

The Herculaneum Conservation Project's programmed maintenance cycles for the archaeological site of Herculaneum

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Herculaneum Conservation Project

1. Introduction

The archaeological site of Herculaneum is located some 10km south of Naples and 20km from Pompeii (Italy). The volcanic eruption of 79 D.C. which battered and buried Pompeii is the same which defined the end of this small coastal town. However, Herculaneum, unlike Pompeii located further from the foot of Mount Vesuvius, was sealed in over twenty metres of volcanic material, preserving upper floors and the most fragile of organic remains. The difficulties this presented led to exploration first through a dense network of tunnels in the eighteenth century and open-air excavation principally in the twentieth century under the enterprising archaeologist Amedeo Maiuri who headed the Soprintendenza, the local heritage authority. Over three decades from 1927, a vast and systematic campaign of excavation, conservation and restoration works recovered every aspect of the ancient town - streets, buildings, architectural elements and objects - and reinstated them wherever archaeological evidence allowed¹. Together with measures to maintain it and present it to the visiting public, the site constituted one of the earliest and most significant examples of a city scale, open-air archaeological museum².

This complex but also relatively rapid campaign also had repercussions at a local level. It formed and organized a group of crafts persons and skilled labourers who, long after excavation activity had ended, continued to oversee the maintenance and protection of the site as Soprintendenza staff. Protection from the elements organized on a seasonal basis benefitted from the floor plates and roofing reconstructed over the most vulnerable archaeological features³ and from the dense network of rainwater collection and disposal which in part reused original elements. Just as other measures adopted to reduce the causes of decay, such as solar shading devices and reburial, they were regulated, maintained and periodically substituted.

Who visited Herculaneum in the late 1960s would have been able to appreciate the site in its entirety, climbing to upper floors and viewing original finds in glass cabinets and wooden furniture in its original location. The beginning of mass tourism, together with ever more restrictive regulations for site-works and the shift to external procurement of consultants and contractors (outsourcing), progressively modified the institutional framework⁴. It was no longer compatible with the organizational approach promoted during the Maiuri era (in-house, locally sourced workers) and led to its inevitable decline and a resulting loss of continuity in the site's care evident from the 1980s onwards. The launch of further excavation campaigns in the 1980s and 1990s (the ancient shoreline and the Villa of the Papyri) saw what could have been vital resources for conservation and maintenance of the existing site directed instead at extending it, and in an era when financial resources were wanting. The aggressive approach bereft of conservation considerations and Maiuri's integrated method meant the new areas created additional problems, many still unresolved today.

At the turn of the twenty-first century, the archaeological site of Herculaneum was facing comprehensive site-wide decline. Over 70% of the buildings and streets were closed to the public for risk of collapse, and the removal to storerooms or advanced decay of all fragile elements, be they architectural or decorative features or finds, diminished those aspects that had constituted the site's richness and uniqueness. In 2002, Herculaneum was deemed the "*worst example of archaeological conservation in a non-war torn country*" (P.I.S.A. Imed Conference in Rome).

2. The Herculaneum Conservation Project and shift from emergency to maintenance

From 2001, thanks to the initiative of the Packard Humanities Institute, a public-private collaboration was set up, in which Herculaneum and the state authority owning and managing the site (Soprintendenza Speciale per i Beni Archeologici di Napoli e Pompei, hereafter 'SANP') could benefit from:

- An interdisciplinary team of specialists present on site all year round;
- Directly commissioned flexible campaigns⁵ of works across the site, thanks to the involvement of a third partner, the British School at Rome, and a dedicated sponsorship contract in 2004.

It became known as the Herculaneum Conservation Project ('HCP'). Campaigns of works in the areas of site most at risk gradually translated into more systematic site-wide repairs and protective measures ('extraordinary' maintenance), including the reinstatement of key site infrastructure. In a timeframe of five years, these campaigns had stabilized the majority of the site bringing it to a more manageable state and returning it to the public realm, both greater visitor access and international appreciation. It became evident to the project team early on that the principal cause of the spiraling decay that had taken over Herculaneum was the gradual abandonment of the systematic maintenance regime instigated by Maiuri and left operating at his death⁶.

