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e del Turismo
Segretariato Generale
Servizio I – Coordinamento e relazioni internazionali
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Alla Commissione Nazionale Italiana
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Al referente del sito UNESCO "Aree archeologiche
di Pompei, Ercolano e Torre Annunziata"
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Al Generale Comando dei carabinieri GPP
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OGGETTO: Sito UNESCO " Aree archeologiche di Pompei, Ercolano e Torre Annunziata". Trasmissione report aggiornato 2016.

Si trasmette in allegato (formato digitale), con preghiera di inoltro al World Heritage Centre, il rapporto aggiornato 2016 sullo stato di conservazione ed adempimenti connessi del sito in questione, richiesti nella Decisione 39 COM 7B.80 e adottata dal Comitato del Patrimonio Mondiale nella 39° sessione di Bonn (2015). Contestualmente se ne autorizza la pubblicazione on line.

IL DIRETTORE DEL SERVIZIO I
Arch. Maria Grazia Bellisario

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Archaeological Area of Pompeii, Herculaneum and Torre Annunziata, Italy, n. 829

1. Executive summary of the report

Soon after the collapse of the *Schola Armaturarum,* UNESCO carried out several missions, involving ICOMOS and UNESCO experts, at the sites of Pompeii, Herculaneum and Torre Annunziata, specifically on 2-4 December 2010 and 10 – 13 January 2011, on 7-10 January 2013 and 8-12 November 2014. These inspections led to the formulation of a set of recommendations, which have ultimately been summarised in decision 39 COM 7B, adopted at the 39th meeting of the World Heritage Committee, to which this report is a reply.

Over the years, many steps forward have been made in the conservation and management of the property. Regarding the Grande Progetto Pompeii (Great Pompeii Project), the State Party has ensured its continuation with a further European financing of 45 **M€** and by maintaining the General Project Management organisation and the Great Pompeii Unit until 31 December 2019.

A further two items of funding have been received: 40 **M€** from the Italian government and 75 **M€** from the Special Superintendency of Pompeii, which has been granted financial, administrative and management autonomy.

The more recent inspection by UNESCO/ICOMOS identified 5 buildings at risk in the site of Pompeii: Casa dei Casti Amanti, Casa delle Nozze d'argento, Schola Armaturarum, Casa di Trebius Valens and Casa dei Ceii. Conservation interventions were then planned for all these buildings, which, to date, are either still underway or have been completed, or which will soon start.

Almost all the legal problems that prevented the start of the works have been solved and now it will be possible to carry out the safety works on and restore the structures of the Schola Armaturarum; open the Antiquarium to the public; and continue the improvement works on the Casina dell'Aquila. The dispute relating to the works for completing the building at Porta Nola, however, is still on-going.

Other works still under way are the rainwater drainage works for the as yet unexcavated areas, while the hydrogeological risk mitigation works and the safety works relating to the excavation faces in the *Regiones* I, III, IV, V, VIII and IX are approaching completion.

The Management Plan has also been completed, which takes into account the recommendations resulting from the Reactive Monitoring Inspection in 2014. The State Party has found no other internal or external threats to maintaining the Outstanding Universal Value. The State Party also intends to build a new visitor centre for the Villa A site at Torre Annunziata. Once completed, the designs for the new building, as well as the valorisation project for the villa that was unearthed during the preliminary excavation works for the building, will be sent to the Committee.

2. Response to the Decision of the World Heritage Committee

2.1 Seek the extension of the Grande Progetto Pompei (GPP) and assess the resources needed to sustain the future management and the conservation of the property.

The total investment for the management and conservation of the property was estimated at 160 **M€**, in the 2017-2019 period, as follows:

- 45 **M€** by the 2014-2020 PON "Culture and Development";
- 40 **M€** by the Italian government (see resolution no. 3 of 1 May 2016, approved by the CIPE - Interdepartmental Committee for Economic Planning);
- 75 **M€** by the Special Superintendency of Pompeii.

2.2 Include the additional five buildings that remain at risk, identified by the Reactive Monitoring mission, in the safeguarding programme

Regarding the five *domuses* thought to be at risk - Casa dei Casti Amanti, Casa delle Nozze d'argento, Schola Armaturarum, Casa di Trebius Valens and Casa dei Ceii – the following may be reported:

- Casa dei Casti Amanti and Casa delle Nozze d'Argento: the projects for the safety works and restoration of the structures have been commissioned and defined.
- Schola Armaturarum: a project has been defined to cover and restore the wall paintings, while the restoration of the floor decorations has yet to be completed.
- Casa di Trebio Valente: works will be carried out within the framework of the **GPP M** - *Safety works for the excavation faces and mitigation of the hydrogeological risks in the Regiones I, III and IX, IV and V of the archaeological site*, the contract for which has been awarded and the works are set to begin in the first quarter of 2017
- Casa dei Ceii: works are under way for the restoration of the roofing and a crowdfunding action for the restoration of the garden paintings.

2.3 Resolve legal issues preventing necessary works at Pompei, as a matter of urgency, in order to the required consolidation works

During the year, several legal problems were solved highlighted in the Reactive Monitoring Inspection. As mentioned above, it has therefore been possible to carry out the works for the restoration and protection of the Schola Armaturarum. At the same time, the problems relating to visitor access to the Antiquarium were also solved, and it was opened to visitors in April 2016. Works are under way at the Casina dell'Aquila, for its future use as a cafeteria. Still ongoing is only the dispute related to the completion of the building at Porta Nola.

2.4 Complete the management plan taking into consideration the recommendations provided by Reactive Monitoring Inspection

The Management Plan has been completed and takes into account the recommendations received after the Reactive Monitoring Inspection in 2014 and will be sent to the Committee on 1 December 2016.

2.5 Carefully monitor the result of drainage work in Regiones III e IX and, if successful, develop a similar programme for the other unexcavated parts of Regio IV e V, and possibly I

The project for the drainage works in the Regiones III and IX is nearing completion, as also the connection of the drainage systems on the unexcavated elevation to the Conte Sarno Canal. In the meantime, the designs relating to the works for ensuring the safety of the excavation faces and mitigating the hydrogeological risk in the Regiones I, III and IX, IV and V of the archaeological site, have been completed, the relevant contracts awarded and the works - totalling 12,916,939-20 **M€** - will commence in the first quarter of 2017.

The planning activities under the CIPE financing provide for the safety works for the southern excavation faces (Regio VIII) totalling 34 **M€.**

2.6 Seek to maintain the staffing levels after the GPP has been concluded and integrate the temporarily provided wardens into the regular system, in order to be able to open the property to the public on a permanent basis

Law no. 125 of 6 August 2015, converting law-decree no. 78 of 19 June 2015, provided for the completion of the extraordinary phase of the Grande Progetto Pompei (Great Pompeii Project) by 31 December 2015, a year earlier than the deadline set out in the provision establishing the Project in 2013. However, law no. 21 of 31 January 2016, converting law decree no. 210 of 30 December 2015, has ensured the functions of General Project Manager, and the activities of the support structure, until 31 January 2019.

Under said law, the General Project Management will become a part of the Superintendency of Pompeii, so that once the extraordinary phase is over, the Great Pompeii Project will return to a situation of normality, albeit within a much more congruent timescale than originally expected.

3. Other current conservation issues identified by the State Party which may have an impact on the property's Outstanding Universal Value

No other problems have been identified, such as to affect the property's Outstanding Universal Value

4. Construction of a new reception and service building for Villa A of Torre Annunziata

Villa A at Oplontis is located within the dense and highly deteriorated urban fabric of the modern-day city of Torre Annunziata, and features inadequate visitor facilities. To requalify the entrance to the site and improve the visitor services, the Special Superintendency of Pompeii has designed a building designated to house the visitor centre, offices and a warehouse for the finds unearthed at the site; the new visitor centre also features disabled access. Based on a prior project of 2008, archaeological excavations were carried out, which led to the discovery of the sea facing facade of the villa; therefore, it was possible to design a building that fits well into the new archaeological surroundings, while another project also provides for the valorisation of the remains that emerged during the excavations. The new building project, which is still being developed, will be sent to the Committee as soon as possible.

5. Public access to the state of conservation report

The State Party accepts the publication of the entire report.

THE GENERAL MANAGER
Prof. Massimo OSANNA

SUMMARY SHEET BEEN IMPLENTING GPP

CONCERNING: STATE OF CONSERVATION OF THE WORLD HERITAGE PROPERTY "ARCHAEOLOGICAL AREAS OF POMPEII, HERCULANEUM, AND TORRE ANNUNZIATA". DECISION 39 COM 7B.80 BONN 2015.

a. ***Report on the status of the GPP projects (concluded, currently under way, or to be put out to tender) and the financial resources deployed, from November 2014 to November 2016***.

A table summarising the state of progress of the Great Pompeii Project as at 31 October 2016 is attached here; to which we would add that during 2015 and 2016, in compliance with a specific legal provision[1], detailed six-monthly reports on the progress of the Great Pompeii Project were sent to the Italian parliament, and detailed updates were provided on the occasion of the hearings of the Culture Committees of the Senate of the Republic and the Chamber of Deputies. Examination of these documents[2] makes it possible to retrace – in greater detail than is given in the summary document attached here – the pathway by which this European project is being implemented.

b. ***Include within these conservation projects the five domūs believed to be at risk and identified in the 2014 WHC/ICOMOS expert monitoring mission***.

Of the five *domūs* believed to be at risk: the House of the Chaste Lovers, the House of the Silver Wedding, the Schola Armaturarum, the House of Trebius Valens, and the House of the Ceii, only the first two are included in the Great Pompeii Project works. The design services for these two have been awarded to the agency Invitalia SpA, as the Commissioning Centre, for implementation of the relevant contract procedures. However in all cases, implementation of the consequent restoration works –also to be contracted out via the Commissioning Centre – is subordinate to obtaining the required funding either via the 2014-2020 "Culture and Development" National Operational Plan, the ordinary resources of the Superintendence of Pompeii, or other sources.

c. ***Maintain in post the GPP operational staff structure in expectation of the possible opening of other archaeological areas***.

Law 6 August 2015, no. 125, which converted into law Legislative Decree 19 June 2015, no. 78, provided for the special works phase of the Great Pompeii Project to be concluded by 31 December 2015, i.e. one year in advance of the deadlines fixed by the instituting law of 2013. However, Law no. 21 of 25 February 2016, which converted into law Legislative Decree 30 December 2015, no. 210, has ensured that the functions of the Project Director General, and the work of the supporting structure, will continue until 31 January 2019, The same statutory provision also sets out that beginning from 01 January 2017, the Project Director General and the competencies attributed to that office are to be incorporated within the Superintendence of Pompeii, with the effect that upon cessation of the special works phase, the Great Pompeii Project can return to normality, albeit not at the time originally planned. Recently, notice has been received in relation to a possible further

[1] Art. 1, paragraph 1, letter f-bis of Legislative Decree 91/2013, as converted by Law 112/2013.

[2] The documents mentioned can be accessed via a specific section of the Transparency Portal (http://open.pompeiisites.org/informazioni-gpp).

slippage (until 01 January 2018) of closure of the emergency phase. Be that as it may, the fact remains that – during 2015 and 2016 – a number of individuals working in the Project Directorate General have either requested early termination of their roles, have expressed the intention of not renewing their work in Pompeii (5 individuals), have been transferred (4 individuals) as a result of ministerial mobility procedures, or have left service because of the age limit (2 individuals). Thus the staff is gradually reducing in numbers; we hope to compensate by advertising new posts which, however, it will not be possible to publish before January/February 2017.

Great Pompeii Project
Status report as at 31 October 2016

The *"Great Pompeii Project for the protection and enhancement of the archaeological area of Pompeii"* (Great Pompeii Project - GPP), dated 26 January 2012 was funded by the European Commission[3], as a Large-Scale European Project financed from the resources of the Interregional Operational Programme "Cultural, Natural, and Tourism Attractors" ERDF 2007-2013 (Interregional Operational Plan), for an amount of 105 M€.

The project is subdivided into 5 Plans (Works, Knowledge, Safety, Capacity-building, Public Use and Communication), within which a total of 76 works packages have been activated.

Plan	Works packages
Works Plan	51 (41 +10 design services)
Knowledge Plan	8
Safety Plan	2
Capacity-building Plan	7
Public Use and Communication Plan	8
Total	**76**

Table 1 –GPP breakdown

Upon closure of the Interregional Operational Plan at **31 December 2015**, the situation in relation to the physical progress of the GPP, referred to the 76 works packages of which the project consists, was as follows:

- 42 concluded (of which 21 fall within the Works Plan, 5 of which relate to the 10 design services awarded to Invitalia as the Commissioning Centre, and 21 fall within the other Plans);
- 23 currently under way;
- 9 starting (including the 5 remaining design services);
- 2 at the tender stage.

The closure of Phase I of the GPP, which was financed from the resources of the 2007-2013 Interregional Operational Plan, as provided for by the European Commission with EU Decision no.

[3] EU Decision no. C(2012)2154 dated 29 March 2012.

1497 dated 10 March 2016 and the framing of Phase II of the GPP within the 2014-2020 "Culture and Development" National Operational Plan, required reorganisation of the project.

In this new organisation, as at **01 January 2016** GPP-Phase II consists of 34 works packages, of which:

- 23 are currently under way (19 in the Works Plan, 1 in the Knowledge Plan, 2 in the Safety Plan and 1 in the Public Use and Communication Plan);
- 9 are awaiting start (all in the Works Plan; 5 works packages relate to the design services awarded to Invitalia);
- 2 are out to tender;
- additionally, although 30 works packages (21 in the Works Plan, 6 in the Knowledge Plan, 1 in the Capacity-building Plan and 2 in the Public Use and Communication Plan) were physically concluded within 2015, they remain within the National Operating Plan in terms of funding only, to enable expenditure of a minimal residual share of the economic frameworks[4].

As at **31 October 2016**, the physical progress of the GPP is described below, referred to the 34 works packages that comprise Phase II:

- 14 concluded (11 in the Works Plan, including 4 design services, 1 in the Knowledge Plan and 2 in the Safety Plan);
- 15 currently under way (14 in the Works Plan, including 1 design service, and 1 in the Public Use and Communication Plan);
- 5 awaiting start (all in the Works Plan).

	Total works packages	Concluded	Under way	Awaiting start	Out to tender
31 December 2015	76	42	23	9	2
1 January 2016	76 - 42= 34	//	23	9	2
31 October 2016	34	14	15	5	0

Table 2 – GPP physical progress

In terms of funding progress, at the **end of 2015** the situation was as follows:

- calls for tenders published (76 works packages) for a total of **M€ 157.5** gross of reductions;
- final tenders adjudicated (74 works packages) for a total of **M€ 126.9** gross of reductions;
- final tenders adjudicated (74 works packages) for a total of **M€ 90.4** net of reductions;
- legally binding commitments for a total of **M€ 71.0** (in addition to M€ 19.4 in respect of sums available to the administration);
- actual expenditure amounting to **M€ 40.7**.

As at **31 October 2016**, the totals registered (Phase I + Phase II) are:

[4] These amounts are referable to balances for works completed near the end of December 2015, but for which the deadlines imposed by the IT procedures meant that payment could not be effected within that year, and sums referable to design incentives for which the responsible functionary of the Superintendency did not complete the payment.

- calls for tenders published (76 works packages) for a total of **M€ 157.5** gross of reductions;
- final tenders adjudicated (76 works packages) for a total of **M€ 157.5** gross of reductions;
- final tenders adjudicated (76 works packages) for a total of **M€ 111.9** net of reductions;
- legally binding commitments for a total of **M€ 92.0** (in addition to M€ 19.9 in respect of sums available to the administration);
- actual expenditure amounting to **M€ 57.0** (of which 40.7 within 2015 and 16.3 from January to October 2016).

	M€ put out to tender (gross of reductions)	**M€ tenders adjudicated (gross of reduction)**	**M€ tenders adjudicated (net of reduction)**	**Legally binding commitments**	**Actual expenditure**
31 December 2015	157.5	126.9	90.4	71	40.7
31 October 2016	157.5	157.5	111.9	92	57.0

Table 3 – GPP funding progress

To provide greater detail, and maintaining the now-accepted method of setting out Plans, the progress situation – as at **31 October 2016** – of GPP-Phase II is given below.

Knowledge Plan – Phase II

Completed.

The works denominated "*Line 3- Digitisation and cataloguing of the photographic and paper archives of the SSPES [Special Superintendency for Pompeii, Herculaneum and Stabiae]*", were concluded during the period May-August 2016.

Works Plan – Phase II

Consisting of 30 works packages (listed below) of which:

- 11 concluded (*nos. 8, 10, 11, 25, A2, N, propping, and 4 design services: 15, B, D, I*);
- 14 currently under way (*nos. 1, 5-9, all within a single site, 7, 12, 23-24, all within a single site, 37, 39, A1, E, Roofs, Wood and 1 design service: 27*); of these, **1 package is currently suspended** (*Roofs*) for the reason that on 4 June 2016, the contracting firm was made the object of mafia disqualification: action is currently in hand to award a contract for continuation of the works to the company that came second in the adjudication procedure;
- 5 awaiting start (*nos. 2-3-4-G-M*); of these: for 1 (*nos. G*) the start of work is conditional upon the completion of other works in GPP-Phase II (*nos. 12*) although foreseeably, these works will start before the end of 2016; for 4 (*nos. 2-3-4, all within a single site, and nos. M*) Invitalia SpA has been requested to check the relevant projects: taking into account the technical time required, it is theoretically possible that these works will begin before the end of 2016/Jan-Feb 2017.

Safety Plan

Completed.

The 2 works packages: "*Installation of a secure network for Wi-Fi coverage serving the Pompeii archaeological area*" and "*Environmental Monitoring – asbestos census, mapping, and removal*" were concluded during the period May-August 2016.

Additionally, the works to install and configure the CCTV system, funded by the National Safety Operating Plan, were concluded on 30 June 2016.

Capacity-building Plan

Completed in 2015.

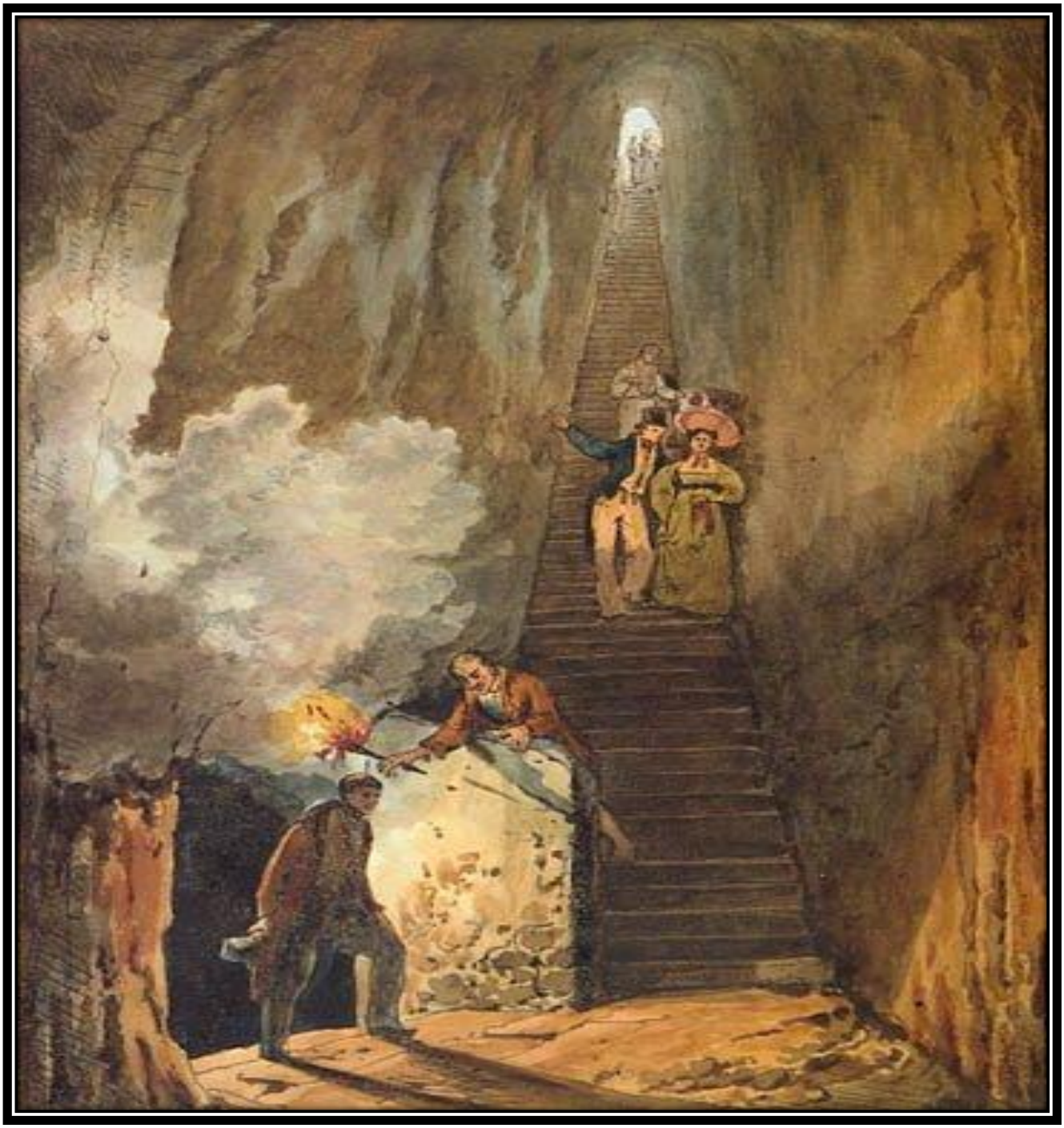
Public Use and Communication Plan

This plan incorporates the convention agreement with the in-house company ALES SpA, which remains in place until 31 December 2016 and includes the three operational branches of the two previous agreements (public use: opening of additional *domūs*; public use: site decorum and maintenance services; and capacity building: legal and administrative support), and repeats the organisational model (total numbers of individuals employed and their tasks) already defined in the previous agreements.

GPP – Works Plan – Denominations of the works packages

GPP 1 - *Making-safe works after hydrogeological reorganisation of the state-owned land bordering the area of the excavations (III and IX).*
GPP 2+3+4 - *Making-safe works, Regiones I, II and III*
GPP 5+9 - *Making-safe works,, Regiones IV, V, IX*
GPP 6 - *Making-safe works, Regio VI*
GPP 7 - *Making-safe works, Regio VII*
GPP 8 - *Making-safe works, Regio VIII*
GPP 10 - *Structural consolidation and restoration works to the House of Siricus*
GPP 11 - *Structural consolidation and restoration works to the House of the Sailor*
GPP 12 - *Architectural and structural restoration works House of the Dioscuri*
GPP 13 - *Structural consolidation and restoration works to the House of the Red Walls*
GPP 14 - *Structural consolidation and restoration works to the House of the Cryptoporticus*
GPP 15 - *Award procedure for surveys, design work, and investigations in respect of: reconfiguration of the earth banks and restoration of the Insula of the Chaste Lovers*
GPP 16 - *Award procedure for surveying and design work in respect of: restoration of the decorations and the garden area of the House of Cerere*
GPP 17 - *Restoration of the painted decorations and flooring of the House of Octavius Quartio*
GPP 18 - *Restoration of the painted decorations and flooring - Fullonica of Stephanus*
GPP 23-24 - *Restoration and architectural and structural consolidation works to the decorations in Regio VIII from vicolo di Championnet to the Sarno Baths (not included)*
GPP 25 - *House of Julia Felix, Regio II, Insula IV – Restoration works to the wall and floor decorations*
GPP 26 - *Reinstatement and structural consolidation works to the House of the Small Fountain*
GPP 27 - *Award procedure for surveys, design work, and investigations in respect of: making-safe works in the insula occidentalis with the urban villas: House of the Library (VI,17,41), House of the Golden Bracelet (VI,17,42), House of M Fabius Rufus (VII,16,20-22), House of Maius Castricius (VII,16,16)*
GPP 29 - *Award procedure for surveys, design work, and investigations in respect of: restoration and consolidation of the Gymnasium of the Baths of the Forum*
GPP 30 – *Restoration works to the decorations of the House of Venus in the Shell*
GPP 31 - *Restoration of the decorations, paintings, and flooring and architectural restoration of the House of Paquius Proculo and the House of Sacerdos Amandus, street numbers 4, 5, 6, 8 – Regio I Insula 7.*
GPP 32 - *Restoration of the decorations, paintings, and flooring in the House of the Anchor*
GPP 33 - *Restoration works to the decorations of the House of the Ephebus*
GPP 34 – *Restoration of the plaster casts and finds of Pompeii*
GPP 35 - *Award procedure for surveys, design work, and investigations in respect of: consolidation and restoration works, Central Baths*
GPP 37 - *Upgrading works to state-owned houses serving the Pompeii archaeological area: building at Porta Stabia and reinstatement of external areas*
GPP 39 - *Upgrading works to state-owned houses serving the Pompeii archaeological area: San Paolino, Casa Tramontano, Casina Pacifico, external areas and adjoining services*
GPP A1 - *Upgrading and revision works to the perimeter fencing of the Pompeii excavations*
GPP A2 - *Upgrading and revision works to the perimeter lighting of the Pompeii excavations*
GPP B - *Award procedure for surveys, design work, and investigations in respect of: restoration of the House of the Silver Wedding*
GPP C - *Restoration works to Regio VII - insula 15 in the Pompeii excavations*
GPP D - *Award procedure for surveys, design work, and investigations in respect of: project for the restoration and enhancement of the northern sector of the fortifications of Pompeii (Tower of Mercury)*
GPP E – *Restoration works to the decorations of the House of the Dioscuri*
GPP F - *Restoration works to the decorations of the House of the Red Walls*
GPP G - *Restoration works to the decorations of the House of the Sailor*
GPP H - *Restoration works to the decorations of the House of the Cryptoporticus*
GPP I - *Award procedure for surveys, design work, and investigations in respect of: project for the restoration of the area of the necropolis of Porta Ercolano **in** Pompeii (Villa of Diomedes)*
GPP L - *Restoration works to the wall and floor decorations of the House of the Pygmies*
GPP M - *Making-safe works to the front face of the excavations and mitigation of hydrogeological risk in Regiones I, III and IX, IV and V of the archaeological site*
GPP N - *POMPEI PER TUTTI - routes for accessibility and the elimination of architectural barriers*
GPP P - *Award procedure for surveys, design work, and investigations in respect of: works for the relocation and technological upgrading of the waste water storage site situated at insula 6 of Regio VII*
GPP-Gates - *Italia per Pompei: Reg. I, II, III – enhancement, decorum, and making safe - GATES* and *BARRIERS*

GPP-Propping - *Italia per Pompei: Regio I, II and III elimination of the existing temporary works – PROPPING*
GPP-Roofs - *Italia per Pompei: Reg I, II, III – upgrading, maintenance, and rainwater disposal – ROOFS*
GPP Wood - *restoration of the Moregine wooden elements*
GPP NewRos- *Award procedure for surveys, design work, and investigations in respect of: restoration of the House of Rosellino and reinstatement of green areas*



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Archaeological Areas of Pompeii, Herculaneum and Torre Annunziata..

MANAGEMENT PLAN

The revision and upgrading of the management plan was conducted as part of the AGREEMENT MIBAC / UNESCO: Towards a governance system for coordinating the updating and the implementation of the Management Plan of the Archaeological Areas of Pompei, Herculaneum and Torre Annunziata Project:

Working group

World Heritage Centre UNITA' PROGETTI SPECIALI; General Secretariat MIBACT; Superior Institute for Conservation and Restoration; General Direction of Antiquity MIBACT; Regional Secretariat for Campania MIBACT

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CHAPTER 10 - THE OBJECTIVES OF THE PLAN

INTRODUCTION

The archaeological areas of Pompeii, Herculaneum and Torre Annunziata were inscribed on the World Heritage List at the session held on 6 December 1997, in consideration of the extraordinary importance of the remains of the towns of Pompeii and Herculaneum, and their associated villas, buried by the eruption of Vesuvius in AD 79, provide a complete and vivid picture of society and daily life at a specific moment in the past that is without parallel anywhere in the world..

UNESCO, in conceiving a list of outstanding properties identified as a heritage of the whole of humanity, aimed at underlining their universal value, beyond the contingency of space and time, as characteristic of the history and development of mankind and its environment, so that they could be considered mankind's common reference - a general *world heritage.*

The UNESCO Plan, as set out in the relevant methodological documents, is a complementary and additional instrument, alongside the economic and territorial planning activities of the central and local government authorities, which it should summarise and integrate. The objective of the management plan is to protect and valorise the archaeological sites of Pompeii, Herculaneum and Torre Annunziata, also by promoting the areas to which they belong and, in order to achieve this goal, it sets out strategies capable of bringing together the diverse public and private interests of the local communities, consistently with the existing cultural and environmental values.

The UNESCO Plan is an attempt to merge *actions* and *governance*, searching for the most suitable approach to bringing about an effective social dialogue, with a view to improving access to and the fruition of the sites by both tourists and residents.

The management Plan of the Pompeii, Herculaneum and Torre Annunziata system aims to take action, with regard to a development model centred on cultural and economic valorisation and, therefore, based on the following inspiring criteria:

- preserving the archaeological heritage from all the possible risks of physical deterioration and external events, and restoring it, where necessary, so that it can be made available to and accessible by the community at large;
- improving the conditions and quality of fruition of the sites, by improving accessibility by and providing a range of services to the visitors;
- fostering the broadest possible integration between the local archaeological resources and cultural heritage and the surrounding communities, with a view to enhancing the general economic impact of the fruition of the sites and improving territorial identity.

The Plan is structured around the actions needed to implement the above mentioned principles, as follows:

- **Protection and Conservation**. The Plan sets out the intervention priorities and the actions that need to be implemented to safeguard and preserve the archaeological heritage;
- **Use, Valorisation**. The Plan contains the interventions aimed at improving the conditions and quality of fruition of the areas and facilitating the development of the economic chain related to the cultural heritage and tourism;
- **Mitigation of the natural disaster risks.**
- **Governance**. The Plan defines the procedures for managing the site and fostering social dialogue among the stakeholders of the UNESCO Plan**.**
- **Monitoring**. The Plan aims to ensure the instruments for verifying and controlling the state of conservation of the Properties and the implementation of the planned actions, as well as the UNESCO Plan as a whole.

By virtue of the proposal to modify the boundaries of the buffer zone as little as possible, and recognise its importance for the social and cultural development of the territory, introduced by Italian law 112/2013, establishing the so-called “Great Pompeii Unit”, with the task to **“enable the economic and social relaunching and environmental and urban requalification of the municipalities concerned by the Unesco management plan for the site «Archaeological areas of Pompeii, Herculaneum and Torre Annunziata», and to enhance the tourism attractiveness of the entire area”**, the Plan identifies the actions for fostering and stimulating the creation of processes for integrating the areas and players, with the ultimate purpose of generating a long-term and large-scale cultural and socio-economic development process.

However, the enormous complexities originating from the territorial and social characteristics require a gradual approach and strategy for changing the cultural and tourism system in these areas.

Therefore, the Plan has established as the priority action the creation of a suitable environment for inter-institutional Governance.
In consideration of the extreme institutional and cultural complexity of the area, with a view to fostering the *coordination* of the public policymakers involved and, where possible, the integration of the protection and valorisation activities, the memorandum of understanding signed on 25 November 2013 provides for a dedicated forum, the Meeting Table, where opinions can be exchanged on a permanent basis and featuring a simple and streamlined organisation.

In 2015, the World Heritage Committee, with its Decision 39 Com 7B.80, paragraph 4, requested the State Party to complete the management Plan, according to the recommendations set out in the report by the Monitoring mission in November 2014, as follows:

1. The management plan must contain, as the basis of the management, the adequate definition of the values of the Property, based on the project of declaration of outstanding universal Value, but also taking into account the other values of the site.

2. Parts of chapter 2, such as section 2.2, appear to be missing.

3. The criticalities related to the three components of the Property - Pompeii, Herculaneum and Torre Annunziata - should be more clearly defined and differentiated;

4. The criticalities, threats and opportunities for the Property should be identified in each of the thematic chapters on the conservation, public use, natural disaster risk management, governance and monitoring;

5. The chapter on conservation must contain an overall evaluation of the state of conservation of the three components of the structure and an assessment of the threats and risks for the archaeology and the buildings;

6. The chapter on natural disaster risk management focuses almost entirely on the potential risk of a volcanic eruption. This is clearly the risk that can cause the most damage, but the chapter should also address other risks, such as earthquakes, the effects of bad weather conditions, local flooding, lack of maintenance, etc., some of which are more likely than others;

7. The purpose of the monitoring activities described in chapter 9 is almost exclusively to measure the progress of the Plan. This is important, but the monitoring should also focus on the state of conservation of the structure and the conditions of the surrounding structures, as well as the state of the buffer zone;

8. Except for chapter 4 (public use), and some brief references to Section 9.4, there are no indications of the objectives and priorities regarding the future management of the inscribed properties; section 9.4 should be developed as if it were a separate chapter, with much more than details on the objectives and priorities, as well as the actions to be implemented during the Plan. Overall, it must present a clearer idea of the objectives of

the plan, in terms of what can be achieved over the five years of its duration, and the necessary resources and commitments;

9. The specific needs of the three components of the Property - Pompeii, Herculaneum and Torre Annunziata - must be differentiated more clearly;

10. Any significant policies extracted from other plans, such as those listed in the introduction to chapter 2, must be included in the plan or its appendixes.

Considering that some of the requests for integration are due to the fact that we had sent UNESCO an abstract, instead of the complete text, so that some of the considerations were already included in the 2014 management Plan, this version of the plan, based on the recommendations received from the Committee, meets the requests and observations contained in the inspection mission carried out in November 2014, integrating the requests in the structure of the previous Plan.

Recently, Art. 6 of the DM of 23 January 2016 has established the Archaeological Park of Herculaneum, separating it from the supervision of the special Superintendency of Pompeii. Although the area of the archaeological park and its management structure are already clear, the latter being modelled on the other autonomous institutions previously identified, the Director of the new Park of Herculaneum will only be appointed by the end of December 2016.

Therefore, believing that the outlook of the plan must fully respect the new director's vision and approach, we have decided not to include Herculaneum in this management Plan. An integration will then be made as soon as the designated Director, and his or her support bodies, scientific committee and executive board, have developed their policies and related actions.

During the Meeting Table session held in September 2016, the draft version of the integrations was presented to and shared with the stakeholder Entities.

The integrations are mostly based on the significant progress made in 2014/2016, with regard to the implementation of the Great Pompeii Project, which has proved an extraordinary testing ground for the various diagnostic, consolidation, restoration, maintenance and risk mitigation activities, which have led to the definition of actions and protocols enabling the Superintendency to include in its programmes and budgets for the next 5-year period the extension to the inscribed sites, and the archaeological areas of the buffer zone, of the activities already tested at Pompeii.

Several important recent innovations have already been included in the plan. For example, the plan submitted in 2014 featured a criticality in the management of the volcanic risk, consisting of a lack of provisions for the cultural heritage properties in the Vesuvius Emergency Plan. Therefore, a working group has recently been set up, under the supervision of the Civil Protection Department of the Prime Minister's Office, comprising representatives of all the local Superintendencies, of the MiBACT's Regional secretariat, of the Naples Cultural Heritage Protection Unit of the Carabinieri, of the Region of Campania

and of the Prefecture of Naples, for the introduction of the Cultural Heritage in the updated version of the volcanic risk emergency plan covering the “red zone” of the Vesuvius area.
Considering that the National Vesuvius Emergency Plan has been designed as a multiple-risk plan, tackling all the risks associated with the Vesuvius, from earthquakes to landslides, the documents produced will be of great importance for managing the risks affecting the UNESCO sites.
Likewise, the Plan also includes the monitoring activities donated by Finmeccanica to Pompeii, an important example of how cutting-edge technology can be adapted to meet the monitoring needs of archaeological sites. These technologies can also be extended to the other sites, for valuable consideration, especially those in the buffer zone.
A lot of work has also been carried out by the Meeting Table, which has surveyed the area and produced a GIS of the heritage properties in the buffer zone, which will be used for planning local intervention projects, as well as for risk prevention purposes and other fact-finding activities.

CHAPTER 1

PREFACE

4. **Why a new management Plan**
5. **Previous studies and management systems for the UNESCO site**
6. **The MiBAC/UNESCO Agreement**

1. Why a new management Plan

For a site to be inscribed on the World Heritage List, having a Management Plan in place as well as being protected by current legislation is one of the important requirements to comply with, besides possessing innate characteristics of integrity, authenticity and uniqueness.

In 1997, the UNESCO Committee decided to inscribe Pompeii, Herculaneum and Torre Annunziata on the List on the basis of criteria III, IV and V, with the following motivation:

"considering that the impressive remains of the towns of Pompeii and Herculaneum and their associated villas, buried by the eruption of the Vesuvius in AD 79, provide a complete and vivid picture of society and daily life at a specific moment in the past that is without parallel anywhere in the world".

This consideration is the basis for ascribing **Outstanding Universal Value** to the site, recognising it as heritage of all Mankind, to be passed on complete to future generations.

The task of the State Party is therefore to maintain the uniqueness of this site over time, protecting it as an asset, conserving its innate characteristics, managing it correctly, and providing for forms of public use that respect its characteristics in ways that communicate its value and significance.

Conserving the integrity of the Vesuvian sites over time is no simple matter, considering that already at the time of their inscription, an ICOMOS report recognised their particular situation in relation to their state of conservation: **"*there are serious structural problems at both sites*** (Pompeii and Herculaneum) ***resulting from a variety of factors, such as inappropriate materials, rising damp and rain and wind attack, and these were exacerbated by the 1980 earthquake"*.**

For all their fascination, the Vesuvian archaeological sites do give the impression of "a paradise inhabited by devils". Rising damp, rain, wind, earthquakes, anthropogenic pressure and processes of urbanisation across the region pose a continuous threat to their conservation and to their relationship with the landscape. Whilst we cannot hope to overcome all the risks that threaten the integrity of these sites, we certainly have a duty to identify short and long-term actions to contain them.

The tool that will enable those responsible for preserving and passing on all the values of these sites, complete, as heritage of mankind, is a Management Plan.

The architect and conservationist Giora Solar has defined a management plan as "*a plan based on identifying cultural values which ensures they are protected by applying legal, administrative, financial and technical methods and tools, and sets out the appropriate strategies to be adopted and the specific action to be taken*".

This definition highlights the two basic components of a management plan: its strategic aspects and its operational characteristics.

All of the management activities currently carried out by the Special Superintendency for the Archaeological Heritage of (*formerly Naples and*) Pompeii (hereinafter "the Superintendency"), as part of its normal work, could in some respects already be defined as a "management plan". In the absence of any other specific management document, the task of protecting the sites and enhancing their appreciation falls on the Superintendency as the responsible institution. In carrying out this role, it applies a range of legal, administrative, financial and technical instruments already provided under Italian law, from identifying ordinary and extraordinary sources of funding to taking specific ad-hoc action.

A fully-fledged management plan is more complex, however, particularly in terms of involving local communities in planning and implementing action to protect, manage and use these sites and to enhance appreciation of them.

Above all, the end goal of a full management plan must be to balance the needs of conservation with the needs of these local communities, and to make sustainable economic use of these sites as an asset.

In relation to the changes this will require, and to balance the needs of conservation with local interests so that the process of change can be managed, it is fundamentally important to involve all interested parties in managing and programming development in the region and all of the local communities.

To foster local understanding of the universal values of these three listed areas and the importance of conserving them, public information will be required, specifically addressed to the communities in the area.

In the 2003 Budapest Declaration, the UNESCO World Heritage Committee invited all States Parties to aim for an appropriate and equitable balance between conservation, sustainability and development, and in order to attain this objective required a Management Plan to be adopted for each site; for the first time, the Operational Implementation Guidelines for the 2005 World Heritage Convention required that "*each nominated property should have an appropriate management plan or other documented management system that must specify how the outstanding universal value of a property should be preserved, preferably through participatory means*" and should set out its own aims and the elements upon which it is based.

The Management Plan for the listed site of Pompeii, Herculaneum and Torre Annunziata is a dynamic tool that, by means of a cycle of planning, implementation, monitoring, evaluation and feedback, ensures conservation of the asset. It is also a tool for coordinating and interconnecting various types of plans or programmes so, although it should not be confused with other urban and regional planning tools, socio-economic development programmes, and above all with the legislation for protecting cultural assets (all of which played a role in its preparation), it serves additionally as a form of integrated programming between different objects and subjects.

Via processes of participation in the local region, it is expected that the Pompeii, Herculaneum and Torre Annunziata Management Plan will orientate decisions about urban

and economic planning in the local area by correctly identifying the ways for dealing with the knowledge, conservation and enhancement of these distinctive resources, taking into consideration the unique characteristics of the region and all the subjects and other planning instruments that play a role within the local administrative organisms.

In addition to conserving the tangible and intangible resources of the region, the ultimate goal of the Pompeii, Herculaneum and Torre Annunziata Management Plan is to identify how socio-economic development and territorial change should be governed in such a way as to balance these different interests and maintain, over time, the integrity of the values that made it possible to obtain recognition of the sites in the first place.

The Pompeii, Herculaneum and Torre Annunziata Management Plan must therefore reconcile the need to conserve the assets with the need for sustainably developing an extremely complex territory where there are strong tendencies to generate conflicts.

The revisions and additions to the earlier Management Plan will include setting out objectives and strategies that balance the social components of the region with its cultural components at a time of particular fragility and risk, taking account of the pressures for socio-economic change along with the need to conserve, protect, enjoy and appreciate the heritage and the universal values that justified its listing, and so that it can be preserved for future generations.

2. Previous studies and management systems for the UNESCO site

The UNESCO areas of Pompeii, Herculaneum and Torre Annunziata are a “serial site” consisting of buildings and archaeological areas owned by the Italian state and managed directly by the Ministry of Cultural Heritage and Activities, and of Tourism (MiBACT) via the local Special Superintendency (**Soprintendenza Speciale Pompei**), as its peripheral body currently in charge.

As part of its ordinary activities, the Superintendency has powers to apply all the legal, administrative, financial and technical tools provided by Italian law to ensure conservation of this heritage.

Thanks to the financial autonomy enjoyed by the Superintendency of Pompeii, funding from ticket sales makes it possible, as part of normal programming, to take specific action that supports the work of conserving and enhancing the sites as an asset.

Although Pompeii, Herculaneum and Torre Annunziata were inscribed on the World Heritage List in 1997, they were not given a proper management plan until 2010. However, before inscription, the need for a comprehensive tool for planning the works at Pompeii had already been identified, and over a long period (1996-2005), with financial support from the World Monuments Fund, the Superintendency drew up a Plan for Pompeii – a synthesis is given below - as the basis for all subsequent action within that particular site.

SUMMARY OF A PLAN FOR POMPEII FOR THE 1996-2005 PERIOD

A PLAN FOR POMPEII – 1996	
Description: It is a tool for the organic planning of the interventions, aimed at ensuring the conservation of the ancient structures and the offer to site visitors via the identification of guidelines for the individuation of the priorities in global and differential conservation.	**Authors:** - Soprintendenza Archeologica di Pompei - Architectural firm (Rome): architects G. Longobardi, A. Mandara - *World Monuments* Found: S Eddy (financial support following the inscription of the archaeological site of Pompeii in the first *List of 100 Monuments to be Saved*). - M.P.Guidobaldi, F. Pesando (analysis and filing of the archaeological buildings)
Objectives (Ref. *A Plan for Pompeii)*	
- design of a **system for the conservation of the ancient structures** and the maintenance, use and management of Pompeii different from the previous, which, after a first extraordinary emergency phase for recovering the resource, is capable of keeping it ongoing on an ordinary basis; - rationalisation of the **preceding historical and archaeological knowledge**; - reorganisation of the **street furniture**; - planning of the location of **areas for resting, services and information points** within the site; - **demolition of incongruous buildings and shifting of several functions outside the walls** thus freeing the buildings and areas that could become strategic structures supporting the visit, such as restaurant, Antiquarium, exhibition deposits; - regulation of all issues regarding the **location of the various service activities** connected to the functioning of the Superintendency, to the **management of visitor flows**, to the control and optimal configuration of **access points**, and to the functioning of services for the public and of network infrastructures. - creation in Pompeii of a **large museum**. Facilitate use and museumification via a museum design project to be used as educational support by the user, necessary for a critical visit of the city, but that implies the congestion of some parts and the desertification of others. Pompeii seen as a large urban museum; - identification of **several preferential and/or thematic itineraries** for optimising management: imagining not one but “many” Pompeii potentially usable by visitors, differing according to themes, spatial layout or according to the season of the year, but always capable of rendering the idea that they are visiting a large ancient city; - setting up of two structures: on the one side the creation, by real estate unit or by space unit, of **maintenance manuals**, calibrated on specific cases, that indicate conservation schedules and methods; on the other the presence of an **organising structure capable of managing the manuals** i.e. the creation of a veritable “**Fabbrica di Pompei**” (“Fabric of Pompeii” - in analogy with the “Fabric of St. Peter” – that was a committee organising the construction, maintenance and administration of the Basilica); - extension, in a second phase, of the studies conducted and of the work performed on all of the buildings in Pompeii; - creation of **general maps based on georeferenced computer data** on which to apply the plan analyses, but that can also be used and updated by the technicians of the Superintendency as well as by the public of scholars. (p. 21) The vectoralisation of the *RICA maps of Pompeii* survey has resulted in the creation of Tables 1 and 2.	

Prospects

Creation of a sustainable Pompeii capable of regenerating its cultural resources:
the use activities, associated to the inevitable deterioration caused by time and by weather, must find a limit in the possibilities of the city's regenerating itself via ordinary maintenance operations.
Indicators of sustainability:
- regeneration capacity;
- operational thresholds;
- necessary investment flows.

Funds

Phase I: 1996-1998 (funds: WMF)
- CAD digitisation of *RICA maps of Pompeii*
  (H. B. Van Der Poel, *Corpus Topographicum Pompeianum*, p. III, Roma 1984);
- drafting of the typological and conservative survey tables;
- identification of the guidelines for methodology.

Phase II: 1999-2000 (funds: WMF)
Start of GIS (Geographical Information System) processing.

Phase III: 1999-2000 (funds: SANP)
Mapping of the state of conservation of the structures and data entry into the GIS systems.

Phase IV: 1999-2000 (funds: SANP)
Construction of a single reference base for the various Local Information Systems, integrating the product of the documentation and cataloguing project *Neapolis* [basic and cadastral mapping data, index cards, photos and diaries of the excavations (various authors, *Neapolis*, p. III, *Planimetrie della città antica di Pompei*, Roma 1994)] with the RICA (Regio, Insula, Civico, Ambiente) management system, thus obtaining a new address book that gives the RICA data and the name of the cadastral unit, so as to connect the two information systems and allow passage from one to the other, making it easier to consult a single GIS platform.

Fact-finding survey (regarding over 600 buildings)

Tools used:
- **Indexing** on easily compiled modules the content of which has been transferred onto a spreadsheet.
  Items have been envisaged capable of providing useful information for any subsequent processing of different thematic maps describing the status of the site.

- Demonstrative maps:
  - Table 01 – **Map of the usability of the archaeological area.**
    Area of interest: excavations visible to all visitors.
    Identification:
    - areas freely accessed by the public;
    - areas to be opened occasionally;
    - service buildings;
    - already funded restoration interventions.

  - Table 02 – **Map of the types of usable buildings.**
    Cognitive base for the formation of a plan that identifies the pattern of intended uses:
    - shop;
    - caupona/popina;
    - domus;
    - access to upper floors;
    - public latrine;
    - bakery;
    - public building;
    - stable;
    - thermopolium;
    - tomb;

- contemporary installations in ancient buildings.

- Table 03 – **Map of the state of conservation and of the needs for intervention on usable buildings**. Identifies the state of conservation of the buildings and the interventions they require in order to stop their deterioration, establishing levels of priority:
  - discrete state of conservation and need of maintenance work;
  - poor state of conservation and need of restoration work;
  - bad state of conservation and need of extensive restoration work.

Plan criteria

Conservation
Principles:
- city as the museum of itself;
- elimination of incongruous buildings;
- identification of new uses: reception, service and information;
- improvement in conservation status via flows addressed onto different visit itineraries;
- improvement in conservation status via alternance between *conservation time* and *use time*.

Use and museumification
Objectives and tools:
- reorganisation of the entrances in order to rationalise visitor flows (schools, groups, individuals);
- spaces for additional services and reception areas outside the perimeter of the excavations;
- signposting and educational panels concerning the excavations;
- search for a common language able to unify the educational and panel activities;
- leaflets;
- thematic installations.

Urban management
Objectives:
- expansion of the entrance at Piazza Anfiteatro considering its close relationship with the Sanctuary and with the modern city;
- setting up the access in Via delle Ginestre so as to welcome only school visits, considering its close relationship with the Auditorium in which to hold briefing sessions prior to the visit;
- setting up the access in Piazza Esedra so as to welcome visitor groups, because it allows not only for the organisation of spaces for queuing but also for creating the temporary tourist bus waiting area;
- setting up the access in the baricentric area from Porta Stabia to favour the possibility of differentiating the itineraries;
- shifting the offices, management and archive to State-owned buildings;
- valorising the pine tree forest for recreational and restoration purposes;
- reorganising the warehouses and therefore of the pieces contained in the *Granai del Foro*;
- clearing of all restoration functions from the ancient buildings and moving them to Casina dell'Aquila;
- setting up of a visitor welcome and information structure in the rooms of the *Terme Centrali*;
- reconversion of the *Antiquarium* to place for the study of findings;
- studies concerning the management and drainage of water;
- studies concerning the increase in public services;
- reorganisation of the site's furniture: unification of the signs, waste baskets, sitting structures, gates, etc.;
- reorganisation of personnel in order to improve surveillance.

External context
Objectives:
- establish **a new relationship with the planning of the contemporary city in technical/town-planning and in economic terms**.

However, the first phase of the "Plan for Pompeii" was not implemented and **in its place a UNESCO Management Plan, funded by the Italian State under Law 77/2006, was drawn up in 2008-2010 by the SANP - "Archaeological Superintendency for Naples and Pompeii" then in charge of the site. Here below is a summary of the plan.**

SUMMARY OF THE PLANS AND ACTIONS FORESEEN BY THE 2010 MP

The MP 2010 was articulated into four different plans:

1. **Knowledge Plan (*Piano della Conoscenza*)**
2. **Protection and Conservation Plan (*Piano della Tutela e della Conservazione*)**
3. **Valorisation Plan (*Piano della Valorizzazione*).**
4. **Communication Plan (*Piano della Comunicazione*)**

<table>
<tr><th colspan="2">KNOWLEDGE PLAN</th></tr>
<tr><td>Location: differentiated according to specific objectives</td><td>General objective: setting up of a dynamic information collection structure supporting the other Plans</td></tr>
<tr><td colspan="2">Specific objectives:
A) Creation of an Information System concerning the state of conservation of the archaeological/cultural heritage and on the intervention initiatives.
B) Creation of an Information System concerning the cultural/tourist supply-demand and the socio-economic dynamics of the area.</td></tr>
<tr><td colspan="2">Activities envisaged:
- analysis and updating of existing tools
- activation of new tools (for measurement, analysis, information communication, etc.)
- setting up of a framework of rules.</td></tr>
<tr><td colspan="2">Specific objective A): Creation of an Information System concerning the state of conservation</td></tr>
<tr><td>Location: Pompeii, Herculaneum and Oplontis area sites + any other sites.</td><td>Specific objective: A) Information system concerning the archaeological and cultural heritage.</td></tr>
<tr><td colspan="2">Description: setting up of an integrated Information System regarding the archaeological and cultural heritage of the set of UNESCO archaeological areas aimed at monitoring the status of the properties and at supporting the resources' protection and conservation activities.</td></tr>
<tr><td colspan="2">Related plans: Protection and Conservation Plan.</td></tr>
<tr><td colspan="2">Activities envisaged:
1) identification and analysis of tools and databases available in each one of the three sites and in the area as a whole;
2) setting up of an implementation/updating programme for these tools and existing databases;
3) analysis of the opportunity of expanding the cognitive system to other local archaeological/cultural resources;
4) design of a GIS-type integrated information tool;
5) identification of the potential users of the Information System and of the methods for disseminating the information;
6) planning of the periodical updating/integration/coordination activities for the system and of the training of the personnel charged with managing it.</td></tr>
</table>

Phases: impossible to determine

Subjects involved: Soprintendenza Archeologica di Napoli e Pompei (Archaeological Superintendency of Naples and Pompeii)

Financial resources: impossible to determine

Timing: impossible to determine

Current implementation status: awaiting activation but the preliminary analysis has begun with the examination of the tools activated in Pompeii as a consequence of "A Plan for Pompeii" (GIS) and in Herculaneum within the framework of the HCP (GIS and new Land Registry of Herculaneum), aimed at monitoring the state of conservation of the properties and the implementation of the interventions.

Results: construction of a constantly updated integrated information tool to be used to support the planned actions for protection and conservation of the properties.

Remarks: presence of fragmented databases, resulting from irregular analyses limited only to some of the areas.

Specific objective B): Creation of an Information System concerning the cultural/tourist supply-demand

Location: Pompeii, Herculaneum and Oplontis area sites + tourist and cultural sites of the Vesuvian area + local economic system.	**Specific objective:** B) Information System concerning the cultural/tourist supply-demand and the socio-economic dynamics of the area

Description: creation of a **Osservatorio turistico-culturale del territorio costiero (Tourism/Culture observatory of the coastal area)** charged with collecting and processing the data within an Information System aimed at monitoring the dynamics of the local tourist market, the conditions of the offer of services and area accessibility. Probable consequences of the promotion of the local economy.

Related plans: Valorisation Plan

Activities envisaged:

1) Creation of the Tourism/Culture Observatory charged with managing the System and reconciliation of the interests of the various stakeholders and of the public and private spheres;
2) Analysis of tourism-related data;
3) Preparation of a programme of ad hoc periodical measurements (regarding the tourism/culture dynamics and regarding infrastructures and mobility);
4) Analysis of the documents of economic and financial planning of the provincial area (PO Campania, POIN Attrattori culturali naturali e turismo, etc.);
5) Planning of an integrated qualitative-quantitative information System for the collection and processing of the data;
6) Setting up of a programme for the dissemination of the data.

Subjects involved: Archaeological Superintendencies of Naples and of Pompeii, Municipal Authorities, specific private professionals, other subjects (Chamber of Commerce, Tess, etc.)

Financial resources: impossible to determine

Timing: 6 months

Current implementation status: to be activated, but related initiatives already started:

- Start of constitution of the Tourism Observatory of the Campania Region;
- TESS Agency: data acquisition and analysis of phenomena related to the tourist/cultural use of the Vesuvian coast (publication: "Costa del Vesuvio. Un distretto turistico di eccellenza", 2004);
- HCP project: study on the behaviour of visitors to the Herculaneum site.

Results: creation of a single, complete and updated information management system regarding tourism and cultural dynamics, for supporting tourist/cultural valorisation policies.

Remarks: scarce, fragmented and partial databases.

PROTECTION AND CONSERVATION PLAN	
Location • **Pompeii area** • **Herculaneum area** • **Oplontis area** • **Local archaeological sites**	**General objective:** • Better and more in-depth *knowledge* of the heritage, both for scientific and historical purposes and for the purpose of tourist/cultural promotion (directly connected, unlike those pertaining to the conservation and protection of the heritage, Knowledge Plan); • Reconstruction of the history and greater knowledge of the city structure, of the sites, of the dwellings, of the construction techniques; • Appropriate conservative actions via testing of techniques, materials, practices and intervention policies; • Creation of a transversal and integrated front in terms of systems and areas.
Specific objective • Identification of three main priority intervention areas: - Knowledge and research: acquiring deeper knowledge of the characteristics of the sites, of the heritage and of the protection and conservation intervention methods; - Protection: guaranteeing an appropriate protection and safeguarding system for the areas by means of specific restrictions and asset protection regulations; - Conservation: acting on the resources via interventions for the recovery, consolidation, elimination of the risks of deterioration or decay, and systematic ordinary maintenance of the areas; • Reconstruction of the state of conservation of the archaeological areas; • Description of the planning and project instruments being used.	
Description - has considered the specific intervention priorities indicated in programming documents and in projects by the Superintendency; - has prepared a set of possible actions intended tp propose tools, procedures and rationales for coordinated and integrated action at overall level, capable of improving the efficiency of the functions of the Superintendency and the state of conservation of the properties of the entire archaeological system.	
Activities envisaged: • Ordinary programming (AP); • Extraordinary interventions (AP).	
Phases: First phase: context analysis. The objectives set by SANP envisage three priority intervention areas (objectives): • Interventions for consolidation and protection addressing the growing risk of volcanic, seismic, hydrogeological calamities, etc.; • Interventions for the restoration and recovery of findings, works and materials; • Interventions for the planned maintenance of the areas, capable of reducing to a minimum the effects of progressive erosion caused by the weather and other deterioration phenomena (weeds, anthropic pressure, etc.).	
Tools • Programmes and study and documentation tools directly connected to the conservation and protection techniques for the residential and commercial structures; • Activities dedicated to data collection and processing (described in the Knowledge Plan); • Processing of a single and integrated programme of stable studies and research supporting the conservation functions of the set of archaeological areas, including those outside the UNESCO perimeter. In addition to improving the intervention conditions on the properties, this programme would help jumpstart the integration of this function at system level; • Creation of a single seat supporting the entire system, and of integrated tools and programmes that, by	

involving any external specialised partners (universities, scientific bodies and organisms, etc.), would allow for the unitary management of the data, of the resources available and of the testing and study programmes, allowing to create, over time, a veritable hub of excellences in archaeological restoration and conservation;
- Involvement of external specialised bodies and subjects (universities, study centres, ICR, international research institutes), via the direct support of a project (HCP Study Centre for Herculaneum), or the creation of specialised intervention teams for specific emergencies or themes (as in the case of the *Laboratorio di restauro dei dipinti murali - Fresco restoration lab* - in Pompeii).

Subjects involved

SANP, *Centro Studi Internazionale Herculaneum,* Universities, study centres, ICR, international research centres, scientific bodies and organisms.

Financial resources

Not yet defined in this phase.

Timing

Not defined.

Current implementation status

To be established.

Results

The HCP - Herculaneum Project indicates the measures required to underline the specific objectives that can be pursued by means of coordinated archaeological conservation study and research actions.

These objectives concern:

- The identification of typical solutions for common conservation issues (waterproofing of floors between storeys acting as roofs, masonry restoration, barriers, protections, bird dissuaders, etc.);
- The identification of solutions to complex localised issues (roofs for large openings, windows and doors for special rooms, etc.);
- The study of the types of deterioration, laboratory analysis and testing for the creation of effective conservation solutions for the wall and floor decoration elements.

Remarks

None.

Protection and Conservation Plan – Knowledge and Research aspects

Location	**Specific objective**
• **Pompeii area** • **Herculaneum area** • **Oplontis area** • **Local archaeological sites**	Primary intervention area: knowledge and research. Acquire deeper knowledge of the characteristics of the sites, of the heritage and of the methods for protecting and conserving: • Research and promote methods and tools for the coordination and integration of research and testing activities; • Strengthen the research and study functions regarding the activities and techniques for conserving the archaeological areas.

Description

As regards the knowledge and research of the most effective techniques, materials and intervention procedures, the Pompeii as well as the Herculaneum and Oplontis areas have been subjected to frequent and sometimes highly scientific and costly observation, study and research campaigns.

Only occasional and fragmented initiatives (specific themes and/or portions of the areas/declined at *insulae* level) and the large numbers of subjects involved over time in this field, however, have hampered the development of continuing support tools and system projects capable of creating shared, integrated and transversal instruments aimed at providing scientific and cognitive support to the activities of the Superintendency.

Activities envisaged

- To define, within the framework of the activities of SANP, a programme of studies and documentation with coordinated objectives, actions and activities regarding transversal or specific themes, possibly in concert with research bodies;
- To also propose the creation of a single seat (study centre) for the management and organisation of these activities, directly run by SANP, that can envisage the involvement of other subjects (universities, specialised centres, ICR, etc.) and specialised partners, including private ones;
- To extend the activities of the rising study centre of Herculaneum (HCP) to supporting the entire archaeological system.

Phases

The action plans must include:

- the initiatives already promoted or envisaged in the main programming documents of the Superintendency;
- a series of strategic proposals or actions, where possible translated into more detailed intervention proposals, aimed at favouring greater integration and coordination of the conservation functions.

Tools

Not defined.

Subjects involved

SANP, possibly universities, ICR, etc.

Financial resources

The level of conservation and restoration activities ordinarily put in place by the Superintendency is insufficient.

The scarcity of financial resources available affects efficiency and planning. This generates the need to seek alternative and additional sources of support.

It should be possible to develop and enhance promotion and coordination actions for study, restoration and conservation interventions capable of boosting the acquisition of additional funding, the enhancement of the Superintendency's intervention capacity and the realisation of medium/long-term integrated programmes for the recovery and valorisation of the heritage (HCP and the Pompeii project financed with resources from the bank Foundation are examples of how it is possible to create highly important projects even without turning to public funding).

Timing

Not defined.

Current implementation status

To be established.

Results

The experience of the *Centro Studi Internazionale Herculaneum*, connected to the HCP conservation project, proved to be extremely interesting and could become the pilot project for the start of the integrated and coordinated planning of actions linked to the search for, and the field study of, materials, techniques and processes.

Remarks

The proposal is still at an entirely hypothetical and embryonic stage, which should be overtaken first of all with the creation of a more detailed project proposal, to be drafted in the wake of the investigations and the verifications regarding the degree of implementation of the Herculaneum study centre and the programs of the private partners of the HCP project.

Protection and Conservation Plan – Protection aspect

Location • **Pompeii area** • **Herculaneum area**	**Specific objective** Primary intervention area: protection. Guarantee an appropriate protection and safeguarding system for the areas by means of specific restrictions and asset protection regulations;

• **Oplontis area**	

Description

The Plan could:

- be limited to verifying the opportunity of amplifying, changing, integrating, upgrading the existing restrictions, especially on the border areas (so-called 'buffer areas');
- analyse the organisation and the surveillance support tools ;
- verify the possibility of introducing or of enhancing - once again at system level so as to exploit the scale economics of any investments – the electronic, remote control and video surveillance systems, in such a way as to allow for complete surveillance both outside (already partly possible thanks to several completed and on-going initiatives) and inside the areas, and to assign part of any human resources left idle to other management functions (guides, maintenance, reception, etc.).

The imminent launch of several surveillance-related projects, including video and remote control systems (Municipality of Herculaneum: video surveillance project outside the areas based on the measures of the Security PON – National Operational Plan), for ensuring the safety of residents and visitors.

There is no need for the revision of projects or initiatives linked to the protection of findings inside the areas, designed and implemented at whole system level for the archaeological areas, since a single technical management and an integrated controls system are envisaged. This system would allow to monitor the areas in an effective manner and to considerably save on surveillance and guard expenses.

Activities envisaged

To implement this initiative, the following activities are envisaged:

1. Design of a system of video cameras and other video-surveillance supports;
2. Setting up of a single office and monitoring, control and assistance service;
3. System installation.

