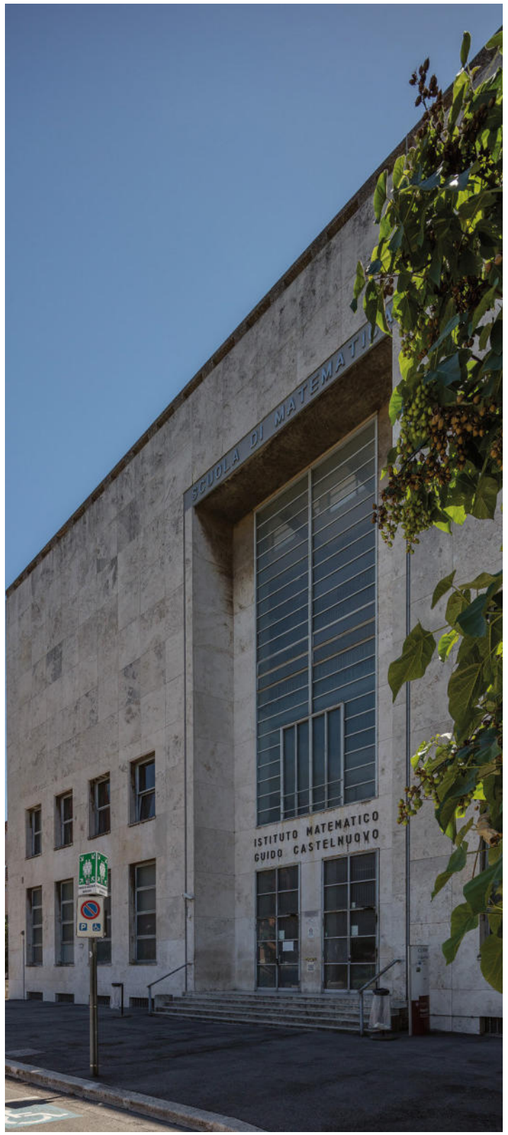

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CONSERVATION, APPRECIATION, ENHANCEMENT, USE

Simona Salvo

Figure 1 - Aerial view of the University campus in the urban context in 2014 (https://g3w-suite. cittametropolitanaroma.it/it/map/inquadramento-territoriale/, March 2022)

SCIENTIFIC RESULTS OF THE RESEARCH AND VALUE ASSESSMENT

The main issue that should be considered when drafting a conservation plan for the School of Mathematics concerns the building's relationship with the rest of the campus. Since the building's function is linked to that of the other buildings on campus, and the campus works as a system, in turn connected to the rest of the city, it is also obvious that appreciation of its architectural and historical value depends on a comparable approach to its context. Due consideration should therefore be paid to the drafting of a general conservation plan for the whole campus, which of course involves issues that are not part of the scope of this research.

Almost 90 years of uninterrupted life inside the campus have undoubtedly reinforced its importance, adding layers upon layer of history, and creating memories produced by years of seamless use.

Yet the changes made to the campus- above all the fact that all the voids and empty spaces between the original buildings have been filled and there have been (albeit few) demolitions[1]- have altered the sophisticated architectural relationships established by Marcello Piacentini's plan. In the case of the School of Mathematics, the insertion of the Pharmaceutical Chemistry building to the right (in the Seventies), and the New Physics building to the left, has had a huge effect on the very refined, stereometric and chromatically elegant composition proposed in Ponti's original project.

In the original plan the context emphasized the idea that the building was the result of the juxtaposition of different stereometric volumes, to be used in different ways, and surrounded by enough space to create perspective views that not only made each building visible, but also enhanced the visual effect of "volumes under natural light". In addition, the inner courtyard was certainly not designed to be a simple void resulting from the layout of the volumes, but another accu-

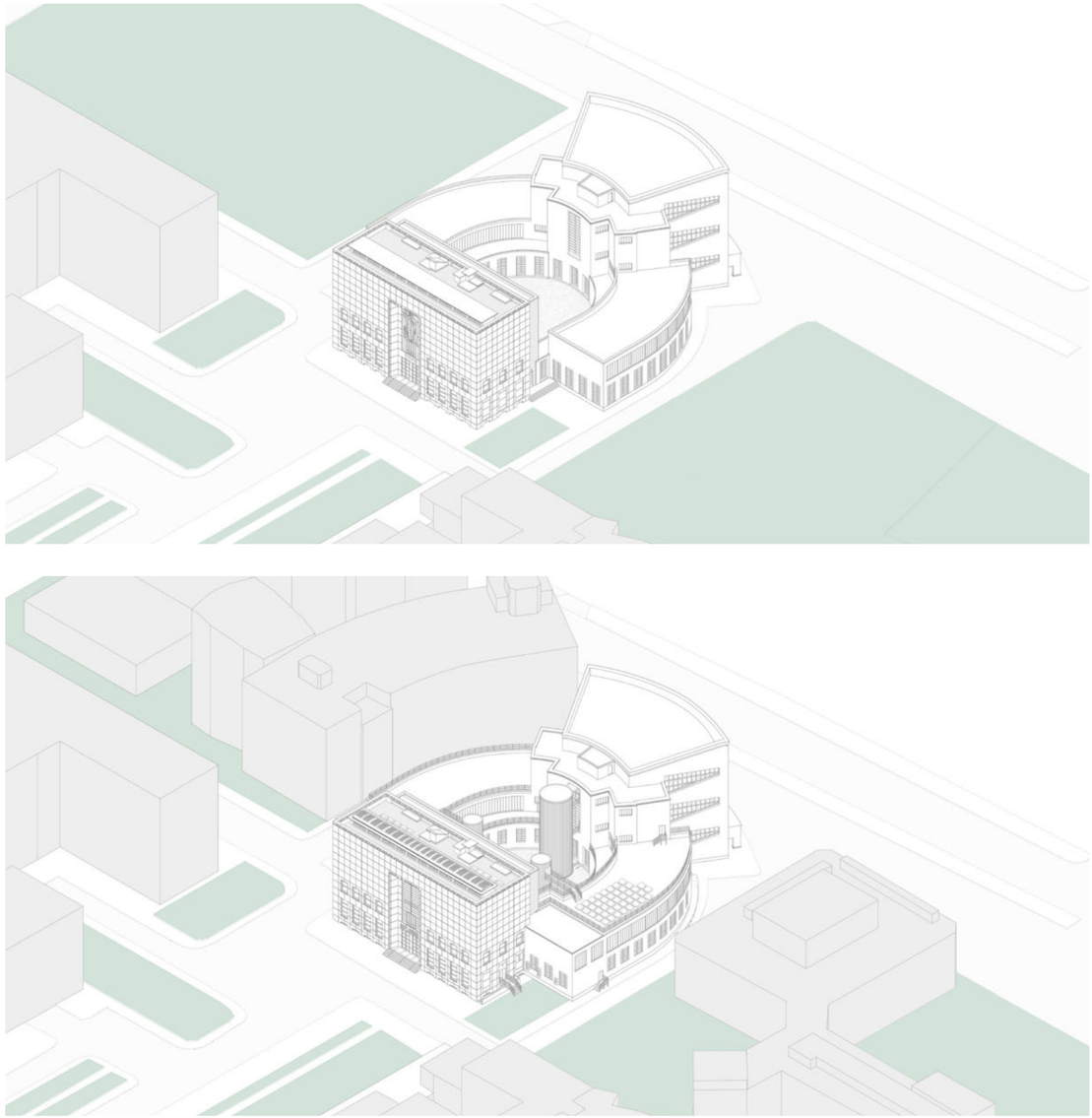


Figure 2 a/b -The building and its surroundings in 1935 (a) and today (b) (© Cortesi 2021)

rately designed (empty) volume, geometrically defined as the core on which the composition was based.

As often declared in principle, the idea that the School of Mathematics is an excellent Gesamtkustwerk reinforces its integration not only with the urban environment, but also with its content- decoration, furniture, finishings, collections- thus providing remarkably complex and enriching values. The architecture and its building elements, structural inventions, furnishings, collection of documents and books in the library, and last but not least- scientific progress in the field of mathematics developed on the premises, represent a material/immaterial heritage that deserves to be protected and perpetuated in its entirety.

A systematic assessment of the value of the building must therefore include a reference to its morphology and its division into several blocks, since this structured the design process from the start and still represents its main compositional feature. This assumption defines not only the relationship between the School of Mathematics and the rest of the campus, but also Gio Pont's architectural production in the Thirties as well as contemporary Italian architectural culture.

Old drawings have made it possible to reconstruct the design process from the very beginning, in April 1932; they reveal Ponti's initial ideas of how he wished to design a building as a composition of volumes.
The project is based on the organic, balanced, and harmonious composition of three blocks- the front building, curved wings, and classroom tower- arranged around the courtyard; although they differ in shape, typology, function, rendering, and distribution, they are interrelated. These volumes maintain their own specific identity throughout the design phases and during construction thanks to their very distinct characteristics, ranging from the load-bearing structure to the completion of finishings and furnishings, albeit rendered in an admirable organic design of the whole.

The alterations implemented over the years have endangered and partially compromised the visibility of such a clear juxtaposition, especially the extension of the two curved wings when the new buildings were added at each end; this seriously affected the overall perception of the building, the way it is approached, and its distribution.

A conservation plan should therefore respect the intrinsic organization that shapes the building and allows the very original composition of volumes- front building / curved wings / classroom tower /courtyard- to guide its reorganization and future transformation. It should be used as a systematic approach, to be adopted not only in functional terms, but also as the principle behind any kind of adjustment. Respect for the original composition of the volumes also represents a guideline for a definitive approach to urgent issues, such as the fire escape system and layout.

In addition, a clear and meditated approach to critically understand each addition should be adopted. The

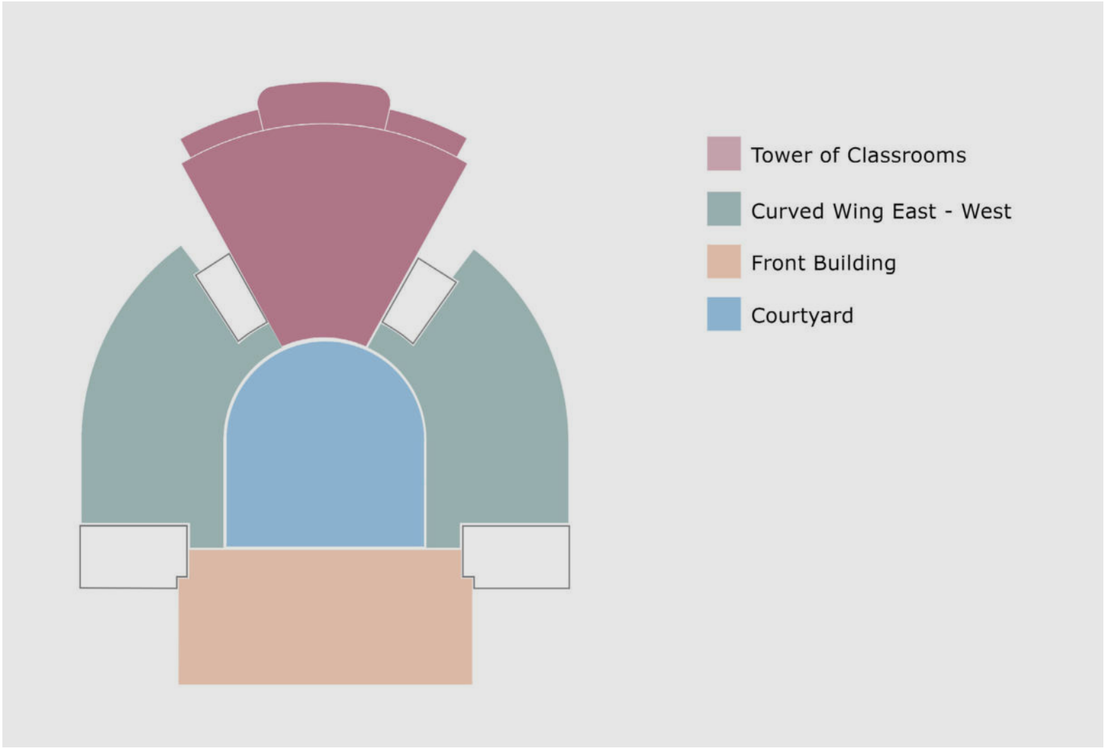


Figure 3 - The three blocks around the courtyard corresponding to the original concept of the building (© Salvo 2021)

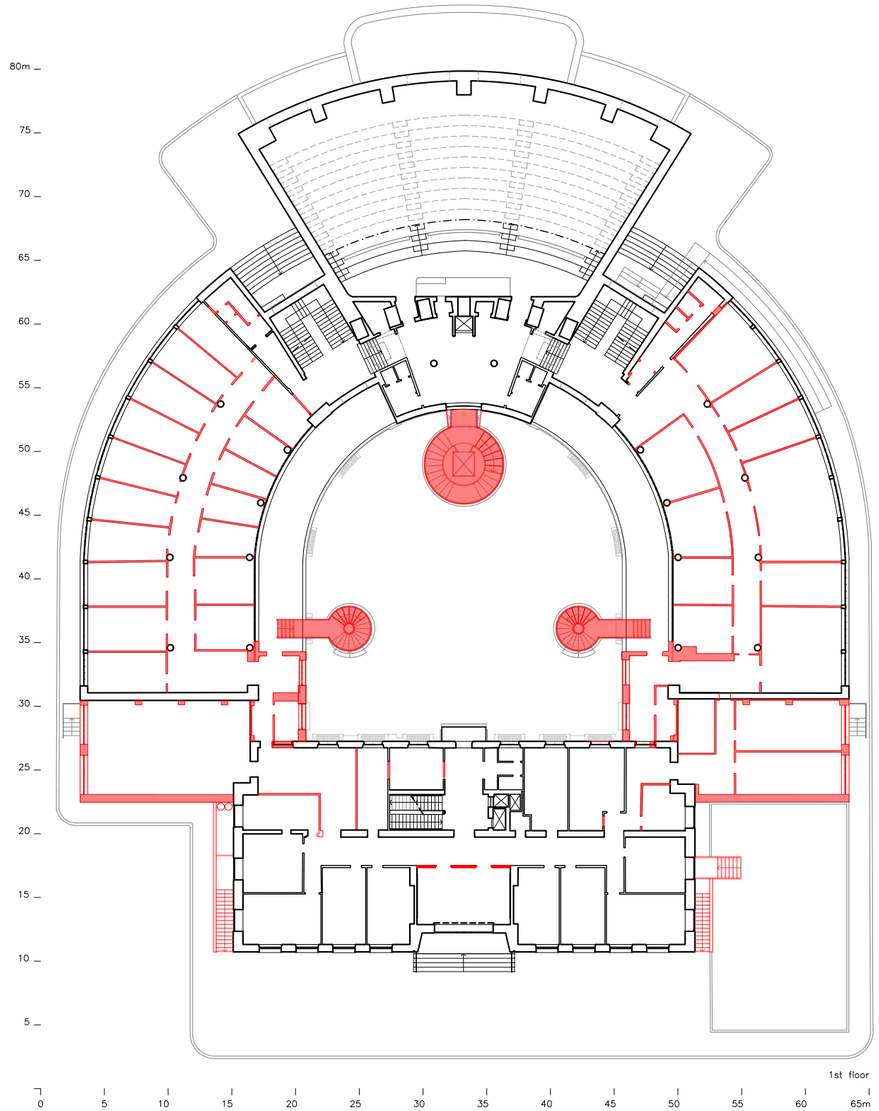


Figure 4 - Additions to the building from 1939 to 2021; plan of the first floor (© Cortesi 2020)

reconstruction of the precise sequence of additions, thanks to archival research regarding its history, has provided scientific documentation to support the evaluation of each added element, the reason for its addition, the period it was implemented, and its 'status' in the current image of the building.

