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Beneath the City: Unearthing Naples' Archaeological Underground for New Urban Continuity

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ABSTRACT

This study explores the potential of connecting the visible cityscape with concealed subterranean spaces, aiming to reshape urban continuity. It departs from the traditional perception of underground areas as purely technical domains, seeking fresh perspectives on inhabiting these concealed environments. Using three Naples locations as case studies, we develop a methodology applicable to similar urban contexts, emphasizing the archaeological underground's ability to trigger socio-economic transformations. Accordingly, it advocates for deliberate design interventions to reintegrate the archaeological underground into contemporary urban dynamics, offering strategies to redefine the relationship between city dwellers and their urban environment. Through case studies and visual representations, the study presents design solutions that enhance the use of subterranean spaces, fostering accessibility, community engagement, and cultural preservation. These initiatives promote enduring economic sustainability, potentially benefiting other cities facing similar challenges, and creating a harmonious connection between archaeological underground layers and the modern urban fabric. In summary, this research underscores the vast potential of subterranean spaces for future urban development, requiring innovative methodologies and technological integration to shape a unified and adaptable cityscape.

Highlights	Contribution to the field statement
- Separation from the technicalistic view of the subsurface, experimenting with well-oriented approaches aimed at the valorisation of assets - Looking for new interpretations of the archaeological underground starting from three case studies in Naples -Excavations, engravings and labyrinths as project actions between the Poggioreale hill, the Sanità district and Monte Echia -New urban continuities through architectural design between above and below.	This paper identifies, in the archaeological underground, a potential space for the socio-economic development of the city, a space that must be, through the design, reinserted into contemporary urban dynamics. The project makes it possible to identify strategies over time, capable of defining new relationships between inhabitants and the city.

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1. Introduction

In ancient times, the underground and the surface were parts of a single complex system that constituted the city. In the present, this condition appears to be completely changed: burdened by a heavy historical past, the city artificially splits into an above and a below (Sacripanti, 1973).

The condition of the city's stratified division lays the foundation for research in architectural and urban design, which aims to experiment with strategies to reverse the separation between the above and the below, revealing the hidden potential in the subterranean world. The research's objective is not to interpret the underground as a space subordinate to the visible world (Lambertucci, 2019) devoid of any archetypal value that traditionally associated the hypogeum with humanity's first refuge. Instead, it is seen as a space with precise and recognizable architectural characteristics, a true urban space within which the contemporary city can expand.

Starting from the analysis of ancient ways of inhabiting the underground, the research explores solutions to reclaim the subterranean world, starting from those *points of exchange* between the above and the below, understood as spaces for dialogue between the contemporary city, the landscape, and the chthonic city.

In recent years, the academic world has begun to question the design potential of the underground, developing studies such as those related to *archeomobility,* which seek to consider the transformation of the hypogeum from a technical space, mostly used for transportation or utility networks, into a public space open to the city. In this regard, numerous European cities, including the exemplary case of Naples, emphasize the issue of new infrastructures intersecting underground archaeology: these subterranean spaces, created by excavation activities, display archaeology found in situ, amidst the *daily flows of subway commuters* (Farris, Grimaldi, & Lambertucci, 2019), blending the functional aspect with the quality of an archaeological space connected to the upper layers of the city.

Based on these considerations, the research aims to expand the scope of investigation and design experiments for the underground, moving away from the purely infrastructural use of hypogeal space, and attempting to discover new ways of inhabiting the subterranean (Marini, 2021) in continuity with the contemporary city, unveiling the hidden archaeological potential (Cellini, 2023) for a socio-economic urban renewal that starts from *human spatial behaviour* (Aiello, 1987, p. 385). Establishing a new continuity between the layers of the city is possible by bringing back, vertically, *the ancient city that lies beneath the city* (Fred & Gubler, 2021), which has almost been entirely erased from contemporary memory.

The research thesis applied experimentally to the city of Naples allows for the verification of different objectives. On one hand, the project for the archaeological underground aims to enhance, make accessible, and showcase the chthonic archaeological spaces, which are often invisible and little known. On the other hand, the project intervenes in the archaeological section, vertically, triggering an urban transformation that creates new public spaces where urban archaeology takes centre stage (Linazasoro, 2017). The proposed design experimentation for the city of Naples can, therefore, serve as a research tool and a guide for further experiments. It can act as a catalyst to promote new solutions for continuity between the underground and the surface, starting from the archaeological potential hidden in the invisible layers of stratified cities (Franciosini, 2021).

2. Interpretations to overturn the condition of the archaeological spaces of the Neapolitan underground

The research begins with an analysis of the various manifestations of the underground through explorations aimed at understanding how the concept of the underground has evolved and how the role of this space has changed from the past to the present.

An initial investigation is conducted through psychological and imaginative explorations that attempt to delve into the underground through the mind, as a place of the subconscious, an imagined realm, of terror and fantasy, of mystery and magic.

The presence of a mysterious world, in fact, dates to the period of the architect Le Corbusier and served as the basis for a new geometry. An emblematic example is the Swiss Pavilion (1930), in which Le Corbusier represents the two worlds, the mysterious underworld and the sunny above-ground, as two hands that intertwine and make contact in an unusual manner. The contact between the upper world and the lower world can also occur through different interpretations.

A second exploration can be derived from the practice of excavation in ancient times, namely, archaeological studies aimed at understanding the architectural characteristics of the underground. By reinterpreting ancient practices, original uses, and respective architectural typologies, it is possible to grasp the significance and value of the heritage hidden beneath the ground. An interesting example is provided by the spectacular underground spaces of the *Domus Aurea*, in Rome, which remained largely unexplored for a long time.

Archaeological reconnaissance of these locations has, on one hand, allowed for the understanding of the sequence of events and the recovery of ancient testimonial memory. On the other hand, it has also served as a catalyst for new design projects that have created a spectacular underground museum. In this museum, the archaeology found *in situ* is "displayed" like artefacts in a museum room. Lastly, the research into contemporary practices that can be realized in a way that is compatible with the geometry of the underground allows for the overcoming of the widespread interpretation of the underground as merely a functional space in service to the city above.

The possibility of returning to inhabit the underground is indeed a modern trend in architectural design, opening new and varied explorations of underground space. Spaces for *underground living*, such as the well-known cave created by *Janya Ishigami* in 2018 in Yamaguchi, places for healing and cave therapy, widespread in Northern Europe, or spaces in which to reconnect with nature, such as *Ca'n Terra* in Menorca, a project completed in 2021 by the *Ensemble studio*, which offers an inner journey into the matter by digging into the chthonic world.

All these different inspirations and interpretations provide valid points of reflection for the city of Naples, where the coexistence of very different underground spaces prompts experimentation with various solutions for continuity between the layers of the city. As Aldo Loris Rossi asserts, among the cities whose radiograph is most extraordinary of all the cities is Naples (Liccardo, 2019).

The city boasts numerous cavities and excavated archaeological spaces, both in the historic centre, sometimes already valorised and made accessible, interconnected with a tourist network that promotes their enhancement, and in the underground areas of urban peripheries.

