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Master’s Thesis

Restoration and Adaptive Reuse of Eshratabad Palace in Tehran: A Sustainability-Based Proposal

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Abstract

I developed this Master's thesis as part of my studies in Architecture for Sustainability. Studying in Italy inspired me to look back at my home country, Iran, and ask how we can bring sustainable conservation and care to our neglected heritage. In this research, I focused on the Eshratabad Mansion (Kolah Farangi), a four-storey Qajar pavilion built in 1881 and registered on Iran's National Heritage List in 1967. Today, the building is enclosed inside an active military garrison in Tehran, suffering from years of physical isolation and a lack of regular maintenance.

Because direct on-site access was restricted, I used archival photographs, historical maps, and comparative case studies to analyze the building. Guided by the principle of minimum intervention, my goal was to propose a compatible new life for the mansion as a Cultural Research and Documentation Center. To solve the vertical accessibility problem and provide safe public access, I designed a new circulation core with a lift and stairs. This intervention is strictly limited to the secondary stair area, where only a minimal, narrow incision was made in the local load-bearing brick wall, which is immediately compensated and reinforced with a localized steel structural frame to guarantee full structural stability. Meanwhile, all primary monumental spaces, vaulted ceilings, central halls, and historic Orosi windows remain completely intact and protected.

From an environmental sustainability perspective, my project shows that repairing and keeping the original brickwork and timber assemblies preserves valuable embodied energy and avoids demolition waste. I also focused on reactivating the building's natural passive features, such as the thick masonry walls for thermal comfort, the shaded upper loggia, and the central garden basin for natural cooling. Ultimately, this thesis is my personal effort to show how restricted and forgotten monuments in Tehran can be protected through continuous maintenance and safely reconnected with cultural and public life.

Introduction

Sustainability in architectural conservation is not conceived here as an added technological layer, but as an intrinsic quality of the historic fabric itself. Conserving the authentic material fabric extends the service life of existing building components, minimizes embodied carbon emissions, and respects the historic and aesthetic values of the monument.[1] Compatible reuse serves as a preventive conservation tool, generating the functional necessity for programmed and continuous maintenance, as emphasized in Italian restoration theory.[2]

This thesis examines Eshratabad Mansion, also known as Kolah Farangi. Published heritage sources date the pavilion to 1881 and associate its construction with Naser al-Din Shah.[3] The building originally formed part of a royal garden but was later incorporated into a military compound. It is now closed to the public and shows visible signs of material deterioration. The extent and causes of this deterioration have not been fully assessed in the sources available to this research.

The research considers repair and reuse as connected questions. Stabilising the building without establishing an appropriate use, management structure or maintenance programme would address only part of the conservation problem. The main research question is therefore:

How can a deteriorating and publicly inaccessible Qajar pavilion be conserved through a compatible new use while addressing environmental, social and economic sustainability?

Three subsidiary questions support this investigation:

- What can be established about the building's present condition when direct access is unavailable?
- Which functions can be accommodated within its existing spatial and structural organisation with limited permanent alteration?
- How can the sustainability benefits and limitations of the proposal be evaluated without presenting unverified claims as measured results?

1. Carbonara, 1997; Feilden, 2003
2. Brandi, 1963/2005
3.Eyn al-Saltaneh, 1995; Ministry of Roads and Urban Development, 2019

Sustainability is not treated here as a separate addition to the restoration proposal. It forms part of the reasoning behind the project. Retaining historic fabric can extend the life of existing materials, avoid demolition waste and reduce the need for replacement construction.[1].Compatible repair can also reduce the risk of further decay[2], while a viable new use may support regular maintenance.[3] These potential benefits are assessed qualitatively because direct measurement, calibrated simulation and project-specific life-cycle assessment were not possible.

The thesis is organised in five chapters.

Chapter 1 defines the research problem, questions, objectives and methodology. It also explains how conservation and sustainability are connected in this study.

Chapter 2 examines four reference projects located in Iran. They are used to study Qajar pavilion typology, changes of use, and timber conservation.

Chapter 3 presents the historical, spatial and preliminary technical assessment of Eshratabad. It examines the available evidence concerning the building's materials, environmental characteristics and visible deterioration.

Chapter 4 develops the conservation and adaptive reuse proposal. It addresses the main pavilion, the proposed circulation core, the landscape, the former peripheral pavilions and the qualitative sustainability assessment.

Chapter 5 summarises the research outcomes and outlines recommendations for further study. It reflects on the limitations of the current thesis and identifies the specialized tests and deeper theoretical investigations that could build upon this work.

Together, these five chapters establish a structured, interdisciplinary framework bridging architectural conservation, passive environmental design, and adaptive reuse within a restricted urban heritage context.

1.Carbonara, 1997; Foster, 2020
2.Brandi, 2005
3.Feilden, 2003

Eshratabad (Qajar) Palace, Tehran, Iran

1. Introduction and Historical Context



1.1 Research Background

Rapid urban development in Tehran has placed increasing pressure on buildings and landscapes associated with the city's nineteenth-century expansion.[1] Highly recognised monuments such as Golestan Palace[2] have received substantial scholarly and institutional attention, while a number of less visible civil and royal buildings remain unused, inaccessible or insufficiently maintained.

This thesis does not attempt to provide a comprehensive evaluation of conservation policy across Iran. Instead, it examines Eshratabad as a specific example of the difficulties faced by a listed monument that remains outside everyday public life.

Eshratabad Mansion was built as the principal pavilion of a Qajar royal garden and was later incorporated into a military compound. This change restricted public access and altered the relationship between the pavilion, its garden and the surrounding city. Available photographs also indicate deterioration in parts of the facade, although the extent and causes of this decay cannot be established without direct investigation.

The case raises three related questions. The first concerns physical conservation: formal recognition does not by itself guarantee regular inspection, maintenance or repair. The second concerns operation: an unused building requires a long-term management and funding structure if periodic intervention is to become continuous care.[3] The third concerns environmental responsibility: retaining an existing building can reduce demolition waste and the need for replacement materials,[4] although the scale of this benefit must be assessed using project-specific data.

Eshratabad is examined through the dual lens of material preservation and compatible social re-functionalization. According to Article 5 of the Venice Charter, the conservation of monuments is always facilitated by making use of them for some socially useful purpose. The thesis investigates how conservation, structural non-invasiveness, and passive environmental performance can be synthesized into a coherent architectural proposal.

1.Reiman, 1976; Najmi, 1988
2. Golestan Palace World Heritage Base, 2023
3.Venice Charter, 1964, Art. 5; Carbonara, 1997
4. RICS, 2023; Preservation Green Lab, 2011

1.2 Research Aim and Objectives

The aim of this research is to develop a documented conservation and adaptive reuse proposal for Eshratabad Mansion and to assess its relationship with environmental, social and economic sustainability.

Five objectives structure the research:

Objective 1. Documentation. To reconstruct the historical development, architectural typology and cultural significance of the mansion using the available archival and published evidence.[1]

Objective 2. Preliminary diagnosis. To identify visible decay phenomena and distinguish between observations supported by photographs and conditions that require on-site investigation. [2]

Objective 3. Comparative analysis. To examine relevant reference projects and identify lessons concerning spatial reuse, conservation of timber and masonry, and controlled public access. [3]



Fig 1 : Eshratabad palace Tehran , Official document center of Golestan Palace in Tehran

1. Golestan Palace Archives, 2023; Najmi, 1988
2. ICOMOS-ISCS, 2008; Torraca, 2009
3. Plevoets and Van Cleempoel, 2019

Objective 4. Design. To develop a conservation and reuse proposal in which every intervention is assessed against the principles of minimum intervention, reversibility, distinguishability and material compatibility, and in which non-reversible operations are declared and separately justified rather than assimilated to the rest.[1]

Objective 5. Assessment. To evaluate the proposal qualitatively against defined sustainability principles covering fabric retention, passive environmental behaviour, circular design, public accessibility and financial continuity, and to state explicitly the confidence limits of each argument made. [2]

1. Brandi, 2005; Carbonara, 1997; ICOMOS, 1964

2. European Commission, 2021; Foster, 2020

1.3 Research Methodology

The methodology of this research was determined by a constraint that could not be removed. The Eshratabad Mansion is situated within the Wali-e-Asr Garrison, an active military compound. Due to strict institutional security protocols, on-site destructive testing, direct physical sampling, and instrumented structural monitoring were not authorized. Consequently, the research employs an evidence-based remote analytical methodology, synthesizing high-resolution archival documentation, historical surveys, digital satellite photogrammetry, and comparative typological analyses. No material was sampled or tested. No opening was made, and no hidden construction was inspected.

Evidence Category	Source & Origin	Application in Research	Methodological Limitations
Historical Photography	Golestan Palace Archives (late 19th–mid 20th c.)	Reconstructing lost garden layouts, pool geometry, and original 30 annexes	Non-metric imagery; variable chronological precision
Cartography & Satellite Data	Historical maps of Tehran & Google Earth Pro	Territorial analysis, urban density, and garrison perimeter identification	Resolution limits; lack of interior structural data
Published Survey Drawings	Heritage & academic surveys (2006–2019)	Spatial syntax, structural stratification, and planimetric drafting	Inability to perform direct metric verification on-site
Contemporary Visual Surveys	High-resolution external documentation (2024)	Preliminary facade decay mapping and material loss identification	Restricted to publicly visible external surfaces
Literature-based user requirements	Peer-reviewed adaptive reuse and workplace literature	Definition of provisional spatial and functional requirements	Not a substitute for site-specific user consultation

Fig 2 : Summary of Research Methodology, by author

Phases of work. The research proceeded in five stages:

- Theoretical Framework: This part builds the theoretical foundation of the research. It reviews major conservation guidelines (from the Venice Charter to the Nara and Krakow documents), adaptive reuse literature, and policies linking heritage to sustainability. These concepts provide a clear set of criteria to assess the proposed project.[1]

- Comparative analysis. Examination of four reference projects, selected against the criteria stated in Section 2.1, to compensate for the absence of direct investigation with transferable evidence from documented interventions.

- Remote assessment. Reconstruction of the building's history, typology, environmental behaviour and pathology from the sources listed above, with each finding attributed to its evidential basis.

- Design synthesis. Development of the conservation and reuse proposal, with each intervention tested against reversibility, distinguishability and compatibility.[2]

- Sustainability assessment. Qualitative and comparative evaluation of the proposal in relation to fabric retention, passive environmental behaviour, circularity, public accessibility and long-term maintenance. The assessment identifies the likely benefits of the proposal while stating clearly the limits created by the absence of on-site measurements [3], detailed material data and calibrated simulations.

Although remote assessment provides a strong foundation for masterplanning and conservation strategies, it cannot replace on-site engineering surveys. Therefore, the proposal in Chapter 4 should be seen as a conceptual guide and a set of principles, which must be confirmed by future field investigations. However, this limitation is actually a key part of the research. For many heritage sites located in inaccessible or restricted areas, remote assessment is the only possible way to begin a project. Developing a clear, evidence-based method for these difficult situations is one of the main contributions of this thesis.

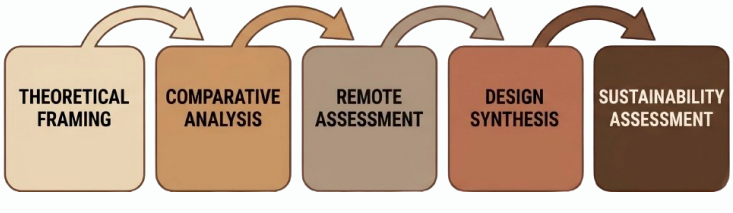


Fig 3 : Research Methodology , by author

1. ICOMOS, 1964; ICOMOS, 1994; ICOMOS, 2000; Council of Europe, 2005
2. Brandi, 2005; Feilden, 2003
3. European Commission, 2021; RICS, 2023

1.4 From Iranian Heritage to Italian Methodologies

My architectural education started in Iran and continued in Italy. During my Master's studies, I learned to approach historic buildings through a clear conservation methodology, focusing on thorough documentation, respect for historical layers, material compatibility, and making modern additions clearly distinguishable .[1] This perspective guided every step of my work on the Eshratabad Mansion.

I chose Eshratabad deliberately over an Italian case study. While working on a local Italian site would have allowed me easy access to archives and on-site measurements, Eshratabad represents an urgent real-world problem: a significant listed building cut off from the city inside a military area.

In my project, my goal is not to copy European architectural shapes, but to apply core conservation principles such as minimum intervention, repairing rather than replacing, and maintaining material compatibility [2] to a fragile Qajar monument while respecting its authentic brickwork, timber elements, and historical context.

1. Brandi, 2005; Carbonara, 1997
2. Feilden, 2003

1.5 Positioning the Thesis within Architecture for Sustainability

The design proposal I submit within this programme must be defensible not only in cultural and formal terms, but also in terms of consequences that can be measured, or at minimum bounded. In this section, I define what sustainability means in my thesis, the instruments I use to assess it, and where I subsequently verify each of my claims.

1.5.1 Conservation as a sustainability strategy

In this project, conservation and sustainability overlap in several practical ways. Retaining historic fabric extends the service life of existing materials. Compatible repair reduces the risk of accelerated decay, while a suitable new use may support continued maintenance.

Existing buildings also contain materials, energy and labour that have already been invested in construction. Their retention can avoid part of the waste and new material demand associated with demolition and replacement. The scale of this benefit varies according to the condition of the building and the extent of the proposed intervention.

The Davos Declaration on Baukultur treats the quality of the built environment as part of sustainable development rather than as a separate cultural concern [1] .The ICOMOS Policy Guidance on Heritage and the Sustainable Development Goals also connects heritage conservation with SDG 11.4, SDG 12 and SDG 13 . [2]

For Eshratabad, the retention and repair of the existing pavilion are therefore treated as the project's primary environmental strategy. This benefit is assessed qualitatively in Section 4.6.1. A numerical whole-life carbon assessment is identified as a requirement for a future implementation phase.

1. Swiss Confederation, 2018
2. ICOMOS, 2021

1.5.2 Conservation Principles and the Circular Economy

The proposal draws on the Venice Charter's emphasis on respect for original material and documentary evidence, the Nara Document's understanding of authenticity, and later conservation literature concerning minimum intervention, compatibility, distinguishability and reversibility.[1]

These principles also affect resource use. Repair extends the service life of existing material. Reversible or partially reversible additions allow future alteration with less damage to the historic building. Distinguishability prevents contemporary work from being mistaken for original fabric.[2] Material compatibility reduces the risk of damage caused by unsuitable mortars[3], coatings and finishes.

1.5.3 A declaration concerning the thirty demolished pavilions

Archival photographs show a repeated group of small pavilions around part of the historic basin. The available evidence does not establish their exact dimensions, internal organisation or complete footprint with sufficient certainty for historical reconstruction. The date of their demolition has also not been confirmed in the sources consulted.

The proposed studios are therefore treated as contemporary additions rather than reconstructed Qajar buildings. Their arrangement refers to the approximate rhythm visible in archival photographs, while their form and detailing remain recognisably contemporary. Their final number and position should remain provisional until further archival and archaeological investigation is possible.

A typical proposed studio measures approximately 8 × 5 metres, giving a gross floor area of about 40 m². If a maximum of thirty units were constructed, the total new area could reach approximately 1,200 m². This is a design calculation rather than a verified historical quantity.