A general approach could be adopted towards the policy involving the removal of additions, considering that all the campus buildings have either been added to, elevated, or enlarged by adding new volumes. Additions were in fact envisaged from the start: in 1932 Mussolini and Piacentini already agreed that the number of students and academics would increase in the near future, so Piacentini told 'his' architects to design foundation systems that could support any increase in height of the buildings, and therefore accommodate this trend. The many changes implemented just after the war, between 1945 and 1955, seamlessly continued on from the construction in the Thirties[2]. Materials, such as the Litoceramica cladding, were produced in great quantity for the repairs and extensions; craftsmanship, for example the design and production of doors, were added during the reorganization of the interior spaces that had either been added or divided. Today these changes are very difficult to distinguish from the ones 'designed by Ponti'[3] and sometimes represent obvious continuity in the overall design, thereby making it difficult to tell the difference between the original parts and the additions.

This approach allowed us to accurately assess the value of all the original parts of the building and identify- either thanks to a philological interpretation based on archival documents and critical reconstruction, or to material evidence and scientific analysis (i.e. sampling, testing, and chemical/physical study)- the material authenticity of the original pieces which must, of course, be preserved. However, the approach must also fully respect the important layers of memory, because their significance is due not only to the original concept, but also to their aged, weathered, and historicized state.

As a result, the design and planning guidelines regarding conservation policies do not refer to the original building, but to the current aged and weathered ‘entity’. Some additions must therefore be accepted, and some removed, based on philological analysis and critical interpretation. The two main additions to the front of the curved wings are to be considered irremovable, not only for practical, functional, and economic reasons, but also because they are now part of the way the building has evolved, as well as a footprint of life on campus. They should be maintained not because of their materials, architecture, or structure, but as a ‘sign of development’; these aspects should be duly considered during a second phase when it will be necessary to insert new functional or technical elements, especially in order to comply to contemporary requirements.

Luckily, the building does not require radical alterations- apart from having to comply to fire safety regulations- but instead does need to be revitalized so that its architectural features can be perceived and its original spaces, that now appear disjointed, can be recomposed. This can be achieved by removing specific additions or by integrating important losses, based on critical, scientific, and philological considerations. The review of the lost stained glass window- that should be considered the most damaging architectural loss to the building- should also be a part of the agenda.

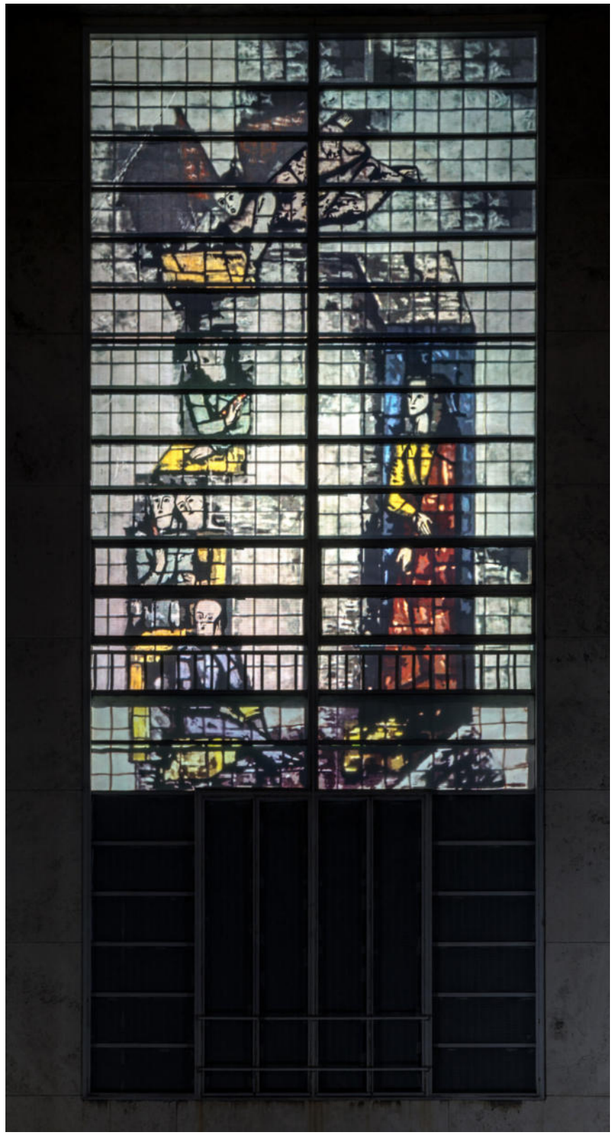


Figure 5 – The stained glass artwork projected into the windows of the main façade in November 2017 (© Lanzetta 2017)

THE BUILDING IN 2021

The current overall state of the building appears rather discouraging although, all in all, there is a fair balance in terms of material authenticity. Generally speaking, this is true for much of Italy's architectural heritage that has suffered more from natural destruction than anthropic action; it is even truer in the case of many modern buildings in Italy.

In general, substantial alterations and additions prevail over demolitions, so much so that the original state could be restored by simply removing the additions rather than through reconstruction.

The historical analysis of the School of Mathematics and a study of the building's functions and uses over the years reveals a relentless attitude to cancel out the fact the building is made up of separate blocks. From the start- i.e., the establishment of IndAM in 1939 in the curved west wing- the building has been seen and organized according to its four main floors (ground, first, second, and third), ignoring Ponti's idea of blocks connected by stairs or entrances. Since then, in a crescendo, Ponti's composition has been disaffirmed by a horizontal spatial organization, rather than by respecting its initial block concept. Consequently, the reorganization of the accessibility, functions and flows should be envisaged. Plans regarding fire safety, air conditioning, interior comfort, and energy saving would also benefit greatly from an overall interpretation of the building's organization.

As regards material conservation, the building has suffered very few material losses if we exclude the stained glass window on the front façade and the elimination of the two stepped entrances on either side of the front building. The former deserves an ad hoc discussion as this work of art played a very special architectural role in the composition of the building, while the latter have been plugged due to the additions to the east and west wings. These entrances are probably still present under the new paving, but undoubtedly cannot be recuperated.

As mentioned earlier, intentional demolition is very limited and chiefly employed to adapt the building to new uses, comply with new regulations, or adjust specific areas to current use.

The building has a specific material 'strength' and architectural resilience, which has allowed it to resist changes and aging. This assumption debunks the idea that modern architecture is fragile, especially as regards Italian buildings constructed in the first half of the XX century. There may also be precise reasons for this resilience, reasons which should be considered during the value assessment process.

One first reason involves Ponti's design; the latter is based on a seemingly traditional architectural idea- symmetry, harmony, and concept- but open to experimentation. This may be considered a 'quasi-perfect' synthesis of the two main contemporary Italian architectural trends- rationalism and traditionalism- that Mussolini (and Piacentini on his behalf) intended to merge into one national mainstream with the construction of the University campus, naturally under fascist leadership.

Another fact to be considered refers to the very solid Italian building tradition that relied on the skills of craftsmen, the use of very resistant materials, and a well-tested, centuries-long construction technique. These characteristics influenced the adoption of modern and industrial techniques, such as the use of reinforced concrete for structures and exposed architectural elements, as in the case of the crowning frame of the front building which is suffering from a persistent lack of maintenance and man-induced damages, suffice it to name one: the installation of the Faraday cage.

To this we must also add the very good work performed by the companies entrusted with its construction and the professional skills and great attention paid by the site managers and technical staff of the CERUR Consortium. It is still possible to appreciate indications regarding care for the details, which did not only depend on Ponti's design, but relied on a very strong construction tradition, for example, the very accurately calculated baseboard of the walls.

Notwithstanding the use of a reinforced concrete skeletal structure, Ponti's building remains opaque and solid, as does much of the Italian architecture built in the Thirties which is easily distinguishable compared to European architecture where transparency, elevation from the ground, and the thinning of the building envelope, was not just a visual effect, but also a revolution in the architectural concept and construction. While Ponti developed the principle of the 'curtain wall'- or the 'wall as a curtain', as per Semper- detaching the elements of the building envelope from one other, other designers instead developed the same idea by dematerializing the wall itself.

On the other hand, and perhaps unexpectedly, underestimation of the historical value of this architecture is partially responsible for the modest interventions performed over the years, and with a very low material impact. These are mainly maintenance projects, reduced to their minimum requirement, or the low-profile redevelopment of the interiors, with all kinds of additions (walls, installations, furniture, signage, etc.) rather than demolitions.

Of all the changes, the windows, many of which have been replaced, modified, altered, or left to fall into ruin without maintenance, have paid the highest price, together with the furnishings.

Today the interiors reflect a pale image of what they originally looked like, considering the colored finishing - plaster and paving- the fixed and movable furniture, the lighting fixtures, and the very austere atmosphere in the premises of a very silent place of study.

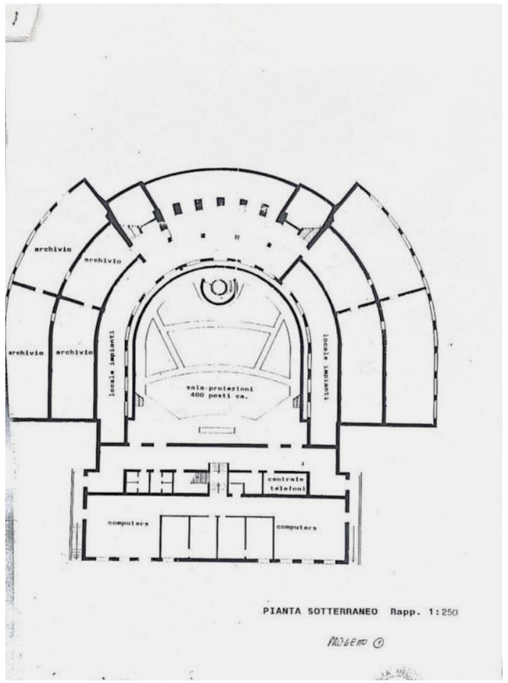


Figure 6 - A detail of the baseboard along the staircases of the classroom tower, a typical detail in the traditional construction methods used in Rome in the Thirties (© Salvo 2021)

Figure 7 - Archival documentation from the Nineties showing the intention to double the ground floor of the curved wings, and cover the courtyard with a canopy to create an auditorium (ADM_dwg_04)

It is important to remember that one of the last proposals regarding functional changes to the building dates to 1990 when the Protection Decree was already in force. It consisted in further dividing up the curved wings, introducing horizontal elements to separate two floors and double the interior space, and excavating an underground auditorium in the courtyard, which would have also been covered with a metal and glass canopy.

Luckily these projects were not implemented, but they still represent a very dangerous precedent, especially because the redesign of parts of the original building is still considered possible. For this reason, redefining the Preservation Decree of 1989 should be considered as a preliminary step to guarantee the conservation of the monument.

Each part of the building has been influenced in a different way by changes, alterations, and modifications. Nowadays it is rather hard to pinpoint the changes that have taken place. When we interviewed several alumni who as young students had studied in the building in the Seventies and Eighties, we realized that almost no one could provide a clear picture of its original interior, especially the drawing halls that has so quickly become unrecognizable. Not many realized that the tiered lecture halls had been divided, while the alteration of the triple height of the library was widely recognized as an alteration- the most painful- probably because beautiful pictures of the original situation have survived and are displayed in the reading hall for direct comparison.

On the other hand, in opposition to its ostensible clarity, the School of Mathematics is a very complicated building.

Figure 8 - Student's desks and seats in a tiered lecture hall of the tower: alterations to, and mistreatment of the furniture is clearly visible (© Salvo 2021)

The front building is by no means the one with the most losses, alterations, and additions, especially because this is the most architecturally and artistically distinguishable part of the complex, and the one that deserves to be preserved the most. Breaking up the triple height of the library, eliminating the discontinuity between the front building and the wings, as well as the additions on either side, has unbalanced the perception of the space: the albeit few additions have wrought extensive damage.

The interior and exterior appearance of the curved wings has been completely altered. The reduction in the number of windows has made the elevation banal; it has been further aggravated by changing the color of the painted exterior, a faded 'Sapienza-red' which is now orange. The juxtaposition and disconnection between the white travertine prism of the front building and the chromatically stronger wings and tower - now perceived as seamless- creates an effect that does not match Ponti's harmonious design. Of course, we don't know what the original color of the building was, as the idea of "color" is in itself vague, nor can we either describe or faithfully reproduce it. Today we can only establish tonalities, shades, and chromatic relationships, relying on contemporary black and white pictures, and classify them using scientific analysis in order to establish a philological interpretation.

The interiors of the wings were modified immediately after the construction of the building and have certainly lost their main feature: the free, wide open space where drawing tables and stools emphasized the freedom of spatial organization. Unfortunately, this is ostensibly an irreparable modification as no teaching activity currently requires such a free, wide-open space. Further considerations involve the furnishings which, in the case of the drawing rooms, has been completely lost. This is an exception in the School of Mathematics where the furniture participates in its material authenticity and integrity. Likewise, the layout of the interior space is an issue; the permanence of IndAM in the curved west wing may hopefully be considered a debatable issue when the functions in the Department of Mathematics have to be rebalanced; this will reopen perspectives regarding the functional rearrangement of the whole building.

A much lower level of authenticity and spatial values involves the extensions added in the Seventies on either side of the front block; the latter are 'reworkable' and can be modified.
Within the layout of the volumes that make up the School of Mathematics, the classroom tower is the least visible, notwithstanding its size. In Ponti's original concept, the 'tower' could probably be seen from a distance, a view that is no longer possible due to the bigger and smaller buildings that have been constructed nearby. This part of the building is currently considered a 'rear', almost hidden from view. Its volume can only be partially seen from via De Lollis as it emerges from the tall boundary walls of the campus. The inversion of the relationship between the scales of the buildings is another effect of the "urban densification" of the campus, especially between the building and the boundary walls, occupied mostly by shacks and deposits.

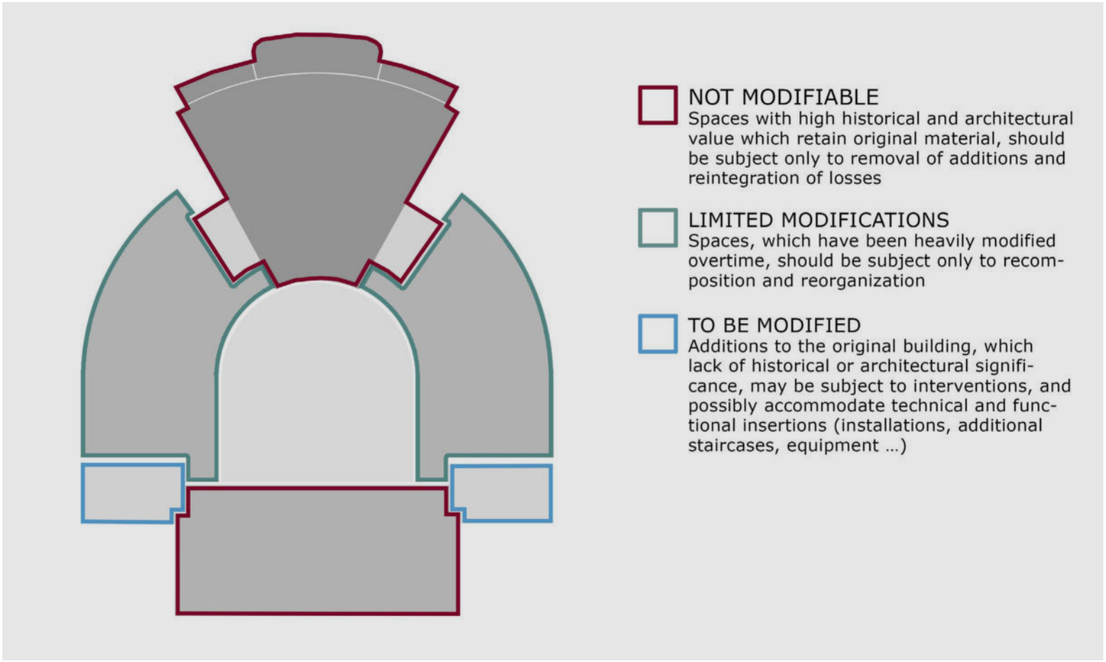
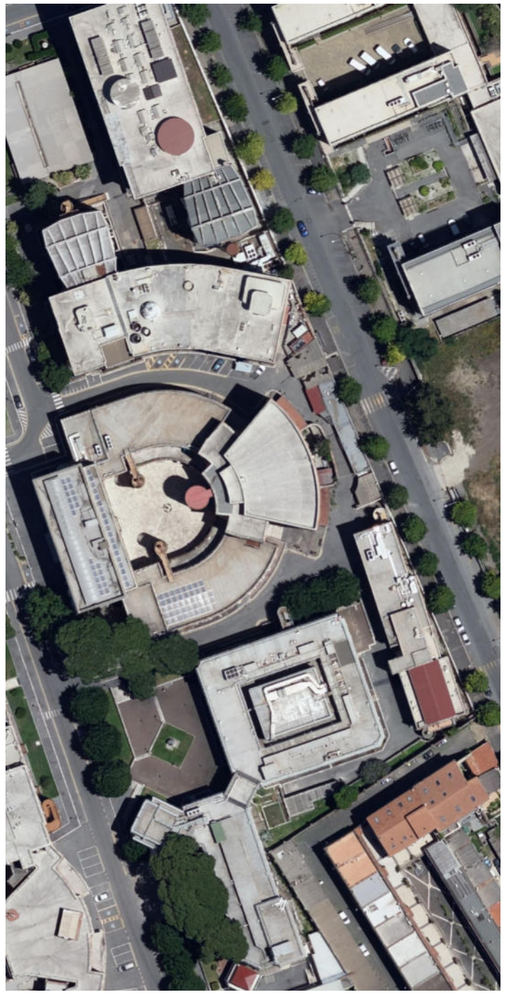


Figure 9 - The three blocks of the building have been modified over the years, albeit each in a different manner (© Salvo 2021)

The interiors of the classroom tower are the ones with the least changes; they have remained more or less as they were in 1935. The few alterations concern the ground floor tiered lecture hall that has been divided into two smaller halls, and other changes concerning the finishings, window fixtures, ceilings, minor alterations to the furniture, additional technological equipment, firewalls, panic handles, and fire safety doors to comply with safety regulations.