The contribution presents specific project strategies for three locations in the city, situated on the outskirts of the historic centre but united by a rich archaeological underground: the Poggioreale area, where the archaeological underground layer has been overlaid with a monumental cemetery over the years; the Rione Sanità area, known for having some of the most spectacular cavities in Naples but currently facing significant issues related to crime and social unrest; the ancient Mount Echia area, whose archaeological underground features numerous quarries and tunnels constructed in very different periods (Fig.1).
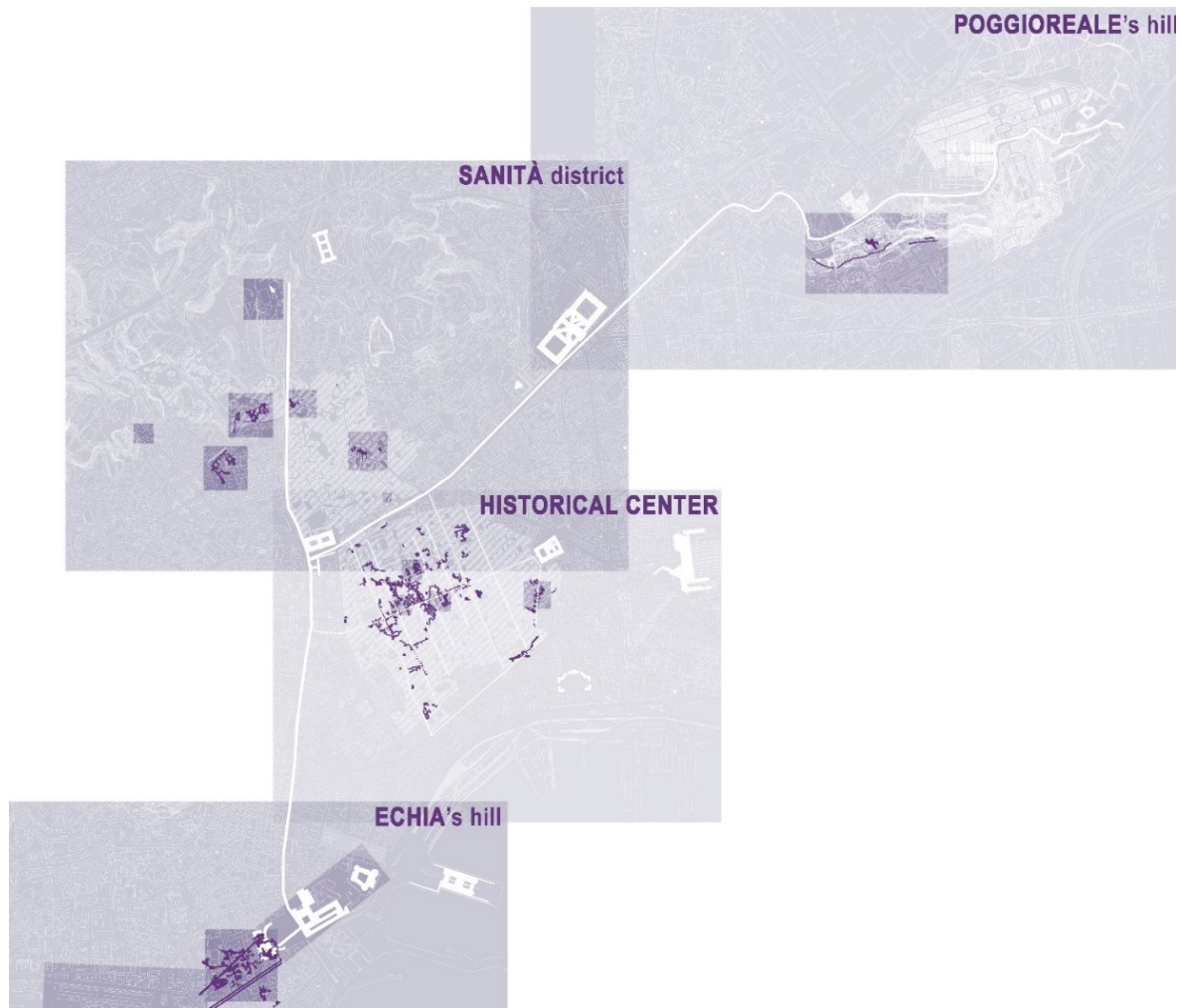
Figure 1. Urban strategy for the three case studies of Naples, Chiara Barone.

Given this heterogeneity, the previously mentioned experiments serve as valuable starting points for proposing specific solutions that can explore the relationship between contemporary architecture and subterranean archaeological spaces. Exploring the relationship between the surface and the excavated *submerged rooms* involves experimenting with strategies to overcome the disconnection of archaeological spaces. This can be achieved by breaking through the *current ground* through operations like soil erosion, and material removal through cuts, excavations, and incisions, which facilitate the recognition of new *continuities* between the layers of the city and which activate hidden layers for an urban socio-economic revitalization. Starting from the study and previous research on the city of Naples (Miano & Bernieri, 2020); (Miano, 2021), different design approaches can be derived depending on the initial condition of the underground space and its relationship with the layers above. This leads to concrete practices that constitute successful solutions applicable in other stratified cities with similar starting conditions. Guiding this design experimentation is what Sergio Polano defines as the "chthonic," mining, ablation, a vein that "would allow for a broader and more objective appreciation of human constructive ability. Tunisian matmata and Sicilian dammusi; Matera's ravines and stones; Mycenaean and Perugia's hypogea; Rome's Cloaca Maxima; catacombs in Naples and Rome; the well of St. Patrick in Orvieto; the Paris sewers; the London Tube; the Simplon Tunnel; the Maginot Line; U-Boat shelters in France and the Atlantic Wall; physics laboratories at Gran Sasso; the Eurotunnel under the English Channel. And, if we reflect on contemporary events, architectural and urban interventions such as the Shinjuku shopping centre in Tokyo and the more recent one in Toronto; the Fosse Ardeatine monument in Rome; the Treasure Museum of San Lorenzo in Genoa; the Louvre Pyramid" (Polano, 1998, p. 2). This list, which can potentially grow longer, of underground

design experiments offers a broad canvas for further exploration. It represents a field of research that has always existed and, as Sergio Polano points out, is a unique vein capable of appreciating human construction skills and versatility.