The project team, and particularly those core specialists who directed the works campaigns, shifted the emphasis⁷ more and more on the conservation of the modern protective structural integrations of Maiuri's campaign and the existing rainwater collection and disposal system, all central to the survival of the archaeological fabric, structural and decorative. In the 2005-2010 period, some 60% of flat and inclined shelters, 70% of lintels and 50% of wall crests were recovered from an advanced state of decay by distributing resources at a site scale in this way⁸, instead of advancing complete conservation proposals for specific areas. Furthermore, the primary network for rainwater collection, which mirror the main decumani and cardini (some 700ml), was reinstated and extended as were numerous sections of the secondary network which collects water within the buildings. A significant campaign also took place to safeguard the most vulnerable decorative features with preliminary conservation measures.

3. Joint programming between the public and private partners

In 2009, HCP's partners embarked on a new phase of collaboration with a reduction in the 'direct' conservation and maintenance works funded and com-

missioned by the private partner and the development of cooperation mechanisms to consent SANP progressively to resume a lead role in safeguarding the site. This took the form of the project team describing in detailed proposals for SANP the works they previously implemented directly, and then delivering technical and administrative support to SANP in the implementation phase for public funded and commissioned works⁹. This provided a context in which to test the approaches consolidated within the private framework in a public works context verifying limitations and effectiveness. In parallel, the resources (human and financial) previously dedicated to commissioning works were directed more and more to activities favouring long-term sustainability in the form of research and experimentation¹⁰, including the geographic information system (GIS) data base¹¹ for documenting, monitoring and planning activities and pilot projects aimed at improving the relationship of the site to the adjacent modern town.

SANP, unlike most other local heritage authorities in Italy, has partial autonomy from the central Ministry of Culture and Tourism and can keep ticket and other sources of income and count on its own annual budget and administrative processes to carry out conservation and maintenance of archaeology in the Vesuvian area¹². This, along with credibility of the private partners given HCP's achievements since 2001, made it relatively easy to reach a financial agreement responding to Packard's financial commitment with substantial public funds¹⁴. The same was not true of the next phase of cooperation. The increased spending capacity created by HCP generated additional administrative procedures for SANP, an organization already overburdened and under capacity for these aspects and beset by a chronic shortage of qualified senior administrative and technical staff and with no remit to manage its own human resources (along with some other aspects they have remained under direct Ministry control)¹⁵.

The recent creation of a new Packard foundation in Italy¹⁶ opens the door to new developments and the current institutional framework for cooperation may well evolve. In the meantime, the project team, departing from the current institutional framework, are focusing on what represents perhaps the biggest challenge in guaranteeing Herculaneum does not descend into a new era of decline such as that which marked the end of the twentieth century: establishing back-to-back cycles of programmed maintenance campaigns for the entire site.

4. The programmed maintenance experiment at Herculaneum

Work is ongoing to develop proposals for the first three-year cycle of programmed maintenance to permit the public works tender process for works contracts awarded and funded by SANP to begin on site by the end of 2014. Objectives include:

- Plan a campaign of works of a simple and repeatable type on cultural heritage of a particularly challenging nature, the case of an archaeological site, reducing to a minimum the unforeseen;
- Where possible and as much as possible, intervene in a uniform way, but without losing sight of the specific demands of archaeological conservation;

- Operate according to seasonal needs and, at times, also on the basis of visitor needs;
- Establish the average financial outlay for maintenance, with due consideration for specific costs related to site logistics, increased operational caution and managing risks and the need for quality control;
- Deliver constant monitoring and control of conservation conditions, without weighing further on the public authority;
- Guarantee the quality of interventions and ensure an upward spiral of continuous improvement to conservation approaches, fostering approaches advanced by HCP;
- Experiment procedural innovation in the heritage sector which draws from experience in other sectors, an example being the 'accordi quadri pluriennali' time-based contracts uniting works, supplies and services;
- Secure effective documentation and an effective information management approach which inform future planning and monitoring.

The particular nature and scale of Herculaneum makes the creation of a single, standalone maintenance programme addressing nearly all types of materials and architectural typologies present a significant challenge. In such an environment, even the most regular basic conservation needs do not always adapt easily to the repetitive uniform form which maintenance takes, and site logistics (operating in a deep crater) offer further obstacles to straightforward planning choices. The need to optimize the use of resources, avoiding doubling up of procedures and other choices that could constitute an unnecessary drain, and at the same time distribute responsibility and unite professional contributions harmoniously, have led us to pursue a two-pronged approach. Plans for programmed maintenance at Herculaneum are uniting interventions of a genuinely routine nature with others of greater complexity and urgency, maintaining where possible criteria of repeatability and standardization.