The courtyard is the key around which all the architectural components of the building are arranged and morphologically and functionally merge. Ponti probably thought of a quiet, 'focused' space at the centre of the building with a rather timid domestic feature: the grass joints between the travertine slabs of the paving. Most of the peaceful and domestic appearance of the courtyard disappeared when the fire escape stairs were built; it deteriorated even further when the grass joints were filled with concrete. The great potential of this inner open space came to light when Greek Tragedies were organized by Sapienza's theater company, part of the Department of Science of Antiquities.

However, the very powerful acoustic performances prove counterproductive during normal working days; they act as a sounding board for even the softest noise and chatter. Consequently, the courtyard is currently 'off limits' for any kind of activity during normal working days as the noise produced by the chatter disturbs work in the offices and classrooms around it. Material and functional degradation, and the presence of the bulky stairs, have therefore eliminated the key role of this space in the architectural composition. Its recovery depends on a combination of actions: the first involves a general functional reorganization of the building and a revision of the fire safety system.



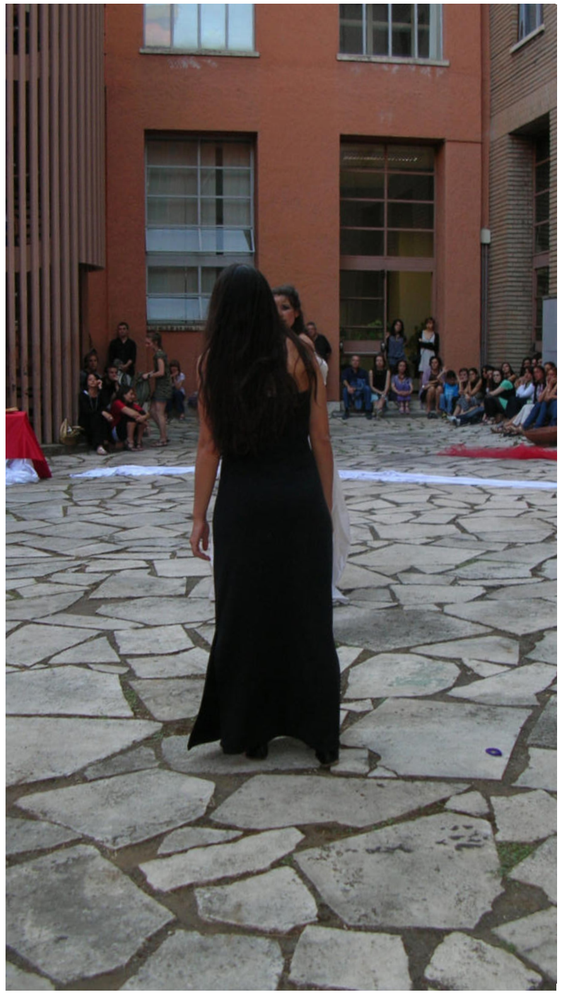


Figure 10 - An aerial view of the building showing how close it is to the bigger and smaller buildings nearby, especially at the 'rear' (https://g3w-suite.cittametropolitanaroma.it/it/map/inquadramento-territoriale/, March 2022)

Figure 11 - The Greek tragedy "Bacchae" staged in the courtyard tested the acoustics of the courtyard (© Salvo 2015)

One last observation: no planning was performed before several systems were placed everywhere in the building (air ducts, HVACs, photovoltaic panels, cooling towers, wirings, etc.). In addition, elements such as the ramp for the physically challenged in the rear of the building (currently out of order) are still functional, while the elevators in the front building and the tower, as well as the book lift in the library (which still has almost all its original elements and still works perfectly), are at risk because they do not comply to regulations.

Unfortunately, further alterations are ongoing; they are not based on scientific knowledge or critical understanding, and have been implemented without taking conservation issues into consideration. They include the replacement of the very characteristic round window frames of the book depot in the winter of 2021 and by a stop-and-start and not always honest intention to respect the cultural value of the building.

In the context of the substantial changes currently being made to academic institutions in Italy, especially Sapienza University[5], the very uncertain future of this monument (and other outstanding buildings in Rome's University campus) should therefore be able to rely on a general, far-sighted conservation program.

There are at least three sources of damage that may impact the conservation of the building: the physiological weathering and aging of the materials; interaction with human beings and their use of the building; and finally the weather. These should of course be considered systematically, i.e., due to the many complex interactions they create since this initiates a reverberation between endogenous and exogenous causes of degradation.

Figure 12 a/b - The round wooden frames of the window of the book depot before (a) (© Salvo 2015) and after (b) replacement (© Salvo 2021)

Figure 13 - Scrapped window frames in the basement before disposal (© Salvo 2021)

The physiological weathering and aging of the materials should be a primary concern; it can be contrasted by developing a maintenance program. The main focus should obviously be the load-bearing structure. This has been considered as providing a good response, notwithstanding the slight change in terms of the permanent loads in static conditions. Dynamic conditions - regulated by recent seismic codes- should instead be considered carefully, mainly as regards interaction with the foundation soil. While a strong, destructive seismic action may not be considered as a first-degree alarm in the area of Rome, minor earthquakes may instead represent a real danger, considering the overall condition of the building. Vibrations, caused by low intensity seismic loads, may affect the stability of the travertine slab and Litoceramica cladding, or of any other overhanging load, including the skylights and the unstable fragments of the concrete crowning frame. It follows that earthquakes may affect safety issues although they do not directly involve the building's load-bearing structure.

In this case the solution consists in performing more research regarding the materials and construction itself so as to gain more knowledge about the consistency, conditions and stability of each piece. It is not surprising that each task group involved in this research has stated that it is necessary to continue and complete in situ investigations, with the proper support- e.g., using movable scaffolding or a movable arm to reach the upper parts of the elevation- and, above all, with permission to collect more than microscopic samples.

The limits imposed on the study of materials and construction techniques has made it impossible to obtain a complete picture- and map- of the real conditions of various features, such as the adhesion of travertine slabs to the façade, the Litoceramica cladding, and the surface plaster of the exterior walls.

Figure 14 - The travertine cladding on the southwest elevation photographed with sidelight in order to show the degradation of the slabs (© Salvo 2020)

One alarming issue is the stone cladding of the main façade made up of more or less square travertine slabs. The chipped edges along the joints reveals that, without mortar joints, they do not absorb excessive thermal expansion. This suggests that the slab anchoring system is not completely secure, despite its very good resistance over the years. In addition, we cannot say that the cladding system ensures the perfect adhesion of each slab. This same situation is applicable to the Litoceramica cladding and the plastered surfaces, especially the ones facing south and southeast.

The situation of the fair-face concrete crowning frame of the front building is even more alarming. It is a very significant architectural element and a key feature in Ponti's design of the front building, as well as a beautiful artifact in terms of design, construction, materials, and technical solutions.

Figure 15 a/b - The condition of the fiber-reinforced resin coating applied in 2013 on the roof and skylights of the library (© Salvo 2021)

Figure 16 - The layer of fiber-reinforced resin coating applied in 2013 has aged quickly and crystallized (© Salvo 2021)

The surfaces and substantial parts of this element have been practically left without any protection, and certainly never maintained, so they are constantly deteriorating: the concrete cover is falling, the concrete component of the surfaces is being washed out, and crusts and deposits are forming. The entire element is thus left to be consumed and decay; the deterioration is more severe on the sides facing south and southeast, subject to stronger thermal cycles. Most of the pieces have fallen onto the terraces and not on the street because the position of the cornice on the southern side of the building is just above a lower terrace, so it is here that the pieces have fallen rather than on the courtyard. This should not reassure us regarding the evolution of the degradation process of all the surfaces that will speed up in the years to come. In short, we foresee that the degradation of the crowning frame will represent a safety hazard for the community and a conservation problem for the building. For this reason the issue should be urgently addressed.

Another issue that must be given due consideration is the deterioration of the materials applied during the most recent maintenance project. The waterproofing applied using fiber-reinforced organic resins in 2013 is gradually but steadily becoming less solid. This material is generally guaranteed for no more than ten-years, in optimal conditions, which is certainly not the case here. The accelerated deterioration of this material is now alarming, especially as regards the skylight on the library roof, due to very specific conditions: the very high summer temperatures that have peaked in the last five years, combined with very strong rainfall; the application of heterogenic materials such as cement, concrete and glass; the total lack of maintenance; the combination with concomitant causes of decay, e.g., mechanical and chemical effects due to the presence of birds. All this has created an intolerable situation.

The result is very visible and consists in the plasticization and crystallization of the material, with ensuing shrinking and breaking. As a result, the protective layer is no longer seamless, allowing water percolation under its surface. We expect to very soon see the effects of this infiltration with the percolation of water through the glass blocks and the loss of glass and concrete pieces. One first urgent action consists in an accurate inspection of the situation and then the removal of this layer and the application of thin layers of either non-organic protective materials or acrylic resins, to be maintained and repeated every five years.

Obviously climatic change is clearly also affecting the protection of the roof, especially given the situation described here. Strong rainfall, combined with high summer temperatures due to the fierce sun in polluted urban environments, are causing a rapid acceleration of the decomposition of protective materials and constituent materials. This is due to chemical and physical processes, but also to mechanical and biological actions that should be observed and possibly accurately measured over a period of time as it is easy to forecast that the rate with which this kind of deterioration processes occurs will easily escalate.

Figure 17 - Fragments of the concrete crowning frame that have fallen on the roof of the library depot (© Salvo 2011)

CONSERVATION MANAGEMENT PLANNING AND THE ITALIAN RESTORATION CULTURE

As we all know, conservation in Italy is a long-established tradition that sinks its roots in the country's cultural landscape and is closely linked to archeology, art, and architecture. The reason for this very specific approach to pre-existing artifacts depends on a great many factors, and requires a very long discussion that would be inappropriate here. However, it is very important to remember that the overwhelming presence of 'old things'- from archaeological ruins to works of art, from buildings to infrastructures- has profoundly influenced and shaped the way the Italians deal with the physical remnants of history with which they share their world. This relationship has shaped a specific culture, imbued with a scientific and critical approach, and defined in Italian by the word *restauro*, a word that has a very specific meaning and involves several different kinds of interventions.

As the relationship between objects and the observer depends on the latter, we can assume that the approach to monuments has never become definitive and that it changes depending on changes in contemporary culture over a period of time.

One of the greatest challenges faced by Italian culture, and tackled by institutions, has involved understanding, acknowledging, and managing the huge complexity of this enormous cultural heritage which, in some ways, hinders the further development of the country, and sometimes everyday life.

After World War II (probably the chief anthropic cause of damage in the past century) and after several natural disasters, namely the great flood of Florence (1966), and the numerous earthquakes that have struck the country from north to south (Friuli, September 1976, Valnerina, September 1979, Irpinia, November 1980), the Istituto Centrale per il Restauro and the Italian Ministry of Culture started working on a new scientific approach to tackle the complexity that Italy's Cultural Heritage has made so difficult to preserve. It redeveloped its traditional approach based on the consideration of single isolated objects within their broader cultural environment. It was not just a matter of reconsidering the scale of analysis and intervention, but of achieving a systemic framework capable of detecting the network of relations within which every single element had to be considered, and then accurately assess the rate of its decay. Conservation planning was actually a version of Cesare Brandi's idea of 'preventive restoration' (*restauro preventivo*), present in nuce in his restoration theory and methodology; it was further developed during studies by the Istituto Centrale del Restauro he had founded in 1939 with the intention of embracing conservation as a transdisciplinary activity, to be implemented over a period of time[7].

In the late Seventies, thanks to the hard work performed by Giovanni Urbani, who had taken over from Brandi as director of the Istituto Centrale del Restauro, the project developed into a pilot plan[8]. The plan essentially established a systemic approach to prevent damages and control national heritage. It created an efficient framework regarding its value (documentation and cataloguing), its specific vulnerability (knowledge about propensity of the artifact to deteriorate and age), the dangers associated with the context (study of the natural and anthropic environment), and the scientific identification and measurement of its exposure to risks[9].

The original Italian idea of conservation planning was based on a strategic vision: "contrary to the notion of selective and therefore fragmented protection, it instead postulated a totally innovative vision based on organic and systemic actions regarding the dynamic interdependencies binding the constituent elements of the territory, considered on a regional scale and in its cultural and non-cultural elements"[10]. The idea not only involved a specific vision of history, philosophy, and art, but also the country's political economy, institutions, and social and cultural assets.

Of course, transdisciplinary evaluations were crucial, but the true novelty consisted in the systematic view of the physical-chemical evolution of objects in their environment, considered within a long-term predictive context, and with a strict operational approach.

To avoid arbitrary evaluations regarding the priority of the interventions, and to provide scientific parameters and measurements of the degree of deterioration, the so-called *Carta del Rischio* (Map of Risk) began to take shape in the Eighties; it involved the territorial mapping of the cultural landscape based on the theory of risk and assessed according to the equation

Danger x Vulnerability x Value = Risk

Note that if any of the terms is equal to 0, there is no risk: seismic risk may also be measured using a similar equation. A graph that relates time to deterioration is known to generate a parabolic line with an exponential increase: this indicates that deterioration does not proceed constantly with time but worsens dramatically over a period of time. Given the above, maintenance - considered as the programmed and managed care of the object- becomes the only affordable approach to preserve heritage and ensure it remains as authentic as possible.

The goal of the Map of Risk was- and still is- the drafting of conservation programs technically based on scientific knowledge and accurate measurements: identification of the rate of deterioration, spacing out of actions over a period of time, and cost evaluation. In addition, the idea was to move beyond the constant approach to act in an emergency situation, or react in terms of repairs, and trust in the fact that the prevention was the response to a preferred holistic and ecological approach that was also economically favorable.

Conservation planning, as proposed by the "pilot plan" produced for the Regione Umbria, also considered landscape based on "a territorial integrated vision… a living framework of the relationship between commu-

nities and the natural resources of the place and the stratified material evidence of their cultures"[13].