3. Materials and methods. Explore the underground spaces through the design

The design exploration presented in this contribution, focusing on three case studies in the city of Naples, addresses emblematic and influential examples that serve as real demonstrators of the significant role that underground spaces can play as catalysts for the revitalization of larger urban areas. The design experimentation on specific areas of the city of Naples, identified as sample areas, allows for a better understanding of the issues to be tackled and the methodological processes to be employed. The choice of sample areas of comparable size stems from the desire to analyse limited urban contexts, and neighbourhoods characterized by specific social, economic, and cultural traits that are inherently part of the project. These sample neighbourhoods were selected with the aim of exploring highly diverse urban scenarios, both from an anthropological and geomorphological perspective. To comprehensively understand the urban fabric, the research relies on bibliographic sources, surveys, and projects related to the underground cavities of Naples, participation in conferences on the topic, as well as fieldwork involving interviews with residents and site visits. This approach seeks to gain a deep understanding of the context, not only as a physical space but also as a cultural, social, anthropological, and political dimension that defines it. The intersection of data resulting from the analysis phase allows for the generation of alternative proposals, gradually leading to the project solution that best meets the needs of Naples. The research process, which includes *turning points* and modifications along the way, makes it possible to derive a methodology and tools. The project is not just an end but rather a research endeavour that engages with reality, affirming certain processes from which a method can be extracted and applied in similar cases in other cities. This implies that through the project, the methodology adopted can be revisited wherever the presence of underground archaeological spaces can be seen as the starting point for urban processes capable of revitalizing entire sections of a city **(Fig.2)**.
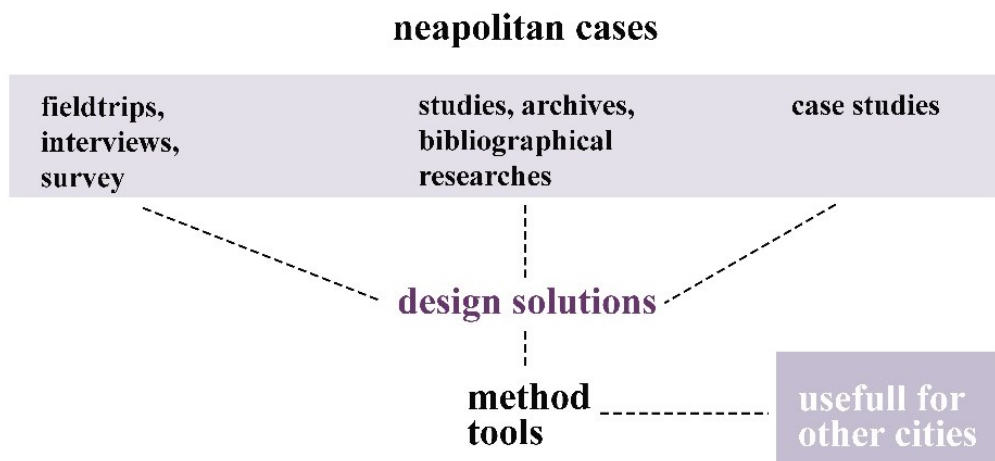

Figure 2. Methodological map of the design research.

In the case of the city of Naples, such as the Poggioreale hill, the Sanità district, and Mount Echia, the intersection and verification through similar case studies demonstrate the practical applicability of the proposed design strategies. These strategies can engage with contextual components like history, local culture, contemporary city dynamics and development, politics, geography, anthropology, and the economy.

Compared with the *Lascaux IV project* (2017) by *Snøhetta , Duncan Lewis Scape Architecture* in Périgueux for the underground cavities of the Poggioreale hill is highly significant. It guides the valorisation of Naples' cave spaces, which, like the French underground, are rich in ancient graffiti, offering the potential for an open-air museum. Similarly, the idea of enhancing not only specific

excavated spaces but the entire urban surroundings find grounding in Toni Girones' project for the *enhancement of the "Illa De La Pietat".* In this project, like the Sanità district, the overlaid layers are repositioned within a unified perspective of contemporary design.

The comparison with analogous cases and reference projects allows for the delineation of concrete scenarios and configurations that can stimulate architectural and urban planning for the city's future. This approach aims at reconnecting the hidden underground layer with the emerging and constantly evolving city. It also serves as a guide for the iterative process of design research in cities with similar starting conditions.

4. Design strategy: A proposal for three undergrounded spaces in Naples

The theme of overcoming the atopy of the archaeological underground and the "breaking" of the *current ground through excavation* (Benjamin, 2003, p. 112) to enable a continuous vertical reading of the city is of great significance. It has been explored in various publications and many architectural and urban projects. The desire to explore the city of Naples through design stems from an interesting design debate that began in the 1980s. In 1988, during the *SottoNapoli* exhibition and the international workshop Napoli Sotterranea (Lampugnani, 1988), held to promote the underground spaces of Naples, seven prestigious professional architects were invited to develop design proposals for the chthonic city. This design exercise proved to be genuinely useful and interesting, providing a range of solutions that, although specific to the location, retained a degree of generality that made them methodologically transferable into possible actions in the urban underground space (Dell'Aira, Grimaldi, Guarini, & Lambertucci, 2015).

Carlo Aymonino, for instance, proposed not to transform the caves into architecture by altering the original material but to insert sculptural and architectural pieces capable of explaining their contemporary use. Through a system of punctual and widespread grafts, it became possible to transform the cave system into places of archaeological knowledge beyond the *museum aura*, with the broadest possibilities for experimental integrations and variables over time. This approach aligns with the proposal made by Francesco Venezia the previous year, to use the underground spaces of Mount Echia as an extension of the city's Archaeological Museum.

Francesco Venezia displayed significant interest in Naples' underground and proposed, as part of the *17th Milan Triennale* in 1987, titled "*Imagined Cities: A Journey in Italy. Nine Projects for Nine Cities*", a section dedicated to the city of Naples, specifically focusing on "Interventions for the Pozzuoli Project." He collaborated with other designers such as Guillermo Vasquez Consuegra, Uberto Siola, and Alvaro Siza.

"Exposed in equal measure to the dominion of the sun and darkness, the city experiences the dialogue between the surface and the underground" (Venezia, 2006, p. 119). The visible form of the city is merely the emergence of what lies hidden underground: caves, grottoes, and tunnels crisscross the city in every direction, intertwining at different depths. The goal of the project presented at the Triennale was to make at least a part of Naples' underground spaces accessible, connecting them through an underground itinerary that would include some artefacts from the *National Archaeological Museum of Naples* (MANN).

In this way, archaeological remains returned to their original space, narrating the city in a mobile manner. Many were the project ideas proposed during the experimental design workshop for Naples' underground. Bohigas and Botta perceived the subterranean space as a symbolic, useless, and grotesque space where alternative solutions and fantastic uses could be experimented with, stimulating the imagination of the visitor, such as an aquatic itinerary. De Sola-Morales suggested stimulating the imagination by enhancing the understanding of the underground and increasing its intersection with the city above through vertical grafts into the material thickness of the ground. Rossi, on the other hand, argued that the excavation of new traces and underground paths allowed for an understanding of what lies beneath while simultaneously increasing one's awareness of the city above (Rossi, 1988, p. 98). Zanuso interpreted the Neapolitan caves as a space of nature, a space that returns to naturalness, starting from the fertility of the soil that, with native plant species, reappropriates the long-abandoned

underground rooms. These design experiments are crucial as they represent an initial archive of ideas and define a first transformative approach aimed at overturning the logic of separation between the city above and the city below, attempting to imagine new physical and visual relationships, new uses and interconnections between currently fragmented interstitial spaces. Building on the foundation of these design considerations, the research proposed in this contribution continues the exploration of ways to overturn the existing separation logic between the different levels of the city through innovative design solutions.