1. ICOMOS, 1964; ICOMOS, 1994; Brandi, 2005
2. Brandi, 2005; Dezzi Bardeschi, 2005
3. Torraca, 2009; UNI, 2006

1.5.4 Confidence limits of the assessment

Since direct physical testing (like in-situ sampling or structural monitoring) could not be carried out, the environmental arguments in Chapter 4 are based on qualitative assessments, visual evidence, and existing research. However, this approach is completely sufficient to prove two main points: first, adapting the building is environmentally better than demolishing it, and second, its original passive design works perfectly with the proposed new use.

Eshratabad (Qajar) Palace, Tehran, Iran

2.Reference Case Studies

2. Reference Case Studies

2.1 Introduction

The reference projects in this chapter are used to examine specific questions raised by Eshratabad rather than to provide a single model for direct replication. Four cases are considered: Masoudieh Palace, Shams-ol-Emareh, Bisim Kolah Farangi, and Chehel Sotoun.[1]

They were selected for their relationship with Iranian pavilion or Qajar architecture, their history of functional change, and their relevance to the conservation of masonry and timber.The available evidence is not equally detailed for every case. The limits of each comparison are therefore stated explicitly.



Fig 4 : eshratabad palace and part of small houses in the picture , golestan palace photos album

1. Plevoets and Van Cleempoel, 2019; Bullen and Love, 2011

2.2 Masoudieh Palace, Tehran

Masoudieh Palace provides a useful local comparison because it is a Qajar complex that has accommodated cultural and public activities while retaining its sequence of rooms and courtyards.[1] Its main relevance to Eshratabad lies in the continued use of the existing spatial organisation.

Separate rooms can accommodate different functions without requiring the removal of load-bearing walls or the creation of a large open-plan interior.[2] This principle is relevant to Eshratabad, where the central halls and surrounding rooms can support shared and more private activities.



Fig 5 : Masoudieh palace,Tehran , golestan palace photos album

1. Sarikhani, 2006; Najmi, 1988
2. Douglas, 2006; Feilden, 2003



Fig 6 : Exterior view of Masoudieh Palace, golestan palace photos album

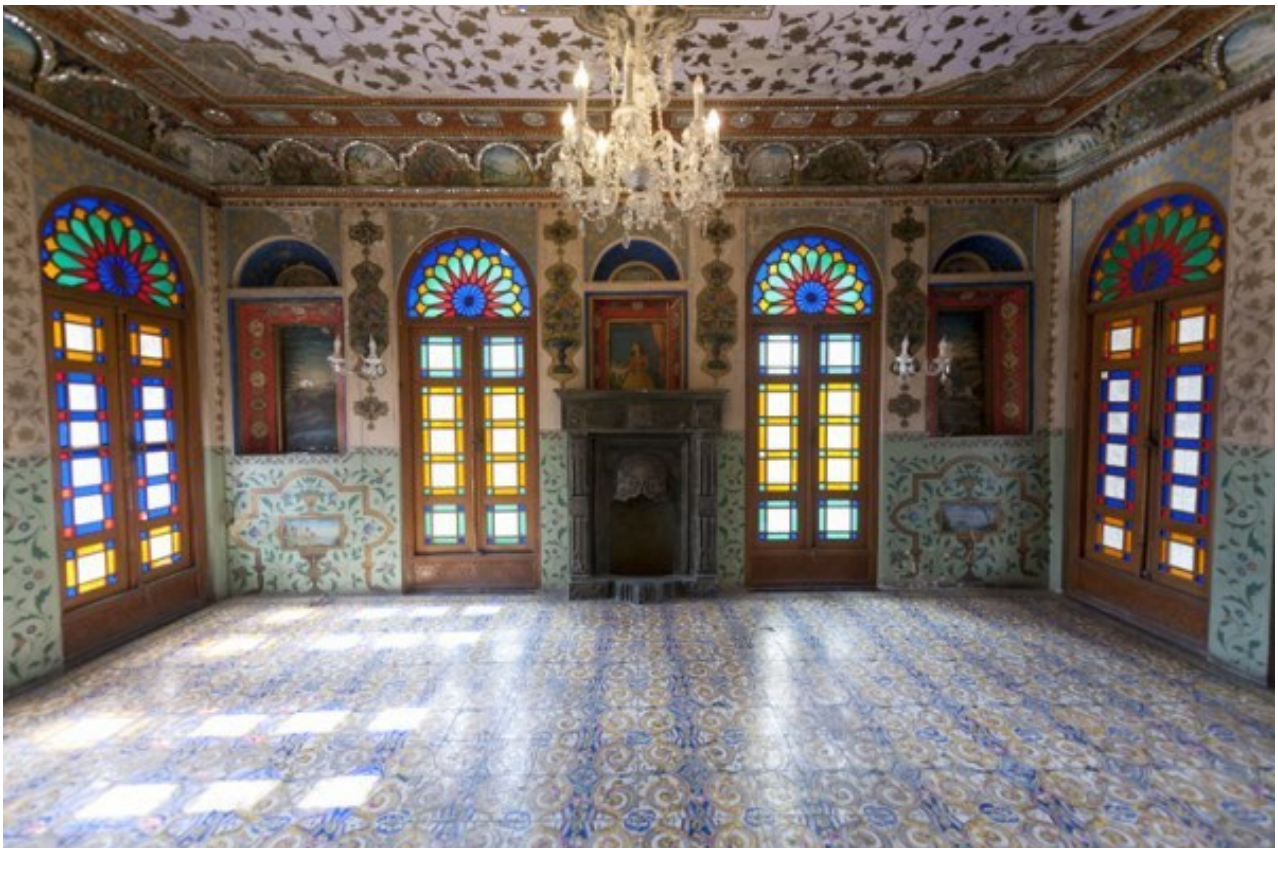


Fig 7 : Interior view of Masoudieh Palace , golestan palace photos album

2.3 Shams-ol-Emareh, Tehran

Shams-ol-Emareh is relevant to this research as a typological comparison. Like Eshratabad, it reflects the Qajar interest in vertical architecture and elevated views [1] while continuing to use Iranian materials and decorative traditions.

The upper open levels also demonstrate the architectural importance of the loggia as a transition between interior space, external climate and the surrounding view. This comparison supports the conservation of Eshratabad's upper loggia as one of its principal spatial features.



Fig 8 : Shamsolemare palace, old , golestan palace photos album



Fig 9 : Shamsolemare palace , current view

1. Golestan Palace World Heritage Base (2023) Photographic and Cartographic Archives of Qajar Royal Estates. Tehran: Cultural Heritage Organization.

2.3.1 Shamsolemare Tehran-Mirror working(Ayneh kari)

Mirror-work formed an important part of the decorative language of Qajar royal interiors.[1] At Shams-ol-Emareh it contributed to ceremonial representation through fragmented reflections and changing light.

Archival descriptions indicate that reflective decoration also existed at Eshratabad, although its surviving extent and present condition require direct investigation. The relationship between mirror-work, daylight and the former basin is visually suggestive, but its environmental effect was not measured in this thesis.

The conservation argument is therefore based on the cultural and material significance of the decoration rather than on an unverified claim concerning glare reduction or energy performance.

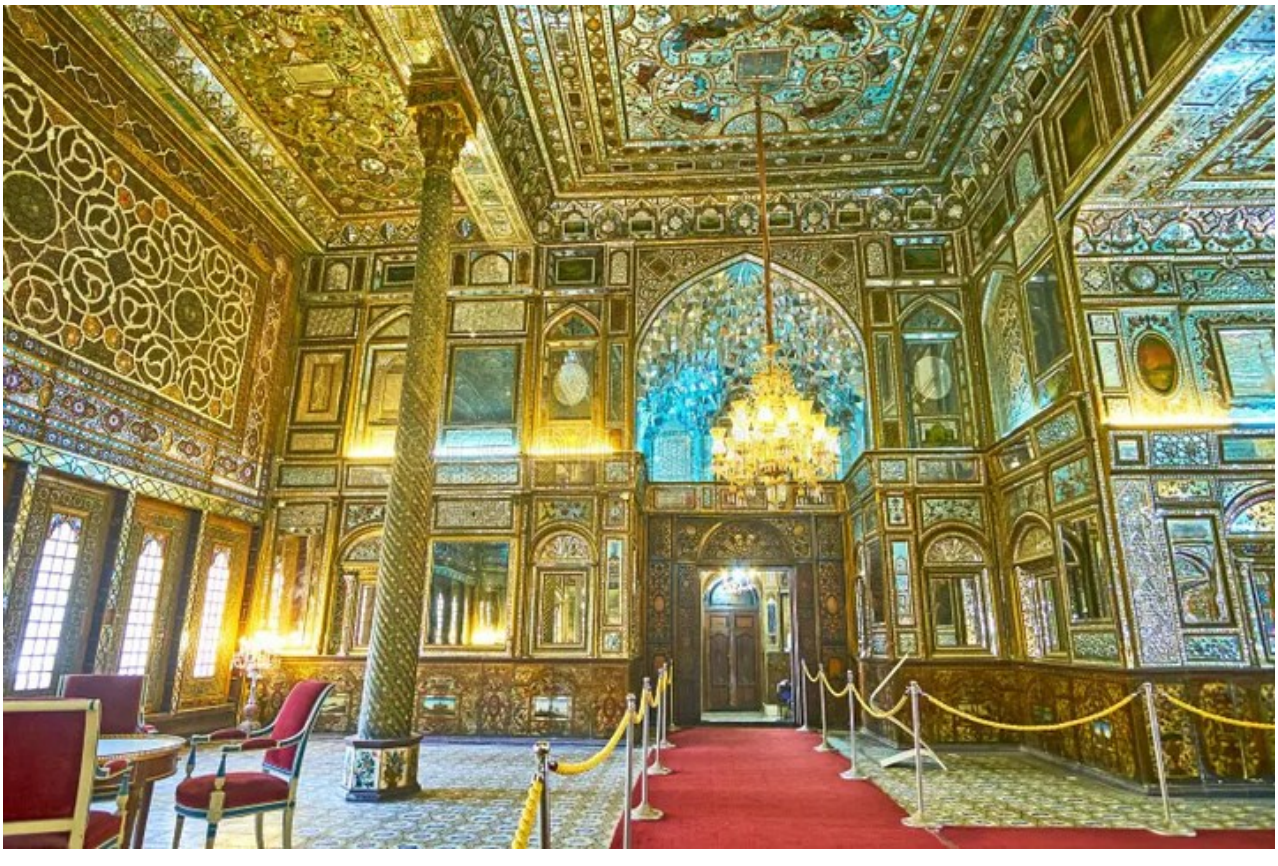


Fig 10 : Shamsolemare Tehran-Mirror working , Main Hall , golestan palace photos album

1.UNESCO Intangible Cultural Heritage, "Ayeneh-Kari: The Art of Mirror-Work in Persian Architecture," 2023

2.4Bisim Kolah Farangi: Functional Change within a Historic Pavilion

Bisim Kolah Farangi is relevant as an example of a traditional pavilion form that later accommodated a technical and institutional use. Its history shows that the Kolah Farangi type was not permanently limited to residential or ceremonial functions.[1]



Fig 11 : Bisim Kolah Farangi , golestan palace photos album

1. Reiman, 1976; Douglas, 2006

2.5 Chehel Sotoun Pavilion Isfahan

Although Chehel Sotoun belongs to the Safavid period and has a different structural configuration, it remains relevant because of the importance of historic timber in its columns and roof.[1]

Its conservation demonstrates that timber repair must begin with the identification of moisture, biological decay and loss of structural capacity.[2] The case does not provide a repair specification that can be transferred directly to Eshratabad.

Instead, it establishes the need for detailed diagnosis of timber beams, roof members and beam ends before new occupancy loads are introduced. The selection of any reinforcement or consolidant must follow material testing and structural assessment.



Fig 12 : Overview of the Chehel Sotoun Pavilion.Isfahan,Iran

1.Sarikhani, 2006
2. Feilden, 2003; Torraca, 2009



Fig 13 : current view of the Chehel Sotoun Pavilion.Isfahan,Iran



Fig 14 : Structural Timber Configuration in the Roof of Chehel Sotoun,Isfahan,Iran

2.6 Summary

The four cases provide different forms of evidence rather than a single transferable model. Masoudieh Palace demonstrates the value of retaining an existing Qajar room sequence when introducing public and cultural uses. Shams-ol-Emareh clarifies the typological importance of Qajar verticality and the upper loggia. Bisim Kolah Farangi shows that the pavilion type has accommodated functions beyond royal residence, although the technical quality of its alterations could not be evaluated. Chehel Sotoun emphasises the need for material and structural diagnosis of historic timber before intervention.

Eshratabad (Qajar) Palace, Tehran, Iran

3.The Eshratabad Mansion

3. The Eshratabad Mansion: Site Analysis and Architectural Survey

3.1 Introduction

This chapter presents a historical, spatial and preliminary technical assessment of Eshratabad Mansion based on the documentary evidence available to this research. The analysis moves from the urban and historical context to the building's plan, section, materials, visible deterioration and potential for adaptive reuse.



Fig 15 :EShratabad palace , Golestan palace album

3.2 Urban and Historical Layers

3.2.1 Territorial and Urban Framework

Eshratabad Mansion stands within the Wali-e-Asr Garrison[1], on land that once formed part of the wider Eshratabad Garden. Urban growth has surrounded the former garden with residential areas, major roads and institutional uses. The site is now physically close to the city but functionally separated from it by the restricted perimeter.

This central location may support a future public and working programme, but pedestrian access, traffic noise and public-transport connections require direct study. The location is therefore treated as a potential advantage rather than as a confirmed condition of quietness or convenience.



Fig 15 : Iran map , personal edit , out of scale



Fig 16 : Tehran map , personal edit , out of scale





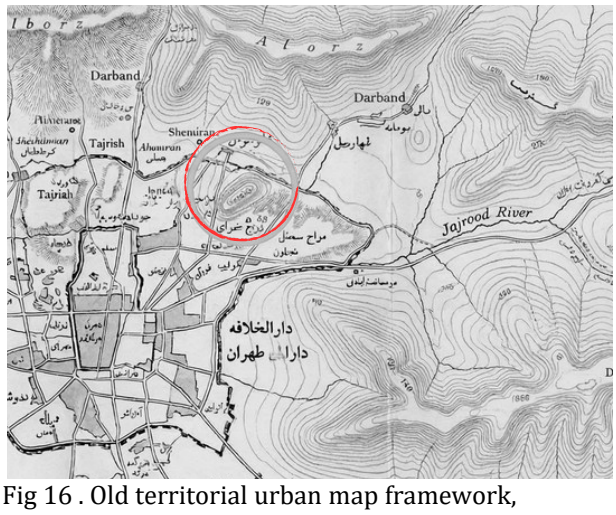


Fig 16 . Old territorial urban map framework, by author

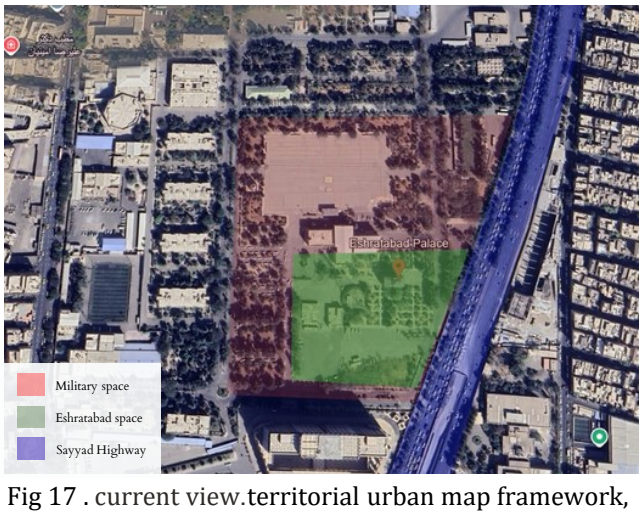


Fig 17 . current view.territorial urban map framework, by author

1. Najmi, 1988; Reiman, 1976

3.2.2 Historical Framework

Eshratabad underwent several changes of use. It began as a Qajar garden pavilion[1] surrounded by a basin and a repeated group of smaller residential buildings. Published descriptions commonly refer to approximately thirty peripheral pavilions, although their exact number and layout require archival verification.