Phases

The action plans must include:

- the initiatives already promoted or envisaged in the main programming documents of the Superintendency;
- a series of strategic proposals or actions, where possible translated into more detailed intervention proposals, aimed at favouring greater integration and coordination of the conservation functions.

Tools

The level of restrictions and of the regulations supporting the safeguarding of the areas is rather high and consolidated throughout all three areas.

Subjects involved

SANP

Financial resources

Not yet defined in this phase.

Timing

Not defined.

Current implementation status

To be established.

Results

Not definable.

Remarks

The introduction of a video surveillance system would have a significant impact on the organising of the SANP workforce.

Protection and Conservation Plan – Conservation and Maintenance aspects

Location	Specific objective
• **Pompeii area** • **Herculaneum area** • **Oplontis area**	Primary intervention area: conservation Act on the resources via recovery and consolidation interventions and by eliminating the risks of deterioration or decay, and the systematic ordinary maintenance of the areas. • **C.I** Conservation (planning of interventions and improvement of efficiency) • **C.II** Planned maintenance • **C.III** Partnerships and search for additional funding resources

Description

The restoration, excavation and maintenance interventions envisaged by the main planning documents are the primary targets of the Superintendency's conservation action on the archaeological heritage of the Pompeii, Herculaneum and Oplontis areas. The main frame of objectives that can be referred to the entire archaeological system (including that existing outside of the UNESCO perimeter) includes actions aimed at gathering knowledge about the sites, about the deterioration issues and about the recovery methods; about the restoration and recovery of the compromised or deteriorated property; about the ordinary maintenance of the areas and the consolidation of the structures; each of the three areas has its very own characteristics, emergencies and issues addressed via specific action plans and specific intervention tools.

Activities envisaged

General

- To promote actions aimed at helping to introduce tools and rationales shared among the various territorial offices of the SANP;
- To promote programming actions, such as the drafting of a complex plan/programme common to all three areas (and possibly extended to all of the other archaeological areas supervised by the SANP) in which, starting from a report illustrating the current state of conservation of the property, an intervention priority scalewill be defined, the resources and projects under way or about to be launched will be identified, and a plan of system interventions will ne defined, so as to improve the overall efficiency of the conservation functions.

Specifications

Pompeii area: conservation, restoration and maintenance interventions are envisaged, deriving mainly from the set of objectives and interventions drafted as from 1997 through the project "Un Piano per Pompei" (A Plan for Pompeii), described in the foregoing.

Herculaneum area: the plan/programme of conservation interventions referring to the 2008-2013 period indicates interventions of various kinds, most of which listed in the HCP conservation project, aimed at increasing the knowledge about the property and at acting on specific aspects: excavations and valorisation (completion interventions and excavation of structures, archaeological surveys, make-safe works); conservation (restoration of roofs and floors, planned periodical maintenance operations) and infrastructures (water supply and drainage systems and surveillance systems).

Oplontis area: a series of interventions is being completed on Villa B aimed at bringing the structures back to light and to making the area safe, also with a view to making the site visitable.

Phases

The action plans must include:

- the initiatives already promoted or envisaged in the main programming documents of the Superintendency;
- a series of strategic proposals or actions, where possible translated into more detailed intervention proposals, aimed at favouring greater integration and coordination of the conservation functions.

Tools

Planning of ordinary actions and of extraordinary projects directly supervised and/or addressed by the Superintendency and with a corresponding detailed program of interventions, partly on-going and partly planned that, naturally, are entirely coherent with an overall heritage conservation and protection strategy, also based on the UNESCO Plan's objectives.

The Plan, that intends to take on an overarching position with respect to the existing tools and to the system of institutional competences, is focused on several specific aspects of conservation, aligning to the specific intervention strategies in the areas formulated by the Superintendency by placing among the specific objectives those aspects linked to the coordination of functions and processes.

Subjects involved

This plan should be assigned entirely to the offices of the Superintendency. The latter, however, would be called to coordinate and integrate the three areas, each one of which, at the moment, has its own practically autonomous intervention guideline and/or conservation programme. Several initiatives launched within the framework of special Superintendency projects could be used as pilot actions for a hypothetical unitary and shared programme of conservation interventions, especially where tools – created within the HCP – for the monitoring of interventions and of vast area emergencies, and system interventions for the solution of emergencies common to all areas (water collection, roofing, etc.) are envisaged.

Financial resources

The UNESCO Plan cannot fail to identify a set of targeted actions that could help launching a debate about how useful and effective planned maintenance would be, a debate that should be extended to the entire set of funding rules and policies and of ministerial programmes. Acting as a tool for coordination and integration, the UNESCO Plan lends itself to being the venue for this debate driven by the overarching (Ministry) and/or regional bodies that could be involved, including in financial terms, in a system discourse linked to the planned maintenance of the local cultural heritage.

The planned maintenance theme, as well as that of the launching of an overall project for the planning of conservation and maintenance interventions, is closely linked to the context of research for alternative sources of funds and of partnerships capable of strengthening the Superintendency's ordinary activities and capacity for intervention. From this point of view, the experience taken from the HCP and from other forms of intervention on the property (participation of mainly private external subjects and foundations) and the creation of partnerships could be put to good use by following up the interventions with a stable and continuous plan of actions over the medium and long term. The search for alternative methods and additional sources of intervention on the property must be one of the Administration's main objectives, considering the notoriously contracting availability of public resources and the need to address a very large volume of interventions on extensive areas.

Timing

Yet to be defined

Current implementation status

To be established

Results

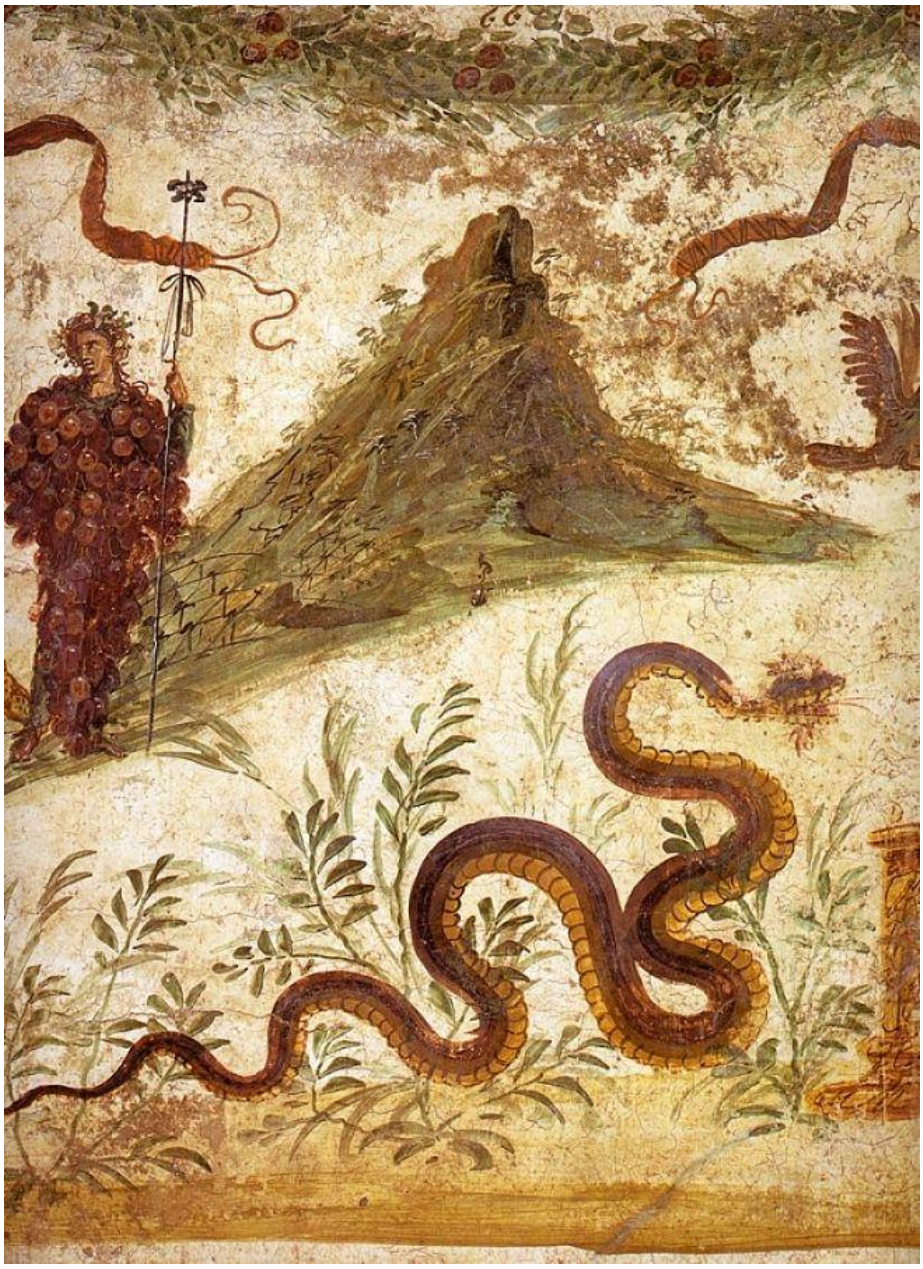
- The need to introduce medium/long-term intervention planning criteria and rationales;
- The implementation of targeted actions for improving the effectiveness of the interventions on buildings, materials and on specific issues of the areas (water collection, roofing, etc.).

Remarks

None

CHAPTER 2

THE INSCRIBED PROPERTY AND THE TERRITORY



6. **Property description**
7. **Vesuvian territory and new boundaries proposed for the buffer zone**
8. **Protection of the inscribed property and of the buffer zone**
9. **Strategic plan for the buffer zone**
10. **Strengths and weaknesses: an analysis of the territory**

1. Property description

The Site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata" was listed as a UNESCO World Heritage Site in 1997, based on three "cultural criteria" – which will be analysed below - out of the total 6 defined by the World Heritage Committee.

Criterion iii: **"Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared"**

The archaeological sites of Pompeii, Herculaneum and Torre Annunziata represent a valuable record of everyday life and society at a specific moment in history unlike any other in the world. They provide a clear picture of what life was like around Vesuvius 2,000 years ago, when, as a result of the most famous and devastating of all eruptions, that struck the area in 79 AD, several cities in the area were buried under a blanket of pyroclastic materials.

The excavation activities undertaken in the Bourbon period and that continued over time allowed us to recover structures, decorations, furnishings, inscriptions and graffiti, and to draw evidence from them of what public and private life was like in the area.

Criterion iv: **"**Be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history".

In the archaeological areas, one can admire the Roman city of the period between the 1st century BC and the 1st century AD in its several facets (urban, architectural and decorative) and its characteristic elements: luxurious villas, apartments, shops, public places, the Forum and the streets, but also items of furniture, tools and objects of everyday life.

The ancient city of Pompeii, which at the time was a major centre of trade based largely on river traffic, presents a complex urban structure rich with public buildings, temples, baths, palaces, theatres and beautiful villas.

The ancient city of Herculaneum, instead, appears as a residential centre and not mainly commercial like Pompeii was. In fact, it was one of the most beautiful residential area of Roman patricians, who built magnificent mansions here.

Torre Annunziata contains the underground villas of *Oplontis*, an ancient residential centre that hosted the summer homes of officials and dignitaries, a set of richly furnished and decorated buildings. One of the richest and most opulent villas of Roman times was brought to light in its territory; it presumably belonged to Poppaea Sabina, Nero's second wife. The architecture retains the fundamental traits of Roman tradition combined with elements of Hellenistic taste, while the walls inside are a triumph of murals.

Criterion v: **"**Be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change**".**

The archaeological sites are located within a complex territorial context that is marked by a mixture of residential areas, production sites and other areas of very high historical and environmental value, where the risk of earthquakes and volcanic eruptions is high. The exceptional housing density and the building expansion of the last forty years have contributed to compromising the archaeological and historical qualities and to radically upsetting the traditional landscape identity of the territory. The territorial area included in the management plan comprises both the properties listed as World Heritage Sites, represented by the archaeological areas of Pompeii, Herculaneum and Torre Annunziata, and a broader territorial context in which the three archaeological sites are included and which lies within the boundaries proposed for the buffer zone.

POMPEII

Historical and geographical context

Pompeii developed near the mouth of the Sarno river, on a small promontory that, until the eruption of 79 AD, was separated from the sea by small lagoons and sand dunes.

The presence of a pile dwelling inhabited for several centuries during the 2nd and 1st Millennium BC and unearthed by recent excavations at a ford of the river in Longola – Poggiomarino, a few kilometres from Pompeii, has revealed the importance that the valley of the Sarno river, a small district in terms of geographical extension, had even before the foundation of Pompeii for North-South communications in Tyrrhenian Italy's historical and geographical context. Between the end of the 9th and the beginning of the 8th century BC, this relevance resulted in a renewed prosperity thanks to the increasingly intense relations established by indigenous peoples with the Etruscan areas of Capua to the North and Pontecagnano to the South, and with the Greek colonial area (Pithecusa, Cuma)

concentrated in the Northern part of the Gulf of Naples. At the end of the 7th century BC, we witness a decrease in the number of settlements and their organisation according to a proto-urban pattern. It is at this time that Nocera, located in the upper valley of the river, and Pompeii, situated at its mouth, began to form.

The plateau on which Pompeii developed was the residue of an ancient volcanic cone formed during the Holocene, of heights varying between 30 and 40 meters a.s.l., and very steep in North-South direction. The significant difference in altitude was partially settled with grading and terracing works. The stage of the first settlement of Pompeii (late 7th century BC) can be linked to the almost simultaneous construction of two shrines, the Temple of Apollo in the place that would subsequently host the Forum and the Temple of Athena and Hercules on the lava outcrop overlooking the mouth of the Sarno, as well as of the city walls in local lava that includes an urban space occupied by villages separated by fields, that remained unchanged in terms of size even in the Samnite and Roman phases of the city.

Around the middle of the 5th century BC, a profound crisis due, among other things, to the migration of populations from the innermost districts of the region, hit Pompeii (as well as other towns of Campania). According to the account of the Greek geographer Strabo (*Strab*. V .4, 8), the city was now permanently occupied by the Samnites. Other sources testify to the involvement of Pompeii in the Samnite wars, at the end of which the city came into the Roman sphere of influence. At the end of the war against Hannibal, at the end of the 3rd century BC and throughout the following century, Pompeii enjoyed a period of great prosperity. New quarters were built and the areas already occupied in previous centuries were renovated, while important public utility buildings were built and existing ones were embellished. Pompeii became an important seaport, trading with the entire Mediterranean basin, as attested by the presence of several families of Pompeian origin at Delos, the largest emporium of the time, and became a magnet for many Italians who moved there, attracted by the advantages offered by its location. The reinvestment of commercial profits led to the creation of large farms specialised in wine production (the famous *Holconia vitis*) and of craft businesses, such as furnaces for the production of bricks and ceramics. This situation continued until the beginning of the Social War, when Pompeii, too, is mentioned among the cities that rose against Rome (Appian, Civil Wars, I, 50; Orosius, V, 18, 21 -22; Velleius Paterculus II, 16, 2). After the war, during which the city was conquered by Silla, the dictator deprived it in 80 BC of the status of *municipium* and established there the *Colonia Veneria Pompeianorum*, an event that marked a

profound mingling of the population due to the arrival of Roman settlers, who became the new dominant class. Roman sources mention Pompeii again on two occasions: in the course of the battles between Pompey and Caesar, and to describe the well-known episode of scuffles that erupted in the amphitheatre on the occasion of the gladiatorial *munus* organised in 59 AD by *Livineius Regulus.*

On January 5, 62 AD, a terrible earthquake devastated Campania, with disastrous effects on Pompeii and Herculaneum (Tac. *Ann*., XV, 22; Sen. *Nat. Quaest.*, VI, 2). Reconstruction moved at a fast pace and the eruption of Vesuvius in 79 AD therefore buried a city that was fully efficient. Immediately after the eruption, Emperor Titus arranged for the provision of first aid by sending two *curatores restituendae Campaniae*, but unlike in other centres, in Pompeii it was not possible to promote the return of the population to the city and its reconstruction.

Urban development

An important aspect of the archaeological Site is the ability, increasingly applied in recent years as part of widespread stratigraphic research, to monitor the urban and architectural evolution of an ancient city of medium size in a significant region of Italy. This ability ties in with the one - already exploited since the early days of excavations - that allowed archaeologists to unearth, along with the other complexes of the Site and the National Museum in Naples (part of the Site “Historic Centre of Naples”), the most comprehensive and significant collection of home decoration and furnishings of a Roman city in the early Empire Age.

The monumental and urban development model considered most reliable for Pompeii was the one that theorised a progressive development of the city. According to this reconstruction, in fact, a village is presumed to have developed in the 6th century, defined by a set of walls, a network of inter-urban roads and squares and of extra-urban streets, with sanctuaries within and without the walls. The urbanisation of the area between the *Altstadt* and the city walls was still very modest and sparse, limited to the sections bordering the streets, with settlements separated by wide cultivated areas. The *Altstadt*, with a surface area of about 9 hectares, was centred on a sanctuary of Apollo with strong Etruscan characterisation, which apparently had a suburban offshoot, the sanctuary of Athena at the Foro Triangolare (Triangular Forum), whose primarily Greek architectural features would seem to point to the fact that is was once a marketplace. Other suburban sanctuaries are present in the harbour area, in the hamlets of Bottaro, S. Abbondio, and Fondo Iozzino.

The stage less documented is the one that encompasses the second half of the 5th and 4th centuries BC, a period marked by a major crisis that caused the demise of the Greek and Etruscan population and the emergence of the Samnites throughout the region. The radical nature of this change is documented by the almost total absence of new buildings and of any maintenance on the religious buildings, and by the contraction of the votive ditches of the shrines. The only work is the construction of the double-curtain city walls in Sarno limestone orthostats.

The decisive phase, which gives birth to the Pompeii that was ultimately buried by Vesuvius, began in the early years of the 3rd century BC. The earliest evidence of public buildings is seen during this period: the Stabian baths, the first stage of the Theatre and a building for public meetings on the Hellenistic model of the *hestiatorion*. With the tracing of the *cardo* (via Stabiana, via del Vesuvio), and of the *decumani* (via della Fortuna, via di Nola and via dell'Abbondanza), the urban layout took on its current shape, in which the road network appears firmly oriented in the territory, with two strongholds, Mount Vesuvius to the North and Mount Torrenone to the East, taking on the religious value of *auguracula* of the city.

During the 3rd century BC, a new city wall was built, where the coincidence between the road layout and the arrangement of the gates and towers points to the knowledge of the dictates of Hellenistic poliorcetics. This organisation remained in use throughout the life of the city. Seven gates have been identified to date: Porta Marina, Porta Ercolano, Porta Vesuvio, Porta Nola, Porta Sarno, Porta Nocera and Porta Stabia.

Stratigraphic excavations carried out on a large scale throughout the city have helped reconstruct the housing model in use in Pompeii in the early 3rd century BC, represented by the model of the Atrium House (Tuscan or "testudinal", i.e. shaped like a tortoise shell), with a complex layout and sumptuous decorative features of direct urban derivation. At the end of the century, the atrium-shaped *domus*, tablinum and *hortus* begin to be used.

The 2nd century BC definitely should be considered the "golden age" of Pompeii. Most of the public buildings date back to this century: the Samnite gymnasium, the final architectural structure of the Stabian baths, the Republican spas, the two theatres with a large quadrangular porch, and the small urban sanctuaries used for the worship of foreign gods. The *Macellum*, the Basilica with the *porticus duplex* linked to it and the porches with colonnades, were built in the most prominent public area of the city, the Civil Forum, dominated to the North by the Temple of Jupiter, later transformed into *Capitolium*. The Temple of Apollo, instead, was reconstructed on the western side of the Civil Forum, and

the Temple of Venus was built just nearby. The city fully adopted the model of organisation of public and private spaces typical of Rome and its colonies. To this period, we also owe the construction of the most luxurious houses in Pompeii: Casa del Fauno, Casa di Pansa, Casa del Labirinto, Casa dei Capitelli Colorati, Casa dei Diadumeni, Casa di *M. Obellius Firmus*, all characterised by their large spatial extent and sumptuous décor. Following a trend which would be continued in the following century, luxurious *domus* were built on the western and southern sections of the city wall - whose military function had now become obsolete in Italy, which was entirely under the rule of Rome -, giving rise to buildings even four stories high and looking onto the landscape.

With the establishment of the Sillan *Colonia Cornelia Veneria Pompeianorum* in 80 BC, several public building sites were opened (Amphitheatre, Forum baths), including in the areas of the Civil and Triangular Forums, which multiplied the city's public spaces. In the countryside, opulent o*tium* villas were built or renovated (Villa dei Misteri, Villa di Diomede, Villa di Cicerone, Villa di *Fannius Synistor*) and even more numerous villas for agricultural production, while in the city most of the *domus* located along the *decumanus maximus* were rebuilt. The Amphitheatre, built around 70 BC by order of the *duumviri* Q. Valgus and M. Porcius, is among the oldest and best preserved amphitheatres of the Roman world, and could accommodate over 20,000 spectators. The *cavea* is divided into three sectors: the *ima cavea* (first row) for prominent citizens, and the *media* and the *summa caveae* higher up, for others. It also featured a canopy to protect spectators. The building is also known for the brawl between the Pompeians and Nocerians of 59 AD, which is also celebrated in the famous fresco from the house of I,3,23, or *of Actius Anicetus,* and preserved in the National Archaeological Museum of Naples, following which the Roman Senate decided to close the building for ten years and condemned its promoter, *Livineius Regulus*, to exile. After the earthquake of 62 AD, the building suffered considerable damage and the ten-year ban was lifted: the entire structure was completely renovated, as evidenced by two inscriptions found in the entrance passage, under *duumviri* C. Cuspius Pansa (father and son).

With the onset of the Empire, we witness the monumentalisation of the Forum up to the Quadrivio della Fortuna. A grand celebratory path of the ruling dynasty is built in this space. Along the eastern side are three buildings reserved to the Imperial cult (the building of Eumachia, the Temple of the Genius of Augustus and the so-called building of the Public Lari), the *Macellum* with the shrine of the *Ministers Augustales Mercurii et Maiae*

and the Temple of Fortuna Augusta. The Temple of Venus takes on the function of celebratory place of the origins of the *gens Iulia*.

The Palaestra Grande was built on the opposite end of the city, a gym dedicated to the physical and cultural education of youth that replaced the ancient Palaestra Sannitica behind the Teatro Grande, which was also renovated. The new housing model is that of the Atrium House, of which one of the best examples is Casa di *M. Obellius Firmus.*

The earthquake of 62 AD caused several changes in the urban layout and especially in the housing model. This period abounds with houses that have large gardens and spaces designed to accommodate guests, in particular, in the South-East quadrant of the city, an example of which is the small urban villa of *Octavius Quartio*, but the quality of the decorations and architecture is impoverished.

The eruption of 79 AD buried the entire city with its houses and shops, temples and theatres, returning to posterity the vivid image of an ancient city and of the tragedy that resulted in its ruin.

History of the excavations

About 44 hectares of the ancient city of Pompeii have been restored, roughly to two-thirds of its original extent. The first findings in the archaeological area date back to 1592. During the construction of the Canale del Conte di Sarno ("Conte di Sarno" canal) designed by Domenico Fontana, at the time of the excavation of the cave that runs just below the level of the ancient city, certain inscriptions and parts of structures were unearthed that, however, were attributed to the site of *Stabiae*. The actual archaeological excavations officially began in 1748, ten years after the beginning of the surveys in the underground of Herculaneum, by order of Charles III of Bourbon and which were meant to bestow even greater honour to the dynasty and add ancient objects to the royal collections. However, the lack of findings worthy of note soon led to the sites being closed, and they were abandoned and resumed only in 1763, following the discovery of an inscription containing the city's full name. It was only with the discovery of the Foro Triangolare and of the surrounding buildings that greater importance was attributed to the findings that emerged from the full excavations and that were left exposed, abandoning the previous practice of re-burying the buildings explored. A new thrust came under French rule (1799-1815), with the direct involvement of Caroline Bonaparte. The search applied scientific criteria and methods with the aim of reconstructing the city's topography and the functionality of its spaces. The city walls around the perimeter of the settlement were surveyed and the foundation for the protection of the urban area was laid thanks to the acquisition of private

land by the Royal Treasury. At the same time, more watchers were hired, visits were monitored and isolated excavations were avoided, focusing on specific areas. Unfortunately, the expropriation process was completed only in 1870, because of the paucity of financial resources allocated for this purpose by the Bourbon Government. In 1858, to facilitate scientific research and the management of an area so vast, Giuseppe Fiorelli, at the time Director of the excavations, divided the city into 9 *regions* (districts) comprising *insulae* (blocks) of varying number, inside of which houses and workshops were opened that were marked with a number, precisely to avoid confusion with the conventional names attributed during excavation. Fiorelli is responsible for reorganising all the documents and layouts gathered until then, the publication of the excavation journals of the Bourbon age in the three volumes of "*Pompeianarum Antiquitatum Historia*", as well as for applying the plaster method to retrieve the footprints left on volcanic soil by perishable materials. Another work completed under the supervision of Giuseppe Fiorelli between 1870 and 1885 by Tascone was the General Map of Pompeii, which was often updated and revised to include new editions. This was followed by the staggering scale model (1:100) now preserved in the National Archaeological Museum of Naples, which represents an invaluable testimony to the condition of the excavations in the last century. A special moment in the city's history is represented by the repeated Allied bombings of September 1943, which struck several buildings, some of which were completely destroyed. During the 20th century, under Vittorio Spinazzola first and then Amedeo Maiuri, most of the excavations in the city and suburbs were completed and excavations began in via dell'Abbondanza. The serious and growing problems in the routine maintenance and conservative restoration of the buildings and ornamental structures led to setbacks in the excavation after the great efforts perfused by Maiuri. Starting in the 1960s, under de Franciscis, the excavation activities were confined to targeted works, with a particular focus on preserving the contexts. After the earthquake of 1980, which was followed by the campaign to estimate damages by the Extraordinary Commissioner Zamberletti, explorations were further slowed down, with a few scheduled excavation (and restoration) works aimed at attracting incoming tourism in the new areas. Currently excavations to unearth new structures are prohibited, and only stratigraphic research and interdisciplinary studies concerning the city's earliest phase are allowed, regulated by a strict protocol established by the Superintendency.

HERCULANEUM

Historical and geographical context

The ancient city of *Herculaneum* is described in sources from the 1st century BC. According to *Sisenna*, the city was an *oppidum* with walls built on a volcanic plateau in an elevated position overlooking the sea and at the foot of Mount Vesuvius, confined on the eastern and western sides by two streams, two river creeks that served as natural and safe harbours.

Historical sources are at odds as to the origins of *Herculaneum*: Dionysius of Halicarnassus (I, 35) attributes its foundation to Hercules on his journey back from Iberia, therefore suggesting the city's Greek origin and connecting it to the myth of the demigod bearer of culture and civilisation by having founded the city. Strabo (V, 4, 8) suggests that Herculaneum and Pompeii were originally inhabited by the Opici-Osci, then by the Etruscans and the Pelasgians, and finally by the Samnites, bearing witness to the progressive complexity of both settlements.

Like Pompeii, *Stabiae* and Sorrento had to be part of the so-called Lega Nucerina, with which it shared a similar fate, falling under Rome's sphere of influence at the end of the 4th century BC. Associated with the other Italic cities during the social war, it was conquered by *Titus Didius*, a legate of Sulla, and became *a municipium* after 89 BC, benefiting of the provisions introduced by the *Lex Plautia Papiria.* Life in the city continued without noteworthy events until its destruction. The amenity of the attractions and the landscape's beauty made it a favourite location of the Roman leaders, who had built numerous villas along the coast, the most famous of which is Villa dei Papiri located near the city centre.

The city came to a sudden end in 79 AD due to the eruption of Mount Vesuvius. After the descent of several *surges* with temperatures of 400°C and at a speed of about 80 km/h, the city was buried with 10 billion tonnes of magma and hundreds of millions of tonnes of water vapour and gases arising at a speed of 300 m/s. This disaster caused a blanket of volcanic deposits between 16 and 30 metres high that covered the city, and the area of Villa dei Papiri was also covered by the lava that erupted in 1631. The eruption of 79 AD handed down a city that crystallised in its later stages of life, in which the decorated building structures, furnishings and, in particular, organic materials such as food and wood remarkably have been preserved.

Knowledge of the urban layout of Herculaneum is determined by applying burial methods. The ancient city, in fact, is covered by the impressive tufa bank that consolidated after the

eruption and on which the modern city of Resina was built, which only in 1969 regained the name Herculaneum. Of its surface, estimated around 20 hectares, only 4.5 hectares have been unearthed, consisting exclusively of private homes. The forum and public buildings have not been explored.

Although limited surveys have been carried out, which have led to assume the existence of an urban layout similar to an "ippodameo" and dating back to the 4th century BC, the insignificance of the portion surveyed and the almost total lack of stratigraphic excavations make a reliable reconstruction of the oldest urban affairs in Herculaneum, impossible. More than half of the city, including the area of the Forum with all the civil and religious buildings annexed to it, is still buried under the modern city. At present, private dwellings of different types are visible, ranging from the home with traditional layout to multi-family tenements, to large residences with entire neighbourhoods arranged on terraces and within which the architectural solutions typical of villas were adopted.

We know for a fact that during the 1st century BC, *Herculaneum* was a small *oppidum* surrounded by walls. Like almost all cities of ancient Italy, it underwent profound renovation in the Augustan age thanks to the local oligarchy's acts of euergetism. In fact, several public buildings were built or radically renovated, among which are the *Macellum*, the theatre, the basilica, the walls and gates, a public scale, a *schola* and a *chalcidicum*, the seat of the *Augustales*, the aqueduct with the network of public fountains and lifting pillars, perhaps the first layout of the Temples of the Area Sacra Suburbana (Suburban Sacred Area), the Terme Centrali and the Palaestra. Alongside these public works, we ought to point out that several private buildings also were renovated. After the earthquake of 62 AD that made many buildings unstable, further damage was caused by the continuous tremors that preceded the eruption of 79 AD. Emperor Vespasian financed the reconstruction of the *Augusteum* and of the Temple dedicated to *Magna Mater* (not yet identified), and many other restorations have been archaeologically and epigraphically documented.

In spite of the limitations imposed by the small size of the portion surveyed, we can affirm that the urban layout was organised on three *decumani* running parallel to the coastline and that were intersected by five streets (*cardines*) and surrounded by defence walls, a small stretch of which are attributable to a more ancient fortification of the 2nd century BC. All the *cardines* led to the sea through permanently shut gates that opened into the walls. The decumanus maximus was intended for pedestrians. Of the road network, three streets and two decumani are currently visible, while the others have been explored through

tunnels. Similarly, the location of the graves is deduced from the floor plans. Only the city's suburban portion is sufficiently well known (the so-called Terrazza Meridionale, with the baths and the sacred area dedicated to Venus), which makes up the southern front of the urban settlement overlooking the beach. With the impressive vaulted substructures, the terraces above and the large private residences, sometimes divided into multiple levels, it provides an illustration of ancient Herculaneum, built on a series of terraces overlooking the coastline. The excavations carried out between 1996 and 1998 in the area of the so-called Scavi Nuovi located North of the archaeological site have unearthed a new city block that validates this reconstruction. The opulent Villa dei Papiri, of which only a fraction has been brought to light, develops North of this block, in a dimension that is now decidedly suburban. The villa was built in terraces that spread over a hill Northwest of Herculaneum in parallel to the coastline and spanned a stretch over 250 metres long. Four main units have been identified: a central unit made up of an atrium, a tablinum and a square peristyle; a series of rooms in the eastern wing; a large rectangular peristyle and a few structures West of the rectangular peristyle in the direction of a terrace that ended in a circular belvedere. The residential complex has brought to light approximately 90 sculptures and over 1800 Papyrus rolls, mostly Greek texts of Epicurean philosophy by Philodemus of Gadara, a philosopher of the 1st century BC, along with some in Latin, including an anonymous *De bello Actiaco* about the war waged against Octavian by Mark Antony and Cleopatra.

History of the excavations

The first findings related to the city were unearthed between 1709 and 1711, when Emanuel-Maurice de Lorraine, Prince of Elboeuf and Commander of the Austrian army that settled in Naples and who had purchased agricultural land in the village of Resìna, having acquired some statues, carried out excavations he personally funded and explored the area of the theatre through tunnels. The official excavations began during the Bourbon period, in 1738, and were funded by the Royal Treasury with the aim of collecting materials for the glory of the Kingdom and for the decoration of the Royal Palace of Portici being built. The excavations continued, applying the method of digging underground tunnels and shafts until 1828, when "open sky" excavations were authorised, and which continued until 1875. The excavation of Herculaneum has taken on much importance in the history of culture, because it marked the beginning of a new season of excavations different from those carried out hitherto in Rome or in other sites, with plans for a complex organisation dedicated permanently to the excavation, study and publication (Accademia

Ercolanese), conservation and museum-rendering on site of the finds (Herculanense Museum) and their promotion through international visits by "meddlers" and the creation of modern furnishings inspired by antiquity. The emerging neoclassical style drew much inspiration from images of Herculaneum and Pompe\1i, while the legislation dedicated to the creation of a system of research and archaeological protection had great influence on laws passed in other countries, starting with the excavations in the Spanish colonies of America.

After a long interruption, the works were resumed in 1927 by Amedeo Maiuri, who oversaw them until 1958, but already in 1942, almost the entire area that constitutes the current Archaeological Park had been excavated and restored. Between 1960 and 1969, other excavation works were carried out in the northern sector of the Insula VI and along the decumanus maximus, while over the past 20 years, the ancient shoreline that coincides with the southernmost range of the archaeological site has been explored. In the years 1996-1998, open excavations were carried out in the area conventionally named "Scavi Nuovi".

Even the excavations of Herculaneum are divided into *insulae*, a total of 9 numbered counterclockwise, in addition to the suburban area of the Terrazza Meridionale (cartography and images).

TORRE ANNUNZIATA

Historical and geographical context

The name *Oplontis* appears only in the *Tabula Peutingeriana*, a medieval map taken from a Roman road map, where it is placed between Pompeii and Herculaneum near modern-day Torre Annunziata. *Oplontis* is believed to have been a small semi-urban cluster that was administratively dependent on Pompeii and whose structure unfortunately can be reconstructed only hypothetically because of intense modern urbanisation, which is an insurmountable obstacle to any research. The main findings that fall in the cultural heritage asset are villa A, the so-called Villa di Poppea, and villa B (a *horreum* belonging probably to a *Lucius Crassius Tertius*). Other villas have been identified along the coast (Complesso delle Suore di Cristo Re, Punta Oncino), near which thermal environments have been surveyed that are believed to have belonged to *Marcus Crassius Frugi*.

History of the excavations

The first remnants of the villa were discovered in 1748, when a farmer who was farming in the village at that time called "Mascatelle" di Torre Annunziata found fragments of frescoes

and marble. To be precise, these were not the first findings, because during the works for the construction of Canale Conte di Sarno (1594-1600), which in East-West direction crosses the southern portion of the villa, "marble with inscriptions in Latin" had been found. The findings in the early 18th century were followed in 1839 by the excavations carried out under Bourbon official Michele Rusca, which led to the discovery of the peristyle of the servile district and of other areas explored through tunnels. Although the excavations were suspended in 1840 due to a lack of funds and the ancient remains backfilled, fortunately, thanks to the foresight of the Superintendent of the time, Francesco Maria Avellino, the area of the villa was acquired by the State, to reserve it for future explorations, saving it from urban expansion. The extensive excavations which therefore were made possible about a century later between 1964 and 1984 by order of Alfonso de Franciscis have unearthed a large part of the old building, whose preservation was guaranteed by the contextual restoration work and coverage. The building is located within the modern urban centre adjacent to a major complex of the Bourbon age used to manufacture weapons. The disposal of this industrial activity and its public property offered an extraordinary opportunity both to extend the excavation of the main district and to build an Antiquarium of the site as part of an advisable and in any case necessary urban redevelopment project. The villa has been explored in recent times, between 1972 and 1985, following the discovery of structures during works to expand a school building. There are additional remains between the two units that document the existence of other complexes.

Architectural context

Located on a high promontory on the coast, as recent excavations have shown, villa A is divided into two sectors. The original unit is ordered around the Tuscan atrium and dates back to the 1st century BC. It features a magnificent pictorial decoration in II style, replaced in some environments by a decoration in III style of the Augustan age. Under Claudius Nero, the villa was expanded eastward, adding a neighbourhood organised around the large pool and decorated in so-called IV style. The villa therefore represents a rare and qualitatively outstanding specimen of decorative patterns and paintings supplemented also by marble furnishings and sculptures. The villa is believed to have belonged to *Poppea Sabina*, wife of the Emperor Nero, based on the presence of graffiti bearing the names of members of the Court of Nero and of freedmen of the Emperor.

The so-called villa B, which is believed to have belonged to *L. Crassius Tertius* based on a ring-seal found in the excavation site, dates back to the 2nd century BC, but shows clear signs of restorations in the 1st century AD.

The excavation brought to light the building and part of another complex located to the North and separated by a road on which there were shops with apartments on the upper floor. The central unit of the building, inaccurately defined as a villa, consists of a large area with packed dirt floor and is bordered by an impressive colonnade with a double row of columns surrounded by rustic environments and linked to a first floor used for habitation, with decorative elements of IV style. More than 400 amphorae, weights in stones and modii for measuring of goods were found. The building, which experienced its social peak at the time of the eruption in 79 AD, was evidently a warehouse (*horreum*) used for the trade in wine and agricultural products.

In addition to other furnishings, the complex has returned a group of objects known as "Ori di Oplontis." In fact, in 1984, a wooden crate was found that contained 170 coins, some jewellery in gold and silver, a series of unguentarium (glass bottles used for oil), bones and glass dishes for cosmetics. In another environment, gold jewellery consisting of various types of earrings, necklaces, bracelets and rings decorated with gems and precious stones were found on the dead bodies of victims of the eruption.

2. Vesuvian territory and new boundaries proposed for the buffer zone

…mias poleos opsin parechontai **("…offer on a whole the aspect of a single city")**

Strabone, Geografia, Libro V

Referring to the recommendations made by the joint ICOMOS/UNESCO mission in the wake od the collapse of the *Schola Armaturarum* at Pompeii in November 2010, the World Heritage Committee asked for the buffer zone to be extended, not only to better safeguard and protect the archaeological areas, but more importantly, to ensure the conservation of the visual relationship between the ancient cities and Vesuvius, since it is this landscape that gives the whole Vesuvian region its identity. Therefore the first step for establishing the limits of the new buffer zone was to analyse the geographical, socioeconomic, and cultural characteristics of this region, and the planning tools currently available for governing its development.

Ever since antiquity, the felicitous geographical position of the Vesuvian territory has made it so attractive for human settlement that during the Roman period the geographer Strabo, describing the Gulf of Naples, wrote "***bounded by two headlands that look towards the south, Cape Miseno and the Cape of Athena, the gulf known as the Krater comes to an end here and is made all the more beautiful by the cities that lie along its sweeping curve, and in the spaces between them by residences and plantations set one next to the other, all giving the appearance of a single continuous city".***

The beauty of this setting, as Strabo observed it, demonstrated how fertile and wealthy it was in ancient times. Even today it is still beautiful even though the inability to control how

it is used, together with demographic pressure, have been having deleterious effects that now put the cultural and landscape heritage at risk.

With one of the highest population densities in Europe, this territory has now become a dense admixture of residential and industrial areas interspersed with areas of high historic and environmental value, which can be seen both as points of strength and points of weakness within the overall territorial system. The strongest, most significant way in which we perceive the Vesuvian landscape is the visual relationship between the sea, the coast, and the great volcano itself, but over the past forty years this has become seriously compromised by the uncontrolled expansion of construction (including widespread illegal building) which affects not only the coastal strip but the very slopes of Vesuvius itself.

The ancient Vesuvian cities are a scientific-cultural reference point and a tourist destination today not only because of the importance they had in the Roman world but above all because of the events that caused their destruction. This established their relationship with the landscape as we now think of it: ever since 79 AD we have seen the eruption of Vesuvious and the destruction of these cities as a single phenomenon of cause and effect. That is what gives the excavations their personality as we understand it, and it would be unthinkable to preserve them without also conserving their immediate surrounding environment and the wider landscape.

For that reason the new perimeter of the buffer zone is intended to strengthen the uniqueness of the UNESCO site by protecting and enhancing appreciation of all the elements of which the region originally consisted when it was an ancient territorial system.

This is a very particular situation that can only be found here. This territory once nurtured an everyday life that emerges not only out of the excavated squares, streets, and houses of the cities, but also from the farms that have been excavated in the countryside where, as at the *villa rustica* of Boscoreale, it has even been possible to reconstruct rows of grapevines, or from the maritime villas of Stabiae, built on the ruins of a pre-Roman city destroyed by Sulla. Despite all the changes brought about by the passage of time and the sedimentation of disparate elements in the landscape, the works of our ancestors still look out over the same panoramic view of the Gulf, and their beauty still moves us.

Analysis of the **Campania Region Territorial Plan** made it possible to identify, as part of the system of territorial development axed on the coastal Bourbons road, a "**Golden Mile"** from Torre Annunziata to Stabiae in which the Vesuvian municipalities can be seen as the element around which to further develop a proposal for the perimeter enclosure of the buffer zone. This is also in view of the fact that the area is already protected by the Landscape Plan of the Vesuvian Municipalities, drawn up in 1998 by the Ministry of Cultural Heritage and Activities under Law 431/85.

The "**National Park of Vesuvius and the Golden Mile from Torre Annunziata to Stabiae**" was recognised as early as 1997 as a **Reserve** of the "**MAB-UNESCO"**

Biosphere, and plays a crucially important part in identifying the new perimeter of the buffer zone, since it opens up the possibility of interconnecting the UNESCO site with Vesuvius.

Thus reconfigured, the buffer zone will include a large area whose great value has been acknowledged in many different ways by a range of different institutions. It will link the archaeological areas of Pompeii, Herculaneum, and Torre Annunziata with the other archaeological, cultural, environmental and landscape evidence in the district, constituting a regional system that will ensure the heritage values of the UNESCO site are protected. Joint action will then be possible to favour sustainable tourism and forms of economic development that focus on the values of this heritage.

Within the buffer zone, protective action will be implemented in accordance with the already existing regulations provided by the regional plans: the **Landscape Plan of the Vesuvian Municipalities** and the **Territorial Plan of the Sorrento Peninsula**. The zoning provisions in these plans is regulated in accordance with the implementation regulations of the **Campania Landscape Plan**.

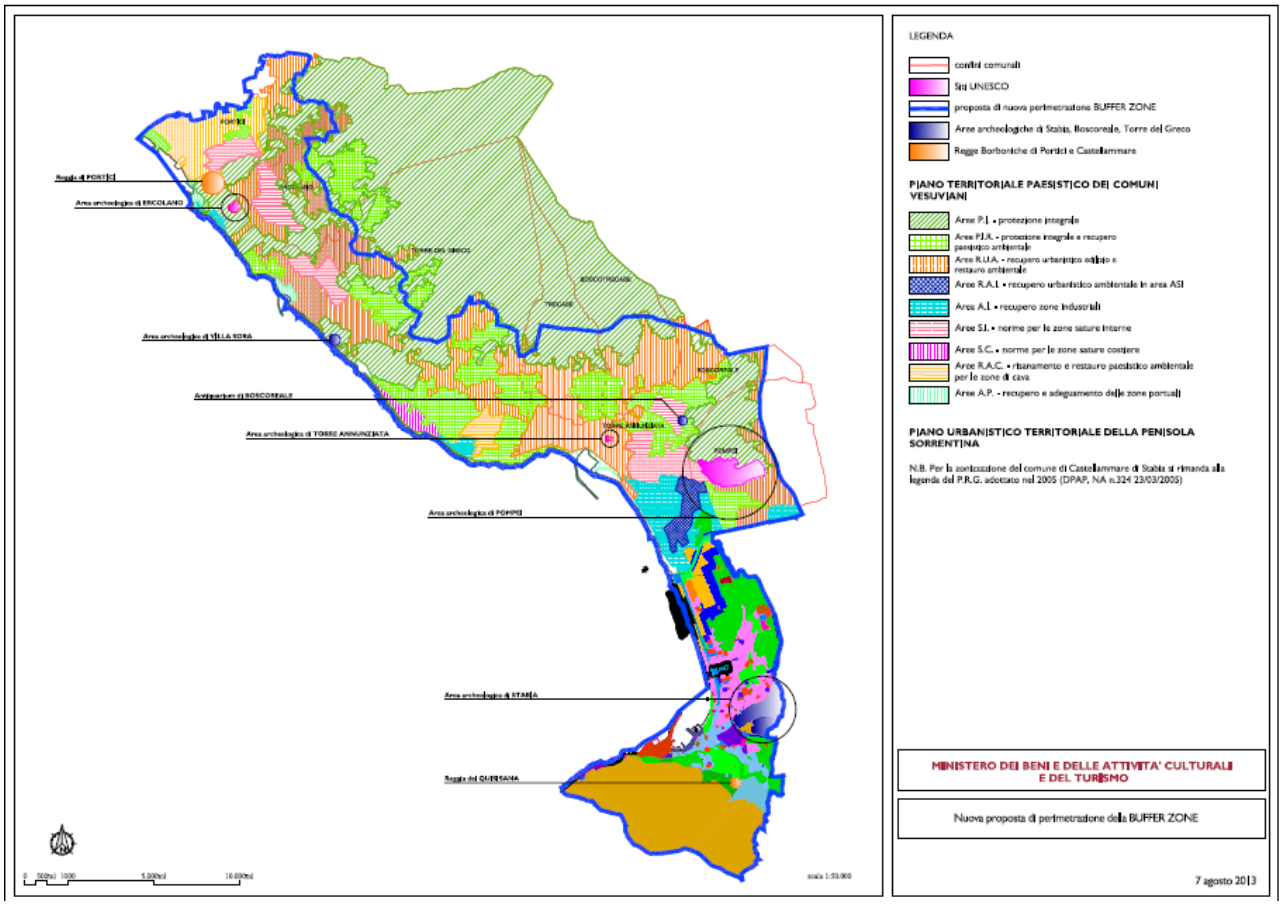


Fig. 1 Buffer zone perimeter proposed with Zoning Landscape Plan

3. Protection of the inscribed property and of the buffer zone

Guidelines for the protection of the archaeological heritage

The **archaeological areas of Pompeii, Herculaneum and Torre Annunziata are the property of the State** and as such are subject to the rules of protection set out in *Legislative Decree No. 42/2004 (Cultural Heritage Assets and Landscape Code)*. The State owes the acquired property of the areas of Pompeii, Herculaneum and Stabia to the fact that they formerly belonged to the French or Bourbon Royal Treasury. With the unification of Italy, the areas of Herculaneum, Pompeii and Villa A in Torre Annunziata continued to be State-owned.

The **protective measures** of the Vesuvian sites for private and public areas not owned by the State intensified during the first three decades of the 20th century. Starting from 1924, Amedeo Maiuri decided to impose constraints on areas of the city of Resina that were still free and that fall within the confines of the city of *Herculaneum.* The State relied on extraordinary funds to acquire an area of seven hectares coinciding with the area southeast of the city.

In 1929, with *Ministerial Decree dated June 10*, the State established the buffer zone for the State-owned area of Pompeii based on *article 14 of Law no. 364 dated June 20, 1909.* The Decree, which is still in force, provides that all routine and special maintenance work that falls within the outlined perimeter should be subject to approval by the Ministry of Education (now the Ministry of Cultural Heritage and Activities, and of Tourism), in compliance with the provisions of law that call for a safeguard area to prevent that the integrity of immovable property subject to the law be jeopardised, that its prospect or light suffer damage, or that the environmental conditions and decor be altered.

The protective measures continued in time, pursuant to *Law no. 1089 dated June 1, 1939, Leg. Decree no. 490 dated October 29, 1999* and *Leg. Decree no. 42 dated January 22, 2004*.

The measures especially concerned **Pompeii**, where the perimeter of the necropolis outside the southern portion of the city walls near Porta Stabia was declared a site of archaeological interest, and the buffer zone for the areas adjacent to the property was expanded in the hamlet of Villa dei Misteri, near the so-called Villa Imperialis, in front of modern-day Piazza Esedra and in the perimeter of the necropolis of Porta Stabia.

Several restrictions were imposed on the area North of the city, the so-called Civita Giuliana, modern place name that preserved the memory of the city buried and of

unidentified *praedia* owned by the Giulii. Other sites in the same area were declared to be of archaeological interest, namely a funerary monument, a cemetery and the rustic villas, which are a testimony to the settlement's continuity even after the Plinian eruption.

Other rustic villas, burial grounds, avenues and a sacred building fell under the State's tutelage in Via Moregine, via Plinio, via Lepanto - traversa Campo Sportivo; via Casone, via Minutella, fondo Pacifico and fondo Iozzino.

In **Torre Annunziata**, by *Decree dated March 10, 1978*, the State declared "the particularly important interest", within the meaning of *articles 1 and 3 of Law no. 1089 dated June 1, 1939,* of the land surrounding the perimeter of the two villas, and the area of Villa B was included among the State's properties.

As for the theatre of **Herculaneum**, in 2002 the State renewed the restriction for the protection of the theatre, establishing an area that includes exactly the surface of the scenic building, part of an ancient street located on the extension of the decumanus maximus, and part of the Bourbon tunnel that connected two ancient wells, which allowed the knowledge of the city.

In addition to the specific measures of archaeological protection, the territories belonging to the municipalities of **Pompeii, Herculaneum and Torre Annunziata** were also subjected to the national legislation of landscape protection established by the *Cultural Heritage Asset and Landscape Code* (*Leg. Decree No. 42/2004*). More specifically, for the archaeological sites of Pompeii, Herculaneum and Stabia, the plan in force is the **"Territorial Landscape Plan of the Vesuvian Municipalities"**, approved by *Ministerial Decree of July 4, 2002*, which under *Title I, art. 4, paragraph 1* indicates that the standards of protection be applied to the areas identified and with the perimeter stated in *Title II* of the same law.

The plan, pursuant to *art. 23 of Royal Decree No. 1357/40*, is immediately binding and prevalent in respect of municipal and provincial urban planning tools and of the **Territorial Coordination Plan**, pursuant to *art. 5 of Law No. 1150 dated August 17, 1942,* and the regional sector plans. For all projects concerning things and properties included in the territories governed by the territorial landscape plan, authorisation must be requested in advance to the competent Superintendency.

The powers of guardianship for areas falling within the UNESCO Site are exercised by the **Soprintendenza Speciale Pompei** (Special Superintendency for Pompeii**)** in relation both to the State-owned and privately-owned areas, and by the **Soprintendenza ai Beni Archeologici, Architettonici e ai Beni Paesaggistici della Città Metropolitana di**

Napoli (Superintendency of the Archaeological, Architectural and Landscape Heritage of the Metropolitan City of Naples) for the external territory. Coordination tasks are entrusted to the **Segretariato Regionale per i Beni e le Attività Culturali della Campania** (Regional Secretariat for Cultural Heritage and Activities of Campania), peripheral agency of the MIBACT, which replaced the former Regional Directorate.

Landscape conservation and protection rules applicable in the *buffer zone*

The *buffer zone* is a territorial system which, in our case, identifies and demarcates an area that has shared the destiny of burial and rediscovery with the UNESCO sites, that to this day continues to share the geomorphological characteristics, plant and wildlife, and cultural heritage in all aspects that bear witness to the action of man on the territory and, above all, the landscape shaped by such action.

The term "**landscape**" has several meanings, but fundamentally, it is the product of the interaction of natural and anthropogenic factors that combine to shape the territory, as an archive of the traces of the history of mankind and nature, a common and symbolic good and collective cultural reference.

The **European Landscape Convention** (Council of Europe, 2000) defines it as something that *"designates a certain part of the territory, as perceived by people, whose character is derived from the action of natural and human factors and their interrelationships"*. This entails that not only the landscape deemed "exceptional" be subject to protection, but above all, the one seen as relevant to each community, through its collective memory and the awareness of its past.

The value of the landscape is confirmed by the current Italian legislation in the **Cultural Heritage Asset and Landscape Code**, which under art. 131 reads as follows: "*For the purposes of this code, landscape means a homogeneous part of territory whose characters are derived from nature, from human history or from their mutual interrelationships. The protection and enhancement of the landscape safeguard the values that it expresses as perceivable manifestations of its identity*".

Protection within the *buffer zone* will be ensured by enforcing the existing rules under the current territorial programming tools, such as:

- the Landscape Plan of Vesuvian Municipalities (for the most part of the territory of the inscribed property)
- the Territorial Urban Plan of the Penisola Sorrentina (for the buffer zone of the Stabian territory)

Landscape Plan of Vesuvian Municipalities

The Territorial Landscape Plan of Vesuvian Municipalities (PTP) issued by MIBACT in 1998, pursuant to Law No. 431 dated August 8, 1985, is immediately binding and prevalent in respect of municipal, provincial and regional urban planning tools, which must be adapted to the rules of the Landscape Plan.

The plan was approved with *Ministerial Decree of 04.07.2002* by the Minister for Cultural Heritage Assets and Activities. The plan contains the rules and guidelines for the territories of the Vesuvian Municipalities - San Giorgio a Cremano, Portici, Ercolano, Torre del Greco, Torre Annunziata, Pompeii, Boscoreale, Boscotrecase, Trecase, Terzigno, San Giuseppe Vesuviano, Ottaviano, Somma Vesuviana, Sant'Anastasia, Cercola, Massa di Somma, Pollena Trocchia, San Sebastiano al Vesuvio, Nola-Castel Cicala - that are subject to the provisions of art. *1* quinquies *of Law No. 431 dated August 8, 1985*.

The field of application covers the whole territory of the municipalities listed above, as identified by *Ministerial Decree dated March 28, 1985*, and which concerns the areas and assets identified pursuant to *art. 2* of *Ministerial Decree dated September 21, 1984*.

The plan consists of the *plan report*, the *implementing rules* and the *zoning tables*.

The report describes the reference laws, the set of methods applied, the objectives of the plan, the scope of planning, the analysis of the territory, the categories of assets, the fields of application and the degrees of protection.

The regulated areas are divided into zones, according to their perimeter and specific regulations. The distinction is inferred from the differentiated *value* of the constituent elements. These values correspond to different *degrees* of landscape protection.

The categories of assets to be protected are those identified in *art. 1* of *Law No. 1497 dated June 29, 1939* and in *art. 1 of Law No. 431 dated August 8, 1985*.

The areas identified and their perimeters can be broken down as follows:

- *P.I.*: Integral Protection.
- *P.I.R.*: Integral Protection with Environmental and Landscape Restoration.
- *R.U.A.*: Urban and Construction Recovery and Environmental and Landscape Restoration.

- *A.I.*: Recovery of Industrial Areas.
- *S.I.*: Standards for Internal Saturated zones.
- *S.C.*: Standards for Coastal Saturated zones.
- *R.A.C.*: Environmental Remediation of Quarry areas of Torre del Greco and Terzigno.
- *R.A.I.*: Environmental Remediation of non-industrial Settlements
- *A.S.I.A.P.*: Rules for the Port Areas

The plan includes general provisions that apply to all zones, the categories of feasible recovery works and the rules for the protection of sea coasts, and describes the actions authorised for all zones. It then goes on to describe the individual zone, each with its own degree of landscape protection, and the afferent rules.

For the territories of the municipalities listed, the PTP identifies the following zones:

Integral Protection Zone (PI): includes the areas of high landscape value listed below:

- Area North-East of the settlement of Herculaneum between the urban nucleus of S. Vito (municipality of Herculaneum) and the foothill town of Torre del Greco.
- Two areas on the eastern side of the area, the one defined by the development of the settlements of Torre Annunziata, Trecase and Boscotrecase; the other by the settlements of Torre Annunziata, Boscoreale and Boscotrecase, and by the flat area of integral protection North of Pompeii.
- Area South of the archaeological excavations of Pompeii on the border of the planned area.

Area of Urban and Construction Recovery and Environmental Restoration (R.U.A.): includes the following urbanised areas prone to high urbanisation and with high landscape value that are to be concerned by the urban and construction recovery and by the environmental and landscape restoration works.

- Town and settlement of the municipality of Herculaneum.
- Nucleus of S. Vito in the municipality of Herculaneum, which is connected to its saturated settlement.
- Settlements articulated in two newer areas located upstream of the highway Napoli-Salerno, in the territory of Herculaneum and Torre del Greco.
- Area in the territory of Torre del Greco and Torre Annunziata grafted on S.S. no. 18 Tirrenia Inferiore (of Calabria) and connected to the nucleus of Cappella Vecchia in the foothills near Colle S. Alfonso (Torre del Greco).

- Large area of the settlement of Torre Annunziata linked to the North with the foothill settlement of the municipalities of Trecase, Boscotrecase and Boscoreale.
- Area on the border with the territory of the municipality of Pompeii South and East of the excavations.
- Area on the border with S.S. del Vesuvio no. 268, from the cemetery of Pompeii to the one in Boscoreale.
- Areas of recent expansion and public housing complexes in the town of Herculaneum (loc. Fosso Grande), up to the area upstream of the saturated zone of Portici.

Recovery zone of industrial areas (A.I.): includes the industrial areas of the municipalities of San Sebastiano al Vesuvio, Portici-Ercolano, Torre del Greco, Torre Annunziata and Pompeii.

Internal Saturated Areas (S.I.): includes the saturated urban areas listed below, some of which have a high landscape value.
- Area of recent expansion of the municipality of Herculaneum, from Corso Italia to the Napoli-Salerno highway.
- Area of recent expansion to the East of the settlement of Torre Annunziata, defined by the bend in the railway line Caserta-Castellammare di Stabia, and wedged up to Pompeii, between S.S. no. 18 and the Circumvesuviana railway.

Environmental Remediation Area of non-industrial Settlements (R.A.I.): includes the areas in the municipality of Torre Annunziata already falling in the industrial development plan (A.S.I.), today characterised by the presence of a widespread building fabric not classifiable as industrial.

Port areas (A.P.) includes the port areas of the municipalities of Portici, Torre del Greco and Torre Annunziata.

Article 18 establishes that the areas and archaeological sites and the historical and archaeological landscape included in the plan, as well as the 300-metre-wide perimeter in front of the sea coast of Torre del Greco, as outlined in the plan's zoning tables, are subject to full protection (P.I.), even in the absence of specific measures taken by the Superintendency. In these areas, the following requirements must be respected:

a) all public and private works falling in areas of archaeological interest that involve works on the ground, excavations or earthworks require the prior and binding approval of the Archaeological Superintendency.

b) unit and executive projects that fall into the areas of archaeological interest must receive prior and binding approval by the Archaeological Superintendency, which as part

of the application process, may order that archaeological essays be carried out at the expense of the applicant.

c) local urban planning tools, general and executive, should include in their legislation the preventive control of the territory, as expressed in the previous sub-point a). The prior approval will consist of binding and graduated measures, depending on the type of work to be carried out and of the historical and archaeological characteristics of the site.

Implementing rules of the Landscape Plan of the Vesuvian Municipalities

Art. 1 - Purpose and content of the plan

1. This plan establish rules and provisions regarding the municipalities in the area of Vesuvio: San Giorgio a Cremano, Portici, Ercolano, Torre del Greco, Torre Annunziata, Pompei, Boscoreale, Boscotrecase, Trecase, Terzigno, San Giuseppe Vesuviano, Ottaviano, Summa Vesuviana, Sant'Anastasia, Cercola, Massa di Somma, Pollena Trocchia, San Sebastiano al Vesuvio, Nola-Castel Cicala, subject to the provisions of art. 1quinquies of the Law August 8, 1985 n. 431.

2. This Landscape Territorial Plan, drafted pursuant to art. 1bis of the Law August 8 1985 n. 43, consists of the implementation rules and zoning plates.

Art. 2 - Boundaries of the plan environment.

1. The area covered by this plan includes all the territory of the municipalities of San Giorgio a Cremano, Portici, Ercolano, Torre del Greco, Torre Annunziata, Boscotrecase, Trecase, San Sebastiano al Vesuvio, Massa di Somma, and also part of the territory of the municipalities of Pompeii, Boscoreale, Terzigno, San Giuseppe Vesuviano, Ottaviano, Somma Vesuviana, Sant'Anastasia, Pollena Trocchia, Cercola and Nola-Castel Cicala, as identified by DM March 28, 1985 regarding the areas and assets identified according to art. 2 of D.M. September 21, 1984.

2. The areas governed by this plan are divided into zones, according to the perimeters and rules specified in the articles of the next Title II. The distinction of the different zones was determined by the distinguished values of the constituent elements recognized by the analysis. These values correspond to different degrees of landscape protection.

Art. 3 - Categories of the assets aim of the protection regulated by this plan.

1. In the area defined above, the categories of the assets to protect are identified by art. 1 of the Law of June 29, 1939 n. 1497 and by art. 1 of the Law August 8, 1985, n. 431.

Art. 4 - Rules of protection and zoning.

1. In the areas identified and defined in Title II of this plan, the following rules of protection shall apply:

P.I. Total protection
P.I.R. Total protection with landscape and environmental restoration
R.U.A. Urban-building recovery; landscape and environmental restoration
A.I. Industrial Areas recovery.
S.I. Rules for inland-overfilled zones
S.C. Rules for coastal overfilled zones
R.A.C. Environmental recovery of the quarry areas of Torre del Greco and Terzigno
R.A.I. Environmental recovery of non-industrial settlements in A.S.I.
A.P.: Rules for Harbour Areas.

Art. 5 - Effectiveness of the rules and the provisions of the plan.

1. This plan has the value of Landscape Territorial Plan pursuant to and in accordance with the first paragraph of art. 1bis Law 431/85.

2. The plan, referred in the preceding paragraph, pursuant to art. 23 R.D. 1357/40, provides rules immediately binding and prevailing against the municipal and provincial instruments of urban planning and

against the Territorial Coordination Plan, pursuant to art. 5 of Law August 17, 1942 n. 1150, and against Field Regional Plan. General and detailed land use plans must be adapted to the present Landscape Plan rules. In adapting the aforementioned planning instruments, or in developing the same instruments for Municipalities which don't as yet have them, areas of archaeological interest must be bounded in agreement with the Archaeological Superintendence responsible for the area; as well as historical town centres, units and rural complex of historical and environmental value, must be identified and bounded in agreement with the Superintendence for Architectural and Artistic Heritage.
The boundaries of historical town centres, units and rural complexes of historical and environmental value, will be approved in the statutory form and in accordance with procedures laid down by law.
3. The authorizations pursuant to art. 7 Law. 1497/39 and art. 1 Law 431/85 regarding projects on things and real estate included in the territories governed by this plan are issued in compliance with the requirements of this legislation. The Mayor, after receiving the formal advisory opinion of Integrated Building Commission ex lege R.C. n. 10/82, monitors the compliance with the rules contained in this legislation, immediately inform the Superintendence for Architectural and Artistic Heritage of any authorizations granted and send them to the Superintendence, together with the corresponding documentation pursuant to the fifth paragraph of Article. 1 Law no. 431/85.
The opinion of the Archaeological Superintendence must be requested in advance to the authorization release pursuant of the art. 7 law. 1497/39, for the areas of archaeological interest, bounded as set out in the paragraph 2 of this Article
4. It being understood the public interest of the Minister for Heritage and Culture for the annulment of the Mayor authorization pursuant to art. 7 law. 1497/39, as enshrined in the law August 8, 1985 n. 431. The building permit will be issued to the interested parties only after the expiry of the period provided by Law no. 431/85.