The pervasive reality of Naples' underground city, a dual city filled with cavities, passages, grottoes, aqueducts, cisterns, and archaeological remains, must be interpreted in continuity with the surface, through design interventions that can reconnect the layers of the city vertically (Varriale, 2004). The separation between the surface and the underground is not only a "physical" barrier but also a "temporal" one, often stemming from a lack of knowledge and information about what is not visible.

The breaking of the vertical limit necessitates a renewed relationship between different temporal layers of the city, a new connection between diachronic layers, ancient and new, coming back into contact, as seen in the city of Cartagena with the intervention by Rafael Moneo. His project proposes to incorporate and connect existing buildings and voids within the urban fabric of the city, creating a museum pathway that "leads from low to high levels, unfolding through exhibition spaces illuminated by a complex system of skylights, and develops by providing visitors with mechanical means of elevation, including stairs and elevators, guiding the presentation of the remains found during excavation campaigns. It is, therefore, a *museum promenade*" (Moneo, 2008, p. 60). The idea that the design process can take the form of a *museum promenade* allows for the overcoming of the notion of separation between above and below, between archaeology and the city, experimenting with intriguing solutions to include subterranean ruins in the contemporary dynamics of the city (Segarra Lagunes, 2017). In this regard, even the vertical limit begins to be seen differently, not only as a contrasting element but also as a place for potential dialogue between architectural and urban spaces from different eras.

Andreina Ricci suggested that "the boundaries that currently encircle areas of the past, like borders that were sought to be advanced during times of war through military actions, could become jagged boundaries that reconfigure themselves from one project to another, marked as they also are during times of peace, negotiation, legal, political, diplomatic relations, and above all, dialogue with neighbours, exchange, conversation" (Ricci, 2006, p. 147).

The *space of conflict* between the contemporary city above and the ancient city below is the space of design, which, in a unified vision, must bring together the layers of the diachronic urban system. This is clearly visible in many contemporary projects of *public archaeology*, as in the horizontal redefinition project of the archaeological margin of the *Temple of Diana* in Mérida by José María Sánchez García, or in the vertical archaeological section design of the *Machado de Castro Museum* in Coimbra by Gonçalo Byrne, where the subterranean archaeological layer, in its complexity, constitutes the primary material for a unified project (Byrne, 2022). Therefore, the project must emphasize the internal/external relationship, as well as the above/below perspective, both physically by allowing direct connections and increased accessibility, and emotionally by stimulating the curiosity of residents and tourists, who are not accustomed to the idea of something hidden beneath their feet.

"But Naples is not only what can be seen in glory or decay. One can almost feel, beneath one's feet, the breath of an invisible or hardly visible world that for many centuries has been building the current city. An enormous and fragmented foundation of many layers, materials often superimposed, placed there by people from different regions and religions. So magnificent monuments emerge, which sometimes men discover by digging. This accumulated material conditions and directs what is being built today" (Siza, 2005, p. 24). The project, as an articulated process, envisions a progressive construction that unfolds over time, gradually establishing *new urban relationships* (Acocella, 2021), with the aim of unveiling the accumulated material beneath the surface that is not visible. As Agamben writes, archaeology is the only way to access the present, due to its intrinsic ability to permeate "every level of stratification, but also to stand outside in order to grasp all together and discern the intricacy

of the relationships of reciprocity and correspondence that bind them together and with what surrounds them" (Carlo, 1995, p. 19). Understanding these palimpsests is a complex but necessary action to build knowledge, memory, and identity of places without compromising them (Padovan, 2009). On one hand, there is the need to delve into the *repressed layers of the city* to permeate the different strata; on the other, there is a need to work with a multiscale approach that allows for the repositioning of scattered interventions and ancient fragments within a larger, complex, and systematic framework.

In this regard, for the city of Naples, reflection has been made on a broader strategic system founded on micro-interventions located in specific areas that are particularly relevant to the theme and can act as driving areas: Poggioreale, Sanità district, and Mount Echia.

4.1 Under the cemetery of Poggioreale Hill

The area of the Poggioreale cemetery hill, which is complex and multi-layered, is currently at the centre of the debate regarding Naples' future urban projects due to its condition as a cultural landscape at risk. The atopic and temporal suspension characteristics of the place create a significant criticality, stemming from the interruption of relationships between the contemporary city and the ancient fabric, between the exterior and interior **(Fig.3)**.
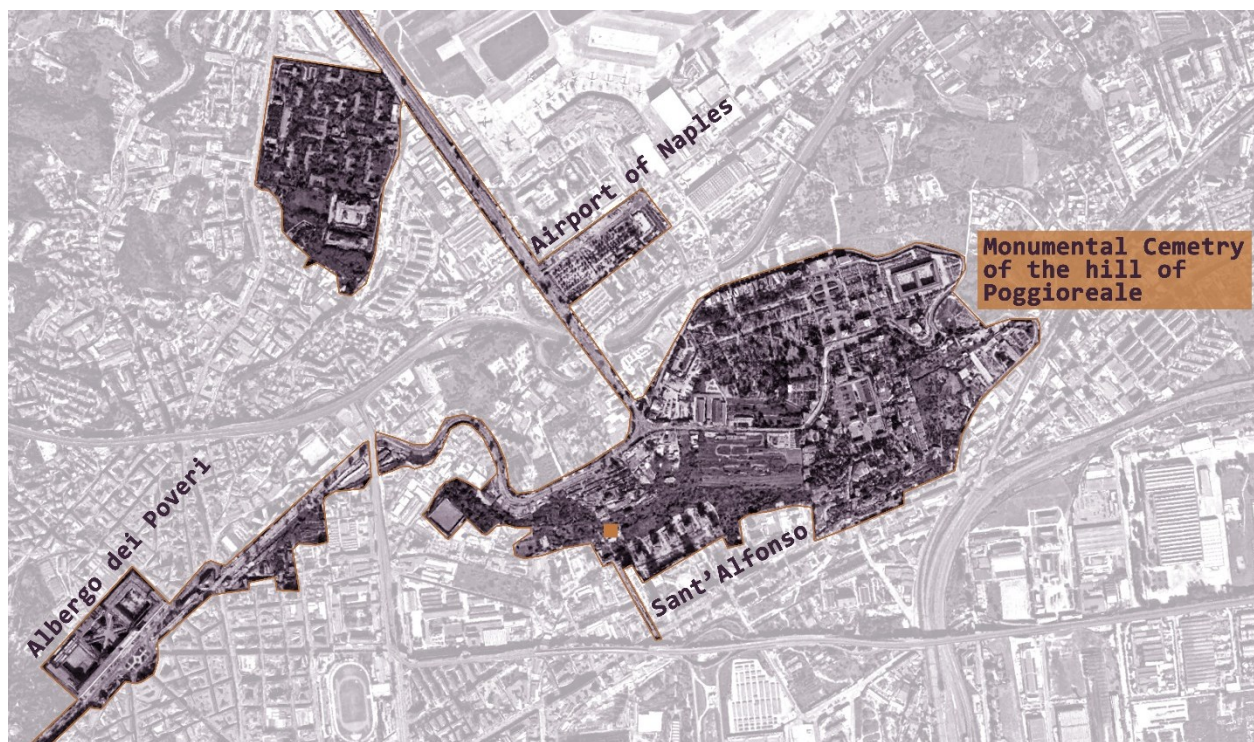

Figure 3. Interpretative map for the area of Poggioreale Hill, Chiara Barone.