The site was later incorporated into a military compound and the mansion acquired institutional functions. Published accounts refer to administrative, communication and detention-related uses, although the chronology of these changes should be verified through further archival research.

Blocked openings, inserted partitions and altered surfaces may relate to these later phases. Rather than treating every later intervention as damage, the conservation proposal requires each alteration to be documented and evaluated before a decision is made about its retention or removal.[2]



Fig. 18: The peripheral pavilions of the Shah's wives (harem). ,Golestan Palace Photographic Archive.

1. Eyn al-Saltaneh, 1995; Golestan Palace Archives, 2023
2. Douglas, 2006; Feilden, 2003

3.2.3 Climate and Environmental Analysis

Tehran has a semi-arid climate[1] with hot, dry summers and a marked difference between daytime and night-time conditions. These characteristics make solar protection, controlled ventilation and the thermal behaviour of masonry relevant to the proposed reuse. The climatic information used in this thesis is regional and should not be treated as a substitute for on-site monitoring.

Thermal mass. The available drawings indicate substantial load-bearing masonry, particularly on the lower levels. Such construction may moderate short-term indoor temperature fluctuations and delay part of the daytime heat flow[2]. The scale of this effect depends on wall thickness, material properties, surface finishes, ventilation and occupancy. Because these variables were not measured, thermal mass is treated as a potential benefit rather than as a quantified performance result.

Vapour-permeable construction is important for moisture management. Dense cement mortars and impermeable synthetic finishes may restrict drying and contribute to moisture accumulation[3]. The proposal therefore recommends compatible lime-based mortars and vapour-permeable finishes selected after analysis of the existing wall construction. This does not necessarily require exposed brick; existing or historically appropriate lime plaster should be retained where evidence supports it.

Orientation and shading. The main facades are approximately aligned with the north–south direction. At Tehran's latitude, the noon solar altitude is approximately 78° at the summer solstice and 31° at the winter solsticeThey indicate that horizontal shading can be more effective against high summer sun than against low east and west radiation.[1]

1. Climate-Data.org, 2024
2. Feilden, 2003; Douglas, 2006
3. Torraca, 2009; UNI, 2006

The actual shading performance of the loggia depends on its depth and the position of the openings. It should therefore be tested through a section-based solar study.

Windows and facade relief. The Orosi windows and coloured glazing[1] influence the distribution and colour of daylight. Their effect on glare and workplace comfort was not measured and should be tested through daylight simulation. Similarly, the relief of the ornamental brickwork creates small changing areas of shade, but its influence on surface temperature was not quantified.

Ventilation. The available sections indicate that the central halls are separated by solid floors rather than forming a continuous vertical void. The historic building therefore does not provide a clear internal stack-ventilation path. The proposal explores whether the new circulation core could also assist controlled upward ventilation through high-level openings and an openable rooflight.

This remains a design hypothesis. It must be validated through airflow simulation, fire-safety assessment and detailed coordination with the lift system.

Site conditions. Archival photographs show that water and vegetation were important components of the former garden. The present site contains more impermeable ground and a reduced relationship between the pavilion, basin and planting. Reintroducing permeable surfaces, shade trees and a managed water element may improve rainwater infiltration and outdoor thermal comfort. The scale of this effect requires future microclimatic simulation and monitoring.

The environmental strategy is therefore based on cautious use of the building's existing characteristics. It identifies potential benefits without presenting them as measured performance.

1. Sarikhani, 2006

3.2.4 Cultural and Military Context

Eshratabad was originally part of a royal garden associated with leisure, residence and court life. The pavilion, basin, vegetation and peripheral buildings formed a connected spatial composition.

The later incorporation of the site into a military compound substantially changed this relationship. Public access became restricted, institutional functions were introduced and the mansion became separated from the everyday urban life of Tehran.

These later changes should not automatically be erased. The Nara Document on Authenticity supports an understanding of significance that may include more than the earliest construction phase.[1] The military period can therefore be treated as part of the building's historical stratification, provided that its surviving evidence is properly documented.

The conservation proposal does not seek to recreate a single idealised Qajar condition. Later additions should be retained where they have evidential value and do not threaten the building. Damaging or obstructive elements may be removed only after documentation and assessment.

1. ICOMOS, 1994; Brandi, 2005

3.2.5 Architectural Form and Typology

The Kolah Farangi, literally the European hat, is a building type that entered Iranian architecture in the Safavid period and was substantially reinterpreted under the Qajars[1]. Its defining characteristics are a compact, freestanding, centralised plan, a position isolated within a garden rather than embedded in an urban fabric, and an elevation designed to be read equally from all sides. What distinguishes the Qajar version, and Eshratabad in particular, is verticality. Where the Safavid pavilion extends horizontally and dissolves its boundary into a colonnaded talar, Eshratabad stacks four levels and terminates in an open loggia, producing a tower rather than a garden room.

This shift is not stylistic borrowing alone. It reflects a change in what the building was for. Naser al-Din Shah's European travels introduced an interest in the elevated viewpoint and in the building as an object visible across distance, and both Shams-ol-Emareh and Eshratabad translate that interest into Iranian construction technique. The result is a hybrid: European in massing, section and the idea of the panoramic room; Iranian in material[2], ornament, structural technique and relationship to water and garden.

Two characteristics are particularly relevant to the reuse proposal.

- First, the centralised plan creates a clear relationship between the main hall and the surrounding rooms. This arrangement can support shared and more private activities without requiring the removal of historic walls.
- Second, the vertical organisation allows different functions to be distributed across four levels, although accessibility, fire safety and structural capacity must be addressed before public use is possible. The upper loggia also provides a distinct relationship with the surrounding landscape and should remain one of the principal spaces of the building.



Fig. 19: Overview of the central pool and surrounding pavilions. ,Golestan Palace Photographic Archive.



Fig. 20: Eshratabad Palace, contemporary perspective view.

1. Sarikhani, 2006; Takmil Homayoun, 1998
2. Sarikhani, 2006

3.3 Introduction to the Selected Building

3.3.1 Building History and Structural Evolution

The Eshratabad Mansion is a prime example of late Qajar "Transition Architecture." Unlike earlier Safavid structures, it demonstrates a move towards verticality and a more complex distribution of loads.

- Foundation. The foundation type and condition are unknown because no trial pits or geotechnical investigation were possible. Broad stone footings and Sarooj mortar are found in comparable Iranian masonry[1] construction, but their presence at Eshratabad has not been confirmed. Any structural proposal must therefore begin with archaeological trial pits and geotechnical assessment.

- Load-bearing structure. The building appears to rely primarily on load-bearing brick[2] masonry combined with timber floor and roof elements. Available drawings suggest that the walls become thinner toward the upper levels, reducing dead load.



Fig 21 : Eshratabad palace - during the military era, Golestan Palace Photographic Archive.

1. Sarikhani, 2006; Torraca, 2009
2. Sarikhani, 2006; Feilden, 2003

3.3.2 Building Form and Function Analysis: Spatial Syntax

The pavilion is organised around a central hall on each level, with smaller rooms arranged around it. The available sections indicate that these halls are stacked but are not connected as a continuous vertical void.

This arrangement is compatible with a shared-work programme. The central rooms can accommodate common activities, while the surrounding rooms can support meetings, individual work and other functions requiring greater separation. Their actual acoustic performance has not been tested, and additional acoustic measures may be required.

The existing historic stairs inside the pavilion were very narrow, steep, and non-compliant with modern safety standards, making them unsafe for public use and fire evacuation.

To address this constraint, my proposal replaces the old staircase within the secondary stair zone with a new lightweight core containing a lift and a compliant staircase. To fit this system, a narrow incision was made in the local brick wall, which is structurally reinforced and braced with an integrated steel frame to ensure total structural stability. All primary load-bearing brick walls, central halls, vaulted ceilings, and authentic timber elements outside this secondary zone remain completely untouched and preserved.

3.3.3 User Needs and Conservation Constraints: A Literature-Based Assessment

Understanding the practical requirements of the proposed programme requires attention to two perspectives: the conservation constraints that any new use must respect, and the spatial expectations of the intended user groups.

From a conservation standpoint, published literature on the restoration of Qajar masonry in Tehran generally identifies moisture management as a critical technical concern. The traditional clay and brick walls of this period depend on vapour permeability to remain structurally sound[1]. A conservation report attributed to ZAV Architects (2016) [2] has been referenced in early notes on this site, but this thesis was not able to consult the complete document or verify its findings directly. For this reason, no specific claim from that source is presented as confirmed. Based on general conservation literature on comparable Qajar masonry, the proposal adopts a precautionary approach: interior finishes should remain vapour-permeable, and impermeable coatings should be avoided on the historic walls unless material testing demonstrates otherwise.

The proposed programme should therefore be understood as provisional. Its functional requirements must be tested through consultation with local residents, heritage professionals, the property owner and potential users before implementation.

Given the site's restricted military jurisdiction and geographical constraints, direct empirical stakeholder surveys were precluded at this conceptual stage. Consequently, the user-requirement framework was established through typological benchmarking of contemporary creative hubs, published architectural reuse literature, and critical spatial analysis. This preliminary programming establishes the functional parameters for the proposal, while comprehensive participatory stakeholder workshops are designated as an essential prerequisite for subsequent detailed design phases.

1. Torraca, 2009; Feilden, 2003
2. ZAV Architects, 2016

Eshratabad (Qajar) Palace, Tehran, Iran

3.4 Survey of Selected Building

3.4 Survey of Selected Building

Archival photographs indicate a large enclosed garden organised around a circular basin, the main pavilion and a repeated series of small peripheral buildings. The available images are not metric records. The exact boundary geometry, number of units and original footprints therefore cannot be established from photographs alone.

For the purpose of this thesis, the historical composition is interpreted through three elements:

- the enclosed garden boundary;
- the relationship between the main pavilion and the basin;
- the repeated rhythm of peripheral structures around part of the water body.

These elements inform the proposal without being presented as an exact archaeological reconstruction.

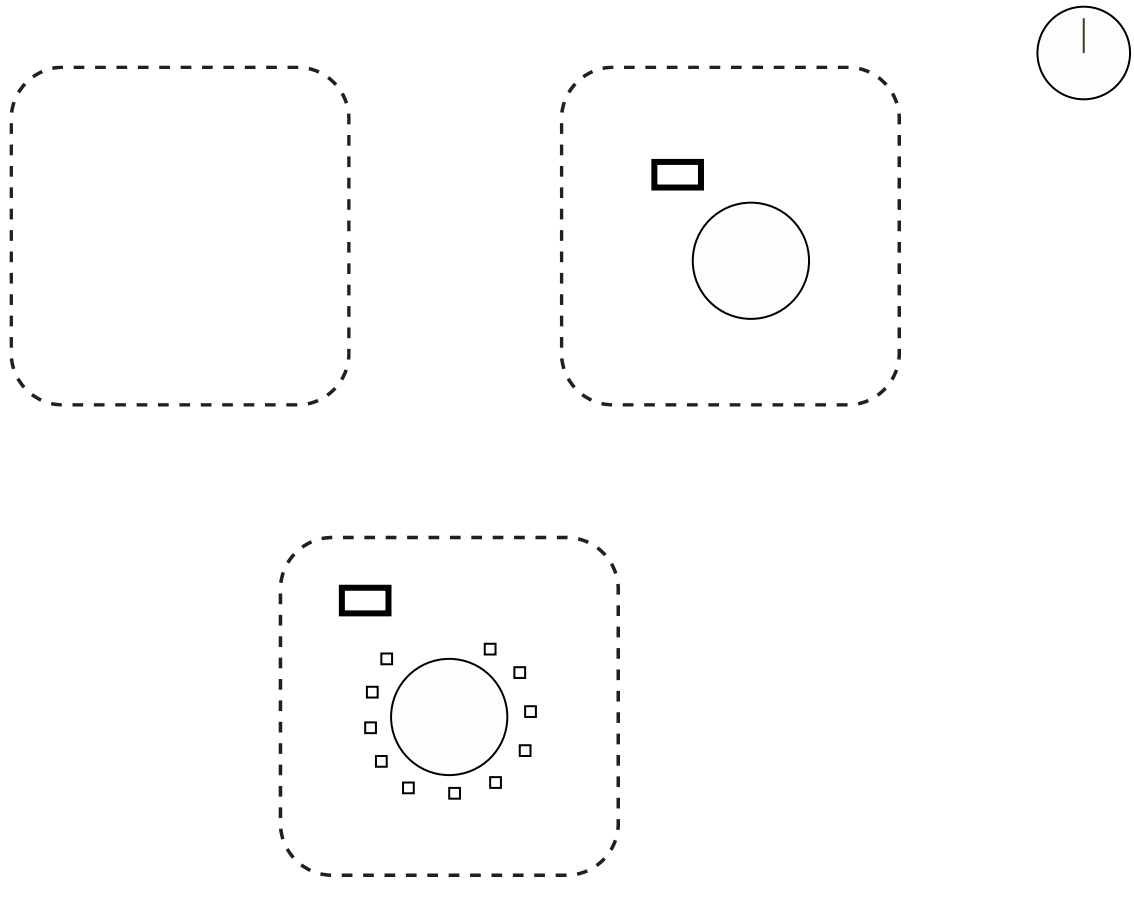


Fig 22 : The morphological evolution of the Eshratabad complex

3.4.1 Planimetry and Site Topography

Planimetric analysis indicates that decades of military utilization have heavily altered the historic setting. Extensive paving with impermeable asphalt surrounding the pavilion has exacerbated the localized urban heat-island effect and disrupted natural surface drainage.

The landscape strategy proposes replacing this impermeable ground with high-albedo permeable paving, dense vegetation canopies, and a reinstated central water basin (Howz) derived from the original Qajar garden footprint. This transformation is designed to enhance evaporative cooling, lower ambient surface temperatures, and optimize rainwater infiltration, thereby establishing an environmentally responsive microclimate around the historic monument.