Art. 6 - Standards and general provisions for all zones.
1. The Plan provides rules for each of the individual zones specified in the next Title II. The general provisions listed below will apply to all areas.
2. Placement of hoardings and advertising objects, even if temporary, along all the roads and on both sides of them is forbidden. The placement of hoardings shall be regulate by a specific plan drawn up by the individual municipalities; this plan must be approved by the Superintendence.
3. Waterproofing the open areas, with the exception of public roads already paved and those to be built, compatibly with the rules of the individual zones, it is forbidden
4. Installation of curtains that prevent the panoramic view from the places accessible to the public it is forbidden.
5. All the residual views between the existing buildings and enjoyable from places accessible to the public, are protected and placed under the protection system of the buffer zones provided by point 1) art. 23 of R.D. n. 1357/40.
6. The areas resulting from the reinstatement of the places following the demolition of illegally built works, which cannot be remedied, are placed under the protection system of the buffer zones. Special projects providing for the demolition and the environmental redevelopment will be draft.
7. Public and private planking with traditional paving or traditional pavements should not be covered or replaced with other materials. After the installation of underground network services, the original planking mantles must be restored and set in place in a workmanlike manner, in accordance with the tradition of the area.
8. The TV antennas of any type, presents in each building, must be unified for buildings or groups of buildings, to not prevent the panoramic views.
9. All property referred in paragraph 3, article. 1 of the Law of 29 June 1939 n. 1497 are subject to the following requirements.
All materials and colours of the external parts of buildings, must be compatible with the environmental decorum: the downspouts visible from public spaces, gutters collecting and removing water from the roof and any other visible pipe or conduit must be made or replaced with parts made by galvanized steel or copper sheets; the channelling of technical facilities should be placed in a conduit; banister, grilles and gates of all types, visible from the outside, must be made of wrought or worked iron. The anodized aluminium is forbidden.
10. In the historical centres, housing units and rural properties of historical and environmental value, with the exception for buildings of recent plant referred in art. 7 point 6 below, only routine and extraordinary maintenance, restoration and conservative renovation works are allowed. The materials will be that of the tradition and they will be used for masonry, window frames, gutters and gargoyles, downspouts, fences, roof coverings and exterior floorings. Roof coverings made with traditional tiles cannot be replaced with other materials. In waterproofing of vaulted extrados the use of bituminous, and all those materials that could modify the appearance, the colour scheme and the external features of the vaults themselves, are excluded.

Paintings of external surfaces of walls with non-breathable synthetic resins and coatings made by polyvinyl or asphalt materials are forbidden. The stone works are not to be painted but they must be cleaned without the use of abrasives.
11. Consolidation work with environmental engineering techniques in case of landslides and erosion phenomena are allowed. If, upon certification of scientific institutes or universities, is certified that the technique of environmental engineering is not applicable, interventions, to evaluate in their environmental compatibility will be permitted case by case.
12. The walls retaining ground are to be made of stone material for the exterior, without pointing of joints; in exceptional cases, where it is essential to resort to reinforced structures, they should be covered with traditional stone.
13. The floors of the uncovered areas, linked to buildings, or at least to unbuilt spaces, must exclude the waterproofing, using materials that allow the absorption of rainwater.

Art. 7 - Categories of recovery.
1. The categories of interventions to provide with Recovery Plans ex lege no. 457/78, aimed to the management of protection of the bound assets, subject of this plan, are defined as follows.
2. Routine maintenance. For buildings of traditional aesthetic value shall apply the requirements of paragraph 9 of article. 6 of this plan.
3. Extraordinary maintenance, with reference to art. 31 letter b) Law no. 457/78, must admit only:
- Static consolidation interventions and earthquake-proof adjustments, health and hygienic improvement and functional upgrading, through renovation or also replacement of structural parts of building, without any change in the outward appearance of the buildings of traditional aesthetic value. Construction of toilets and technology device without alteration of the volumes and surfaces of the individual real estate units.
4. Restoration, with reference to art. 31 c) Law no. 457/78, must admit only:
- Measures to preserve the building structure and to ensure its functionality through a systematic set of works that, in respect of the typological, formal and structural elements of the organism itself, will allow compatible destinations use. This principle will applies to all properties listed under law June 1, 1939 n. 1089 and for all other buildings of cultural and historical value, which are recognizable as significant assets of the history of art and architecture, even dated to the twentieth century. In all cases of property subject only to restoration, the obligation is extended to the parks and gardens linked to them, which form a constituent element of the urban landscape of the municipalities subject to the rules of this plan, as a fusion of nature and architecture.
5. Conservative recovery, with reference to art. 31 c) Law no. 457/78, should include only those cases of "recovery" in which the property to be protected, especially isolated or inserted in layered complexes, were grossly disfigured by accretions, added, interstitial aggregations and similar, to require significant changes in order to restore the typological structure and original appearance. The conservative renewal can contemplate new uses that are compatible with the protection of property and the contexts of the site as a whole.
6. Building renovation, with reference to art. 31 d) Law no. 457/78, shall be admitted only for buildings recently planted (after 1945), with the exclusion of the buildings of historical/artistic and natural/landscape value, as well as those referred to in paragraphs 2 and 3 of Art. 1 of Law no. 1497/39.
7. Urban restoration, with reference to art. 31 letter e) Law no. 457/78, shall be accepted only for areas recently planted, with the exception of installations or parts of them, having historical/natural and artistic/landscape, as well as those referred in paragraph 3 of article. 1 of Law no. 1497/39.

Art. 8 - Protection of coastline.
1. On the coastline, unless otherwise requirements laid down for individual areas, are allowed only interventions aimed at upgrading and nourishment of beach and preservation of rocky coasts through constant work of ordinary maintenance in charge of the Municipality and individual private owners or licensees for the state-owned part, always in compliance with any archaeological findings. Any extraordinary measures to defend the coast must be preceded by executive projects involving the use of bioengineering technologies safeguarding the environmental and archaeological features. If, upon certification of scientific institutes and universities, it will be establish that the technique of natural engineering is not applicable, other interventions will be allow only if compatible with the protection of environmental values.
Interventions to defend the coast and coastal settlements, to be performed at sea, must be preceded by executive projects accompanied by specialized and sea weather studies that ensure the protection of the environmental, archaeological and landscapes feature of the marine environment and ensure, even after the intervention is carried out, to maintain shorelines and water edge in their present position.
The periodic recovery and maintenance operations of existing cliffs must provide the integrations and/or replacement of the artificial plain concrete rocks with stone elements of volcanic origin. These actions must be authorized under art. 7 law. 1497/39, according to the procedures of art. 5, and will be notified in advance

to the Archaeological Superintendence for the controls and any requirements, if they fall in the areas of archaeological interest listed in art. 5, paragraph 2, or in those already identified in this plan.
2. Within 300 meters from the coastline the following interventions are allowed, unless otherwise requirements for individual areas of Title II:
- Conservation of existing coastal vegetation cover, with particular attention to the psamofila and halophyte vegetation, both of rocky and sandy coast and for that behind, along the strips of beach and backshore;
- Interventions for the rehabilitation and reconstruction of the coastal vegetation with native species in accordance with phytosociological requirements that meet the dynamic-evolutionary processes and the potential of the vegetation of the area;
- Bathing establishments authorized must be checked in order to verify the compatibility of existing works with landscape, environmental and archaeological values of the area; sanitary and technological adjustments are permitted only without increases in existing volumes;
- Existing shipyards, other coastal industries, shops and restaurants and sailing clubs must be checked in order to verify their compatibility with the protection rules for the landscape and the quality of the marine environment.

Art. 9 - Interventions allowed for all zones.
For all areas, included in this plan, even derogating from the rules and provisions for the protection of the individual zones (Title II), according to the provisions of Articles. 6, 7, 8 of this plan and in any case unless it is causing damage to tree species of high and mid-shaft, the following interventions are allowed:
a) Ordinary and extraordinary maintenance, restoration and conservative recovery interventions; building renovations (to be expected limited to buildings of paragraph 6 of art. 7 of this plan), which will point to the redevelopment of recent building without causing any increase in existing volumes; interventions for the demolition and reconstruction in situ, funded under Law 219/81, of property damaged by the earthquakes of 1980 and 1981.
b) Interventions of landscaping for the buffer strips on both side of the road ex DM n. 1404/68, in respect of road safety rules. You may not use those strips.
c) Interventions aimed at the environmental restoration of the plant system, the ordinary and extraordinary maintenance of gardens and parks.
d) Restoration, surveys and archaeological excavations and arrangement of related areas, including the works aimed at the safety, the useful services for visitors and the institutional activities of the Archaeological Superintendence.
e) Extension of existing cemeteries and related works connected and indispensable.
f) Interventions of upgrading to new safety standard and for the removal of architectural barriers, in the existing buildings. These interventions must be compatible with the needs of landscape protection with particular reference to the respect for viewpoints, residual panoramic views between the existing buildings, the geomorphology and natural morphology of the ground, the heights of the buildings themselves and that of the existing in the boundary.
g) Interventions for the fencing of agricultural funds, the free and built areas in compliance with the methods listed below:
- In agricultural areas, woods and uncultivated land, areas of maquis, fences and wooden poles can be realized with wire, or with hedges and shrubs of local plants, not preventing the open views;
- In areas for residential use and other areas different from those listed above, falling in all areas of this plan, masonry fences can be realized, even with inclusion of metal gate completely see-trough. In any case, the height of the fences, of any type, cannot exceed 2 meters.
h) Settlement and upgrading interventions even through the expansion of pedestrian and vehicular traffic with the use of the existing one. For scenic stretch of existing roads, or exposed to the panoramic views of the sites, the possible works to enlarge road will exclude retaining walls and overhang structures or pillars, cutting and harvesting of high-stem trees.
i) Interventions for redevelopment the feature of public roads, square and sidewalks, stairs and resting place with stone materials and traditional techniques; flower beds and trees; street furniture such as benches, seats, walls, light fixtures.
For interventions in points b), c), i) Mediterranean essences or essences historically included in the Vesuvius landscape must be used.

Art. 10 - Performance of local authorities.
1. The Municipalities, the Province, the Region and the state and local Management Authority, are required, in the formulation, adoption and approval of the respective planning tools to observe the rules and provisions contained in this plan. The rules and provisions of the Landscape Plan prevail against all the instruments of urban planning, general and executive, both regional and sub regional.

TITLE II - RULES AND PROVISIONS FOR INDIVIDUAL PROTECTION ZONE

Art. 11. - Zone P.I.

1. Description of the boundaries.
The area P.I. includes the most relevant elements and geological, naturalistic, environmental, archaeological, landscapes areas within the Vesuvian slopes. From north northeast to northwest: the Vesuvius cone, the Atrio del Cavallo, the Valle dell'Inferno, the slopes of Monte Somma, up to the municipalities of San Sebastiano, Massa di Somma, Pollena Trocchia, Anastasia, Somma Vesuviana, Ottaviano, San Giuseppe Vesuviano, Terzigno. The slopes up to the route of the S.S. 268a between the municipalities of Somma Vesuvius and Octavian, and between the towns of San Giuseppe Vesuviano and Terzigno (landlocked). The slopes of the volcano on the coastal side up to the municipalities of Portici, Ercolano, Torre del Greco, Trecase, Boscotrecase, Boscoreale. The natural, historical, archaeological park, up to the coastline, just by the Upper and Lower park of the Palace of Portici in continuity with the archaeological excavation of Herculaneum, historical parks of the Vesuvian villas Favorita and Campolieto, the park and archaeological site of Villa Sora; the area of the parks of the Vesuvian villas Bruno and Vannucchi in the territory of San Giorgio a Cremano (landlocked); the Castel Cicala hill in the territory of Nola; the strip of sea, for 300 meters from the coastline, from the settlement of Villa Sora to the industrial area of Santa Maria La Bruna. The zoning tables identify boundaries of each area.
2. Protection rules.
The above-mentioned area are subject to the rules of Integral Protection (P.I.).
3. Admissible actions.
Interventions aimed at the conservation and improvement of the green land in compliance with the phytosociological principles respecting the dynamic-evolutionary processes and the potentiality of the vegetation of the area. Interventions against fires with exclusion of firebreaks. Environmental remediation and restoration interventions aimed at the reconstitution of the vegetation characteristics of the sites, as well as their redevelopment including the removal of structures and infrastructures in contrast with the environment and of each other environment detractor. Interventions of settlement and upgrading of existing pedestrian and vehicular road system, even through the expansion with the limitations of art. 9 letter h) of this plan, to allow better use of landscape and views values.
4. Prohibitions and restrictions.
Any intervention involving increase of existing volumes with the exclusion of those referred in paragraph 7 of this Article; the construction of roads of any type is forbidden; crossings of power lines or other air infrastructures of new plant; the cultivation of quarries existing in the area are forbidden.
Any modification of the natural ground feature and of the existing agrarian settlement is forbidden. Cutting and removal of the high-stem trees and of the shrub vegetation, both of exotic species and spontaneous Mediterranean maquis, is forbidden. The essences to explant because of the phyto-pathological diseases must be replaced with the same species; if the species are unrelated to the landscape cultivation context they should be replaced by native species or compatible with the above context. Any replacement intervention of essences unrelated to the landscape cultivation culture must be gradual and programmed. Chopping down high-stem trees for safety reasons must be communicated, for the authorization, to the offices of the State Forestry. Are exception to this rules cuts and explants strictly necessary for the excavation and restoration of ancient monuments by the competent Superintendents, or to those absolutely necessary for the purpose of scientific Vesuvius Observatory.
5. Land use.
The owners and the holders, even using the available providences of state and regional law, must do interventions to ensure the conservation and protection of the natural vegetation complex; notably these interventions must tend to the maintenance, restoration and redevelopment of the vegetation typical of the sites. Agricultural use of the land, through the recovery of traditional crops, is allowed with the following requirements:
-Tillage over fifty cm deep in areas of archaeological interest referred to in paragraph 2 of art. 5 of this law, is forbidden;
- The introduction of agricultural crops foreign to local traditions is forbidden;
- The use of means and techniques of cultivation resulting in a reduction of the productive potential of the soil and other primary resources is forbidden;
- The replacement of tree crops with field crops is forbidden;
- The planting of new greenhouses of any type and size, is forbidden.
6. Marine protection.
The zoning tables identified a 300-meter offshore zone in front of the coast of the town of Torre del Greco. The Archaeological Superintendence with territorial jurisdiction, in cooperation with Authorities and competent Bodies, will draft a detailed marine plan defining the area aimed to become Archaeological

Underwater Parks, and control the use of this marine area, with particular reference to the navigation, both recreational and commercial, to the moorings, the fishing, the mussel farming and any fish farming. Pending the approval of this detailed Plan, all interventions, even extraordinary, involving the seabed must be subject to prior opinion of the Archaeological Superintendence.

7. Rural housing upgrading.

In addition to interventions under Articles. 7 point 6 and 9 letter. a) the hygienic-functional upgrading of the rural houses, also through expansion, is allowed, with the exception of the buildings with landscape and environmental value and of those referred to in paragraphs 2 and 3 of Art. 1 of Law no. 1497/39.

Any extensions aimed at the hygienic-functional upgrading must not exceed the maximum limit of 20% (twenty percent) of the existing residential area and may be granted only once for the same unit.

The volumes arising from such extensions shall not exceed the height of the existing volumes and must be made in compliance with the criteria of environmental protection (respect for scenic views, the morphology of the land, and prohibition of terraces).

Building permission must compulsorily register, in the Land Registry, the restriction of the fund for agricultural use and of the buildings authorized by the permission.

Art. 12 - Zone P.I.R.

1. Description of the boundaries.

The area P.I.R. includes the areas of high landscape value listed below.

- the coastal area in the municipal territory of Portici, from Pietrarsa up to Villa d'Elboeuf.

- three large areas, extended south-north, bordering the saturated areas respectively belonging to the municipalities of Portici and San Giorgio a Cremano and to the urban areas on the axis Cercola-S. Sebastiano al Vesuvio.

- the area located to the north-east of the town of Herculaneum between the town of San Vito (Herculaneum) and the foothill town of Torre del Greco.

- the coastal area located to the north of the town and the port of Torre del Greco.

- the internal foothills area near the railway line "Circumvesuviana" in the territory of Torre del Greco and bordering the urban areas of the same town.

- two areas located around the perimeter of the quarry of S. Maria La Bruna; one closed to the west, on the sea, by the saturated coastal zone of Torre Annunziata; the other extended up to the coastline to the north of Torre Annunziata.

- two areas on the eastern side of the planned area, defined one by the development of the villages of Torre Annunziata, Trecase and Boscotrecase; the other by the villages of Torre Annunziata, Boscotrecase and Boscoreale, and by the level area, with full protection, north of Pompeii archaeological area.

- the area to the south of the ruins of Pompeii up to the border of planned area.

- the area in the territory of Terzigno to the north-west of the town, close to the north from the town of Terzigno itself.

- two areas of limited extension in the territory of San Giuseppe Vesuviano, closed from the town itself and from the area of recent expansion in S. Maria la Scala.

- areas landlocked, on the north-west of the planned area, including the settlements located along the Vesuvio Main Road n. 268, from Cercola up to S. Anastasia and those located, upstream of the town of Cercola, Massa di Somma and Pollena Trocchia The zoning tables identify the boundaries of each area.

2. Standards of protection.

The defined area is subject to the rules of protection of Integral Protection with Environmental Landscape Restoration (PIR).

3. Admissible actions

Interventions aimed at the conservation and rebuilding of the green land in compliance with the phytosociological principles respecting the dynamic-evolutionary processes and the potentiality of the vegetation of the area. Interventions against fires with exclusion of firebreaks. Environmental remediation and restoration interventions aimed at the reconstitution of the vegetation characteristics of the sites, as well as their redevelopment including the removal of structures and infrastructures in contrast with the environment and of each other environment detractor. Interventions of settlement and upgrading of existing pedestrian and vehicular road system, even through the expansion in compliance with the limitations of art. 9 letter h) of this plan.

4. Prohibitions and restrictions.

Any intervention that involves increase of existing volumes with the exclusion of those referred in paragraph 6 of this Article; the cultivation of existing quarries in the area are forbidden;

Any modification of the natural ground feature is forbidden.

Cutting and removal of the high-stem trees and of the shrub vegetation, both of exotic species and spontaneous Mediterranean maquis is forbidden. The essences to explant because of the phyto-pathological diseases must be replaced with the same species if these are not unrelated to the landscape-crop context.

Chopping down high-stem trees for safety reasons must be communicated, for the authorization, to the offices of the State Forestry. Are exception to this rules cuts and explants strictly necessary for the excavation and restoration of ancient monuments from the competent Superintendence or to those necessary for the purpose of scientific Vesuvius Observatory.

5. Land use.

The owners and the holders, even using the available providences of state and regional law, must do interventions to ensure the conservation and protection of the natural vegetation complex; notably these interventions must tend to the maintenance, restoration and redevelopment of the vegetation. Agricultural use of the land, through the recovery of traditional crops, is allowed with the following requirements:

- Planting of new greenhouses of any type and size, is forbidden;

- Tillage over fifty cm deep in areas of archaeological interest referred to in paragraph 2 of art. 5 of this law;

- The removal of the orchards for crops renewal, is allowed.

6. Rural housing upgrading.

In addition to interventions under articles 7 point 6 and 9 letter. a) the hygienic-functional upgrading of the rural houses, also through expansion, is allowed, with the exception of the buildings with landscape and environmental value and of those referred to in paragraphs 2 and 3 of Art. 1 of Law no. 1497/39.

Any extensions aimed at hygienic-functional upgrading must not exceed the maximum limit of 20% (twenty percent) of the existing residential area and may be granted only once for the same unit. The volumes arising from such extensions shall not exceed the height of the existing volumes and must be made in compliance with the criteria of environmental protection (respect for scenic views, the morphology of the land and prohibition of terraces). Building permission must compulsorily register, in the Land Registry, the restriction of the fund for agricultural use and of the buildings authorized by the permission.

Art. 13- Zone R.U.A.

1. Description of the boundaries.

The area R.U.A. includes the urbanized areas with high landscape value to be submitted to urban and housing regeneration and landscape and environmental restoration, listed below:

- The area including the towns of Portici and San Giorgio a Cremano with their historic centres.

- Old town and residential area of the town of Herculaneum.

- S. Vito area in the town of Herculaneum, welded to the saturated of Herculaneum itself.

- Settlements divided into two areas of more recent construction, located upstream of the Napoli-Salerno toll road, in the territory of Herculaneum and Torre del Greco.

- The old town and the area of Torre del Greco.

- The area in the territory of Torre del Greco and Torre Annunziata near the SS n. 18 Tirrenia Inferiore (or Strada delle Calabrie) connected to the foothills area of Cappella Vecchia near Colle S. Alfonso (Torre del Greco).

- The large area of Torre Annunziata joined north with the foothills settlement of the municipality of Trecase, and Boscotrecase Boscoreale.

- The area in the municipal area of Pompeii south and east of the Archeological Area of Pompei.

- The area near the S.S. del Vesuvio n. 268, from the cemetery of Pompeii to that of Boscoreale.

- The area so called Boccia al Mauro til the village and the historic center of the municipality of Terzigno.

- Area including the old towns and settlement of recent expansion, beside the route SS Vesuvio n. 263 north, Casilli and S. Maria la Scala in S. Giuseppe Vesuviano, San Giuseppe Vesuviano, Ottaviano.

- Area of the settlements near the SS Vesuvio n. 268, in the territory Somma Vesuviana.

- Area of the town of St. Anastasia, including the historic center of the town itself.

- Settlement and historical center of Pollena Trocchia.

- The large well-structured area, including the built areas of Cercola, the built area at the turn of the road Cercola-S. Sebastiano al Vesuvio, the town of San Sebastiano al Vesuvio, the historic centre of Massa di Somma and, further south, the areas of recent expansion and public building in the town of Herculaneum (loc. Fosso Grande), til the area upstream of the saturated zone of Portici.

- The limited area on the border of the area of Castel Cicala in the municipal area of Nola.

The zoning tables identify the boundaries of each area.

2. Standards of protection.

The so-defined area is subject to the rules of protection for Urban and Housing Regeneration and Landscape and Environmental Restoration (RUA).

3. Prohibitions and restrictions.

Any intervention that involves increase of existing volumes with the exclusion of those referred in paragraph 5 and 6 of this Article; the cultivation of existing quarries in the area are forbidden.

Cutting and removal of the high-stem trees and is forbidden. The essences to explant because of the phyto-pathological diseases must be replaced with the same species if these are not unrelated to the landscape-crop context.

Chopping down high-stem trees for safety reasons must be communicated, for the authorization, to the offices of the State Forestry. Are exception to this rules cuts and explants strictly necessary for the excavation and restoration of ancient monuments from the Superintendence.

4. Admissible actions.

Intervention aimed at the conservation of the residual agricultural green, and those in compliance with the phytosociological principles respecting the dynamic-evolutionary processes and the potentiality of the vegetation of the areas. Interventions aimed at soil conservation. Interventions aimed at upgrading the appearance of public roads, streets and sidewalks, stairs and resting place, they could include street furniture, lighting, benches or seats, walls and traffic islands, flower beds, trees and public gardens. These elements must be compatible with the restoration of the constituent characters of the urban landscape, using mostly traditional stone materials, fair-faced, and natural colours.

5. Public facilities.

Planning instruments and those for planning implementation must identify soils and existing buildings owned by municipality to allocate, with prior recovery, for public equipment for the respect of urban standards under state and regional laws. If these properties were unsuitable to the planned destination, soils and private buildings can be identified for this purpose. However, the interventions to be implemented in these areas will take into account the landscape protection criteria (respect for scenic views, the geomorphology of the land; prohibition of terraces). The height of new buildings shall not exceed the average of the existing buildings all around and, however, may not exceed 10 meters. Works to re-modelling the areas and the related primary infrastructure in order to achieve the sector urban standards, are allowed.

6. Building Rehabilitation.

The instruments of planning and implementation of planning can provided measures aimed at hygienic-functional upgrading of housing units, as well as building renovations to be performed according to the limitations and requirements dictated by art. 7 point 6 and art. 9 letter a) of this regulation;

Any additions in order to improve the health and hygiene of the above units, shall not exceed the maximum limit of 20% (twenty percent) of the existing residential area and may be granted only once for the same unit. Therefore, the planning permission must be transcribed in the Land Registry. The volumes resulting from these expansions will take into account the criteria of landscape protection (respect for scenic views, the morphology of the land). The height of the new volumes will not exceed than that of the buildings to the boundary. For buildings of historic, artistic and environmental-landscape value, as well as those referred to in paragraphs 2 and 3 of Art. 1 of Law 1497/39, the upgrading cannot provide a volumetric expansion.

The Municipality will prepare special detailed plans aimed at the recovery and landscape-environmental upgrading of the whole urban fabric, in the limit of the existing total volume, except the extensions for upgrading mentioned in the preceding paragraphs of this point 6, according to the categories of restoration mentioned in art. 7 of this regulation, for the areas falling within the area covered by this article (RUA) and outer of the perimeters of the historic centres, settlement and rural complexes of historical and environmental value, identified and approved in accordance with the provisions of art. 5 paragraph 2 of this legislation. The height of any new buildings should not exceed the average height of the existing buildings in the boundary.

Pending the approval of these detailed plans interventions described in points 2, 3, 4, 5 and 6 of art. 7 of this legislation, shall be carry out on existing buildings.

Art. 14 - Zone A.

1. Description of the boundaries.

The area A.I. includes the industrial areas of the Municipalities of San Sebastiano al Vesuvio, Portici-Ercolano, Torre del Greco, Torre Annunziata and Pompeii. The boundaries of the area are identified in the zoning tables.

2. Standards of protection.

The above described area is subject to the standards of protection for the Recovery of Industrial Areas (AI).

3. Eligible actions.

Ordinary/extraordinary maintenance and building renovation of industrial, craft and commercial plants not decommissioned, i.e. still active, at the date of entry into force of this Regulation, as well as ordinary/extraordinary maintenance and building renovation of existing residential building.

The areas, plants and buildings, available because of the decommissioning of industrial activities, must be subjected to environmental and landscape recovery and intended to be used for activities compatible with the character and the specific vocations of each of them as part of the district Vesuvius (scientific-technological, cultural, tourist accommodation; productive).

The Municipalities concerned shall prepare an appropriate implementing planning tool, which may also include the urban restoration as described in art. 7, paragraph 7, of this regulation, for the redevelopment of brownfields with details of the intended uses that must be compatible with the specific vocations of each of them.

The overall space allowed by that implementing planning tool, aimed at the landscape and environmental recovering of the areas, may not exceed 40% of the space subject to decommissioning and existing at the date of entry into force of this Regulation. Restoration and conservation, with intended use compatible with the characteristics of the buildings themselves, should be allowed only for the buildings that, by character and architectural style, are of historical interest.

Art. 15 - Zone S.I.

1.Description of the boundaries.

T*he area S.I. includes the urban areas of high landscape value, even saturated, listed below:*

- Area of recent expansion belonging to the town of Portici, from Piazza S. Ciro to the toll road.

- Area of recent expansion belonging to the town of Herculaneum, from Corso Italia to toll road Naples-Salerno.

- Area of recent expansion belonging to the town of Torre del Greco, close to the old town and up to the Circumvesuviana railway line and at the Torre del Greco tollhouse.

- Area of recent expansion to the east of the town of Torre Annunziata, defined by the loop of the railway Caserta-Castellammare di Stabia, and wedged up to the ruins of Pompeii, between the SS n. 18 and the route of the railway Circumvesuviana.

- Area of recent expansion with public housing in the territory of Boscotrecase, south of the town.

- Area of recent expansion of the town of San Giorgio a Cremano until the border with the district of Ponticelli (Naples).

- Area of recent expansion in the north area of S. Sebastiano al Vesuvio, falling in the municipalities of Massa di Somma and Pollena Trocchia.

2. Standards of protection

The above-described area is subject to the rules established by planning and ordinary planning implementation tools that discipline territorial changes in Saturated Internal Urban areas (SI).

3. Prohibitions and restrictions.

Any intervention that involves increase of existing volumes with the exclusion of those referred in paragraph 5 of this Article; the crossings of power lines or other air infrastructures of new plant are forbidden.

4.Eligible actions.

Ordinary and extraordinary maintenance, restoration, conservative, rehabilitation, building renovation, urban renewal, as described by art. 7 of this regulation, are allowed.

5.Public facilities.

Planning instruments and those for planning implementation may provide public facilities for the respect of urban standards under the state and regional laws. The actions to be taken in these areas shall, however, take into account the criteria of landscape protection (respect for scenic views, for the geomorphology and the natural ground feature; prohibition of terraces). The height of any new buildings should not exceed the average height of the existing buildings in the boundary, however, may not exceed 10 meters.

6.Building Rehabilitation.

The instruments of planning and implementation of planning can provided measures aimed at hygienic-functional upgrading of housing units, as well as building renovations to be performed according to the limitations and requirements dictated by art. 7 point 6 and art. 9 letter a) of this regulation. Any additions in order to improve the health and hygiene of the above units, shall not exceed the maximum limit of 20% (twenty percent) of the existing residential area and may be granted only once for the same unit. Therefore, the planning permission must be transcribed in the Land Registry. The volumes resulting from these expansions will take into account the criteria of landscape protection (respect for scenic views, the morphology of the land). The height of the new volumes will not exceed than that of the buildings to the boundary.

For buildings of historic, artistic and environmental-landscape value, as well as those referred to in paragraphs 2 and 3 of Art. 1 of Law 1497/39, the upgrading cannot provide a volumetric expansion.

The Municipality will prepare special detailed plans aimed at the recovery and landscape-environmental upgrading of the whole urban fabric, in the limit of the existing total volume, except the extensions for upgrading mentioned in the preceding paragraphs of this point 6, according to the categories of restoration mentioned in art. 7 of this regulation. The height of any new buildings should not exceed the average height of the existing buildings in the boundary.

The height of any new buildings should not exceed the average of the existing buildings in the boundary. The planning and implementation of planning tools must exclude from building reconstruction and urban renovation the buildings with historical, artistic and environmental-landscape value, as well as those referred in paragraph 3 of article. 1 of Law no. 1497/39.

Pending the approval of these detailed plans, interventions in points 2, 3, 4, 5 and 6 of art. 7 of this regulation will be done on existing buildings.

Art. 16 - Zone S.C.

1. Description of the boundaries..

The area S.C. includes the saturated urban area with high landscape value, in the municipality of Torre del Greco, along the sea road south of the town.

2. Standards of protection.

The above-described area is subject to the rules set out through a specific, binding, planning tool and ordinary planning implementation tool that shall discipline the territorial transformations that area Saturated Urban Coast (SC), according to the criteria set out in paragraphs 5 and 6 of this Article

3. Prohibitions and restrictions.

The increase of existing volumes, with the exception of what provided for in paragraph 5 of this article, is forbidden.

4. Eligible actions.

Ordinary and extraordinary maintenance, restoration, conservative rehabilitation, building renovation, urban renewal, as governed by art. 7 of this regulation, are allowed.

5. Public facilities.

Planning instruments and those for planning implementation may provide public facilities for the respect of urban standards under the state and regional laws. The actions to be taken in these areas shall, however, take into account the criteria of landscape protection (respect for scenic views, for the geomorphology and the natural ground feature; prohibition of terraces). The new buildings will observe the criteria set out under, in paragraph 6.

6. Urban renewal

The interventions of urban renewal, governed by the specific detailed plan, shall be aimed at landscape and environmental rehabilitation of the coastal strip, according to the character and the specific vocations of the area (residential and tourist accommodation), taking in consideration the following criteria:

- Protection of buildings of historical, artistic, landscape, environmental value;

- Progressive vertical thinning of the buildings, starting from the built curtain (to predict with a maximum height of 7 m) located upstream the coastal road, until the buildings inside the area (to predict with a maximum height of 12 meters);

- Transfer of existing volumes resulting from the above-mentioned thinning, in the areas available in this zone and in accordance with the criteria set out in this chapter;

- Protection of the axes of unobstructed and panoramic view of Vesuvius from coastal road and coastline;

- The tract of the coastal road between the two National Railway track underpasses and the existing volumes between the coastal road and the coastline (falling in the P.I. area) must be transferred in the areas of this zone, upstream of the coastal road itself.

Pending the approval of the implementation tool for planning, restoration, conservative renewal, ordinary and extraordinary maintenance and building renovation, as governed by art. 7 of this law, are allowed only.

Art. 17 - Zone R.A.C.

1. Description of the boundaries.

The area R.A.C. includes the quarry areas in the towns of Torre del Greco and Terzigno. The boundaries of the area are identified in the tables of zoning.

2. Standards of protection.

The above-described area is subject to the rules of Remediation and Environmental Redevelopment of Quarries Areas (RAC).

3. Prohibitions and restrictions.

The prosecution of mining activity is not allowed. Any work that involves increase in existing volumes is forbidden.

4. Eligible actions.

This area is subject to environmental and landscape remediation interventions governed by specific projects of Municipal initiative. This project shall regulate the activities compatible with the environmental characteristics of the area, and will provide for the elimination of precarious structures and environmental detractors.

In implementation of the aforementioned projects of municipal initiative, aimed at the environmental restoration of the area, the transfer of existing volumes acquired as municipal assets, through demolition and reconstruction, is allowed only for the allocation of the necessary equipment and services

Ordinary and extraordinary maintenance, building renovation, restoration and rehabilitation conservative are allowed only for the residential buildings existing in the area.

Art. 18 - Zone R.A.I.

1. Description of the boundaries..

The R.A.I. area includes areas in the town of Torre Annunziata, already falling in the industrial development plan (ASI), today connoted by the presence of a widespread building not related to the nature of the industry. The boundaries of the area are identified in the tables of zoning.

2. Standards of protection.

The above mentioned area is opposite to the standards of protection for the environmental and urban recovery, set by a specific binding instrument for planning and implementation of the ordinary planning that will govern, according to the criteria set out in paragraphs 5, 6 of this Article, the territorial changes in this area, predominantly rural and with a high archaeological wherewithal (RAI).

3. Prohibitions and restrictions.

Any work that involves increase in existing volumes, with the exclusions set in section 5 of this article; crossings of power lines or other air infrastructures of new plant are forbidden.

4. Eligible actions.

Ordinary and extraordinary maintenance, restoration, conservative rehabilitation, building renovation, urban renewal, as governed by art. 7 of this regulation, are allowed

5. Public facilities.

Planning instruments and those for planning implementation must identify soils and existing buildings owned by municipality to allocate, with prior recovery, for public equipment for the respect of urban standards under state and regional laws. If these properties were unsuitable to the planned destination, soils and private buildings can be identified for this purpose. However, the interventions to be implemented in these areas will take into account the landscape protection criteria (respect for scenic views, the geomorphology of the land; prohibition of terraces). The height of new buildings shall not exceed the average of the existing buildings all around and, however, may not exceed 7 meters.

6. Building rehabilitation.

The building rehabilitation, regulated by a specific mandatory detailed plan, will be aimed at the landscape and environment rehabilitation, according to the characteristics and specific environmental quality of the area (rural, archaeological), with the following criteria:

- Maintaining the agricultural character of the area, given the exceptional potential of archaeological landscape of the site;

- Preservation of buildings of historical, artistic, landscape and environmental value;

- Elimination of environmental detractors and vertical thinning of the building exceeding 7 meters height;

- Transfer of existing volumes resulting from the above-mentioned thinning or the demolition of volumes constituting environmental detractors, in the available areas of this zone and in accordance with the criteria set out in this chapter and in compliance with the criteria of landscape protection (respect for scenic views, respect for geomorphology of the land, prohibition of terraces, respect of the agricultural and archaeological landscape).

Art. 19 - Zone A.P.

1. Description of the boundaries.

The area A.P. includes the port areas of the municipalities of Portici, Torre del Greco and Torre Annunziata. The boundaries of the area are identified in the tables of zoning.

2. Standards of protection.

The above mentioned area is subject to the rules for protection aimed at the recovery and upgrading of port areas, set by a specific instrument for planning and implementation of the ordinary planning that will govern the territorial changes in the area (AP), according to the potentiality and the specific vocations of each individual areas, and respecting the criteria set out in paragraph 3,

This plan must be submitted to the binding opinion of the Superintendence BB.AA.AA. and the Archaeological Superintendence, responsible for the territory.

The mandatory instrument for planning and implementation of the ordinary planning of port areas will assess the compatibility of the activities and of the existing buildings (shipyards, coastal industries, storage areas, handling and storage, shops, restaurant and hospitality facilities, yacht clubs, etc.) with the specific characteristics of the sites (environmental, landscapes, history, archaeology) and with the nature and vocation of the each ports (commercial, industrial, fishing, tourism, etc.).

3. Prohibitions and restrictions.

The interventions in defence of port facilities and docks, to be performed in the sea, must be preceded by executive projects accompanied by specialized and sea weather studies that ensure the protection of the environmental and archaeological landscapes of the marine environment and safeguard, even after the implementation interventions, the conservation of the current coastline and shoreline trend. The construction of emerging reefs in not allowed.

The periodic recovery and maintenance operations of existing reefs must provide for integration and / or replacement of artificial boulders placed on the surface with stone elements.

Any structure built for residential purpose as well as the increase of the existing residential volumes is forbidden.
The plan for the port areas must specifically provide for the protection of:
- Buildings of historic and artistic landscape and environmental value;
- Artefacts similar to the testimonies of industrial archaeology, for character and architectural style;
- Road systems of historical and environmental value such as roads, ramps, tiers, underpasses, bleachers, etc.;
- Characteristic and distinctive features of historical and environmental systems, such as terraces and ramparts mentioned above, docks and railways, pavements, etc.
The recovery of the existing volumes through interventions of building and town planning renovations, as defined by art. 7 of this regulation, in accordance with criteria of landscape protection, is allowed.
Any new volumes done for the necessary provision of public facilities and public interest, necessary and functional to the redevelopment and/or upgrading of port areas, each according to its specific vocations, will be located in areas made available as a result of neglect and / or activities decommissioning already practiced.
Pending the approval of the implementation tool for the port areas planning, only restoration, conservative renewal and ordinary and extraordinary maintenance, building renovation, as governed by art. 7 of this regulation, are allowed.
Projects relating to individual projects shall follow the procedures of the law n. 1497/39 and Law. 431/85, for its approval.

Art. 20 - Areas, archaeological sites and historical-archaeological landscape.
The areas, archaeological sites, and the historical-archaeological landscape falling under this plan, the areas and sites of archaeological interest as defined in paragraph 2 of art. 5 of this law, as well as the band of sea 300 meters wide in front of the coast of Torre del Greco, as bounded in the zoning tables of this plan, are subject to the integral protection (P.I.) in the absence of specific measures taken by the Superintendence.
a) All work, of public and private initiatives, falling in areas of archaeological interest, involving action on the ground, excavation, earthworks; require the prior binding advice of the Archaeological Superintendence.
b) Joint and executive projects falling in areas of archaeological interest must acquire the prior binding advice of the Archaeological Superintendence that may provide at the appraisal stage also archaeological probes to perform by the applicant at his own expense.
c) The local planning tool, general and executive, must provide in its rules a prior control of the territory, as expressed in above-mentioned paragraph a). The preliminary decision will be divided into graduated binding rules, depending on the type of action foreseen and the characteristics of the historical and archaeological site.

Art. 21 - Public works and of public interest.
In all areas of this plan, notwithstanding the rules and requirements of each area covered by this legislation, it is allowed:
- The creation and / or upgrading of technological and infrastructural systems, such as sewage and water treatment, water, electrical, telephone and similar public utility systems of municipal and supra-municipal importance.
- The adaptation and the upgrading of the existing motorway network, with its junctions and link roads, and of the rail networks with the works connected to the abolition of level crossings;
- Remediation and accommodation of riverbeds and channels that fall into areas of this plan.
Under the circular of P.C.M. n. 1.2.3763/ 6 April 20, 1982 and n. 3763/6 June 24, 1982, the location of the buildings works and of the volumes, absolutely indispensable to the creation and functionality of the aforementioned technological and infrastructure plant, must first be authorized by the Ministry BB.CC.AA. The executive projects of such works, that will take into account the criteria of landscape protection, notwithstanding the rules of the area where they fall, will incorporate any information and requirements dictated by the BB.AA.AA. and Archaeological Superintendence (if they fall within area of archaeological interest).
The permitting procedures of the aforementioned works are those provided for by law n. 1497/39 and Law. 431/85.
For the protection of landscape and environmental values of the Monte Somma and Vesuvius the installation of antennas, repeaters, trusses and the similar on its top and above the five hundred meters altitude is forbidden. Existing plants over the height 500 will be removed. For the identification of new locations, the owning authorities should prepare a special project in order to reduce and downsize the plants, taking into account the environmental and landscape values of the scenic areas.

Art. 22 - Transitional rules.

The authorizations already granted for works not yet started, should be considered void if they conflict to the provisions of this plan.
It is allowed, notwithstanding the rules and requirements done for each area covered by this legislation, the use for public facilities or public interest through interventions urban restructuring, in equal volumes existing buildings acquired the equity in law enforcement February 28, 1985 n. 47.
Authorization procedures for operations above are those provided for by law n. 1497/39 and n. 431/85.
Is allowed in all areas of this plan, notwithstanding the rules and requirements of each area covered by this legislation, the completion of public works already started and suspended, or still in progress and in an advanced stage at the date of entry into force of this plan, as well as the construction and / or completion of the primary and secondary infrastructure works for the areas of public and social housing already achieved at the date of entry into force of this plan. For artefacts incomplete and destined to residence in implementation of programs of public and agreement above, allowed the completion.
It allowed the implementation of programs of public housing, only in areas classified RUA and SI under this legislation, if it has already begun, the date of entry into force of this plan, the procedure for the acquisition by the municipality of the areas hit by the building program.
Authorization procedures for operations above are those provided for by law n. 1497/39 and n. 431/85.
For the purpose of implementing programs for the development of Torrese-Stabiese area (TESS plan) it is allowed, notwithstanding the rules of the area where they fall, the realization of the following works:
- Arrangement of Torretta di Siena road ant the road connecting the town cemetery in the territory of Torre Annunziata;-
- Upgrading the road connected with the SS 268 Vesuvius, in territory of Boscotrecase.
For the development of tourism potentiality, as well as the upgrading of the services and infrastructure of supra-municipality interest, is allowed, notwithstanding the rules of the area where they fall, the realization of the following works:
- Pedestrian recovery of the Cook railway, from the town of Herculaneum to the site of the former station of the Vesuvius chair lift;
- Completion and expansion works of the Justice Palace, as well as the new road link to the existing motorway network, in the municipality of Torre Annunziata;
- Realization of the Hospital Consortium and related infrastructure works in the municipality of Boscotrecase.
For the purpose of strengthening and upgrading of the services and facilities of local interest it is allowed, notwithstanding the rules of the area in which they fall, the realization of the following works:
- City of Herculaneum. Access road and parking area for the archaeological area (zone P.I.).
- City of Torre del Greco. Expansion of Judicial Offices in place Cemetery (area P.I.); Sports Centre in Santa Maria La Bruna (R.I.P. area); Completion of the Constructive Program ex-Law 219/81 art. 2a in the localities Lamaria and Leopardi.
- City of Massa di Somma. Building restoration of Via Marini through a special recovery plan pursuant to Law n. 457/78, according to intervention categories and related restriction as described in art. 7 of this law.
- City of Terzigno. Realization of the Municipal House in place Croce del Carmine (area R.U.A).
- City of Pompeii. Arranging the area overlooking the road connecting Porta Marina Superiore and Porta Marina Inferiore for the establishment of commercial structures of light type. The proposed arrangement shall still preserve the existing natural arboreal heritage. and the conformation of the altitude in the area and its boundary (area P.I.).
All above-mentioned works, of municipal or supra-municipal interest, must be submitted to the authorization of the Municipality pursuant to art. 7 of Law no. 1497/39.
If the above works fall into the area of archaeological interest, as defined in art. 5, paragraph 2, of this law, they shall be submitted, also, to the binding advice of the Archaeological Superintendence.

Art. 23 - Plan of detail of illegal works.
This territorial landscape plan has been prepared for the purpose of evaluating landscape protection, the status of the territory in the presence of all the existing buildings you can see in the ortho-photos on which zoning has been traced, integral part of this plan.
In the areas, even large, where works illegally executed are gathering, the advice requested by art. 32 of Law no. 47/85 will be made in accordance with the requirements contained in a detailed plan to be drawn up within a period of twelve months from the date of entry into force of this plan by the Ministry for BB.CC.AA. and with the support of the Technical Offices of the municipalities involved. This plan is aimed at the specific assessment of the compatibility of the works carried out illegally with the degree of impairment of its environmental area.

4. **Strategic plan for the buffer zone**

Law Decree No. 91 dated August 8, 2013 converted with amendments into Law No. 112/13 as amended, in order to facilitate the socio-economic revitalisation and environmental recovery and urban planning of the municipalities included in the Master Plan of the UNESCO site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata", as well as to make the site more attractive to tourists, created the “Great Pompeii Unit”. The task of this unit, based on the guidelines provided by the General Manager of the Project, is to draw up a strategic plan for the development of the areas listed above, with the aim of ensuring the performance in collaboration of the activities of common interest of the public administrations involved and to converge all administrative decisions necessary for the implementation of the plans, projects and works that are instrumental to the achievement of the objectives set out above, into a single unit. Furthermore, the law provides that the Master Plan (UGP) make the decisions regarding the design, implementation and management of the works included in the plan.

The plan must provide for the urgent infrastructural works that are necessary:

- for the improvement of the access roads and interconnections to the archaeological sites;
- for the environmental recovery of degraded and compromised landscapes, primarily through the recovery and reuse of abandoned industrial sites;
- for the redevelopment and urban regeneration works, while respecting the principle of lower consumption of land and the priority of recovery;
- for actions and works designed to promote and foster donations and sponsorships and the creation of forms of public-private partnerships, as well as the involvement of associations and non-profit organisations engaged in the promotion of cultural heritage.

In preparing the Strategic Plan, therefore, the focus of every environmental remediation and spatial development perspective should be the enhancement of the urban and peri-urban landscape (by recovering unused agricultural and interstitial spaces) and of the most important architectural and archaeological sites in the area, as well as the reuse of large abandoned industrial areas. The plan, therefore, also aims at identifying the infrastructures

that cater to the needs of the community for the purposes of socio-economic revitalisation of the area of the buffer zone and the enhancement of its attractiveness as a tourist site.

On the one hand, the plan represents an ambitious design that will fit in a territorial context rich in natural and cultural resources – despite some risks (seismic, hydrogeological, etc.) involving the area – and, on the other hand, an attempt that encourages the development of a new operational tool that can expertly combine spatial development, public resources and private investment.

Law Decree No. 91/13 identifies the Management Committee, formed by the Minister of Cultural Heritage and Activities, and of Tourism as Chairman, the Minister of Infrastructure and Transports, the State Secretary for the Presidency of the Council of Ministers responsible for territorial cohesion policies and sports, the President of the Campania region, the Mayor of the metropolitan city of Naples and the Mayors of the municipalities concerned (Boscoreale , Boscotrecase, Castellammare di Stabia, Herculaneum, Pompeii, Portici, Torre Annunziata, Torre del Greco, Trecase), as the body responsible for approval of the strategic plan that produces the effects foreseen by art. 34 of Leg. Decree No. 267/00, articles 14 and ff. of Law No. 241/90 and art. 2, paragraph 203, of Law No. 662/96, and supersedes every other obligation and opinion, clearance, authorisation or deed of consent deemed necessary for the execution of the works approved.

Strategic guidelines

The plan identifies key strategic guidelines for the socio-economic revitalisation and environmental and urban remediation of the municipalities included in the Master Plan of the UNESCO site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata", as well as for the enhancement of the site’s attractiveness in terms of tourism.

Strategic guideline 1: Improvement of the access roads and interconnections to the archaeological sites for the execution of improvement actions:

- Accessibility by train
- Accessibility by sea
- Accessibility by road
- Interchange and connection with the archaeological sites

Strategic guideline 2: Environmental recovery of degraded and compromised landscapes

- Recovery and reuse of abandoned industrial areas
- Coastal recovery
- Recovery of agricultural and peri-urban agricultural landscape

Strategic guideline 3: Urban redevelopment and regeneration

- urban regeneration of functional axes to ensure accessibility to cultural sites and their context
- recovery, restoration and enhancement of tourism, trade and crafts in abandoned volumes

Strategic guideline 4: Promotion of donations, sponsorships, forms of public-private partnerships, etc.:

- “Art Bonus” (Law No. 106/2014)
- “Sblocca Italia” (Law No. 164/2014)

The actions that have been identified as essential for the various strategic guidelines are listed below:

Guideline 1: Improvement of the access roads and interconnections to the archaeological sites:

- New railway station FS-EAV "Pompei scavi" and tourist-cultural Hub;
- New railway station of Herculaneum;
- Sustainable mobility (electric shuttles network);
- Accessibility to the Vesuvius National Park from Trecase – Boscotrecase and service area;
- Accessibility to the Vesuvius National Park from Herculaneum;

Guideline 2: Environmental recovery of degraded and compromised landscapes

- Re-conversion of the railway line Torre Annunziata-Castellammare and environmental urban regeneration of the waterfront;
- Transformation of the abandoned railway line Torre Annunziata – Boscoreale in linear service area;
- Recovery of the agricultural landscape: area North of the site of Pompeii up to Boscoreale, with an archaeological walk from Villa dei Misteri to Villa Regina – Antiquarium;
- Enhancement of the archaeological area of Villa Sora in Torre del Greco;
- Enhancement of the archaeological area of Stabia;

Guideline 3 - Urban redevelopment and regeneration

- Redevelopment of axes connecting to sites of cultural interest: from Miglio d'Oro to Via Plinio, from train stations and from ports-marinas:
- Redevelopment of the roadway connecting the archaeological area of Pompeii to the archaeological site of Oplontis;
- Enhancement of the Miglio d'Oro;
- Plan for the development and reuse of available real estate complexes:
- Torre del Greco, Molini Marzoli – Pompeii, Istituto del Sacro Cuore – Castellammare, Reggia del Quisisana – Torre Annunziata, Real Fabbrica D'Armi "Spolettificio";
- Portici, monumental complex of the Royal Bourbon Site;
- Herculaneum, complex of Favorita.

4. Strengths and weaknesses: an analysis of the territory

In order to ensure a more effective focus to the strategic and operational choices of the Plan, we have conducted a SWOT analysis to highlight the major problems requiring intervention and the strengths to be exploited, with reference to the site as a whole and to its three archaeological areas. Though belonging to the same territorial context, the three sites, in fact, have their own peculiar characteristics, which call for a differentiation of the works that are to be carried out in each one.

In spite of the problematic nature of the territorial context to which the sites belong (high population density, high unemployment, poor sense of belonging, high crime rate*), the area where the site is located has considerable and prestigious varieties of natural, cultural and architectural resources. In addition to its remarkable archaeological heritage, consisting not only of the sites included in the WHL and of those of *Stabiae* and Boscoreale which we want to include, the area, in fact, has several valuable natural sites (Vesuvio, Monti Lattari, Monte Faito), the thermal spas of Castellammare di Stabia and Torre Annunziata, the shrine of Pompeii, the royal palace of Portici and the Bourbon site of Quisisana in Castellammare, as well as museums and ethnological and anthropological resources of great interest. The strategic location of the area, too, is quite favourable, as it is centrally located in the Amalfi-Sorrento Coast and close to other important archaeological, artistic, historical, natural and cultural sites, primarily Naples but also Sorrento, Baia, Capri, Ischia and Pozzuoli. Tourism, however, is characterised by the limited stay of tourists in the area and the low level of per capita expenditure, resulting in minor effects on the area's economic development. These go hand in hand with the low quality of the range of hospitality services offered. The area also highlights some

weaknesses insofar as concerns the usability of the archaeological sites of Herculaneum and Oplontis due to a shortage of services for visitors, the inaccessibility for disabled persons and the insufficiency of the restaurant and catering business. The cultural offer, which is broader in Pompeii and characterised by events that take place within the archaeological areas, continues to be poorly structured in Herculaneum and Oplontis. Of the three sites, the latter is the one that records the least number of visitors, due to a number of critical issues, such as the difficulties linked to reaching the site and the almost complete lack of ancillary services.

The difficulties in using the sites goes hand in hand with parts of the archaeological areas having been closed to the public because of the need to ensure their conservation and to carry out maintenance. Despite several works having been carried out to ensure the safety of the new structures excavated, in some cases their use is still limited due to temporary closures, also because of the contained load capacity of some areas. In other cases, instead, use is limited because to the impossibility of unearthing buildings that are still buried due to lack of funds or because they are obliterated by modern buildings, as in the site of Herculaneum. Another factor that affects accessibility and the process of conservation, protection and enhancement of the site is its exposure to pollution and weathering that impact unearthed buildings and accelerate their degradation. In addition to preservation problems associated with the direct exposure of the structures to the atmospheric agents, the high seismic and volcanic risk must be considered and, with reference to the archaeological site of Pompeii, the hydrogeological disruption of the excavation sites and a water drainage system that continues to be inadequate.

The deficiencies of the infrastructures and services linking the three archaeological areas and the other territorial resources represent additional critical elements, in spite of local administrations and the Superintendence having pursued a path for the improvement of the overall accessibility and usability of the area (parking lots, signage, online ticket sale, etc.).

The network of infrastructures and mobility, and the accessibility to the area

The transport infrastructures of the territorial area of reference, as regards the main road network, to date are the *A3 Napoli Pompei - Salerno* motorway and the *SS268* national road. Insofar as concerns the railway network, instead, there are the *Napoli-Torre Annunziata-Sorrento*, *Napoli – Somma Vesuviana Poggiomarino* lines, the *Torre*

Annunziata-Poggiomarino line of the Circumvesuviana railway company, and the *Napoli-Torre Annunziata-Salerno* and *Torre Annunziata-Cancello* lines of RFI.

Therefore, the archaeological sites of Pompeii, Herculaneum and Oplontis are presently reachable by car, by bus departing from the cities of Naples and Salerno, or by train. During the high season (from 30.05 to 07.09), you can reach Herculaneum and Torre del Greco by sea from Naples with the MM1 line of Metrò del Mare. More specifically, accessibility to the three archaeological sites (map 5 at the end of Chapter 4) appears as follows:

- Pompeii can be reached via the A3 motorway and is likewise served by the State railway station and the two Circumvesuviana train stations, one of which, the one of "Pompei-Villa dei Misteri", is adjacent to the entrance of the excavations at Porta Marina and Piazza Esedra, and the other one, the one of Pompei Santuario, near the entrance at Piazza Anfiteatro. It is also possible to reach Pompeii by bus from either Naples (SITA bus lines) and Salerno (CSTP bus lines), in both cases with access to the excavations from the entrance of Porta Marina or Piazza Esedra.
  Not far from the three entrances to the excavations (Porta Marina, Piazza Esedra and Piazza Anfiteatro) are three private parking lots. The parking lot located on via Villa dei Misteri, adjacent to the namesake Circumvesuviana train station, also offers caravan parking and features a camping site.

- Herculaneum is accessible by car via the A3 motorway and is served by two Circumvesuviana train stations, one of which ("Ercolano-Scavi") is closer to the archaeological site, from which it is 700 m away. There is also the railway station of "Portici-Ercolano" located in the municipality of Portici, which is 1.6 km away from the archaeological site of Herculaneum.
  It is also possible to reach the excavations of Herculaneum by bus from Naples (ANM bus lines).

  The archaeological area features a spacious parking lot for tour buses at the new entrance to the excavations from via Alveo. There are also two private parking lots for cars, one at about 500 m from the excavations, and another 600 metres away from the archaeological area.

- Torre Annunziata can be reached by car via the A3 motorway and is served by the Circumvesuviana station "Torre Annunziata-Villa di Poppea", near the

archaeological area of Oplontis. The city can also be reached by bus with the Circumvesuviana bus lines that stop in via Vittorio Veneto near the excavations.

To date, an integrated visit to the three sites must be planned using private transport, as there still is no real logistics network connecting the resources of the territory.

The need to plan a network of interconnections, however, is now commonly felt by local governments. In particular, the region of Campania in the PTR and the province of Naples in the draft PTCP identify mobility strategies as the means to stimulate and promote territorial development.

Campania retains a system of natural and anthropic resources of exceptional importance and with a huge potential. Typological components of this complex system include the evidences of civilisation and culture that have been stratified over the centuries by the history of anthropisation.

These typological components can generate a multiplicity of opportunities, especially linked to luxury tourism, if we promote a synergy between them and their mutual accessibility.

In other words, a proper system of transport and the transverse joint mobility opportunities can enable the integration and thus the usability among the various resources of Campania that undoubtedly represent the highlight of this region.

A series of works have been planned and developed in this context, of which the following (especially important for the territory herein examined) ought to be mentioned:

- the extension of the A3 Napoli-Salerno motorway with the construction of a third lane (for each travel direction) and the redesign of almost all the junctions, with the inclusion of new ones and the adjustment of existing ones;
- the extension of the Circumvesuviana railway by doubling the Torre Annunziata-Castellammare di Stabia line and the development/restyling of some stations, including the Pompei Scavi stations;
- the construction of the variant Acerra – Pomigliano – Cercola of *SS268 national road* (“Strada Statale 268 del Vesuvio”) that will allow, through the toll booth of Angri along the Napoli-Salerno highway, to connect the Vesuvian area and coastline with the Nolan area, thus favouring the decongestion of the state highway and the motorway, in particular as concerns heavy traffic;

- the transformation of the coastal railway line Naples-Torre Annunziata – Pompeii - Salerno into a *Regional Metropolitan* line aimed at increasing widespread accessibility of the area by public transport;
- the establishment of the *Metrò del Mare*, which helps provide a transport offer that reconnects portions of the territory in a polycentric logic, directly linking coastal areas that had thus far been kept "isolated" by the presence of large hubs of attraction consisting of the provincial capitals;
- the construction of a number of interchange nodes of clear territorial importance.

Of considerable strategic interest is the introduction in the Neapolitan area of the **High Speed (AV) railway line** ("*General Programme of construction of systems for the upgrading of railway junctions*" defined by FF.SS. in 1994), in order to create a new North-South corridor for the long-haul passenger services located in the eastern part of the province of Naples.

The main works inherent to the AV line can be summarised as follows:

- construction of the "New AV Station of Porta" in the municipality of Afragola;
- link between this station and the existing stations;
- construction of dedicated infrastructure;
- use of the two lines connecting to Napoli Centrale train station;
- completion of the line upstream of Mount Vesuvius with access to Napoli Centrale;
- direct connection of the Rome-Naples line with the line upstream of Mount Vesuvius.

The effects on the Vesuvian area will obviously be very important. First of all, these works will provide an effective link between the city of Naples and its province with rather short travel times. In addition, the works linked to the "metropolitanisation" of the coastal railway line Napoli-Salerno will bring great benefits to the local mobility by improving accessibility to the sites and, by redeveloping the Vesuvian coastal area, will facilitate the interconnection between the coast and the hinterland.

Finally, the sea routes and the process of enhancement of the ports and strategic harbours aimed at regaining the coast and increasing the diversification and further development of tourism should be considered an essential component of the integrated regional transport system.

Tourism

Accommodation facilities in the province of Naples overall have more than 61,000 beds, which are concentrated (roughly 60%) in the tourist resorts of the island of Ischia and the Sorrento peninsula (these have respectively 35.2% and 24.8% of beds at provincial level).

In this territorial context, the Pompeii area, which includes the municipality of Torre Annunziata and another 9 municipalities (Boscoreale, Boscotrecase, Castellammare di Stabia, Gragnano, Sant'Antonio Abate, Santa Maria la Carità, Terzino and Trecase) in terms of beds counts for less than 6% and the area of Miglio d'Oro, which includes the 4 municipalities of Herculaneum, Portici, Torre del Greco and San Giorgio a Cremano, for only 0.6%.

Among the municipalities of the Pompeii area, the one with the highest vocation for tourism and hospitality is by far Castellammare di Stabia, which has more than 1,800 beds (52% of the district), outstripping even Pompeii, which has just under a thousand (28%). The number of accommodation facilities is actually similar in the two municipalities (22 are in Pompeii, one more than Castellammare), but the average size is rather different: 87 beds per hotel in Castellammare compared to the 45 in Pompeii.

The number of accommodation facilities in other towns in the area is rather low: all of them count 1-2 facilities of medium-small size (on average between 30 and 40 beds). One exception is the town of Gragnano, adjacent to Castellammare di Stabia, which includes 6 hotels with a total of 343 beds.

The situation in terms of tourism and hospitality in the area of Miglio d'Oro looks similar to that of the Pompeii area. Herculaneum, in fact, despite being the town with the highest flow of incoming tourism and the highest number of accommodation facilities, has a number of beds (297), equal to 32.7% of the total of the area, compared to the 55.9% in the municipality of Torre del Greco (507). The number of accommodation facilities is actually similar in both municipalities (8 in Herculaneum and 6 in Torre del Greco). What is noticeably different, instead, is the average size of the facilities: 84 beds per hotel in Torre del Greco, compared to the 37 in Herculaneum.

The number of accommodation facilities of the other municipalities in the area is again very small. In fact, Portici has only 3 facilities with 80 beds and San Giorgio a Cremano only 1 hotel with 23 beds.

Insofar as the quality of the tourist offer is concerned, while in the whole province of Naples almost 1 bed out of 2 (48%) now falls into the 4- and 5-star category, the Pompeii area has a slightly lower profile. There is no hotel of the highest category, while the number of 4-star accommodations is a little over 36% of the total amount. As with the Pompeii area, also in the area of Miglio d'Oro there are no 5-star hotels, while the number of 4-star hotels amounts to roughly 28% of the total.

Taking into consideration the tourist offer concerning facilities other than hotels, the situation is quite similar in the Pompeii area and in the Miglio d'Oro area.

In the category "campsites and holiday resorts", where the "leadership" is held by the Sorrento peninsula with nearly 49% of the total beds, followed by the Phlegraean area (with almost 20%), the incidence of the Pompeii area is 2.7%. The indicator, though, which is lower than the hospitality one, should not deceive. The accommodation facilities (three campsites for a total 360 beds) are all located in Pompeii, which happens to have a slightly lower number than the towns of Sant'Agnello, Vico Equense or Piano di Sorrento, each with between 500 and 600 beds in campsites.

Rather low is the number of "holiday home rentals", which are 4, for a total of 38 beds in the Pompeii area and only 3 with 34 beds in the area of Miglio d'Oro. In this case, Naples ranks in first place, with 49 facilities for approximately 600 beds, followed by the holiday resorts in Ischia and the Sorrento peninsula, which together have about seventy facilities for almost 900 beds.

Even the number of "bed & breakfasts" is quite low, although the situation in this case is totally the opposite. In fact, the area of Miglio d'Oro counts 10 bed & breakfasts (64 beds), compared to the 4 of the Pompeii area (24 beds): 3.8% and 1.8% respectively. As for the category of "holiday home rentals", even for the bed & breakfasts the first place is held by the city of Naples, followed by the Sorrento peninsula: 141 facilities respectively in the first (623 beds) and 72 in the second (357 beds).