Unfortunately, there were several reasons why the Pilot Program and the Map of Risk were never implemented at national level but later salvaged by the Regione Lombardia in the late Nineties and brought into effect at the turn of the century (1997) as the "Polo Lombardo della Carta del Rischio del Patrimonio Culturale" (Lombard Center for the Map of Risk of Cultural Heritage)[15]. Due to the increasing frequency of natural disasters in Italy (another series of earthquakes, in Umbria in September 1997, in L'Aquila in 2009 and Central Italy in 2016), the need to save the cultural heritage at risk encouraged the Italian government to re-launch the Map of Risk project[16]. Unfortunately, very little literature on this subject has been published except in Italian, although there is growing interest in this matter, especially recently, and the international dissemination of this literature would be a benefit for all[17].

This is just a very brief excursus to highlight the fact that, thanks to this very elegant and refined cultural approach to heritage conservation, Italy has continued working on the implementation of a model to manage the protection, conservation and enhancement of our national heritage, notwithstanding a lack of resources[18].

In this scenario, modern buildings are 'considered last' although they host and support the Italians' everyday life.

Efforts in this direction are summarized in some publications[19], but are chiefly reflected by the activities of the Regione Lombardia; the latter has promoted a special research program regarding XX century properties, in collaboration with university research centers[20]; the program was responsible for the restoration of the Pirelli tower curtain wall in 2002-2004[21]. Based on this first important result in the Lombardy region, the original theory of preventive restoration and conservation management planning was further improved: "predictive (or preventive) and maintenance practices are not sustainable unless they are as part of the ordinary, continuous management of cultural heritage, especially architectural heritage, taking into account its immediate context together with its current use by owners and users"[22].

However, this approach would be incomplete if we did not recall the constant Italian tendency to wait for an emergency, to enact a recovery only after the damage done, intervening without a strategic, planned approach to the conservation of the cultural landscape. This is also an institutional problem involving numerous stakeholders- mainly national and regional- which has lately called into question the institutions directly responsible for their properties, such as Universities.

The School of Mathematics is one of the very good examples of the typical situation regarding the current state of modern buildings with extraordinary historical and architectural value: a strategic function, a monumental value (on paper), an exponential value acknowledged by specialists, but with very little awareness of its value by the public, and an inversion between achieving functional needs and ensuring heritage values.

Effective conservation management planning for this one building is undoubtedly very limited in the absence of a crucial broader view. We should think in terms of scale (e.g., considering the University campus as an organism that 'lives' beyond its boundaries and involves the city of Rome), and in terms of the political involvement of Sapienza's management- the Rector, the Administrative Director, the Technical Management Office, and the Energy Manager- as well as the academic community and all the students. In addition, without adopting a long-term view of management activities we cannot hope that a conservative approach will take root and become 'culture', instead of just remaining a theory and method, albeit refined and unique.

The scope of this very brief overview is to underline the context within which this research has been developed, on the one hand involving scientific data regarding the material nature of the building, closely correlated to its specific environment and the life that has taken place in it and, on the other, paying great attention to the specificities and needs of its inhabitants, which are the main stakeholders of its future life. The goal was to investigate, understand, interpret and monitor the acknowledged value that still binds the users- Sapienza's scientific and administrative community- to this and other buildings on campus.

We believe that Sapienza's stakeholders are the recipients of the ecological, holistic, and systemic approach proposed by conservation management planning.

CONSERVATION MANAGEMENT PLANNING, STRATEGIES, AND ACTIONS

The primary output of this research consists in defining a systemic conservation strategy to tackle the complexity generated by the merging of several variables, stakeholders, and behaviors. The problem is not (just) scientific or merely technical, neither is it exclusively administrative, operational, or cultural; it is a complicated combination of all these aspects.

An initial attempt to tackle conservation management planning should therefore consider a dual perspective: on the one hand, implement operations to ensure the material conservation of the building, thus providing protection and repairing the most exposed elements physiologically damaged by ageing and weathering; on the other, remodel the relationship between the building and its users. Although not separate, the two aspects should be treated differently in terms of urgency, strategies, and actions. In both cases, any alterations to the building should respect two key conditions: all work should follow the original concept behind the building, and be based on scientific evidence and critical interpretation, bearing in mind current functional requirements.

The possibility to invest significant resources in this task is objectively limited due to the enormous upcoming expenditure that Sapienza is bound to face since it has to independently administer its funds. Although preservation and enhancement of Sapienza's architectural heritage is regulated by law, it is clear that managing this situation will be anything but easy.

It is therefore of primary importance to revive not only the conscience of the community, but also the need to take control of this cultural asset. Sapienza's academic community is prepared to become a "heritage community"- as described in the 2005 Faro Convention- a role that past experiences have shown it is ready to take on.

Sapienza's academic community thus plays a dual role: that of stakeholder, active in terms of expressing cultural demands, and that of an actor who boosts appreciation. While professionals, scholars and technicians are of great importance in this context- producing scientific information and designing conservation strategies- administration is responsible for managing the process. In this context, a forward-looking, multi-annual plan is crucial, coupled with Sapienza's accountability in terms of conservation and maintenance of its own architectural heritage.

In a nutshell, the conservation of the School of Mathematics and Rome's University campus is a matter of governance.

This Conservation Management Plan is based on these premises; the timescale and interventions involved are based on this approach.
Another essential step that needs to be taken, involves redefining the Protection Decree; it has to be integrated and thoroughly updated to suit the current situation. The decree could, for example, be imbued with a renewed sensibility towards modern built heritage and be based on a scientific framework that is now available with a much broader cultural reference, perhaps also integrating the general decree with an ad hoc document dedicated to the School of Mathematics. This should include the building's fixed and movable furniture, reflecting the overall value of *Gesamtkustwerk*.

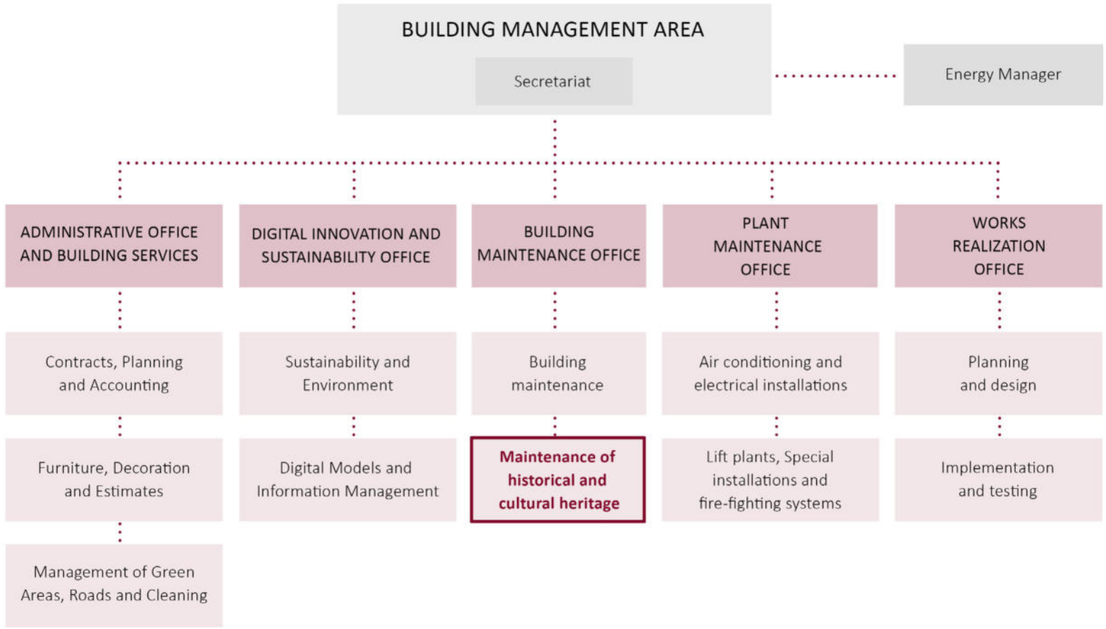


Figure 18 - Organization of Sapienza's Technical Office; an office responsible for the maintenance of the University's historical and cultural heritage is envisaged, but is not yet operational (© Salvo 2021)

Apart from urgent conservation and protection measures for specific endangered parts and elements such as the concrete crowning frame, one priority of the conservation management plan should be preliminary operations regarding ‘preventive restoration’. The idea is to plan indirect but effective actions to revive the community’s interest and awareness towards this heritage: an initial, important project could be to re-propose the reenactment of Ponti’s stained glass window (already displayed in 2017) based on the data and information collected during this research. Today this operation would be scientifically correct, but also groundbreaking, visible, and communicative, with long-lasting benefits that would ‘surf the long wave’ of Ponti’s revival.

Finally, the reenactment of the stained glass window would initiate a virtuous circle, encouraging both cultural appreciation and the material conservation of the building. In addition, it would clearly reveal how the horizontal element effectively divided up the triple height of the library: the fact its removal is so important would become a shared initiative, requiring the courage to reinstate Ponti’s very special architectural concept. The cultural resonance of such an initiative would certainly reach an international public and become as meritorious as the conservation of the Pirelli curtain wall. It would also attract the attention of an ever-growing audience towards the School of Mathematics.

At the same time, two strategic initiatives should be undertaken prior to any further steps: decide/plan/achieve a reduction of the number of people in the building and redesign its fire safety layout. These preliminary actions will effectively prompt further interrelated conservation regarding the building’s materiality and use. These may be considered as specific ‘restoration’ projects involving the removal of additions and the integration of lost parts, based on the guidelines of the Italian theory of restoration.

Most of the conservation issues affecting the School of Mathematics should be considered in light of the damage caused by the overload of functions and users. Burdensome functions and excessive crowding cause consumption, and also produce counter effects, making it harder to comply to fire safety regulations, which are much stricter if the building is overcrowded. Excessive use is counterproductive as it places more pressure on exploitation rather than cultural appreciation. Appropriate, ongoing use should also be guaranteed, in continuity with the past, preserving the binomial reference to the School of Mathematics as a place and institution for research and teaching in the field of mathematics.

In consideration of Gio Ponti’s idea of ‘daytime and nighttime’ architecture, the possibility of opening the building to the public at night, especially the library and the courtyard (and some study rooms), could be considered as a means of enhancement. This last consideration would pair perfectly with the initiative of re-enacting the nighttime projection of the original stained glass window.

One last consideration about the use of the building refers to the permanence of the porter’s residence within the building. This not only represents an element of continuity with the past, but also ensures the best use of this part of the building; it also guarantees the continuous presence of a custodian to look after immediate requirements, small repairs, and also record even the slightest changes.

Figure 19 - The fire escape stairs in the courtyard in the Eighties (© Salvo 2021)

Figure 20 - Fire safety regulations in Italy since the Eighties. The law of 1985 - later Decree of 1986 - involved the installation of the three fire safety stairs in the courtyard (Salvo 2021)

REGULATORY COMPLIANCE TO FIRE SAFETY REGULATIONS: AN URGENT ISSUE

The School of Mathematics is famous within the University campus for the three huge fire escape stairs placed in the courtyard in the late Eighties; they are considered invasive and responsible for spoiling the building's architecture.

The stairs were built to comply with the fire escape regulations issued in 1985-1986, but paradoxically they were in complete contrast to the new up-and-coming process to re-evaluate the historical importance of the building established by the Protection Decree of 1989. The result was devastating and rather disrespectful of the architectural context. The three steel-and-concrete cylinders were probably placed in the courtyard based on a rather old-fashioned rule according to which a building's exterior appearance is more important than its interior due to its higher public impact.

However, the courtyard plays a crucial role in the architectural layout, now compromised by the fire escape stairs. Their insertion has impaired the perception of the visual axes of the spatial sequence crossing from one side to the other of the building and establishing an ideal 'optical telescope'. In addition, it has materially damaged the paving, the elevation, and the window frames, in particular the huge central window to which the metal stairs are attached. Notwithstanding the many attempts to find a document about their installation, none were found regarding the process used to install them.

They are an essential part of the building's fire safety equipment and therefore considered 'irremovable'; nevertheless, they have not been maintained and are practically never used. In 2011 the Director of the Mathematics Department, Vincenzo Nesi, reported the damages and water infiltrations that made the two smaller ones unusable. These stairs were then closed (and are still closed and useless for safety purposes),

Figure 19 - The fire-escape staircases placed in the courtyard in the 1980s (© Salvo 2021)

Law 818 of December 7, 1984 (also **Circular of the Ministry of the Interior 36, December 11 1985**) - Temporary authorization for activities subject to fire pevention controls, and integrative rules of the National Corps of the Firefighters.

Decree of the Ministry of the Interior 218 of September 16, 1992 - Fire safety standards for school buildings

Decree of the President of the Republic 418 of July 30, 1995 - Fire safety safety standards for buildings of historical interest, containing libraries and archives.

Legislative Decree 139, of March 8 2006 - art. 15 «Reorganization of provisions relating to the functions and tasks of the National Corps of the Firefighters».

Decree of the President of the Republic 151 of August 1, 2011 - Regulation to the simplification of fire prevention procedures.

34.2.C - Archives and libraries with quantities of paper exceeding 50.000 kg.
67.4.C - Schools with more than 300 people.
72.1.C - Building declared of historical importance according to Law 42 January 22, 2004, containing libraries and archives.

Ministerial Decree of August 3, 2015 and Ministerial Decree of August 7 2017 - Approval of technical fire prevention standards

Figure 20 - Fire safety regulations in Italy since the 1980s. The law of 1985 - then Decree of 1986 - implied the installation of the three fire-safety staircases in the courtyard (Salvo 2021)

while the main central stair has recently undergone costly maintenance.

The stairs have recently proved to be ‘useful’ only on unexpected occasions; they were used during theatrical performances as ‘stage equipment’ to allow actors to perform and be clearly seen by the public sitting in the courtyard, for example during the Greek tragedies staged by the Theatron company of Sapienza University.

The stairs in the courtyard of the School of Mathematics have therefore become a problem of their own, i.e., a thorny issue, for three reasons: a) the building has to comply to fire safety regulations; b) classrooms, especially in the bigger tiered lecture halls in the tower, are overcrowded; c) the functional organization of the building has been ever-changing during the last three decades, which means the fire escape plan must necessarily include the fire escape stairs in the courtyard; and finally d) the fact that they are obsolete and must be updated. The partial or total removal of these stairs, or their maintenance for fire safety reasons, is therefore an issue compounded by various problems, and should be approached as such, bearing in mind that academics, students, and administrative staff all agree they are invasive and would be very glad if they were removed. Indeed, their installation obviously contrasts with the assessment of the historical and architectural value of the building, finally drafted- at least verbally- by experts, policy makers, professionals, academics, students, and the civil society at large.