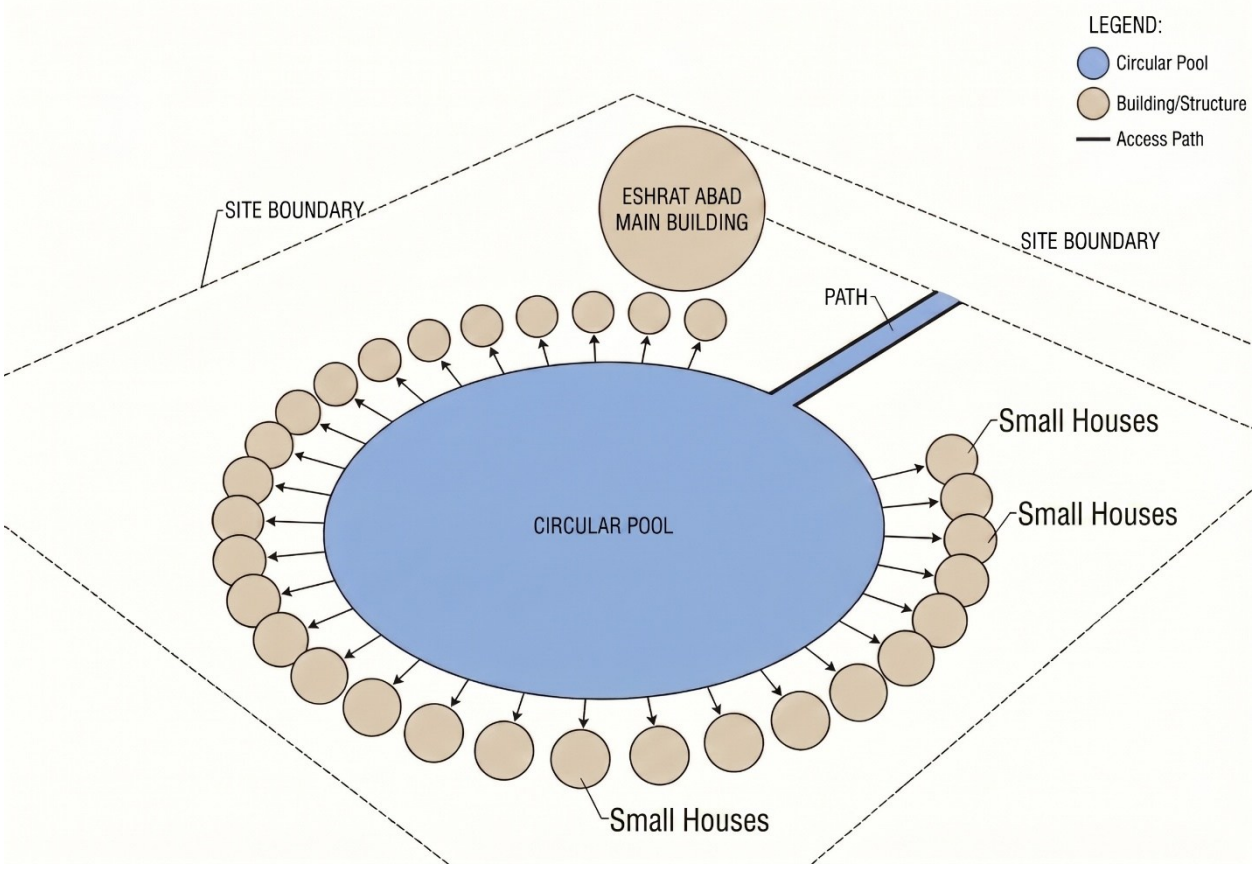


Fig 23 : bubble diagram of eshratabad palace , Tehran , by author

3.4.2 Floor Plans: Spatial Zoning

- The architectural survey of the Kolah Farangi pavilion reveals a symmetrical, centralised layout structured across four distinct vertical tiers:
- Ground Floor (Planimetric Base): The ground level features a robust masonry layout organized around a central cruciform hall flanked by four peripheral corner chambers. Heavy load-bearing brick walls and vaulted openings provide structural foundation and thermal stability, originally serving as the formal transition between the surrounding garden and the interior.
- First and Second Floors (Intermediate Levels): The middle levels replicate the centralized layout with stacked central halls surrounded by partitioned rectangular chambers. These rooms feature high ceilings, deep window reveals, and timber joist floor assemblies (Tir-choobi), providing clear acoustic and spatial compartmentalization.
- Third Floor (The Belvedere / Loggia)[1]: The uppermost level terminates in an open, extroverted pavilion surrounded by a colonnaded loggia. Slender brick columns and expansive perimeter openings frame 360-degree panoramic views of Tehran and the Alborz mountain range, functioning historically as a privileged viewing and cooling platform (Kolah Farangi).
- Vertical Circulation: Vertical movement is currently accommodated through narrow, steep internal masonry stairs located within the wall thickness, which pose significant accessibility limitations for modern public use.
- This historic spatial hierarchy provides the physical baseline upon which the adaptive reuse zoning in Chapter 4 is developed.

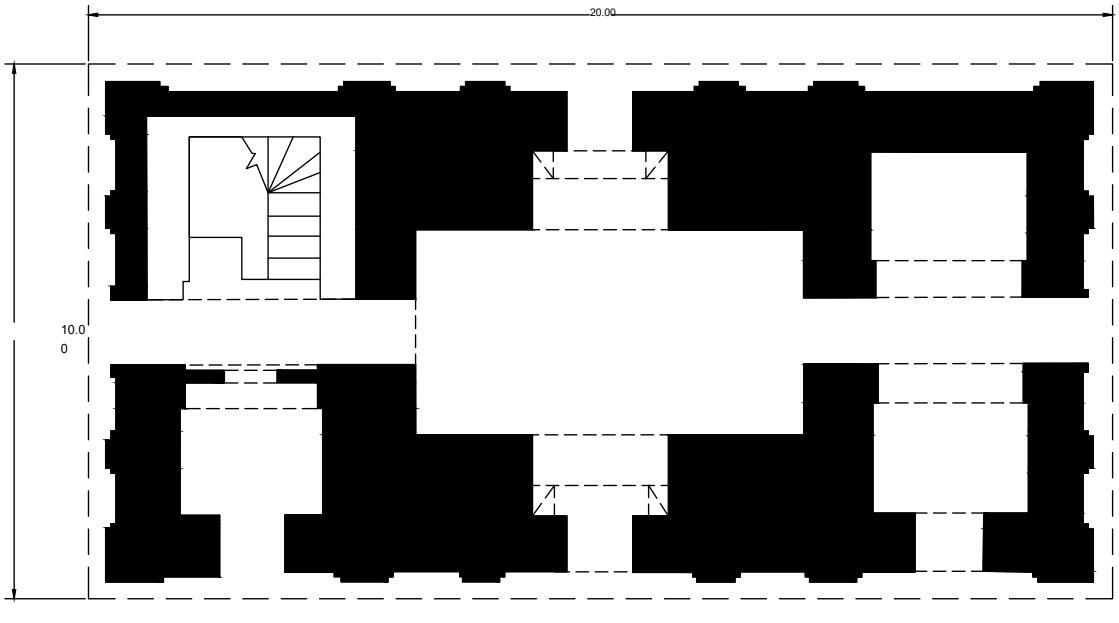


Fig 24 : Ground floor plan, current situation , Out of scale

1. Sarikhani, 2006; Reiman, 1976

3.4.2 Floor Plans: Spatial Zoning

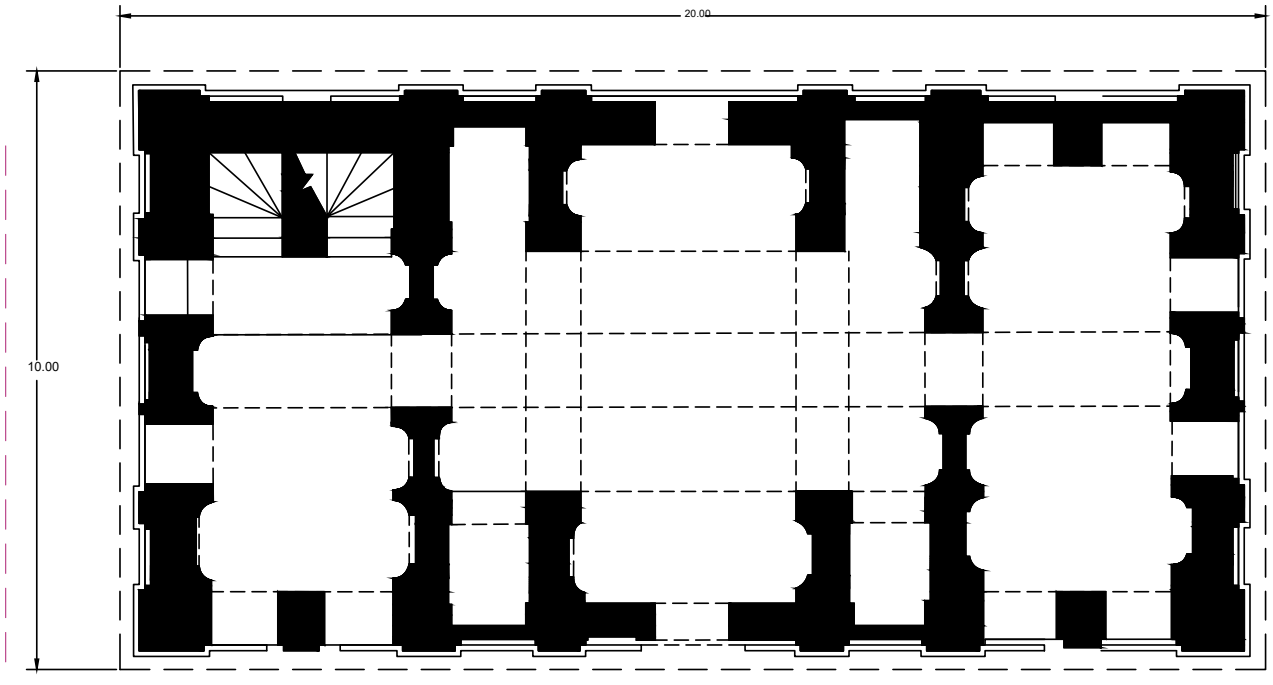


Fig 25 : first floor plan , current situation , Out of scale

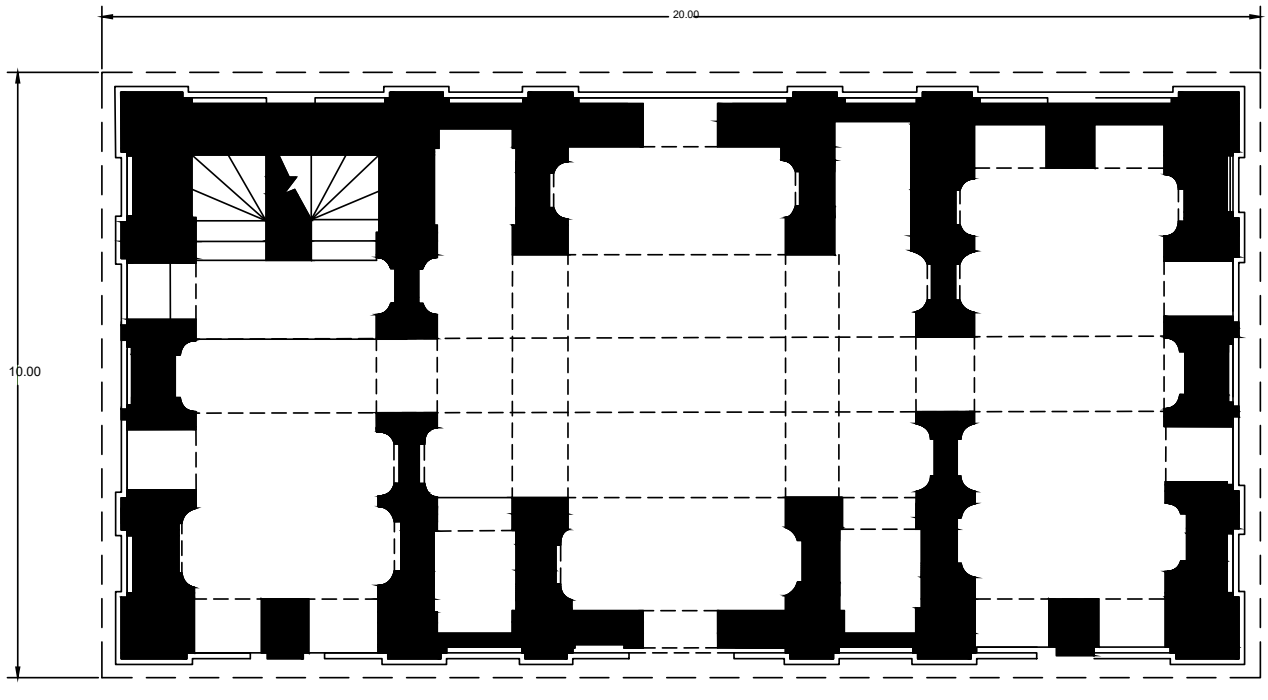


Fig 26 : Second floor plan , current situation , Out of scale

3.4.2 Floor Plans: Spatial Zoning

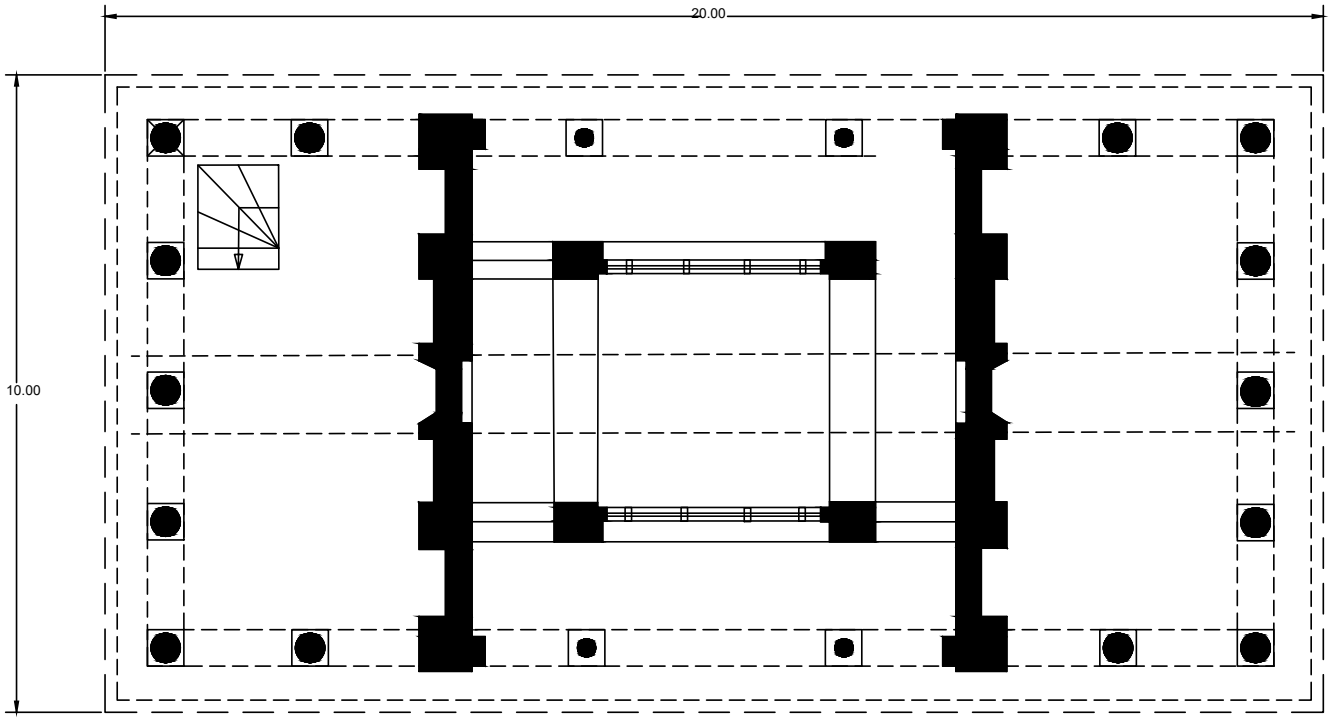


Fig 27 : Third floor plan , current situation , Out of scale

3.4.3 Facade Documentation: The Architectural Skin

- The facade combines brick masonry, timber joinery, coloured glazing and decorative relief. These elements contribute to the building's architectural character and may also influence daylight, shading and moisture behaviour.
- Orosi windows. The subdivision and coloured glazing alter the distribution and spectral quality of daylight. Their effect on glare and visual comfort was not measured and should be evaluated through daylight simulation.