The point of departure for the planners¹⁷ has been that of a two-part approach which entails:

- A three-year contract dedicated to simple and repeatable maintenance, both for works on architectural structures and on decorative features;
- A more traditional works contract for interventions of a more exceptional nature, again for both categories of works.

In this way, even with the restrictions imposed by the public works environment, it is possible to foresee interventions differentiated by the level of conservation mid-works at the moment of intervention. A second step has been that of defining the 'objects' to maintain. It became evident very quickly that the modern structures or partially modern structures, derived from reconstructions more or less ad identicum during or post excavation, are the most important for the structural integrity of the buildings, even those reduced to ruins, and for the protection of the decorative features and finds. They are also the portions of the standing structures with the most evident conservation problems and intense maintenance requirements.

The archaeological wall fabric, far from being perfectly 'functional', is, however, less relevant to maintenance goals because it fulfils a more limited role in the direct protection of decorative features and finds but also because its

demands conservation approaches which are difficult to standardize. When it comes to the site's infrastructure, it is difficult to find real parallels with the management of modern urban areas but there are services and access arrangements whose management is proving compatible with the programmed maintenance framework. Examples include the ancient and modern networks of gutters, channels, drains and sewers for rainwater collection and disposal, pavements, staircases and site access points for visitors and maintenance. When it comes to the decorative features, all the typologies have been taken into consideration for maintenance purposes, even if the difficulty in defining the boundary between a pure maintenance intervention and an actual conservation intervention makes the range of genuine maintenance operations available somewhat limited¹⁸.

The principal tool utilized for strategic planning, the detailed development of proposals and the all-important mid-works and 'post operam' evaluation is the new interrogation framework for the Herculaneum GIS database currently under development specifically for programmed maintenance cycles. The architect and conservator-restorer leading the planning process have identified the 'objects' to be maintained and have worked in conjunction with other team specialists to construct¹⁹ an information system which gathers data relative to location, characteristics and degree of 'maintainability' of the objects. Connecting this information with the related schedules for each intervention and the price analyses prepared by the planners of a specific programmed maintenance cycle makes it possible to evaluate the overall cost of maintenance of the site on an annual and a triennial basis. The juxtaposition with other relevant data available within the wider GIS system facilitates diverse types of interrogation and analysis including: areas open/closed visible/closed out of site to the public, other works sites underway or foreseen, site logistics and accessibility, archaeological value, state of conservation. The information gleaned is central to the programming choices being made, ensuring a 'best-fit' definition of the scope, timing, location and performance of interventions, and a just distribution of the resources available to meet the site's needs.

For example, the works most which are most significant for guaranteeing visitor safety and limiting visitor wear and tear have been focused on the areas open to the public where as those aimed solely at general decorum of the site have been extended to closed but visible areas. New data is being gathered on seasonal visitor tendencies as part of a wider audience development initiative, and will be integrated with information on seasonal decay patterns to inform planning choices and, in particular, the works time schedule. For example, with visitor numbers down in the winter period, the closure of some houses for specific repairs and the opening of others less 'robust' to visitor wear and tear to compensate is viable.

When it comes to the procurement route to adopt, the contract form known as the 'accordo quadro' was identified (in conjunction with SANP colleagues) as the most suitable for those programmed maintenance works of a repetitive and standardized nature (routine maintenance). It is a form of contract introduced by new laws for public contracts of 2006 with the aim of allowing public bodies to procure through a single tender goods, supplies and services of a

repetitive nature and constant in time²⁰. A later integration to the 2006 laws²¹ extended its scope to include works, albeit limited to maintenance operations characterized by 'mass production' and standardized design features. The adoption of the *accordo quadro* for Herculaneum will allow services related to verifying the effectiveness of the works interventions and supporting the public authority define the state of conservation of the site and periodically update this data to be integrated into the programmed maintenance cycle²².

Mandatory self-control procedures are being developed for the contracting company who wins the tender along with improvements to the tender process itself to reinforce quality and control mechanisms during site-works.

The existence of the dedicated GIS database for programmed maintenance is central to the correct monitoring and evaluation of the effectiveness of the works undertaken. In this respect, the simplified documentation is envisaged as *intra operam* rather than *post operam* to track works as they are being carried out. In other words, documentation will be prepared directly by the contracting company as each intervention is completed, with constant information uploads onto a GIS web platform currently being created for this purpose. The aim is to facilitate ongoing monitoring and checks on the part of the heritage authority.