The last category we need to consider are "hostels". Altogether, there are not many at provincial level: only 9, for a total of nearly 500 beds. However, there are hostels in both areas considered. In fact, in the area of Miglio d'Oro, there is a hostel that counts 87 beds and in the area of Pompeii a hostel with 50 beds.

Historical and cultural heritage

The activity carried out by the meeting table created for implementation of the Master Plan has allowed for the establishment of a GIS of the heritage, both for the implementation of a Vesuvian tourism system (see operating plan) and for the prevention and mitigation of disasters (see risk plan).

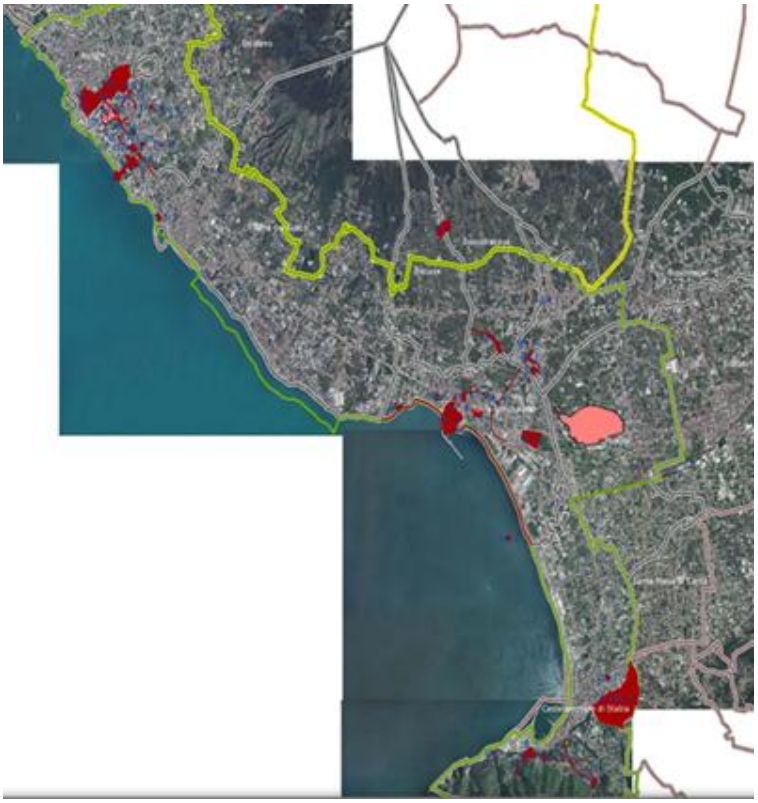


Fig. 2 - Gis of the heritage in the buffer zone area

It is clear that the widespread presence of cultural heritage sites, although concentrated in the territorial systems of the cities of Herculaneum, Pompeii, Torre Annunziata and Castellammare, represents one of the most significant elements of the landscape and likewise one of the most significant opportunities for the territory, which at the same time can be a dangerous weakness if its importance is not clear to the local communities.

SWOT analysis of the sites and territory

<table>
<tr><th colspan="4">POMPEII</th></tr>
<tr><td rowspan="2">STRENGTHS</td><td>- Archaeological site that preserves large portions of the ancient city in its original extension and with its own urban peculiarities.

- Cultural attractor of international interest.

- Suburban transport network with major centres (Naples and Salerno) and with the neighbouring Vesuvian municipalities.

- Presence of a GIS of the archaeological area of the site of Pompeii.

- Collection of data on incoming tourism flows.

- Internal and external video-surveillance system implemented under the GPP.

- Projects completed and in progress under the GPP (Knowledge Plan, Use Plan, Capacity Building Plan, Works Plan, Security Plan).

- Events sponsored and hosted by the archaeological site of Pompeii and by the Archaeological Museum of Naples.

- Distribution of informational material (leaflets) at the entrances to the excavations.

- Experiments on the use of identification devices to monitor exits and re-access to the site during the day.

- Accessibility for disabled persons partly guaranteed.</td><td>- Substantial extension of the archaeological site.

- Presence of areas not yet excavated.

- Insufficiency of surveillance staff.

- Localised rainwater drainage problems.

- Some buildings are not accessible due to safety reasons and/or load capacity.

- Reduced accessibility in some areas of the archaeological area.

- Insufficient presence of parking spaces for cars and buses.</td><td rowspan="2">WEAKNESSES</td></tr>
<tr><td>- Strategic location vis-à-vis neighbouring areas that are competitive in terms of tourism (Sorrento, Capri and Ischia, Amalfi, Naples, etc.).

- Tourist routes linking the site to the Ente Parco Vesuvio.

- Extension proposal for the AV line and creation of a railway hub at the excavations of Pompeii.

- Drafting of the PUC in progress.

- Bridging of the GPP.

- Possible use of the Sarno canal for draining waters from the archaeological site.</td><td>- Low-quality tourist offer.

- Limited stay of tourists in the area and low expenditure per capita.

- Hydro-geological risk involving the excavation sites.

- Seismic and volcanic risk.

- High flow of visitors, especially in summer.</td></tr>
<tr><td>OPPORTUNITIES</td><td colspan="2"></td><td>THREATS</td></tr>
</table>

HERCULANEUM			
STRENGTHS	- Links to the railway network and to the Circumvesuviana railway. - Presence of a GIS of the archaeological area of the site of Herculaneum. - Projects carried out under the HCP, funded and conducted by the Packard Humanities Institute and the British School at Rome. - Internal video-surveillance system. - Distribution of informational material (leaflets) at the entrances to the excavations.	- Construction of the modern city on the ancient ruins and inability to unearth more remains. - Insufficient urban signage on how to reach the site. - Absence of integrated events with the other sites and the Archaeological Museum of Naples. - Absence of a refreshment area integrated into the archaeological site. - Lack of an integrated system of street furniture and signage within the site. - *Antiquarium* not open to the public. - Buildings not open to the public for safety reasons. - Site not accessible to disabled persons.	**WEAKNESSES**
OPPORTUNITIES	- Strategic location near neighbouring areas that are competitive in terms of tourism (Sorrento, Capri and Ischia, Amalfi, Naples, etc.). - Adjacent to the Vesuvius National Park. - Proximity to the twenty-two 18th century villas along the Miglio d'Oro. - Incoming tourism flows on the rise. - Presence of a business sector boasting a strong identity with the historical places. - PUC in progress. - Implementation of a number of urban projects under the European economic plan.	-High rate of crime and petty crime, strong social and economic discomfort. - Weak urban identity and sense of belonging to the local community. - High unemployment rate, especially among young people. - Low-quality tourist offer. - Lack of areas specialised for tourism and related services. - Limited stay of tourists in the area and low expenditure per capita. - Urban and environmental degradation. - Seismic and volcanic risk.	**THREATS**

TORRE ANNUNZIATA			
STRENGTHS	- Connection with the Circumvesuviana railway. - Organisation of thematic exhibitions in collaboration with the municipality.	- Construction of the modern city on the ancient ruins and inability to unearth them completely. - Villa B closed for safety reasons. - Parts of Villa A closed for safety reasons. - Absence of a GIS for the archaeological area of Torre Annunziata. - Insufficient urban signage on how to reach the site. - Lack of an internal and external video-surveillance system. - Lack of services for visitors. - Absence of integrated events with the other sites and the Archaeological Museum of Naples. - Lack of an integrated system of street furniture and signage within the site. - Absence of information material. - Site not accessible to disabled persons.	**WEAKNESSES**
OPPORTUNITIES	- Strategic location near neighbouring areas that are competitive in terms of tourism (Sorrento, Capri and Ischia, Amalfi, Naples, etc.). - Adjacent to the Vesuvius National Park. - Proposed redevelopment of the waterfront.	- Limited incoming tourism. - Urban and environmental degradation. - High rate of crime and petty crime, strong social and economic discomfort. - High unemployment rate, especially among young people. - Low-quality tourist offer. - Lack of areas specialised for tourism and related services. - Illegal construction phenomena. - Seismic and volcanic risk.	**THREATS**

SWOT SITE 829			
OPPORTUNITIES	- Encouragement of private support to the management of the conservation and enhancement of the cultural heritage. - Availability of regional and European funding for knowledge, restoration, enhancement and utilisation of the archaeological sites. - Significant landscape relationship between sea, coast and volcano. - Transport network connecting the major centres and the Vesuvian municipalities. - Legislative and administrative instruments for the protection and governance of the territory. - Varied tourist offer: cultural, environmental and religious attractors of international importance. - Strategic location near neighbouring areas that are competitive in terms of tourism (Sorrento, Capri and Ischia, Amalfi, Naples, etc.). - Organisation of events with an international outreach. - Proposal for a new buffer zone bordering the Vesuvius National Park. - Incoming tourism flows on the rise. - Presence in the territory of non-profit associations having as their purpose the knowledge and enhancement of the cultural heritage.	- High housing and building density. - Low-quality tourist offer. - Social decay and crime, including organised. - Little sense of belonging to the territory. - Low level of accessibility of most of the cultural and landscape resources. - Seismic and volcanic risk. - Natural degradation phenomena and local conditions affecting the conservation of buildings (pollution, weathering, erosion, moisture, temperature, humidity, etc.). - Anthropic degradation phenomena (high flow of visitors, especially in summer, high anthropic pressure in most well-known buildings, vandalism).	**THREATS**

CHAPTER 3

CONSERVATION

8. **The objectives of conservation**
9. **Identifying risks and vulnerability**
10. **Identifying the priorities - risk mitigation projects**
11. **Planned maintenance actions**
12. **Guidelines for identifying and assessing deterioration**
13. **The guidelines for planning interventions on the archaeological heritage**
14. **The guidelines for mitigating hydrogeological risks**

1. The objectives of conservation

In the organisation of the Management Plan, the chapter dedicated to preserving the integrity and authenticity attributes of the inscribed property deals with the problem of conservation of the archaeological heritage of the Vesuvian cities inscribed on the WHL, and of the archaeological sites in the new buffer zone, by identifying, assessing and mitigating the risks of deterioration or loss of the Properties themselves.

The activities carried out, in this respect, by the officials of the Superintendency have given rise to policy guidelines and operational indications for the various risk situations present in the above mentioned areas. In particular, the Plan defines the criteria for diagnosing the degree of deterioration and using the information collected by the Superintendency's Information System, to design interventions for consolidating and restoring the built heritage, besides preserving the decorative elements, for designing the interventions aimed at mitigating the hydrogeological risks and landslides and for planning maintenance activities. All these criteria form the Guidelines to which reference should be made by the planning decision-makers in both the inscribed sites and the buffer zones.

Other defined criteria are the intervention priorities for preventing and mitigating the risks, which should inform both the works already completed and in progress, financed by the Superintendency with EU funds, and those planned for the 2017-2019 3-year period with the ordinary funds of the Superintendency and with the refinancing of the Great Pompeii Project (GPP) interventions by the European Union.

The major medium-term objectives are:

- to extend the deterioration documentation and analysis activities (Knowledge Plan) to all the sites and implement the information system developed with the GPP funds;
- to develop risk maps based on the collected information;
- to structure the planned maintenance actions based on the risks maps;
- to complete the hydrogeological risk mitigation interventions at Pompeii and Torre Annunziata;
- to carry out the consolidation and restoration interventions, with regard to the architectural elements and large decorated surfaces.

In the long run, the above mentioned activities should allow the coordinated management of the interventions concerning the inscribed Properties, with the systematisation of the various types of intervention, planned maintenance and consolidation/restoration interventions concerning the structures and decorated surfaces over an established time sequence, allowing the monitoring of the instability and deterioration in an ordinary way. Such a coordinated management should become the solid foundation for mitigating most of the risks, natural disasters, effects of climate change, anthropic risks and, above all, help replace emergency interventions with ordinary care, restricting the former to circumstances and events that are really out of the ordinary.

2. Identifying risks and vulnerability

In preparing the plan, a distinction has been made between the typical risks affecting the historical and archaeological heritage, which are addressed in this chapter, and the risks brought on by disastrous events, unrelated to the properties themselves, which are tackled in the Plan chapter desaling with the identification and mitigation of disaster risks (see Chapter 5). Therefore, following is a list of the major risks affecting the archaeological artefacts and properties in the inscribed sites of Pompeii, Herculaneum and Torre Annunziata, and in the archaeological areas included within the new boundaries of the buffer zone.

Risk assessment: vulnerability and hazard

Quantitative risk assessment is generally defined with regard to earthquakes, but the concept can be extended to include other environmental risks. A risk is substantially the result of a sort of equation that brings together factors such as dangerousness, vulnerability and value of the exposed property.

Since these concepts are not very widespread in the world of archaeology, it is probably best to explain beforehand the difference between vulnerability and dangerousness, which consists in the fact that the former indicates a disposition to *undergo* damage, while the latter indicates a disposition to *cause* damage: therefore, the former refers to a structure or an area, while the latter refers to any environmental or anthropic features; the third factor refers to the value of the property exposed to a risk. The different relations between these three factors determines the extent of the risk to which an archaeological property or area may be exposed.

The vulnerability of an archaeological artefact, therefore, consists in its disposition to be damaged, as a result of its degree of deterioration (culminating in its collapse), or of possible environmental (earthquakes, landslides, terrain instability) or anthropic (destruction, demolition, excessive frequentation, etc.) events.

Instead, dangerousness, generally speaking, identifies the frequency and magnitude of an event that can jeopardize the integrity of a structure, and the likelihood that such structure be affected by such an event.

Risk can be defined as the possibility/probability of being damaged, to a higher or lesser degree, as a result of the dangerous event, and in relation to the value of the property.

Within this framework, knowledge of the different causes that have produced the existing situation of an ancient artefact is particularly important to effectively assess the environmental and anthropic risks to which an archaeological area can be exposed. In particular, precise knowledge is required of the different environmental hazards affecting an archaeological area, and especially of the frequency and magnitude of the natural or anthropic events that concerned the area in the past, in order to assess their relevance for the future.

Geological and morphological risks

The geology and morphology of the area have a general effect on the conservation of ruins, in relation to natural phenomena such as landslides, subsidence, coastal erosion, variations in ground water levels, etc.

Geological dangerousness can be determined in terms of quality and probability, based on specific surveys. The effects of surface movements can be mitigated by means of maintenance actions, or by monitoring the relevant physical magnitudes of the phenomenon.

Structural risks

The structural vulnerability of an archaeological artefact depends on its configuration over time, as well as its type, geometrical dimensions, materials and state of conservation. Sometimes, the condition of an artefact can be substantially altered as a result of archaeological excavations, which modify the relationship between the parts of the structure above and below ground.

To analyze the structural vulnerability of a ruin, the following factors should be taken into account: form, geometrical dimensions, nature and quality of the materials and their state of conservation, relations between the excavated and buried parts.

An analysis of the crack patterns is particularly important, because they could be the result of past actions and not necessarily of a current situation of instability.

Therefore, it might be expedient to define historical crack patterns, examined and discussed by the design and structural engineers and by the archaeologists.

Geotechnical risks

Geotechnical vulnerability depends on the interaction between the nature and mechanical characteristics of the soil and on the type and geometrical and construction characteristics of the foundations and structure of the artefact.

Geotechnical vulnerability is generally related to excessive deformation of the foundation soil, with consequent damages. Movements of the soil are usually difficult to see and are normally signalled by the interacting constructions, which due to their greater fragility feature cracks even in the case of small movements of the soil on which they are built. Therefore, constructions generally show the symptoms of an artefact’s geotechnical vulnerability.

It is necessary to survey the geotechnical aspects of the problem, to identify the causes and, possibly, distinguish between the origins of the situations of instability.

The nature and mechanical characteristics of the soil can be determined in quantitative terms, by means of geotechnical surveys – typical of geotechnical engineering – based on experimental on-site or laboratory procedures and tests.

Geotechnical surveys are one of the stages of a field study, closely related to the objectives that need to be pursued and the characteristics of the artefact that needs to be safeguarded.

Regarding the static conditions of an artefact, these are greatly affected by the horizontal actions exerted by the huge amounts of soil that have accumulated over the centuries for natural or anthropic causes. The weight of the soil on a construction is particularly damaging when there is accumulation of water or in the presence of seismic events.

Hydraulic risks

Hydraulic vulnerability depends on the physical characteristics of the artefact, its altimetric and planimetric position in relation to watercourses and basins, the nature of the soil and of the physical environment as a whole.

Hydraulic and geotechnical vulnerability are often related and should, therefore, be considered jointly. In particular, during excavation, especially with regard to steep excavation faces, trenches and tunnels, it should be kept in mind that silty sandy soils are only apparently cohesive and the presence of water can rapidly make them very unstable.

Environmental and geographical risks

Geographical vulnerability is related to the biophysical context in which the archaeological site or artefact is located.

Land transformations caused by the construction of infrastructures and facilities for primary, secondary and tertiary activities have clearly altered the balance of the original ecosystems, producing a new situation that can be harmful to the conservation of the archaeological built heritage.

Factors such as environmental pollution and deterioration can also damage the archaeological heritage.

Intrinsic and additional risks

The vulnerability of the historical, and especially the archaeological, built heritage can be broken down into two components: an “intrinsic” component linked to the building concept of the work and how it has been altered through history, and an “additional” component caused by deterioration. The intrinsic vulnerability depends on the type and volume of the building and the nature of the construction materials and techniques, which are all recognised as being elements of cultural importance.

The additional vulnerability can be defined as the impairment, over time, of the quality of the building, as a result of its ageing and of the natural and anthropic events.

The former type of vulnerability can often be mitigated by means of radical interventions capable of altering important features of the work, while the second may require interventions limited to the restoration of the degraded building elements, which, in any

case, are necessary to prevent any further deterioration of the historical and/or archaeological property.

Weather risks

This vulnerability, which affects all the built heritage, is particularly serious in the case of archaeological remains, because ruined masonry is particularly susceptible to the effects of weathering, such as run-off, wind erosion, encroaching vegetation and the presence of micro and macro-organisms.

This type of vulnerability, which affects ancient decorative elements such as plasterwork, mosaics, frescoes and floors, can only be contrasted by effective maintenance programmes capable of balancing the effects of the deterioration and the conservation interventions.

Thermohygrometric risks

Hygrometric vulnerability depends on the interaction between the artefact and the surrounding surface and/or ground water, as well as on the presence of any adjacent embankments; the former produces rain penetration and rising damp, while the second leads to dampness penetrating from the embankment.

Rising damp is caused by ground-water rising up through the walls, depending on their porosity and eventually deteriorating the entire building; a similar phenomenon occurs in the case of penetration damp from an embankment, the difference being that, in the latter case, the water does not not need to be pushed up the walls by capillary action. In the case of rising damp, the mitigation measures depend on whether the damp is caused by surface or ground water.

Heat and humidity risks require conservation interventions aimed at blocking ventilation inside the buildings.

Anthropic risks

Anthropic hazards are due to both the interventions connected to the use of a property and those caused by the widespread alteration, by man, of the surrounding environment.

The former include the alterations aimed at ensuring the safety of visitors, the wear and tear of the property and the damage caused by maintenance and restoration activities.

The latter include the alterations affecting the wider environment, as a result of new excavations or new infrastructure, pollution, industrialisation, etc., the difficulty in implementing protected archaeological areas.

3. Identifying the priorities - risk mitigation projects

Having decided that, based on the vulnerability and hazard criteria, the predominant risks are the geological, morphological, geotechnical, hydraulic and structural ones, for some time now projects have been implemented to the purpose of preventing and mitigating the

effects of said risks. In the case of Pompeii, the European funds provided under the Great Pompeii Project have been invested, while the works at other sites have been financed by the Superintendency or, as in the case of Herculaneum, by international donations.

Planned maintenance activities are in progress in the archaeological areas of Pompeii and Oplontis, under a contract with Ales, an in-house company of the Ministry, which has allowed to identify an intervention model to be applied in many situations, by financing such fundamental risk prevention activity with ordinary funds by the Superintendency.

Of primary importance for all the risk-mitigation planning activities is the use of the data that has already been systematised for Pompeii, within the framework of the interventions provided by the GPP Knowledge Plan, while in the case of the other sites projects will be implemented in 2017 financed by the Superintendency.

The data will be used to plan the interventions, but especially to develop thematic maps concerning the various risk categories, which will be kept continuously updated by means of planned maintenance activities providing for an initial phase dedicated to monitoring the instability and deterioration phenomena, and a final phase for monitoring the effectiveness of the intervention.

The following tables show the risk profiles, ranked by order of magnitude, for each component of the inscribed site. Each type of risk features the risk prevention and mitigation interventions already carried out or being presently carried out, as well as those planned or scheduled for the 2017/2019 three-year period.

POMPEII		
RISK	**PRESENT**	**MITIGATION PROJECTS**
Geological and morphological risks **Geotechnical and hydraulic risks**	**YES**	**GPP FUNDS, M. intervention "Safety works regarding the excavation faces in the ancient city and mitigation of hydrogeological risks in *Regiones* I-III-IV-V-IX" in progress** **€ 19.423.600,00**
		GPP FUNDS "Safety works, to be carried out after the hydrogeological stabilisation of the state-owned land bordering the excavation area in *Regiones* III and IX" in progress **€ 2.824213,12**
		Extra Moenia- Diagnostic and fact-finding surveys and safety works **Scheduled forn 2017/2019** **€ 700,000.00**

Structural risks	YES	**GPP FUNDS" Safety works in *Regio* VI" completed; € 5.210.882,20**
		GPP FUNDS "Safety works in *Regio* VII in progress € 5.457.867,84
		GPP FUNDS "Safety works in *Regio* VIII" completed € 6.212.000,00
		GPP FUNDS "Safety works in *Regiones* I, II and III" in progress - € 10.608.234,84
		GPP FUNDS "Safety works in *Regiones* IV, V and IX" completed- € 11.300.250,29
		ORDINARY FUNDS BY THE SUPERINTENDENCY "Planned maintenance works" In progress and scheduled for the 2017/2019 period € 17.700.000,00
Environmental and geographical risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY "Planned maintenance works" In progress and scheduled for the 2017/2019 period Risk maps**
Weather risks **Intrinsic and added risks**	YES YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY "Planned maintenance works" In progress and scheduled for the 2017/2019 period** **Thematic risk maps developed by the operational unit of the Superintendency** **ORDINARY FUNDS BY THE SUPERINTENDENCY "Planned maintenance works" In progress and scheduled for the 2017/2019 period**
Heat and humidity risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY "Planned maintenance works" In progress and scheduled for the 2017/2019 period**
Anthropic risks		**GPP FUNDS Installation of a video-surveillance system;** **GPP FUNDS "Fruition Plan I" completed ORDINARY FUNDS BY THE SUPERINTENDENCY "Fruition Plan II" Scheduled for 2017/2019 € 2,000,000.00**

TORRE ANNUNZIATA		
RISK	**PRESENT**	**MITIGATION PROJECTS**
Geological and morphological risks **Geotechnical and hydraulic risks**	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY Project for determining and assessing the risks affecting Villas A and B at Oplontis - "Knowledge Plan" Scheduled for 2017/29019**
Structural risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY "Excavation, restoration and valorisation works of Villa A at Oplontis" Scheduled for2017/2019 € 1,500,000.00**
		ORDINARY FUNDS BY THE SUPERINTENDENCY "Architectural restoration and overhauling of the roofs of Villa A" Scheduled for 2017/2019 € 3,660,000.00
		FONDI ORDINARI YESOPRINTENDENZA "Architectural restoration and overhauling of the roofs of Villa B" Scheduled for 2017/2019 € 6,018,834.51
Environmental and geographical risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY Ales Convention Planned maintenance works**
Weather risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY Ales Convention Planned maintenance works**
Intrinsic and added risks	YES	
Thermo-hygrometric risks	YES	**ORDINARY FUNDS BY THE SUPERINTENDENCY Ales Convention Planned maintenance works**
Anthropic risks		**ORDINARY FUNDS BY THE SUPERINTENDENCY "Installation of a video-surveillance system in Villa B" Scheduled for 2016/2018 € 294.700,00**

4. Planned maintenance actions

During the implementation of the Great Pompeii Project, an experimental planned maintenance support service has been launched through an organisation consisting of a multidisciplinary team, for the purpose of providing an ongoing response to the multiple conservation needs of the site[1]. Requested for more than fifty years, and widely supported from a theoretical point of view, maintenance actions are hardly ever applied in the field of archaeology, due to scarce motivations and lack of adequate cultural policies. The good practices of daily widespread 'care', frequently adopted in the past, have been gradually neglected over the last few decades, in favour of the restoration of individual monuments, which, however necessary, are nevertheless insufficient, on their own, to ensure the safeguarding of the context as a whole. The meaning assigned today to the maintenance of archaeological architectures, however, is profoundly different from the past, when the focus was primarily on operational practices that lacked a process-based viewpoint. This change in methodology, due to the fact that, in the meantime, maintenance has acquired a cloak of scientific dignity, on a par with restoration, consists in the transition from primarily operational activities to organisational procedures, based on study and control, that need to be implemented before, during and after the purely executive phases.

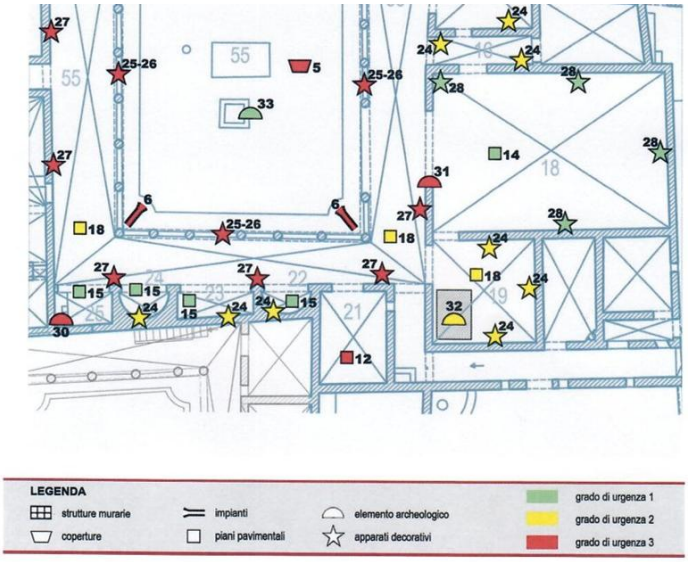
The maintenance process. Being characterised as an activity with a high degree of cultural content, planned maintenance can be achieved through a process featuring three key stages: *inspection, execution* and *critical review*. These phases, although distinct and with their own typical features, are nevertheless closely related. The process, in fact, is seamless, because it needs to be periodically re-iterated on the basis of a defined timeline (**fig. 1**). It can therefore be assumed that a process-based and cyclical approach to maintenance activities, organised in the above mentioned fashion, is the only possible tool we have for contrasting the advancement of deterioration, especially in so complex and physiologically fragile a site as Pompeii, where the degenerative alterations caused by the environment combine with an anthropic pressure that often conflicts with the sustainability

Fig. 1 Maintenance as a 'process': methodology.

[1] This service, launched in 2015, was contracted out to Ales SpA, an in-house company of the Ministry of Cultural Heritage and Activities, and of Tourism. The team features 1 Project manager, 1 Engineer, 4 Specialised archaeologists, 3 Architects specialising in restoration work, 5 Restorers of cultural properties, 16 Specialised workmen, 5 Qualified workmen.

threshold of the decorative structures and apparatuses.

Inspection phase. This is the first step in the process for approaching and identifying the problems of a monument, based on a direct and repeated inspection of the building, to determine the deterioration phenomena in progress and their possible causes. In order to accurately identify the dynamics of the deterioration, the direct inspection should be accompanied by the gathering of as much preservation information as possible relating to the past. However, in most cases, the case history of a monument is fragmentary and partial, due to the scarcity and loss of documents produced in connection with past conservation actions. Therefore, the information inferable from the GPP Knowledge Plan



Casa del Menandro. A graph showing the criticalities found.

will be of great help because, for the first time, they can provide reference data applicable to the site as a whole, albeit related to a specific moment in time. For a broader and thorough understanding of the conservation needs of the building, the inspection must be based on visual and empirical observations by an inter-disciplinary team. This is a great opportunity to successfully test the teamwork by an archaeologist and an architect, supported by a restorer, with the task of analysing the decorations, and a structural engineer, with the task of conducting specialist investigations to detect any structural problems. This multi-disciplinary approach can minimise the interpretational uncertainties regarding the deterioration phenomena, improving the quality and overall reliability of the final result. All the observations made during an inspection are collected in a *Report*, a sort of “medical record” of the monument, summarising the principal processes of deterioration observed according to three different levels of severity and urgency, for the purpose of prioritising the relevant interventions. The Report should satisfy the need, in the shortest possible time, for a general view of the criticalities in a graphical format (**fig. 2**), in order to

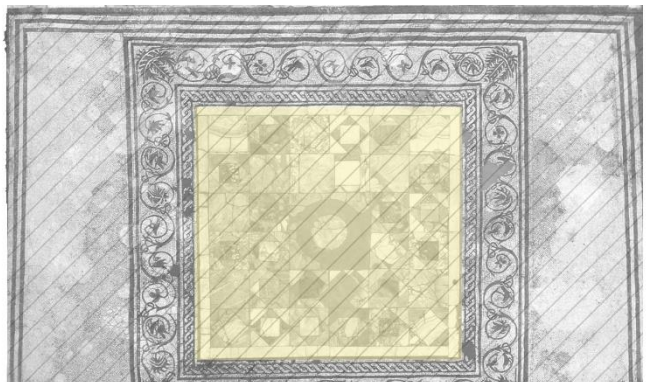
develop a short- and medium-term intervention plan to be submitted to the competent authorities.

The Report is divided into technological units (roofs, elevation structure, decorations, floors, systems), for each of which specific types of alteration or deterioration have been found, indicating their severity, scale and urgency. Summary datasheets are also provided for each situation featuring the criticalities, phenomena and probable causes; the assessment of the severity of the damage, and the interpretation of the deterioration process under way, determine the urgency required to remedy the problem. The overview resulting from the inspection activities serves as a foundation on which to build diversified programmes, depending on the state of conservation of the single artefacts, distinguishing between urgent corrective measures (safety works, repairs, consolidation) and ordinary maintenance activities (removing loose deposits, cleaning decorated surfaces, checking the rainwater drainage systems, improving any modern constructions for aesthetic reasons). Another important activity to be carried out during the inspections is observing the visitor flows in order to recommend improvements in the fruition of the building, while mitigating the anthropic vulnerability of the structures and decorated surfaces.

Execution phase. The corrections or maintenance requirements, emerging from the various strategies adopted during the inspection phase, must be planned and carried out according to a specific timescale. To promptly address at least the more critical situations, which if left untreated would probably determine the loss of the artefact, it is necessary to employ at the site, on a daily basis, specialised personnel operating as part of a dedicated structure and coordinated by technical and scientific experts. Since any maintenance activities carried out directly on ancient artefacts entail historical and aesthetic interferences and manipulations, the interventions must always be guided by critical judgement and never left to unbounded creativity. The constant presence of highly qualified personnel during the execution of the works is necessary to ensure respect of the monument's identity and to best exploit the opportunities for scientific knowledge that always arise when working directly on archaeological architectures (ancient construction techniques, stratigraphic reports on the masonry, identification of past restorations, understanding of the deterioration processes).

Critical review phase. The decisive contribution of archaeologists, architects and restorers engaged in the maintenance process primarily consists in the production of documents, a fundamental activity for controlling results, because it makes it possible to test the effectiveness of the interventions at a later date and, if necessary, to change the operational strategy. The documents must be as accurate as possible and provide a detailed description of the materials used and the techniques adopted and not just the location and type of the works. The widest possible circulation of the documentation, and the entry of data in the Information System, should limit the fragmentation and dispersal, in the future, of the conservation information, which is absolutely necessary to assess the speed and extent of the deterioration over time and the outcome of the decisions taken (with regard to the materials and techniques). The critical review of the data collected during the inspection and execution phases is important to plan the ordinary maintenance

activities, by identifying the type, location and frequency of the interventions required. This entails the development of maintenance sheets and procedures for planning and scheduling the maintenance activities on the basis of real data, and enabling the Superintendency to outsource the maintenance services, at least in part (**figs. 3-4**). Hopefully, this process will lead to the gradual construction of a maintenance plan for the site, providing in the forthcoming years an increase in spending, as a result of the gradual increase of the number of buildings to be inspected and the implementation of the maintenance programmes.



Casa di M. Lucretius Stabia. An example of detailed maintenance procedure for the *opus sectile* of the *tablinum*. If adequately planned, the maintenance activities will prevent the repeated occurrence of situations of serious deterioration (top left-hand corner) requiring expensive correction interventions (top right-hand corner).

ATTIVITÀ	PERIODICITÀ *	AREA**
Rimozione dei depositi superficiali incoerenti (quali terriccio, particellato atmosferico, residui di deiezioni animali).	7 gg	▨
Rimozione meccanica dei depositi superficiali coerenti (quali terriccio e particellato atmosferico sedimentato).	15 gg	▨
Rimozione chimica dei depositi superficiali coerenti (quali terriccio, particellato atmosferico e residui di deiezioni animali aderenti al substrato).	30gg	
	60gg	▨
Disinfestazione colonizzazione biologica.	Settembre	▨
	Marzo	
Applicazione protettivo.	365 gg	

Pompei - Servizio di manutenzione programmata

SCHEDA DI MANUTENZIONE SM 0003

Ministero dei beni e delle attività culturali e del turismo — ALES — POMPEII

TIPOLOGIA DI ATTIVITÀ 2.1.1: rimozione di dilavamenti di terra, lapilli, frammenti lapidei, malta disgregata, depositi biologici, vegetazione erbacea / assi viari

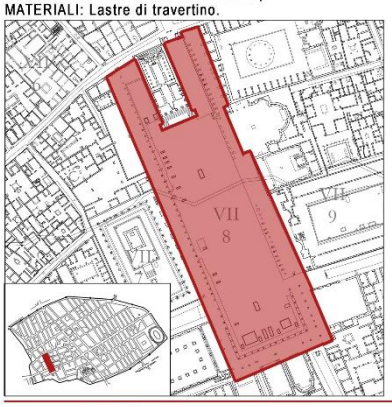
FORO CIVILE

localizzazione

DESCRIZIONE: Area scoperta costituita dalla piazza centrale circondata dal portico, di cui non si conservano le coperture; la pulizia si effettua unicamente sui tratti pavimentati conservati.

SUPERFICIE INTERESSATA: 1.060 mq.

MATERIALI: Lastre di travertino.



operatività e produttività

PERSONALE

2 operai

1 archeologo garantisce l'applicazione di corrette metodologie di documentazione e recupero di eventuali elementi archeologici

ATTREZZATURE

carriole, scope, cazzuole, pale, palette, soffiatore a spalla

DURATA

120 ore uomo — primo intervento

4,5 ore uomo — intervento a regime

PRODUTTIVITA' A REGIME

un operaio garantisce la pulizia di 235 mq/h

FREQUENZA

l'attività viene svolta ogni

mesi — settimane — 3 giorni

CONDIZIONI OPERATIVE in caso di:

flusso turistico alto — l'attività viene svolta dalle 7:00 alle 9:00

flusso turistico basso — l'attività viene svolta sempre con dissuasori

pioggia — l'attività non viene svolta

supporto scientifico e documentazione

RINVENIMENTI:
dalla pulizia non sono emersi reperti o nuovi dati archeologici.

OSSERVAZIONI:
la pulizia ha consentito di evidenziare i danni alla pavimentazione provocati dal bombardamento del '43

ELABORATI DI CORREDO:

- Scheda di documentazione: descrizione degli interventi e modalità di esecuzione
- Documentazione fotografica pre/post intervento
- Piano di lavoro: cronoprogramma delle attività

Pompei - Servizio di manutenzione programmata

SCHEDA DI MANUTENZIONE SM 0011

Ministero dei beni e delle attività culturali e del turismo — ALES — POMPEII

TIPOLOGIA DI ATTIVITÀ: rimozione di dilavamenti di terra, lapilli, frammenti lapidei, malta disgregata, depositi biologici, vegetazione erbacea / domus - complessi edilizi

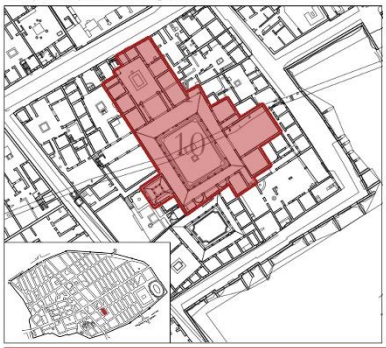
DOMUS DEL MENANDRO

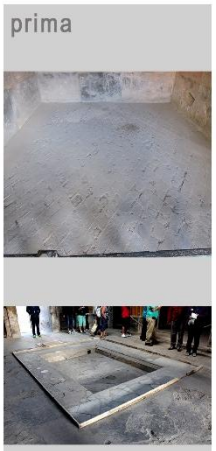
localizzazione

DESCRIZIONE: *domus* con coperture moderne e piani pavimentali antichi parzialmente conservati. La *domus* risulta esposta ad un flusso turistico molto alto e quindi ad un forte degrado antropico.

SUPERFICIE INTERESSATA: 719 mq.

MATERIALI: pavimentazioni in battuto di calcare con elementi marmorei, rivestimenti in mosaico, in cocciopesto e lavapesta; parziali integrazioni di restauro.





operatività e produttività

PERSONALE

4 operai

1 restauratore garantisce l'applicazione di corrette metodologie di pulizia su superfici delicate e sulle superfici musive

ATTREZZATURE

carriole, scope, scope morbide, cazzuole, pale, palette, aspirapolvere, dissuasori

DURATA riferita all'intervento con frequenza quindicinale

23 ore uomo — primo intervento

16 ore uomo — intervento a regime

PRODUTTIVITA' A REGIME

un operaio garantisce la pulizia di 45 mq/h

FREQUENZA (dal protocollo di manutenzione)

intervento 1: ogni 7 gg.
intervento 2: ogni 15 gg.

Orari (dal protocollo di manutenzione)

aree fruibili: 7:00-9:00
aree non fruibili: 7:00-f.t.

CONDIZIONI OPERATIVE

in caso di pioggia — l'attività sulle aree scoperte non viene svolta

interventi di manutenzione straordinaria

Insieme degli interventi di conservazione necessari all'avviamento della manutenzione ordinaria

- consolidamento strutture murarie
- ripristino sistemi di displuvio delle acque meteoriche
- consolidamento, integrazione e pulitura piani pavimentali
- messa in sicurezza e pulitura apparati decorativi
- ripristino e verniciatura cancelletti in legno
- riverniciatura teca espositiva e pulitura schermi in vetro

PERIODO: settembre 2015 - gennaio 2016
DURATA: 1.484 ore

supporto scientifico e documentazione

PROTOCOLLO DI MANUTENZIONE

Il protocollo di manutenzione descrive in dettaglio le aree interessate, le tipologie e le metodologie di intervento, i tempi, il personale e le attrezzature necessarie. Gli interventi di pulizia individuati, raggruppati per frequenza, sono:

1. Pulizia ambienti fruibili: a, b, 4, 6-9, 12, 55, 19, 21a, 22-25;
2. Pulizia ambienti non fruibili: 1, 3, 5, 10, 11, 13, 15, 16, 18, 21, 46.

ELABORATI PRODOTTI

- Report
- Protocollo di manutenzione
- Piano di lavoro
- Documentazione fotografica pre/post intervento

Nota: La durata dell'intervento a regime corrisponde alla somma degli interventi previsti dal protocollo di manutenzione.

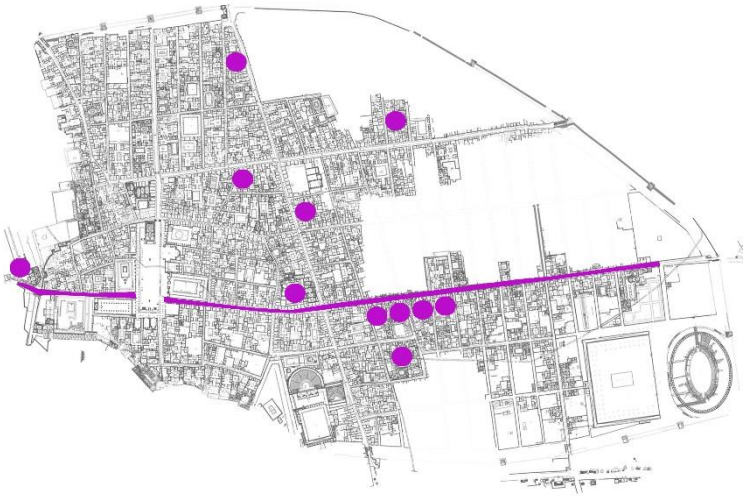
Maintenance data sheets relating to the removal of loose deposits from the streets and buildings: Foro Civile (top), Casa del Menandro (bottom).

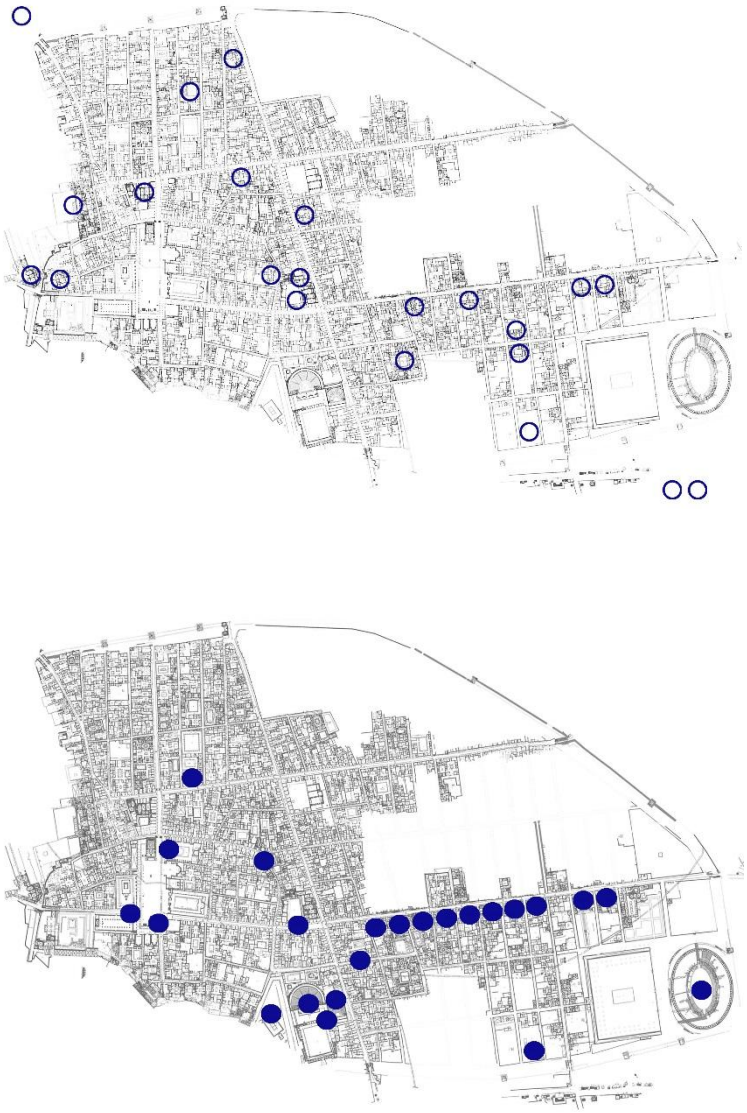
The first results. The monitoring teams have carried out visual and empirical inspections of wall surfaces and decorations along the streets and inside the buildings, producing 30 Reports on buildings and 110 technical reports or inspection sheets relating to single artefacts. In thirteen of the reported buildings, conservation interventions have been implemented on a regular basis according to the maintenance programmes. In these buildings, priority was given to the major criticalities, as well as to less urgent situations, as a means for controlling and preventing the deterioration processes in progress. The technical and scientific personnel has coordinated and documented the conservation interventions set out in the maintenance programmes. To ensure their indirect conservation, the masonry structures and decorative elements have been checked and cleaned and the relevant waterproofing and drainage systems repaired, with regard to both the roofs and the *impluvia*, peristyles and gardens. Besides the planned interventions, the teams have also strived to promptly respond to emergency requests from the Superintendency, with regard to precarious masonry structures and decorations (87 interventions) inside the buildings or along the main streets. In the space of a year, they have carried out a total of 300 conservation and scientific support operations, maintenance oerations on modern buildings and transportation and removal of materials.

The key purpose of the service was also to improve the appearance and fruition of the site, in the shortest possible time, by improving its accessibility, safety and the conservation of the visitor routes. This included the cleaning and periodical maintenance of the streets, of the areas open to visitors and of the houses, by removing the earth and loose deposits carried by the run-off water (3 km of streets and a total area of approx. 17,000 m2). The frequency of the street cleaning operations needed to maintain the results achieved is based on the monitoring operations and on the analysis of the documents prepared by the archaeologists. In parallel with the gradual implementation of the Reports and the maintenance procedures, and before the opening hours, periodical cleaning activities are planned and carried out on the floors in a growing number of houses; these activities are coordinated by the restoration staff and the archaeologists, who direct the operators and manage the execution procedures according to the nature and state of conservation of the areas concerned. Always with a view to improving the appearance of the site, the modern buildings have been given a coat of paint, the fencing systems have been checked and improved and some of the principal visitor routes re-qualified, while all the transparent shields protecting the plasterwork and frescoes, as well as the showcases and description panels, are kept constantly clean, and the 220 marble slabs and 381 slates with the street and other place names written on them have also been overhauled and improved.

The interventions are widespread, which means that they have been designed and planned over a large urban context and not confined to single isolated monuments. Although, with regard to certain specific processes, the urban sectors featuring the highest visitor flows have inevitably been singled out (streets such as the Via Marina – Via dell'Abbondanza axis, the Forum and the Via del Foro, the Theatre, Amphitheatre and Large Palaestra complex, several newly opened houses), the focus is still on the organic whole, with a view to ensuring a rational distribution of the differentiated interventions.

Following are several examples of coordinated planned maintenance interventions in Pompeii.

Reports on the identification of priorities **Reports (30)** *Domus* dell'Ara Massima; *Domus* della Caccia Antica; *Domus* di M.Lucrezio Stabia; *Domus* del Frutteto; *Domus* di M.Lucrezio Frontone; *Domus* del Menandro; *Domus* del Poeta Tragico; *Domus* di *Fabius Amandio*; *Domus* del Fauno; *Domus* della Fontana Piccola; *Domus* degli Amorini Dorati; *Domus* di *Paquius Proculus*; *Domus* di *Octavius Quartio*; *Domus* del *Sacerdos Amandus*; *Domus* dell'Efebo; *Domus* di Trittolemo; *Thermopolium* di *L. Vetutius Placidus*; Fullonica di *Stephanus*; Terme Stabiane; Terme Suburbane; Quadriportico dei Teatri; Villa dei Misteri; Via di Nola; Via dell'Abbondanza; Vicolo del Menandro; Via di Castricio; Via Marina; Via Consolare; Via della Fortuna; Via delle Terme **Maintenance programmes in progress (13)** *Domus* dell'Ara Massima; *Domus* della Caccia Antica; *Domus* di M.Lucrezio Stabia; *Domus* del Frutteto; *Domus* di M.Lucrezio Frontone; *Domus* del Menandro; *Domus* di *Paquius Proculus*; *Thermopolium* di *L. Vetutius Placidus*; Fullonica di *Stephanus*; Terme Stabiane; Terme Suburbane; Via dell'Abbondanza; Via Marina	 

Control, cleaning and minor repairs of the waterproofing systems and of the eaves and ridge (21 buildings) *Domus* del Menandro; Terme del Foro; Orto dei Fuggiaschi; *Domus* dell'Ara massima; *Domus* di *Octavius Quartio*; *Domus* della Venere in conchiglia; Villa dei Misteri; Terme Stabiane; *Domus* della Nave Europa; *Domus* della Caccia Antica; Vicolo del Lupanare; *Domus* dei Pittori; *Domus* di *M.Fabius Rufus*; *Domus* di Trittolemo; *Domus* di M. Lucrezio Stabia; *Domus* di *Paquius Proculus*; *Domus* del Frutteto; *Domus* dei Vettii; *Domus* di Giulio Polibio; Porta Anfiteatro (biglietteria); Padiglioni espositivi presso Piazza Anfiteatro **Drainage of flooded areas along the streets and in the buildings (about 660 m2)** Via dell'Abbondanza; Via Marina; Vicolo del Menandro; Vicolo del Citarista; Foro; Teatro Grande (orchestra); ambulacro di accesso al Teatro Grande da Via Stabiana; area antistante i containers (camerini del Teatro Grande); *Odeon*; *Domus* del Fauno; Terme Stabiane; *Macellum*; Foro Triangolare; Fullonica di *Stephanus*; *Domus* di *Fabius Amandio*; Orto dei Fuggiaschi; *Domus* del Criptoportico; *Domus* di *Paquius Proculus*; *Domus* dell'Efebo; *Domus* del *Sacerdos Amandus*; *Thermopolium* di *L.V.Placidus*; *Domus* del Frutteto; *Domus* della Venere in conchiglia; Lupanare; Anfiteatro.	

Removal of soil and loose deposits carried by rainwater (about 17.000 m2) **Seasonally maintained streets (3 km)** Via Marina; Via dell'Abbondanza; Via del Foro; Via delle Terme; Via della Fortuna; Via delle Tombe; Via di Mercurio; Via di Nola; Via Stabiana; Vicolo del Menandro; Via di Castricio; Via Consolare; Via delle Tombe; Via di Nocera; Vicolo di *Octavius Quartio* **Buildings cleaned and maintained on a regular basis (22 buildings)** Foro; Teatro Grande; *Odeon*; *Domus* di M. Lucrezio Stabia; *Domus* del Menandro; *Thermopolium di Vetutius Placidus*; Fullonica di *Stephanus*; *Domus* di *Paquius Proculus*; *Domus* di *Fabius Amandio*; *Domus* del Criptoportico; *Domus* dell'Efebo; *Domus* del *Sacerdos Amandus*; *Domus* della Venere in Conchiglia; *Caupona* di Asellina; *Domus* del Frutteto; *Domus* di *Octavius Quartio*; *Domus* di Casca Longus; *Domus* degli Amorini dorati; Villa Imperiale; Terme del Foro; Terme Stabiane; Terme Suburbane.	

Restoration work is in progress on the decorative apparatus of the porch on the western side of the pool of Villa A and the floor mosaics are being cleaned.

5. Guidelines for identifying and assessing deterioration

The development of the GPP Knowledge Plan has been an opportunity to systematise the documentation, fact finding and data filing procedures, with regard to the condition of the architectural properties and decorated surfaces.

These procedures can be reproduced in a range of contexts and are summarised below:

1. Graphical documents including:
   - Preparation of a 1:50 floor plan of all the levels included in the lot.
   - Georeferencing of the floor plans in the reference system of the Superintendency and, therefore, in UTM 84 and Gauss Boaga coordinates, and in coordinates referring to the elevation above sea level.
   - Preparation of an agreed number of Sections regarding the entire lot.

2. Photogrammetry
- Ortho-corrected high-definition photos will be taken with FULL frame cameras of all the vertical and horizontal surfaces.

3. Georeferenced laser scans

4. Preparation of inspection sheets showing the diagnostic data of the analysed surfaces.

5. Development of a GIS system

- The Information System receives all the data collected based on a GIS graph as the connecting point between the totality of the work carried out and the data management system.
  A software platform based on the Web Gis system forms the database, which can be implemented online and is easy to consult. The data stored in the IS will be used for the technical and scientific activities related to the sites, from design to scientific and site management activities.
  The data will make it possible to develop thematic maps of the degree of deterioration for the continuous monitoring of the state of conservation of the properties.

6. The guidelines for planning interventions on the archaeological heritage

Preliminary considerations

The aim of the project must be to conserve a unique document and make it accessible in the modern world; this means that even though the conservation of the archaeological heritage generally only has a cultural purpose, it is essential also to give due consideration to urban planning implications. Where there is no effective policy of control and territorial

development that extends to evidence from the past, the safeguarding measures laid down for protected archaeological sites all too often produce effects of marginalisation and degeneration.

The conservation project must relate ancient monuments to the urban and territorial context, establishing the principles for a plan for the archaeological sector that is able to interact with the other operative plans drawn up by the local authorities. This will make it possible to incorporate the features of the safeguarding project into the norms of the P.R.G. [*Regio*nal planning blueprint] and the development schemes. Therefore, any structural territorial interventions will have to take into account the presence of scattered archaeological artifacts or isolated monuments, as well as the safeguards already in place for protected areas. To this end, it is essential for each local authority to draw up a specific Archaeological Map for its territory.

The conservation of archaeological finds and their integration in the activities that characterise a city or territory are essential requisites for a modern society. This is why it is necessary to rectify the situation in which the conservation of the material documents of the history of our civilisation has been in opposition to the planning of spaces destined for society at large. The archaeological built heritage and modern living spaces can come together in a planned city, each taking on the most significant qualities of the other. When it comes to restoring the ancient fabric, the capacity of modern technical culture must be expressed in reducing intervention to a minimum, without altering the original construction conception of the artefact being conserved.

Recognised projects of conservation, enhancement and restoration of archaeological monuments and areas are only some of the possible cases, whereas widespread interventions involve complex situations generated by the transformation of ancient constructions. The restoration of ruins, even on a large scale, occurring in complex urban stratigraphic situations, may not only make the most of the potential of what exists and anticipate future needs, but may also constitute an effective response to the demand for widespread urban quality, initiating an on-going process for selecting the use, materials and technologies compatible with the historical context.

The semantic value of artifacts reduced to ruins, often highlighted by a condition of romantic abandonment, is comparable to that shown by whole monuments and may consist in sheer grandness, visible or evoked architectural quality and the ability to acquire an autonomous role in the urban fabric, bearing witness to an important phase of the past. The intervention criteria will obviously vary according to the value to be attributed to the historical artefact in the local urban context and to the general guidelines for territorial or metropolitan development.

For urban and extra-urban archaeological parks, just as for historic city centers or residential districts, the relationship with the contemporary city can be ensured by locating the necessary service infrastructure, required to integrate the new with the old, in open spaces, or decommissioned industrial buildings, or obsolete transport infrastructures, thus

safeguarding their architectural quality and urban value, or again by regenerating former industrial sites on the basis of appropriate projects.

Conservation and restoration alone cannot ensure the survival of the ancient artifacts if the planning of the contemporary city does not acknowledge the permanence of the historical structures as an essential feature.

Hence, the need to explicit the intervention procedures capable of directing urban planning decisions in a sectorial plan aimed at safeguarding archaeological areas and monuments.

Preserving the material substance of the artefact can also be ensured by means of the legally envisaged project phases – preliminary project, final project, executive project – as long as these phases are planned as a single sequence and contain safeguarding measures for the territorial or sectorial scale, combined with verifying the conservation projects, maintenance programmes and monitoring efficiency. The project must coordinate feasibility, environmental objectives and costs, ensuring the compatible use of the artefact.

The following instruments are indispensable:

• the historical/critical analysis of the archaeological resources, assuming the built fabric of which the artefact is or was once a part as the reference; thus, it becomes necessary to research the artefact's original form, also through typological comparison, as well as the function it performed in the ancient urban context, since the variations in form and context, brought about by historical events, may have led to its destruction or favored its conservation. Knowledge of the structural conception and construction techniques adopted makes it possible to recognize any additions or transformations that do not belong to the original configuration, as well as the effects produced by such transformations. Thus, the historical investigation must include a typological analysis, at the urban level and of the single structure, in order to identify any convincing references and parallels; this will enhance knowledge of the construction system and any transformations it underwent, to help make a correct assessment of damage and vulnerability.

• a geometric survey and, where appropriate, metrological analyses providing indications as to the criteria applied to the conception of the artefact, and to gain a full understanding of its dimensions; a partialised structure can be understood with the help of typological analyses, construction repertories, the existence of repeatable construction modules, and knowledge of the relevant techniques and materials;

To this end, the survey must make use of direct measurements taken on the existing artefacts, and theoretical matching with known or knowable types. Lastly, the survey should accurately describe the configuration of any structural damage and surface degeneration; a critical interpretation of the measured geometries can be the starting point for outlining the project;

• a logical and documented case history of the transformations, deformations and restoration and maintenance interventions, identifying their motivations and coherence with the conservation, necessity and effectiveness of the artefact;

• as complete as possible a diagnostic study of the mechanical, chemical and physical properties of the materials used, including analyses of any disturbances, knowledge of the construction techniques and the nature of the interventions that transformed the original form. This diagnosis aims at collecting technical and scientific knowledge on the ruin and will contribute to defining the conservation project.

Preliminary project

Knowledge of the artefact in question is always the first step in any conservation intervention. It can be based on written and iconographic records, surveys or reports of previous restorations, excavation logbooks or working notes, while in archaeological areas it cannot ignore the symbolic value of the ancient artefact, however this is documented. Furthermore, the project and operative phases will have to be measured against the requirements of the contemporary world, abiding by the normative and standard restrictions, without however impairing or deforming the ancient structures.

In defining the qualitative and functional features of the work, the overall requirements to be met, as well as the objectives and the administrative and technical feasibility of the planned intervention, the preliminary project must focus primarily on gaining knowledge of the material substance of the archaeological artefact, and the historical events which brought it about, ensuring the correct definition of the criteria needed to contrast deterioration and complying with the standard of “minimum intervention”. A procedural report will be able to outline the measures held to be urgent, necessary or expedient, for safeguarding the artefact or site, and the scale of the resulting interventions.

It will then be possible to indicate the general criteria to be respected, the periodicity of the applications and controls, and the scale of the worksites, so as to draw up an efficient picture of the material and economic feasibility. The preliminary project can draw on all the necessary disciplinary contributions, with relation to the problems and importance of the work in question, as well as multidisciplinary analysis and comparative studies.

Final project

The aim of the final project is to conserve the material substance of the archaeological resources, designating functions and uses that are compatible with the existing structures; it identifies the work that needs to be carried out, in accordance with the requirements, criteria, orientations and indications set out in the preliminary project. In the case of extraordinary maintenance actions, it will be necessary to foresee the priorities, define the technical operations, establish the operational timescale and sequence of works, in relation to the investment budget. Excavation campaigns must also be planned in their entirety and must envisage adequate protection measures; since the findings of an excavation do not always match the forecasts, a significant part of the work must at least be completed, before moving on to further investigations. Even when the archaeological areas only serve cultural purposes, conservation must be guaranteed so as to avoid situations of vulnerability for the artefacts and danger for visitors.

The project receives and organizes the findings of the many disciplines which define the conditions for the conservation of the materials and its place in the surrounding environment, composing, with new modes of equilibrium, images and data on the history of the territory and the ancient city as values for the modern city. Every spatial metamorphosis reflects the project culture which, based on the specific nature of each location, is transformed into a valid instrument for measuring the reciprocity of ancient and modern. Continuity and discontinuity in the materials used, new viewing areas and itineraries can express different and more complex analytical and formal approaches, which are qualitatively related to architectural objects as repositories of a large amount of information, even recomposing the fragments of images open to multiple interpretations, with the readiness to experiment a contemporary frequentation of successive phases of construction history without betraying the principles of conservation. Attention to this issue in conservation and restoration projects concerning the archaeological heritage can be expressed, at the territorial level, by requiring excavations to be carried out prior to the construction of any infrastructure, defining buffer zones, identifying ordered sequences that can be freely followed, organised according to parameters that are consistent with the most ancient spatial values, obtained using non-invasive instruments, materials and technologies, which can easily be reversed. In each of these cases the final restoration project will be based on the broadest possible knowledge of the artefacts, on conservation decisions that are consistent with the different situations, and on the criterion of minimum intervention.

Executive project

The purpose of the executive project is to provide a detailed description of the work to be carried out, enabling the effective setting up and organisation of the worksite for carrying out the planned conservation tasks, on a previously defined portion of the archaeological heritage. The tasks must be consistent with the relevant general principles and achieve the improvements envisaged by the project, involving the completion of one or more sites according to the established timetable; at the conclusion of the tasks, all the requisite documentation must be provided for a full comprehension of the work carried out, an evaluation of its effectiveness over time, and the applicable maintenance requirements.

The executive project must form part of the general intervention programme and receive sufficient funding, to ensure the achievement of the minimum envisaged goals. It can, however, represent just one stage of the final project, with further investigations being contemplated, concerning significant data that will permit subsequent stages in the executive project. The executive project must set up a maintenance plan setting out the operations to be reiterated, according to an established timetable. A conservation intervention, in fact, can never be considered finite or definitive; it inevitably involves ongoing interventions and the constant confrontation of conservation and maintenance requirements.

The executive project must include a specific security plan for each site, accompanying the work. In organising the worksite it must be borne in mind that the image of an historical artefact and archaeological complex is the result of the many varied transformations that –

from ancient times to the present day – have affected the urban and natural landscape, with differing roles over time. The permanence of the ancient structures, which underpins the city's topography and history, identifying spatial sequences for which one can reconstruct the architecture, technology, function and duration, can be highlighted and enhanced also during the phases of the intervention, using various systems of communication.

Nowadays, attestations of the ancient art of building, which grew out of practical experience and experimentation with forms and the durability of materials, confront structures conceived according to the modern epistemology of design and calculus. A commitment to the knowledge and conservation of the former is not in contradiction with the latter, but actually enhances the autonomous pursuit of innovatory spatial qualities, which may not be so lasting but are undoubtedly more flexible, and it is the responsibility of the executive project to ensure any such joint presence without conflict.

The restoration project must not consist in a variety of incoherent indications, but rather in orderly ongoing sequences, which can be freely adopted, organised with instruments, materials and technologies that may also be modern, but which respect parameters that are consistent with the older spatial values featuring light, water and earth, produced by human labor through the manipulation of natural materials.

Transgressing the rules as a way of deliberately breaking with the past, ushered in by the Avantgarde movements in the 1920s, in both architecture and the visual arts, was based on a critical and, in part, political discussion on the role of the arts. Today, this discussion has lost a lot of its meaning because flouting the rules has come to be expected of every planning and aesthetic initiative; and when any manner of surprise is taken for granted, surely the only true surprise lies in a planning approach based on the rules which architecture has patiently pursued for centuries. Recomposition fragment by fragment, the reversibility of interventions, the multi-functionality of spaces can, in fact, come to be seen as a strikingly new expression of modernity.

The executive project should take into account the following considerations:

– the intervention takes place in an existing context, which is already defined, even if not necessarily known, and takes the form of a complex process involving different phases, based on a scrupulous examination of the technical and construction qualities of the artefact, on the comprehension of the resulting space, and on a recognition of its intrinsic qualities. The project involves preserving the artefacts in their spatial and structural integrity and their "contamination" with modern materials designed to give the artefact a new functionality. This must be compatible with the quality and nature of the ancient structure and, in any case, must respect minimum intervention and maximum reversibility;

– in ancient structures, the rules of the art of building constitute a unique document of material history, and knowledge of the design and executive canons becomes an indispensable tool for investigating and identifying the fundamental principles for their conservation. In fact, the ancient concept of construction, often adapted from nature through the mediation of geometry, together with experimentation of materials with a

significant specific weight, inertia and durability, generate exemplary construction prototypes. Materials and adhesives, used with skillful and accurate experimentation based on observation, have contributed, through a long history of trial and error, with successes and failures, to determining the widespread convictions that for thousands of years have been at the heart of the principles underlying the historical built heritage.