Brick relief. The ornamental brick bonds create small and changing areas of shade across the facade.



Fig 28 : orosi windows , by author

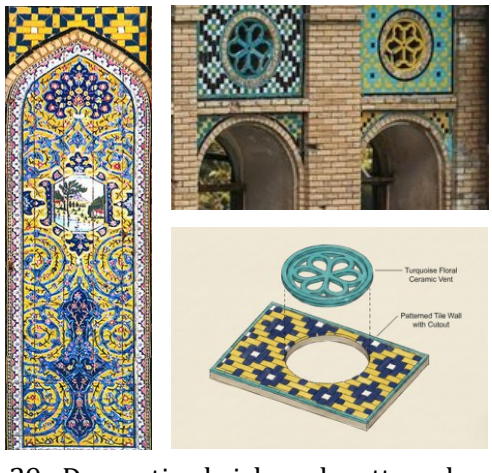


Fig 29 : Decorative brickwork pattern, by author

3.4.4 Brick column

The upper loggia includes slender cylindrical brick columns set on square bases and completed with stepped capitals. Their condition and internal construction could not be examined directly.

Conservation should therefore begin with dimensional survey, material identification and assessment of cracking, mortar loss and the connection between the columns and the roof structure.



Fig 30 : Brick columns of the upper loggia, Eshratabad, Tehran

3.5 Sections

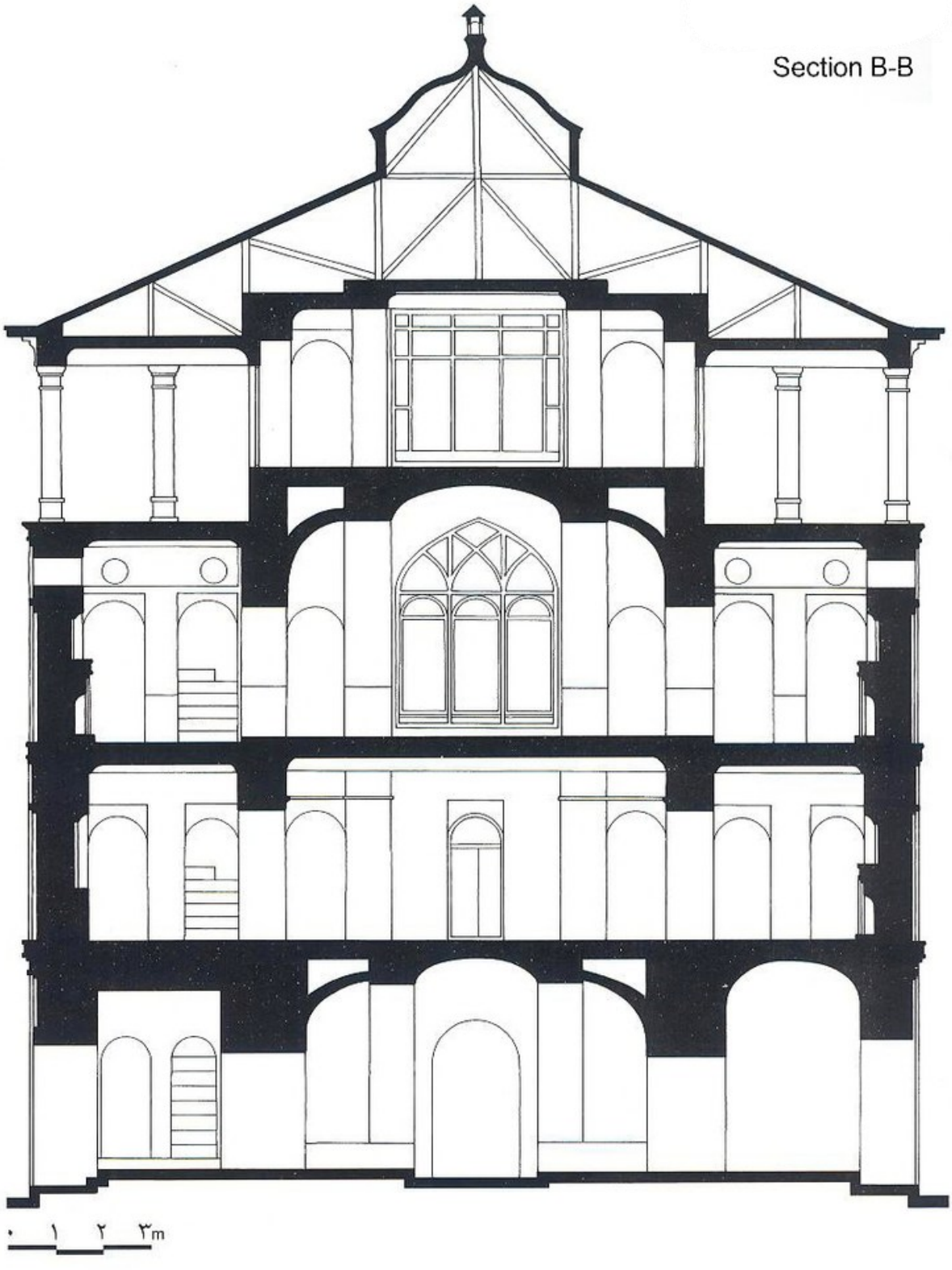


Fig 31 : Section B-B current situation , out of scale , by author

3.5 Sections

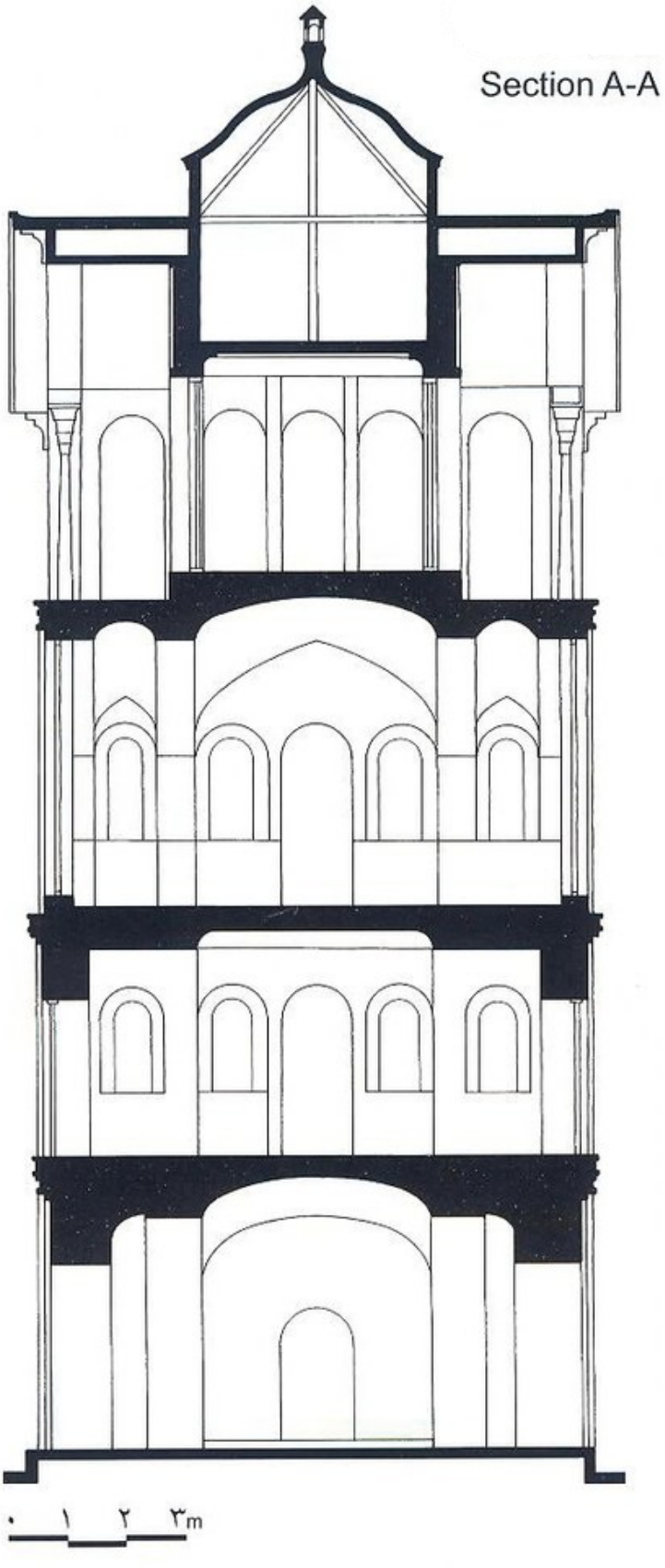


Fig 32 : Section A-A current situation, out of scale , by author

3.5 Section:
Vertical Stratification and Structural Separation

The available sections show four distinct levels separated by floor structures that appear to include timber beams[1]. Unlike a continuous atrium, this arrangement may provide some separation between activities on different floors. Its actual airborne and impact-sound performance requires testing.

The historic stairs appear narrow and steep in relation to the proposed public use. Accessibility, fire escape and occupancy limits must therefore be addressed in the next design phase.

3.6 Construction Elements of the Selected Facade

- The facade consists mainly of brick masonry, timber openings, coloured glazing and decorative surfaces. Any internal secondary glazing should be designed as a visually unobtrusive and removable layer.

1. Sarikhani, Majid. A Study of Archaeology in Qajar Architecture, 2006. P.12

3.7 Decay Analysis of Selected Facade: Pathological Diagnosis

The following assessment is based on archival images, recent photographic documentation and visual observation of the parts of the building that are visible from outside the military perimeter. As direct access to the monument was not possible, the analysis should be understood as a preliminary diagnosis. A complete conservation project would require on-site survey, material testing and structural investigation. The visible condition of the facade suggests that the building has been affected by a long period of limited maintenance. The main observable problems include weathering of brick surfaces, erosion of mortar joints, local loss of decorative material, surface staining and cracks around some openings. These conditions are likely to be related to moisture, urban pollution, exposure to temperature changes and the absence of regular repair. One of the most evident forms of deterioration is the loss of mortar between brick units. In several areas, the joints appear recessed or washed out, leaving the edges of the bricks more exposed to water and environmental stress. This may increase the risk of water penetration and local material loss. The original mortar composition should be analysed before repair, but lime-based mortar is expected to be more compatible with the historic masonry than cement-based products.[1]



Fig 33 : Local material loss and surface deterioration on the selected facade. Source: photographic documentation; graphic annotation by author.

1. Fund for Revitalization and Exploitation of Cultural and Historical Places. Shahrestanak Complex. 2019, p. 7.

Cracks are also visible in selected parts of the facade, particularly near openings and at the junction between different architectural elements. These cracks may be related to several factors, including settlement, thermal movement, traffic vibration, past alterations or the gradual weakening of mortar joints. Their exact cause cannot be identified through photographs alone. Before any structural repair is undertaken, the cracks should be mapped, measured and monitored in order to understand whether they are active or stable. The decorative elements of the facade also show signs of deterioration. In some areas, brick details, plaster decoration and tile fragments appear damaged, detached or partially missing. These elements should not be replaced automatically. The proposed approach gives priority to the conservation and stabilisation of surviving material. Reintegration should be limited to cases where the loss affects the stability or readability of the facade and where reliable documentary evidence is available. Moisture is likely to be one of the main causes of continuing deterioration[1]. Rising damp at the base of the walls, damaged drainage systems and impermeable ground surfaces around the building may contribute to the deterioration of mortar, brick and concealed timber elements. For this reason, water management must be treated as the first stage of conservation. Roof repair, drainage improvement, permeable surfaces and compatible mortar repair should be completed before any aesthetic restoration is considered. The analysis therefore suggests a clear order of intervention. First, the building should be protected from water infiltration and further decay[2] . Second, cracks and structural conditions should be investigated. Third, damaged materials should be cleaned, consolidated and repaired using compatible methods. Only after these stages should limited reintegration of lost decorative elements be considered.



Fig. 34 : Visible fissures around an opening on the selected facade. Source: photographic documentation; graphic annotation by author.