The project idea proposed for this area is driven by the desire to strengthen the existing relational processes between Poggioreale Hill and the urban centre to overcome the separation that has led to considering Poggioreale as a peripheral area for years.

The project proposal aims to emphasize the continuity between the hills of the metropolitan park of Naples, a continuity found in both architectural-monumental and landscape characteristics. What is of considerable interest is that this continuity between the Poggioreale hill and the other hill of the city is also manifested at the subterranean level: there are numerous ancient cavities, such as the Grotta degli Sportiglioni, which, both in their articulation and in the historical period of their construction, can be considered an extension of the complex system of Naples' archaeological underground, hidden and underappreciated.

The project, therefore, intends to start from the system of elements scattered underground, with the intention of integrating them into a single large multi-relational complex, nourished by open multi-level intersections capable of reconnecting the layers of the city.

This connection between the layers begins in the Sant'Alfonso district, a residential district south of the cemetery area, where the pre-existing retaining wall becomes a design element: the decomposition of the wall, seen as an inhabited element with variable thickness, allows for incorporating access to the underground system from the urban level while also reconnecting this space with the higher elevation of the park.

The subsoil of the hill has only been recently explored by Neapolitan speleologists, including Clemente Esposito (Esposito, 2018), when numerous collapses and sinkholes occurred following the construction of the tunnel for the metropolitan subway network.

This necessitated an investigation of the soil and any potential *interferences* between the cavities (Farris, Grimaldi, & Lambertucci, 2019). It is precisely from the condition resulting from the primitive "colonization" of the hill that the project aims to start, using a subtraction-based approach to promote the opening of "cuts" capable of reconnecting the subterranean level to the upper park level and providing access to the underappreciated cave system. Access to the caves and tunnel system, as well as the connection with the metropolitan tunnel that will cross the area at the subterranean level, becomes the driving element for a dual connection: vertical and horizontal. The desire to create new continuity between urban layers, the subsoil system, and the upper park system is expressed within the interpretive drawing, where a system of gradual squares and specific entrances to the cave system allows for the crossing of the hill from bottom to top and from the outside to the inside of the ground **(Fig.4)**.
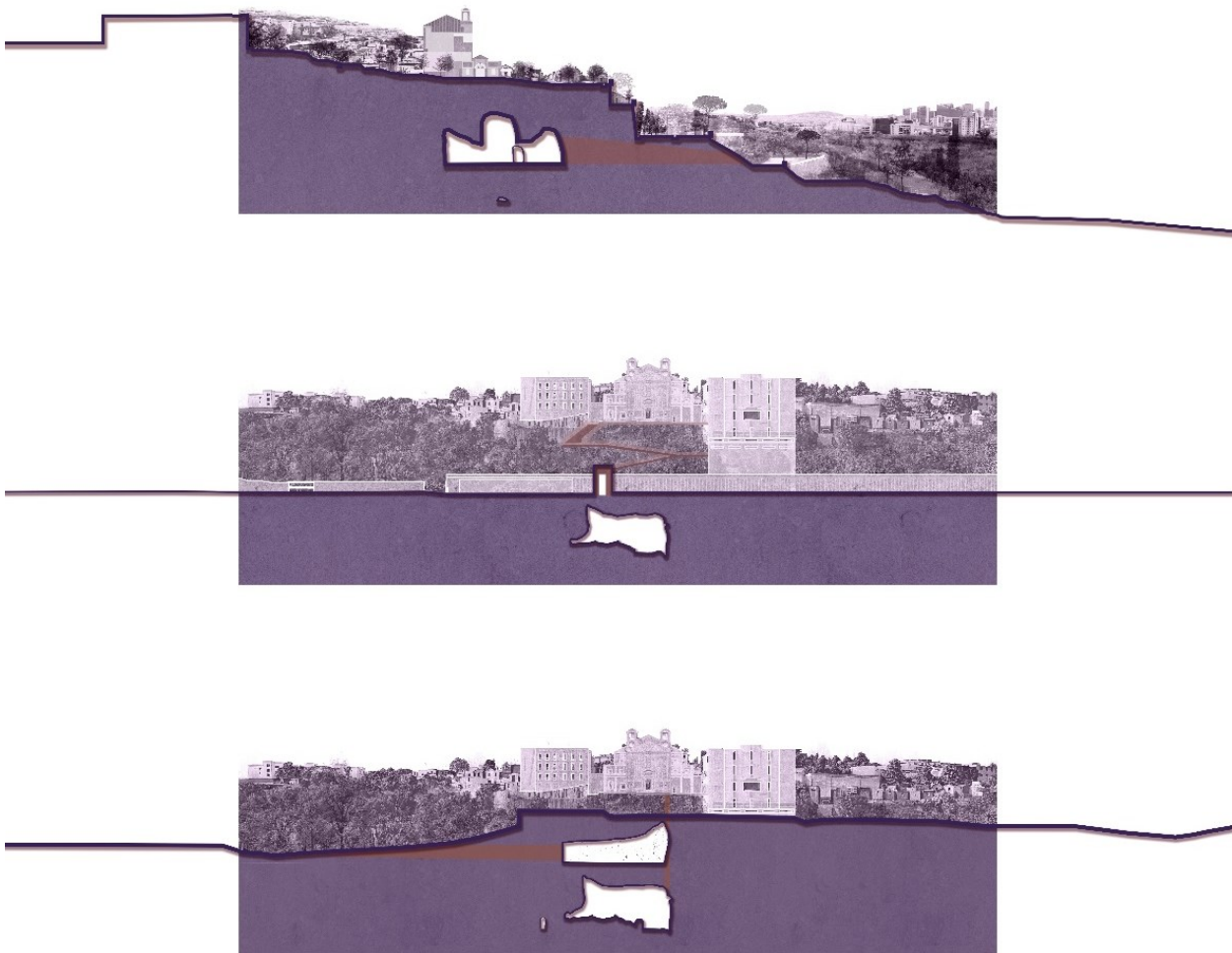

Figure 4. Sections of the underground caves of Poggioreale Hill, Chiara Barone.