Once no doubts remain as to the original form and technique, one may consider the advisability of reconstructing some portions, to ensure the structural improvement of parts of the ancient structure.

In other cases, often with a view to use, surface elements can be rebuilt, such as flooring, plasterwork, etc..

Structural calculus based on rational mechanics, which makes use of simplified theoretical models formulated analytically in interpreting nature, is at the service of an ever greater specialisation, which separates the planner from the practical know how of the worksite and makes it difficult for him to appreciate the laws and potential behind the historical built heritage.

It can be unequivocally stated that it is harmful for the planner to respond exclusively to the schemes proper to calculus and the inevitability of normative measures. Only recently has the development of calculus based on finite elements made it possible to obtain a more reliable approximation of the static behavior of ancient buildings, suggesting the possibility of bridging the irreconcilability of epistemological approaches, which are so much at odds with one another.

– Also in the planning phase, a different concept of construction and structure reveals the dichotomy between the historical built fabric and its modern counterpart. While construction, carried out according to the rules of the art, gives form to a unitary spatial organism that responds to all requirements, the structure is a material organism designed, based on the mechanical models, exclusively to fulfill static functions and connect the load-bearing parts of the building, which can be made by assembling industrial components. If the project envisages the even partial use of elements to be produced off the worksite, with processes far removed from the craft-based aspect of the historical built heritage, this must be taken into account when drawing up the construction details of the points of contact.

Technical intervention operations

Interventions in an archaeological context feature specific aspects, which often set them apart from interventions regarding the historical heritage.

First of all we, can note that, as a rule, the levels of risk for people are significantly lower, while from a conservation point of view archaeological sites should not be used for large-scale public events.

The archaeological ruin is a built element that has come down to us in a modified, mutilated and transformed condition, with respect to its original configuration and function.

It is what remains of an ancient building, about which we may not know very much and the identification of whichcan be quite difficult and laborious.

It is not what it was, originally, and it makes sense and is of value, in its current condition, as a document in the “archive of material history”. It has to be safeguarded and preserved for its cultural content and material substance. It is essential to preserve every part of an archaeological ruin, irrespective of the reasons behind its use.

Archaeological ruins can be classified as follows:

– large-scale ruins standing above ground (features which have always been present in the cultural landscape);

– remains uncovered through excavation, generally less significant in terms of configuration and complexity, as well as scale. Hence the need to respect the inalterability of the archaeological heritage; the inevitable and irreversible processes of wear and tear can only be retarded by a correct application of technological progress, employing all the currently available means and techniques (databases, geometric and material surveys, etc.) in realising the most comprehensive and exact documentation possible.

Ancient building materials and techniques have always been one of the fundamental domains of archaeological research. Since the middle of the last century this has been complemented by archaeometric research and engineering for cultural properties, two new developments, which are now in the forefront of scientific research on the ancient world. This has emphasised the significance of documents in the archive of material history, to the point that, at present, our greatest cause for concern is the deterioration of the building materials, whether natural or artificial, brought about by maintenance shortcomings. Protection from deterioration due to weathering and biological aggression thus constitutes a priority that outranks even seismic vulnerability.

Two fundamental criteria have to be adopted for archaeological interventions:

• improvement;

• possible reversibility.

The criterion of “improvement”, referred to in art. 34 of the national Code for Cultural Properties (in its definition of restoration), is not restricted to seismic vulnerability. Given the durability of the archaeological ruin over millennia, it tends to ensure stability, besides protection from deterioration, by means of uniform interventions compatible with the material nature of the ruin, planning the various technical operations according to the criterion of minimum intervention. In other words, the aim is to remedy deterioration by restoring the structure, as far as possible, to its original conditions, showing maximum respect for the ruin’s material integrity and long-term durability. The concept of “reversibility” is intimately linked to a critical approach to historical knowledge, for which archaeology is a fundamental proving ground. The intangibility of the document derives first of all from the possibility of its reinterpretation, in the light of more complete historical knowledge. Unfortunately, however, while the intangibility of a paper document has finally

been taken on board by modern historiographical culture, the same does not hold for the documents of material history, in particular, for the history of buildings and the built fabric, of which the archaeological heritage represents the oldest manifestation.

This blind spot of historians, concerning the material history, of the built heritage, has left room both for restoration interventions keen more on leaving their own mark than in safeguarding the identity of the monuments, and for technical interventions designed to ensure stability and functionality using materials and techniques that are quite alien to conservation. If the focus is on the safeguarding and transmission of the monument-document, it is clear that the concepts of reversibility and durability become cogent, and must be confirmed both in the conservation projects and in the programmed maintenance process.

The criteria required to ensure the above principles are:

• respect for the construction concept of the archaeological artefact,

• use of materials and techniques which are compatible with reversibility.

These criteria must be adopted, first of all, as methodological references, while various difficulties may be encountered in their technical application. Moreover the “specific weight” of reversibility changes, according to whether it involves deconstruction or is, above all, a methodological touchstone for new interventions.

When interventions concern situations that have firmly established themselves over time, it is necessary to act with particular caution, since significant new documents of material history have become stratified over the long time span of the archaeological ruin. Suffice it to mention, for example, the major archaeological “insertions” that can be seen in a lot of religious architecture. In many cases, reversibility can be safeguarded, awaiting technological developments that will specifically benefit conservation.

With reference to new conservation projects, the hope is that they will be drawn up in a historical/critical perspective, focusing primarily on the integrity of the monument-document. This means scientifically documenting the status of the artefact and then drawing up a conservation plan based on full knowledge of both the possible reversibility and the need for the intervention to be readily identifiable.

When reversibility becomes objectively impossible, as in the restoration of masonry structures, it will be necessary to adopt materials and techniques that are as consistent as possible with the ancient ones, so as not to alter the construction concept or distribution of stresses and preserve the durability of the artefact. Where restoration or use requires the introduction of new construction elements, such as horizontal axes, roofing, etc., architecture and modern structural engineering provide many technological possibilities for adding these elements without altering the ancient artefact or its structural behavior, minimising the linking and transmission of stresses between the ancient construction and the new structure.

Great care must be taken when applying the recent structural norms to the archaeological heritage, and this also applies to the recent guidelines for the evaluation and reduction of seismic risks in the cultural heritage, issued by the Ministero per i Beni e le Attività Culturali, drawn up for the historical heritage without making any specific allowance for its archaeological counterpart.

Unfortunately, the so-called consolidation interventions, which on the one hand have ignored the ancient construction concepts and on the other have applied the standard technologies of reinforced concrete or metallised timber, have caused irreversible damage, which now requires an urgent overhauling of the general strategy, putting an end to the concreting of the archaeological heritage and the interpretation of its stability in terms of standard structural coefficients

Archaeological sites and geotechnical problems

Archaeological sites often feature geotechnical aspects. The mechanical characteristics of the terrain influence the progress of excavation, the stability of embankments and the security of the operators involved. In these brief notes it is clearly not possible to discuss the principles of soil mechanics in any great detail, or address the technical problems of excavation in general.

We shall merely look at the situations that are most likely to arise, pointing out the relative geotechnical problems and the appropriate precautions.

In shallow excavations, or when it is possible to extend the area of intervention and limit the slope of the embankments, obviously no difficulties or risks of instability arise. A trench in a terrain which is not stony exceeding 1.5 m in depth, however, does require attention. Frequently, archaeological sites concern deposits which are not natural in origin, such as infills or shifted earth, deposits of detritus or the remains of collapsed previous structures, containing stone elements or fragments of bricks and mortar; generally speaking, these materials conform to the mechanical behavior of “incoherent soils”.

Archaeological sites involving sloping embankments higher than a few meters require a preliminary stability analysis conducted with geotechnical engineering investigation methods and procedures. Now, there are means and procedures for intervention that are not so invasive and make it possible to ensure the stability of the embankment and the security of the operators, preventing, or minimising, the risk of damaging any structures or features out of sight.

Foundations

Often the foundations of a ruin go down into an archaeological deposit level or one which is, in any case, fundamentally stable.

As a rule, where there has been no disruption caused by landslides, seismic events or floods, only very limited interventions are carried out. These must nonetheless be based

on a comprehensive knowledge of the existing foundations, as well as the geotechnical profile of the terrains in question. It will be necessary to ensure the greatest possible uniformity for the conditions of simple supported, restoring and strengthening the horizontal connections or, where necessary, underpinning the wall structures, a technique which can afford a better knowledge of the archaeological foundation area. In any case, no piles or micro-piles should be drilled, because this causes the definitive concreting of the deposit level, obliterating all the archaeological evidence and altering the original relationship between foundation and construction.

Masonry

Archaeological masonry constitutes a precious and complex attestation of material history in general and construction history in particular.

Its integrity has to be safeguarded now more than ever before, in view of the fact that contemporary technological development in the applied sciences enables us to make investigations that transform masonry into a historical document of outstanding value. Masonry enables us to determine the nature and provenance of the materials used and the mechanical, chemical and physical characteristics that determine their structural behavior. From its dimensions, analysis of its foundations and, where possible, study of the built structure, it is possible to gain precious evidence concerning the “rules of the art” and the construction techniques on a given territory at a certain time in history.

Further contributions can come from a stratigraphic analysis and, in the near future, methods for dating inorganic materials, currently at an advanced stage of research, will place analysis of masonry in the forefront of our historical knowledge of any construction whatsoever, enabling us to establish its origin and all successive interventions.

The definition and analysis of pattern of cracks and different forms of deterioration, if analyzed using scientific methods backed up by modern diagnostic, can provide new information about the recent evolution of the artefact, as well as being fundamental to defining the most appropriate conservation intervention.

When planning an improvement intervention it is necessary to use materials with physical and chemical characteristics that are as uniform as possible with the original materials. In particular, the stone or brick materials and adhesives used should be similar to those present in the artefact, while concrete and cement-based mortars must be avoided at all costs.

Using such materials, circumstances will determine one or more of the following actions:

• making localised repairs and making good fractured parts by closing up the lesions and, where necessary, “unsewing and resewing”;

• restoring existing alterations to the artefact in successive phases, which have been deemed inappropriate when the restoration was being planned;

• making integrations which are indispensable for ensuring the stability of the structure.

In any case, it is essential that the wall being treated should regain complete homogeneity of fabric, uniformity of resistance and rigid continuity, carrying out where necessary the appropriate connections by means of an efficient refurbishment of the masonry. Perforating the fabric, with or without the insertion of steel, fiberglass or other rods should absolutely be avoided, for four reasons: their invasive effect on the ancient fabric, their obvious irreversibility, the legitimate doubts as to their durability and, last but not least, the lack of evidence concerning their effectiveness, especially in the case of earthquakes.

When dealing with masonry that features particularly poor mechanical characteristics, as also micro-cracks and gaps in the masonry fabric, it is possible to draw on more modern techniques of cement-free adhesive compounds, which must be given a preliminary trial in terms of their feasibility and effectiveness, by making specific injections into the mortar joints and any cavities. There can be no question of reinforcing the masonry by concrete plating, whether reinforced or not, of using cement-based plasterwork.

Such interventions obliterate the ancient fabric and cause major damp-related problems, because they prevent the wall from transpiring.

Clearly, walls decorated with frescoes or mosaics are particularly delicate. If the fresco is only on one wall surface the intervention can be carried out with great care on the other surface. In any case, such interventions must always be performed working with specialists in the specific sector.

Pillars and columns

First of all, pillars and columns were generally designed to bear vertical loads with only a small degree of eccentricity: any action that affects this static behavior will negatively affect resistance and stability. Actions of this kind are due, above all, to the pressure from arches, vaults and roofing, caused by such dynamic events as earthquakes or wind.

In the interests of improvement, interventions on pillars and columns involve the following:

• restoring, where necessary, the original resistance under normal stress by means of hoops and inserts;

• removing or in any case limiting horizontal pressures by introducing chains into arches, vaults and roofing and providing or renewing buttressing;

• restoring, where appropriate, connections designed to transmit horizontal actions to elements that are more rigid and resistant.

On the contrary, it is important to avoid interventions designed to endow columns and pillars with resistance in the forms of bending and shear, such as reinforced perforations, pre-compression and the insertion of metal pins. Such interventions, as well as being invasive and non reversible, are generally of limited use and often damaging because they drastically modify the structure’s overall behavior.

Another technique to be avoided is swathing with carbon fiber or the like, and any other type of cladding that obliterates the construction element and modifies its static behavior.

Non-vertical situations must be analyzed with care, identifying causes and effects and evaluating the advisability of correcting or preserving them.

To the extent that they can be applied here, the observations made in the preceding section on walls remain valid.

Chaining and tie bars

The technique of inserting “chains” in masonry structures has been practiced for centuries. It has recently received new support and should be adopted systematically, especially for interventions in seismic zones. It is preferable to use chains made of bars of stainless steel with “keystone” fixtures, such as to distribute pressure across large areas of the masonry, better if fixed onto the outside of the walls. Alternatively, fiberglass bars or innovatory materials may be used, as long as they have proven mechanical, chemical and physical qualities and durability.

The chains serve to achieve the so-called “box effect”, meaning the capacity to function structurally as a single spatial structure.

To this end the chains will mostly be placed along the main walls, at all levels, using double chains round the walls themselves whenever possible.

Generally speaking, in the case of external walls, a single chain will be used on the inside. Where it is necessary to pierce the wall lengthwise (which should be done as rarely as possible), lined rather than injected bars should be used, ensuring reversibility, the possibility of replacing the tension and avoiding anomalous and harmful stresses.

As a rule, chains are horizontal. In some cases vertical or transverse tractions tie bars may have to be used. Whenever tractions are introduced the masonry must always be monitored to ensure that the induced actions are tolerated, with ample safety margins, also in the transitory installation phase. In some cases a masonry element in a condition of ruin may be stabilised with the use of adequate tractions anchored to the ground or to adjacent constructions. The intervention should be left visible so as to demonstrate the vulnerability of the ruin.

Arches and vaults

Construction elements featuring arches and vaults are characteristic of the all the historical built heritage. Contrary to widespread belief, based on knowledge restricted to the modern technical theory of the beam, which has had decidedly negative consequences for the conservation of ancient architecture, the behavior of arches and vaults during earthquakes is actually very good, a fact that becomes evident when assessing the damage suffered. It is no coincidence that underground structures, or those built on the lower floors, are traditionally covered by vaulting, specifically to increase the building’s box-like behavior.

Besides, arches have been used throughout the Mediterranean *Regio*n as an antiseismic connection between the various outbuildings of a complex, to dissipate the seismic energy over large masses or link up highly asymmetrical parts of a construction.

In ancient masonry roofs with a flat extrados and vaulted intrados, resistance is provided by all the masonry and not just by the arch-shaped intrados, enabling the pressure curve to adapt to the various stress conditions.

Regarding the presence of crack patterns, the arches and vaults can be subjected to local supplementary interventions similar to those indicated for the masonry, bearing in mind that some cracks can be physiological, making it advisable not to repair them; this is true in particular for fiches at the top and the sides, as long as resistance to trust is ensured.

A judicious adoption of chains of the kind described above can bring about significant improvements; as a rule, they will be applied to the trunk of arches and vaults. It is as well never to make use of lining techniques, which use various materials to introduce a countervault to the extrados; such techniques not only make the structural behavior of the two overlapping elements ambiguous, but also give rise to lack of uniformity in the materials with very different durability, while also being largely non-reversible.

Floors

Floors are generally only subject to vertical loads. In the presence of seismic actions they take on the important role of link between walls and transverse bracing stiffening, helping to produce the “box effect” which is essential for the building’s spatial behavior. To this end it is necessary for the floors to be well connected to the load-bearing walls and to have an adequate rigidity on their own plane. This said the following may serve as intervention guidelines:

• the introduction of beams involving the constant bisection of the masonry must be avoided. Instead, well placed external connections must be adopted, where necessary with chains and continuous fixtures in wood or steel framing, joined to the masonry by means of suitable fixtures. If the floor has to be replaced, it is important for this intervention to be largely reversible;

• usually wooden floors must be preserved; where this is not feasible, the replacement itself should be in wood. Beam heads must be well lodged into the masonry and rest on stone or brick underlays; where necessary they should be reconstituted, just as any trace of deterioration in the beams must be removed. Moreover it is advisable, wherever possible, to introduce an extra fixture presenting any significant horizontal movement. Finally the standard techniques for stiffening the deck will be adopted and, in any case, adequate provision must be made for air to pass, to avoid the risk of long term rotting;

• for ceilings with a beam and small-vaults or bricks it is advisable to provide stiffening by means of a reinforced ceiling linked to the girders, where necessary inserting chains and protecting the metal beams against corrosion;

• floors made of cemented brick are best replaced by new floors preferably made of wood.

Roofs

Wooden roofs with tiles should be preserved; if they weigh unduly on the structure it is best to remove the pressure by means of simple devices such as tie bars. The same conservation guidelines apply here as for floors, with the addition, of course, of effective and lasting waterproofing.

Other interventions

Sometimes, ruined structures can become very precarious and even verge on instability, or are stable enough in normal conditions, but become highly precarious in the case of earthquakes. This includes walls that are very slender or too high and not wind braced, or again fragments of vaults which merely function as cantilevers. These problems can be resolved, in general, with traditional improvement interventions, for example, by means of traction, or else with limited additions using uniform materials, which are in any case left visible, or, finally, by limiting the use of the structures to spaces that are safe from collapse. In planning such interventions it is essential to constantly safeguard the identity and material integrity of the ruin.

The contribution of innovation: diagnostics and materials

In the context of a historical/scientific theory of conservation of the archaeological built heritage, diagnostics is increasingly emerging as a key to scientific knowledge of material history. Over the last decade there has been a considerable development in geotechnical, structural, physical, chemical and biological diagnostics, and this is sure to continue in the immediate future, making it possible to achieve a reasonably certain dating of inorganic materials. Thus, before planning a conservation intervention, and alongside the case history of the remains in question, it is advisable to draw up a diagnostic plan for the specific case that can ensure a deeper scientific knowledge of the construction concept of the ruin, the materials and techniques used, and the various aspects of the ongoing deterioration. It is also indispensable to collect data from previous monitoring and analytical studies, of considerable value in interpreting the current and potential phenomena of destabilisation.

In recent decades materials engineering has developed numerous innovatory materials including artificial stones, fiberglass elements, composites, etc.. These materials must be used with extreme caution in interventions on the archaeological built heritage since there is no proof of their compatibility with traditional materials, nor indeed of their real reversibility or durability. Besides, recalling the damage done by widespread use of cement and construction elements in reinforced concrete, everything must be done to avoid such catastrophic experiences.

We would emphasize that it is becoming increasingly possible to design materials with specific physical, chemical and mechanical qualities, so that one can envisage a further stage in the scientific interaction between archaeology and engineering.

Protection against rising damp and control of the microclimate

In order to reduce the risks arising from the presence of water in the masonry, it is necessary to identify the relevant causes and magnitude, by means of an accurate diagnosis. If rising damp is due to the presence of surface water it is necessary to channel, regulate, contain and drain off the water. It is normally possible, and in any case preferable, to make use of structures sunk into the ground as being less intrusive than masonry or concrete constructions, which require the excavation of foundations and which are bound to hamper any future investigations. If, on the other hand, the rising damp is due to the water table, it is necessary to intervene on the filtering conditions of the terrain by means of deep drainage systems and the installation of (temporary or permanent) pumping equipment. These are, of course, particularly costly interventions, to be planned with extreme caution, assessing not only the positive effects, but also the possible risks. With respect to the risk linked to the presence of high levels of humidity in the air, which can cause deterioration on contact with the artefact, it is necessary to install a natural or mechanical ventilation system, depending on the circumstances, featuring adequate amounts of circulating air to ensure relative humidity values compatible with the conservation requirements.

Conservation of surfaces

A correct conservation intervention on the surfaces of historical architecture has to recognize the fundamental importance of knowledge of the intrinsic characteristics of the constituent materials and their state of conservation. The validity of this method has been amply borne out by the important findings achieved in defining the methodologies to adopt in restoration. These findings show that a scrupulous verification of the materials used in cladding, finishing, decorations and materials that make up the wall structure can have a considerable impact on historical and aesthetic evaluations, and represent a unique tool for formulating a correct diagnosis, planning the interventions required for the artefact’s conservation, and drawing up the programme for ordinary maintenance.

The planning choices which concern the surfaces of the archaeological built heritage in particular are heavily conditioned by the need to conserve a multiplicity of features. As a result, interventions must be strictly conservative, involving operations of strengthening and/or renewal of the adhesive properties. The conservation of the stratifications and, in particular, of the ancient plasterwork makes it possible to acquire and pass on a material archive of the transformations in working techniques.

The finishing materials which overlay the masonry, often found only in tiny fragments, require particular attention in the phase of firsthand observation, and specific tests may be needed to establish their identity.

We must stress that the ancients made frequent use of artifices that imitated noble materials, using simple coats of mortar applied in various ways and colored to ennoble the final aspect.

The first phase of the restoration intervention must consist in firsthand observation, so as to establish the material substance and state of conservation of the surfaces, recording the forms of alteration, visible on the macroscopic scale, in specific graphic records that permit

their precise localisation. Close-up scrutiny of the wall surfaces must be possible, using provisional structures if necessary, as well as their stratigraphic investigation. A number of stratigraphic assays may be necessary to make a correct identification of the constituent materials and their state of conservation. The stratigraphic sequences constitute a precious record of the artefact's conservation history and the building techniques; in the specific case of an architectural feature, it is important to identify the articulation of the single parts in relation to the idiom of the architectural order as a whole. In the case of plastered surfaces, it is often the deterioration itself which reveals, albeit only in summary fashion, the succession of layers, offering numerous interfaces caused by destruction episodes, where larger or smaller portions of the surface have flaked off or been prised off. Only after firsthand observation of the surfaces will it be possible to programme detailed diagnostic tests both on-site and in the laboratory. The taking of samples must be properly documented by means of permanent localisation and, when this is stipulated, with the due authorisation of the competent bodies.

Preliminary observations prior to establishing the conservation interventions required for the surfaces of ancient artefacts in stone should be approached in the same way, once again respecting and preserving all the transformations which are not actually detrimental and which have come about in the surfaces in the course of time and events.

Prior to direct intervention on the artefact, one must evaluate the possibility of intervening on the external causes that have produced the damage, whether connected to the environment (pollution, traffic, etc.) or the geometric configuration of the architectural feature (structural deformations, splaying at the joints, lack of surface water run-off, etc.).

In evaluating damage, the extent to which interaction with the environment and the conservation interventions have affected the surface of monuments must be assessed. In the most serious cases of disintegration and erosion, this may even have modified the volume of the structure.

In situations of pronounced surface erosion, it is clear that the restoration of the original color of the stones would not only require a major consumption of material, but would result in an "original" color scheme for a structure that has lost its original configuration. In view of such a limitation, conservation interventions regarding stone surfaces must take as their prime aim the removal of the products of alteration and non compatible materials which can constitute a further cause of deterioration over time, and the restoration of the cohesion and continuity of the materials.

The uniformity of the materials that can be identified on an architectural surface (natural stone, brickwork and terracotta, plasterwork, stucco, mosaic, wall paintings, graffiti, etc.) may well require widely differing intervention techniques. The most common intervention methodologies refer to the typologies of wall surfaces in stone or masonry clad with plasterwork and/or stucco.

Prior to any cleaning intervention it is necessary to ensure the security of the materials displaying damage such as to compromise their conservation even in conditions of minimum interference. Once the chemical and physical characteristics of the single

materials is known and the environmental situations with which they interact, it will be possible to identify the techniques and products to use in limiting loss of the material. The complex issues and all too frequent failures which have accompanied interventions of consolidation of stone materials are all too familiar; the problems involved both scant penetration of the consolidating products applied by impregnation, and incompatibility of the products with the mineralogical/petrographic characteristics of the material in question with the ensuing chemical/physical alterations.

The choice of product and manner of application must be established according to data which are absolutely reliable, ensuring their efficacy; where these are not available, preliminary testing must be carried out in the laboratory according to standard practice.

In the case of finishing made from artificial materials (plasterwork, stucco, etc.) ensuring their security may require both consolidation by impregnation, in the presence of forms of disintegration, and renewal of the adhesive properties, in situations where layers of plasterwork or stucco have flaked off, whether between one layer and another or away from the wall. The forms of disintegration can be treated using methodologies analogous to those indicated above for consolidating stone work, while the flaking of layers of different consistency requires the infiltration of suitable mixtures with low saline content accompanied, when necessary, by appropriate pointing.

The successive cleaning operations must always be preceded by extensive experimentation conducted first on site with products and techniques which match the chemical composition of the materials and the products of alteration in question. In choosing the techniques to be adopted, it is always advisable to favor methods that, with the same efficacy, can enable the restorer to operate in a gradual and selective manner, maintaining close control over the operation. When the conditions of the material permit the use of sprayed water, preceded by the appropriate consolidation and protection of parts at risk, this can usefully remove widespread deposits, after which precision cleaning can be carried out by mechanical means, or by the localised action of wads of solvents or again, in particular cases, instruments of greater precision still such as laser.

The surfaces of architectural features in archaeological parks are frequently affected by forms of degeneration due above all to bio-deterioration.

In such cases disinfection and disinfestation are particularly appropriate, and will normally precede any cleaning intervention. Disinfestation involves biocides and/or herbicides, according to the biological species to be eliminated. This operation can require several application cycles, and thanks to water’s solvent power and the bland mechanical action of scrubbing generally results in a good level of surface cleaning, except in the presence of serious forms of degeneration such as tenacious forms of encrustation.

The importance of conserving the repertory of evidence linked to significant events that have taken place in the course of time must also guide the conservation operations that concern layers of mortar, whether at joins or in plasterwork. Here the objective of the intervention must be the integration of the existing mortars, eliminating or limiting any that are irremediably useless or those involving unsuitable recent substances. Mortars can be

integrated by making up traditional compositions, according to type and granular size of the inert components, so as to ensure continuity with the existing mortars or make good small gaps in the stone elements, especially when these constitute barriers against water. One should also pay particular attention to the introduction of new layers of mortar, in view of the levels of fragmentation of the aspect of the structure caused by possible excesses of philological scrupulosity.

In treating surfaces in stone and plasterwork exposed to the elements it may be appropriate to apply a protective surface at the end of the conservation intervention, to limit the harmful action of atmospheric agents and in particular rain water. The choice of product has to take into consideration the issues reviewed above concerning consolidation, and also the aspects concerning the limited durability of the intervention and the likely effects of a faster run-off for the surface water, leading to the formation of dark threadlike deposits.

The conservation techniques used for prestigious architectural surfaces and the archaeological built heritage must be left to specialist restorers who are able to operate with the requisite expertise.

Protection systems for archaeological areas

More often than not, ruins in archaeological areas are kept covered over. While such coverings undoubtedly benefit conservation by limiting the impact of rainwater, they remain an alien element in the archaeological context. The ISCR - Istituto Superiore per la Conservazione e il Restauro - has carried out an accurate study of archaeological coverings, and this should become standard reference material prior to any planning decisions. In any case coverings must be conceived in full awareness of the many requisites that accompany the conservation of ruins, identifying the most appropriate environmental characteristics and ensuring efficient maintenance.

Emergency interventions

Over recent years an analysis of emergency has been developed which can ensure its management and limit the scale of damage, all too often catastrophic. Emergencies can involve fire, flooding, earthquakes, acts of terrorism or serious acts of vandalism. Methodologies have to be constantly updated, permitting the formalisation of operations in the awareness that bad emergency management can cause irreparable damage to the archaeological heritage. It is clear that urgent action should never be improvised, and those responsible must be able to identify the scope and type of damage to be tackled as quickly as possible.

Forecasting and prevention actions should already be in place at the outbreak of the emergency.

One emergency to be tackled is seismic activity which, in cycles that are to a small extent already familiar, is bound to affect zones at seismic risk. The first requisite in situations of emergency is to have an accurate and reliable documentation. This must be easily

available and familiar to managers, scientific staff and the people in charge of security and plant structures. A “team leader” has to devise an action plan which will establish the priority for a sequence of interventions alternating evaluation and action. The presence of a team leader is essential for formulating an emergency plan immediately, providing the forces of civil protection, army and volunteers with ample documentation and monitoring the intervention operations since, as as was only too often the case in recent seismic events, crude, uninformed interventions cause irreparable damage.

For each archaeological site or monument, an intervention protocol should be drawn up containing all necessary information, to avoid wasting time and to curb injudicious interventions. To this end a squad of volunteers could be set up, receiving specific training so as to give an immediate response to the emergency. Finally, as the Civil Protection advises, it is important to carry out periodic simulations of a seismic event, designed to show up problems of knowledge and documentation and accumulating a store of experience that will be triggered automatically on the outbreak of an emergency.

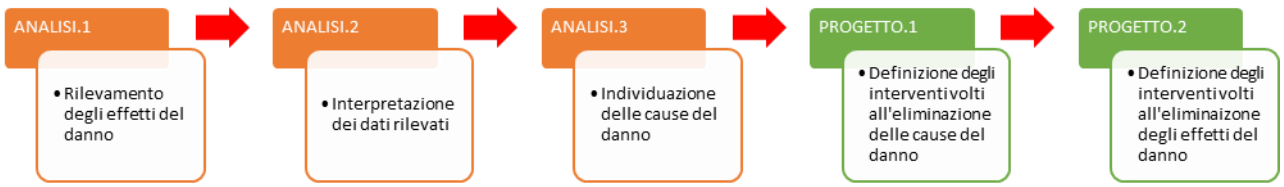
7. The guidelines for mitigating hydrogeological risks

The need to identify a method for ensuring the safety of the excavation faces and mitigating the hydrogeological risks in the *Regiones* I, III and IX, IV e V of the archaeological site of Pompeii, most of which has yet to be excavated, has enabled the definition of an intervention system that can be reproduced in other sites affected by hydrogeological problems, such as Oplontis and Herculaneum and other areas in the Vesuvian area.

The methodology identified focuses on:

1. reducing the hazards associated with the perimeter walls bounding the plains by means of a systematic set of hydraulic and geotechnical artefacts aimed at mitigating the hydrogeological risks and consisting in a series of slope reconfiguration and stabilisation interventions;
2. ensuring the safety of the walls by means of consolidation and basic restoration works aimed at mitigating their intrinsic vulnerability;
3. identifying design solutions for maximising the conservation of the integrity of the archaeological heritage and of the relevant context, as well as the durability of the works and the reduction of the maintenance costs.

The approach to the project definition begins with an analysis and synthesis phase, according to the methodological process summarised in the diagram below:



Phases included in the intervention design

Existing studies, surveys and investigations

- Before starting the design activities, it will be necessary to review the existing documentation, consisting of studies, surveys and investigations carried out in the area.

Assessment based on direct surveys

The existing data shall be supplemented by means of the following activities and surveys:

- hydraulic and geological analysis;
- geotechnical survey of the area concerned***;***
- structural-architectural-archaeological surveys***;***
- study of the decorative apparatuses;
- agronomical survey.

Direct archaeological-architectural-structural analysis

This type of survey, carried out directly on the field, focuses on the following aspects:

- Deterioration of the surfaces (*disintegration of the mortar ridges and joints, gaps and holes, detachment of the plaster and decorative apparatuses, weeds, etc*.)
- Structural deterioration *(off plumb, through cracks, collapses, shorings, lack of masonry joints, presence of chains, etc.)*
- Masonry/terrain ratio (with the identification of typological cross-sections)
- Archaeological analysis
- Analysis of the decorative apparatuses
- Cross-sections of topographical surveys (if any)
- Photographs
- Identification of any existing natural engineering works, with reference to their degree of effectiveness
- Identification of areas affected by landslides and earth faces lacking gravity support works at the foot of the slopes.

Examination of the findings

The examination of the findings of the surveys carried out will provide data relating to:

1. soil stratigraphy;
2. hazards posed by the earth pushing behind the masonry walls;

3. hazards related to the characteristics of the slopes of the plains (both with free toe or with toe adjacent to the walls), in particular in the cases in which the slope is steeper than the natural slope of the terrains, with regard to the considerable mechanical thrust against the masonry walls, to the greater effects of the run-off rainwater and to the geomechanical stability of the slopes themselves;
4. presence of natural engineering works and their slope stabilisation effectiveness;
5. the presence of trees planted on the slopes, entailing wall collapse mechanisms as a result of the roots thrusting against and breaking the walls.

Assessment of the multi-disciplinary studies and identification of the intervention criteria

Based on the outcome of the multi-disciplinary analysis carried out, it has been possible to define the objectives that the project must pursue, which can be summarised as follows:

a) reducing the mechanical thrust of the embankments behind the walls and stabilising the slopes;

b) reducing/mitigating the rainwater run-off along the slopes;

c) improving the performance of the masonry walls, in structural terms.

These requirements can be achieved by means of design choices based primarily on two key principles:

1) ensuring maximum conservation of the material integrity of the excavated archaeological heritage by implementing the actions described below;
2) allowing the future generations to carry out further excavations activities of the ancient city, by adopting a rationale featuring the re-iterability of the process, also based on future innovative excavation and slope stabilisation techniques.

Before describing the solutions adopted in accordance with the points above, it must be specified that the definition of the design choices takes into account the fact that, in most cases, the faces feature, with regard to the slopes, physical and geometric constraints of the following types:

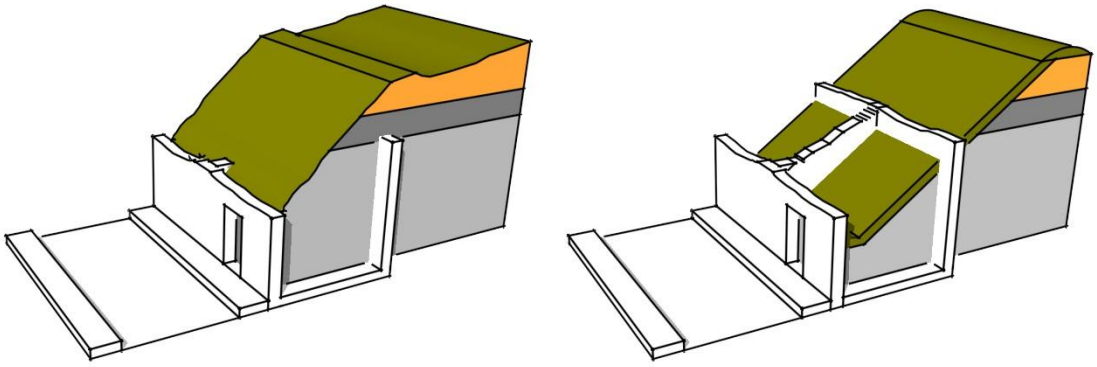
a) fixed toe, when the situation at the toe of the slope cannot be delocalised (i.e. moved elsewhere) (e.g., a wall flanking a street open to the public);

b) fixed crown, when the situation at the crown of the slope cannot be delocalised (i.e. moved elsewhere) (e.g., an architectural structure[2], or else the pathways envisaged in GPP 1);

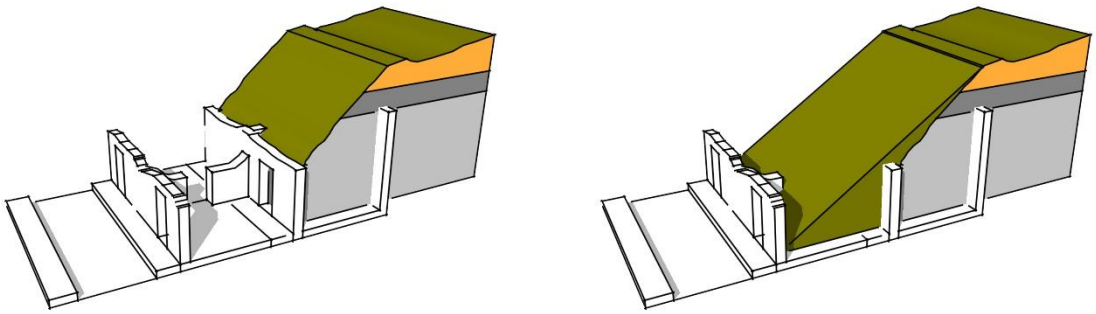
c) fixed toe and crown, when both the above mentioned situations occur.

Therefore, the technical choices can be assessed in relation to the need to change the gradient of the slope and its height behind the wall. Therefore, different approaches have been considered for remodelling the slopes:

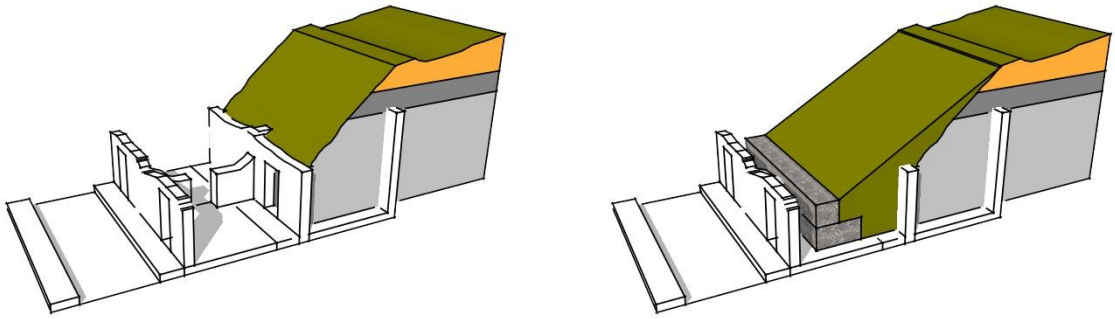
A. by removing soil. This solution consists in moving the crown of the slope towards the inside of the plain and reducing the height (of the soil) behind the wall and the gradient of the slope by means of excavation, based on the design inclination. This would solve the situation at the toe of the slope; however, it is extremely likely that archaeological remains would be intercepted during the remodelling and excavation of the slope, for which adequate conservation solutions must be designed.



B. by adding soil. This features moving the toe of the slope forward to reduce its gradient. This type of intervention would maintain the crown, but determine the reburial of a part of the walls in front of the toe, to ensure their stability.



C. by means of containment and natural engineering techniques. This solution provides for the use of gabions, which feature a significant degree of compatibility and reversibility, and is adopted when there is a need to reduce the thrust against the wall from behind, or when it is necessary to reduce the length or gradient of the slope by means of the “step” determined by the height of the gabion.



D. by shoring up the wall. This solution is adopted when it is not possible to reduce the thrust of the soil behind the wall by remodelling the slope and is only used in exceptional circumstances, compared to the previous solutions.

The approach described here has, therefore, led to different design solutions illustrated in the following paragraphs and in the specialist studies, depending on the diversity of cases considered and the multiplicity of factors involved.

Designing the interventions

The project must identify:

Hydraulic interventions

From a hydrological point of view, it will be necessary to provide for interventions entailing large-scale improvements in the capacity to withstand rainfall by diminishing the amount of water absorbed by the soil and the amount of water running off and eroding the slopes of the excavation faces.

It will also be necessary to provide for a rainwater drainage net.

Geotechnical interventions

Based on the analyses carried out, it has emerged that the conditions of stability and general safety could be achieved, theoretically at least, by implementing the following solutions:

- **traditional geotechnical solutions:** reinforced concrete walls, micropile bulkheads, tie rods;
- **natural engineering solutions:** palisades, woven wicker fences, geonets and biotextiles.

Given the location of the interventions and the historical and archaeological importance of the site, it has been decided to apply the least invasive solutions, excluding the use of reinforced concrete. Furthermore, given the necessity to preserve the wall structures, that are often located at the bottom of the excavation faces, and the difficulty of conducting the

archaeological excavations, the intervention hypotheses must aim at requiring the least possible earthworks, avoiding the use of polluting products, while at the same time minimising the need for maintenance operations over time.

In particular, the factors affecting the decision-making process are:

- the conditions of geotechnical criticality;
- the possibility/impossibility to move the excavation faces backwards;
- the possibility of reducing the excavation volumes, where possible;
- the need to focus on the fabric of the ancient city already uncovered in the previous digs and of any newly uncovered areas;

Therefore, the following types of intervention will be preferred:

Intervention A – Reshaping the excavation face, with a maximum slope gradient of 30°. Regularising the gradients of the excavation faces, moving back the crown of the face towards the plain, where necessary, so as to obtain the best possible gradient.

Intervention B – Reshaping the excavation face, with a maximum slope gradient of between 30° and 40°. Regularising the gradients of the excavation faces, moving back the crown of the face towards the plain, where necessary, so as to obtain the best possible gradient. The slopes of the excavation faces will be stabilised, given the steep gradient.

Intervention C – This intervention features a higher springing line to allow the partial reburial and the adequate reshaping of the excavation faces, with a gradient of between 30° and 40°.

Three applications of this type of intervention are provided:

- Closing the openings of the *domus* by means of new walls, or improvement of the existing walls;
- Closing the alleys with a gabion system;
- Positioning the basement system at the toe of the slope (gabion or edge beams).

Intervention D – Limited to the excavation face portion downstream from Casina dell'Aquila, on the side facing via dell'Abbondanza, where the conditions of the face and the presence of constraints at the top do not allow the required moving back for reshaping purposes; the intervention also provides for safety measures along the face, consisting of slope stabilisation works.

Intervention E – Construction of a timber grid, with the base element consisting of wood pilings, also suited to conditions that require a considerable degree of flexibility in positioning due to the possible presence of archaeological remains. The gradient of the slope thus obtained is about 45°. The intervention concerns exclusively the face that will be created by the archaeological excavation operations in the "wedge" area of *Regio* V,

given that none of the other solutions presented here are suited to the area, with its special characteristics. This intervention enables a drastic reduction of the length of the excavation face and the conservation of the archaeological wall structures.

Intervention F – This is related to the works for safeguarding the Conte Sarno Canal (*Regio* I) and the masonry walls along Vicolo del Citarista. The solution requires in the first place the reshaping of the excavation face, with a gradient of between 30° and 40°, together with a series of other works detailed in *11_A_geote.1 – Studio geotecnico*.

Intervention G – This essentially consists of the regularisation of the surfaces, so as to reduce the irregularities present in the examined stretches, with slight reshaping and hydroseeding.

Intervention H – Reduction of the volume of soil behind the wall structures, until a height of the soil of no more than 1.5 m above the structures is obtained.

Construction of ditches at the top – To avoid rainwater run-off along the slopes, it will be necessary to build ditches at the crown of the excavation faces, at a certain distance behind the slope brink, obviously. The gradient facing the plain must be very low, about 3-4%. The ditches will be either about 30-40 cm or about 50-60 cm deep, depending on the area that needs protecting. The ditches will be protected with 3D geonets and biotextiles, to ensure their durability and avoid any surface erosion.

Regarding the above mentioned interventions, and in particular the reshaping of the slopes, the following indications shall apply:

- the soil placed on the surface must have the minimum characteristics set out for the “A-type” terrain (with reference to the paragraph showing the stratification characteristics of local soils), for a depth of at least 30-40 cm;
- hydroseeding shall be carried out, using a mixture of grass seeds previously selected based on agronomical indications, so that they can take root easily. This process is necessary for ensuring the success of the intervention;
- behind the wall structure placed at the toe of the excavation face it will be necessary to provide for a horizontal protection space about 1-1.5 m deep, to minimise the direct thrust of the excavation face against the wall structure itself (featuring a slight gradient from the wall to the face of about 3 %);
- in the event new wall structures are unearthed during the reshaping operations, it will be necessary to temporarily protect any surfaces exposed during hydroseeding by means of waterproof sheets.

Agronomical interventions

From an agronomical point of view it will be necessary, in the design phase, to remove everything from the intervention areas, including any vegetation planted there and not deemed of any particular value. Furthermore, it will be necessary to provide for a grass cover, consisting of a multi-grass meadow, on the plain, as well as a grass cover over the

natural engineering works along the excavation faces, in order to stabilise and protect the soil from erosion and run-off water due to rainfall, and to achieve an evaporating-transpirating surface for natural draining of the rainwater.

Regarding the multi-grass meadow, this shall preferably consist of a mix of 6-7 species of grass, the selection of which shall take into account the commercial mixes sold on the market, based on parameters such as soil and climate conditions, precocity and resistance to diseases. When selecting the mix, and fixing the number of species, it will be necessary to accurately balance the leguminous and graminaceous types of grasses; it goes without saying that the best period for sowing the grass is, of course, spring. The grass covering of the faces may be obtained by means of hydroseeding, which provides for use of a mixture containing water, a mix of seeds suited to the environment, fertiliser, adhesives, plant growth hormones and soil improvement products, all mixed together and sown with a hydroseeder. If it proves necessary to provide for a protective layer of the soil, for the purpose of supporting the growth of the vegetation, in the initial stages at least, geosynthetic and natural fibres may also be used.

The choice of the flower species shall pursue the aim of favouring the best possible biological stability and the least possible incidence of fungal diseases and parasites, preferring the native plant and grass species found in the surrounding countryside, so as to ensure the fast growth of the grass cover to protect the soil from erosion, while at the same time gradually introducing the spontaneous species already present at the site. A sampling of the spontaneous grass flora most representative of the archaeological park would be useful in fostering the choice of grass mixes to be used in the grass cover design; maintenance of the grass cover shall provide for all the necessary agronomical operations for ensuring the conservation over time of the quality characteristics of the grassy cover, until the new spontaneous flora gradually replaces the planted grass. The formation of a spontaneous grass cover in the archaeological area is suited to covering the slopes, even when the gradient is not close to the normal gradient. The loose soil forming the so-called “Bourbon” mounds, in fact, has proved stable over the years thanks precisely to the grass cover. These observations are also the result of the simple realisation that several of the slopes parallel to the city walls, between the necropolis of Porta Herculaneum and Porta Vesuvio and between Porta Nola and the Amphitheatre, have stabilised over the years without showing any instability.

Archaeological interventions

The observations made during the analysis of the archaeological heritage is very important for determining not just the nature of the conservation solutions to be adopted with regard to the unearthed structures, but also the more general strategy that needs to be applied for ensuring the safety of the excavation faces. Regarding the former, the actions provided are characterised by consistency, recognisability and, where possible, reversibility, aimed at restoring the static balance of the walls, protecting the e exposed surfaces and the summit crowns from weathering, and strengthening the wall structures, by means of integrations, repairs, also adopting the stitch/unstitch method, refacing of the cores or crumbling surfaces and/or surfaces lacking cohesion. Where there are decorated and/or

otherwise cladded surfaces (including floors), the restoration work shall be completed with special conservative interventions for preserving the plasterwork, paintings, cocciopesto, marble and floors, for which reference should be made to the chapter on the decorative apparatuses.

The archaeological excavation process, therefore, is necessary and preliminary to the stabilisation of the slopes aimed at ensuring the safety of the excavation faces.

CHAPTER 4

PUBLIC USE PLAN

7. **Objectives of the use plan**
8. **Current status of property use**
9. **Interpretation and presentation systems**
10. **Communication and fruition program in the archaeological area of Pompe**
11. **City and territory: planning for a sustainable tourism system**
12. **A sustainable tourism system in the Vesuvian area**

1. Objectives of the use plan

The development of a use plan of the Pompeii, Herculaneum and Torre Annunziata sites aims to adapt to international standards the site reception, visit aid and site leaving services, to alleviate the risks associated with the pressure exercised by the excessive anthropic pressure of tourism on Pompeii as opposed to the limited influx seen in other inscribed properties such as Herculaneum and Torre Annunziata.

The objective is therefore to identify the necessary actions that will provide inscribed areas with services they are currently lacking, improve the existing ones and set up a site interpretation and presentation plan aimed at maximum visitor involvement, while guiding the visit so as to avoid excessive concentration in the most famous places.

To this end, suitable actions will be identified to facilitate a longer stay at the sites (ideally several days), as well as visitors' mobility, to create a closer relationship between the ancient city and the modern one, such as the temporary exit facility from the archaeological areas now being experimented in Pompeii.

Functional to that is also the development of communication campaigns through social networks and the Superintendency website, to promote the sites and assist visitors' choices in travel arrangements.

Lastly, the Plan wants to create a sustainable tourism system in the territory, combining inscribed areas and buffer zone areas in one comprehensive offer that will allow visitors to have a richer cultural experience during the visit, and local people to increase their sense of belonging by appropriating the key elements of knowledge necessary to understand the site's universal values, thus enhancing their ability to cooperate for its conservation.

That is also the *modus operandi* of Unità Grande Pompei [Greater Pompeii Unit], created by Law 112 in 2013, that set up a Strategic Plan for the buffer zone of the UNESCO site made up of the Pompeii, Herculaneum and Torre Annunziata Archaeological Areas.

2. Current status of property use

A significant proportion of the sites cannot be visited, for various reasons ranging from the partial unearthing of some buildings to the lack of staff. As regards the basic offer, to this date an increase in excavated areas is not being envisaged, except for the completion of a few ones already partially brought to light.

<u>Pompeii</u>

The ancient city of Pompeii is spread over an area of 66 hectares, of which two thirds have been excavated. Of the approximately 44 hectares, only 35% are practicable for the public, with 90% public spaces and 30% private homes open to visit. Limited access areas were set up to avoid congestion in busier periods, such as the Lupanar (brothel), open to just 10 visitors at a time, and a few *domus* accessible only during part of the day. However, the completion of interventions to make the ancient city's *Regiones* safe and of the restoration works of many notable *domus* has recently widened the tourist offer.

Herculaneum

As regards ancient *Herculaneum,* most of the city is not above ground and often buried under modern buildings. An area of 4.5 hectares, making up about 25% of the ancient city, has been excavated. Wall structures are certainly better preserved in Herculaneum than in nearby Pompeii, since during the eruption the city was buried deeper and there was a good process of lithification of the ashes due to higher temperatures. Unfortunately it was not possible to bring to light many of the public buildings, which have a greater carrying capacity.

Torre Annunziata

In Torre Annunziata, near the Oplontis site, only the so-called Villa di Poppea has been brought to light and can be visited. Although it cannot count on a great carrying capacity, it can accommodate around two hundred people, divided into the villa's different spaces (swimming pool, atria, peristyle, garden, salon and colonnade). The site surface area is around 20,213 sqm, but the strictly archaeological part covers 12,200 sqm. The monumental complex of Villa B is closed to the public.

The tables below illustrate the critical points currently found at the sites with respect to the following service categories:

- **Site reception services** (ticket office, info-point, cloakroom, rest room for coach drivers, kindergarten, distribution of visit aids)
- **Site visiting services** (meeting point, visual routing system, lighting, bar, restaurant, pic-nic areas, semi-mobile kiosks, first aid);
- **Site leaving services** (bookshop, banking services).

Site reception services

INFO-POINT		
Pompeii	2	At Porta Marina and Viale delle Ginestre
Herculaneum	1	Available at the ticket office
Oplontis	0	Under construction
CLOAKROOM – BAGGAGE ROOM		
Pompeii	3	At Porta Marina, Piazza Anfiteatro, Piazza Esedra
Herculaneum	1	Near the new ticket office
Oplontis	0	Under construction
REST ROOM FOR COACH DRIVERS		
Pompeii	0	Not available
Herculaneum	0	Not available
Oplontis	0	Not available
ARCHAEOLOGICAL KINDERGARTEN		
Pompeii	0	Not available
Herculaneum	0	Not available
Oplontis	0	Not available
VISIT AIDS ON PAPER		
Pompeii	YES	- Map with numbered buildings, including routes recommended by the SSP - Site information booklet - Various information material (bus timetable, events) on request
Herculaneum	YES	- Map with numbered buildings - Site information booklet
Oplontis	YES	- Map of the Villa - Site miniguide
AUDIOGUIDES		
Pompeii	YES	In Italian, English, French, German, Spanish
Herculaneum	YES	In Italian, English, French, German, Spanish
Oplontis	NO	Not available

Site visiting services

MEETING POINTS (allowing visitors to form groups heading for different destinations)		
Pompeii	0	Not available
Herculaneum	0	Not available
Oplontis	0	Not available
PRESENTATION AND INTERPRETATION SYSTEMS		
Pompeii	YES	The site coding system includes the "paline" (i.e. poles placed along the routes), information boards on the monuments with possible QR CODE, audio guides and maps. Multimedia support applications for themed itineraries. Reconstruction model with image mapping. Widespread museumification. Night projections.
Herculaneum	YES	The site coding system includes the "paline" (i.e. poles placed along the routes), audio guides and maps
Oplontis	NO	Not available
LIGHTING		
Pompeii	YES	
Herculaneum	YES	
Oplontis	YES	Lighting in operation during evening openings only
BAR		
Pompeii	YES	
Herculaneum	NO	
Oplontis	NO	
RESTAURANTS		
Pompeii	YES	
Herculaneum	NO	
Oplontis	NO	
PIC-NIC AREAS		
Pompeii	3	One in the north area, one in the area below the Amphitheatre and one outside the area
Herculaneum	0	Not available
Oplontis	0	Not available
SEMI-MOBILE KIOSKS		

Pompeii	0	Not available
Herculaneum	0	Not available
Oplontis	0	Not available
TOILETS		
Pompeii	14	At the three entrances and inside the area
Herculaneum	2	- In the eastern area of the excavations - At the ticket counter
Oplontis	2	- In front of the ticket counter and offices
FIRST AID		
Pompeii	YES	Only available in the summer period (pending tender to allocate the service throughout the year)
Herculaneum	NO	Not available
Oplontis	NO	Not available
SERVICES FOR DISABLED PEOPLE		
Pompeii	YES	"Pompeii for everyone" route and visit aids for partially sighted and blind people
Herculaneum	YES	- Access ramp for disabled people on the eastern side of the excavations - Toilets for disabled people
Oplontis	NO	Not available

Site leaving services

BOOK SHOP		
Pompeii	1	At the Antiquarium
Herculaneum	1	
Oplontis	0	Not available
BANKING SERVICES		
Pompeii	1	At Porta Marina
Herculaneum	0	Not available
Oplontis	0	Not available

3. **Interpretation and presentation systems**

Developing a plan for the interpretation, presentation and communication of the cultural values of the site is essential in order to manage a World Heritage site.
The interpretation and presentation of the cultural heritage, already the subject of many considerations and discussions during the preparation of several Cultural Tourism Maps, is a very complex and delicate task that must observe such standards as to allow visitors to enrich themselves culturally during the visit and local people to increase their sense of belonging, appropriating the key elements of knowledge necessary to understand the universal values of the site, thus developing the ability to cooperate for its preservation.
In particular, the document known as “Carta di Ename” [Ename Paper], prepared by ICOMOS, has become a fundamental tool in developing an interpretation, presentation and communication system.
Its key principles can be summarised as follows:

I. Facilitate the understanding and appreciation of cultural heritage sites and promote public awareness together with a commitment to the need for protection and preservation.
II. Communicate the meaning of cultural heritage sites to diverse people through a deep and well documented recognition of such meaning, using approved methods of scientific analysis and research assisted by living cultural traditions.
III. Safeguard material and immaterial values typical of the cultural heritage sites in their own cultural and natural environment and in their social context.
IV. Respect the authenticity of cultural heritage sites while communicating the importance of their historical contents and the scope of their cultural values, protecting them from the negative outcomes of intrusive interpretation expedients, the pressure exercised by the public and from inaccurate and inadequate interpretations.
V. Contribute to the sustainable conservation of cultural heritage sites, promoting the understanding and participation of the public in the ongoing conservation work, and ensuring long term maintenance of equipment and

interpretation services, together with a regular review of their interpretative content.

VI. Encourage participation in the interpretation of cultural heritage sites by facilitating the active involvement of all players and of the communities associated with the development and implementation of interpretation programs.

VII. Develop technical and professional standards for the interpretation and presentation of the heritage assets, including technology, research and training. These standards must be appropriate and sustainable in their own social context.

Considering the critical points highlighted in the sites, the following actions will be required in order to apply the standards laid down in the “Carta di Ename” to the UNESCO site “Archaeological areas of Pompeii, Herculaneum and Torre Annunziata” and to the associated integrated routes in the territory:

- removal of architectural barriers (by adapting existing structures and, where possible, by creating new routes and a dedicated assistance service);
- increase of the area open to visits, after restoring and making safe the buildings or part of the currently closed architectural complexes, without increasing the amount of excavated area;
- upgrade of the site access system and creation or upgrade of observation points on the archaeological landscape, in particular for Pompeii, by providing accesses that will facilitate a cultural exchange between residents and visitors; that will include the completion of current projects in the area outside Herculaneum’s excavations;
- improvement of the fixed educational illustration system, with short and clear texts in Italian, English, German, French, Spanish, Russian, Chinese and Japanese, also by updating technological communication facilities;
- visitor quotas in certain portions of the sites, with the offer of routes open to groups, in limited numbers and at fixed times;
- planning of themed itineraries, according to an itinerary rotation logic to cover the areas in turn, year after year;
- expansion of visiting routes and set up of domestic settings to represent Pompeii lifestyle, in addition to graphic reconstructions and models;

- planning of alternative routes for school trips;
- planning of itineraries and visits with animations, interactive games and virtual reality;
- creation of integrated routes, with comprehensive tickets, on the tourist sites of the Vesuvian area, thanks to an efficient local mobility and adequate communication and promotion activities;
- improvement of reception services (ticket office, info-point, cloakroom, rest room for coach drivers, kindergarten, distribution of visit aids, etc.);
- improvement of site visiting services (meeting point, visual signs, lighting, bar, restaurant, pic-nic areas, first aid, toilets);
- improvement of site leaving services (bookshop, gift shop);
- initiatives that will contribute to manage and promote the cultural heritage (improvement of the website, opening of social networks);

4. Communication and fruition program in the archaeological area of Pompeii

The work carried out on the archaeological areas registered in the WHL, aimed at intervening on the identified issues and upgrading the reception and visit service system, saw the Superintendency focused on the problems of the Pompeii archaeological area in connection with the significant number of visitors, the risks associated with the strong anthropic pressure and the need to make visits to the site more engaging. The work was financed by European funds of the Great Pompeii Project. The Pompeii project was seen as a test for a number of projects to be later extended to other registered archaeological areas and to the buffer zone, financed by the Superintendency's ordinary funds.

In the work done for the Pompeii Communication and Fruition Plan, the considerations expressed in the statement concerning inscription in the UNESCO lists have become the concept underlying the identification of themed itineraries, the *fil rouge* of the whole project. Visitors are invited to participate in the awakening of the city from a sleep of millennia, and their very presence starts the time clock, starting to run again on the occasion of their visit. Thanks to the visitors interest, Pompeii people resume their life and tell their story of men and women, merchants and bankers, politicians, matrons, slaves and gladiators; the streets, houses, squares and temples are no longer mere remains, albeit

extraordinary, of a past buried under the volcano ashes, but a place where the stories we are telling actually took place.

The fruition system that was put in place acts as introduction or support to a new way of visiting Pompeii, where the city becomes the subject of the visit and no more a passive object for “distracted and weary” visitors; it can be outlined by the following actions:

A. Identification of 6 themed itineraries assisted by cross-media technology, improving the visit experience and offering it interactive guidance systems, so as:

a) improve the perception of Pompeii as the place where ancient Pompeians used to live rather than where they died, through the tale of their daily life, their stories, their habits;
b) illustrate the places, buildings and monuments of ancient Pompeii, their function, transformations, uses and modifications;
c) improve the understanding of the city urban history, from its birth to its destruction;
d) reveal in a scientifically correct way how Pompeii was buried, the history of Mount Vesuvius eruptions and the discovery of Pompeii;
e) promote personalised and alternative visiting routes, oriented at discovering Pompeii as a place of great environmental and landscape value, not just historical and archaeological.

Layout of a themed itinerary on public life in Pompeii

B. Creation of interactive 3D reconstructions to complete the visit routes and provide an opportunity to consider the knowledge acquired during the visit.

Three-dimensional reconstruction of the basilica

Reconstruction model of Pompeii in 79 AD

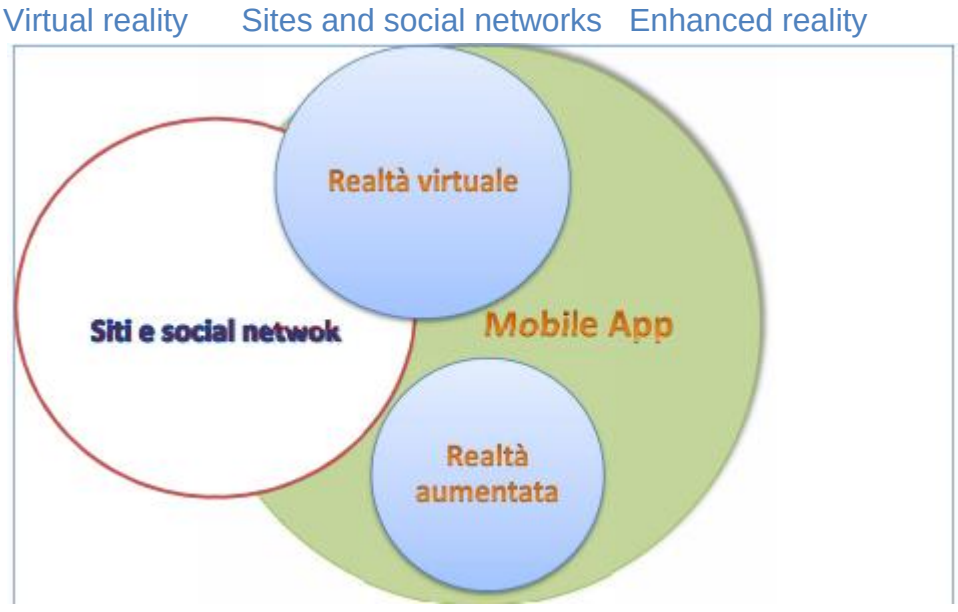
C. Reconstructions of buildings and widespread museumification in the area touched by themed itineraries. Original materials and faithful reproductions are displayed in ancient spaces of the ancient city.

Settings at Isis temple

D. Creation of settings for night viewing in the theatre area, given the central role of these buildings in the Site fruition circuit.

Night projections at the small theatre

E. Creation of a system that, through different ways to access information, will allow to assemble a polysemantic set of cross references, reminders and feedbacks between visitors, and between visitor and site, to improve the quality of the Site visit and expand its scope from the time of preparation to the next one.