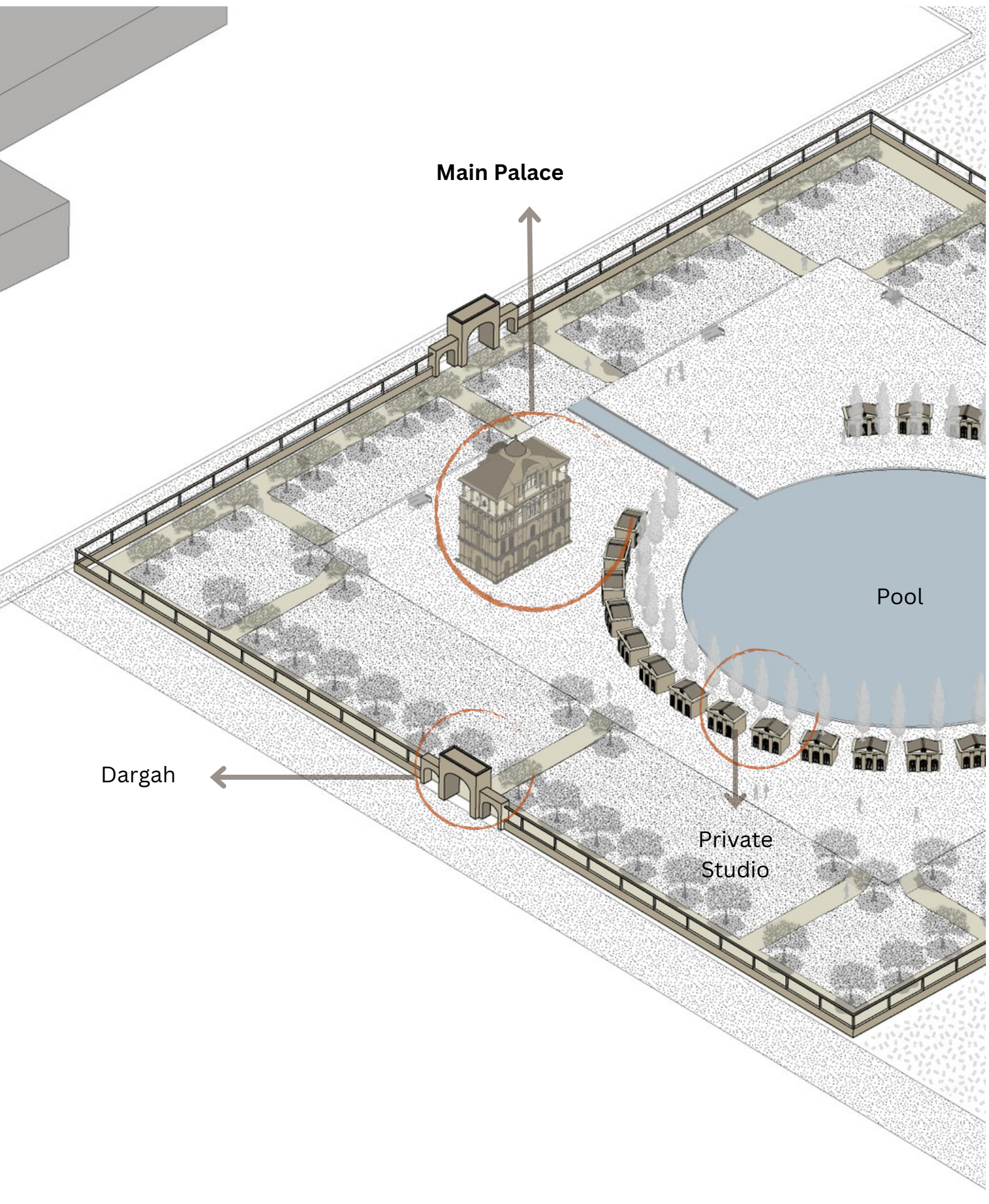
1. Feilden, 2003; Carbonara, 1997
2. Torraca, 2009; Feilden, 2003

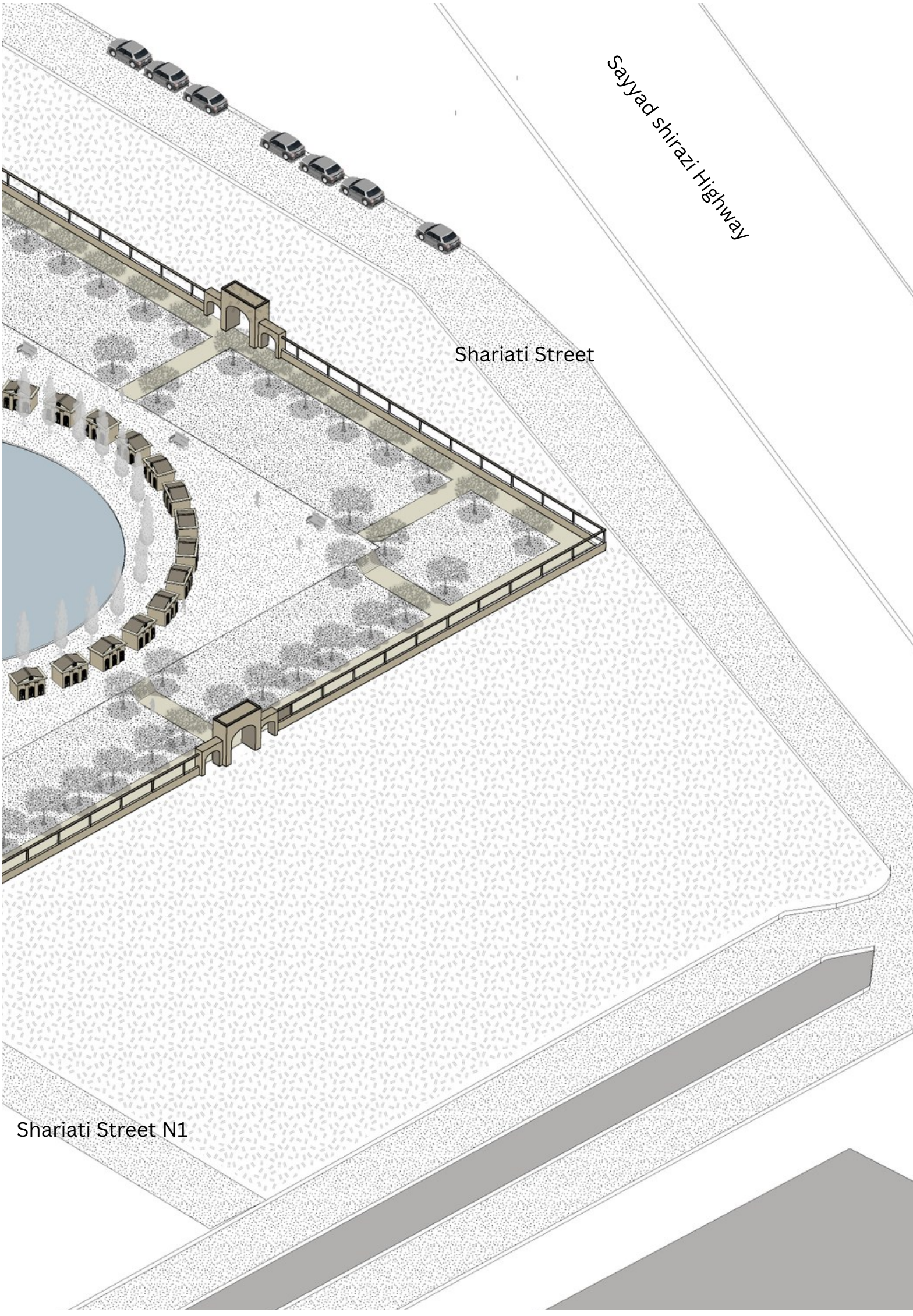
3.8 Conclusion of Problems and Potentials

The analysis presented in this chapter confirms that Eshratabad Mansion is a heritage building of considerable cultural and architectural value, but one that currently faces serious physical, functional and managerial challenges. The building survives as an important example of Qajar garden architecture in Tehran, yet it remains inaccessible to the public and has experienced a long period of limited maintenance. The main physical concerns include weathering of brick and mortar surfaces, deterioration of decorative details, visible cracks in selected parts of the facade and the probable presence of moisture-related problems. Since the present assessment is based on remote documentation, the condition of concealed structural elements, foundations, timber floors and roof components must be verified through future on-site investigation. The most important functional problem is the building's isolation. Although Eshratabad is registered as a national heritage property, it is still separated from the public life of Tehran by the military boundary. A monument that remains closed and unused cannot easily develop the regular maintenance, financial support and public awareness required for long-term conservation. For this reason, the proposed new function is considered part of the conservation strategy rather than a separate design decision. At the same time, the spatial organisation of the building provides important opportunities for adaptive reuse. The central halls can support shared activities, while the surrounding rooms can accommodate quieter and more private functions. The solid separation between floors makes it possible to organise the programme according to different degrees of activity, from public functions on the lower levels to more focused work and research activities on the upper levels. The building also contains environmental qualities that can be reactivated. Its thick masonry walls, shaded upper loggia, Orosi windows and relationship with the historic garden provide a basis for passive environmental performance. The proposal seeks to recover these qualities through compatible restoration, improved drainage, permeable landscape surfaces, planting and the reinstatement of the water basin. The project therefore proposes a phased approach. Emergency conservation and water control must come first.

Eshratabad (Qajar) Palace, Tehran, Iran

4. Restoration and Design Proposal


Main Palace
Pool
Dargah
Private
Studio


Sayyad shirazi Highway
Shariati Street
Shariati Street N1

4.Restoration and Design Proposal

4.1Critical Assessment of Conservation Constraints and Reuse Potentials

HERITAGE VALUES & ASSETS	CONSERVATION CONSTRAINTS
• Unique four-storey Qajar pavilion (Kolah Farangi) with distinctive vertical massing. • Authentic surviving fabric: load-bearing brick masonry, timber floor systems (Tir-choobi), and traditional Orosi stained-glass windows. • Natural passive potential: thermal inertia of thick masonry and solar shading from the upper loggia.	• Restricted access due to the military enclosure. • Surface weathering, eroded lime mortar joints, and local moisture risks. • Steep internal stairs that cannot provide barrier-free public access without an external solution.
COMPATIBLE REUSE OPPORTUNITIES	**MATERIAL & CONSERVATION RISKS**
• Re-functionalizing the mansion as a public Heritage Documentation and Academic Research Center. • Integrating a safe lift and stair core through a minimal, narrow incision in the secondary stair wall, structurally reinforced with a localized steel frame while preserving all primary monumental spaces. • Restoring the microclimate by replacing asphalt with permeable paving, tree canopy, and the central water basin (Howz).	• Risk of decay if regular maintenance and monitoring are not established. • Potential damage from incompatible modern materials, especially impermeable cement mortars. • Loss of public awareness and historical memory due to continuous isolation.

Fig. 35. Assessment of conservation values, constraints, and reuse opportunities, by author.

4.2 Restoration of Historical Heritage

The restoration strategy for Eshratabad Mansion is based on the understanding that the building is both an architectural object and a historical document. Its cultural value does not belong only to its Qajar origin. The later military use, the physical changes introduced over time, the surviving decorative elements and the visible signs of decay are also part of its history. For this reason, the project does not propose a complete return to an imagined original condition. Such an approach would require the removal of later historical layers and the reconstruction of missing elements for which the available evidence may be incomplete. Instead, the proposal follows the principles of minimum intervention, material compatibility, reversibility, distinguishability and respect for historical stratification. Minimum intervention [1] means that repair is preferred to replacement. Original brickwork, timber joinery, plaster surfaces and decorative details should be retained wherever possible. Replacement should be limited to elements that are structurally unsafe, completely lost or beyond repair. Material compatibility means that repair materials should not damage the historic fabric. Lime-based mortars are proposed for brickwork repair because they are more compatible with traditional masonry [2] than cement-based mortars. New finishes should remain vapour-permeable in order to allow moisture to evaporate naturally from the walls. Reversibility should be considered according to the physical impact of each intervention. Furniture and some service elements may be fully removable. The stair and lift core, however, would require interfaces with foundations, floors and landings and should therefore be considered partially reversible. These interfaces must be minimised, documented and justified through structural investigation.

1. Carbonara, 1997; Brandi, 2005
2. Torraca, 2009

Architecture value	The complex originally featured a central four-story tower (Kolah Farangi) surrounded by a large pool and 30 small annexes for the Shah's wives. The main tower features an extroverted style designed for panoramic views of the capital, while the surrounding harem houses were introverted. This layout represents a unique "garden-city" concept within the Qajar architectural tradition.
Structural and material value	The main tower is a rare example of a multi-story masonry structure from the Qajar period. It is constructed using traditional brick, timber, and mortar, featuring decorative arches, muqarnas cornices, and gable roofs. The structural integrity of the tower, despite decades of neglect, highlights the engineering quality of the era.
Environmental value	Originally built as a summer retreat on the outskirts of old Tehran, the palace is now surrounded by the dense urban fabric of the city centre. The restored garden could provide local shade, permeable ground, planting and improved water management within a densely built context. The scale of this environmental contribution should be assessed through future microclimatic study.
Cultural value	Published heritage sources report registration on Iran's National Heritage List in 1967 under no. 648.The building is associated in published sources with the court life of Naser al-Din Shah and represents a significant chapter in the architectural transition of Tehran from a traditional town to a modern capital.

Economic value	The proposed mixed use may generate income through workspace membership, studio rental, cultural events and café operation. The scale of this income and its ability to support conservation require a separate financial and operational feasibility study.
Social value	Currently isolated within a military garrison, the site's social value lies in the potential for "reconnection." Opening it to the public would return a lost heritage asset to the citizens, fostering a sense of identity and historical continuity for the local community and the wider population of Tehran.

The values identified above need to be translated into practical conservation decisions. Architectural value requires the protection of the pavilion's original spatial hierarchy, facade composition, upper loggia and surviving decorative elements. Structural and material value requires further investigation, crack monitoring, roof repair and moisture control before any new occupation is introduced. Environmental value requires the recovery of passive features, including thermal mass, shading, filtered daylight, permeable ground surfaces, planting and the water basin. The proposed coworking and cultural programme was selected because it can be accommodated with relatively light and flexible interventions. It does not require heavy machinery, large structural alterations, extensive wet areas or deep service channels within the historic masonry. Its spatial requirements can be met through furniture, limited reversible partitions and carefully distributed technical infrastructure.

LEVEL	ROOM-NUMBER	PROPOSED MAIN FUNCTION
Ground Floor	**4**	Entrance, reception, café and cultural information
First Floor	**3**	Shared workspaces, atelier and computer laboratory
2nd Floor	**3**	Hot desks, meeting rooms and community workspace
3rd Floor	**3**	Conference area, research space and terrace

Fig. 36 : Approximate spatial capacity and proposed functional distribution of the main pavilion. Source: author, based on available survey drawings.

4.2.1 Core Conservation and Restoration Principles

Retain sound original material. Existing brickwork, timber, plaster, tile and decorative surfaces should be repaired rather than replaced wherever their condition permits.

Treat causes before symptoms. Water penetration, defective drainage, roof failure and incompatible earlier repairs must be addressed before cleaning or decorative reintegration.[1]

Use compatible materials. Mortars, plasters, paints and consolidants should be selected after analysis of the existing materials and should allow appropriate drying of the historic fabric. [2]

Make new work legible. Contemporary additions should be recognisable on close inspection without creating unnecessary visual contrast. [3]

Minimise irreversible intervention. New services, furniture and access elements should avoid unnecessary cutting of historic masonry. Where irreversible work is unavoidable, its extent and justification must be documented.[4]

Record all operations. Survey drawings, photographs, material tests and intervention records should form part of a permanent conservation archive.

1. Feilden, 2003; Torraca, 2009
2. Torraca, 2009; UNI, 2006
3. Brandi, 2005; Dezzi Bardeschi, 2005
4. Carbonara, 1997; Feilden, 2003

4.3 Design Concept

The proposal seeks to transform Eshratabad from an inaccessible monument into an actively used heritage site. Its design is organised around three related ideas: conservation through use, environmental improvement through landscape and public reconnection through controlled access.

Conservation through use means that the programme follows the existing spatial organisation. Shared work, research, small educational events and cultural activities can be accommodated within the central halls and surrounding rooms with limited permanent alteration.

Environmental improvement focuses on the relationship between the pavilion, planting, permeable ground and the former basin. These interventions are expected to improve shade, rainwater infiltration and outdoor comfort, although their performance requires future testing.

Public reconnection is addressed through a controlled route from Shariati Street to a defined heritage precinct. This is a design proposal rather than an approved security arrangement. Its implementation would require agreement between the property owner, heritage authorities and the future operator.

User Categories and Spatial Requirements:
The following user requirements are provisional and derived from the literature and the proposed programme.

- Freelancers & Startups:
  - Needs: Professional workspaces, high-speed internet, meeting rooms, relaxation zones.
  - Architectural Response: Converting the peripheral rooms into private offices and focused work areas; using larger halls for hot-desking.
- Cultural Tourists:
  - Needs: Access to Qajar architecture, historical insight.
  - Architectural Response: Guided tours of the main tower (Kolah Farangi), historical galleries in corridors, and timeline exhibitions.
- Locals & Citizens:
  - Needs: Social interaction, leisure, artistic events.
  - Architectural Response: Open garden spaces, cafe-restaurants, art galleries, and multi-functional outdoor event spaces.
- Researchers & Students:
  - Needs: Quiet study environments, access to historical data.
  - Architectural Response: A specialized reference library, digital archive access, and focused study nooks.