The question of whether to remove them or not should be based on a clear technical, legislative and organizational picture of the situation. Information has been collected by interviewing technical officials and specialists in the field of fire safety compliance that are currently working on this matter at Sapienza’s Technical Office. In addition, specialized experts have been hired to develop safety plans for all the campus buildings that are dealing with the same issue. However, the problem can only be solved by acting on several

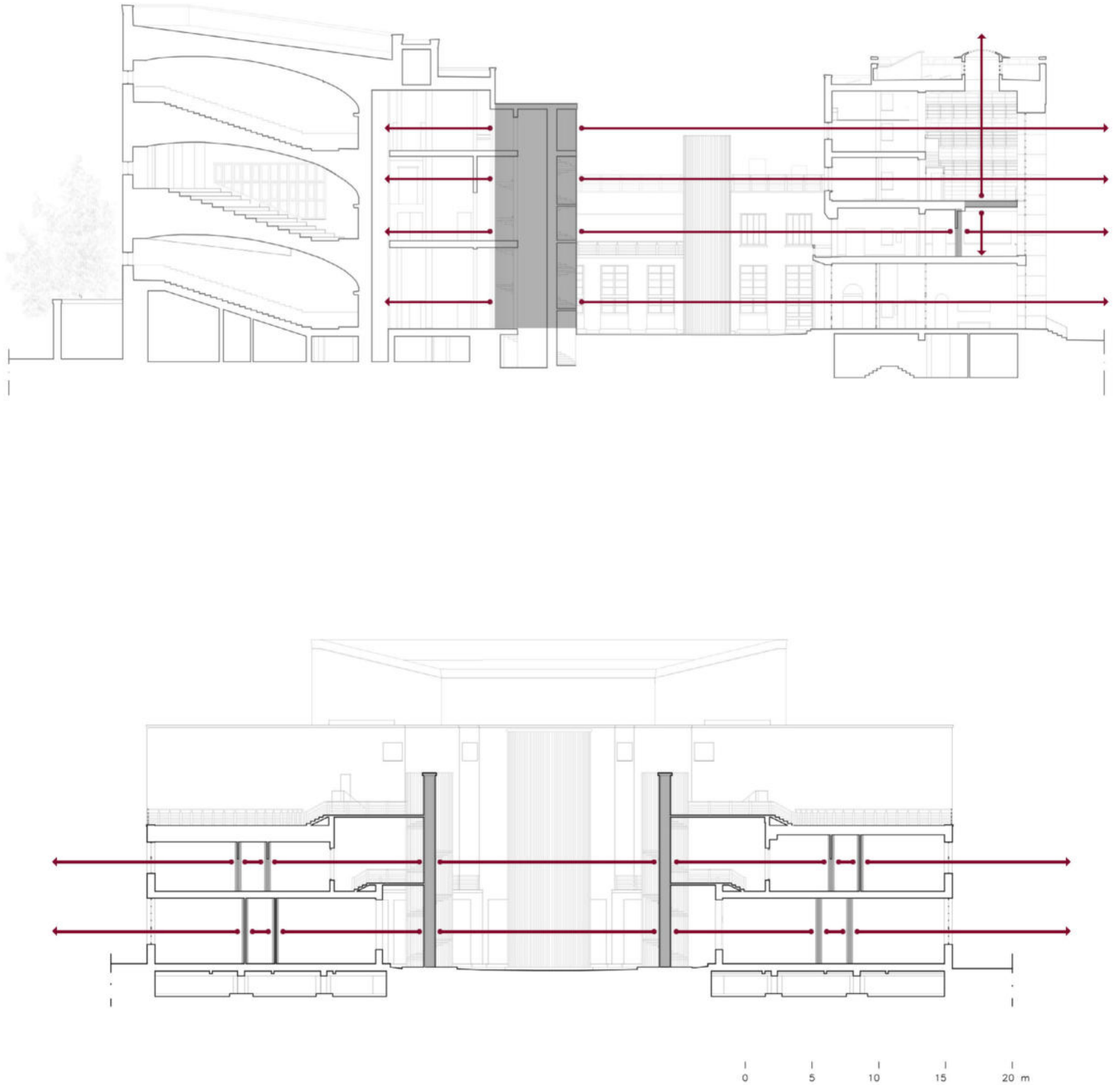


Figure 21 a/b - The visual axes crossing through the building (© Salvo 2021)

fronts and by reaching a compromise in order to assist in the conservation of the building.

One initial assumption is that, based on the fire risk assessment, there is a high level of risk within the building's premises. This depends on its function (schools, etc., where many individuals gather), its fire load (especially in the library and book depot, compounded by the presence of old books and manuscript collections combining a high fire risk with exceptional heritage value), and the activities that may take place in the building.

As shown in Figure 23, compliance to fire safety rules has been determined by dividing each floor into fire compartments (or homogeneous areas), and by surveying the horizontal continuity of the building and relative calculation of surfaces, number of escape routes and exits. The fire risk evaluation therefore currently refers to horizontal compartments rather than to homogenous 'blocks'.
This could be carefully re-determined based on a historical analysis of the building and precise data regarding its original layout and juxtaposed volumes which should be considered separately in view of a revision of the fire safety organization. Such an alternative assessment would reduce the maximum distance to reach the exits and safe places, making it possible to redistribute fire escape corridors and stairs, which are undoubtedly necessary but could be relocated elsewhere, in a more strategic and appropriate location than the courtyard.

The fire safety compliance resolution therefore needs a multifaceted strategic approach, combining the issues and values at stake into one comprehensive observation.

An initial consideration is that a sufficient supply of water should be available in case of fire. Since the building has a high fire load due to the huge amount of paper present, especially in the front building and basement, a huge amount of water has to be available.

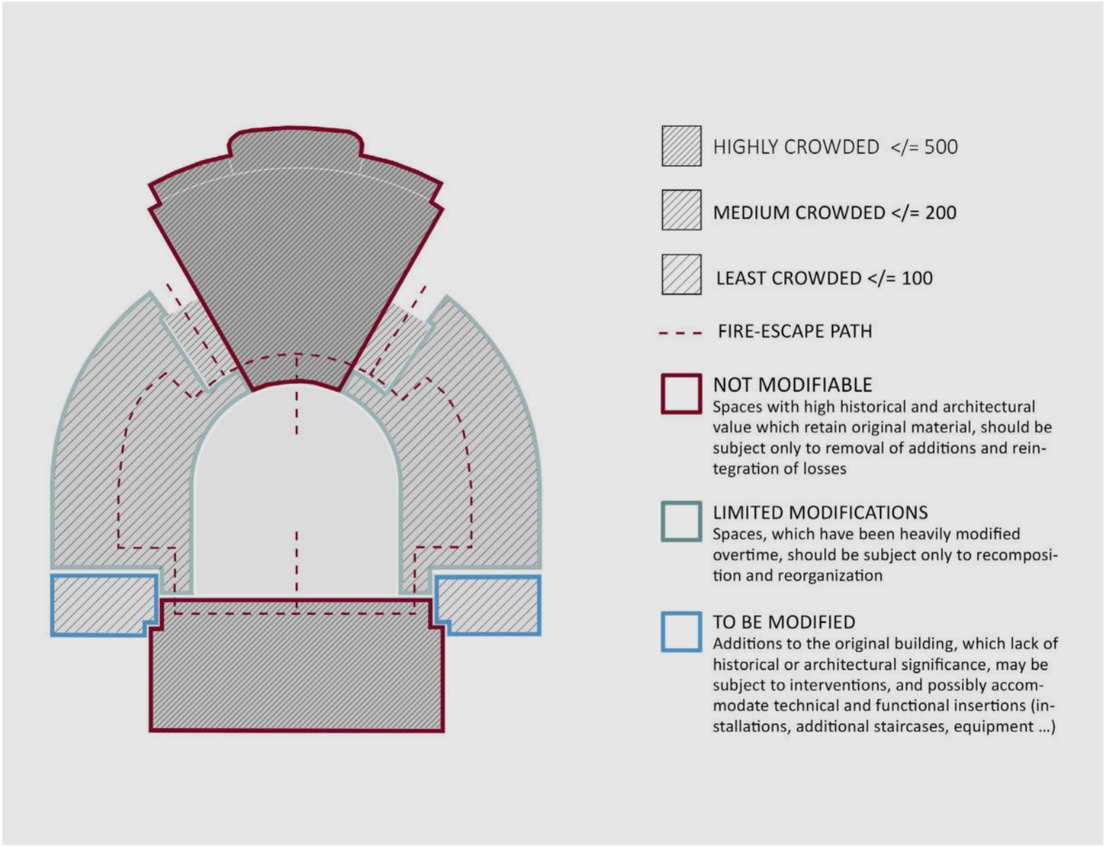


Figure 22 - Plan showing the fire escape paths, crowded areas, and level of applicable modifications according to their historical and architectural values (© Salvo 2021)

	Compartment / Homogenous Area	N.of doorways/ width cm	Exit Modules	Flow capacity Per unit	Flow capacity Total	Crowding	Verified	Max. length of safety path (m)	Maximum length of safety path (D.M. 26/08/92)	Verified	Minimum width of safety path (m)	Min. width of safety path (m) (D.M. 26/08/92)	Verified
1	Front Building, Basement floor (*IT laboratories, deposit, archives*)	N=2 / 120 m N=1 / 100 m	5	60	300	110	YES	15	60	YES	1.20	1.20	YES
2	Tower of classrooms, Basement floor (*PhD students' rooms*)	N=1 / 90 m	1	60	60	27	YES	5	60	YES	1.80	1.20	YES
3	Front Building, Ground floor (*Offices, classrooms*)	N=2 / 180 m N=1 / 100 m N=2 / 80 m	9	60	540	490	YES	35	60	YES	1.40	1.20	YES
4	Tower of classrooms, Ground floor (*Lobby and tiered lecture halls I and II*)	N=2 / 190 m N=1 / 120 m	8	60	480	400	YES	5	60	YES	9.00	1.20	YES
5	Front Building, First floor (*Studies, offices, assembly rooms*)	N=3 / 110 m N=1 / 145 m N=1 / 190	8	60	480	200	YES	20	60	YES	1.20	1.20	YES
6	Tower of classrooms, First floor (*Lobby and tiered lecture hall III*)	N=1 / 120 m N=1 / 140 m N=1 / 190 m	7	60	420	435	NO	5	60	YES	9.00	1.20	YES
	Tiered Lecture Hall III	N=2 /180	6	60	360	434	NO						
7	Front Building, Second, Third, Fourth floors (*Library, reading rooms, offices, archive*)	N=3 / 120 m N=1 /140 m	8	60	480	115	YES	40	60	YES	1.50	1.20	YES
8	Tower of classrooms, Third floor (*Lobby and tiered lecture halls IV and V*)	N=2 / 1.90 m N=1 / 1.40 m	8	60	480	396	YES	5	60	YES	3.00	1.20	YES
	Tiered Lecture Hall IV	N=2 /180	3	60	180	198	NO						
	Tiered Lecture Hall V	N=2 /180	3	60	180	198	NO						

Figure 23 - Chart showing crowding, flow capacity, length of safety paths, and corridor width of the building's fire compartments (© Salvo 2021)

Compliance to fire regulations requires that an independent firewater ring main and a water pump be installed in the immediate vicinity of the building, for example in the basement, provided this space is cleared from garbage- an absolutely crucial requirement. However, installing a fire ring main involves digging a roughly one meter deep hole in the basement; this seriously threatens the continuity and stability of the foundations which will lose the ground counter-push in an almost century-long consolidated situation.

Secondly, the chief issues that affect compliance with fire regulations depend on how crowded the halls and rooms are (the number of people in each room) and the size of the openings (the width of the doors and corridors), given that university buildings comply to the regulations regarding schools. Therefore, since the classrooms in the tower in particular are overcrowded, the number of people must be reduced to avoid invasive interventions such as opening new doors and widening the existing ones. Reconfiguring fire safety paths to suit current crowding would not only require making alterations to the original spatial layouts, but also to the fixed furniture, such as the original doors, floors, and teachers' desks; it would also include eliminating the very original doors cut into the blackboards. On the other hand, a less than 20% decrease in the number of people present in the tiered lecture hall on the first floor- from 434 to 360- and less than 10% on the third floor- from 198 to 180 in each room- would be sufficient to avoid alterations.

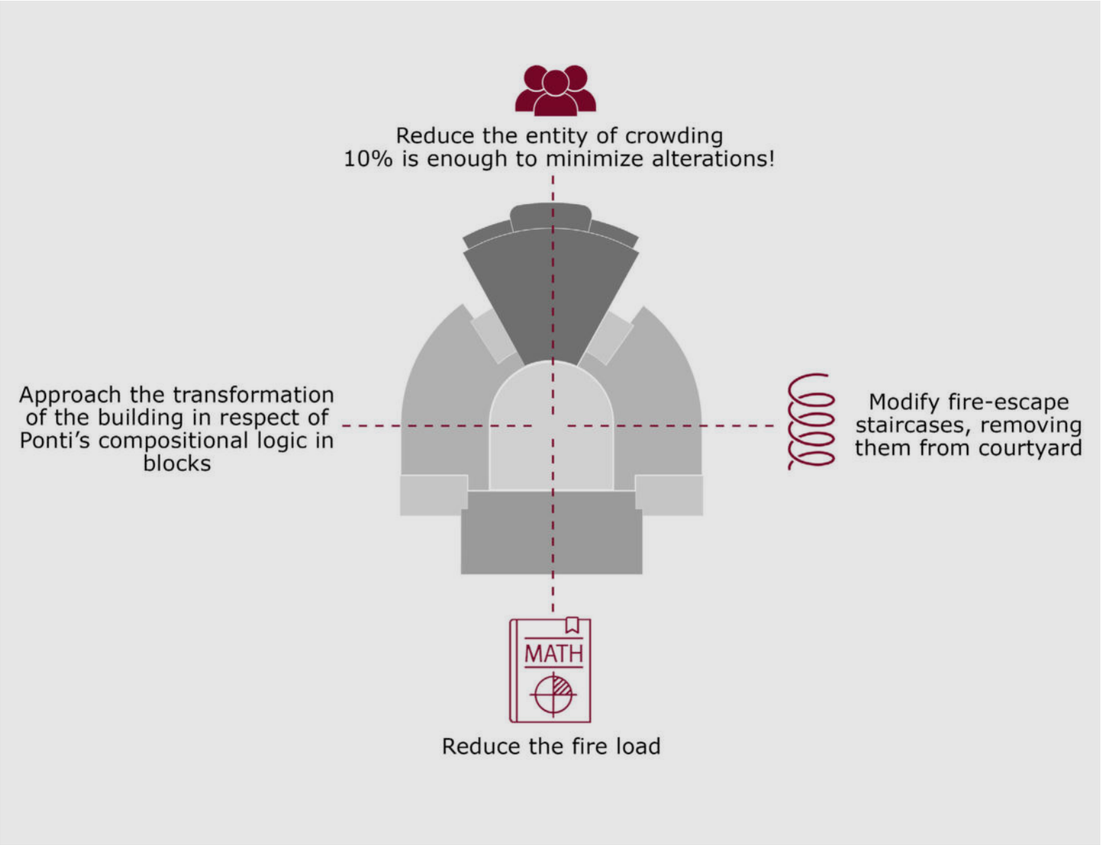
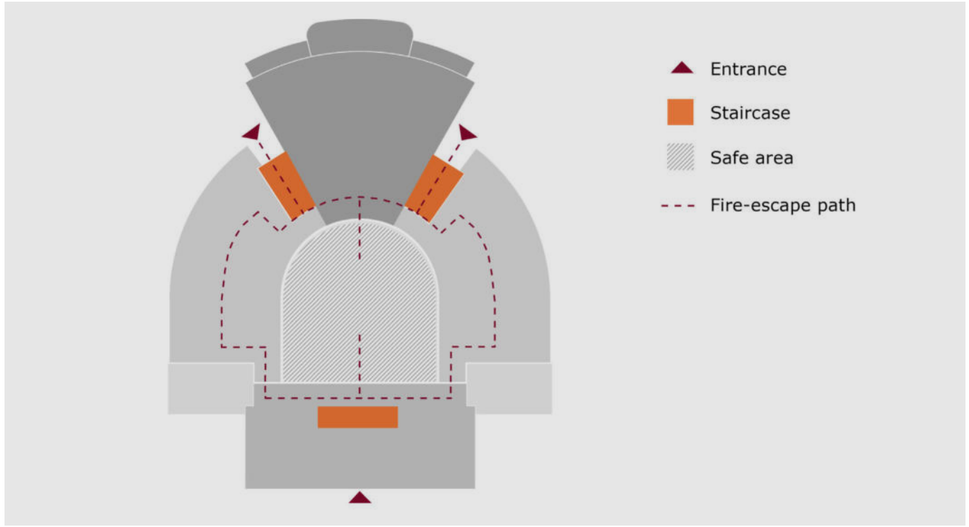


Figure 24- Multifaceted fire safety planning strategy (© Salvo 2021)

Thirdly, the possibility of removing/relocating the fire escape stairs should be assessed against the need to protect escape routes throughout the building, and thus produce more damage. According to the specialists entrusted with reviewing the fire escape plans, removing the stairs from the courtyard would require

Figure 24 - Manyfold strategy to approach fire safety planning (© Salvo 2021)



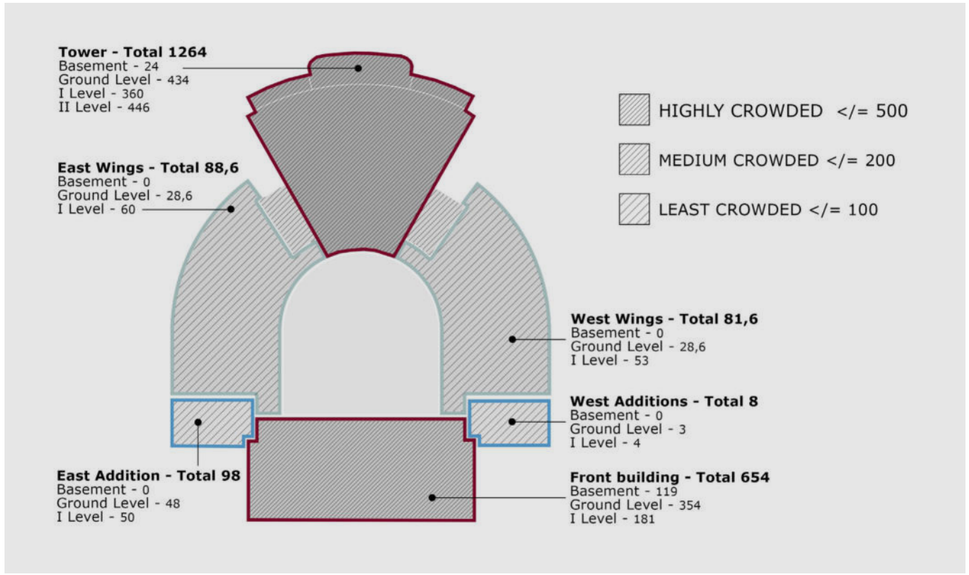


Figure 25 - The original distribution of the building: the three main blocks were separate and had independent entrances, paths, and staircases (© Salvo 2021)

Figure 26 - The overcrowding in each block, calculated as the sum of each floor: the 10% reduction of people present (and removal of additional bookshelves with journals) would be sufficient to avoid further modifications (© Salvo 2021)

the construction of two new ones elsewhere, with a minimum width of 120 cm, preferably in a symmetrical position (this would also respect the building's 'innate' symmetry). Whatever the solution, the relocation of the fire escape stairs must take into consideration that the building's spatial layout is complex and should not be separated from the overall reconfiguration of the distribution and position of interiors, paths, and entrances.