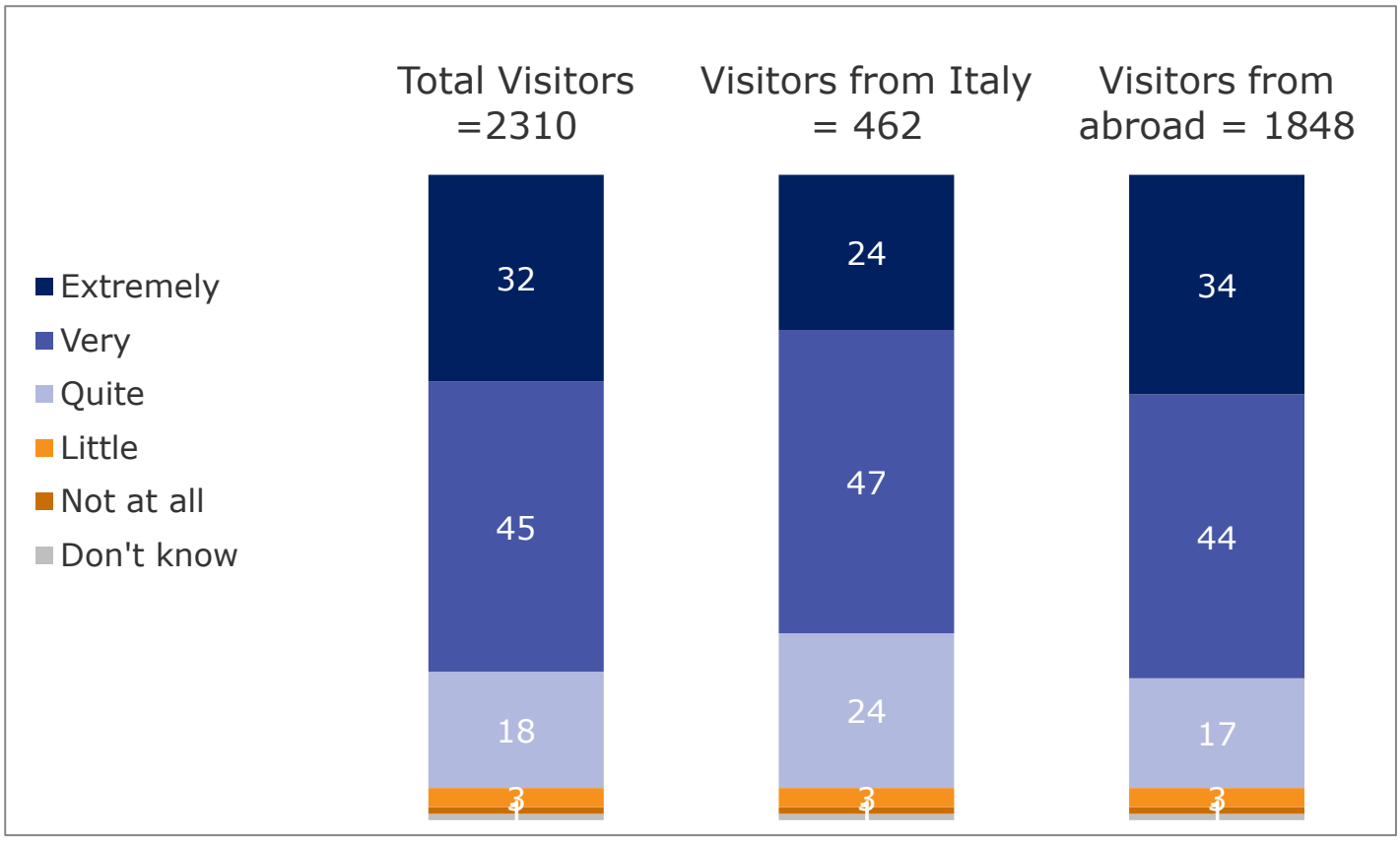


Cross-media system

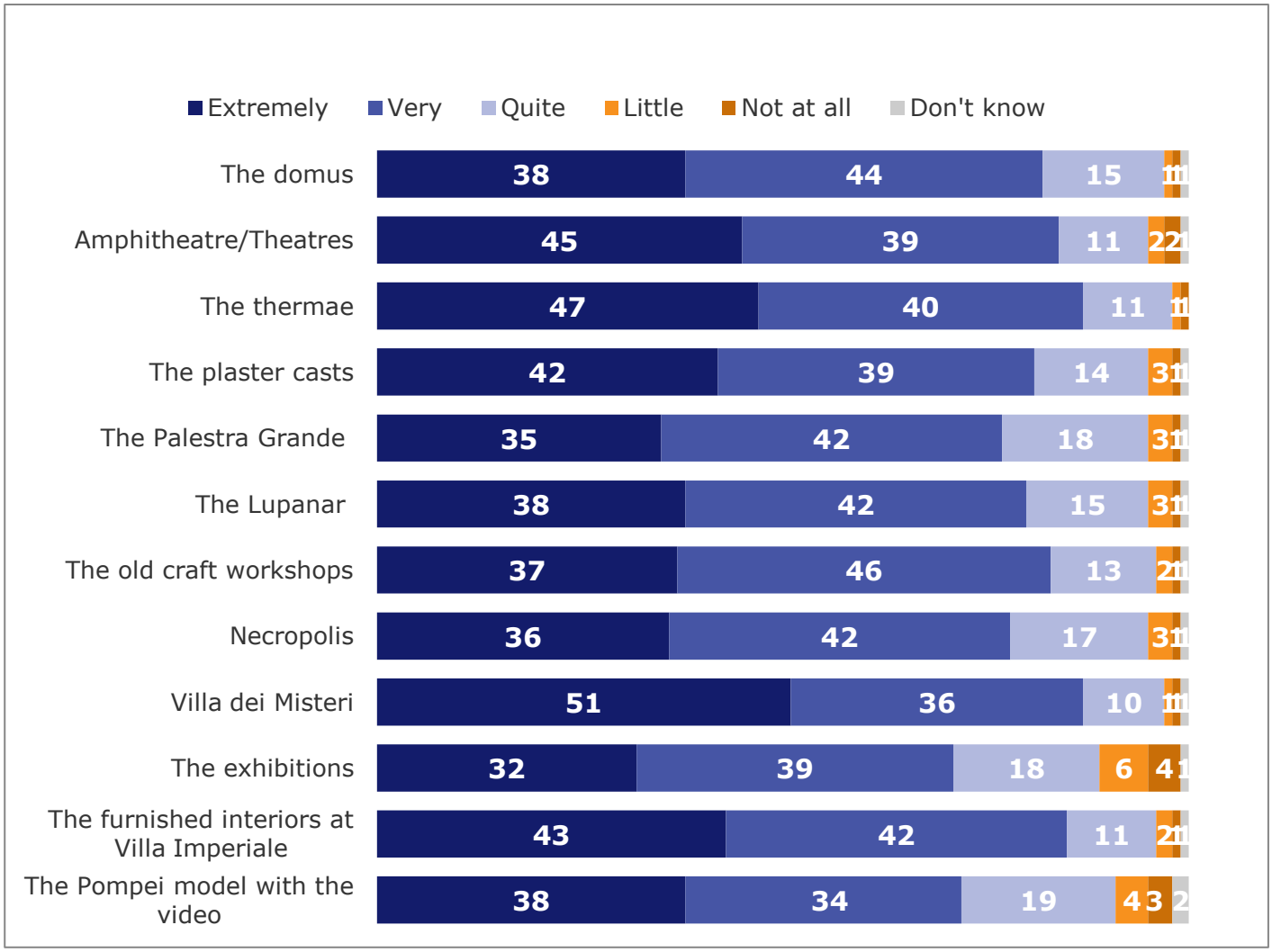
The implemented cross-media system allows the applications assisting the themed itineraries being directly connected to the Superintendency's social channels and website, thus providing a virtual place where you can gather and exchange information, images and impressions before, during and after the visit. Among the available applications, one in particular is devoted to providing visitors with a direct and continuous connection with the Superintendency, to express their opinion on the visit or report inconveniences or mishaps and receive adequate responses. The "Pompeii advisor" application will enable the Superintendency to gather directly from its visitors indications on system criticalities, so as to introduce any due changes in the visitor management activity.

The system fruition part so implemented was subjected to public approval analysis through a market research conducted as part of a study on the "proposals for the Pompeii Excavations offer model", in order to highlight any issues before planning other sets of activities in Pompeii and in the other areas.

The survey conducted by cross-referencing the results of three different activities - in-situ interviews with visitors of the Pompeii archaeological site, on-line survey and social media listening – showed that Pompeii visitors, who present on average a high socio-cultural profile, do like the new proposals.



Satisfaction graph of the visit to Pompeii



Graph showing the liking of different visited places

Given these results, in the medium-term program (2017/2019 planning), greater work to support the Pompeii visit was therefore envisaged, including the landscaping work on non excavated areas and the introduction of themed itineraries focused on historic or historicised gardens of the ancient city.

The next 2018/2020 planning phase will include the extension of these activities to the other registered sites and the territory, following consolidation and restoration work on the monuments.

Medium term fruition projects:

POMPEII		
GPP N. Routes for disabled people ”Pompeii for everyone” - Lot 1	Completed	
GPP Fruition plan	Completed	
GPP Communication plan	Completed	
Improvement of the cultural offer through work focused on site fruition	2017/2019 Planning	**€ 2,000,000.00**
Enhancement and functional upgrade of the external area to complete the GPP N "Pompeii for everyone" project	2017/2019 Planning	**€ 1,000,000.00**
Landscape enhancement of non excavated areas in view of a renewed connection with the street axes of via Stabiana and via di Nola	2017/2019 Planning	**€ 9,000,000.00**
Landscape upgrade project. Lots 1 and 2. Archaeological Promenade and Viale delle Ginestre	2017/2019 Planning	**€ 4,200,000.00**
Lighting and fruition project for the area from Porta Marina to the Pompeii Forum		
OPLONTIS		
Villa A Construction of a building for reception services	In progress	**€ 2,170,000.00**

5. City and territory: planning for a sustainable tourism system

The World Tourism Organization defines sustainable tourism as a tourism development that “meets the current needs of tourists and hosting regions, while protecting and enhancing future prospects. Sustainable tourism aims to integrate the management of all resources in such a way as to fulfil economic, social and aesthetic needs while preserving cultural integrity, essential environmental processes, biological diversity and living systems”.

Starting from the consideration that while a site inscribed on the World Heritage List gathers the identity values and evolutionary signs of a territory and represents its complexity while acting as an element of highly competitive local development, such aspect should be managed respecting the site values and aiming to maintain them as the heritage of future generation, the identification of a sustainable tourism system must be based on universally recognised principles such as those reported below[3]:

Principle 1: Contribution to World Heritage objectives

Tourism development and visitor activities associated with World Heritage properties must contribute to and must not damage the protection, conservation, presentation and transmission of their heritage values. Tourism should also generate sustainable socio-economic development and equitably contribute tangible as well as intangible benefits to local and regional communities in ways that are consistent with the conservation of the properties.

Principle 2: Cooperative partnerships

World Heritage properties should be places where all stakeholders cooperate through effective partnerships to maximize conservation and presentation outcomes, while minimizing threats and adverse impacts from tourism.

Principle 3: Public awareness and support

The promotion, presentation and interpretation of World Heritage properties should be effective, honest, comprehensive and engaging. It should mobilize local and international awareness, understanding and support for their protection, conservation and sustainable use.

Principle 4: Proactive tourism management

The contribution of tourism development and visitor activities associated with World Heritage properties to their protection, conservation and presentation requires continuing

[3] WHC-10/34.COM/INF.5F.1

and pro -active planning and monitoring by site management, which must respect the capacity of the individual property to accept visitation without degrading or threatening heritage values. Site management should have regard to relevant tourism supply chain and broader tourism destination issues, including congestion management and the quality of life for local people. Tourism planning and management, including cooperative partnerships, should be an integral aspect of the site management system.

Principle 5: Stakeholder empowerment

Planning for tourism development and visitor activity associated with World Heritage properties should be undertaken in an inclusive and participatory manner, respecting and empowering the local community including property owners, traditional or indigenous custodians, while taking account of their capacity and willingness to participate in visitor activity.

Principle 6: Tourism infrastructure and visitor facilities

Tourism infrastructure and visitor facilities associated with World Heritage properties should be carefully planned, sited, designed, constructed and periodically upgraded as required to maximize the quality of visitor appreciation and experiences while ensuring there is no significant adverse impact on heritage values and the surrounding environmental, social and cultural context.

Principle 7: Site management capacity

Management systems for World Heritage properties should have sufficient skills, capacities and resources available when planning tourism infrastructure and managing visitor activity to ensure the protection and presentation of their identified heritage values and respect for local communities.

Principle 8: Application of tourism-generated revenue

Relevant public agencies and site management should apply a sufficient proportion of the revenue derived from tourism and visitor activity associated with World Heritage properties to ensure the protection, conservation and management of their heritage values.

Principle 9: Contribution to local community development

Tourism infrastructure development and visitor activity associated with World Heritage properties should contribute to local community empowerment and socio-economic development in an effective and equitable manner.

A conclusion that can be drawn from the above principles is that we must set up a process allowing to:

I. identify a territorial area that combines the anthropic-settlement characteristics with the natural ones, giving rise to a homogeneous territorial context centred on the Property, to be considered in a territory planning based on protection, conservation, enhancement and tourism management programs for the site, assessed in terms of sustainability;
II. establish open and regular contacts with the communities involved, in a participative way;
III. develop a sustainable tourism system that takes into account, in addition to the rules governing **cultural tourism**, the **site capacity for sustainable hospitality.**[4]

Sites like Pompeii, Herculaneum and Torre Annunziata, among the most visited in Italy and located in a territory full of historical, cultural and naturalistic resources of enormous value, have a longtime tourist offer tradition, with a significant economic fallout on a regional scale that must be protected as a source of income for local people, for a sustainable tourism that will safeguard, in the long term, the Property integrity and its environmental and landscape context. As a matter of fact the tourist flow, especially if considerable, can generate a strong impact on the territory, and become one of the risk factors that should be taken into account in managing the Property.

A key criterion for identifying the sustainability limit of tourist flows is the Tourism Carrying Capacity, or the limit beyond which the territory is no longer able to sustain the exploitation of its own resources, with a consequent loss of autonomy. The crux of the discussion, in aiming to define the carrying capacity of a given area, is therefore the ability to identify the critical threshold beyond which there is no capacity left to sustain more anthropic pressure.

According to the World Tourism Organization (WTO) definition, the Carrying Capacity of a tourist location is given by "t*he maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction"* (World Tourism Organization, 2000).

In general terms, we could say that tourism becomes sustainable when it does not exceed its carrying capacity, i.e. when tourism activities develop in such a way as to remain indefinitely vital and attractive, without altering the natural, social and economic environment, while managing to satisfy all players involved (tourists, businesses, the host

community and the political-administrative system that happens to be governing the destination).

According to the same organisation (WTO, Ottawa Conference,1991), the high or low carrying capacity depends, in addition to the site features, on the management situation, the tourists' acceptance, the residents' acceptance, the characteristics of the environmental resources and the available technology.

In fact, the TCC is defined by a set of capacities, including:

- System capacity, i.e. the availability of the destination's resources in relation to the anthropic fruition;
- Aesthetic and experiencing capacity, i.e. the measure of the aesthetic and cultural satisfaction and of the expectations of tourists visiting the destination;
- Socio-economic capacity, i.e. the social and economic satisfaction of people living in the destination with respect to the tourist phenomenon.

The TCC analysis is decision-helping tool and as such it must be conducted in a context of participation of all main players in the extended local community. The participation of local communities in decision making becomes therefore extremely important.

In the specific case of the Vesuvian sites, the TCC and the management of visitor flows could benefit from measures taken to integrate the archaeological areas with local environmental resources, in particular as regards accessibility, fruition and the provision of reception services.

Tourism Carrying Capacity of the inscribed sites

Site	Carrying capacity (visitor number)	Average duration of visits (hr)	Max visit offer per year
Pompeii	2,720	3	4,345,367
Herculaneum	360	3	1,029,300
Oplontis	200	1	342,500

Source: Studio Andersen

An effective analysis tool for a rational management of tourism with regard to the visitors' behaviour is provided by the *Visitor Management*.

This is defined as a "visitor management maximising the quality of tourist experience, while helping to meet the management objectives of local administrations" (Hall, McArthur, 1996).

The Visitor Management methodology, through the analysis of tourists expectations, the impact assessment, the management of destinations and the stakeholders involvement, can guide policies and administration processes to provide a high quality guest experience, protect the environment and maintain profitability for the local community.

Its strategies must converge towards efficient tourist flow management objectives in relation to the specific needs of the tourist attraction considered, working on the three closely linked themes of accessibility, reception and information.

In particular, the Visitor Management instrument can help public decision makers and managers of tourist resources to guide tourism management policies, work on weaknesses and rationalise visitors' presence in the territory.

Today, the extremely complex picture of the Pompeii site, of the system made up of the three archaeological areas and of the larger system of resources at territorial scale requires policies and solutions with an impact on reception, the offer to visitors, service localisation and signage rationalisation. From this point of view, the Visitor Management methodology applied to the site could provide and quantify absolutely significant knowledge elements for the definition of such policies within a resource rationalisation framework.

6. A sustainable tourism system in the Vesuvian area

A "tourism system" is based on the overall offer, meaning a *"complex of activities and attractiveness factors that, located in a defined space (site, locality, area), are able to provide an articulated and integrated tourist offer, i.e. represent a specific and distinctive tourist hospitality system that enhances local resources and culture"*[5].

A territory is characterised by material and tangible elements such as morphology or infrastructures but also by cultural heritage and immaterial elements such as social values, skills and, lastly, by that special product of the relationship between men and the site's history that is commonly called "*genius loci*" and embodies its deepest essence.

[5]M. RISPOLI, M. TAMMA (1995), *Risposte strategiche alla complessità. Le forme di offerta dei prodotti alberghieri*, Giappichelli, Torino.

In this sense the Vesuvian area, with its widespread presence of great archaeological and naturalistic wealth, marked by the power of nature and its effects on human lives, provides something unique, offering great attraction possibilities.

This is certainly a complex and contradictory territory, with sights of great impact such as the lava rock formations alternating with wide plains and elevations covered in pine trees, wild Mediterranean vegetation and cultivations, as in ancient times when the large and peaceful mountain was described and represented as covered in vineyards: a natural landscape now unfortunately contrasting with a strongly urbanised environment, where concrete has devoured the space once occupied by vegetable gardens, orchards and multicoloured flower expanses.

The environmental and urban degradation of the territory is often accompanied by social decay and crime, even organised crime, constituting one of the major weaknesses with respect to the cultural and socio-economic growth of the territory, also in view of the development of an integrated tourist system.

Deep at the heart of the Vesuvian coastal territory, the Pompeii, Herculaneum and Torre Annunziata sites offer a great testimony of historical, cultural and landscape values combined to characterise the whole Vesuvian area, and highlight the contrasting and complex character of this territory.

If tourism development can be seen as one of the driving factors within an overall context of cultural, social and economic development of the area, then we should identify a tourism system allowing the implementation of a strategy based on the exploitation of the strengths and the mitigation of weaknesses and risks. It is certainly necessary to activate a coordination between the territory and its different social and cultural components in order to develop themed itineraries that, taking into account the landscape and the historical and cultural heritage of the area, offer visitors the possibility to choose a route according to the length of stay and to the cultural offer.

A Vesuvian tourism system plan focusing on the inscribed site of “Pompeii, Herculaneum and Torre Annunziata archaeological areas”, requires therefore a number of actions: the identification of a homogeneous area with attractiveness factors, the definition of an environmental sustainability characterised, among other things, by ecological production and consumption systems along the whole tourism chain, and a sustainable management and conservation of resources that are at the base of tourism activities.

An important structural element of such tourism system is also its social and ethical sustainability, aimed at transforming the tourism phenomenon into an opportunity for

cultural growth and development of the local communities and, through knowledge, for peaceful and tolerant relationships and the coexistence of peoples.

The territorial system made up of the UNESCO Site and its buffer zone may therefore be considered a complex of monuments and landscape, which can become the setting of actions for enhancement and sustainable development mostly related to the growth of tourist offer.

Although a large protection area surrounding a World Heritage List site, seen as a homogeneous area containing part of the site values, may demand an extended, strong and coordinated safeguarding action to preserve its distinctive cultural values, it may also be seen as a tool to achieve sustainable social and economic development.

This is consistent with the objectives of the Management Plan for the UNESCO site "Pompeii, Herculaneum and Torre Annunziata archaeological areas", aimed at promoting, through the new perimetral boundaries of the buffer zone, an awareness of the cultural values of the territory, at encouraging residents to play an active role in identifying shared actions for the protection, conservation, enhancement and socio-economic development of the territory, and at favouring a sense of belonging in the whole territory.

A Vesuvian tourism system organised through fruition, animation and visitor management activities maximising site enhancement in terms of increased conservation, knowledge and fruition, would allow to pursue cultural growth thanks to a better knowledge of each site, while economic growth would be produced by an increase in visits to "minor" sites and a longer period of time spent by visitors at the sites. At the same time, the system would lead to greater "educational" effectiveness and a better fruition of the archaeological sites, coupled with better visit quality.

The increase, both in space and time, of tourist offer solutions would thus lead to a concrete enhancement and protection action through definition of an organised fruition of the sites, with an obvious social and economic fallout on the territory.

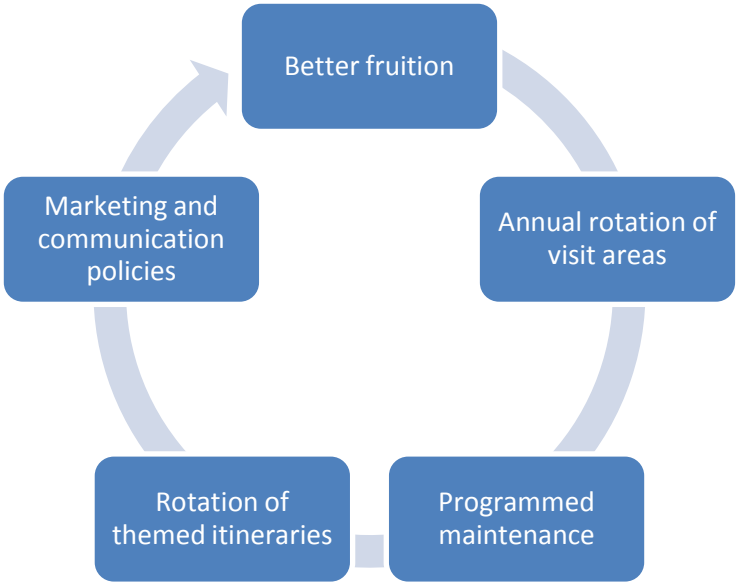
This type of fruition involves the setup of themed itineraries in the archaeological areas and in the territory, coming up beside any free visits; these itineraries should be booked through the Superintendency's and Communication Centre's websites and offered according to a planning and rotation logic, for example on an annual basis.

Such a method, involving a programmed rotation of themed itineraries to go with the annual rotation of visit areas, offers significant positive implications in terms of:

- *educational effectiveness*, increased thanks to less congested sites and to visits directed to "minor" sites and attractions;

- *greater visitor numbers*, due not only to an increase in visits to minor sites and the spreading of visits throughout the day and throughout the year, but also to the marketing policies that the management of itineraries would allow to implement;
- *increased protection*, as a direct consequence of being able to carry out a "programmed maintenance" for all itineraries.

This organisation of tourist routes will be all the more necessary as it is the only possible way to coordinate tourist flows and the restoration and extraordinary maintenance work of the *insulae* and *regiones* as envisaged by the Great Pompeii Project.



The operation of the Vesuvian tourism system routes will be ensured through the services offered by the UNESCO Communication Centre, as part of the Superintendency website, that will report any change in routes and visit areas and promote cultural marketing actions on behalf of the Superintendency, in coordination with the activities carried out by local institutions and tourist operators. Visitors will thus have the possibility to choose between different types of stay, which the wider offer should however orient towards longer stays than the current popular short day visit, as well as between different itineraries, which could start from the UNESCO sites and continue in the territory or, vice versa, start from the territory and finish off with a visit to one of more inscribed sites.

The Management Plan identifies as one of its priorities the promotion of actions for the use and functionalisation of environmental, architectural, archaeological and historical assets enclosed in the Buffer Zone perimeter and capable to ensure, in full compatibility with both the environment and the localities, and with any specific protection restrictions, the

development of an integrated economy: the use of assets intended as care and encouragement to active conservation.
The Use Plan therefore pays special attention to activating public resources, attracting private ones and envisaging a financial benefit for both the individual assets and the social and economic concerns around them.
The Management Plan should in this way contribute to entrench in the territory a sustainable capacity for hospitality through the support and promotion of activities and initiatives that stimulate the residents' pride and sense of belonging.
All that is taken into account by the Meeting Table in finalising its activity and function.
In order to facilitate and simplify the reading of the territorial area of reference and its special features, it was decided to create a SWOT matrix to illustrate in brief the results of the context survey.

The analysis highlights the strengths and weaknesses typical of the territory and brings out opportunities and threats that may have an impact on the success or failure of the Plan's objectives, allowing to guide strategic and operational choices more effectively.

Although the analytical reading of the territorial system may bring out on the one hand the certainly not glowing picture of an area characterised by considerable problems and weighed down by old and recent difficulties, it highlights on the other hand potentials of rare magnitude, associated in particular to its environmental and historical-cultural resources. As a matter of fact, the area offers a remarkable and fine variety of natural, cultural and architectural resources: in addition to the extraordinary archaeological heritage, composed not only of the WHL sites but also of the *Stabiae* and Boscoreale ones, it can also boast natural sites of outstanding value (Vesuvius, Monti Lattari, Monte Faito), the spa complexes of Castellammare di Stabia and Torre Annunziata, the Pompeii Shrine, the Royal Palace of Portici and the Bourbon site of Quisisana in Castellammare, as well as museums and ethno-anthropological resources of great interest.

No less important, moreover, is the area's strategic location, a real centre of gravity with respect to the Amalfi and Sorrento coast, and close to other important archaeological, artistic, historical, natural and cultural sites, first of all Naples, and then Sorrento, Baia, Capri, Ischia, Pozzuoli.

In contrast with these features, in some ways unique in the whole of Italy, the examined territorial system appears characterised by a strong demographic congestion, with

consequent cases of unauthorised construction that may also involve architectural buildings of great value.
Particularly serious is also the absence of an effective waste disposal system, a problem common to the whole Region, which had a negative impact on the area image both nationally and internationally, contributing to a decrease in tourist presence, as well as causing, and continuing to cause, huge inconvenience to residents.

All this in an area subject to high seismic, hydrogeological and volcanic risk, representing the most significant and serious threat to the territory, as well as the most emblematic one, since it can definitely compromise the conservation of the archaeological sites.

The territorial context of reference is characterised by high unemployment levels, especially youth unemployment, resulting in emigration to more developed areas, and by a fragile and fragmented production structure, made up of small and very small businesses, unable to invest in development and innovation.
The tourism sector shows many weaknesses, too, both in demand and in supply. The short stay of tourists and the consequent low daily expenditure, the lack of services to visitors and of accommodation facilities, an insufficient number of tourist operators, all constitute key critical points for the development of local tourism. Although three million visitors a year come to the area, and especially to Pompeii, and despite the huge potential of local resources, the tourism system is still unable to express a tourist offer capable of encouraging tourists to stay.

As regards potentials, priority is in any case given to a sustainable tourism development associated with the promotion of the remarkable natural resources offered by the territory. In the tourist sector job opportunities are plenty, provided that action is taken in several directions. Like all resources, tourist resources also need the co-presence of a number of conditions in order to be valorised: liveable cities, personal safety, accessible prices, operators trained in tourist catering and accommodation, efficient transport, suitable infrastructures.

With respect to the last two points, the transport and mobility/accessibility system appears inadequate despite the presence of important railway lines (State Railways and Circumvesuviana), motorways, ports, and the successful initiatives of the Campania Region and transport companies, which made public mobility in the area more efficient,

also thanks to the comprehensive UNICO Campania ticket, allowing to use in an integrated way the different public transport means on the entire regional territory.

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
- An archaeological, historical, cultural and environmental heritage of enormous value - Cultural, environmental and religious attractions of international importance - Quality local handicrafts - Strategic sectors for the development of the area (floriculture, shipbuilding, working of coral and lava stone) - Typical farming products: apricots (IGP), cherry tomatoes (DOP), Vesuvio and Lacryma Christi wines (DOC) - High quality food and wine tradition - Presence of supra-municipal territorial planning bodies (Agenzia Locale di Sviluppo TESS – Costa del Vesuvio, Ente per le Ville Vesuviane, etc.) - Scientific research centres and training institutions of excellence - An industrial tradition going back to the early 20th century - A varied tourist offer (naturalistic, spa, cultural, food and wine)	- High unemployment/inactivity rate - Emigration of younger people - Strong diffusion of undeclared work - Excessive business fragmentation and small business size - Lack of adequate tourist–accommodation services - Poor usability of most landscape–cultural resources - Municipalities unable to produce an integrated tourist offer - Inadequacy of accompanying services for cultural, hiking, geo-volcanological and alternative tourism - Lack of awareness by local communities of the territory historical, cultural and landscape heritage - Short stay of tourists in the area and low expenditure per capita - Inadequacy of transport and mobility networks - Urban and environmental decay - Presence of unauthorised building activities - Inadequacy of infrastructure and service facilities - Poor safety perception linked to the phenomenon of organised crime
OPPORTUNITIES	**THREATS**
- Positive trend of quality tourism demand (cultural and environmental) - Numerous tools for local development: territorial planning bodies (PTR, PTCP, PSO, PTP, Vesuvius National Park Plan) - Upgrade of the mobility and transport infrastructure network - Organization of international events - Greater willingness of institutional operators to put in place actions for the enhancement and promotion of the historical and cultural heritage - Reclamation of the Sarno river - Policies to mitigate the Vesuvius risk - Strategic position of the area in the Gulf, proximity to the city of Naples and to the Sorrento - Amalfi coast	- Endemic and well routed presence of organised crime - Volcanic, seismic and hydrogeological risk - Lack of efficient and effective waste disposal system - High anthropic pressure - Competition with neighbouring, more competitive tourist areas (Sorrento, Capri and Ischia, Amalfi, Napoli, etc.)

What emerges more clearly is, ultimately, the need to create an integrated system involving the whole territory with all its economic, social and institutional components. Such an objective must be at the same time the starting point for a tourist development system in the area and the arrival point for the management and integrated valorisation strategies for the sites.

The Meeting Table called to implement the Management Plan has so far operated in this direction by cataloguing the assets maintained in the territory for each municipality, and the creation of a Geographical Information System (GIS) that has allowed to define the Vesuvian tourism system as the complex of inscribed sites and their buffer zones. Within the system, the subsystems of assets that are concentrated around Hercolaneum, Pompeii and Castellammare di Stabia have been identified and, within them, the themed itineraries that can link them together. Thanks to the collaboration of all Table members, three main axes were identified:

I. North-South axis: **from Royal Palace to Royal Palace**. From the Bourbon Royal Palace in Portici starts an itinerary that, through ancient cities and picturesque landscapes, reaches the Royal Palace of Quisisana in Castellammare di Stabia. In addition to leading visitors to the archaeological sites, this itinerary brings them closer to history and to the fascinating rediscovery of the cities in Bourbon times, to the birth of a Pompeian imaginary world in 1738, when the remains of the buried cities of Herculaneum and Pompeii were discovered. At that time, with its open air excavations, Pompeii immediately became one of the popular destinations of the grand tour (the journey to Italy undertaken by young Europeans from the aristocracy and the upper classes to complete their education), and one of the essential points of reference for new architectures, decorations and even clothing, especially women clothing.

   In those years, watercolours, drawings, etchings and paintings started depicting the Vesuvian cities just as the excavations were returning them to the world, while short stories, novels and essays on daily life in the first century AD gave an ideal picture of it, showing how the mystery of the discovery had instantly turned into a fascinating collective imagination loaded with charm.

   Among the strengths of this itinerary, which puts together most of the unique historical, cultural and landscape features of the area, are the Royal Palace in Portici with its museum illustrating the history of the Bourbons' collections from the Herculaneum site, the Herculaneum excavations, the golden mile villas, the Pompeii excavations, the Stabiae villas.

   This complex material and immaterial heritage, comprising the excavations, their history, the history of those who made them possible and the strong and contrasting landscapes they were creating little by little, is the fertile ground on which to build a very attractive route.

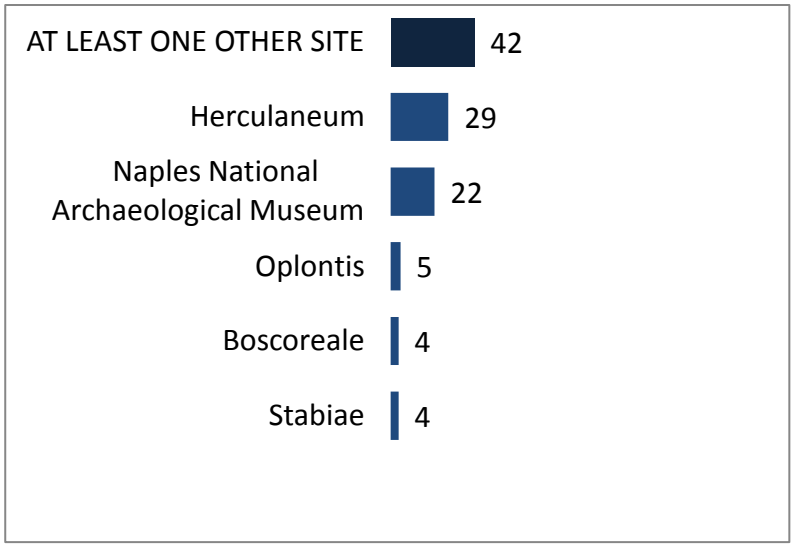
   A key weakness in organising such an itinerary are the infrastructures related to mobility; in this connection, the bodies participating in the Meeting Table asked to reconsider the possible reactivation and boosting, with dedicated trains, of the railway connection between Naples and Castellammare di Stabia, which on the stretch between Naples and Portici follows the route of the oldest Italian railway.

II. East-West axis: **Beyond the Walls**. City and countryside in the shadow of the Vesuvius. The itinerary goes from the cities of Pompeii and Herculaneum to the Vesuvius following in the footsteps of the archaeologist, the geologist and the farmer, among *otium* villas, rustic villas and great country mansions combining large production areas with imposing architectures and figurative decorations of great elegance.
The route branches out into two directions, the one pointing north towards the Oplontis and Boscoreale Villas and the Vesuvius across a still preserved Pompeian farmland as in the Civita Giuliana area, and the other pointing south to the Faito through luxury villas and production sites that replaced the city of Stabiae after Silla's wars.
In order to develop the many strengths of this itinerary, however, agreements must be reached with various institutions like the Vesuvius National Park, the Vesuvius Observatory and the Lattari Mountains Regional Park.
Here too, the strength of the itinerary must be supported by an upgrading of road infrastructures and the organisation of dedicated transport services.

III. North-South axis, from the sea: the **Talassa** itinerary aims to promote the development of already existing tourist destinations in order to favour access to the Vesuvian area from the sea.
This highly evocative itinerary encloses in an ideal triangle, having as its base the coastal strip, all the area's archaeological and naturalistic sites.
It will need a great joint effort of the whole territory in coordinating tourist and cultural offer activities. A challenge that will have to start from an overall view of the territory and develop a coordinate picture of it.

IV. The analysis of tourist flows in the territory clearly shows that the introduction of a themed itinerary system, both inside the excavations area and in the territory outside, cannot do without the organisation of a reception area making large spaces available to receive tourists at the initial stage before they make their choice, to then redirect them, with dedicated transport means, to the chosen areas of visit.
To this end, discussions are under way about including in the strategic plan of the buffer zone the railway hub of Pompei, which would act as an interchange for different mobility systems, and about finding the right location for a dedicated space where to welcome visitors, guide them to the visit and offer them some space and time for a direct contact with the features of the territory.

The survey, conducted for the project "Proposals for the Pompeii Excavations offer model", showed that slightly less than half of the Pompeii visitors are interested in other places on the circuit, with preference given to Herculaneum and the Naples National Archaeological Museum.

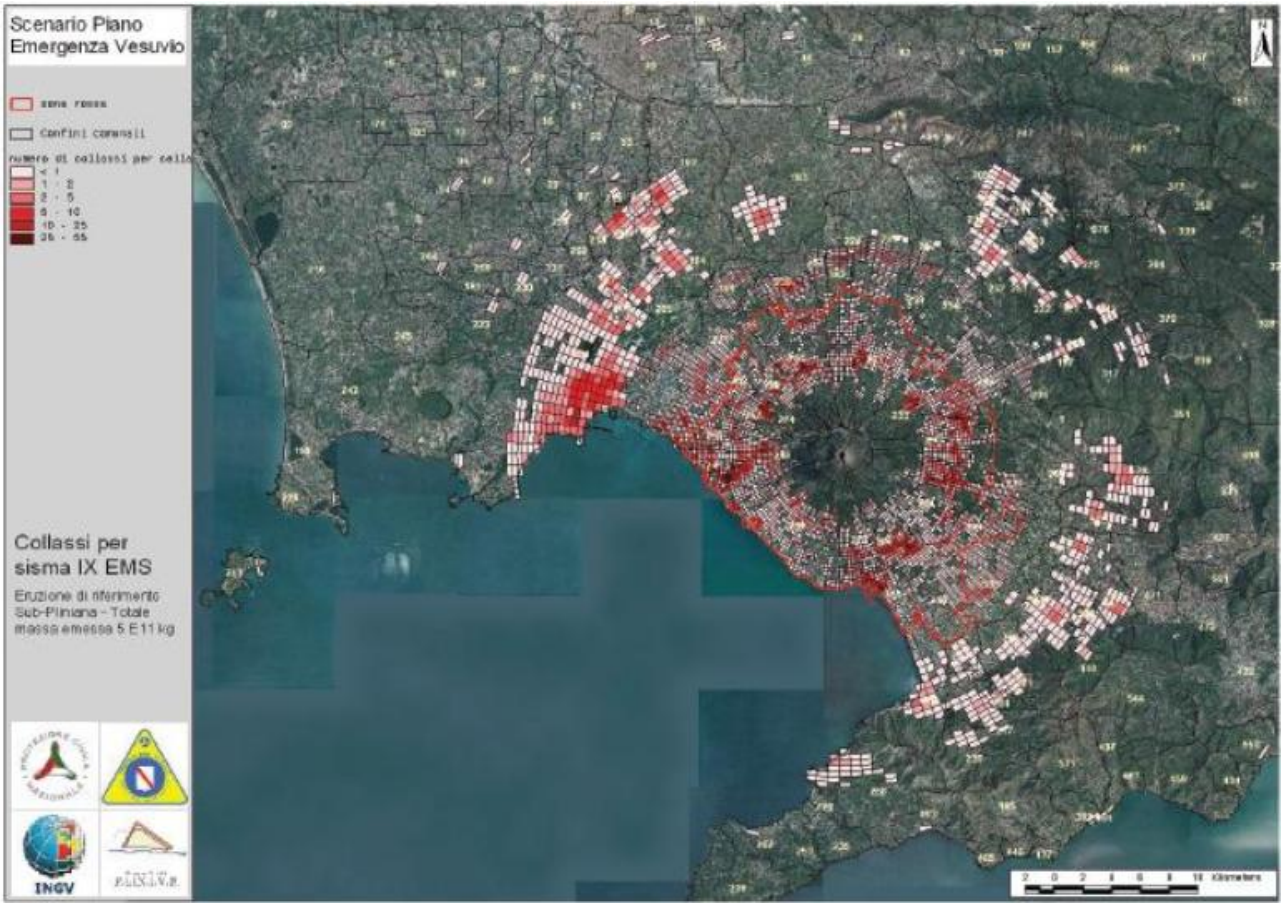


Graph of visitors willing to visit other sites in the territory

It is clear from the graph that a marketing of the Vesuvian tourism system that can maximise the cultural and landscape assets of the area, together with the creation of a dedicated mobility system, could activate a virtuous cycle, with longer stays and considerable fallouts on the social and economic development of the territory.
While testing different systems to facilitate stay and mobility between the ancient city and the modern one, a temporary exit system was created, at the moment working only during one single day, that could easily be arranged to work over several days and at several sites in the territory. Thanks to a bracelet incorporating a chip and a machine placed at the entrances, this would allow tourists to move freely, entering and leaving the archaeological area at ease.

CHAPTER 5

DISASTER RISK PLAN



8. **Objectives of the Plan**
9. **Identification of the major risks in the area**
10. **Identifying the risk of natural and anthropic disasters in the WHL inscribed areas**
11. **Preventing and mitigating the risk of disaster**
12. **The Commission for updating the volcanic risk emergency contingency plans in the red zone of the Vesuvian area**
13. **The Commission for updating the volcanic risk emergency contingency plans in the red zone of the Vesuvian area**
14. **Forecasted actions for preventing natural disaster risks over the 5-year length of the plan**

1. Objectives of the Plan

The objective of the plan is to identify, prevent, mitigate and manage any disasters of natural or anthropic origin, which could damage the integrity and authenticity of the properties inscribed in the WHL, or even cause their loss.

These risks, of course, cannot be entirely eliminated, and the plan should focus on the following three key principles: prevention, protecting the heritage from possible damage, and identifying the procedures for intervention and the chains of command that need to be put into place if a disaster occurs.

The national regulations provide that the responsibility for identifying, mapping and preventing/mitigating the major risks lies with the central and local government authorities, as described in greater detail further on. In this context, the actions relating to the UNESCO site are set out in an emergency contingency Plan by the Superintendency, in which it sets out the key risk prevention and mitigation actions for which it is responsible, in connection with its heritage protection and conservation duties, in coordination with the provisions contained in the national and local emergency contingency plans.

The disaster risk mitigation Plan, therefore, provides for the following actions:

1. Creation of a dedicated risk database and maps

2. Risk management assessments and planning

3. Damage control planning (including maintenance programmes)

4. Continuous activity planning

5. Coordination with the firefighters and other authorities (including feedback activities)

6. Personnel training and management

In view of the pre-eminent volcanic risk in the Vesuvian area, and in agreement with the Commission for updating the emergency contingency plans for the volcanic risk in the “red zone” of the Vesuvian area, the management Plan for the UNESCO site proposes **setting up an international study group for determining the procedures for and systems of conservation of the built heritage**, in particular the decorated surfaces and mosaic floors, which, in the event of a Plinian eruption, would be reburied and, therefore, lost to the future generations. These are documents of fundamental importance, suffice it to mention that Pompeii has proved to be the greatest single source of our knowledge of painting in the ancient world, and therefore **passive protection is simply not enough and innovative active protection systems also need to be looked into.**

One of the key objectives that needs to be pursued, in the 2017/2019 period, is to complete the study of these systems and then, in 2020/2021, implement the first interventions, on an experimental basis.

2. Identification of the major risks in the area

The role of the Civil Protection Department

Considering that the Italian territory is fragile and exposed to a large number of specific risks, related to this territorial vulnerability, the Italian Government – pursuant to Law 225/1992 – has placed the Civil Protection Department of the Prime Minister's Office in charge of implementing risk forecasting and prevention activities, carrying out rescue and relief operations in disaster-affected areas, counteracting and overcoming emergency situations and mitigating risks.

The Department directs, promotes and coordinates – in collaboration with the regional and local governments – all activities for protecting people and safeguarding the territory.

The Department is responsible for forecasting activities, in partnership with the competent scientific and technical bodies, for assessing the risk scenarios and, where possible, predicting, monitoring, supervising and overseeing the expected events and risk levels. It is also responsible for alerting, planning, training, circulating civil protection knowledge and information to the local communities, organising drills and applying the technical regulations, as the key civil protection instruments for preventing risks, with the aim of preventing or controlling damage in emergency situations.

The forecasting and prevention plans are the instruments for defining priority interventions and the schedules for implementing the civil protection actions, depending on the hazardousness of the event, the vulnerability of the territory concerned and the available funds. The Civil Protection Department issues the guidelines for preparing the forecasting and prevention plans, which must then be implemented by the local authorities – the provincial and municipal governments first and foremost – by means of forecasting activities and prevention interventions.

Prevention activities should range from determining the risks affecting a certain territory, to implementing specific measures for mitigating those risks. An example of this is the seismic classification of the country, which has enabled the definition of earthquake protection standards and regulations for building construction.

The Department is also responsible for emergency contingency planning related to "expected" events, the nature and extent of which require the intervention of the central government authorities. The regional governments issue the guidelines for preparing the provincial plans for type-B events, and the local governments prepare the plans for type-A events, depending on the local risks. Pursuant to Law 100/2012, the municipal authorities are required to prepare the local emergency contingency plans within 90 days from the entry into effect of the law, and are then responsible for periodically updating them.

Seismic risk

The seismic risk, determined as a combination of hazard level, vulnerability and exposure, is the measure of the damage expected – over a certain amount of time – on the basis of

the type of earthquake, the resistance of the buildings and the extent of human activities (nature, quality and quantity of the exposed properties).

- **Hazard level**
  The seismic hazard studies, especially in recent years, are being used in territorial and regional surveys for the purposes of zoning (basic hazard levels for seismic classification) or micro-zoning (local hazard levels). In the latter case, assessing the hazard level means identifying the areas, within a certain municipality, which could be amplified, in the event of an earthquake, and provide useful information for town planning purposes.

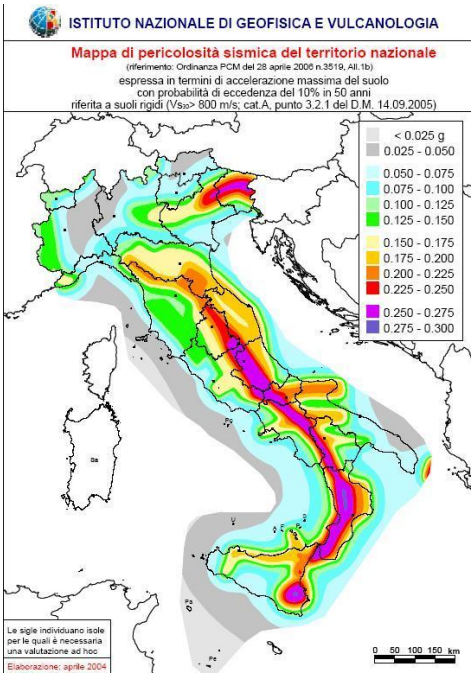


Fig. Map of the seismic hazard levels in Italy

- **Vulnerability**
  Statistical methods are used to classify buildings according to the materials and construction techniques, on the basis of the damage, observed in previous earthquakes, on buildings of the same type. This method requires damage data collected during previous earthquakes, which, however, is not always available, and which, in any case, cannot be used to assess the vulnerability of a single building, because it is of a statistical, not punctual, nature.
  Instead, a more mechanistic approach uses theoretical models that reproduce the principal characteristics of the buildings, examining the damage caused by simulated earthquakes.
  Finally, several methods use expert opinions to assess the seismic behaviour, and the vulnerability of predefined structural types, or to identify the factors that determine the behaviour of buildings and assess their influence on vulnerability.
  To assess the vulnerability of buildings across the country, it is necessary to use statistical methods based on uniform data relating to their characteristics. In the

case of Italy, we have the data collected by the Istat housing censuses, which are used in the application of the statistical methods.

- **Exposure**
  Assessing exposure requires taking into account a series of factors, the most significant of which, in relation to the protection of human life, are: the number of people living in the buildings, the possibility of evacuating and/or protecting themselves, the type of involvement of people (number of fatal or other casualties), the possibility of dying even after having been rescued. Another significant aspect of exposure is the presence, in Italy, of an invaluable cultural heritage, consisting of the built heritage in the historic city centres, the size and quality of which has still not been adequately quantified.
  The first step in seismic risk prevention and mitigation, with regard to the historical and architectural heritage, is, of course, acquiring an in-depth knowledge of the properties exposed. Therefore, in partnership with the MiBAC, a nationwide census has been launched of the historic centres exposed to risk, combined with the development of a fact-finding survey method for historical buildings, based on the development of an ad hoc software called “Centri Storici e Rischio Sismico - Csrs" (Historic city centres and seismic risk) shared with all the competent local authorities.

Therefore, the nationwide hazard level data, as referred to in the applicable regulations, are processed within the framework of the national plans.

Historical seismic micro-zoning studies

Seismic Micro-zoning studies have been considerably boosted over the least 40 years, from a scientific point of view, although the importance of soil resistance and stability in connection with seismic events had already emerged in the past. From the 18th century, and the increased interest by the Enlightenment in natural phenomena, it had become clear to many scholars that the foundation soil conditions played a significant role in determining the effects of an earthquake. A century ago, the Technical Regulations approved by Royal Decree No. 193 dated 18 April, 1909, in the wake of the disastrous earthquake of Messina and Reggio Calabria of 1908, prohibited the construction of new buildings, or reconstruction of existing buildings “on ground placed above or in the vicinity of fractures, subject to landslides, or otherwise unstable, or to subject them to vibrations, or other forms of stress, as a result of their different geological constitution or differing degree of resistance of parts thereof”.

Internationally, in a 1969 study by several US scholars, conducted in the wake of the San Francisco earthquake of 1957, highlighted how the earthquake had had different effects in the city, even in neighbouring areas, depending on the thickness and geomechanical characteristics of the soils making up the surface layer. Since then, many studies have been carried out on large earthquakes (e.g. Friuli, 1976; Irpinia, 1980; Mexico City, 1985; Kobe, Japan, 1992; Izmir, Turkey, 1999; San Giuliano di Puglia, 2002), collecting data and information that have shown how the local characteristics of a territory can significantly alter the effects of an earthquake.

The Seismic Micro-zoning studies have the purpose of rationalising our knowledge on the alterations that the quakes can cause on the surface, providing useful information for land management, design, emergency contingency planning and reconstruction purposes.

In the field of land planning and management, depending on the various scales and levels of intervention, Seismic Micro-zoning studies are carried out in those areas for which the applicable regulations allow or provide for their use for building or infrastructure construction purposes, their potential transformation for these purposes, or otherwise for civil protection purposes.

SM studies are of fundamental important in planning for:

- guidance in the choice of areas for new settlements

- defining the interventions that can be carried out in a certain area

- planning the extent and level of investigations

- setting out guidelines and procedures for interventions in urban areas

- defining priority interventions.

All the above aspects are included and taken into account in developing the Seismic Micro-Zoning (SM) studies, for identifying and characterising stable and safe areas, areas subject to local amplification and areas subject to instability, such as landslides, fractures caused by fault lines and dynamic soil liquefaction.

For local and provincial emergency contingency planning purposes, SM studies can help identify the strategic elements of an emergency contingency plan and of the civil protection resources in general.

Knowledge of the possible local effects of a seismic event can help in:

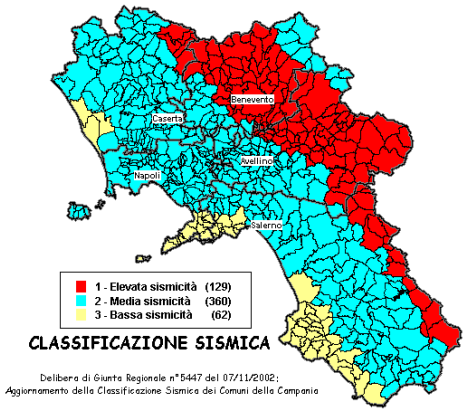
- selecting emergency refuge areas and facilities and strategic buildings in stable areas;

- identifying, in the case of collapse, the “critical” sections of road and service networks and significant works that could require specific safety assessments.

The technical procedures for implementing and applying the SM in Italy are defined in the “Guidelines and Criteria for Seismic Micro-zoning”, which have recently been approved by the Civil Protection Department and the Committee of Regions and Autonomous Provinces (SM working group, 2008).

Campania

Following the preparation and approval of the nationwide seismic hazard map, the region of Campania, under a resolution by the regional Government (no. 5447 of 7 November 2002), has classified each municipality according to its seismic risk. The municipalities in the shadow of the Vesuvius feature a medium seismic hazard level.



The seismic classification of the municipalities in Campania

The regional government then issued the Guidelines (resolution no. 146 of 27 May 2013) for preparing the municipal emergency contingency plans, although, to date, not all the Vesuvian municipalities have adopted this instrument.

Hydrogeological and hydraulic risks

Generally speaking, the expression “hydrogeological instability” is used to define the phenomena, and related real or potential damage, caused by surface (in its liquid or solid state) or ground water. The typical manifestations of hydrogeological phenomena are landslides, flooding, coastal erosion, subsidence and avalanches.

The risks are differentiated and defined as either:

- hydrogeological risk, caused by excess rainfall on the slopes, rising water levels and flow rates in minor rivers and surface water run-off; or
- hydraulic risk, caused by rising water levels and flow rates – in excess of certain critical values – in major rivers, which can cause flooding.

In Italy, hydrogeological instability is very widespread and is a very serious problem.

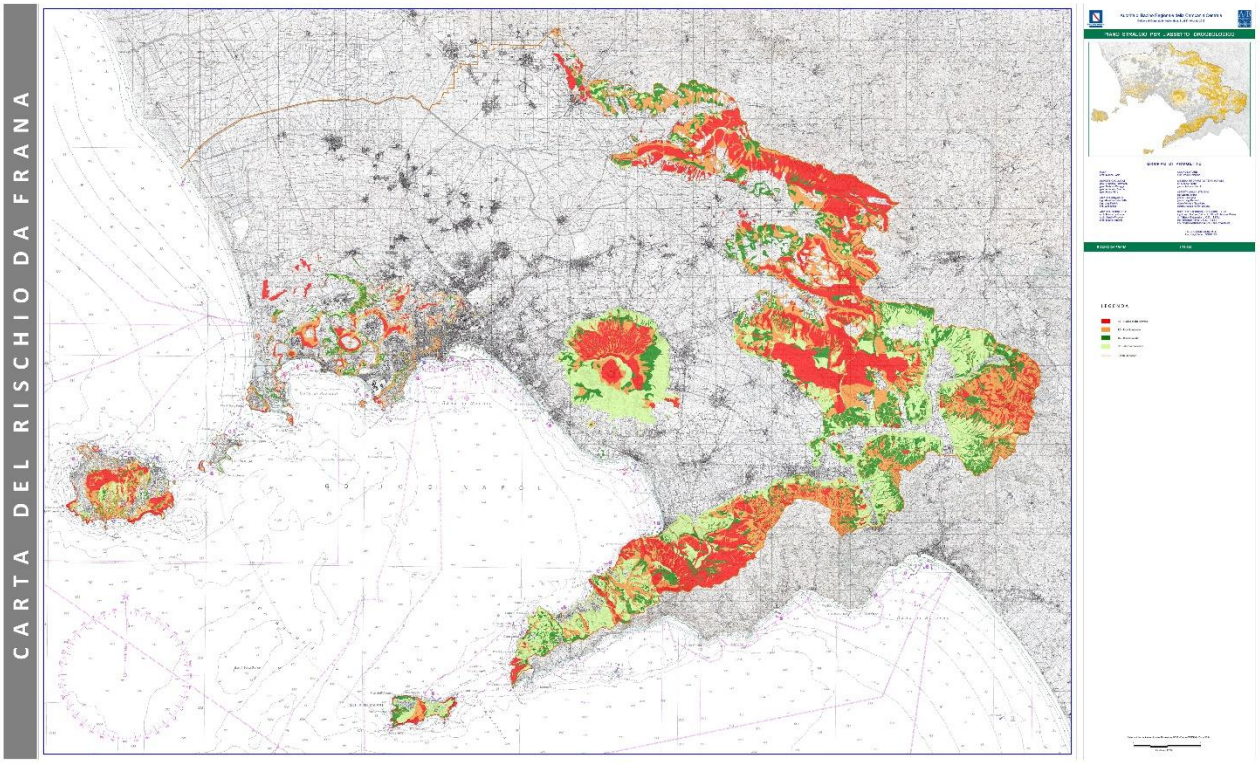
Among the reasons causing widespread hydrogeological instability in Italy are the country’s geological and geomorphological features, characterised by a complex orography (distribution of the mountain chains) and generally small drainage basins, which, therefore, feature extremely rapid response times to rainfall. This means that the time between the start of rainfall and the overflow of water from a river can be very short indeed. Localised severe weather, combined with these territorial characteristics, can therefore rapidly produce various extreme and violent phenomena (mudflows and flash floods).

Hydrogeological risk is also heavily affected by human activities. Population density, increasing urbanisation, mountain depopulation, unauthorised building, deforestation, the use of non-environmentally-friendly farming techniques and the scare maintenance and management of slopes and rivers have unquestionably aggravated this instability and further highlighted the fragility of the Italian territory and increased exposure to these phenomena, thus heightening the related risk.

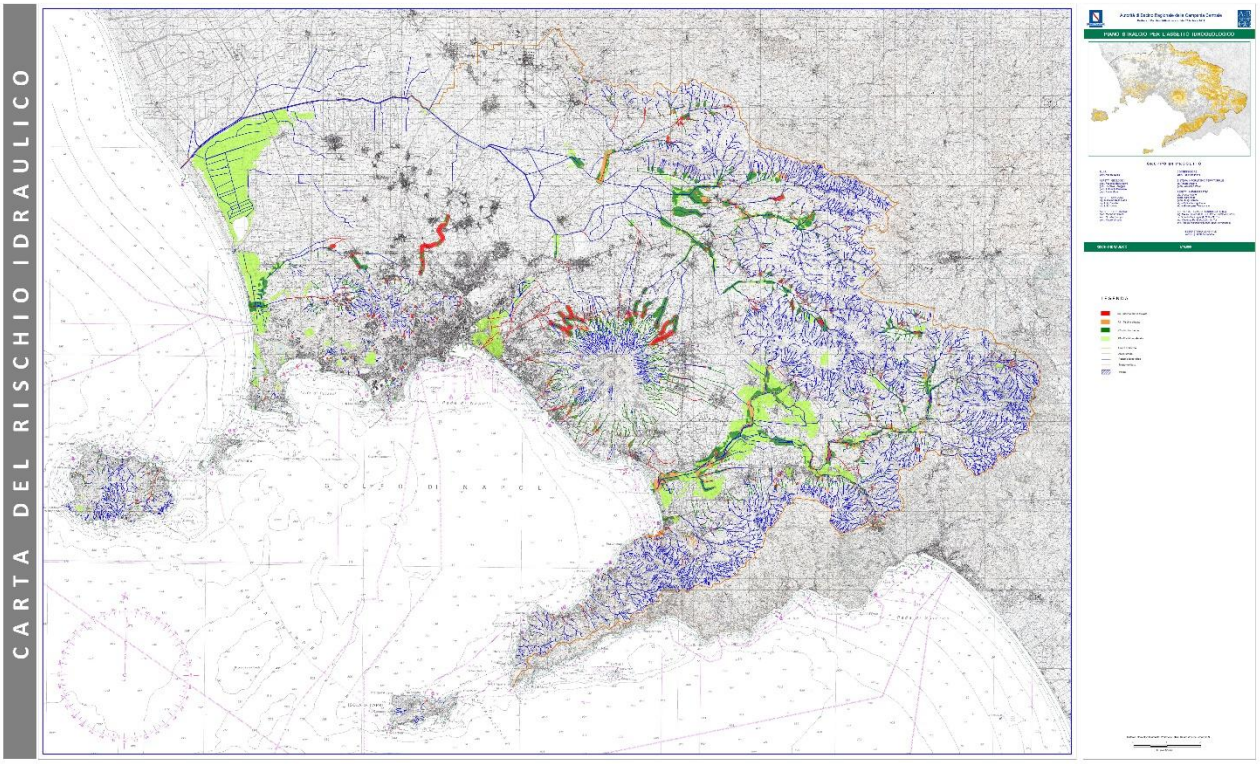
Regulatory measures now require the bounding of areas at risk, and alert and supervisory systems have been developed, which, combined with adequate local civil protection planning, are important resources for mitigating the risk, where structural measures cannot be implemented.

Italy has developed a network of centres for collecting, monitoring and sharing meteorological, hydrogeological and hydrological data called the National Alert System. The system is managed by the Civil Protection Department and the regional governments, through a network of functional Centres, regional facilities and Centres of Competence. Each region lays down the procedures for alerting its civil protection system at the regional, provincial and local levels.

Regarding the area in which the inscribed sites are located, the Basin Authority of Central Campania has developed a study of the hydrogeological and hydraulic risks and, as shown in the relevant maps, the sites are affected by a low level or risk.



Basin Authority of Central Campania: landslide risk map



Basin Authority of Central Campania: flooding risk map

Tidal wave risk

All the Mediterranean coastlines are subject to tidal wave risk due to high seismicity and the presence of numerous active volcanoes, above and below sea level. Various cases of tidal waves have been documented along the Italian coastline over the last thousand year, only some of which were devastating. The most affected coastal areas are eastern Sicily, Calabria, Apulia and the Aeolian archipelago. Smaller tidal waves have also been recorded along the Ligurian, Tyrrhenian and Adriatic coastlines. The Italian coasts are also within the reach of tidal waves generated far away, in other areas of the Mediterranean (for example, in the wake of a strong earthquake in the Greek seas).

Fire risk

The alert system is managed by the Civil Protection Department, through the Cfc – Centro Funzionale Centrale (Central Functional Centre) and the Forest Fire Risk Service, which issues a daily nationwide forest fire susceptibility bulletin, with three risk levels for each province (low – medium – high), corresponding to the following circumstances:

- low risk: the event can be handled using the ordinary means and without any special deployment of personnel;
- medium risk: the event can be handled by ensuring a fast and efficient response of the active fire fighting system;
- high risk: the event can require the use of the national aircraft fleet.

The forecasts are made not just on the basis of the weather conditions, but also by taking into account the type of vegetation, the physical conditions and use of the soil and the morphology and organisation of the land. The bulletin provides a provincial forecast, estimating the average fire susceptibility over the next 24 hours and an outlook for the next 48 hours.

Prevention activities consist in:

- forest operations, providing for the proper management of the forest resources, for which the regions are entirely responsible; and
- training and information operations for preventing improper behaviour, promoting awareness of the risk and the adoption of proper rules of conduct.

The bulletin is made available to the regions and autonomous provinces, the Prefectures, the forest police and the firefighters. The decentralised functional centres, in the regions that have implemented an alert system, may also issue a fire susceptibility bulletin.

Nuclear risk

After the incident in the Chernobyl nuclear power plant, in 1986, and the moratorium on the peaceful use of nuclear power following the 1987 referendum, Italy has suspended the operation of its power plants and has since prepared an initial version of the National Plan for Nuclear Emergency.

Despite having closed down its nuclear plants, the focus on nuclear risk in Italy remains high, especially due to the presence of many nuclear plants in neighbouring countries, at less than 200 km from its borders. To date, in fact, there are no less than thirteen active nuclear power plants in France, Switzerland, Germany and Slovenia.

The National Radiological Emergency Plan – approved on 19 March 2010 – sets out the necessary measures for addressing the incidents occurring in nuclear plants beyond the country’s borders, such as to require nationwide coordinated actions.

Environmental risk

The civil protection system starts taking an interest in the various types of pollution when the environmental risk is related to the probability of an event caused by a sudden change in the chemico-physical parameters that characterise the environmental matrices of water, air and soil, with immediate or short-term effects on the health of the population living in a certain area, or such as to entail the adoption of emergency contingency measures.

Many parts of the country have experienced, or are currently experiencing, situations that require urgent regulatory measures for the safety of the public. The work of the Civil Protection Department in this field, in fact, is significantly increasing.

The Department is also involved in the remediation of polluted sites, in the management of the SIN - Siti di Interesse Nazionale (Sites of National Interest), which are areas identified on relation to the characteristics of the site, to the quantities and hazard levels of the pollutants found there, as a result of the surveys for assessing their impact on the

surrounding environment, in terms of health and environmental risks, and prejudicial to the cultural and environmental properties. The Sites/Areas of National Interest require urgent measures and concern about 316 municipalities in all the Italian regions, with about 7 million inhabitants.

Industrial risk

The presence of industrial plants, which use or stock chemical substances, expose the surrounding communities and environment to industrial risk. An industrial incident, in fact, can cause harm to the population and the environment.

The effects on human health, in the case of exposure to toxic substances released into the atmosphere in connection with an incident, may vary, depending on the characteristics of the substances, their concentration, the length of exposure and the absorbed dose.