The second connection is the vertical one: through discussions with speleologists, it emerged that there is a possibility to introduce a vertical design element that reconnects the layers of the soil by traversing them. This idea draws inspiration from the project proposal made by De Sola Morales for the

experimental workshop *SottoNapoli* in 1988. This vertical element would penetrate the ground at the point where geological surveys and investigations have already determined an opening. It would establish continuity and provide access to various ancient caves located at different elevations, ultimately leading to the square in front of the Church of Santa Maria del Pianto. From the square, one can access the new high/low connection element to reach the intermediate elevation, which is the urban level of the Rione Sant'Alfonso **(Fig. 5)**.
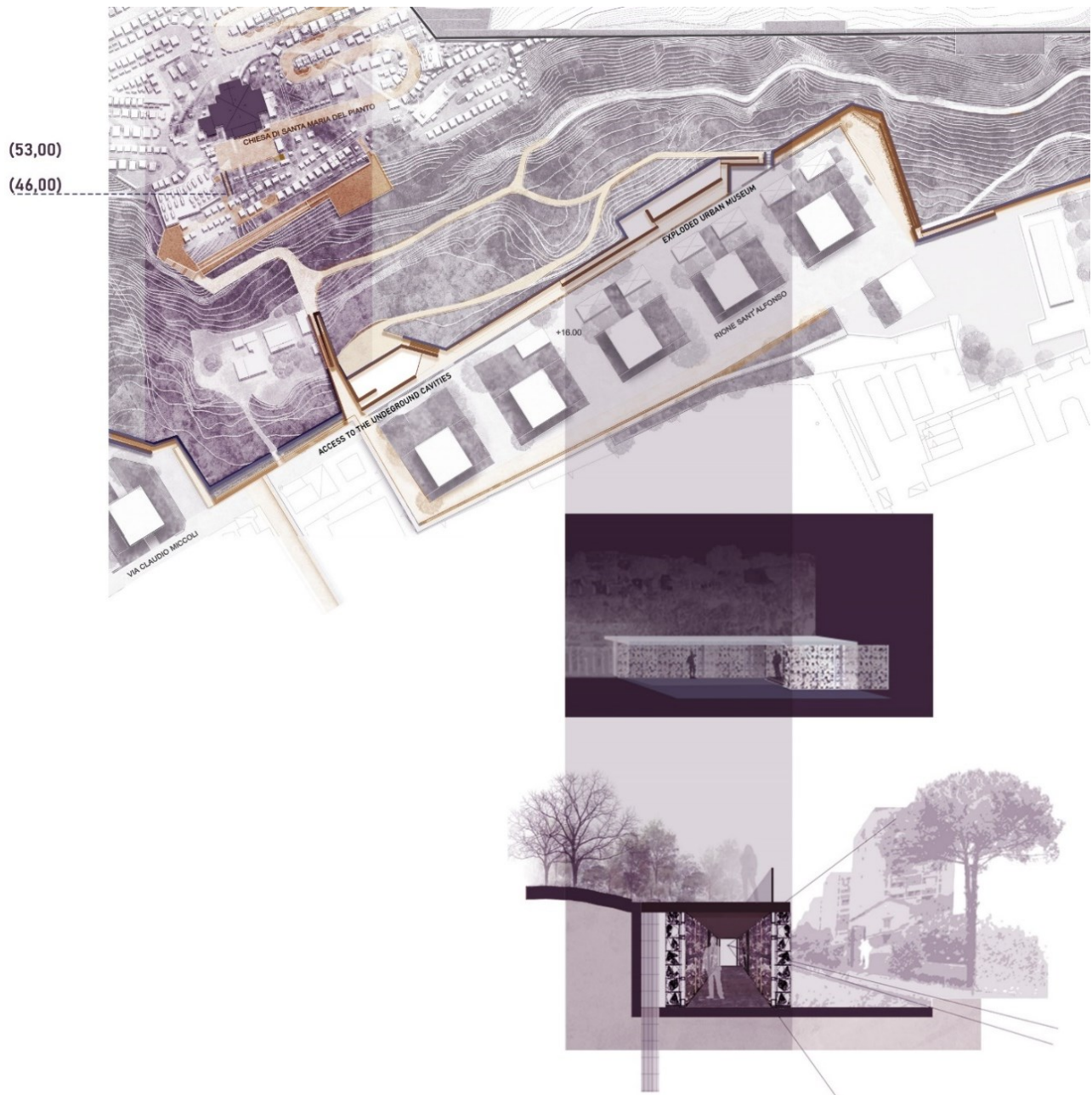

Figure 5. Vision from the level of S. Alfonso's district, Chiara Barone.

From there, one can descend further into the heart of the city to reach a second cavity located at an even lower elevation. This cavity is rich in ancient graffiti, making it a *spectacular underground museum space* in the city. The design element, therefore, intervenes by reconnecting the three levels of the city. It makes the ancient cavities accessible and usable while also providing a new horizontal passage that extends to the underground metro tunnel that is under construction **(Fig.6)**.

Figure 6. Vision from underground: crossing Poggioreale's hill, Chiara Barone

4.2 Under the Sanità district

The second area of interest is the Sanità district, located north of the historic centre, where underground structures like the Hypogeum of the Togati, Hypogeum of the Pomegranates, and the Hypogea of Vico Traetta have been discovered since 1685. These underground sites are distributed in a well-defined area just outside the city walls. The last discovery dates to 1888 when excavations from Vico Traetta to Vergini continued towards Porta San Gennaro, bringing to light some tombs in the Hypogeum of the Cristallini, four contiguous rooms entirely carved into tuff, consisting of a vestibule and an underlying hypogeum (Esposito, 2018).

These archaeological fragments, belonging to different eras, can be reconnected both physically and figuratively, involving the urban public space. The numerous hypogea found here, such as those of the Togati, Pomegranates, and Vico Traetta, or even the Hypogeum of the Cristallini, can be made more attractive through an archaeological setup connected to the *National Archaeological Museum of Naples* (MANN), by integrating archaeological exhibitions into the urban space. Continuing along the historical axis of the district, the ancient Via Sanità, it is possible to reach the complexes of the catacombs of San Gaudioso, San Severo, and Santa Maria della Vita, which can become additional points for archaeological exhibitions and displays related to archaeology and the city.

The project intervenes through a hybrid path, which oscillates between the above and the below, ensuring continuity between the scattered spaces in the archaeological underground, the contemporary city above, and its monuments, to unveil the archaeological areas of Sanità in new ways **(Fig 7)**.

Figure 7. Interpretative map for the Sanità's district, Chiara Barone.

The contemporary grafts act punctually to ensure the up-down connection and access to the archaeological caves, which constitute an identity for the neighbourhood and can promote socio-cultural and economic revitalization by attracting new tourist flows.

These specific insertions are held together by a continuous path, that guides the user in visiting all the catacomb systems, expanding to the city level to create high-quality public spaces to be returned to the local population. In this perspective, the design process is not just an archaeological route but an urban crossing: within the courtyards of historic Neapolitan buildings, new specific elements can be inserted to allow access to the underground, serving the community.

The Neapolitan model is similar to many other European and Italian cities. An example is the city of Siena, where the former Santa Maria della Scala, ex-hospital complex has been transformed into an archaeological museum open to the city, traversable on multiple levels and capable of reconnecting two different urban levels. From Piazza Duomo, through the historic hypogea, it is possible to reach Via Fosso di Sant'Antonio, where additional exhibition spaces can be found. Like Siena, in Naples, the project intervenes not only in urban connections but also within the underground, through an exhibition system that enhances the ancient spatiality and engages the senses of the visitor, who will be emotionally involved in discovering a place that was previously unknown.