Although the purpose of the intervention is to ensure the safety of those who live and work in the building, the conservation of the building is also important, and possible. Compliance to fire safety regulations should therefore be conservative in order to avoid further damages. It is useful to remember that the building is protected by a decree issued by the Ministry of Culture: damages to the building are punishable by law.

In addition, alterations should not:

- produce a visual impact on the interior and exterior of the building, including the courtyard;
- affect the original concept of the building divided into separate blocks;
- affect the 1935 part of the building, and instead concentrate on the added parts;
- impact the original distribution, especially junction points between the blocks;
- occupy more space than necessary.

EVALUATION / SOLUTION	IMPACT								
	IMPACT ON USE	IMPACT ON HERITAGE VALUE	IMPACT ON STRUCTURE	IMPACT ON HISTORICAL VALUE OF THE BUILDING	IMPACT ON ARCHITECTURAL VALUE OF THE BUILDING	IMPACT ON AESTHETIC PRESENTATION OF THE BUILDING	COSTS	COMPLIANCE TO REGULATION	COMMENTS
LEAVE SITUATION UNALTERED	-	-	-	-	-	-	-	*	* NOT POSSIBLE - Lateral fire-escape staircases are no compliant and MUST be updated
REDUCE CROWDING OF 10-20%	VERY POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	-	POSITIVE	PRODUCTIVE - Reduction of crowding - about 10-15 % in the tiered lecture halls - should be taken into consideration in any case, whichever decision is undertaken, as this facilitates the solution to compliance. Today the building bears a higher functional load than due; moreover, the presence of students (not only Math students) is concentrated in the Tower of classrooms and on specific days. Current statistics and forecasts on number of students and professors should be carefully analyzed, together with the distribution of math students in other building.
REPLACE THE EXISTING STAIRCASES IN THE COURTYARD WITH NEW ONES	POSITIVE	NEGATIVE	NEUTRAL	NEGATIVE	NEGATIVE	VERY NEGATIVE	NEGATIVE	POSITIVE	COUNTERPRODUCTIVE - Except for the immediate
REMOVE ONE OF THE THREE EXISTING STAIRCASES BUT COMPLY FURTHER TO FIRE REGULATIONS	POSITIVE	POSITIVE	NEUTRAL	POSITIVE	NEUTRAL	POSITIVE (?)	NEGATIVE	NEUTRAL	NOT PRODUCTIVE - This intervention implies important changes along the escape paths, and insertion of fire-resistant doors and panic handles. This kind of alterations have already affected the connection between curved wings and tower of classrooms, especially at the three levels of the lobbies.
SHIFT FIRE ESCAPE STAIRCASES FROM THE COURTYARD: TO OUTSIDE OF BUILDING	NEGATIVE	NEGATIVE	NEUTRAL	NEGATIVE	NEGATIVE	VERY NEGATIVE	NEGATIVE	NEUTRAL	COUNTERPRODUCTIVE - Several alterations to the distribution would be necessary in addition to the replacement of the staircases, but without improving the perception of the original conception of the building
SHIFT FIRE ESCAPE STAIRCASES FROM THE COURTYARD TO INSIDE OF BUILDING: IN THE TOWER OF CLASSROOMS	VERY NEGATIVE	VERY NEGATIVE	VERY NEGATIVE	VERY NEGATIVE	VERY NEGATIVE	NEGATIVE	VERY NEGATIVE	NEUTRAL	COUNTERPRODUCTIVE - This option implies a significant impact on the consistency of the original building and on the inner distribution.
SHIFT FIRE ESCAPE STAIRCASES FROM THE COURTYARD TO INSIDE OF BUILDING: WITH DUE CONSIDERATION OF THE HISTORICAL ANALYSIS	POSITIVE	POSITIVE	NEUTRAL	POSITIVE	NEUTRO	POSITIVE (?)	NEGATIVE	NEUTRAL	RESOLUTIVE - This research has identified areas of the building that are more/less sensible to alterations in terms of impact on heritage value and functional value. The correct positioning of the fire-escape staircases should not involve parts with high authentic consistency. Fire prevention could become an opportunity to recover valuable parts of the building.

Figure 27 - Compliance with fire escape regulations and interventions on the fire escape stairs: assessment of intervention options (© Salvo 2021)

An assessment of the pros and cons would suggest that it is also possible to shift the stairs to a less visible and invasive position, perhaps relocating them in a least sensitive position within the added volumes. The new position of the fire stairs should have the following characteristics: it should not affect the original building, i.e., have no impact on the parts of the building that date back to 1935; produce the least possible visual impact, but improve the perception of the original spaces, exterior and interior, including the courtyard.

On the other hand, the stairs should be placed where the external and internal routes for safe transit meet, or define places; they should possibly respect the original symmetry of the distribution, thus enhancing the original spatial block concept.
Given the fact that the current situation does not satisfy the regulations, and that changes must be made, said changes should enhance the building, possibly correct previous alterations, and involve the additions and not the original building fabric. It is important to reach a necessary compromise between a reduction in available space- e.g. seats, chairs, and study areas - and the conservation of the building, reconsidering crowding as a decisive factor.

One last important task is to update the protection decree; it should consider the furniture as significantly inputting into the building's value and indicate how to ensure preservation based on the conditions that accompany change.

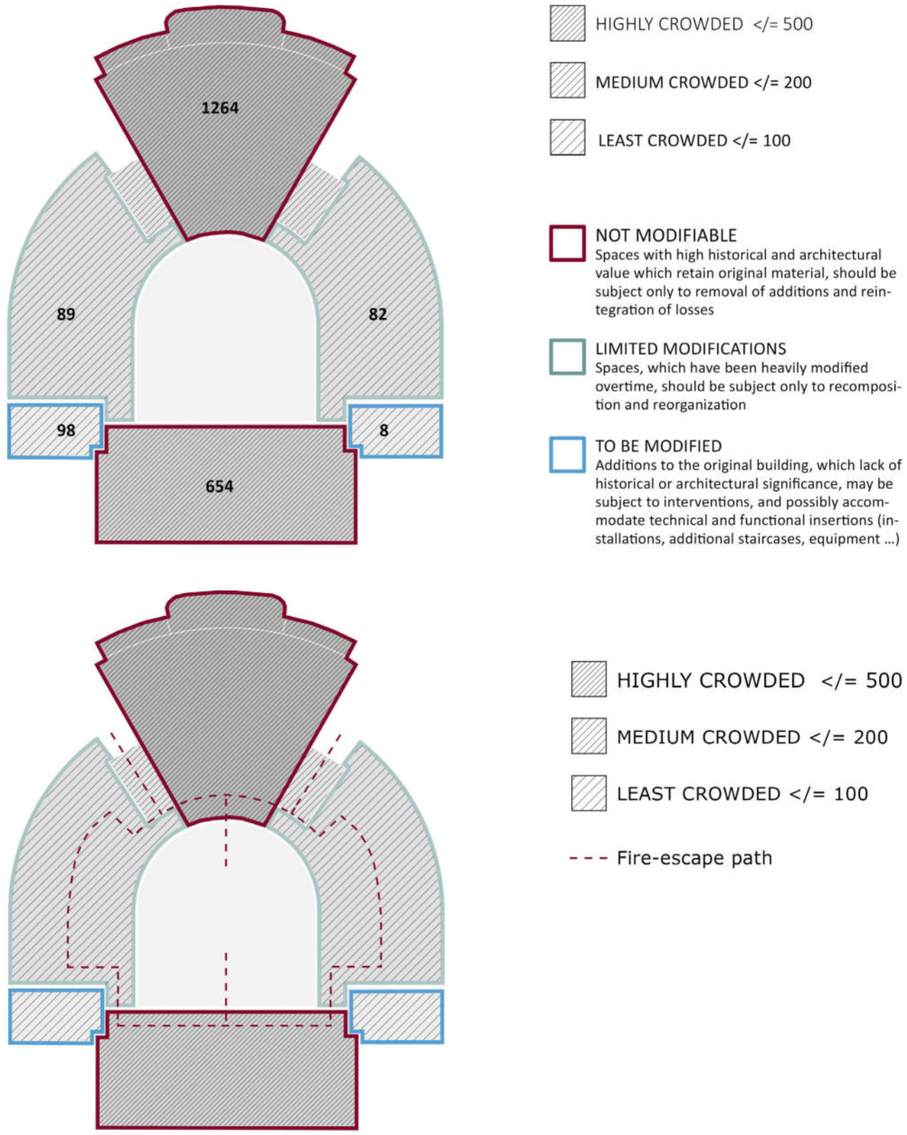


Figure 28 - Crowding and preference to modify the blocks based on a historical and architectural value assessment and authenticity (© Salvo 2021)

Figure 29 - A contextual interpretation of spaces, crowding, and fire escape paths, suggests that the two added blocks on either side of the front building are suited to accommodate functional additions and installations, including fire safety stairs (© Salvo 2021).

REALIGNING CONSERVATION PLANNING TO THE ORIGINAL CONCEPT OF THE BUILDING

A coherent conservation plan for the School of Mathematics should carefully evaluate each addition and establish a conservation /removal policy for each addition based on an assessment of its historical value and coherency with the concept of the building and current contingencies. And yet, the overall approach does not propose any kind of reconstruction or restoration of the original state of the building, as it was in 1935, which is instead a philological point of comparison for a critical assessment.

Undoubtedly the 1939 elevation of the curved west wing and the 1974 extensions on either side of the front building cannot be dismantled now since they are to be considered consolidated and irreversible. Instead, certain conditions can be discussed, modified or reinstated. They include: the presence of the IndAM in the curved west wing, the position of the fire escape stairs in the courtyard, the division of the triple height of the library with the ensuing loss of a decorative and colored filter; and the distribution of the interior spaces.

Instead, conservation policies should be established based on the original concept of the building and the overall value assessment that initially refers to the three-block design.

The approach is defined in terms of urgent measures, preliminary conservation, restoration, and enhancement interventions, depending on their priority, scope and impact.

As discussed in previous paragraphs, regulatory compliance to fire escape legislation is urgent and cannot be postponed. If considered in the context of a general reassessment of the building, this implies reorganizing functions and accessibility, including reducing overcrowding, especially in the classroom tower. A plan to reorganize all the systems- especially the electrical and photovoltaic systems- is part of the initial approach to further preliminary interventions.

The building requires general monitoring and maintenance, two interventions that are necessary for all buildings, especially old buildings. Traditional maintenance operations consist in meticulous, periodical monitoring of downspouts; the latter are all embedded in the walls and have already produced leaks, infiltrations, and breakages. Downspouts are loosely linked to the roofs and sewage system; these are two of the building's major weak points. In the last ten years the relationship between the building and natural elements- rain, wind, and sun- has become very unique. Scientists and specialists commonly observe that in Rome climate change has produced effects in terms of rainfall and increased temperatures, combined very intense meteorological events. Frequently considered as the 'tropicalization' of the weather, rainfall appears concentrated and severe in the intermediate seasons, combined with strong winds, while temperatures may rise drastically in the summer for considerable periods at a time. The consequences of these phenomena on the School of Mathematics appear to accelerate damage in the most exposed parts- namely the upper cornices- and in more and more problems regarding humidity, moisture (moss, efflorescence, etc.) and the growth of thick vegetation on the roofs and, in the general, in between the joints. The rate at which these damages multiple has not been specifically measured; this makes monitoring, attention to, and continuity in research even more valuable.

Front building

This is certainly the most important feature of the complex, and the library is undoubtedly its most valuable space. Regaining the triple height of the reading room is crucial to reestablish Ponti's architectural concept and should be considered a step towards a 'chain reaction' of virtuous interventions.
In other words, the elimination of the horizontal element added in 1954 is an excellent initiative, highlighting a new approach to the building's conservation. The operation is quite easy, affordable, and localized, but requires a new perspective with which to view the future of the building. In practical terms, it would require that several working areas be eliminated, i.e., one or two offices.
This would provide enough space to reorganize the functions and uses of the offices on the first floor and library reading room. A transparent partition between the 'Aula Ponti' would be enough to mitigate the direct link between the two floors and, as a result, any thermal and acoustic disturbance. A new policy regarding behavior in the library would also be necessary.

Material conservation refers instead to the conservation and care of the most exposed parts, especially the crowning frame, skylights, roofs, and the travertine balcony; work is urgent since these parts also represent a possible public safety hazard. In addition, the structure and travertine cladding of the balcony overlooking the courtyard should be monitored and investigated further. An accurate monitoring of the travertine cladding of the front façade and the Litoceramica cladding of the rear façade are less alarming, but should also be considered since earthquakes may loosen these unstable elements.

Finally, the big window in the middle, once occupied by the stained glass window designed by Ponti, deserves a special mention. The destruction of this work of art, designed and built in 1935, should be considered a true 'loss', as it is impossible to recover other than through virtual reconstruction with the support of AR digital technologies, as in the case of the 2017 projection. This experience could be repeated, considering the amount of scientific data acquired during this research, and become a permanent fixture. An open competition call for ideas to compensate the loss, with new translucid colored glass for the big window, would highlight this matter both nationally and internationally.

Figure 30 - The main facade of the School of Mathematics at end of the lighting performance that re-enacted the stained-glass window designed by Ponti, on the night of November 24, 2017 (© Lanzetta 2017)

Curved wings

The interior of the curved wings has long been altered by dividing the open spaces designed by Ponti for the drawing classrooms. There is very little chance that these will regain their original layout, although technically it would be rather easy. Secondary changes, such as the plugging of the windows for one third of their height is also technically possible, but again does not represent a priority for the conservation of the building.