4.3.1 User Groups and Spatial Requirements

User Group	Core Need	Proposed Facilities
Freelancers and start-ups	Flexible professional workspace	Shared desks, small offices, meeting rooms, reliable digital infrastructure and informal work areas
Cultural visitors	Access to heritage interpretation	Guided route, historical timeline, exhibition panels, viewpoints and public garden spaces
Local residents	Social and cultural activities	Café, garden seating, small events, exhibitions and educational workshops
Researchers and students	Quiet study and access to information	Reading areas, digital archive access, seminar rooms and research-oriented workspaces
Heritage professionals	Documentation and training	Small conservation workshop, archive station and temporary research studios

Fig 37 : User groups, core needs and proposed facilities, by author

4.3.2 Design proposal

The proposed intervention is organized through four connected layers: conservation of the main pavilion, replacement and modernization of the vertical circulation core, environmental recovery of the garden, and contemporary reoccupation of the footprints of the lost peripheral pavilions.

The main pavilion remains the primary heritage element of the complex. Its authentic masonry walls, facade composition, surviving decorative surfaces, timber windows and upper loggia are carefully conserved and repaired using compatible materials. The new cultural and research programme is introduced mainly through movable furniture, lighting, secondary glazing and discreetly positioned services rather than through major demolition of the historic fabric.

To resolve the critical accessibility and safety limitations of the building, the narrow and steep old staircase in the secondary service zone was carefully removed. In its place, within the same vertical shaft, I introduced a new modern circulation core incorporating a compliant staircase and an integrated lift. To accommodate this new core, a minimal, narrow incision was made in the local load-bearing brick wall of the stair area. To compensate for this localized removal and guarantee total structural stability, the opening is reinforced with an integrated steel structural frame that carries the new circulation loads and braces the masonry. Meanwhile, all primary load-bearing walls, historic vaults, decorated central halls, and authentic timber ceilings outside this secondary zone remain completely intact and untouched. The new core structure is lightweight, clearly distinguishable from the historic fabric, and assembled using dry, reversible connections.[1] The same core can also support controlled natural ventilation through an openable rooflight and high-level ventilation openings.

The landscape proposal restores the environmental role of the historic garden. The circular basin is reinstated as both a spatial and climatic element, while the surrounding ground is transformed from impermeable asphalt into a combination of permeable paving, planted areas and shaded paths. The aim is not to recreate the garden exactly as it appeared in the Qajar period, but to recover its environmental and spatial principles.[2]



Fig 38 : Eshratabad palace , Golestan palace album

1. Brandi, 2005; Carbonara, 1997
2. Council of Europe, 2005; Swiss Confederation, 2018

The final layer concerns the thirty demolished peripheral pavilions. Their approximate rhythm and relationship to the basin, as inferred from archival photographs, are used as a provisional guide for a contemporary series of small studio units. These structures do not reproduce Qajar decoration or claim to be historical reconstructions. They are new, low-impact buildings that make the memory of the former complex visible while providing flexible spaces for researchers, visiting academics and small creative teams.

PROJECT OBJECTIVE	DESIGN AND CONSERVATION RESPONSE
• Protect and stabilise the historic fabric. • Introduce a compatible and potentially viable mixed use. • Improve public accessibility without compromising the security of the wider military context. • Explore opportunities to reduce operational energy demand through passive environmental strategies. • Recover the environmental role of the garden and water basin. • Make the historical evolution of the complex legible. • Provide a phased strategy that can be implemented progressively.	• Roof weathertightness, drainage remediation, and breathable lime-based repointing. • Coworking, research pods, and exhibition zones structured around existing room syntax. • Proposed controlled public entrance, subject to institutional approval from Shariati St. creating a protected civilian enclave. • Retention of existing masonry and testing of passive strategies, Assessment and conservation of Orosi windows, and proposed ventilation through the new core, subject to simulation • Replacement of asphalt with permeable surfaces, tree canopy, and evaporative basin recovery. • Multi-layered historical interpretation distinguishing Qajar, military, and contemporary layers. • 4-stage implementation (Emergency stabilization → Access/Core → Main Pavilion → Studios).

Fig. 39 : Relationship between project objectives and design responses., by author

4.3.3 Masterplan and Spatial Organisation

The masterplan is organised around a controlled public route connecting Shariati Street to the main pavilion and the restored garden precinct. The proposal distinguishes between public, semi-public and restricted areas. This zoning allows the heritage complex to be opened gradually while respecting the security requirements of the wider military site. The central basin is reinstated as the main organising element of the landscape. The new studio units follow the rhythm of the historic peripheral pavilions but remain low-rise, detached and clearly contemporary. Permeable paths, planted areas and shaded outdoor workspaces connect the studios with the main pavilion.

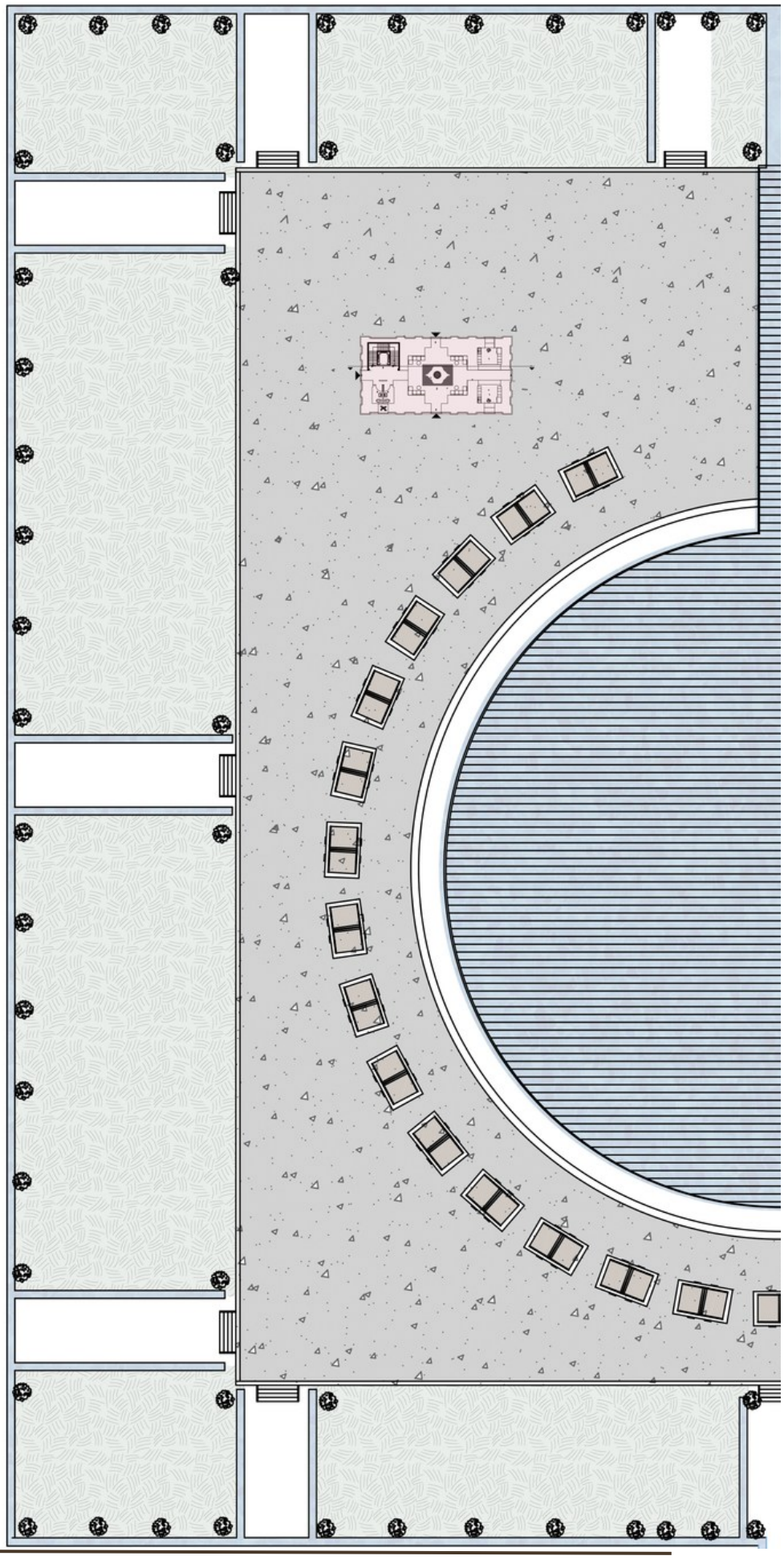
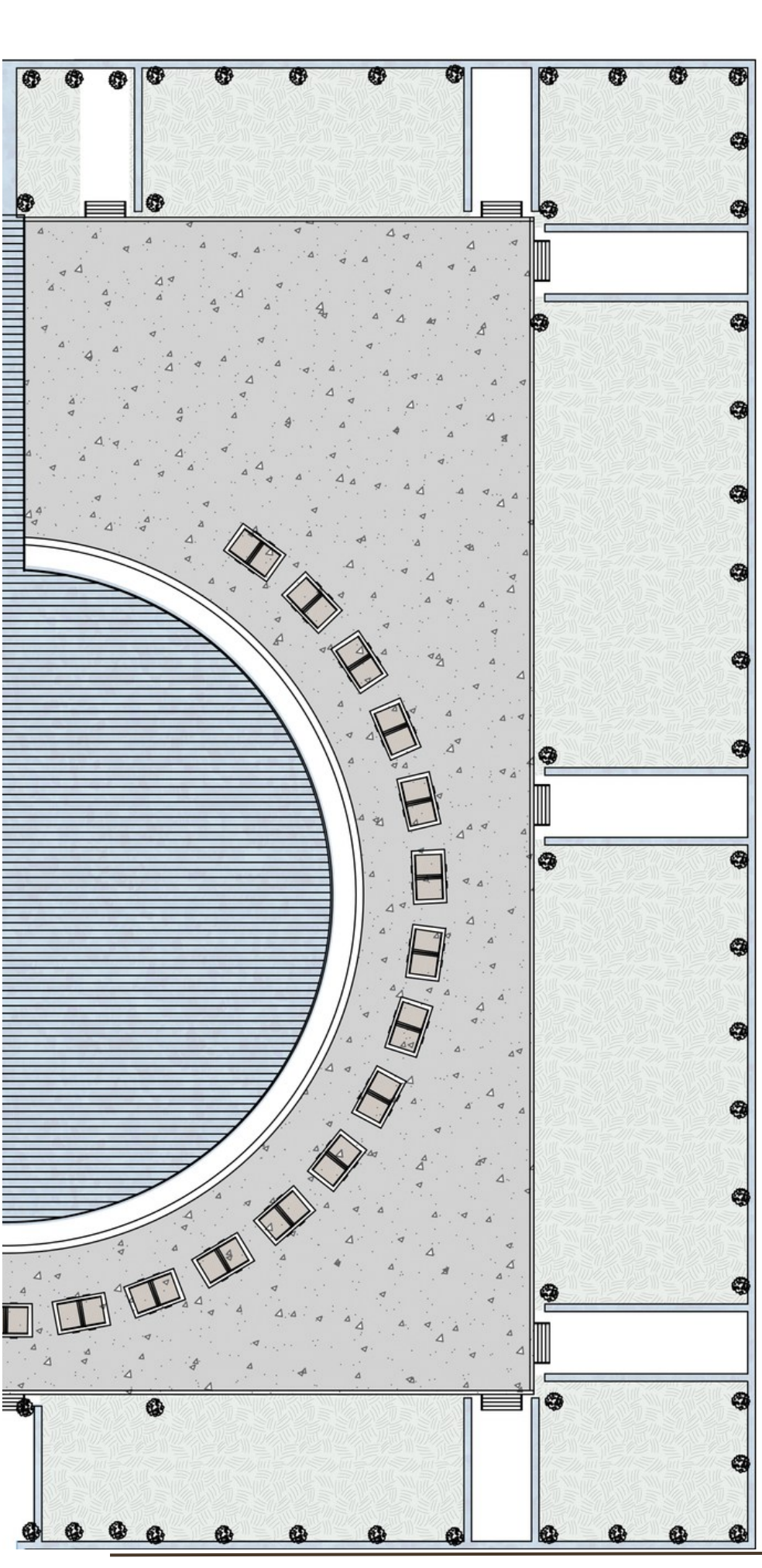
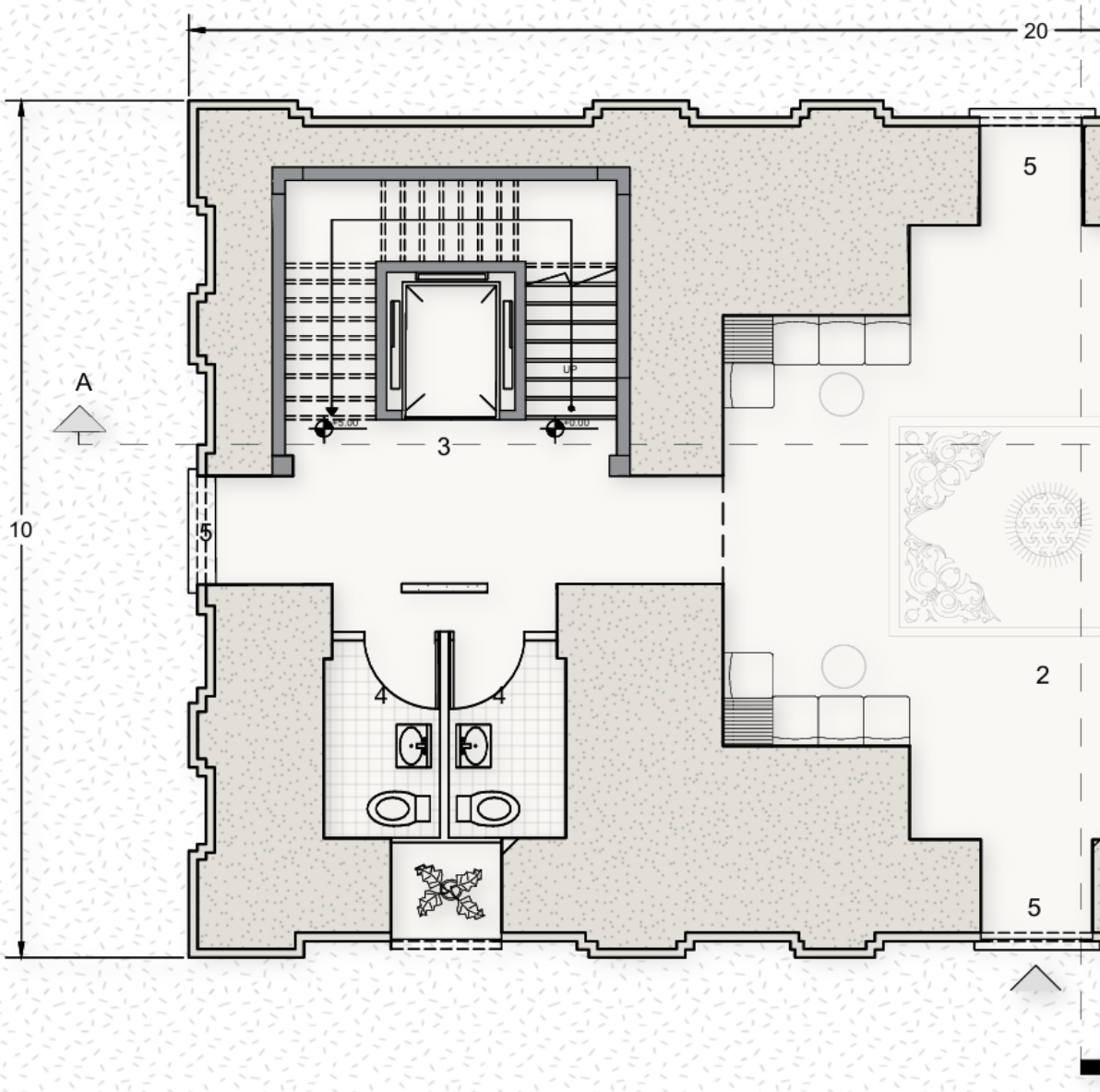