Absolutely, the exhibition serves as a strategic and design tool for appropriating archaeological space, promoting a full understanding, and gradually opening these spaces to the city **(Fig.8)**.

Figure 8. From the public space to the underground museum in the Sanità district, Chiara Barone.

4.3 Under the Echia hill

The third area of interest is the underground of the Echia hill, the foundational area of the city with a highly stratified palimpsest: ancient cavities, water cisterns, a long Bourbon tunnel, important squares like Piazza del Plebiscito all interlace to form a complex continuous system (Caterina, 1987).

From Piazza Municipio, with the project by Alvaro Siza and Souto de Moura for the archaeological-metropolitan station and its square, you reach Piazza del Plebiscito, with the Royal Palace and its garden.

From there, crossing Mount Echia, you reach the Chiaia district, with the municipal villa, a public park that extends along the seaside promenade to the Vergiliano Park, at the foot of the Posillipo hill. The two hills, Echia and Posillipo, are intersected by underground tunnels, no longer used for city transportation but still existing.

Establishing a new connection between these two diachronic underground systems involves new excavation work that facilitates the opening of an underground urban passage, always accessible below ground level, with the dual function of unveiling the ancient cavities and reconnecting two pieces of the city, reducing travel times: from the historic centre at Piazza del Plebiscito, the subterranean path allows you to reach Piazza Vittoria, the opening to the public park system of the Neapolitan villa, and then, through the *Crypta Neapolitana*, it is possible to cross the Posillipo hill, reaching the Fuorigrotta district **(Fig. 9).**
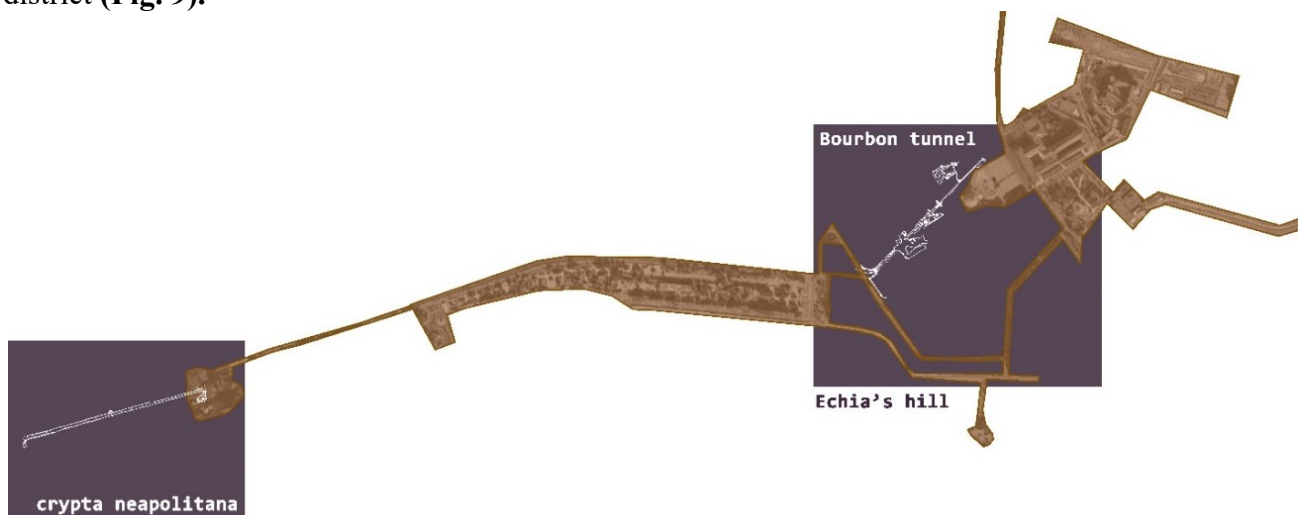

Figure 9. Interpretative map for the underground cavities of Mounts Echia and Posillipo.

The design exploration has focused on the area of the Mount Echia, where there is a significant presence of underground infrastructures. The possibility of providing continuity to these incomplete and disconnected cave systems leads to the proposal of creating a unified system that, from Piazza Plebiscito, through the underground of the Church of San Francesco di Paola, allows direct access to the Bourbon gallery in Via Morelli, currently used as a parking lot and for exhibitions and events.

A continuous system, supported by the blending of various public functions, promotes the intersection of heterogeneous uses, resulting in hybrid itineraries. The idea of transcending the typological and formal paradigm of the tunnel as a space for transit, solely functional for urban mobility, leads to the discovery of new correlations with the forms of residential space and exhibition space, to showcase the submerged archaeology in the soil.

The design logic to be adopted is like that described by Moneo for the creation of the museum in the archaeological areas of Cartagena, where the project is an urban path capable of systematizing the subterranean spaces along with the contemporary city above **(Fig.10)**.

Figure 10. Vision for Mount Echia: between strata, Chiara Barone.

Pathways, tunnels, and galleries for urban transit connect excavated spaces from different eras: from the narrow section of the transit space, one enters very spacious areas where, like in a catabasis process, the visitor loses contact with the outside world, entering a state of *sensory deprivation* (Ustinova, 2009, p. 154), i.e., a loss of senses due to the interruption of contact with external stimuli.

In the specific case of Mount Echia, underground cavities such as the ancient aqueducts and cisterns, the Bourbon tunnel, as well as spaces intended for contemporary use like parking, are connected in a unified vision with public spaces, bridging the gap between the surface and the underground (Cervini, 2023), for a journey through the body of the earth that moves from the contemporary urban scene.

5. Discussions. Open visions and possible configurations for a new continuity between urban strata: from Naples to other cities

The previously described case studies, related to specific areas in the city of Naples, are important, as they demonstrate the validity of the research question and provide real-world solutions that can be applied in a specialized manner to other cases with similar conditions.

The research, which primarily aims to demonstrate how the space of the archaeological underground can serve as a strategic starting point for bridging the gap between the above and below while highlighting the hidden archaeology beneath the Earth's surface, is proven in all three cases in the city of Naples, despite their heterogeneity **(Fig.11)**.