More could be done, at least to highlight the parts that have been added to the original ones- e.g. by using different colors of paint or plaster with diverse effects on the added surfaces, e.g., on the ceiling of the “Aula Ponti”- as well as the continuity of the original open spaces, for example by inserting transparent glass windows along the upper part of the partitions; indeed, this has been implemented in some rooms. The original paving, a green ‘battuto alla veneziana’ floor, which has survived in good condition, may very well represent said continuity.

The removal- or reorganization- of the signage, systems, wiring, and ducts, which add background noise to the perception of the spaces, would contribute to the correct perception of the interiors. In addition, the exterior appearance of these volumes would benefit from the removal of metal parapets and balustrades on the roofs, in combination with the revision of the existing fire escape stairs.

Certainly, both the west wing and the whole building would greatly benefit from moving the IndAM to other premises, as the Department would regain not only space for teaching and research purposes, but also spatial and functional continuity, which is currently not available because this Institute is not open to students and professors. This could be considered a preliminary step towards solving regulatory compliance with fire safety regulations. General revision, maintenance, and conservation is also required for the exterior and interior finishings, especially the color of the painted plaster on the exterior.

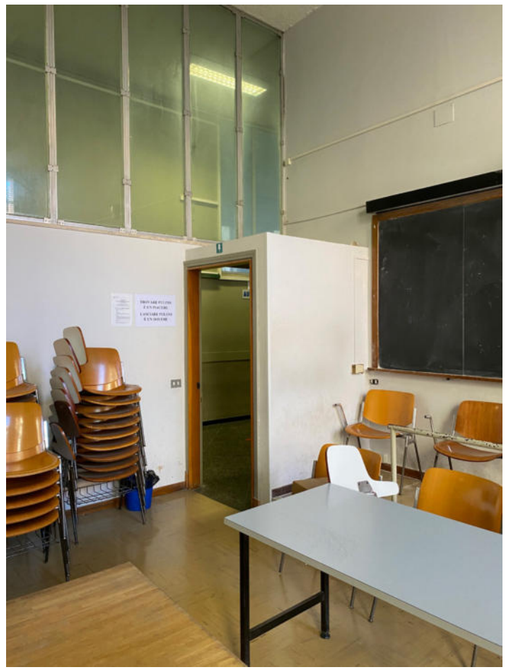


Figure 31 - One of the classrooms created by dividing the drawing rooms in the curved wings (© Salvo 2021)

Classroom Tower

Although this part of the building retains most of the original fabric, the few additional partitions and fire walls have damaged perception of the space, especially in the main lobby and tiered lecture hall on the first floor. This is why the revision of the fire safety plan represents a potential source of damage unless it is accurately drafted taking into consideration the values at stake.

Again, there is little chance that the additions will be removed since this is not a priority for the conservation of the building. And yet, a careful design of the treatment of the surfaces- color, plaster rendering, etc.- would improve the general appearance of these magnificent spaces.

On the contrary, it is a matter of urgency to focus on the protection of the fixed furniture- the teachers’ and students’ desks and seats- and save it from the continuous damage produced by the installation of any sort of equipment. A dramatic increase in this kind of damage has been produced very recently during the pandemic when these halls were equipped with IT equipment (computers, cameras, videos screens …) in view of either remote teaching or a combination of remote and in-person teaching.

Figure 32 - The lobbies of the classroom tower towards the courtyard, on the ground floor (© Salvo 2021)

Figure 33 - The big vertical window providing light to the lobbies on the three floors of the classroom tower; top-down view (© Salvo 2021)

Figure 34 a/b - The landings on the first floor (a) and second floor (b) of the staircases in the classroom tower (© Salvo 2021) Figure 36 - The tiered lecture hall on the second floor in March 2021 during installation of IT equipment for remote teaching (© Salvo 2021)

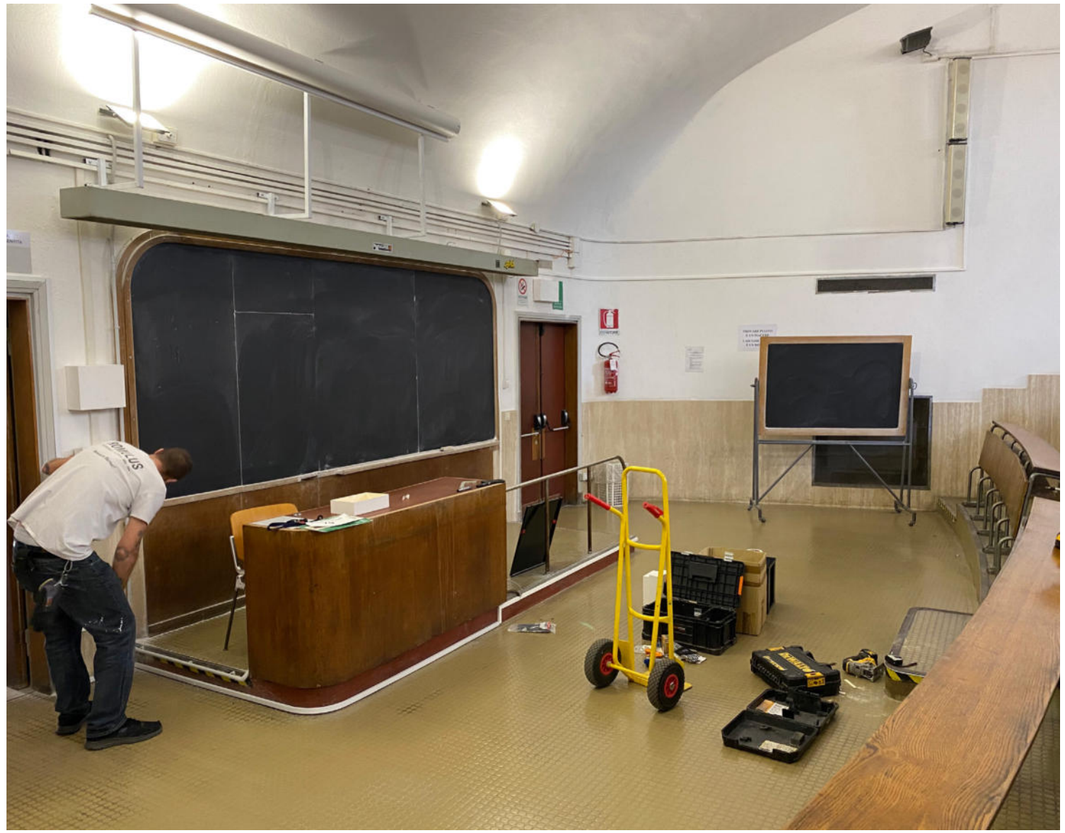


Figure 35 - The hall of the classroom tower on the first floor; note the niche over the door leading to the staircase, closed by a wall and a fire door (© Salvo 2021)

Figure 36 - The tiered lecture hall on the second floor in March 2021 during installation of IT equipment for remote teaching (© Salvo 2021)

Courtyard

The courtyard has a great architectural and functional potential, currently hindered by the presence of the fire safety stairs. Hopefully these will soon be removed as part of the reorganization of the general plan for the building. In any case, an urgent solution should be found regarding their material degradation, interaction with the roofs, and the exponential growth of vegetation where the courtyard touches the building. Should the joints be once again filled with grass and periodically maintained, this ostensibly non-influential detail would contribute to the correct interpretation of this key space in Ponti's composition.

Furniture and collections

The first thing that has to be done to protect the furniture from being broken up even further is to revise the Protection Decree, perhaps by drafting a specific document for the School of Mathematics, integrating and enhancing the general decree referred to the University campus. The document could benefit from this research and acknowledge Ponti's work as Gesamtkunstwerk, not only highlighting its historical and architectural values, but also the value of its furniture and book collections that should be considered integral parts of the building. The decree should consider the fixed and movable furniture as a historical 'witness', but also as a typical product of Ponti's design since he worked closely with many companies that already produced very modern furniture in the Thirties. In order to protect this important heritage a complete and systematic inventory must be provided, perhaps on behalf of the work already done within this research; each piece must be classified so that no action - such as moving, changing, repairing, adjusting or disposing of said pieces- can be implemented without specific authorization.

Raising awareness by initiating an information campaign targeting the academic staff and students would also help to increase respect for these historic pieces and instill pride among the entire community since they are the ones who have the opportunity to continue using and appreciating them. The cleaning staff should also be trained to correctly handle and clean the furniture, surfaces and frames, using the most appropriate cleaning supplies.

Naturally, a general reorganization plan should initially focus on cleaning, repairing, preserving and maintaining the original pieces; it should include guidelines for choosing new pieces of furniture, and probably also the removal of the redundant, insignificant objects that clutter the rooms. In the end, at least one space - i.e. the professors' lounge in the front block- could be philologically recreated using the original furniture plus a few integrations. This would provide an example of an original "Ponti interior", similar to the reconstruction of the interiors designed by Ponti and displayed at the exhibition entitled Tutto Ponti archi-designer held in Paris in 2018.

The ancient book collection, so closely linked to the creation of the library and the birth of the School of Mathematics, also requires specific, professional treatment. This treatment should be included in the conservation management plan and could represent a further, invaluable expansion of this research.

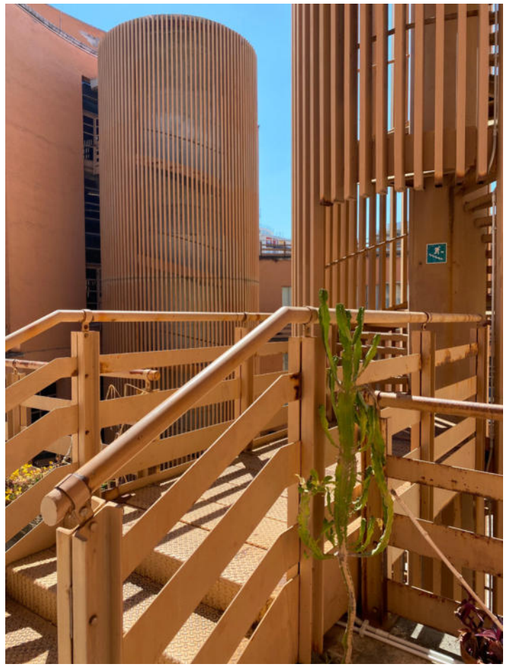


Figure 37 - Visual effects produced by the metal cages of the fire escape stairs (© Salvo 2021)

Figure 38 - Reconstruction of the interior of the Rector's Office at the University of Padua designed by Ponti in the late Thirties, and displayed at the exhibition Tutto Ponti archi-designer, Musée des Arts Decoratifs, Paris 2018 (© Salvo 2018)

NOTES

1. Demolition only affected the so called 'Casermetta' (military barrack), designed by Gaetano Minnucci and Eugenio Montuori, to create space for the secretariat building in the late Seventies.
2. Continuity between pre- and post-war Italian life has been a matter of discussion during the complex process of elaborating the difficult heritage left by the dictatorship in all aspects of Italian culture; it should perhaps be assumed as a general framework for critical interpretation.
3. The same may be said for the metal and wooden window frames. The first, the so-called 'ferrofinestra', had been repeatedly produced by the Curti company before and after the war, while the wooden frame belonged to Italy's long-standing traditional that continued well after the war.
4. The IndAM had wanted to move to new premises for years, but unfortunately at this point the solution had not been found.
5. Sapienza is one of the biggest universities in Europe; the reform of Italian education system, enacted by law in 2010, strongly impacted academic life, which is now adapting to the new conditions.
6. Italy has the highest number of World Heritage sites (58 against the 48 in China although the latter are spread in an incomparably bigger territory); this indicates the complexity of Italian cultural heritage.
7. Brandi 1956.
8. Pilot program 1976.
9. A concise but effective narration of the cultural background, story, and protagonists of the "Pilot Program for heritage conservation planning in Italy" is provided in Petraroia 2022.
10. Petraroia 2022, p. 3 (translated by S. Salvo).
11. Castelli 1997, La Carta del Rischio 2001; Accardo, Giani, Giovagnoli 2003.
12. Pilot Program 1976.
13. Petraroia 2022, p. 15.
14. Guidelines 2005. Following the issue of the General Act on Cultural Heritage n. 42, 2004, in 2017 the Ministry of Culture revived the Conservation planning project – referred to article 29/paragraph 5 of the law – and organized a research group to establish the guidelines for its implementation at national level.
15. Biscontin, Driussi 1999.
16. Petraroia 2014.
17. In English: Accardo, Giani, Giovagnoli 2003; Accardo, Altieri, Cacace, Giani, Giovagnoli 2003. The project is also described in La Carta del Rischio 2001; Petraroia, Della Torre 2008 and more recently, in relation to its digital implications, in Accardo, Cacace, Rinaldi 2005.
18. Maintenance and conservation planning are part of the requirements indicated in the General Law for the protection of cultural heritage n. 42 of 2004; these requirements are compulsory for public administrations.
19. Canziani 2009.
20. La conservazione programmata 2003; Petraroia 2006.
21. Salvo in print, but 2022.
22. Petraroia 2022, p. 40-41.
23. The stairs in the courtyard were installed shortly before the Protection Decree of 1989: "Before the recent adaptation to the regulations established by Law 818/1985, the courtyard appeared well maintained, with the internal elevation of the building in gray-yellow Litoceramica: the paving made of irregular travertine slabs with grass joints is compromised by the presence of three cylindrical-shaped stairs", Protection Decree Declaration of historical significance of Rome's University Campus, August 2, 1989, Ministry of Cultural and Environmental Heritage.
24. In 2011, 2012, 2013 Sapienza's Ancient Theatre organization 'Theatron' staged a Greek tragedy in the courtyard. These performances highlighted the architectural qualities of this area, recalling the classical matrix on which Ponti based his design. These plays became an annual summer performance attended by a huge crowd.
25. This is also due to the permanent lack of space within the University campus, especially as regards study courses in Sciences, so much so that classes of specific courses sometimes 'migrate' from one building to the other depending on the number of enrolled students; these changes are modified accordingly each year.
26. According to Italian law, this cannot be more than 60 meters.
27. Installing the firewater ring mains in the basement requires lowering the paving by one meter; it should be preceded by preliminary trenching in order to test the situation.
28. IndAM has long since deliberated to move to new premises, but unfortunately has not yet found a new venue; Cacace, Giovagnoli, Gaddi, Cusano, Bonanni 2014.

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Petraroia P. (2022): Conservazione programmata: nascita, rifiuti, adozioni, mutazioni (memorie 1976-2005).

TIMETABLE OF INTERVENTIONS AND MAINTENANCE

Simona Salvo

* All interventions should be accompanied by a photographic campaign, survey and research; mapping of the state of conservation prior to the intervention should be drawn up and updated during the works.