Current provisions (including works on structures, infrastructure, decorative features and a number of on-site exhibits) foresee an average expenditure of roughly €300,000euro a year net of VAT and professional fees for simple and repetitive maintenance and the equivalent for interventions of greater complexity and urgency. This balance is destined to change progressively, with a gradual shift towards works of a more routine nature as the state of conservation of more and more of the site's built fabric subject to programmed maintenance (primarily modern integrations) is improved enough to comply with the repetitive and continuous care.

5. Conclusions

Simply replicating Maiuri's organization of Herculaneum's maintenance with dedicated specialist teams constantly active on site is no longer feasible in the current institutional framework or compatible with conservation requirements. The archaeological site has been disfigured by a further half century of exposure to the elements and escalating neglect and differs greatly from the legacy Maiuri left us. The administrative framework shaped by European wide directives in which SANP operates makes bodies of in-house maintenance staff no longer a viable option, making it impossible to train up a loyal fixed squad of trained workers as Maiuri did. Indeed, the dominating tendency is downsizing of public institutions and outsourcing, in particular of activities which carry risks such as site-works.

That said it is impossible to consider the long-term conservation of archaeological sites such as Herculaneum without properly addressing maintenance, which in itself offers solutions to the vast majority of long-term conservation problems. It is also unthinkable that the public heritage authority has no means to determine with clarity the hard costs related to the continued use of this heritage, also in view of the very large number of visitors that visit Her-

culaneum and the economic resources resulting. Visitors, the real users and today's 'inhabitants' of the ancient city, use and consume the archaeological site and, at the same time, release resources (along with other stakeholders) that are necessary to sustain it. It is in this cycle of usage-income-maintenance-usage that a lasting solution needs to be found to make maintenance (and therefore, for the most part, conservation) of Herculaneum sustainable. The HCP experience in Herculaneum is showing that it is possible to return a site gradually to an acceptable state of preservation by intervening in an extensive and widespread way and without exceptional capital injections or 'complete' conservation projects.

The commitment of the project team and the HCP partners to make cyclical programmed maintenance feasible at Herculaneum is significant, with technical methods and procedures compatible with the public sector and already achievable in the current conservation environment of ongoing fragility and instability in many areas of the site. It is an important chapter in the life of this public-private partnership.

The first-three year programmed maintenance cycle is funded in its entirety by the public authority and will enjoy technical assistance from the project specialists appointed by the private partners. It will illustrate the results possible with the procedural framework adopted and the level of quality realistically achievable with the dependence on externally sourced contracting companies. Whatever the outcome of the first trial cycle, the results will contribute to our understanding of the financial and human resources implications of sustaining the site of Herculaneum and its ongoing use and help us evaluate future approaches to conservation and management.

Notes

¹ Maiuri operated in a period and context only marginally influenced by the growing Italian and international conservation debate culminating in, amongst other things, Cesare Brandi's 1963 'Teoria del Restauro' and the Venice Charter of 1966. He was nonetheless sensitive to the issues at stake as shown by his participation in the 1931 International Conference of Athens dedicated to conservation, flanked by personalities such as Gustavo Giovannoni who were to influence the Italian debate thereafter [G. Rocco, *La figura dell'architetto-archeologo e la formazione universitaria in Italia*, in *Area* vol. 62, 2002, pp. 118-123].

² D. Camardo (2006).

³ Maiuri and his staff chose which roofs and floor plates (the latter constitute 70% of all shelters at Herculaneum today) to reconstruct based on the archaeological importance of the space it covered but also the legibility of the original Roman structure for the visiting public. They were generally 'ad identicum' replicating the original form when archaeological evidence allowed and the wall integrations required to support it modest. The floor plates acting as shelters, though treated with screed and waterproofing by Maiuri, are the most demanding in maintenance terms today, particularly with regard to effective rainwater disposal given the lack of continuity between them.

⁴ Thompson J. (2007).

⁵ Flexibility was possible thanks to the private procurement framework in which the works contracts commissioned (in which transparency and open tender selection promoted) made possible by the sponsorship contract (article 120 of the Urban Code)

signed in July 2004.

⁶ Thompson, J. (2007).

⁷ The project management approach led by Jane Thompson consolidated decision-making mechanisms in HCP that gave due importance to the voices of the specialists (including SANP staff) closest to the problems to be solved, as well as the needs of the project partners. This promoted an unusually 'bottom-up' approach which has proved effective in harnessing the full interdisciplinary participation of the team and allowing greater transparency and care in the use of resources, human and financial and responsiveness to the shortcomings of the existing management system to be overcome.