The effects on the environment are linked to contamination of the soil, water and the atmosphere by hazardous substances. The effects on things primarily concern damage to the structures.

A full knowledge of these aspects is the necessary pre-requisite for minimising the industrial risk as far as possible, preventing damage to health and the environment.

3 Identifying the risk of natural and anthropic disasters in the WHL inscribed areas

Based on the study and processing of the thematic maps by the competent authorities, the risks affecting the WHL inscribed areas can be identified as summarised in the table below.

SITE OF RISK	**TYPE OF RISK**	**LEVEL**
	SEISMIC	
POMPEII		catastrophic
HERCULANEUM		catastrophic
OPLONTIS		catastrophic
	VOLCANIC	
POMPEII		catastrophic (red zone)
HERCULANEUM		catastrophic (red zone)
OPLONTIS		catastrophic (red zone)
	HYDROGEOLOGICAL	
POMPEII		medium

HERCULANEUM		medium
OPLONTIS		medium
	TIDAL WAVES	
POMPEII		non-existent
HERCULANEUM		low
OPLONTIS		low
	FIRE	
POMPEII		medium
HERCULANEUM		low
OPLONTIS		low
	NUCLEAR	
POMPEII		non-existent
HERCULANEUM		non-existent
OPLONTIS		non-existent
	ENVIRONMENTAL	
POMPEII		medium
HERCULANEUM		medium
OPLONTIS		medium
	INDUSTRIAL	
POMPEII		low
HERCULANEUM		low
OPLONTIS		low
	risk of terrorist attack with explosive devices	medium
Pompeii		medium
Herculaneum		medium
Oplontis		medium-low
	risk of terrorist attack with explosive devices	medium
Pompeii		medium
Herculaneum		medium
Oplontis		medium-low
	risk of terrorist attack with telephone bomb threats	

Pompeii		medium
Herculaneum		medium
Oplontis		medium
	risk of terrorist attack by means of an explosive letter/package	
Pompeii		medium
Herculaneum		medium
Oplontis		medium
	risk of terrorist attack by means of a letter/package containing biological agents	
Pompeii		medium
Herculaneum		medium
Oplontis		medium
	risk of visitors being attacked by armed terrorists	
Pompeii		high
Herculaneum		high
Oplontis		high
	risk of attack by placing an explosive device near the site	
Pompeii		medium
Herculaneum		medium
Oplontis		medium
	risk of damage to or theft of cultural heritage properties	
Pompeii		medium
Herculaneum		medium
Oplontis		medium
	risk of theft of heritage properties at the site, in restricted access areas	
Pompeii		medium
Herculaneum		medium
Oplontis		medium

4. Preventing and mitigating the risk of disaster

Clearly, the highest risks are the volcanic and seismic risks, which, in this area, are closely related because volcanic eruptions are generally preceded and accompanied by earthquakes, which can also be very strong. Likewise, eruptions are also accompanied by the risk of mudflows and landslides.

To prevent and mitigate the volcanic, seismic and hydrogeological risks, the Civil Protection Department, working with the Prefecture of Naples and the local governments concerned, has prepared the **Vesuvius National Emergency Plan, which is a "multi-plan"**, i.e. a plan that envisages the necessary actions for managing the volcanic and associated seismic and hydrogeological risks.

Following is an overview of the salient parts of the plan for preventing and mitigating the risks affecting the archaeological areas of Pompeii, Herculaneum and Torre Annunziata, as well as the newly bounded buffer zone.

Vesuvius National Emergency Plan (www.protezionecivile.gov.it)

The first "national emergency contingency plan for the Vesuvian area" was prepared in 1995 by two national Commissions, set up in 1991 and 1993, to assess the risk linked with an eruption in the Vesuvian area and to plan the response to such an emergency.

"Additions and variations" to various sections of the Plan were approved in 2001.

A first test of the activities carried out by the new Commission was organised in 2006, with the international Mesimex exercise - Major Emergency SIMulation EXercise – in which a volcanic eruption of Vesuvius was simulated to assess and improve the emergency procedures, including the evacuation of the people living in the red zone.

The 2001 National Emergency Plan for the Vesuvian area was modified in the wake of the exercise, agreed by the Civil Protection Department, the Vesuvius Observatory, the regional Government of Campania, the Prefecture and the Province of Naples.

On 26 April 2012, the Department received, from the working group of the National Commission for the emergency contingency plan, a document containing new scenarios and alert levels, on the basis of which different risk zones – and the relative operational strategies - should be defined. On 27 June 2012, the scenario document was presented to the National Major Risks Commission – Volcanic Risk Sector for an assessment, which found it consistent with the most recent studies on the issue. From then on the Department initiated a series of discussions with the regional Government of Campania to collect the necessary information for redefining the boundaries of the red zone, which now includes the territories of 25 municipalities in the provinces of Naples and Salerno. In particular, the

zone to be evacuated includes the area exposed to the risk of pyroclastic flow invasion (red zone 1) and the area featuring a high risk of roofs collapsing due to the accumulation of volcanic ash and lapilli (red zone 2). The new scenario was presented to the municipalities in the red zone of the Vesuvian area on 19 December 2012, and was then shared with the national authorities on 11 January 2013, at an Operational Committee meeting.

The National Emergency Plan for the Vesuvian area has examined the morphology of the volcano, its eruptive history, geochemical and geophysical data. The main types of explosive eruptions associated with various risk levels have been investigated and classified:

- Plinian eruptions;
- Subplinian eruptions type I;
- Subplinian eruptions type II;
- Violent Strombolian eruptions;
- Eruption characterised by the continuous emission of ash;
- Medium Strombolian eruptions (strictly associated with effusive activity)

Following these studies, a reference eruption event was selected, in order to define the scenario to act as the basis for the emergency contingency planning. This obviously represents the most delicate and difficult decision, and the one that most greatly affects the entire Emergency Plan.

Although the data provided by the studies was poor and fragmentary, it was thought reasonable to assume for the Emergency Plan a reference scenario similar to the one already adopted for the previous plan, namely, a Subplinian type event, for the following reasons:

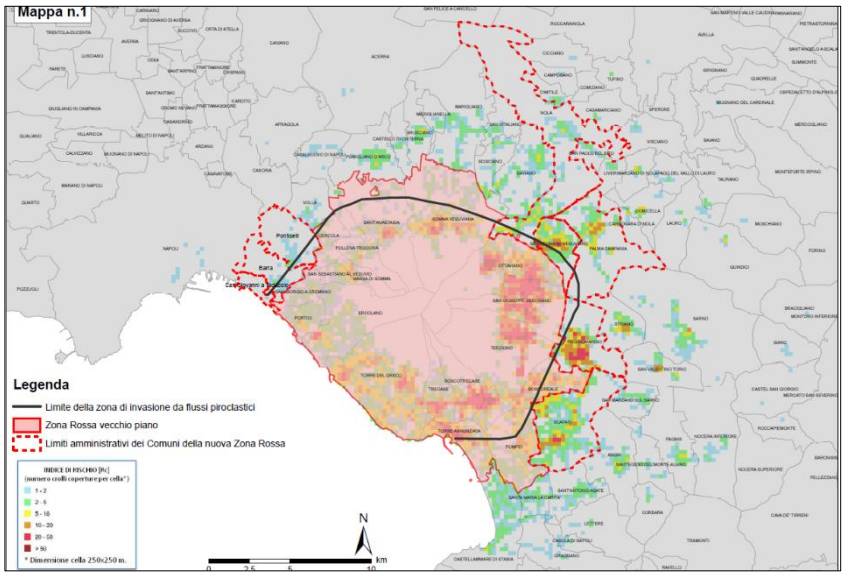
- it has a relatively high conditional probability of occurrence, just below 30%;
- it corresponds to a reasonable choice of "*acceptable risk*", considering that the probability that this event is exceeded by a Plinian eruption, with VEI=5 is, in the next 140 years (approx.), is only 1%;
- the geophysical data does not detect the presence of a surface magmatic chamber with a volume sufficient to generate a Plinian eruption (see Table 3.1 and subsection 2.3.2).

It should also be noted that, whilst the most probable events (VEI=3) would not produce pyroclastic flows, they could result in mudflows, which could invade a large part of the area exposed to the risk of pyroclastic flows in the reference event (VEI=4). Consequently, the definition of the high risk zone based on the reference event (VEI=4) also covers the area of high risk for events induced by eruptions with VEI=3.

Volcanic hazard and expected damage for the reference event

On the basis of the characteristic phenomena of the reference eruption, we can identify three areas with different risk levels, which partially overlap each other: one exposed to pyroclastic flows, one exposed to falling pyroclastic materials, and one exposed to flooding and mudflows (lahars), as described below.

- Area exposed to pyroclastic flows (red zone)



National Emergency Plan for the Vesuvian area – New red zone

Due to the intrinsic characteristics and speed of the pyroclastic flows, they represent by far the most dangerous phenomena for human life. The flows produced during the eruption of 1631 affected all the slopes of Vesuvius, with the sole exception of the southern slopes of the Somma. However, it is worthwhile, for the purpose of preparing the Civil Protection Plan, not to consider the caldera “wall” of Monte Somma as an insurmountable barrier. In effect, only slight modifications to the position of the eruptive mouth and the eruptive parameters would be sufficient to produce an overtopping of this barrier and consequent pyroclastic flows in the direction of the towns of Ottaviano, Somma Vesuviana and Sant’Anastasia. It is worth noting that the physical-numerical modelling of pyroclastic flows with characteristics similar to those which could be produced by the collapse of a Plinian column – as in 1631 – has confirmed that the overtopping of the caldera “wall” of Monte Somma is possible. The same modelling has also indicated that the time for propagation of

the flows between the crater and the inhabited areas along the coast is only 10 minutes. This confirms the absolute need for a preventive evacuation of the areas exposed to risk.

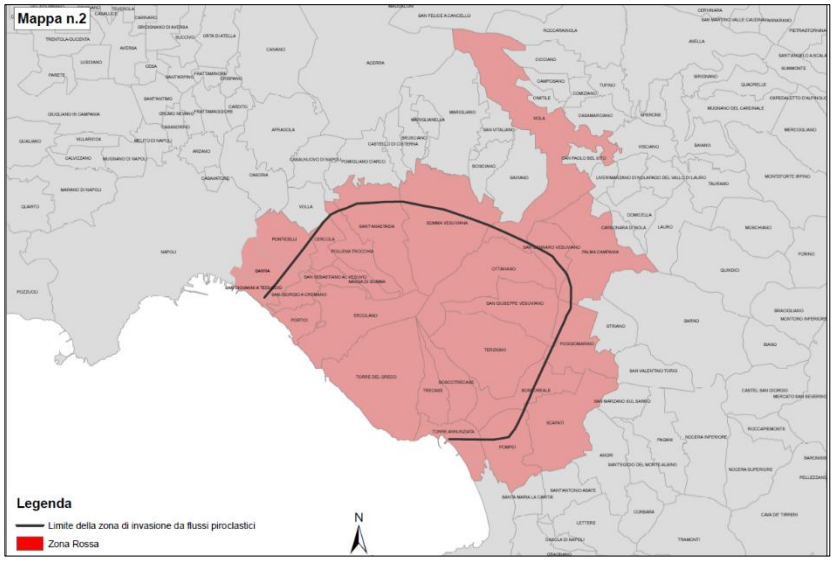
The findings of a recent research (Exploris Project) indicate as probable that there is a decreasing level of damage in the inhabited areas, proceeding from the parts closest to the crater to those furthest away, also due to the attenuation of the dynamic pressure of the pyroclastic flows caused by impact with the barriers of the first buildings encountered. The study of the effects caused by the pyroclastic flows of recent eruptions also indicates that the damage could be considerably reduced, at least in the peripheral areas, if the openings of the houses (doors and windows) were adequately protected and reinforced. However, the danger linked with the high temperatures and the presence of suspended "dust" particles, as well as toxic gases, means that the total preventative evacuation of the red zone must be maintained in the Plan.

The Work Group carefully assessed whether or not it was worthwhile to modify the boundaries of the area exposed to the risk of pyroclastic flows outlined in the previous Emergency Plan (red zone).

In the majority of cases, the boundary of the previous red zone is not exceeded, except for certain exceptions, and in those cases it is a matter of *ash cloud* deposits, of a possible co-ignimbritic origin, that is to say, due to convective and wind dispersion of the surface, less dense part of the pyroclastic flow. This is a less dangerous phenomena, compared with the main, denser flow, which generates the massive deposits, due to a significant reduction of the dynamic pressure and temperature. On the other hand, the massive deposits of the pyroclastic flows of 472, which have so far been discovered, are all well confined within the red zone.

The boundaries of the red zone of the previous Plan were selected on an administrative basis, that is to say, they coincided with the borders of the municipalities in which all, or a major part, of the area exposed to the risk of pyroclastic flows from a Subplinian eruption was located. Consequently, there is an irregular boundary with some anomalies, even in the opposite direction, the most evident of which are in the municipalities of Torre Annunziata and, above all, Pompeii, the outer south-eastern parts of which could be excluded from the red zone, and in the municipality of Nola, the south-western part of which should, on the other hand, be included, as should the easternmost part of the Municipality of Naples, which includes the districts of Ponticelli, Barra and S. Giovanni a Teduccio. Bearing in mind the delicate nature of the issue and the relevant implications of each modification of the red zone boundaries, the Work Group suggests that the Civil Protection Department make the decisions considered most appropriate for safeguarding the population.

The only variation that is suggested is that the red zone include the *enclave* belonging to the municipality of Pomigliano d'Arco, which is located physically within the boundaries of Sant'Anastasia.



National Emergency Plan for the Vesuvian area – Red zone and limits of pyroclastic flows

- Zone exposed to the falling of lapilli and ash (yellow zone)

The falling downwind of lapilli and ash from a Subplinian column causes various types of problems and includes the possibility of accumulation of the material dispersed by the wind up to the possible collapse of the roofs of buildings. Deposits with a thickness of more than 10 cm can cover areas of 300-1,000 km2 at distances of up to 20-50 km from the volcano (Table 3.2).

Up to distances of a few kilometres, the falling of heavy fragments represents a tangible risk for individuals in the open air, as well as for roofs, which can be seriously damaged by the blocks of rock falling at high speeds.

It should be noted that, besides the problem of the collapse of roofs, the living conditions in these areas would be very difficult, albeit not immediately dangerous for human life (darkness, unbreathable atmosphere, clogging of sewers, water pollution, poisoning of pastures, transport problems, interruption of power and communication lines, possible stopping of engines, etc.), so it could be necessary to move people away, at least from the most seriously affected zones. Table 4.1 shows the main problems which can be caused by deposits of various thicknesses of volcanic ash.

In the previous Emergency Plan, the boundary of the yellow zone was fixed to a load of falling pyroclastic material of 300 kg/m2, and the shape of the zone was represented in order to take into account the main wind direction at high levels. However, this representation led to ambiguities, even though it was clearly stated in the Plan that only a part of the zone, estimated to be about 10%-15% of the total, would actually be affected by an eruption.

The Work Group paid considerable attention to this issue, with the production of new maps and original data which are presented here for the first time, making use of the findings of the Exploris and Speed Projects, as well as the collaboration of prof. Giulio Zuccaro.

The new findings concern the following issues:

- vulnerability of roofs
- simulation of deposits of ash falling from a Subplinian eruption, for various wind directions
- estimation of probable collapsing of roofs
- preparation of a risk map
- vulnerability of roofs to the load of pyroclastic material

Compared with the vulnerability assessments contained in the previous Plan, the recent studies have enabled a better definition of the most widespread structural types of roofs present in the area exposed to the risk of falling of pyroclastic material.

The territory was subdivided using a radial grid with its centre in the crater; each cell has a constant surface area of 50,000 m2 up to a distance of approximately 12 km from the crater (corresponding roughly to the red zone), rising to an area of 200,000 m2 for the outermost zone (Figure 4.2). The data relative to the elements at risk which lie in that area (i.e. typological-structural characteristics, population etc.) are associated with the cell; this enables impact analyses to be performed using the results on the set of elements of the cell at risk.

Simulation of falling deposits and estimation of roof collapses

The Vesuvius Observatory has provided 16 simulations for the distribution on the ground of the pyroclastic material produced by a Subplinian eruption, which is assumed as the reference event, having the same characteristics (column height = 18 km, total erupted mass = 5 x 1,011 kg) but with a variable direction depending on the wind. For each of the 16 sectors considered, the probability is indicated (deduced from the NOAA data for the decade 1991-2000) that the wind direction carries the centre of mass of the deposit inside the area. The data confirms that the highest probability is in the sectors to the east of the volcano, in accordance with the direction of dispersion of the falling deposits of the historic eruptions of Vesuvius.

The probability that the wind blows westwards, carrying the falling ash to the city of Naples, is very low, with a probability of always less than 1% (Figure 4.5). The real wind speed profile nearest to the average of the sector has been adopted for each simulation.

Compared with the representation of the yellow zone contained in the previous Plan, the current one is preferable as it allows the effects for a specific eruptive scenario to be assessed, for which the probability of occurrence is also provided. There are certain discrepancies with respect to the load curves used in the previous Plan. These discrepancies depend on the fact that the current simulations are based on a new and more reliable law for falling particles, which also uses a better estimation of their grain size distribution.

Thematic Maps

The findings of the simulations and the damage assessments are shown in the Thematic Maps.

A first map is shown for each sector which describes the lines of equal thickness (isopachs) of the falling deposit up to 1 mm. These maps identify the outer zones, at distances of also many tens or hundreds of kilometres from the volcano, which can be affected (with various degrees of probability) by the falling of ash, the thickness of which, even if they are too small to cause the collapse of roofs, can nevertheless cause serious problems for pastures, animals, transport, engines, power and phone lines, water pipelines and sewers. The people living in these zones (even the outermost ones) must be instructed to protect the respiratory tracts and the eyes.

It is possible, however, that the living conditions, even inside this outer strip, at least that close to the red zone, become unbearable and that it is necessary to move those individuals most exposed to the risk (the elderly and children).

The second map for each sector indicates the expected collapses of the roofs of the buildings in each of the above-mentioned subdivision cells of the territory. These maps have been obtained by overlapping the load curves of the falling deposit (which are also indicated in the maps) provided by the simulations, with the vulnerability data for the roofs.

Each map contains a table summarising the expected damage, in terms of number of collapses and homeless, for each Municipality of the Sector affected by the falling of ash. It is also indicated whether the Municipality is included in the red zone or if it is outside of it (yellow zone).

Damage scenarios

The attached Maps and the Tables summarising the roof collapses indicate that in the outer area, but close to the boundary of the red zone, there can be a high number of roof collapses. For these reasons, consideration was given to the possibility of also planning for these zones, in the same way as for the red zone, an evacuation of at least for the most vulnerable buildings at the time of declaring the state of emergency for the imminent eruption.

However, an analysis provided by the Vesuvius Observatory indicates that the probability that the wind remains in the same direction rapidly diminishes over time and after three days it is already only approximately 10%. It is therefore confirmed that prevention measures for these zones are only possible after the eruption has started, when the actual wind direction and, therefore, the sectors in question are known. As already successfully experimented during the Mesimex exercise on Vesuvius in October 2006, the scientific community is able to continuously update, during the pre-alarm and alarm phases, the maps of falling pyroclastic materials, taking into consideration the real wind parameters. It will therefore be possible to keep the Municipalities in question continuously alerted, up until the alarm for the falling of ash which coincides with the start of the eruption.

The Work Group suggests the following two lines of action:

- for the time being, that is, for the purposes of the current Plan, the Municipalities in question must identify their most vulnerable districts (number of collapses greater than 10) and these should be evacuated at the start of the eruption;
- for the future, that is, for a next revision of the Plan, it is necessary to assess vulnerability, looking in detail at the buildings in order to prepare detailed information which allow a more focussed emergency contingency planning at a local level.

Zone exposed to floods and mudflows (lahars)

This zone is exposed to the risk of syn-eruptive flood and mudflows (*lahars*). The floods are caused not only by the intense rainfall but also by the reduction of the soil permeability, due to the deposit of fine ash emitted during the eruption (the rainfall, which is unable to filter into the ground, flows mainly on the surface and accumulates in the morphologically depressed zones), whilst the lahars are due to the remobilisation, caused by the rainfall, of melted pyroclastic material (falling material) deposited on steep slopes.

With regard to the dangers from syn-eruptive lahars and floods, recent studies have enabled the exposed areas to be identified with greater detail than that defined in the previous Plans. In particular, three distinct areas are exposed to these risks:

- Vesuvian area;
- Apennine Area;
- Acerra-Nola Plain Area.

These consist of the zones around Vesuvius which would potentially be affected by rapid mudflows originating directly on the slopes of the volcano (lahars). This area largely coincides with the red zone, even though some lahar deposits have been identified outside that area, as shown by morphological evidence which features a slightly more extensive *apron* of the volcano. The apron is an area with slight inclines linking the slopes of the volcano with the surrounding alluvial planes. This strip, which is roughly circular in shape, is the area in which the volcanic materials re-sedimented by the mudflows will collect. The apron therefore defines, on a geological and morphological basis, the outer boundary of the expected invasion of rapid mudflows (lahars) from the volcanic cone.

The map indicating the danger (susceptibility) of lahars in Figure 4.8 shows the boundary of the apron as obtained from the ground model. The area of the cone with the steepest slope has an extension of 75 km2. The 6° corresponds to a break in slopes and boundaries, approximately the area characterised by the presence of the source basins. The zone between 0.5° and 6° outlines the apron and features a surface area of 179 km2.

The area corresponding to the apron includes more than 18 municipalities in the Vesuvius red zone, including part of Naples, in particular, portions of the districts of San Giovanni, Barra and Ponticelli, and also marginal portions of the municipalities located north of the

volcano. However, it should be noted that the energy of the mudflows is considerably dampened in the marginal parts of the apron and a detailed geomorphological study would be necessary to identify the zones most exposed to the risks in the depressed areas and valleys.

Apennine Area

The deposit by falling of melted pyroclastic material in areas with steep slopes is an extremely favourable situation for the generation of mudflows and detritus (lahars), during both an eruptive event and the periods immediately afterwards. This is without doubt a risk which should not be underestimated in the Apennine areas located downwind, in the case of an eruptive explosion. It should be expected that the loose pyroclastic material which has just been deposited can be easily eroded and become unstable on steep slopes, if it becomes saturated by water due to rainfall. This could occur even at some time – months or years – after the eruptive event. However, stabilisation of the pyroclastic deposits does not eliminate the risk factors in the medium and long term, as demonstrated by the numerous tragic events of Sarno and the Sorrento Peninsula.

Alert levels

The Work Group believes that the same alert levels, as set out in the previous Emergency Plan, should be maintained, that is:

- BASE (GREEN)
- WARNING (YELLOW)
- PRE-ALARM (ORANGE)
- ALARM (RED)

The warning, pre-alarm and alarm levels correspond to a progressive increase in the probability of eruptive reactivation of the volcano, and imply an increasing response of the Civil Protection system, which culminates (alarm level) with the evacuation of the population present in the red zone, exposed to the pyroclastic flows and lahars.

The monitoring system, managed by the Vesuvius Observatory, consists in controlling the following main parameters, which are described below:

- Seismicity (distribution in time and space of the shocks, energy, focal mechanisms, spectral characteristics);
- Ground deformations (vertical and horizontal movements) monitored by various techniques (levelling, geodimetric surveys, inclinometer surveys, GPS, wave metering, interferometric SAR);
- Geochemical variations (flow of CO2 and heat, variations of temperature and chemical and isotopic composition of the fumaroles and thermal springs);
- Other useful information can also be obtained from variations in the gravimetric, magnetic and electrical fields, as well as from geological and

volcanological observations (e.g. opening of new fractures, variation in the groundwater levels and the flow of springs, appearance of new fumaroles).

The aim of the monitoring system is to recognise the first signs which can be associated with the process of magma rising towards the surface, and follow the developments. The variation of a single parameter may not be considered decisive, but the reliable diagnosis results from the combined, multi-parametric and multi-disciplinary interpretation of all the information which must be used in a model for interpretation of the process in progress.

The variations in the main parameters (seismicity, ground deformations and geochemistry) to be taken into consideration for the purposes of the monitoring system are as follows:

Seismicity:

- appearance of long-period events (VLP) and/or seismic tremors;
- anomalies in the characteristics of occurrence of the seismic swarms;
- exceeding the maximum magnitude of the Vesuvius earthquakes, observed during the current dormant phase.

Ground deformation:

- exceeding the annual average rate of deformation;
- appearance of fractures in the ground.

Geochemistry:

- Exceeding temperature of 100-105°C at the fumaroles;
- Increase in flow of CO2 from the ground in the crater area;
- Increase in flow of vapour and gas at the surface;
- Increase in thermal radiation measured continuously in the crater area;
- Chemical and isotopic variations in the gases from the fumaroles, in the springs and water wells indicative of a significant increase in the input of magmatic fluids.

It should be noted that, with the current level of knowledge, it is not possible to establish the timing of the reactivation dynamics. In effect, the rising of the magma could be associated with a large magnitude earthquake, or with numerous earthquakes of a smaller magnitude. Similarly, for the deformations, either a rapid dynamic or a slow dynamic could be observed.

The definition of the critical thresholds, the exceeding of which would result in activation of the various alert levels, is a complex and delicate operation. It is considered that only by the change from the base level to the warning level is it possible to establish a criteria based on the exceeding of the *background* values of the parameters monitored (e.g. based on the data recorded over the decades in which the monitoring system has

operated during the current dormant phases). The variation of a parameter is considered to be significant when it exceeds the background level by at least twice the value of its standard deviation (sigma). In particular, it is established that the change to the warning level occurs when there at least two of the parameters monitored (seismicity, ground deformation, geochemistry) has recorded significant variations.

If the above-mentioned variation occurs for a single parameter, this does not imply a change to the warning level, but activates for the entire surveillance system, as well as for the Operational Centre of the Civil Protection Department, an extraordinary surveillance phase. During this phase a detailed analysis will be carried out of the parameters which have shown variations, even with the use of additional instrumentation and dedicated measurement campaigns.

For the higher alert levels, it is considered that the definition of predetermined critical thresholds results in the high probability of false and missed alarms; consequently, the assessment of the evolution of the process during a volcanic crisis must be based on real-time analysis of the parameters monitored by experts.

It is worth noting that comforting results were obtained during the Mesimex exercise in October 2006, during which a crisis of Vesuvius was simulated and it was possible to verify the capacity of the national scientific community to provide in an extremely short time a considerable quantity of data, collected both from the permanent monitoring networks managed by the Vesuvius Observatory, and by numerous teams of specialist involved in activities on the volcano.

Lastly, the Work Group underlines that:

- an operational objective to be pursued in the emergency contingency planning is the reduction to the absolute minimum of the time needed to evacuate the population: the shorter this time is, the lower will be the probability of a false alarm;
- it may be necessary to face a long waiting period between the evacuation and the eruption; this period could be characterised by major controversies and enormous pressures to return home, which it will be necessary to deal with.

It is extremely important that the national, regional and municipal Civil Protection Authorities are aware of these difficulties and problems, and that the population affected is adequately informed.

5. The Commission for updating the volcanic risk emergency contingency plans in the red zone of the Vesuvian area

The Decree issued by the Head of the Department on 2 February 2015, laying down indications for the members and operational facilities of the National Service for updating the emergency contingency plans for the precautionary evacuation of the people living in the “red zone” of the Vesuvian area, contains updates for the volcanic risk emergency contingency plans relating to the red zone of the Vesuvian area.

The indications and updates provide for planning activities and operations relating to the safeguarding and protection of the cultural heritage properties, as specified below.

Planning for protecting cultural heritage properties

Contact person for planning purposes: the regional Secretary for Campania of the Ministry of Cultural Heritage - MiBACT (Crisis Unit – regional coordination committee – UCCR Campania)

Planning for protecting the cultural heritage properties in the Vesuvian area should focus on two key elements: (i) the high density of immovable property, (i) the large number of movable properties, which are very often preserved inside buildings that are themselves heritage listed.

Responsibility for planning and implementing the necessary measures for pursuing the defined objectives lies with the *regional Secretary for Campania of the Ministry of Cultural Heritage* (Crisis Unit – regional coordination committee – UCCR Campania), who is also in charge of coordinating the regional offices of the Ministry of Cultural Heritage in Campania, the firefighting authorities, the public emergency and civil defence authorities and the Cultural Heritage Unit of the Carabinieri. The regional Secretary will also operate in coordination with the Secretary General of the Ministry of Cultural Heritage, the Civil Protection Department and the regional Government of Campania.

Following is an overview of the main activities that should be programmed with the support of all the competent authorities:

<u>Immovable properties and archaeological areas</u>

- performing a census of the immovable properties of cultural interest and of the archaeological areas, including geographical location data, specifying the intervention priorities. These priorities are defined by the Regional Directorate for Cultural and Natural Properties of the Region of Campania (UCCR), in agreement with the competent Superintendency offices;
- identifying methods and techniques for ensuring the protection of the immovable properties and archaeological areas, for mitigating, where possible, any damage caused by the events preceding an eruption, or by the eruption itself;
- determining the instruments, formats and procedures for sharing the data, especially with regard to the agreements already concluded on the matter between the Department and the MiBACT.

<u>Movable properties</u>

- performing a census of and locating all the movable properties, indicating the intervention priorities for ensuring their safety, under the responsibility of the competent Superintendency offices;
- defining the procedures for ensuring the safety of the movable properties (either in situ or by providing for their removal);

- identifying safe temporary storage facilities or alternative shelters, away from the areas at risk, for the short or long-term storage of the properties;
- definition of the procedures for transferring the movable properties in the pre-alarm II phase and indicating the priorities of intervention and the removal procedures;
- identifying and training the specialised volunteer organisations engaged in the protection of the cultural heritage properties in Italy;
- defining the adequate procedures for alerting and deploying the emergency teams, in agreement with the provisions set out in the Operational Rules and in the Procedure for managing Emergency Operations (see the Directive issued on 12 December 2013 by the MiBACT).

The meeting table is made up of the Civil Protection Department, the peripheral bodies of the MiBACT, the Heritage Protection Unit of the Carabinieri, the Prefecture of Naples, the firefighting authorities and the Region of Campania, and it has started working on the census of the cultural heritage properties, consisting of movable and immovable properties; specific datasheets are being prepared, with regard to the latter, which also contain the priority actions that need to be implemented, while, with regard to the buildings, on-site protection systems are being investigated.

6. The emergency contingency plan by the Superintendency of Pompeii

In 2016, the Superintendency of Pompeii revised and updated its emergency contingency plan, which dated back to 2004.

Risk management according to the UNI EN ISO 31000:2011 standard – Principles and guidelines

This international standard describes in detail the logical and systematic process for achieving risk control.

Risks are better managed when a risk management process is put into place. However, where the process is implemented by a large organisation, a number of operational groups and processes may be involved, each with its own objective and approach, with the effect of ultimately hampering risk management.

This standard provides a risk management process that can be interpreted by various entities involved, creating an operational synergy between the groups operating according to uniform models.

By implementing these processes, an organisation may:

- achieve its objectives efficiently and effectively,
- oversee the entire risk management process,
- determine whether the risks are managed proactively, in specific areas and activities,
- ensure the effectiveness of the corporate risk management process,

- promptly react to any changes in the scenario.

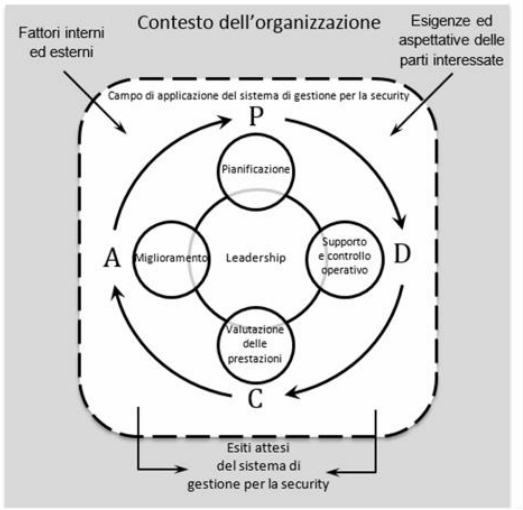
The approach envisages the following actions:

P – planning the relevant actions,

D – implementing corrective measures,

C – controlling the efficiency and effectiveness of the corrective measures,

A – improving the actions, if necessary.



The emergency contingency plan takes the following hazards into account:

- Natural hazards
- External accidental hazards
- Internal accidental hazards
- Internal anthropic hazards
- External anthropic hazards
- Hazards relating to tangible assets
- Hazards relating to intangible assets
- Other hazards

The standard envisages 5 risk levels, determined by multiplying the severity of their consequences and the likelihood of their occurrence:

5 – catastrophic

4 – high

3 – medium-high

2 – medium-low

1 – acceptable

Identification and assessment of the risks

Risk of volcanic eruption

This risk should be based not only on whether the site is directly involved, although the likelihood is undoubtedly very high, but also on whether the Plinian type eruption can reach areas that are distant from the archaeological site in question. It should also be remembered that this risk features many related risks, such as the seismic risk, collapsing buildings, personal injuries and traumas, etc..

Assessment of probability and impact

Based on the historical records regarding the eruptions of the Vesuvius, geologists have inferred that on average, over the centuries, there has been an eruption every 50 years. Since the last eruption was recorded in 1943, the probability of an eruption occurring is very high.

An important aspect concerns the nature of the Vesuvius and its eruptions, which are totally different from those of Mount Etna. The latter, in fact, is characterised by lava eruptions, which can be kept under control – to a certain extent – by directing the flows towards uninhabited areas, while Plinian eruptions feature the formation of a column of ash and lapilli, even several kilometres high, which then fall to the ground in an area determined by the winds.

Since the prevailing winds in the area are north-westerly winds, the area of Pompeii could easily be directly affected.

Therefore, this risk level is classified as 5-catastrophic

Risk control measures

The section of the Vesuvius National Emergency Plan setting out the measures for the prevention and mitigation of the volcanic risk affecting cultural heritage properties is currently being drafted by a meeting table comprising the Civil Protection Department, representatives of the peripheral bodies of the Ministry of Cultural Heritage in the Vesuvian area, the Prefecture of Naples, the firefighting authorities, the Cultural Heritage Protection Unit of the Carabinieri and the region of Campania.

A designated safe area can be identified, at the site, where visitors can await the emergency services. The identification of this site, however, must be closely related to the identification of the designated assembly or muster areas, which, in the majority of cases,

must be located outside the excavation area and must be identified by the competent civil protection authorities, namely, the civil protection service of the Municipality of Pompeii.

Irrespective of the identification of the safe areas, a key factor is the involvement and availability of the (adequately trained) safety staff members, who must be able to direct the visitors to the safe areas.

Residual risk level

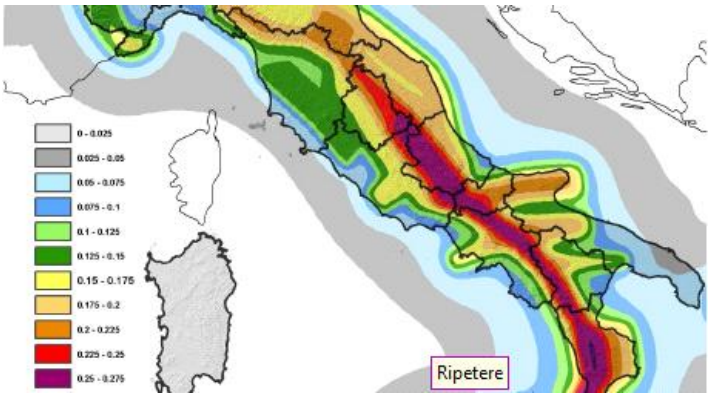
The residual risk level is very high, due to the insufficient amount of facilities that could be made available by the Superintendency, while the overall risk level, with regard to the entire site and the surrounding areas, cannot be determined because of the lack of support documents.

Therefore, the risk level of 5-catastrophic can be maintained.

Seismic risk

This risk too can be associated with many other related risks, such as collapses, personal injuries and traumas, etc..

Based on the update of the national state of the art, regarding the civil protection plans by the Civil Protection Department of the Prime Minister's Office, at 18 September 2015, only 39% of local governments in Campania have actually prepared a prevention plan.



In making this assessment, we have taken into account the indications by the Ministry of Cultural Heritage in its "Guidelines for assessing and mitigating the seismic risk for the cultural heritage".

Assessment and probability of the impact

Based on the available information, although the likelihood of an earthquake alone is relatively low, the probability of earthquakes occurring in association with a volcanic eruption is decidedly much higher.

Therefore, based on the historical records, this risk is classified as 5-catastrophic.

Risk control measures

Effective risk control measures are related to the stability assessments of the archaeological structures and office buildings. Of fundamental importance, in this respect, is the preparation of thematic maps on the state of conservation of the archaeological built heritage. For damage mitigation measures, it will be necessary to train safety teams

capable of rapidly ensuring the evacuation of the premises at risk, as well as first aid teams for assisting any injured persons. Reference should be made to the specific description below.

Residual risk level

The residual risk level is very high, for the exposure of both properties and persons.

Therefore, the risk level of 5-catastrophic can be maintained.

Hydrogeological risks related to ordinary and extreme weather conditions

This risk is taken into account for reasons of completeness, rather than for its frequency or severity. This risk, in fact, which can only slightly affect employees and visitors, may have a rather more significant impact on the cultural heritage.

Assessment of probability and impact

This risk should be classified in two categories, namely, flooding and extreme weather conditions, such as tornadoes.

The risk of flooding at Pompeii may only occur in the lower areas of the site, compared to the upper part, where the *castellum aquae* is located. Therefore, it can be assumed that, in the case of heavy rainfall for a protracted period of time, flooding might occur in the area of the Porta Stabia, where the ground is significantly lower compared to the adjacent areas.

Flooding may occur at Herculaneum and Oplontis, which sites are lower than the modern-day towns.

Only recently have the climate changes under way started producing intense effects resembling tornadoes and hurricanes.

Considering the low probability of this event, and its modest impact on both employees and visitors, this risk is classified as 2-medium-low.

Risk control measures

One risk control measure could consist in broadening the safety instructions for visitors, especially on the map of the site which is distributed to all visitors, free of charge.

Non-structural interventions are typically represented by the following actions:

maintenance programmes

- town and land planning policies;

- insurance cover for the properties exposed to the risk and not covered by the structural measures;

- monitoring and alarm systems;

the structural interventions may be inspired by two different criteria:

- active defence (or preventive) measures, aimed at preventing instability;

- passive defence (or protective) measures, aimed at mitigating the effects of instability.

It will be necessary to liaise with the firefighting authorities for emergency services, in the case of intense and widespread rainfall.

Residual risk level

The implementation of the suggested measures will make it possible to downgrade the risk.

Considering the low probability of the event, and its probably limited impact on both employees and visitors, this risk is classified as 1-acceptable.

Risk of fire inside the site, in the archaeological areas.

Generally speaking, archaeological excavations are not deemed particularly subject to the risk of fire, however, fires could break out in parts of the site featuring large amounts of vegetation.

Assessment of probability and impact

Based on the available historical records, the probability of a fire breaking out inside the site is linked only to the cultivated areas or where there is vegetation. The impact may be more or less severe, depending on the time required for the firefighters to reach the scene.

Based on the statistical data and an analysis of the known historical events, this risk is classified as 2-medium-low.

Risk control measures

In the second half of the last decade, drills were carried out, in partnership with the local firefighting authorities, featuring water tenders entering the site and reaching all the accessible points from where the firefighters could tackle a potential fire.

The drills highlighted the fact that most of the areas at risk of fire could be rapidly reached by firefighting teams, which could, therefore, promptly intervene and significantly minimise any damage to the structures. It is hardly likely that a fire can affect the visitors to the site, because the examined areas are scarcely frequented by visitors, which means that the evacuation of the few visitors present there would be a relatively fast and easy operation.

Residual risk level

In the light of the above mentioned measures, the residual risk level is classified as 1-acceptable.

Risk of fire occurring outside but affecting the site

Most of the area surrounding the site does not feature significant amounts of vegetation. Furthermore, along the perimeter of the site there are no structures or industrial plants posing a significant fire risk. The only areas featuring an – albeit low – fire hazard are found to the south-east of Piazza Anfiteatro, where several retail outlets and hotels are located.

Assessment of probability and impact

A careful examination of the structures located close to the perimeter of the site has shown that the probability of a fire breaking out is very low and its impact would also be low, in consideration of the modest fire load. **Therefore, the risk level is classified as 1-acceptable.**

Risk control measures

In the light of the above considerations, it has been thought unnecessary to implement any risk control measures, which, in any case, would have an extremely limited effect on the risk mitigation. It should be highlighted, in fact, that the patrols carried out inside the site, with the invaluable support of the firefighting authorities, have shown how very little time would be required to reach any areas bordering the site and affected by a fire.

Residual risk level

In the light of the above, the risk level of 1-acceptable will be maintained.

Risk of collapse inside the site and affecting visitors and employees

Collapses may occur and, indeed, have recently occurred a number of times, for both endogenous and exogenous reasons. The latter include earthquakes and heavy rainfall.

Assessment of probability and impact

Although a number of collapses have occurred within the site, involving, for example, sections of columns, walls and similar structures, no harm has been caused to visitors or employees. However, a low probability of occurrence does not necessarily mean a low impact, especially if the collapse were to affect visitors and employees.

Therefore, it is expedient to classify this risk as 3-medium-low.

Risk control measures

There are three types of measures for controlling this risk:

- periodical inspections of the structures, which are by their very nature exposed to the risk of collapse,

- consolidation of any structures which, after an inspection, are deemed to be at risk of collapse,
- cordoning off the areas adjacent to the structures deemed at risk of collapse.

A further (reactive, not proactive) risk control measure that can be implemented is providing for readily deployable first aid teams and ensuring that all routes for emergency vehicles are kept open and accessible at all times, to ensure the safety of any collapsing or collapsed structures.

Residual risk level

Since none of the above mentioned measures are yet operational, **it is deemed expedient to maintain the risk level of 3-medium-low.**

Risk of a terrorist attack with explosive devices inside the site

This is a significant risk, because the size of the site makes it very difficult to detect any concealed explosive devices. Moreover, the objective of a terrorist attack with explosive devices would be to involve the largest possible number of people, to ensure its success, which means that the device would have to be concealed in a particularly frequented area. In our experience, the security personnel have found unattended objects in the past, capable of raising security concerns.

Assessment of probability and impact

To date, the probability of a terrorist attack is very low, based on historical data, but the developments in terrorist attack methods could lead to the possibility of terrorists considering the possibility of an attack with explosive devices.

Since there are no security controls at the entrances to the site, unlike the Colosseum and the Roman Forum, the security personnel have no way of detecting or intercepting any explosive devices carried by a visitor. Moreover, even if security screening devices were to be used, there are many other ways in which an explosive device can be introduced into the site and then moved to a location with a high density of visitors.

The impact of any such explosive devices depends on:

- the size of the explosive charge, which could be about 10 kilos, considering that it needs to be easily transported, and
- its distance from the areas frequented by visitors.

The final classification of this risk is based on the low probability of its occurrence, for the time being at least, combined with a high lethality rate, therefore, **the risk level is classified as 3-medium-high.**

Risk control measures

The most effective and efficient measure is undoubtedly heightening the awareness of the security personnel and stepping up controls for detecting unattended objects. This would benefit both the visitors, in the event of a lost object, and the security of the site, in the event of a potential explosive device.

After a specific training course for the security personnel, their heightened level of awareness, at least for a certain period of time, led to the discovery of a number of unattended objects, which, of course, could have been explosive devices.

A new training programme would undoubtedly help keep this risk under control.

Residual risk level

Lacking any training programmes, **the level of risk remains 3-medium-high**. However, if adequate training and awareness-raising programmes are held, the risk level could be downgraded to 2-medium-low.

Risk of a terrorist attack with a telephone bomb threat

This risk is very particular, because it can be easily perpetrated by anyone, without the need for any complex preparations. Indeed, this type of attack is very common throughout Italy and elsewhere. Although there are procedures for assessing the credibility of the threat, the caution required in these cases means that such a threat should always be handled as credible.

Assessment of probability and impact

The Cesis makes available, each year, a list of terrorist attacks perpetrated in Italy, specifying the date, place, method, target and possible consequences, and the name of the person or group claiming responsibility. Based on an examination of these documents, it appears that telephone bomb threats are rather widespread. However, in the majority of cases, the threats are unsubstantiated and, therefore, **the relevant risk level is classified as 2-medium-low.**

Risk control measures

I myself have held training courses for the Superintendency staff, to enable them to adequately tackle this risk. A special course was organised for the secretarial staff, which could more easily receive telephone threats of this kind.

I also made available a special form to be compiled immediately after receiving such a call, plus an ad hoc procedure.

Residual risk level

Based on the efficiency and effectiveness of the implementation of the risk control measures, verified at a number of public and private institutions that have contacted me on the matter, I believe that **the applicable risk level in this case is 1–acceptable, provided that the training programmes are implemented.**

Risk of terrorist attacks with explosive letters/packages

This type of terrorist attack is also very easy to carry out and does not require any special training or arrangements, which means that it too is rather widespread.

Assessment of probability and impact

Reference should be made to the above, regarding the availability of accurate statistical data on this type of attack, in Italy and elsewhere. One particular aspect of this type of attack is the fact that, given the limited amount of explosive that can be contained by an envelope, it would almost exclusively involve the person opening the envelope.

In the light of these considerations, I believe that **the level of this risk is 3-medium high**.

Risk control measures

The most efficient and effective risk control measures in this case is purchasing a security screening machine, costing approx.. 30,000 euros, for screening all incoming mail. Many of my clients have already purchased these machines and the results are very satisfying. Awaiting the implementation of this rather important measure, the most effective approach is to heighten the awareness of the Superintendency staff responsible in any way for handling the mail, by means of ad hoc training. In the past, I have already held such training courses for the Superintendency staff members concerned.

I am not aware of any refresher courses ever having been held, so I assume that the people who attended these courses in the past have now forgotten most of what they learned at the time.

Residual risk level

If a security screening machine is purchased, based on my personal experience, the **risk level can be downgraded to 1-acceptable**. At present, however, and based on the assumption that the staff members who attended the training course in the past remember nothing of what they learned, **the risk level is classified as 3-medium-high.**

Risk of terrorist attack by means of a letter/package containing biological agents

This risk is similar to the risk of receiving explosive letters or packages. However, a biological risk features certain peculiarities, which are linked to the fact that even only the assumption that a letter may contain active and toxic biological agents is enough to spread panic among the people present in an area where such an envelope has been opened.

Assessment of probability and impact

Once again, based on the above mentioned statistics, such events are relatively rare, in Italy at least. The impact could be very high, not just because of the panic caused, but also because, in the presence of a real threat, a large number of people would be infected. In the light of this fact, **this risk is classified as 3-medium-high**

Risk control measures

The most effective risk control measures, as is often the case, consist in specific training programmes.

In the past, I have held training courses tackling this specific risk for all the Superintendency employees potentially involved.

Since no steps have been taken to update the training programme held 10 years ago, I believe that the staff members remember hardly nothing of what they learned at the time.

Another very effective measure, implemented by me in the recent design of a high-risk building, is providing for a post room fully isolated from the rest of the premises and fitted with an adequate and equally isolated ventilation system. This measure would ensure that any biological particles would not spread to the rest of the building.

Residual risk level

Based on the fact that no refresher courses have been held on the subject, **the risk level remains 3-medium-high**. I am convinced that continuous training programmes could downgrade the risk by a notch. The risk could be further downgraded by a level by providing for a separate post room in the building.

Risk of visitors being attacked by armed terrorists

This is a relatively new risk, taken into account after a spate of such attacks, in recent months, in a number of European and non-European countries. The security and law enforcement authorities have already alerted the population as to the possibility of such attacks happening in Italy as well.

Many security experts, who deal with protecting the general population, as well as visitors to tourist attractions and other venues where large numbers of people gather, speak of the so-called “Bataclan effect”.

Assessment of probability and impact

At present, we cannot assess the probability of such an attack, although it can be easily assumed that its impact, were it to happen, would be absolutely dramatic. The impact could be both direct, with many casualties among the visitors, and indirect, seriously

affecting the security image of the site, leading to a drastic drop in the number of prospective visitors.

In the light of these considerations, the risk level is classified as 5-catastrophic.

Risk control measures

The experience of other countries, such as Kenya, USA, Germany, France and Belgium, shows that the most effective risk control measures are those put into place by the national security authorities, and that the Superintendency can do very little to control this type of risk.

What the Superintendency can do is strengthen its emergency contingency plans for treating the casualties.

Another measure that can be implemented by the Superintendency is to closely liaise with the security and law enforcement bodies, which can provide timely information on any security concerns, based on specific investigations.

Residual risk level

Once again, based on the experience of other European countries, the risk control measures are deemed to be only slightly incisive and, therefore, **the 5- catastrophic risk level is maintained**.

Risk of attack by means of an explosive device in the vicinity of the site

An attack of this kind can be carried out using either an explosive device or a car bomb.

Since the impact of an explosive device is undoubtedly lower than that of a car bomb, it would have to be placed as close as possible to the site or in an area frequented by large numbers of visitors.

In the latter case, the effectiveness of the device, from the terrorists' point of view, would be further heightened if placed inside the site, but this would place it in a different category and it would have to be handled as specified above.

Instead, a car bomb parked along the perimeter of the site would be much more effective, because the high explosive charge would cause a significant amount of damage within a much broader range.

There are at least two entrances to the site, where the distance between a car parked near the perimeter of the site and the entering visitors is sufficiently small for the blast to create havoc.

Of course, the entrances most at risk as those with ticket offices, namely, Porta Marina and the entrance of Piazza Anfiteatro.

Assessment of probability and impact

No attacks of this kind have ever concerned archaeological sites in Italy, to date. There are reports of such attacks in Middle Eastern countries, but terrorism there is much more widespread than in Italy. The impact of an explosion, in the event of such an attack, would of course be disastrous, although the probability of this risk occurring multiplied by the severity of the impact **produces a risk level of no more than 3-medium-high**.

Risk control measures

Other countries have adopted the following risk control measures: requiring cars to park beyond a certain safety distance from certain sensitive targets or, as in the case of Egypt, using special vehicles fitted with explosive detection systems for sniffing out suspicious cars.

Residual risk level

Since none of the risk control measures have yet been implemented, the risk level is maintained at 3-medium-high.

7. Forecasted actions for preventing natural disaster risks over the 5-year length of the plan

SITE	RISK	ACTIONS
	Volcanic and seismic	
Pompeii, Herculaneum, Oplontis and surroundings		Carrying out a census of the movable and immovable properties Setting up an international study group for the purpose of identifying the best methods and techniques for ensuring the *in situ* protection of immovable properties Identifying instruments and procedures for sharing data Defining procedures and methods for ensuring the safety of movable properties Identifying storage facilities away from any areas at risk for storing the movable properties Defining the procedures for transferring movable properties elsewhere Selecting and training volunteer organisations Defining procedures for alerting and sending out teams, in agreement with the instructions laid down by the MiBACT Testing innovative systems for the in situ

		conservation of immovable properties
	Seismic-Tectonic	
Pompeii, Herculaneum, Oplontis and surroundings		Assessing the static stability of all the archaeological built heritage Developing thematic maps on the state of conservation of the archaeological built heritage Maintaining the built heritage on a continuous basis Signposting evacuation routes and assembly points Informing and training emergency teams for evacuating visitors Informing and training first aid teams in the archaeological sites Informing and training first aid teams so that they can assist any injured persons
	Hydrogeological risk and risks entailed by ordinary and severe weather conditions	
Pompeii, Herculaneum, Oplontis and surroundings		Developing risk maps Implementing maintenance programmes Setting policies for town and territorial planning Monitoring and installing alarm systems Active (or preventive) defence actions for preventing terrain instability Passive (or protective) defence actions for mitigating the effects of terrain instability Drills with firefighters
	Fire risk	
Pompeii, Herculaneum, Oplontis and surroundings		Constant maintenance of green areas and areas featuring spontaneous vegetation in the vicinity of the excavations Drills with the firefighters Information and training of emergency teams Installation and maintenance of fire

		protection systems in the archaeological sites
	Risk of various types of terrorist attacks	
Pompeii, Herculaneum, Oplontis and surroundings		Maintenance activities to ensure the perfect operation of the video surveillance systems Liaising with the security and law enforcement authorities Information and training of security personnel

CHAPTER 6

GOVERNANCE

5. **The concept of governance**
6. **Governance goals**
7. **Managing Body and internal governance**
8. **External Governance**

1. **The concept of governance**

Governance is defined by the European Commission as the set of different ways in which individuals and institutions, both public and private, manage the common interests, with reference to principles of openness, participation, accountability, effectiveness and coherence.

Governance, therefore, is a system of rules and structures designed to coordinate the various subjects that are responsible for a cultural heritage property.

To each Governance system, for its characteristics of coordination of ongoing activities carried out by various actors, a monitoring and auditing system (*Accountability*) must correspond, ensuring that the results of management are consistent with the original project.

That is true, in particular, for the sites included in the UNESCO World Heritage list, for which UNESCO requires, on the one hand, the participation of all the institutions and *Stakeholders* of the territory in the management of the properties, and on the other, the sharing of all the principles of protection, conservation and valorisation.

From the point of view of Governance, the Site of "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata", due to the complexity of the territorial components and the fact that the areas listed belong to the State, presents a situation in which it is essential to establish the relationships and mutual obligations of the Managing Committee and of the institutions and stakeholders in the territory.

In the context of the inspections conducted by ICOMOS/UNESCO after the collapse of the *Schola Armaturarum*, it has been repeatedly reported that the instability in the organisation of administrative structures and in the management system could entail a tangible element of risk for management and especially for the preservation of the properties include in the WHL.

In this regard, it seems useful to trace the changes that have taken place since that date, which have allowed a more precise configuration of the administrative structures and of the management.

Law Decree No. 91 dated August 8, 2013, converted into Law No. 112 dated October 7, 2013, containing urgent provisions to accelerate the completion of the Great Pompeii Project and the urban regeneration, environmental remediation and development of the areas that are part of the tourist-cultural route of the area of Pompeii and Stabia, as well as for the valorisation of Pompeii,

- orders the separation of the Superintendency of Pompeii, Herculaneum and Stabia from that of Naples;
- designates a General Project Manager for the Great Pompeii Project, without prejudice to the functions, duties and powers of the Superintendency responsible for the ordinary management of the site and as the final beneficiary of ordinary and

extraordinary measures implemented in the site, and in close connection with it, with, among others, the following duties:
a) defines and approves the project plans of the safety, restoration and valorisation works that are involved in the completion of the "Great Pompeii Project";
b) ensures the effective and timely execution of bidding procedures for the assignment of the works and the contract of the supplies and services necessary for the completion of the Great
Pompeii Project;
c) ensures the most effective management of the service of public use and valorisation of the archaeological site, preparing the documentation for bid submission and following the implementation and enforcement steps of the relevant contracts;
d) establishes guidelines in order to improve the efficient conduction of the site, setting the goals and procedures to ensure the reinforcement of competences and the contribution of the staff of the Superintendency to the use and valorisation improvement goals for the site;
e) guarantees the conditions of organisational and administrative support to the protection and valorisation activities for which the Superintendency is responsible;

- Forms the Unità Grande Pompei (Greater Pompeii Unit), in order to facilitate the socio-economic revitalisation and the urban and environmental regeneration of the municipalities included in the Management Plan of the Unesco site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata", as well as to enhance the entire area's tourist attractiveness. The Unit ensures the execution in cooperation of activities of common interest to the public administrations involved and the convergence in a single decision-making unit of all administrative decisions necessary for the implementation of the plans, projects and works that are conducive to the achievement of the objectives mentioned above.
- Appoints the Project Manager and legal representative of the Great Pompeii Unit, who is vested with administrative and accounting autonomy.
- Provides for the establishment of a **Managing Committee** with the task to approve a "strategic plan" for the development of the areas included in the Management Plan on the basis of the proposal submitted by the General Project Manager. **The Managing Committee is formed by the Minister of Cultural Heritage and Activities and of Tourism, the Minister of Infrastructure and Transport, the Minister for Territorial Cohesion, the President of the Campania region, the President of the Province of Naples (now Metropolitan city of Naples), the Mayors of the municipalities concerned and the legal representatives of the public authorities and private stakeholders involved.**
- Establishes that the Project Manager, acting as legal representative of the Greater Pompeii Unit, is authorised to receive donations and free sponsorships from private subjects, aimed at the conservation, maintenance and restoration of the archaeological area of Pompeii.

Subsequently, with **DPCM No. 171 dated August 29, 2014**, the special Superintendency for Pompeii, Herculaneum and Stabia is identified as an Institute with special autonomy headed by a General Manager.

Finally, the **Decree of the Ministry of Cultural Heritage and Activities, and of Tourism, dated 23.12 2014** establishes the organisation and duties of the structure and of the General Management of the Special Superintendency of Pompeii:

- the activity focuses on the protection of the cultural heritage and the promotion of the development of culture and scientific and technical research. It is based on the principles of impartiality, good conduct, transparency, publicity and reporting (accountability);
- the administration must in all cases include the following functional areas, each assigned to one or more staff members in charge:
  a) management;
  b) care and management of collections, study, teaching and research;
  c) marketing, fundraising, public relations and services;
  d) administration, finance and human resources management;
  e) structures, installations and safety.
- the General Manager is responsible for managing the sites as a whole, as well as for the implementation and development of its cultural and scientific project.
- The functions and institutions having special autonomy are listed below:
  a) the General Manager;
  b) the Board of Directors;
  c) the Scientific Committee;
  d) the Board of Auditors.
- More specifically, it is the responsibility of these functions to:
  a) ensure the achievement of the mission;
  b) check the cost-effectiveness, efficiency and efficacy of the activities carried out;
  c) check the scientific quality of the cultural offer and conservation, fruition and valorisation policies of the Cultural Heritage Properties delivered to them.

The Board of Directors determines and plans the research guidelines and technical focuses of the activities, in line with the directives and other acts of the Ministry.
More specifically, the Board:

a) adopts the Statute of the Museum and any amendments thereto, after having acquired the approval of the Scientific Committee and of the Board of Auditors;
b) approves the Service Charter and the annual and multi-annual activity programme of the Museum, checking their financial compatibility and implementation;
c) approves the draft budget, its variations and the financial statements;
d) approves the service verification tools granted in concession in relation to the valorisation projects prepared by the Project Manager, monitoring their application;
e) expresses its opinion on any other issue that may be submitted to its attention by the General Manager.

The Scientific Committee has an advisory function to the General Manager on scientific matters within the framework of the Institute's activities.
More specifically, the Committee:

a) makes proposals to the General Manager and the Board of Directors;
b) supports the General Manager on scientific issues in the preparation of the annual and multi-annual programme of activities;
c) prepares annual reports on the evaluation of activities;

d) reviews and approves, in consultation with the Board of Directors, the policies for loans and planning of exhibitions;
e) evaluates and approves the publishing projects of the Museum;
f) expresses its opinion on the Statute of the Museum and on amendments thereto, as well as on any other matter referred to it by the General Manager.

Recently, article 6 of Ministerial Decree dated January 23, 2016 created the Herculaneum Archaeological Park, separating it from the special Superintendency of Pompeii.

2. Governance goals

In the management of the UNESCO site "Archaeological areas of Pompei, Herculaneum and Torre Annunziata", considering the direct management of the site by the State and the need to coordinate and link the latter with the management and programming of the territory by different stakeholders and policy makers, we must distinguish ***internal* Governance**, namely that which lays down the rules relating to the activities of the Managing Body, from ***external* Governance**, which ensures coordination between the Managing Body and other entities, both public and private.[6]

The administrative structure's stability and the responsibilities of management being guaranteed by law in the forms described above, the Management Plan aims to identify the internal governance procedures and responsibilities in relation to the management of the UNESCO site, also referring to the coordination with the activities of the General Project Management and of the Greater Pompeii Unit.

Similarly, for the external governance, the forms of coordination of the activities of the Concertation Table for the implementation of the Management Plan with the work of the Greater Pompeii Unit are identified, whose "Strategic Plan" must pursue the objectives outlined by the legislator for the valorisation of the historical and cultural resources through the establishment of an integrated and sustainable tourism system, in synergy with the provisions set out in the Management Plan of the UNESCO site and the principles referred to therein.

The ultimate goal is to identify the forms of governance after overcoming the emergency phase that led to the establishment of the General Project Management and after completing the activities of the Great Pompeii Project. The systematic application of the verification procedures concerning the site integrity and authenticity preservation, the mitigation of risks and the fruition activities for mitigation of the anthropic risks, just to mention a few of the actions foreseen by the plan, depend on the clear identification of an action Protocol, of a set of procedures and of the chain of command. As regards the territory, the challenge is to create a tourism system of the Vesuvian territory through actions contemplated in the Strategic Plan for the development of the areas included in the Management Plan of the UNESCO site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata".

[6] A.F. Leon and V. Tuccini, *The economic dimension of cultural heritage*, in Law and Management of Cultural Heritage Assets, M. Cammelli, G. Sciullo, published by Edizioni Il Mulino, Rome 2011

3. **Managing Body and Internal Governance**

The archaeological areas of Pompeii, Herculaneum and Torre Annunziata are owned by the Italian State and therefore are managed directly by the Ministry of Cultural Heritage and Activities, and of Tourism, through its peripheral Institutions that represent the Managing Body of the site.

The institutional task of the Special Superintendency for Pompeii and the Herculaneum Archaeological Park consists in the protection of the sites and in their conservation and valorisation. To accomplish this, the Institutes apply in their activity all *legal, administrative, financial and technical tools* made available by Italian law and by the ordinary and extraordinary funding sources, carrying out specific actions from time to time.

The implementation of the programmes of the Institutes is guaranteed by the Managers with the cooperation of officials in the various operational, administrative, scientific and technical areas and of all staff based on their specific individual skills.

Decision Tree

The decision tree of the Managing Body consists of:

- **the General Manager of the Special Superintendency for Pompeii and the Manager of the Herculaneum Archaeological Park**, who are responsible for the management of the sites as a whole, as well as for the implementation and development of the cultural and scientific project. More specifically, the Managers must:
  a) ensure the achievement of the mission;
  b) check the cost-effectiveness, efficiency and efficacy of the activities;
  c) check the scientific quality of the cultural offer and of the conservation, use and valorisation practices of the Cultural Heritage Properties under their supervision.
- **the Boards of Directors**, which determine and plan the research guidelines and technical focuses of the activities;
- **the Scientific Committees**, which have an advisory function to the General Manager on scientific matters within the framework of the Institute's activities;
- **the Boards of Auditors**, which have a supervisory function.

The operational structure consists of:

- **the permanent Secretariat**

  formed by the UNESCO Office of the Special Superintendency for Pompeii.

  The secretariat carries out general secretarial tasks for the UNESCO site; follows up the implementation of the Management Plan in relation to the forecasts of the various areas of action: knowledge, works and maintenance, fruition and communication, Capacity Building and risk management, with the collaboration of

officials and technicians involved in the aforementioned areas of action. Collaborates with the Greater Pompeii Unit. Entertains, on behalf of the Superintendency, the relationships with the Concertation Table. Coordinates the information and educational activities. Performs the functions of Communication Centre of the UNESCO site of the Archaeological areas of Pompeii, Herculaneum and Torre Annunziata.