Whether in the case of a specific intervention in the underground, as in the area of Poggioreale, or in the case of a chain of interventions defining an archaeological-urban path that moves between above and below, as in the Sanità area, or the case of more extensive infrastructure development of the ground with the continuation of excavation and the systematization of diachronic underground elements, archaeological cavities can, in different ways, stimulate a reversal of the city's spatial dynamics.
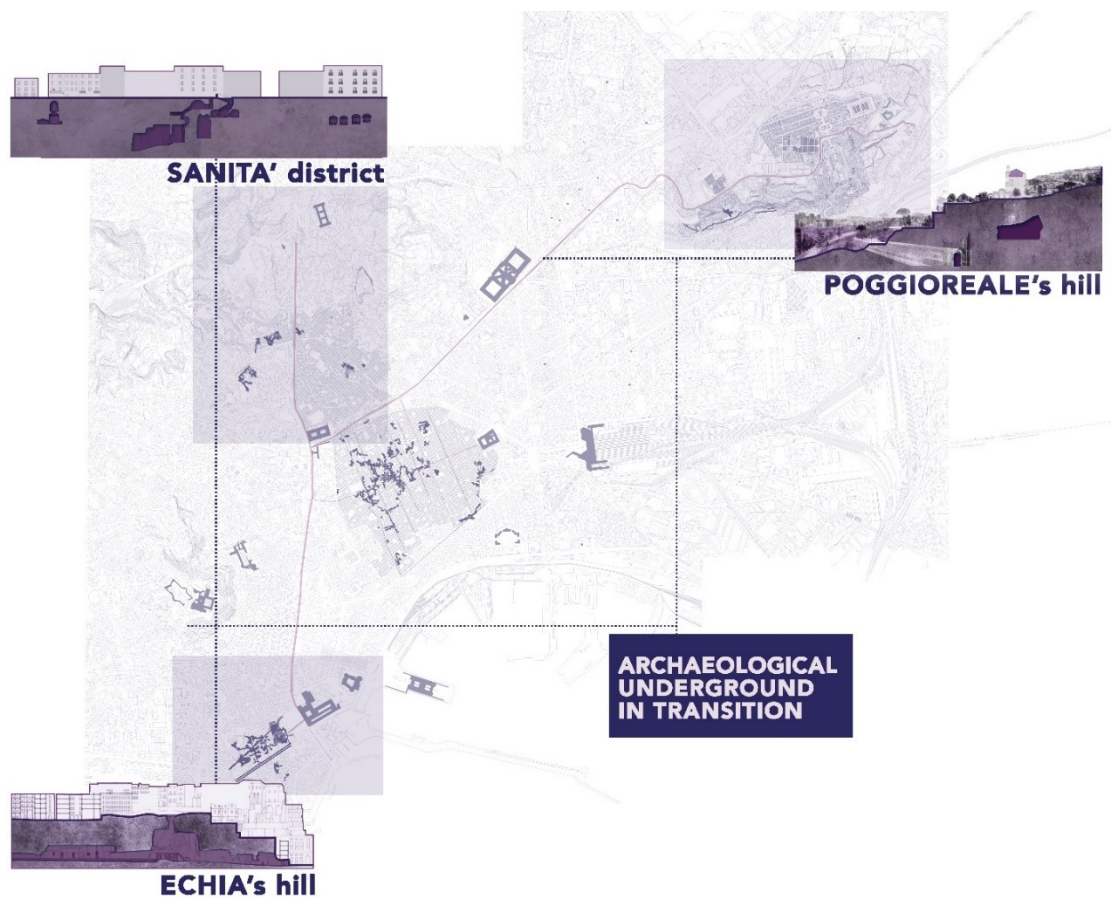

Figure 11. Urban strategy and architectural grafts for the underground in Naples, Chiara Barone

The choice to analyse very different cases from each other has allowed for the development of highly varied design solutions, all capable, however, of reversing the condition of isolation of the underground compared to the contemporary urban scene.

The three projects, described also through visualizations, are useful for deriving a research process and for understanding the tools that have contributed most to achieving effective applicable solutions.

The search for design solutions, the comparison with similar cities and reference case studies, along with a deep understanding of the location, undoubtedly constitute the main tools of this experimentation aimed at enhancing the ancient underground space.

This enhancement aims not only to enable accessibility and use but also to stimulate the local economy through new tourist networks and to convey the social, cultural, and historical values of the place through a *community-based* approach that involves the local population fully.

Economic sustainability, local involvement, and integration with broader tourist routes allow for the development of a project capable of *self-financing* over time, activating processes that operate over the long term, driving new chain reactions that gradually move these places away from oblivion and abandonment.

"First, temporary or settled occupation of the cave as a refuge, [...], then 'very specific paths, double volumes, intersecting views, targeted openings to the outside, everything thought out, everything imagined, everything designed: from the mere reuse of existing places or the realization as the sum of works and interventions capable, only at a later stage, of giving rise to a system, to an *urban idea of the underground*" (Boschi, 2015, p. 30). The design methodology identified can be applied to other situations where the contemporary city has taken precedence over the archaeological underground: accessibility, usability, visitability, enhancement and understanding of spaces, as well as innovative uses, local participation, tourist networks, exhibitions, and staging, are all project themes that methodologically guide an intervention to reconnect the archaeological underground layer.

The three design interpretations related to archaeological spaces in the urban underground of Naples are therefore just some of the possible *trajectories* to explore through design, with the common goal of investigating achievable solutions to overcome the separation between the underground and the surface and to reactivate underground spaces, preparing for the city of the future a unified and continuous scenario, as it was in the past.

6. Conclusions: Design approach to overturn the separation between the city above and the underground

The research contribution experiments with design solutions for ancient spaces underground, proposing actions of reconnection that intervene in the interstitial spaces between the above and the below. The strategies for the three sample areas in Naples define open and evolving processes, capable of triggering multiple transitions both for the archaeological space underground and the urban space.

The proposed solutions are all very current and consistent with the real data. In the case of the Poggioreale hill, the project aims to be a connection between urban layers, but also as a filter for entering the chthonic world, to be protected and enhanced.

The blending of public spaces that are always accessible, such as the Cemeteries Park, and spaces to be enhanced with controlled access, such as the ancient Greek cavities, allows for the achievement of a dual project approach that has proven very successful in the Neapolitan case. It also allows for interventions in subsequent stages through step-by-step project actions.

The phased approach to project solutions defines a valid method even in the intervention for the Sanità district, where the social and cultural issue necessitates a slow and gradual involvement of the population for a complete acceptance of the changes implemented. Authorities, organizations, citizens, and specialists involved can thus gradually support the transformations introduced by architecture, between what is visible and real and what is invisible and can be imagined, proposing modifications and adjustments where necessary. In this regard, numerous associations currently work actively in the Sanità area, proposing substantial processes to valorise the architectural heritage.

The research method and tools adopted define a holistic approach that can also be applied to similar cases, with the common goal of overcoming the existing separation between the underground and aboveground aspects of the city. However, the applicability and feasibility of the solutions implemented must also confront technical constraints.

The architectural space underground is inherently difficult to fully understand from a formal and geometric perspective. The lack or insufficiency of ground-penetrating radar surveys and graphic representations or surveys of these spaces poses a significant challenge for architectural design, which inherently requires a thorough understanding of the spaces it operates in.

Therefore, the research can orient itself towards finding new ways to understand space and new processes capable of making more rapid and technologically advanced modifications, like the use of BIM for most aboveground architectures. Expanding the research field to include technologies can lead to greater integration between knowledge, surveying, and design, enabling a more rapid adjustment of proposed architectural solutions during the knowledge phase. In conclusion, the subterranean city should be interpreted as a palimpsest of opportunities and new principles, offering fresh perspectives in architectural terms and new methodological approaches and research tools. These approaches draw from contemporary trends that increasingly view underground living as an ideal housing model for the city of the future.

Conflict of Interests
The Author declares that there is no conflict of interest.

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Individual Work. The Author has read and agreed to the published version of the manuscript.

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