⁸ The emergency campaign in its most intense period (2005 to 2007) spent some € 2,500,000 to stabilize the areas of the site most at risk, approximately € 700,000 on rainwater management and disposal (2005-2010) and € 500,000 on the repair and substitution of existing shelters (figures net of administration costs and professional fees).

⁹ After submission of executive proposals to SANP, the project team specialists proceed with assistance for project 'validation' required by law, drafting of the tender announcement and management of the tender process (with no interference in the evaluation of the bids), and lastly, technical and cost management assistance to the SANP staff member appointed as Director of Works.

¹⁰ From the outset of the project, a specific urban block, Insula Orientalis I, was adopted for conservation trials dedicated to particularly complex conservation problems and informing the emergency campaign. Recently, Insula Orientalis I is once again the focus of project experimentation in the search for model solutions of many conservation and maintenance issues.

¹¹ Since 2007 all the studies relating to the state of conservation of the site's structures and infrastructure have been inserted in a GIS database GIS accessible to the team and project partners online. In the same year, the commitment of the information manager and the diverse specialists involved in HCP led to the GIS being used not just as a way to host and analyze data but as a means to improve our understanding of decay phenomena at the site.

For the first phase of HCP dedicated to Insula Orientalis I refer to A. Wallace Hadrill, D. Camardo, M. Martelli, G. Rizzi, L'Herculaneum Conservation Project, in "Oebalus" I (2006), pp. 234-271.

¹² The Soprintendenza Archeologica di Pompei (from 2008 merged with Naples to become the Soprintendenza per i Beni Archeologici di Napoli e Pompei) in 1998 received scientific, financial and partial administrative autonomy from the Ministry thanks to the law 352/97.

¹³ SANP guarantees the safeguarding of archaeological heritage in the Province of Naples which unites 92 city councils.

¹⁴ Since the launch with SANP in 2009 of 'Joint Programming' for Herculaneum, the Italian State has already directed some €9 million of public funds for site-works planned by the project team in the period 2010-2013 (all works have been completed or are being tendered). Planning is underway for a further €6 million of public-funded works for the period 2013-2016. It is a significant response to the €15.5 million of PHI grants to the British School at Rome for the HCP conservation programme and the interdisciplinary team in the period 2004-2013 (PHI has also been active on other fronts in Herculaneum).

¹⁵ Zan, L. and Paciello (1998).

¹⁶ The Istituto Packard per i Beni Culturali, with legal headquarters at Pisa, is being

constituted at the time of drafting this paper.

¹⁷ Architect Paola Pesaresi (author of this paper) is developing the detailed proposals for works on architectural and structural fabric within the programmed maintenance campaign, whereas conservator-restorer Annunziata Laino is planning the related works on decorative features. Other project team specialists are making significant contributions to the planning process, including, among others, Ippolito and Alessandro Massari (specialists in water management), structural engineer Gianni Vercelli and archaeologist Domenico Camardo.

¹⁸ At least for the first three-year cycle, considered something of a trial, it has been decided to test only some operations for decorative features which, although stable, are yet to be properly conserved: choices are being governed by the desire to maintain the current state of conservation. More space is being left for works on decorative features in the more traditional and parallel contractor appointment of this first programmed maintenance cycle, that dedicated to 'extraordinary maintenance' (as it is known in Italy) i.e. more substantial complex repairs.

¹⁹ Information management approaches have been central to the effectiveness of HCP to date and the new bespoke GIS for programmed maintenance, another brainchild of information manager Ascanio D'Andrea (Akhel Srl), harnesses broad team input and aims to meet team needs today but also site and SANP needs long into the future.

²⁰ In particular, contract laws ('Il Codice degli Appalti') define the creation of an *accordo quadro* in the following way: "An agreement between one or more contracting authorities and one or more contracting companies, the purpose of which is to establish the precise terms governing contracts to be awarded during a given period, in particular with regard to price, and where appropriate, the quantity envisaged," (Article 3, comma 13, Law 163/2006)..

²¹ Regolamento Attuativo D.P.R n. 207 del 05/10/2010

²² Contract laws ('Il Codice degli Appalti') exclude professional intellectual services from integration into an *accordo quadro* (e.g. developing project proposals). Particular attention has thus been dedicated to defining the nature of the services which need to be characterized by elevated repetition, standardized procedures and clearly defined outputs.

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