4. **External Governance**

The Management Plan, though, takes on a more complex and structuring role in the process of preservation of the values of a site, especially in connection with the involvement of local communities in the planning and implementation of actions of protection, management, use and exploitation. If, in fact, the purpose of a Management Plan is primarily to balance conservation with a sustainable economic use of the property and with the development needs of local communities, to balance those different interests and demands for change, it is essential to involve all institutions involved in the management and planning of the territory and local communities.

The coordination of the activities of the Managing Body with those of the institutions responsible for the governance of the territory will take place through the Concertation Table, which is the place where to compare and analyse the site and territory, and resolve contradictions and difficulties.

In order to identify a tool for external Governance that is able to coordinate, in the various skills and requirements, the activities necessary for preservation of the values of the sites and the territory, a **Concertation Table has been formed, with a memorandum of understanding signed on 25.11.2013 by the Secretary General of MiBACT, by the Director General of Antiquities, by the Regional Director for the Cultural and Landscape Heritage of Campania, by the President of the Campania region, by the Mayors of the municipalities concerned by the new perimeter of the buffer zone, and by the Mayors of Herculaneum, Pompeii and Torre Annunziata, on whose territory the properties inscribed are located**. This Protocol also contains the general guidelines of action for the protection, conservation and valorisation of the sites and the territory underlying the Management Plan.

The Concertation Table is a tool aimed at fostering the comparison and implementation of synergies for the pursuit of the common objectives of protection, valorisation and promotion of the UNESCO site, matching these needs with the integrated and sustainable development of the territory’s resources.

With this tool, which provides the definition of a coherent, shared and sustainable path for the spatial development and the coordination of the different actors, all the problems concerning the programming of an integrated intervention system in the territory for a sustainable use of the same will be addressed, as well as development processes, such

as identifying a Vesuvian tourist system that may involve all the territory included in the buffer zone of the site.

The statutory members of the Table can decide to convene, for particular issues, the social partners, trade associations and tourist operators, in order to develop and share the decisions necessary for the implementation of the Management Plan. In order to ensure a wider participation of the citizens, the Concertation Table may rely on the help of representatives of the community, associations and manufacturing businesses active in the area to collect instances and to arrange the lines of intervention and the action strategies for involvement.

Participation in the table will help foster collaborative processes for the implementation and monitoring of the Management Plan. This collaboration has also brought about the introduction of report cards regarding the analysis of the cultural, natural, architectural, landscape and infrastructural components of the territory of competence of each signatory local authority.

First, after having shared and approved the Management Plan, the work of the Table addressed the need - certainly a most pressing issue for the territory - to identify and address a system of sustainable tourism for the Vesuvian area included in the buffer zone.

The work began with the compilation of fact-sheets of the heritage in the territory based on a surveying model identified by the Concertation Table itself in collaboration with the Campania region during the sessions held to share the Management Plan.

This reporting work found:

1) the most significant presences, in nature and/or size, whether public or private, of which it described: the entity, the state of consistency and preservation, the use condition, the availability status, the proposals and projects under way for their transformation, reuse or conservation, and any funding available;
2) local planning and programming choices, in force and/or adopted, as inferred from the official records;
3) detailed assessments about the degree of compatibility between the mentioned presences and the principles of protection, valorisation and sustainable development of the territory;
4) focus notes for the urban planning and economic choices in the short, medium and long term.

The method adopted for surveying the data was a full census survey of all Cultural Heritage Properties in the territory.
The fact-sheets produced have been subject to prior review by the Table, which therefore was able to examine and discuss the coherence of the material submitted based on the objectives of the project.
In several subsequent meetings of the Table, an ever deeper analysis was conducted of the compatibility with the purposes of the plan, with particular reference to the protection of the properties and the preservation of the universal values of the site, as well as of the proposals and the territorial system, which ended with the creation of a themed digital

cartography in which all the elements gathered were included, and which was created in collaboration with the local authorities. The study of the cartography produced allowed us to identify thematic routes around which to organise the territorial tourism system.
The work for the establishment of a tourist system of the Vesuvian area continues through an additional process of analysis of the situation of the territory as concerns the tourist offer. Report cards regarding the tourist destinations and both the urban and social needs will be compiled, so that a top-level cultural offer may go hand in hand with a tourist offer that can satisfy the needs of visitors and the expectations of residents. This widespread surveying work in the territory will have to involve not only the members of the Table, but also the various stakeholders: hoteliers, tour operators, tour guides and inhabitants of the territory.
This work can support the operation of a complex system of governance that invests both the properties inscribed and a territory where it is not easy to find shared goals and strategies.
The data collected by the local authorities thanks to these fact-sheets, which was included in a structured information system within the framework of the Great Pompeii Project will be analysed and evaluated in order to carry out a proper heritage protection and conservation activity.

Strategic Plan of the Greater Pompeii Unit

A key action aimed at achieving a sustainable development of the territory based on the protection and preservation of the cultural and landscape heritage is the definition of the "Strategic Plan" drawn up by the Greater Pompeii Unit . In its current stage, the Plan, by taking into account the postulates of tourism management (i.e. hospitality, accessibility and information), aims to promote a proposal identifying method which, in order to implement the strategic plan, will act as an incentive to ensuring the integration of each project in the networks, systems and actions, including in particular:

a. connection networks, also available with eco-friendly vehicles, that ensure the best accessibility to places of historical, artistic, archaeological and landscape interest in the buffer zone;
b. a naturalistic and landscape reconstruction system of green areas and peri-urban residual areas;
c. the royal palaces system and the system of the main architectural emergencies;
d. infrastructural interventions aimed at the regeneration and recovery of abandoned industrial areas, in compliance with the legislation, which calls for a stringent limit to the consumption of soil, even considering that the whole of the buffer zone is exposed to different types of risk (volcanic, seismic, hydrogeological).

Of great importance for the preservation of the cultural and natural values of the area is the proposal made by the strategic plan for the intended use of the territory strips located in immediate proximity of the areas and archaeological sites in the buffer zone, and characterised by historical forms of use that are mostly agricultural. For these areas, in fact, the aim is to continue their valorisation and recovery by maintaining their widespread naturalness, also through the **creation of urban agricultural parks** allowing for the maintenance of existing cultural activities, by encouraging forms of indigenous crops and

their subsequent marketing within the park itself. The establishment of urban agricultural parks would respond to a number of objectives aimed at:

a. recognising, in peri-urban agricultural spaces, the value of strategic areas that are critical to the diversification of tourist offer through accommodation facilities such as "bed & breakfasts" and/or holiday farmhouses;
b. avoiding, by planning in advance, the depletion of peri-urban agricultural spaces;
c. promoting the agrifood tradition with the proposition of typical products and plant and animal biodiversity in the buffer zone;
d. enhancing the consolidated characters of the countryside;
e. safeguarding specialised crops or ones that are considered significant from the point of view of the landscape. No new constructions will be allowed in these areas. Instead, there will a need to provide for the renovation of existing ones, changing the intended use for the reception of tourists, if necessary.

In keeping with the initiatives undertaken for the UNESCO site Management Plan, intangible actions may be envisioned in the Strategic Plan that are oriented to synergising and unifying the valorisation of cultural sites in the buffer zone, including through a better regulation of the ever-growing stream of visitors to the archaeological area of Pompeii by attracting them even to smaller sites. We could consider, in
this framework, a single ticketing system available on multiple days – even with a special bracelet, currently only available for the excavations of Pompeii and for a single day – extended to the entire system of cultural heritage properties and other attractions of the area, also linking it to tourist and hospitality promotions. In other words, we would allow tourists to purchase a ticket at a discounted price
valid for two/three days to allow them to visit not only the ruins of Pompeii, but also those of several other archaeological sites in the buffer zone. The solution would entice tourists to stay overnight in the area, thus taking advantage of the local accommodation and catering offers.
Similar synergies could be identified in proposals involving transport to and from the buffer zone
and the internal connections between the sites of cultural interest, including through eco-buses.
In addition, the ability to extend the tourist offer with side initiatives targeted at specific classes of users, such as children, youth groups or the elderly, could lead to longer stays by tourists. These initiatives could see the resident population participate actively, pursuing that improvement of the quality of life that is at the core of sustainable tourism.

CHAPTER 7

CAPACITY BUILDING

5. **The Capacity Building action**
6. **Objectives of the Capacity Building action**
7. **Capacity Building for the UNESCO site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata"**
8. **ICT and the Capacity Building project**

1. The Capacity Building action (CB)

The United Nations define Capacity Building as a tool for improving individual skills in organisation, enterprise and project management handling, from conception to economic feasibility.

Within the UNESCO, the concept of CB normally is conceived as the reinforcement of the capacity of individuals and institutions so as to improve their skills and their capacity to solve problems in a sustainable manner.

For its part, when developing the guidelines for CB the Intergovernmental Oceanographic Commission (IOC) has assigned 3 main objectives to this process:

• develop and have the organisation undergoing CB assimilate a continuing learning and improvement process via the acquisition and sharing of better applicable practices;

• provide an archive of solid experiences and of points of reference regarding CB, to be used to guide the decision-making process;

• stimulate thought and debate regarding best CB practices.[7]

To support the action of the structure managing the site inscribed on the World Heritage list and of the local bodies in reinforcing their capacity to conserve and valorise the Property and work towards the socio-economic development of the area, it is necessary to reinforce in them the various capacities they require to do this: intellectual, organisational, social, political, cultural, material, practical or financial."[8].

This means that the reinforcement of skills is mainly aimed at consolidating the awareness and comprehension of the reasons justifying the inscription of the Property on the World Heritage list.

This can be obtained by planning an educational programme aimed both at improving staff skills, acting especially on organisational efficiency and effectiveness, and at improving the quality of the services supplied.

2. Objectives of the Capacity Building action

The main objectives to be achieved by means of the capacity building actions consist in upgrading the following skills:

- Management of the sites inscribed on the WHL via the strengthening of the capacities of the scientific, technical and administrative structure of the Superintendency as Body in charge of managing the Properties;
- Management of the relations with the territory via dialogue with all of the stakeholders;
- Analysis of a situation and creation of a vision regarding the importance of the heritage in sustainable development;
- Definition of objectives and strategies;
- Management of the available budgets, allotting them to the best result for the growth of the site;
- Direction and implementation of the envisaged actions;

[7] unfccc.int@cooperation&support ioc-unesco.org

[8] Eade, D. 1997. "What is Capacity-Building?" in Capacity-Building, An Approach to People-Centered Development, pp. 23-49. Oxford: Oxfam Publications

- Monitoring and assessment of the results;
- Creation of a maintenance manual.

The capacity building action shall allow the administrative, scientific and technical structure of the managing body, over the long period, to coordinate the various aspects of the conservation, use and promotion of the WHL sites in terms of organisation, business and project management, stimulating the increase of the local population's capacity to understand the value of the heritage and to pursue its conservation by supporting a participated protection and shared responsibility process, while favouring in visitors the capacity to profoundly activate the exchange of culture, values and traditions with the location and its population.

3. Capacity building for the UNESCO site "Archaeological areas of Pompeii, Herculaneum and Torre Annunziata"

The increase in skills of the administration in charge of management, intended to include the use of tools, methods and procedures derived from technological innovation, must be based on several key elements:

- Development of human resources;
- Organisational development, including the creation of management and process structures as well as of the creation of procedure manuals;
- Development at the institutional and legal levels, also via the proposal of amendments and improvements to current laws, so as to allow the bodies involved to improve their capacities and efficiency;
- Reinforcement of the technical-scientific skills and of the methods for supplying services via a specific and targeted acquisition of specific knowledge and experience;
- Technological innovation via the adoption and development of more advanced tools, methods and procedures, seeing to their harmonisation with the effective procedures already in place.

Through the Capacity building plan of the Great Pompeii Project, in addition to the action specifically focused on the technological upgrading of the Superintendency and the reinforcement of the capacity of the entire scientific, technical and administrative structure, two important projects have been carried out: the creation of an Information System that also includes a map system, and of a data centre and disaster recovery hardware infrastructure.

The use of the information system, already loaded with all of the data from the surveys and investigations on the state of deterioration of the archaeological area of Pompeii conducted through the Knowledge Plan, and with the database created via the same project, shall form the base for all of the work aimed at creating the deterioration theme maps, the planned maintenance and the site monitoring activities. In consideration of such an important function, technical and scientific officials are already being trained in the use of the system and of the data it contains.

As regards the enhancement of the skills of the Administration, in particular, personnel has been called in to support the employees; in particular, a legal counselling service has been

activated to address various issues, such as the frequent recourse to administrative justice proceedings for the awarding of tenders, for example.
An important part in the planning of a capacity building action is the need to sustain and reinforce the skill of the local population, of Italian citizens and of the visitors in better comprehending the cultural specificities of the Vesuvian sites and their potential for becoming extraordinary development boosters.
The identification of a vision of the cultural, social and economic importance of the Vesuvian archaeological sites originated from the concept that, due to the history of their destruction and their re-discovery, in the collective mind of humanity they are locations featuring four interconnected aspects of strongly evocative and symbolic value:

1. They are ancient cities that have been entirely preserved and therefore illustrate the everyday life of people who lived two thousand years ago, fixed and dated at the time of the volcanic eruption in 79 B.C.. In the sites not only the public buildings but also the dwellings, the shops, the park areas, the streets, the walls, the tombs have been preserved, in a state of conservation that as a whole has never been seen elsewhere but in the Vesuvian area.
2. Evidence of the customs and traditions of the ancient Romans. The entire cities, and not only their urban fabric but also the objects and the expressions of everyday life as well as of the trade, production and religious activities, are all present and for the last 250 years have been the stage for the study and research of generations of scholars, as well as the object of the interest of tourists and visitors of all ages and from all over the world. They represent the most complete documentation in the world about the life and customs of the ancient Romans and of the local population in the 1st century A.D..
3. The eruption of the Vesuvius with its victims. The Vesuvian archaeological sites are also the place where the devastating effects of a volcanic eruption on a city and on its population are preserved. They represent a case history of reference for international volcanology, also because they allow to compare the coeval literature against the scientific data collected in the field.
4. The onset of modern archaeology. The discovery of Pompeii, Herculaneum and of Stabiae also represents the moment in which modern archaeology was born, thanks to the effect the diffusion of the Vesuvian archaeological findings had in Europe in terms of formation of a neoclassical culture that influenced the development of modern societies. They are, therefore, locations where one returns to find the roots and inspirational motivations of European culture, as places from which depart innovations and choices for change in the fields of protection, conservation, analysis and valorisation of the national and international cultural heritage.

Since their discovery, moreover, Pompeii and Herculaneum have been the field of experimentation and introduction of solutions and techniques for research, conservation and restoration applied to archaeology. Among the many themes and aspects typical of these activities, noteworthy are the consolidation of structures, the issue of covering buildings lacking roofs, the integration or consolidation of decorative systems, the

replacement of elements deteriorated by exposure to the weather, the casting techniques, the restoration of park spaces and gardens, the protection of ancient artefacts, the consolidation of the excavation fronts, the drainage of rainwater, the detachment of frescoes, etc.. The Vesuvian archaeological school has produced solutions to these problems and has tested choices, not always the best, which however have become common legacy in the world of archaeology.

For all these reasons, the activity shall focus on the themes that are key to the exchange of knowledge:

- The design and management of national and international projects concerning the promotion of the development of skills, of the transfer of the scientific knowledge and of the technical know-how needed for the protection and conservation of the archaeological built heritage;
- The dissemination of Property protection and valorisation programmes by means of training courses and seminars, in cooperation with the local administrations;
- The organisation and coordination of internships and stages on issues regarding the protection and conservation of the Properties, with special reference to the training of operators capable of carrying out interventions on the archaeological built heritage and on wall and floor coverings;
- The development of methods and activities for the dissemination of information and knowledge to be used by the decision makers of the site areas and of the buffer areas in order to put in place a management of the territory that is sustainable and proportionate to the value of the Properties;
- The organisation of e-learning projects aimed at promoting the scientific and technical knowledge at various educational levels, ranging from elementary school to university courses;
- Education in promoting knowledge of the value of the Properties among school-going as well as adult citizens, so as to build the feeling of belonging and of sharing these values.

Article 27 of the UNESCO convention on the protection of the World Heritage defines the role of the educational and information programmes as key to reinforcing appreciation and respect of the peoples to their Heritage.

Indeed, communication, information and knowledge are the dynamics capable of guiding sustainable development via the involvement in various ways of the local population.

In particular, it will be especially useful to provide teachers with the best knowledge of the Property and of its values, using courses, conferences or stages, so as to render them capable of creatively inserting into their school programmes moments of education and information about the Property to their students.

Another highly significant element of the educational activities and of the activities for transmission of the heritage values is the work of the local associations that, thanks to their operating throughout the region, can vehicle information and knowledge and reinforce local skills. In this sense, already quite important are several local non profit associations, such as the Associazione Internazionale Amici di Pompei (International Association “Friends of Pompeii”), founded in 1955 by the great archaeologist and Superintendent of Naples Amedeo Maiuri, and the Centro Herculaneum, established to integrate the

activities of the “Herculaneum Conservation Project” willed by the US donor David W. Packard, which already envisage in their bylaws the aim of operating not only towards the knowledge and valorisation of the heritage but also towards the promotion of the relationship with local communities, especially the younger generations. In particular, the Associazione Internazionale Amici di Pompei has operated ever since its foundation the meritorious publication of studies on the Vesuvian archaeological sites.
These two Associations, as well as any others identified in the region, shall be assigned with the task of communicating in a non-commercial fashion by using training projects organised, within the context of the activities of the Meeting Table, together with the Superintendency and the local bodies and with the assistance of local schools.

4. ICT and the Capacity Building project

Considering the importance of communicating with the potential users of the archaeological areas in order to increase the appreciation of the Property they intend to learn more about, as well as of making contact with the tour guides in order to reinforce their capacity to choose the tourist and thematic itineraries intelligently and, finally, of reaching the young generations with messages that are more in tune with their way of feeling, the project aimed at reinforcing the knowledge of the sites and of their universal values must necessarily be based on the new tools provided by the Information and Communications Technology (ICT) that allows to reach a much wider platform of users.
This part of the project falls under the activities envisaged by the Communication Plan implemented with the European funds of the GPP and currently being conducted by the Special Superintendency for Pompeii.
The communication structure carries out its function with the framework of the knowledge reinforcement project by means of:

- **The new website of the Superintendency:**
  The new website, designed in such a way as to reach the large public of users, as well as the local stakeholders for the exchange of information, and the scholars so that they can make the documents and scientific information circulate more easily, will include a section dedicated to the UNESCO website that in turn includes:
- A presentation of the UNESCO website and the communication and dissemination of the most significant news and events as well as news regarding the development of projects under way with pictures and short videos of the activities and characters involved;
- A presentation and description of the Management Plan and of the actions envisaged for the conservation and valorisation of the site;
- A presentation of and report on all of the activities carried out by the Meeting Table;
- A presentation of and report on the progress made in the study and filing activities for creation of the Vesuvian tourist system;
- A report on the monitoring activities carried out on the site and on the implementation of the Management Plan;
- A blog dedicated to the exchange of information between scholars, allowing them to present scientific papers of all kinds for a deeper knowledge of the WHL site and of the buffer zone. The blog shall dedicate space also to discussion with other

managers and experts of the UNESCO sites regarding the themes of conservation, use, risk mitigation and the governance of the WHL sites and of the buffer zone;
- The chance to download the apps created to illustrate the thematic itineraries (available to date only for the archaeological site of Pompeii).

Podcasts and Apps

By using the Podcasts, that allow users to access the audio and video content by downloading them automatically from the websites and blogs and viewing or listening to them on PCs or on MP3 (or similar) players, a vast audience of users can be reached in a manner closer to the needs of today's public that often has very little leisure time.

Considering the popularity of mobile devices such as smartphones, tablets and similar, the GPP's Fruition Plan has generated applications that illustrate the thematic itineraries and can be downloaded for free directly in the archaeological area thanks to the Wi-Fi coverage of the entire area – this too provided thanks to GPP funds – or from the website. To date, this kind of visit aid has been achieved only for Pompeii, but it has been envisaged for the other sites too.

Indeed, products of this kind would make it easier and quicker to acquire information of all kinds, ranging from scientific data to information concerning the tourist itineraries available in the region and news regarding the areas available for visits, etc. This would streamline the divulgation and knowledge of the values of the site, presenting the information in a quick, easy to use and attractive manner.

Social networks

A profile of the UNESCO website on social networks such as Facebook or Twitter today is an interesting opportunity for facilitating access to information, especially for the local population that in this way would come closer to the life of the archaeological sites, participating directly in their progress and interacting with the governance in the choices concerning them, thus also favouring communication between the participants as regards the activities and the development of the site's conservation, valorisation and promotion projects.

The Superintendency for Pompeii, by way of implementation of the Communication Plan, has activated four social channels - Twitter, Facebook, Instagram and Youtube - all of which have great followings and constantly stimulate debate on the conservation, valorisation and promotion of the WHL sites.

Works and services carried out for the Superintendency's Capacity Building project:

Project	Amount	Progress
GPP - Knowledge Plan Line 3 Conditioning, digitisation and filing of photographs and paper material	€1,053,730.40	completed
GPP - Knowledge Plan Information System	€ 610,510.00	completed
Data centre and disaster recovery	€ 340,399.75	completed
GPP – Creation of a secure network infrastructure for Wi-Fi coverage	€ 585,489.50	completed
GPP – Superintendency's technological upgrading	€ 397,300.97	completed
GPP – Communication Plan	€ 699,243.48	completed
GPP – Technological upgrading and Capacity Building plan Agreement with ALES Arte Lavoro Servizi S.p.A "Support to Capacity Building"		under way

CHAPTER 8

FUNDRAISING

L'heureux donateur. René Magritte (1966. Oil on canvas)

5. **What is fundraising?**
6. **The fundraising cycle**
7. **The law on Art–Bonus, donations and *crowdfunding* for the UNESCO sites "Archaeological Areas of Pompeii, Herculaneum, and Torre Annunziata"**
8. **Sponsorships**

1. What is fundraising?

"*Fundraising is not only about collecting funds, but should be seen as a funding development process that transforms ideas for projects into actual projects (strategic management) and involves the outside world (communication), possibly ultimately leading to a transfer of financial resources.*

At the same time, fundraising is a method: it builds social relationships and creates opportunities to ask for support; it involves the people who work within an organisation; it adapts the organisation to the point of view of the outside world and to what the outside world expects. It is also a technique: it analyses the outside world on the basis of a quasi-marketing approach, to identify potential donors; it promotes and disseminates requests for funding; effectively manages the necessary human, technical, and economic resources; establishes a positive relationship with backers and stays in touch with them."

This definition of fundraising was developed by James M. **Greenfield**[9] and comprehensively sums up its meaning, which is necessarily based on proposing projects that relate the task of an organisation to the outside world in ways that the outside world sees as significant, and on correctly identifying potential donors.

Fundraising is "*…the science of maintaining the financial sustainability of a social cause… making it understood that culture is not a private matter, but a shared project in which more and more social groups should participate*".[10]

That is surely the most important task for anyone intending to set up a campaign whose aim is to seek funding through sponsorship, patronage or other forms of support. Very significant outcomes can result if institutions are able to share the historic, social and cultural values of the assets entrusted to them with citizens and business, in a receptive and open manner that welcomes outside stimuli and encourages them to get directly involved.

So far as implementing fund-raising strategies in the cultural field is concerned, comparisons with more highly-evolved situations clearly show that consolidating private support for cultural projects not only comes about by developing specific skills, but also by

[9] Greenfield J. M., *Fund-Raising Cost Effectiveness: A Self-Assessment Workbook*, Hoboken, NJ, Wiley, 1996
[10] P.L. Sacco, edited by, *Il fundraising per la cultura*, Meltemi, Roma, 2006

adopting strategic decisions and policies that are based primarily on involving the community and that enhance relations with the public.[11]

The global crisis has led to more and more budget cuts that are forcing institutions, including state institutions, to begin looking for alternative sources of funding to protect, maintain and manage their cultural heritage. Fundraising has become gradually more and more important in the cultural heritage sector but so far - alas - private funding in the field of cultural assets has been sporadic and unplanned, and has consisted primarily of sponsorships that basically aim at large-scale events to ensure that the greatest possible emphasis is focussed on the sponsor's own brand image.

Searching for public or private funding in a more logically organised way is a much more complex matter in which fundraising becomes an effective tool that triggers a quasi-marketing process that includes feedback to measure and monitor the needs, perceptions, desires and values of potential donors.

Undertaking fundraising means setting up a stable network of long-term, reliable backers and in the case of the Vesuvian sites, requires an ad-hoc group to be set up within the Superintendency, trained specifically for this task.

2. The fundraising cycle

Developing a fundraising cycle must be based on action that enables potential donors to understand the reason why they are being invited to participate, and to agree with it. This consists of:

- *Sharing the institution's vision and mission*
- *Setting out the objectives*
- *Choosing the tools to be used*
- *Choosing which markets to approach*
- *Implementing the decisions*
- *Assessing the outcomes*

[11] Martina Seleni, *Le nuove frontiere del fund raising per la Cultura. Il distretto culturale evoluto, esempi tecnici di progettazione culturale sul territorio*, PhD thesis, University of Trieste, SECS-P/09 Finanza Aziendale.

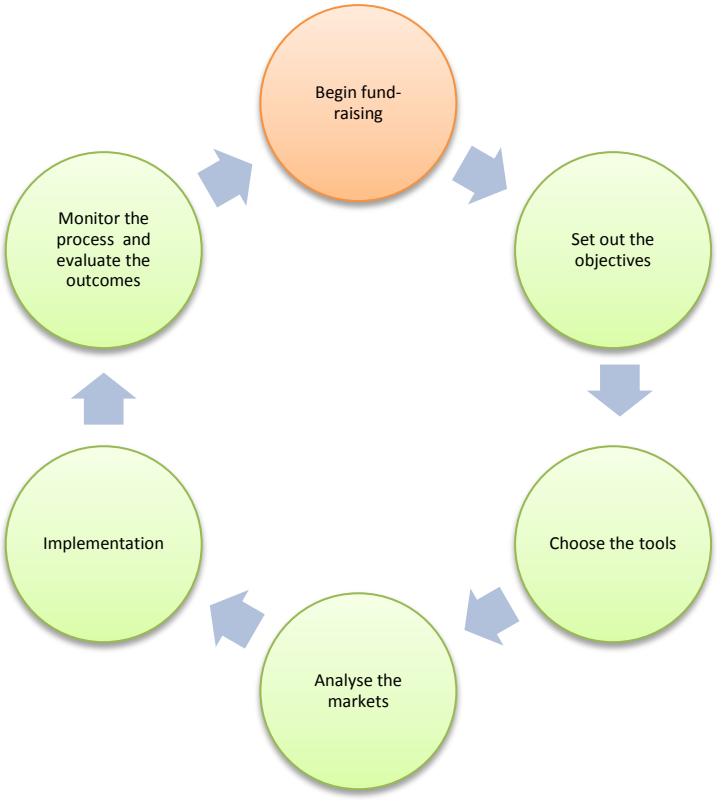
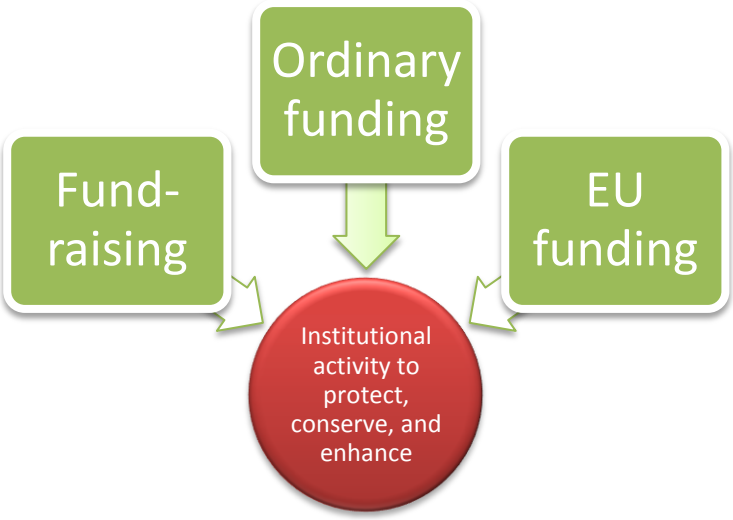


Diagram of the fundraising cycle

The international fame of the Vesuvian archaeological sites, particularly Pompeii and Herculaneum, has tended to attract sponsorships or donations that are often one-off or only focused on spectacular events that have little or nothing to do with the work of properly protecting and conserving the sites.

In the case of the listed UNESCO site as a whole, which includes all three “Archaeological Areas of Pompeii, Herculaneum, and Torre Annunziata”, and also taking into account the wider Vesuvian region, the fundraising cycle must be used by the state agency (the Superintendency) as an effective planning and management tool for conserving and maintaining these places and enhancing appreciation of them.

A basic workflow to ensure that the fundraising is coordinated with the strategic and operational objectives of the state agency should consist of analysis, project design, implementation and evaluation. In this way, fundraising becomes an integral part of the overall programme, working with other funding sources within a general plan to protect and enhance the sites.



Any fundraising project must begin by making known a *cause* or "mission", in such a way as to convince third parties to agree with it and wish to support it. This process can be set in motion by implementing a CRM (Cause-Related Marketing) campaign.

Having a *good cause* is the reason why a state agency decides to seek funding; fundraising is the project by means of which that goal is pursued. A CRM campaign document is a way of bringing together and summarising various kinds of information that can be used by the Superintendency to introduce itself to its different publics, persuade them to share in the *good cause* and the vision, and explain what the purposes are of its fundraising campaign.

3. The law on Art–Bonus, donations and *crowdfunding* for the UNESCO sites "Archaeological Areas of Pompeii, Herculaneum, and Torre Annunziata"

The "Art-Bonus" Law Decree (converted with amendments into Law No. 104/2014) introduces regulations designed to foster and strengthen the support of patronage in protecting and promoting the cultural heritage, held by the Republic. The legislation introduces a tax relief regime - in the form of tax credits - in favour of individuals and legal entities making cash donations for interventions in favour of culture and entertainment (65% for donations made in 2014 and 2015, 50% for 2016). It therefore seems clear that the intervention of the lawmaker contains the potential to strongly boost the development of crowdfunding projects dedicated to the cultural heritage sector, which can act as a catalyst for donations promoted by these new tax incentives.
Article 1, §5 of the Decree provides that wide publicity be given to any payments received, either through the corporate website of the beneficiary or through a specific portal managed by MiBACT. This portal, as described in §6, in addition to providing information about the state of conservation of the property, any renovation or redevelopment that may be in progress, government funding allotted for the current year, the institution responsible for the Property, as well as information related to its use, can be assigned to a facility dedicated to encouraging donations by private individuals and fundraising.

To this regard, on 5 February 2015, a convention between MiBACT and Arcus S.p.A was underwritten, assigning to the latter the task of preparing the platform envisaged by the "Art Bonus" decree.
Moreover, Art. 1, §7 of Law No. 112 of 2013 states that "The general director of the project, in his/her capacity as legal representative of the Unit, is entitled to receive donations and grants by private individuals intended for the conservation, maintenance and restoration of the archaeological area of Pompeii."
Following the activation by the State of the regulatory measures mentioned above, to encourage donations for Cultural Heritage properties, the Superintendency has already enabled several channels of donations, particularly with the **crowdfunding** technique with which several projects have been launched or completed:

1. Casa di Adone Ferito: with the contributions coming from sales of the book written by Alberto Angela "I tre giorni di Pompei" (The Three Days of Pompeii), two restoration sections have been completed;
2. a. Safety works of the fresco "Injured Adonis" for € 23,180
   b. Safety works for the pictorial and floor decoration structures of oecus 11 in the Casa di Adone Ferito for € 27,757.44;
3. A crowdfunding campaign is under way for a cubicle of the Domus del Centauro for the tentative amount of € 50,000 euros, of which to date about €10,000 euros have been collected;
4. A crowdfunding campaign is also under way for the Casa del Fauno, the convention of which is still being organised;
5. A crowdfunding campaign is also under way for the Hunting fresco of the Casa dei Ceii, still being organised;
6. Another form of donation is the convention with Finmeccanica for the continuous monitoring of the archaeological area of Pompeii, that is an indispensable tool for the conservation of the property and for the prevention of the risk of deterioration (see Ch. 9).

The Herculaneum Conservation Project (HCP), financed with donations from the Packard Foundation, remains the most significant example of intervention by a sponsor in the field of cultural heritage in general and in the Vesuvian area in particular.

The priority of this public/private cooperation, one of the most important in the world as regards the conservation of archaeological heritage, has been to slow down the deterioration of the archaeological structures by eliminating or reducing any possible causes and, at the same time, to understand the needs of the Herculaneum site over the long term so as to be able to establish a sustainable approach to its conservation and to the involvement of the community.

Following the stabilisation in the first years of activity of the site's areas at risk, that thus have become easier to manage, thanks to Dr. Packard's vision the Project's objectives were extended towards new initiatives of more ample scope, beyond the mere physical conservation of the site, so as to embrace more encompassing activities:
- improvement of the relationships between the ancient city and the modern Herculaneum that surrounds it, both in terms of physical accessibility and in terms of participation extended to the protection of the Site by the local community, the local bodies and the other groups of interest;

- increase in the knowledge about the ancient city via new archaeological campaigns at the Site (aimed also at solving issues such as semi-excavated buildings, instability of the bordering escarpments, etc.), opening of new museum spaces so as to make the site's artefact collections easier to visit.

In addition to this vast range of initiatives, it was deemed vital to make sure that each conservative action conducted for the archaeological site was well-rooted within the territory so as to guarantee the long-term sustainability of the conservation and management approaches and to ensure that they evolved from the concept of protection intended as defence to the concept of shared responsibility in protecting the Property.

Only if based on the partnerships and on the awareness of the great variety of values that the archaeological site can bring to the various groups of interest can this archaeological heritage play a more dynamic role in society and guarantee its own future via new forms of support: the expansion of the work context of the HCP has triggered new partnerships, allowing for the interaction between various groups of interest such as, for example, the launching of the Herculaneum Centre, an innovative cooperation between the supervising body, the Municipality of Herculaneum and the British School of Rome (BSR), along with other partners. The vitality, the commitment, the mutual responsibility and the general consent, together with the wide base of knowledge that these partnerships bring with them, can only benefit the archaeological site over the long term and ensure its sustainability.

4. Sponsorships

Sponsoring is a very complex form of public-private financial relationship between a funder and a public body that consists of associating a particular brand or product with some specific event or cultural asset. It has recently been regulated in Italian legislation by Ministerial Decree 19.12.2012 "*Technical standards and guidelines concerning sponsorships of cultural, similar, or related assets*".

These standards and guidelines always ascribe a central role to the public body. In the case of the "Pompeii, Herculaneum, and Torre Annunziata" site, the state agency responsible for planning and implementing any sponsorships will be the Superintendency.[12]

[12] For the full text (in Italian) of the "*Technical standards and guidelines concerning sponsorships of cultural, similar, or related assets*" see www.beniculturali.it

CHAPTER 9

MONITORING

6. **The system that monitors the state of conservation of the listed UNESCO sites**
7. **Monitoring of assets in the Buffer zone**
8. **Monitoring indicators for the Property**
9. **The Monitoring project of the Management Plan for the "Archaeological site of Pompeii, Herculaneum and Torre Annunziata"**
10. **The system of indicators**

1. The system that monitors the state of conservation of the listed UNESCO sites

At the time of the site's inscription in 1997, the ICOMOS report already mentioned the particular characteristics of the UNESCO site of the Archaeological areas of Pompeii, Herculaneum and Torre Annunziata as regards its state of conservation: ***"there are serious structural problems at both sites resulting from a variety of factors, such as inappropriate materials, rising damp, rain and wind, and these were exacerbated by the 1980 earthquake"*.**
It is obvious, therefore, that the most important task of the Superintendency is to manage to limit the deterioration phenomena that would result in the loss of parts of the property.

In Pompeii, as in all other archaeological areas and monuments, the level of risk of an archaeological structure exposed to the elements is rather high, and keeping it adequately under control and preventing its loss requires constant monitoring and prevention and protection measures, as well as assiduous and long-term 'care'.

Deterioration is an expected phenomenon and the structure materials' and components' response to the attack of natural and anthropic elements is like a disease of the archaeological asset, a natural event that cannot be separated from the artefact.

This means that it is commonly accepted that frequent maintenance is capable of checking and containing the advance of deterioration in buildings in a much better way and more extensively than destructive consolidation actions.

Hence the need to put in place a structured system of monitoring and checking in the archaeological areas capable of leading to the definition of effective maintenance plans and programmes.

Maintenance should be seen as a planned set of scheduled operations activated in the wake of a general evaluation of the risk factors (Giovanni Urbani and his "Piano pilota per la conservazione programmata dei beni culturali in Umbria" (Pilot plan for the planned conservation of cultural assets in Umbria), 1976).

The activities conducted on the asset should be divided into the following phases: knowledge, evaluation of safety status, controls and monitoring, and prevention, maintenance and intervention activities.

The knowledge of the status of the asset is key to taking any decisions regarding intervention, and monitoring is an indispensable knowledge-acquiring tool prior to intervention as well as afterwards, so as to check its effectiveness.

The data of the Knowledge Plan will be used to create theme maps of the major risks found, from the hydrogeological risks to the structural ones, which will then be referred to as basis for the assets' monitoring activities.

In order to achieve monitoring capable of acquiring adequate knowledge of the artefact and of its condition, in addition to its structural and static characteristics, that can be calculated based on technical parameters, it is necessary to measure a set of special

conditions such as the presence and effectiveness of architectural protection artefacts; the existence and effectiveness of rainwater drainage and removal; the presence, effectiveness and adequacy of partial or seasonal protection measures; the existence of an ordinary maintenance and weed-killing programme; the compatibility of any utilisation of the ancient structures.

2. High technology monitoring

As regards the continuous monitoring of the Pompeii archaeological site that is currently the one most vulnerable to the risk of structural deterioration, an agreement has been entered into with Finmeccanica that envisages the company's free supply, by way of donation, of high technology services concerning the following macro areas: protection of the artistic heritage from deterioration, pollution, hydrogeological and seismic risks; efficiency, sustainability and safety of the spaces dedicated to culture; accessibility and fruition of the artistic heritage. In particular, the aim of the project is to monitor the Site's stability. The interferometric monitoring service provides data on the slow shifting of grounds and of buildings both throughout the Pompeii Scavi site and in the surrounding areas (amounting to a total of about 10 km²), while allowing for the analysis of the context surrounding the excavation sites, to be used by the persons in charge of planning the prevention actions or of responding to emergencies. The service uses data from the **Cosmo-SkyMed satellite constellation** run by the ASI - Italian Space Agency, equipped with radar sensors that can shoot daytime and night-time pictures of planet Earth in any weather conditions.

The service is divided into two phases: the historical analysis of the trends in the shifting of points measured over a period of two years, preceding the start of the work, and the monthly monitoring service for the three-year duration of the agreement.

A second set of data shall come from wireless networks for early warning purposes, capable of providing real-time information about specific site areas. Overall, the service shall be made accessible via the Internet through the infrastructure supplied by **e-Geos**, and therefore it will be available by using Internet browsers. Users entitled to access shall be managed by MiBact itself, the staff of which shall be trained in the use of the platform by Finmeccanica.

This chain of services includes the putting into service of a secure system for mobile radio communication interoperability for the archaeological site and the implementation of Collaborative **Applications made available to the** smartphones of predefined users (security operators, technical entities). The system will allow security operators equipped with radio units (analogic radios as well as **Tetra** devices) to communicate in an integrated manner, thus ensuring optimal coordination in the performance of the control and prevention activities within the site.
Finmeccanica has also provided a ground-based remote sensing service that employs hyper-spectral imaging devices for the acquisition of images and the spectral signatures of the various materials and chemical components present in areas identified as critical.
SImilarly, a new monitoring campaign has been started by a team of **Enea** researchers in order to check the status off the reinforced concrete, wood and steel structures of the **Villa**

dei Misteri. These structures were built about 50 years ago in order to provide roofing for Pompeii's most famous villa. The project envisages the extension of the inspection not only to other houses in Pompeii but also to the reinforced concrete structures of the houses of Herculaneum and of the villas of Stabiae and Boscoreale.

2. Monitoring of assets in the Buffer zone

The three-year programme for the works conducted by the Special Superintendency envisages for the year 2017 the extension to the villas in Stabiae of the activities of the Knowledge Plan entailing the measurement of the state of deterioration and the setting up of a non-invasive diagnostic campaign intended for extraordinary maintenance and structural adjustment activities in the archaeological area; geological survey; dynamic monitoring survey. The data collected shall be analyses for the production of theme maps of the risks of the villas, then used to identify the priorities and the types of interventions to be planned. The programme for the year 2018 instead envisages the same actions for the other archaeological areas in the buffer zone.

3. Monitoring indicators for the Property

In processing the various management areas, the actions to be implemented and the procedures necessary for the conservation, use and protection of the assets from disaster events have already been identified, but in defining the monitoring systems it was deemed useful to make a brief summary of the contents of the plan:

Areas	Actions	Expected outcomes and time frame
Conservation	Extension to all sites of the deterioration documentation and analysis activities (Knowledge Plan) and implementation of the information system created with the GPP funds	Identification of deterioration risks 2017-2018 Programme
	Drafting of the risk theme maps based on the data collected	Evaluation of deterioration risks 2017-2018
	Systematisation of the planned maintenance operations based on the risk maps	Mitigation of deterioration risks For the entire duration of the 2017-2021 plan
	Completion of the hydrogeological risk mitigation actions in Pompeii and Torre Annunziata	Mitigation of hydrogeological risks 2017-2019
	Performance of architectural consolidation and restoration operations and in extension on the decorated surfaces	Mitigation of deterioration, seismic and volcanic risks 2017-2021
Use of assets	Overcoming of architectural barriers	Improvement of the tourism-related offer

		1st lot completed 2nd lot 2017-2019
	Increase in surface area open to visitors	Mitigation of anthropic risks 2017-2021
	Requalification of the site access system	Improvement of the tourism-related offer 2017-2021
	Improvement of the fixed illustrative didactic system	Improvement of the culture-related offer 2017-2018
	Restriction of visits in several parts of the sites	Mitigation of anthropic risks 2017-2021
	Planning of thematic itineraries	Mitigation of anthropic risks 1st lot completed 2nd lot 2017-2018
	Expansion of visit routes and setting up of domestic furnishings	Improvement of the culture-related offer 2017-2021
	Planning of alternative itineraries for school group tourism	Mitigation of anthropic risks 2017-2021
	Planning of itineraries and visits with animations, interactive games and virtual reality	Improvement of the culture-related offer 2017-2021
	Creation of integrated itineraries	Improvement of the culture-related offer and mitigation of anthropic risks 2017-2021
	Improvement of reception services	Improvement of the tourism-related offer 2017-2021
	Improvement of site visiting and site leaving services	Improvement of the tourism-related offer 2017-2021
Disaster risk mitigation	Creation of special databases rand risk maps	Risk mitigation 2017-2018
	Risk evaluation and planning of risk management	Risk mitigation 2017-2021
	Damage control planning	Risk mitigation 2017-2021

	Continuous planning of maintenance activities	Risk mitigation 2017-2021
	Coordination with Fire fighting brigades and other authorities	Risk mitigation 2017-2021
	Staff training and management	Risk mitigation 2017-2021
	Census of real assets and movables	Risk mitigation 2017
	Formation of an international study group for identifying the methods and techniques for the *in situ* protection of the real assets	Risk mitigation 2017
	Identification of data sharing tools and procedures	Risk mitigation 2017
	Definition of the procedures and methods for making safe the real assets	Risk mitigation 2017
	Identification of storage facilities outside the risk area for storing the movables	Risk mitigation 2017
	Definition of the methods and procedures for the transfer of movables	Risk mitigation 2017
	Identification and training of volunteer organisations	Risk mitigation 2017-2021
	Definition of the emergency alerting procedures and procedures for the sending of emergency teams to the sites in compliance with MIBACT provisions	Risk mitigation 2017
	Testing of innovative *in situ* building conservation systems	Risk mitigation 2017-2021

The summary table clearly highlights three different time frames identifying the priority interventions to be carried out in the first and second years of the plan, which all refer to the field of risk knowledge and management, in particular, in relation to the conservation and risk prevention. These will be followed by the activities planned in the first three years of the plan that have already been included in the budget forecasts by the Special Superintendency of Pompeii, in relation to the identification of the direct interventions on the asset, ranging from maintenance to consolidation and restoration. The third group consists of the activities that need to be carried out throughout the lifetime of the plan, in

relation to the systematisation of the activities, such as, for example, the planned maintenance works, the consolidation and restoration works, risk assessment, improving the cultural and visitor services, personnel training and information.

The priority conservation actions are:

a. extending the deterioration documentation and analysis activities (Knowledge Plan) to all the sites and implementing the information system developed with the GPP funds;
b. risk mapping, based on the collected data;
c. maintenance planning, based on the risk evaluation data.

Regarding the natural disaster risk prevention and mitigation operations, with special focus on the volcanic risk represented by the Vesuvius, all the activities under way - within the framework of the works by the Table for updating the volcanic risk emergency plans relating to the red zone in the Vesuvius area - have been assigned priority status and, in particular:

a. creating dedicated databases and risk maps;
b. carrying out a census of the real assets and movables;
c. setting up of an international study group for identifying the methods and techniques for the *in situ* protection of the real assets;
d. identifying data sharing instruments and procedures;
e. defining the procedures and methods for ensuring the safety of the movables;
f. identifying storage facilities outside the area at risk, to which the movables can be removed;
g. defining the procedures for removing the movables;
h. identifying and training the volunteer organisations;
i. defining the emergency alerting procedures and for locally deploying the emergency teams, in accordance with the instructions received from the Ministry of Culture;
j. testing innovative *in situ* conservation systems on the immovable properties.

4. The monitoring strategy included in the Management Plan for the listed UNESCO site “Archaeological areas of Pompeii, Herculaneum, and Torre Annunziata”

As defined at point III of the operational guidelines of the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, an effective management system should include:

- a thorough shared understanding of the heritage on the part of all the stakeholders;
- a cycle of planning, implementation, monitoring, evaluation and feedback;
- monitoring and evaluating the impacts of trends, changes and proposed interventions;
- involving partners and stakeholders;
- allocating the necessary resources;

- capacity-building;
- describing in an accountable, transparent manner how the management system functions.

Monitoring is thus an essential part of the Management Plan, since it is the only way of correcting the plan and maintaining its effectiveness.

The three fundamental phases of monitoring are:

- measuring;
- evaluating;
- correcting.

These three phases correspond to three types of action that may seem straightforward, but are in fact complex because when cultural assets are involved it is not easy to identify which elements should be measured or what tools to use.
Therefore, in order to prepare correctly for monitoring, the following must be identified:

- A method for measuring the outcomes achieved, based on various different criteria (protection, conservation, valorisation, knowledge, communication, promotion, etc.);
- Using indicators that can actually be measured and are relevant to the intended objectives;
- Ensuring that measurements are actually taken;
- Using feedback methods that are capable of evaluating the outcomes obtained.

Action	Activity	Funding source	Timing
Measurement	Annual survey of indicators of outcomes in relation to protection, conservation, valorisation, knowledge, communication, promotion, etc., by preparing summaries of the survey information from the sites and the local territory	Ordinary Superintendency and local authority funding	2017-2021
Evaluation	Entering the data into the GPP IT system and analysis of the data provided by the surveys	Ordinary Superintendency funding	2017-2021
Correction	Defining corrections and applying them	Ordinary Superintendency funding	2017-2021

The monitoring strategy will set out standard objectives and time-frames which those responsible for measuring will use to collect the data and assess the outcomes. A significant (but not excessive) number of indicators has already been selected, of types that will get all the stakeholders involved. Specific survey information summary data

sheets, tailored to the local situation, have already been prepared for compilation by the local authorities, and are designed to track the progress of local projects on a regular basis in relation to infrastructure, the hospitality sector and the recovery of local heritage. The data sheets on tourist destinations in and around the listed heritage sites follow a ready-made model taken from a study carried out on behalf of the European Commission. The data on heritage conservation will be derived from progress certificates for consolidation, restoration and maintenance works.

This data, collected in relation to the objectives specifically defined, will be uploaded to the GPP (Great Pompeii Project) IT system and will be processed to a standard that makes the monitoring strategy an effective one.

The survey work will be undertaken by:

- The local authorities and the Grand Pompeii Project units for the local region;
- The General Project Director of the GPP;
- The Superintendency (in relation to the listed sites and the buffer zone)

A suitable individual has been identified within the Superintendency and will be tasked with analysing and evaluating the data, in collaboration with the Concertation Table and the General Project Director

5. The system of indicators

Area measured	SITES	Activity type	INDICATORS
Protection and conservation	Pompeii	Consolidation and restoration Maintenance	GPP projects completed Percentage of general maintenance works
	Herculaneum	Consolidation and restoration Maintenance	Projects completed with ordinary Superintendency and HCP funding
	Torre Annunziata	Maintenance	Projects completed with ordinary Superintendency funding
	Pompeii	Planned maintenance	Number of carried out works

Area measured	SITES	Activity type	INDICATORS
Risk mitigation	Pompeii	Seismic/volcanic risk	No. of meetings held to take forward the co-planning process in order to reduce risk
		Evaluating the risks of deterioration of buildings and finishes	No. of survey information summaries prepared
Use of assets Herculaneum		Visitor management	No. of tourist

			satisfaction surveys
Use of assets Pompeii		Upgrading presentation standards	No. of activities carried out
Governance Local region		Negotiation	No. of Concertation Table meetings

Area measured	SITES	Activity type	INDICATORS
Use of the asset	Local region	Vesuvian tourism system	Percentage completed
Capacity building	Local region	ICT project	Percentage completed
Capacity building	Local region	Education	No. of projects completed
Capacity building	Pompeii	International scientific and technical knowledge exchange	No. of projects completed

The monitoring system too shall be assessed and adjusted, if necessary, in order to be more performing in controlling the efficiency of the Plan.

CHAPTER 10

THE OBJECTIVES OF THE PLAN

Diagramma: Tre pilastri che illustrano il valore universale eccezionale. Fonte: UNESCO, ICCROM, ICOMOS e IUCN. 2013. *Managing Cultural World Heritage*. Parigi. UNESCO World Heritage Centre. (World Heritage Resource Manual.), pag. 54 e 55.

The above diagram, which outlines the concept of outstanding universal value of the world heritage properties, defining the three pillars on which it is founded and maintains itself, is an important key for determining the objectives and priorities of the management plan.

The ultimate objective of the plan, in fact, is to prevent the impairment of the inscription criteria and of the conditions of authenticity and integrity of the Property, by meeting its protection and management needs.

This general aim can be achieved by determining the objectives and deciding the priorities supported by the managing Entity's commitment to abiding by the decisions taken and their implementation, subject to the effective monitoring of the effectiveness of these decisions and their overhauling, if necessary, to ensure that they comply with the objectives as closely as possible.

The following have initially been identified as the objectives of the plan:

- preserving the archaeological heritage from all the possible risks of physical deterioration and external events, and restoring it, where necessary, so that it can be made available to and accessible by the community at large;
- improving the conditions and quality of fruition of the sites, by improving accessibility by and providing a range of services to the visitors;

- fostering the broadest possible integration between the local archaeological resources and cultural heritage and the surrounding communities, with a view to enhancing the general economic impact of the fruition of the sites and improving territorial identity.

The necessary actions for implementing the above principles are outlined below:

- **Protection and Conservation**: the intervention priorities and the actions that need to be implemented to safeguard and preserve the archaeological heritage;
- **Use, Valorisation**: the interventions aimed at improving the conditions and quality of fruition of the areas and facilitating the development of the economic chain related to the cultural heritage and tourism;
- **Prevention and Mitigation of the natural disaster risks:** the interventions aimed at preventing, mitigating and managing risks;
- **Governance**: the procedures for managing the site and fostering social dialogue among the stakeholders of the UNESCO Plan**.**
- **Monitoring**: the instruments for verifying and controlling the state of conservation of the Properties and the implementation of the planned actions, as well as the UNESCO Plan as a whole.

The 5-year Plan has been divided into 2 phases: (1) a medium-term phase, with a time horizon between 2017 and 2019, which includes activities already under way, or which have been planned and budgeted by the Superintendency; and (2) a long-term phase, including the activities for consolidating the interventions and the related implementation protocols and guidelines.
The ultimate objectives of the plan, considering the starting conditions, is to set up a sound site management structure capable of tackling all conservation, use and valorisation, risk prevention and mitigation, governance and monitoring issues, so that, once the emergency stage has passed, it effectively meet the ordinary and day-to-day protection requirements of the properties and the surrounding territory.
The plan is based on the identification of the general objectives, as follows:

1. Conservation of the inscribed properties and of the properties in the buffer zones, by:
   a. means of interventions aimed at collecting facts and documents relating to the deterioration phenomena,
   b. risk mapping,
   c. carrying out safety and consolidation works and restoring the built heritage and decorated surfaces,
   d. means of the hydrogeological protection of the excavation faces;
2. Maximum control of the physiological deterioration of the archaeological structures and decorations, by means of planned maintenance activities in all the archaeological areas;
3. Natural disaster risk mitigation, by:

a. coordinating with the National and Local emergency Plans,
b. emergency planning by the Superintendency,
c. participation in the activities of the committee for the integration of the cultural heritage in the red zone of the Vesuvius emergency plan.

4. Improvement of the cultural services offered by the inscribed sites and buffer zone, by:
   a. adapting to the presentation and interpretation standards of archaeological sites (Ename Charter) ;
   b. upgrading visitor services;
   c. implementing a Masterplan for the fruition of Pompeii;
5. Reduction of the anthropic pressure on the most visited archaeological sites, by:
   a. creating a Vesuvian tourism system extended to include the buffer zone sites;
   b. maximum opening of the road network in all the regiones of the archaeological area of Pompeii, with the well-distributed opening of monuments and the singling out of points of interest;
   c. rotating the visitor routes, for carrying out maintenance, restoration and conservation works;
6. Protection of the new buffer zone, by:
   a. implementing the strategic plan of the Great Pompeii Unit;
   b. involving the local communities in the Concertation Committee.
7. Spreading the concept of “participated conservation and shares responsibility” through education programmes aimed at enhancing knowledge and awareness of the value of the sites among the local communities.
8. Advancing scientific research and presenting the results with the coordination of the Italian and foreign missions.
9. Internationalisation of relations, by signing protocols with the most important cultural institutions worldwide.
10. Restoration of the old gunpowder factory (Polverificio borbonico) at Scafati, to house a multi-purpose restoration and training facility, including a school of archaeology (Scuola Superiore di archeologia) established by the MiBACT.
11. Reorganisation of the storage facilities of the Superintendency and museumification of a part of the facilities, for improved fruition by scholars and visitors alike.
12. Valorisation of the laboratory of applied sciences, with regard to technology, and museumification of the organic exhibits preserved there.

The following can be achieved in the medium term:

Medium-term objectives	**Current state**	**Funding**
Processing of the knowledge plan data and deterioration mapping	Under way	Superintendency activities and GPP funds
Implementation of deterioration analysis campaigns in all the inscribed property areas and	Planned	Superintendency 2017/2019 funds

the buffer zone		
Development of the "Guidelines for the planned maintenance" of the inscribed Properties and archaeological of the buffer zone and preparation of the relevant specifications	Under way	Activities of the Superintendency activities – Ales
Consolidation and restoration activities	Under way	Ordinary planning by the Superintendency for all the sites 2017/2019 planning and GPP
Hydrogeological improvement works for the excavation faces of the archaeological area of Pompeii	Under way	CIPE funds and GPP funds Superintendency 2017/2019 funds
Planned maintenance activities in the inscribed sites and archaeological areas of the buffer zone	Under way at the sites of Pompeii and Torre Annunziata and planned	Ales Contract, Superintendency 2017/2019 funds
Completion of the works by the Table for the National Vesuvius Emergency Plan with the introduction of the natural disaster prevention and management actions for cultural properties	Under way	Activities by the Civil Protection Department - MiBACT
Completion of the Superintendency's emergency plan and activation of the studies on the risk mitigation methods on movable and immovable properties, implementation of the drills	Under way	Superintendency planning
Planning of interventions for improving the cultural services and completion of the master plan for Pompeii	Planned 2nd lot of the fruition Plan	Superintendency 2017/2019 funds
Planning of the interventions for adapting the visitor services, with the realisation of further lots of routes for disabled persons, integration of the routes for visually impaired and blind visitors, a children's nursery, rest area,	Planned construction of a kindergarten 2nd lot of routes for disabled persons Museum of the deposits of the granaries of the Forum Other planning interventions	Superintendency 2017/2019 funds

widespread musealisation, and creation of reception areas		
Completion of the Strategic Plan for the buffer zone	Under way	Great Pompeii Unit
Design and implementation of the education programmes	Not yet planned	
Advancement of scientific research and presentation of the results, with coordination of the Italian and foreign missions	Under way	Activities of the Superintendency structure
Internationalisation of relations by entering into protocols with the most significant cultural institutions worldwide	Under way	Activities of the Superintendency structure
Restoration of the old gunpowder factory (Polverificio borbonico) at Scafati	Under way	Superintendency 2017/2019 funds
Reorganisation of the Superintendency's storage facilities and museumification of a part of the facilities for improving fruition by scholars and visitors alike	Under way	Superintendency 2017/2019 funds CIPE funds
Valorisation of the applied sciences laboratory, with regard to technology, and museumification of the organic exhibits preserved there	Under way	Superintendency funds

There has been an enormous scientific, technical and economic effort, by the Superintendency, to achieve the above mentioned objectives, which has earmarked the following funds in its 2017/2019 budget:

1. European funds for the Grande Progetto Pompei, as part of the 2014/2020 National Operating Programme for "Culture and Development", totalling 45 million euros;

2. funds made available by the Italian government through the CIPE (Inter-departmental Economic Planning Committee) (see resolution no. 3 of 1.05.2016, totalling 40 million euros;
3. ordinary funds by the Superintendency of Pompeii, totalling 75 million euros,

The implementation of the planned activities, within the three years of the Plan, will pave the way to establishing a normal management system capable of meeting the needs of the site of Pompeii, of the other WHL inscribed heritage areas and of the buffer zone.

The basic study for analysing the needs and identifying the priorities for the consolidation and restoration interventions, and for planning the maintenance and risk prevention activities will be the risk mapping of the entire UNESCO site and the surrounding territory.

Extending the planned maintenance operations to all the archaeological areas will help check deterioration and support the management's attempts to prevent structures from collapsing, events which, in the past, have seriously affected the entire management system. Likewise, the projects for the hydrogeological works for ensuring the safety of the unexcavated elevation and the excavation faces, with investments of approx. 46,000,000 euros in 2017/2019, will finally control the principal hydrogeological risks that have caused so much damage to Pompeii in the past.

The implementation of an emergency plan for the Superintendency and the completion of the activities by the Table for the integration of the cultural properties in the red zone of the Vesuvius emergency plan, will allow the management to plan all the risk prevention and management activities, from seismic to volcanic risks, in particular by identifying the actions required for ensuring the safety of the properties.

The activities for adapting the cultural services to the international standards will enable the inscribed Properties and the archaeological areas in the buffer zone to launch the tourist system of the Vesuvius area, identified in the management plan as an instrument for easing the anthropic pressure on the more widely-known monuments and help the cultural and social growth of the surrounding territory, which is the more important, the more it characterises itself as one of the most heterogeneous and problematic areas of southern Italy. The completion of the strategic plan provided in Law 112/2013 will dictate the development lines for the interventions needed to ensure the sustainability of tourism in the Vesuvius area.

The internationalisation of relations will ensure the networking of the inscribed Properties with the most significant museums and cultural institutions worldwide, spreading knowledge of the cultural values of the site, while the exchange of knowledge through the advancement of scientific research and the presentation of the results in coordination with the Italian and foreign missions, will enable the exchange of information and opinions between scholars, which is unquestionably the only instrument for cultural growth and the best possible application of the new knowledge and technologies.

Furthermore, the opening of a multi-purpose facility in the marvellous building at Scafati that used to house the gunpowder factory in the Bourbon period, and will now house the

School of Archaeology, will help Pompeii, and the entire UNESCO site, regain a leading role in international culture, just like when the excavations began in the 18th century.

Based on the planned actions and activities, it is possible to identify the long-term objectives that it will be possible to achieve during the further two-year validity of the plan. These objectives, as already observed, must enable the systematic management of the Properties through the determination and standardisation of intervention protocols laying down the rules of the activities to be carried out in each field. The determination of the intervention protocols will ensure that the general management of the UNESCO site is never affected by any instability, in the wake of changes of governance or political instability.

Considering the planning activities over the first three-year periods, the long-term objectives of the Plan may be summarised as follows:

1. Systematisation of the interventions for preventing and mitigating the heritage deterioration risk, by means of restoration and consolidation works.
2. Development of the Guidelines for planned maintenance activities and preparation of the relevant specifications.
3. Systematisation of the interventions for preventing and mitigating natural disaster and anthropic risks.
4. Systematisation of the services for visitor reception and site presentation and interpretation.
5. Implementation of the provisions contained in the master plan.
6. Structuring of the tourism system in the Vesuvius area, by implementing the interventions set out in the Strategic Plan of the buffer zone.
7. Systematisation of the heritage education and awareness raising activities.
8. Systematisation of the knowledge exchange activities and structuring of the system of international relations with the most significant cultural institutions worldwide.
9. Restoration of the historical gunpowder factory building at Scafati, for housing a multi-purpose facility.
10. Establishment of an Archaeological School by the Ministry of Culture.

Long-term objectives	Current state	Funding	Field
Systematisation of the interventions for preventing and mitigating the heritage deterioration risk, by means of restoration and consolidation works	Under way	GPP, 2017/2019 Superintendency planning and 2019/2021 Superintendency planning	Conservation and risk prevention

Development of the Guidelines for planned maintenance activities and preparation of the relevant specifications		2017/2019 Superintendency planning and 2019/2021 Superintendency planning	Conservation and risk prevention
Systematisation of the interventions for preventing and mitigating natural disaster and anthropic risks		2017/2019 Superintendency planning and 2019/2021 Superintendency planning	Risk prevention, mitigation and management
Systematisation of the services for visitor reception and site presentation and interpretation		GPP, 2017/2019 Superintendency planning and 2019/2021 Superintendency planning	Use and valorisation
implementation of the provisions contained in the master plan;		2017/2019 Superintendency planning	Use and valorisation
Structuring of the tourism system in the Vesuvian area, by implementing the interventions set out in the Strategic Plan for the buffer zone		UGP 2017/2019 and 2019/2021 Superintendency planning	Use, valorisation and risk mitigation
Systematisation of the heritage education and awareness raising activities			Conservation, use, valorisation and risk mitigation
Systematisation of the knowledge exchange activities and structuring of the system of international relations with the most significant cultural institutions worldwide		Activities of Superintendency structure 2017/2021	Conservation, use and valorisation
Realistoration of the historical gunpowder factory building at Scafati, for housing a multi-purpose facility		2017/2019 Superintendency planning and 2019/2021 Superintendency planning	Conservation, risk mitigation
Establishment of an Archaeological School by the Ministry of Culture		Superintendency, Ministry of Culture and other institutional partners	Conservation, use, valorisation