	URGENT	PRELIMINARY	CONSERVATION TO BE PROGRAMMED	MAINTENANCE TO BE REPEATED *SEE CHRONOPROGRAMME	RESTORATION "ONCE ONLY"	VALORIZATION & ENHANCEMENT "HAULING INTERVENTIONS"
BUILDING	**REGULATORY COMPLIANCE to FIRE ESCAPE LEGISLATION** - installation of firewater ring main in the basement. **REORGANIZATION of FUNCTIONS AND USES** **REORGANIZATION of ACCESSIBILITY** – pairs with compliance to fire safety rules. **ROOFS -** cleaning, removal of dirt, rubble and waste, vegetation. **BASEMENT FLOOR** - cleaning, retrieve of furniture, removal of debris, garbage and dirt. **PLANNING OF INSTALLATIONS REORGANIZATION -** removal of improper interaction of wiring, ducts and cabling of all kinds, with reinforced concrete structures (basement level); reorganization of wiring, ducts and cabling in corridors, aisles and lobbies behind false ceilings. **DOWNPIPES** - Inspection, cleaning, reintegration, and reinstatement of finishes.	**REORGANIZATION of TEACHING ACTIVITY -** decrease of number of users (students and teacher). The scope is to reduce crowding of classrooms, especially tiered lecture hall III, IV, V **NON-DESTRUCTIVE SAMPLING AND ESSAYS** - Planning and execution of further specific preliminary investigations **REDESIGN of FIRE SIGNAGE** – replacement of current system with new design **TRAINING of CLEANING STAFF** - about products to be used, specific accuracy towards furniture, window frames, stone paving, and cladding **WINDOW FIXTURES -** inspection, fixing, replacement of broken parts **HEATING SYSTEM –** Installation of thermostatic valves on all radiators **ENERGY EFFICIENCY -** Improvement of building envelope with addition of double glazing, where possible **REPLACEMENT** of lighting with LED bulbs and lamps **INSERTION** of timer s for automatic switching-off of lighting system according to time/use/area	**FIRESCAPE STAIRCASES** - removal and re-establishment of corresponding finishes: door and window fixtures of the Tower of classrooms, courtyard paving plastering of facades. **SEWAGE SYSTEM AND MANHOLES** - unblocking and cleaning **REINFORCED CONCRETE STRUCTURE -** repair elements damaged by oxidation / spalling / blemishes	**ROOFS** – monitoring, removal of dirt, rubble and waste and cleaning every 1 year **WINDOW FIXTURES –** inspection, fixing, replacement of broken parts **SEWAGE SYSTEM AND MANHOLES** - periodical unblocking and cleaning **DOWNPIPES** – Inspection and cleaning		**REDEFINE THE PROTECTION DECREE –** revised value assessment and inclusion of furniture CONTINUE **ARCHIVAL RESEARCH** (see box 1) COMPLETE INVESTIGATION ON **MATERIALS AND CONSRUCTION TECHNIQUES** with minimal destructive sampling with support of scaffolding and /or movable arms (see box 3) COMPLETE INVESTIGATION ON **LOAD-BEARING STRUCTURES AND TESTS ON CONCRETE** (see box 4) COMPLETE SURVEY OF **ENERGY EVALUATION AND DEFINE COMFORT VARIABLES** (see box 5) **CONTINUE SCIENTIFIC DISSEMINATION** **INSTALLATION OF NIGHT LIGHTING SYSTEM** **REORGANIZATION OF ENTRANCE AND SURROUNDING PUBLIC SPACES** **REORGANIZATION OF INDAM -** delocalization to other prestigious seat or reorganization within the building

Conservation Management Plan,
Timetable of interventions (© Salvo 2021)

	URGENT	PRELIMINARY	CONSERVATION	MAINTENANCE TO BE REPEATED *SEE CHRONOPROGRAMME	RESTORATION "ONCE ONLY"	VALORIZATION & ENHANCEMENT
FRONT BLOCK	**CONCRETE CROWNING FRAME -** consolidation, cleaning, reintegration, protection. **TRAVERTINE BALCONY ON THE COURTYARD** – propping, removal of broken pieces, cleaning, passivation of metal clamps, re-adhesion of pieces, protection. **BOOK DEPOSIT SKYLIGHT** - **LIBRARY SKYLIGHT** – monitoring of waterproofing resins applied in 2013	**TRAVERTINE CLADDING** – monitoring. **LITOCERAMIC CLADDING** – monitoring. **ENERGY EFFICIENCY –** Replacement of single glazing of the great window with double glazing	**LIBRARY SKYLIGHTS GLASS-CEMENT BLOCKS** - removal of waterproofing resins and application of protective film (to be monitored and repeated). **BOOK DEPOSIT SKYLIGHTS GLASS-CEMENT BLOCKS** - removal of waterproofing resins and application of protective film (to be monitored and repeated). **LIBRARY SKYLIGHT WINDOWS** – removal of paint, reactivation of operability, maintenance of hinges and handles. **TRAVERTINE SLAB CLADDING** – cleaning, reintegration, protection. **LITOCERAMIC CLADDING** - cleaning, reintegration, protection. **CONCRETE CROWNING** – Cleaning, reintegration of rebar covers, where necessary, protection. **METAL INSCRIPTION** - inspection of anchoring system and cleaning. **WIRING, DUCTS AND CABLING –** revision and reorganization **INSTALLATION** of thermo-hygrometric system ad hoc for the ancient book collection	**LIBRARY SKYLIGHT WINDOWS –** monitoring and inspection **TRAVERTINE SLAB CLADDING** - Cleaning and application of biocide, if necessary, every 6 months / monitoring of joints and cracks every 1 year / monitoring and comparison of overall condition and with previous mapping every 1 year **CONCRETE CROWNING** - Cleaning of surface, disinfection from biological deposits every 6 months / monitoring and comparison of overall condition and of cracks and grout adhesion with previous mapping, application of protective film every 1 year / application of converter on exposed iron bars where necessary 2 years / **LITOCERAMIC CLADDING** - Cleaning and application of biocide, if necessary, every 6 months /monitoring of cracks and adhesion of bricks every 1 year / monitoring and comparison of overall conditions with previous mapping every 2 years. **DOWNPIPES** - monitoring and cleaning **WOODEN WINDOW FIXTURES** - inspection, fixing, replacement of broken parts, protection **METAL WINDOW FIXTURES** – **LIFT + ELEVATOR** - maintenance of electric mechanism, of surfaces and finishes. **FINISHES - MARBLE PAVING** Cleaning, monitoring of slabs and protective treatment **FINISHES - LINOLEUM PAVING** Cleaning and monitoring **LIBRARY and BOOK DEPOSIT SKYLIGHT** - monitoring of glass cement blocks and window fixture.	**LIBRARY** - reinstatement of the triple height of the reading room with removal of slab and partition wall at level I (Aula Ponti). **INTERIORS -** Recomposition of original furniture in at least one of the professors' offices with light fixtures, windows, doors and colors.	**STAINED-GLASS WINDOW** - Permanent installation of a nightly projection of the image of the original stained-glass window designed by Ponti on the window on behalf of the knowledge acquired with this research.

	URGENT	PRELIMINARY	CONSERVATION	MAINTENANCE TO BE REPEATED *SEE CHRONOPROGRAMME	RESTORATION "ONCE ONLY"	VALORIZATION & ENHANCEMENT
CURVED WING EAST	**REVISION OF COOLING TOWERS**	**REPLACEMENT** of individual heating and cooling system with centralized system	**FACADES** - investigation of detached patches of plaster, removal of last layer of paint, consolidation, painting with lime-based paint with apt color. **STONE INSCRIPTION** - inspection of anchoring system and cleaning		**CLASSROOMS at I LEVEL** – reinstatement of distribution aisle on courtyard side and remodulation of single classrooms. **OFFICES at II LEVEL** – reinstatement of distribution aisle on courtyard side and remodulation of single classrooms **TREATMENT OF SURFACES** – removal of red paint, reintegration and consolidation of plaster and reestablishment of clear color (white-travertine).	
CURVED WING WEST	**REVISION OF PHOTOVOLTAIC SYSTEM**	**REPLACEMENT** of individual heating and cooling system with centralized system	**FACADES** - investigation of detached patches of plaster, removal of last layer of paint, consolidation, painting with lime- based paint with apt color. **STONE INSCRIPTION** - inspection of anchoring system and cleaning	**DOWNPIPES** - monitoring **METAL WINDOW FIXTURES –** Monitoring, minor replacements, cleaning with special products, coating **WOODEN WINDOW FIXTURES –** Monitoring, replacement of broken parts, protection of surface with oil **FINISHES - PAINTED PLASTER -** Cleaning, monitoring **FINISHES - MARBLE PAVING -** Cleaning, monitoring of slabs and protective treatment **FINISHES - LINOLEUM PAVING -** Cleaning and monitoring	**OFFICES at I LEVEL** – reinstatement of distribution aisle on courtyard side and remodulation of single classrooms **INDAM -** Redistribution and reorganization **TREATMENT OF SURFACES** – removal of red paint, reintegration and consolidation of plaster and reestablishment of clear color (white-travertine)	
TOWER of CLASSROOMS	**FAKE TRAVERTINE FLASHINGS** - consolidation, cleaning, reintegration, protection. **PREVENTION FROM DAMAGES TO FIXED FURNITURE IN THE TEARED LECTURE HALLS** (students' and teachers' desks) -	**REQUALIFICATION** of the original thermo-ventilation system	**ELEVATOR** – revision of electrical system, minor replacements, cleaning and protection of surfaces **FALSE CEILINGS in TIERED LECTURE HALLS** – removal and restoration of original ones	**DOWNPIPES** - monitoring **METAL WINDOW FIXTURES –** Monitoring, minor replacements, cleaning with special products, coating **FINISHES - PAINTED PLASTER -** Cleaning, monitoring **FINISHES - MARBLE PAVING -** Cleaning, monitoring of slabs and protective treatment **FINISHES - LINOLEUM PAVING -** Cleaning and monitoring **CURTAINS** - Replacement in the tiered lecture halls	**TIERED LECTURE HALL II LEVEL** - removal of partition wall and reinstatement of one hall. **OUTER SURFACES** – removal of red paint, reintegration and consolidation of plaster, layer of new paint color on philological basis (white-travertine?)	

	URGENT	PRELIMINARY	- CONSERVATION	MAINTENANCE TO BE REPEATED *SEE CHRONOPROGRAMME	RESTORATION "ONCE ONLY"	VALORIZATION & ENHANCEMENT
COURTYARD	**MAINTENANCE OF CURRENT FIRE SAFETY STAIRCASES -** in wait of changes to the general safety plan	**PAVING** – readjustment of travertine irregular slabs and reestablishment of grass joints	-	**PAVING** - maintenance of grass joints; check stability of travertine slabs. **BASEMENT SKYLIGHTS** - Monitoring, minor reparations	**REMOVAL OF FIRE SAFETY STAIRCASES**	**PERIODICAL STAGING of THEATRICAL PERFORMANCES** – in agreement with the department of Ancient Studies, Sapienza University
FURNITURE	**REMOVE PIECES FROM BASEMENT** - select furniture pieces that are subject to excessive usury, damaged or in bad conditions. **PRELIMINARY INVENTORY** - labeling and cataloguing of each peace, collection and recovery of furniture pieces in the basement and in other building of the campus.	**INVENTORY** – Coding of furniture – fix or movable – with number corresponding to catalogue.	**CLEANING CONSERVATION AND PROTECTION OF PIECES** **MINOR REPLACEMENTS IN FIXED AND MOVABLE FURNITURE**	**METAL JOINTS AND HINGES** - Monitoring, cleaning, lubrification with handy oil. **TAPESTRY** - Monitoring and control, treatment. **WOODEN SURFACES** - Monitoring, cleaning, surface treatment	**MAJOR REPARATIONS AND REPLACEMENTS** **REPLACEMENT OF DAMAGED PIECES**	**PHILOLOGICAL RECOMPOSITION OF ONE INTERIOR WITH ORIGINAL PIECES** **REVISION OF PROTECTION DECREE –** Inclusion of furniture within specificities. CONTINUE **SURVEY AND INVENTORY OF FURNITURE** (see box 1f)
ANCIENT BOOKS COLLECTION	**EVALUATION OF RISKS (fire, humidity, insects, …)**	**REORGANIZATION AND SHIFT OF COLLECTION TO APPROPRIATE ROOM** **PROFESSIONAL CLEANING and DUSTING** of the books, especially on open shelves **INSTALLATION OF SPECIAL MICROCLIMATE SYSTEM** for ancient books collection storage room	**INSTALLATION OF SPECIAL FIRE SAFETY SYSTEM IN THE ROOM FOR ANCIENT BOOKS COLLECTION** **INSTALLATION OF THERMO-HYGROMETRIC REGULATED SYSTEM AND MONITORING**	**PERIODICAL REMOVAL OF DIRT FROM BOOKSHELVES AND SPECIALIZED CLEANING OF ANCIENT BOOKS COLLECTION**		**ORGANIZATION OF DIDACTIC VISITS AND EXHIBITIONS**

	INTERVENTION		YEAR 1												YEAR 2				YEAR 3		YEARS 4-5	YEARS 6-10	YEARS 10-20
			MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6	MONTH 7	MONTH 8	MONTH 9	MONTH 10	MONTH 11	MONTH 12	MONTHS 13-15	MONTHS 16-18	MONTHS 19-21	MONTHS 22-24	MONTHS 25-30	MONTHS 31-36	MONTHS 37-60	MONTHS 61-120	MONTHS 121-242
BUILDING IN GENERAL	ROOFS	Monitoring, and cleaning						*						*				*		*	*	*	*
	WINDOW FIXTURES	Inspection, fixing, replacement of broken parts												*				*		*	*	*	*
	SEWAGE SYSTEM AND MANHOLES	Periodical unblocking and cleaning						*						*				*		*	*	*	*
	HYDRAULIC SANITARY SYSTEM	Periodical maintenance												*				*		*	*	*	*
	ELECTRIC SYSTEM	Periodical maintenance (elevators and lifts)												*				*		*	*	*	*
FRONT BLOCK	LIBRARY AND BOOKDEPOSIT SKYLIGHT	Monitoring of glass cement blocks and window fixture												*				*		*	*	*	*
	LIBRARY SKYLIGHT WINDOWS	Monitoring and inspection												*				*		*	*	*	*
	CONCRETE CROWNING	Monitoring and Protection			*			*			*			*		*		*	*	*	*	*	*	*
	TRAVERTINE SLAB CLADDING	Monitoring and cleaning												*				*		*	*	*	*
	LITOCERAMIC CLADDING	Monitoring												*				*		*	*	*	*
	DOWNPIPES	Monitoring and cleaning						*						*				*		*	*	*	*
	WOODEN WINDOW FIXTURES	Monitoring, replacement of broken parts, protection of surface with oil												*				*		*	*	*	*
	METAL WINDOW FIXTURES	Monitoring, minor replacements, cleaning with special products, coating												*				*		*	*	*	*
	FINISHES - MARBLE PAVING	Cleaning, monitoring of slabs and protective treatment												*							*	*	*
	FINISHES - LINOLEUM PAVING	Cleaning and monitoring												*							*	*	*
CURVED WINGS	FAUX TRAVERTINE CORNICES	Monitoring, cleaning from vegetation, mapping of degradation processes			*			*			*			*		*		*	*	*	*	*	*

Conservation Management Plan ,
Timetable of Maintenance works (© Salvo 2021)

	DOWNPIPES	Monitoring and cleaning						*						*				*		*	*	*	*
	WOODEN WINDOW FIXTURES	Monitoring, replacement of broken parts, protection of surface with oil												*				*		*	*	*	*
	METAL WINDOW FIXTURES	Monitoring, minor replacements, cleaning with special products, coating												*				*		*	*	*	*
	FINISHES - PAINTED PLASTER	Cleaning, monitoring																*			*	*	*
	FINISHES - MARBLE PAVING	Cleaning, monitoring of slabs and protective treatment												*							*	*	*
	FINISHES - LINOLEUM PAVING	Cleaning and monitoring												*							*	*	*
TOWER OF CLASSROOMS	DOWNPIPES	Monitoring and cleaning						*						*				*		*	*	*	*
	METAL WINDOW FIXTURES	Monitoring, minor replacements, cleaning with special products, coating												*				*		*	*	*	*
	FINISHES - PAINTED PLASTER	Cleaning, monitoring																*			*	*	*
	FINISHES - MARBLE PAVING	Cleaning, monitoring of slabs and protective treatment												*							*	*	*
	FINISHES - LINOLEUM PAVING	Cleaning and monitoring												*							*	*	*
COURTYARD	PAVING	Monitoring and cleaning of grass joints; check stability of travertine slabs						*						*				*		*	*	*	*
	BASEMENT SKYLIGHTS	Monitoring, minor reparations												*				*		*	*	*	*
FURNITURE	METAL JOINTS AND HINGES	Monitoring, cleaning, lubrification with handy oil						*						*				*		*	*	*	*
	TAPESTRY	Monitoring and control, treatment						*						*				*		*	*	*	*
	WOODEN SURFACES	Monitoring, cleaning, surface treatment						*						*				*		*	*	*	*
ANCIENT BOOK COLLECTION	BOOKSHELVES	Cleaning, removal of dust						*										*		*	*	*	*
	BOOKS AND DOCUMENTS	Monitoring, cleaning, removal of dust, xylophagous insects check			*			*			*					*		*	*	*	*	*	*