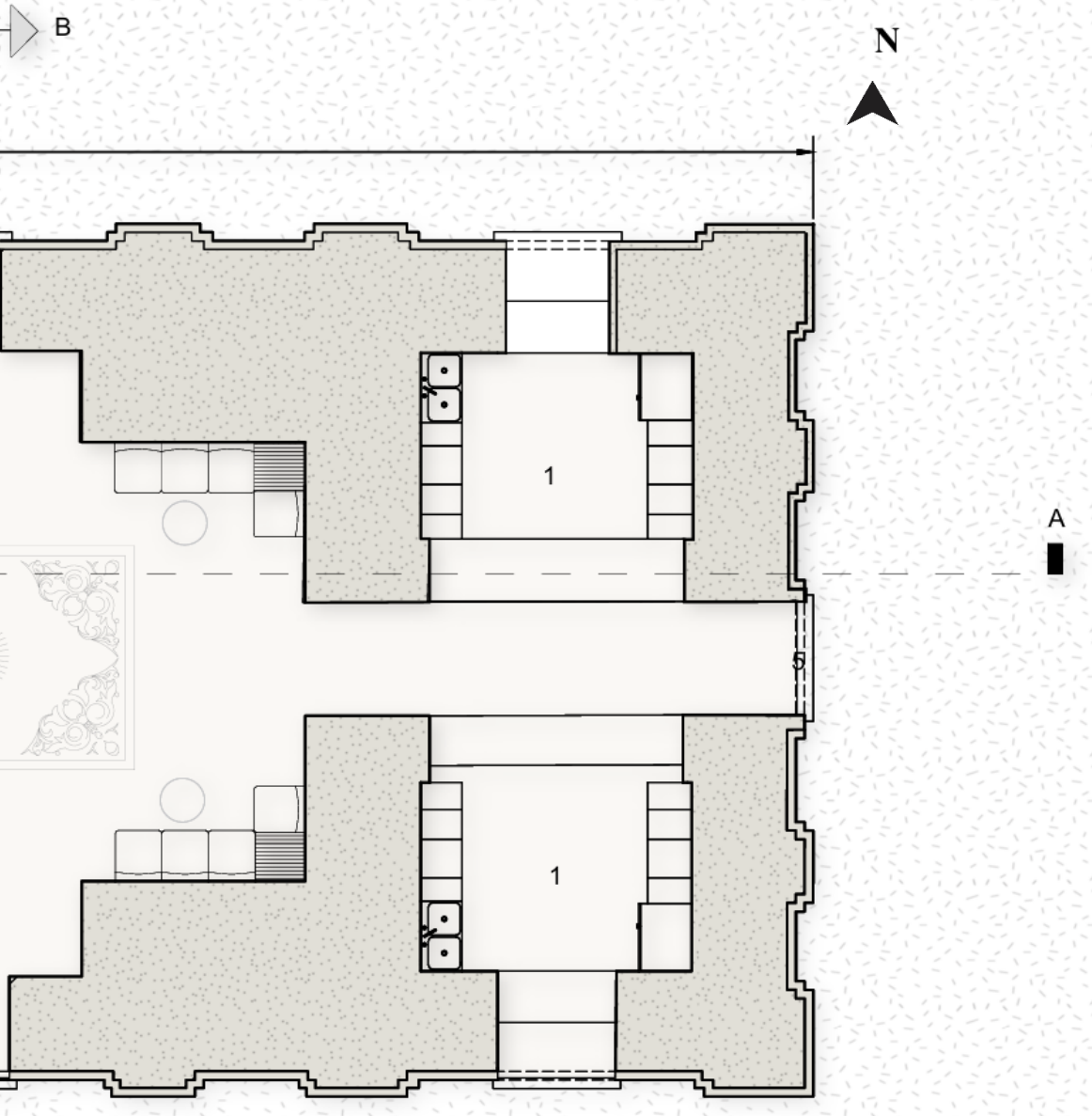
Fig 40 : site plan , scale 1:1000


N



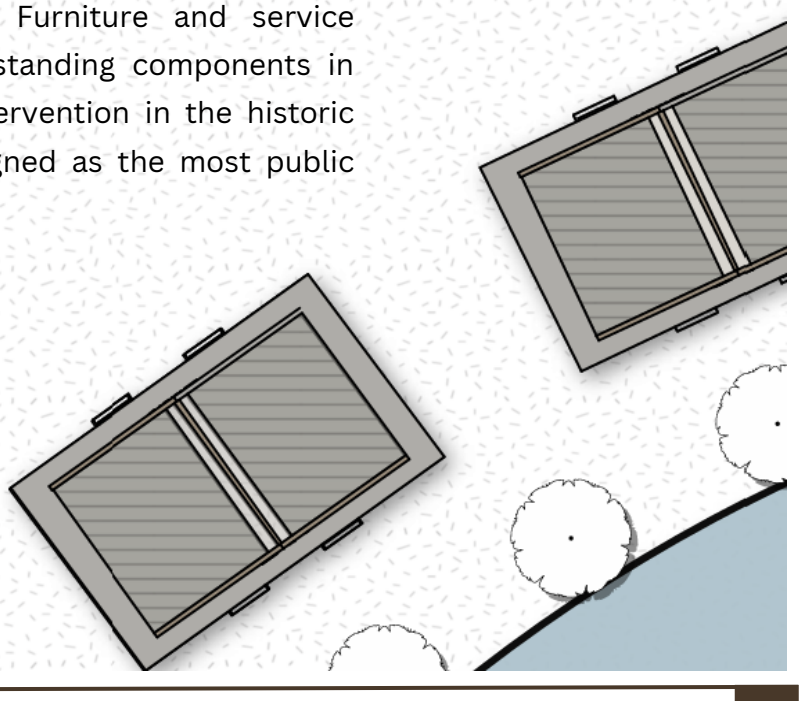
Ground Floor	
1	Café service area
2	Public gathering space and café area
3	Stair and lift core
4	WC
5	Entrance

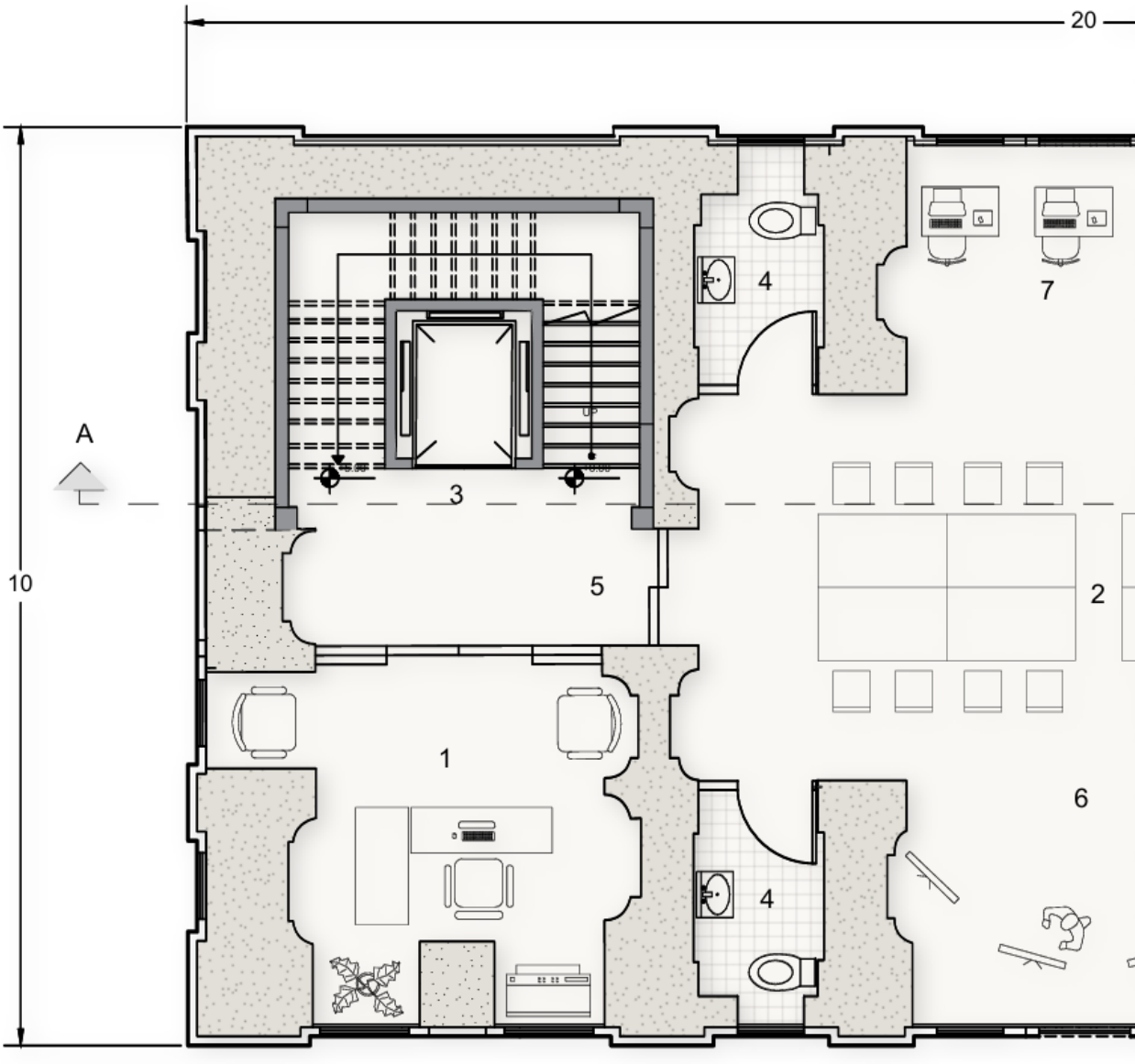
Fig 41 : Void and Cafe, Ground Floor , Scale 1:75



The central hall remains open and legible, while the surrounding rooms accommodate reception, café support functions and basic services. Furniture and service elements are designed as freestanding components in order to avoid unnecessary intervention in the historic walls. The ground floor is designed as the most public level of the pavilion.

It acts as the threshold between the city, the restored garden and the coworking programme.The intervention is intentionally limited to movable furniture, service elements and the proposed access core.



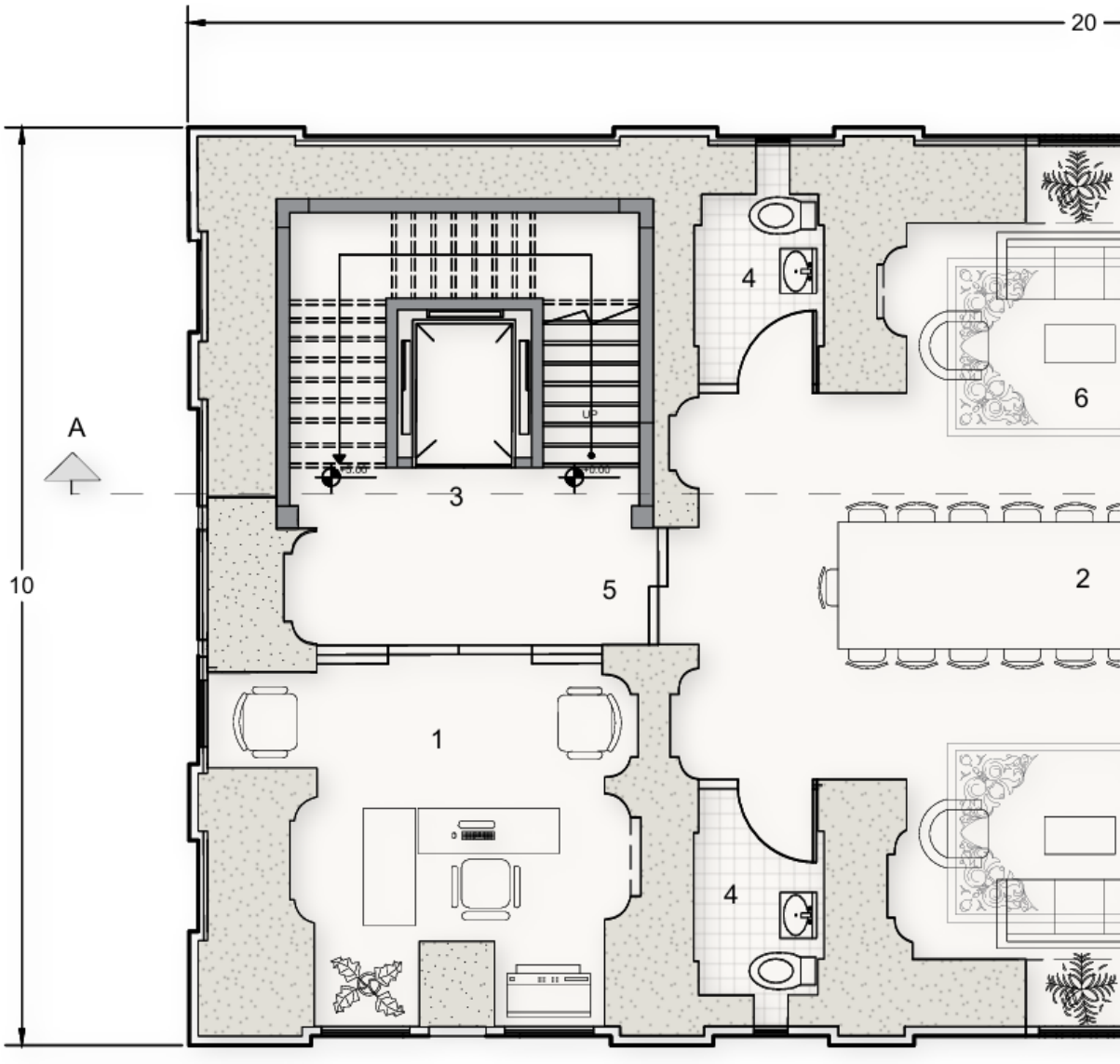


First Floor	
1	Reception
2	Semi-private working space
3	Stair and lift core
4	wc
5	Entrance
6	Atelier
7	Shared computer workstations
8	Digital workspace

Fig 42 : CO WORKING PUBLIC, First Floor , scale 1:75

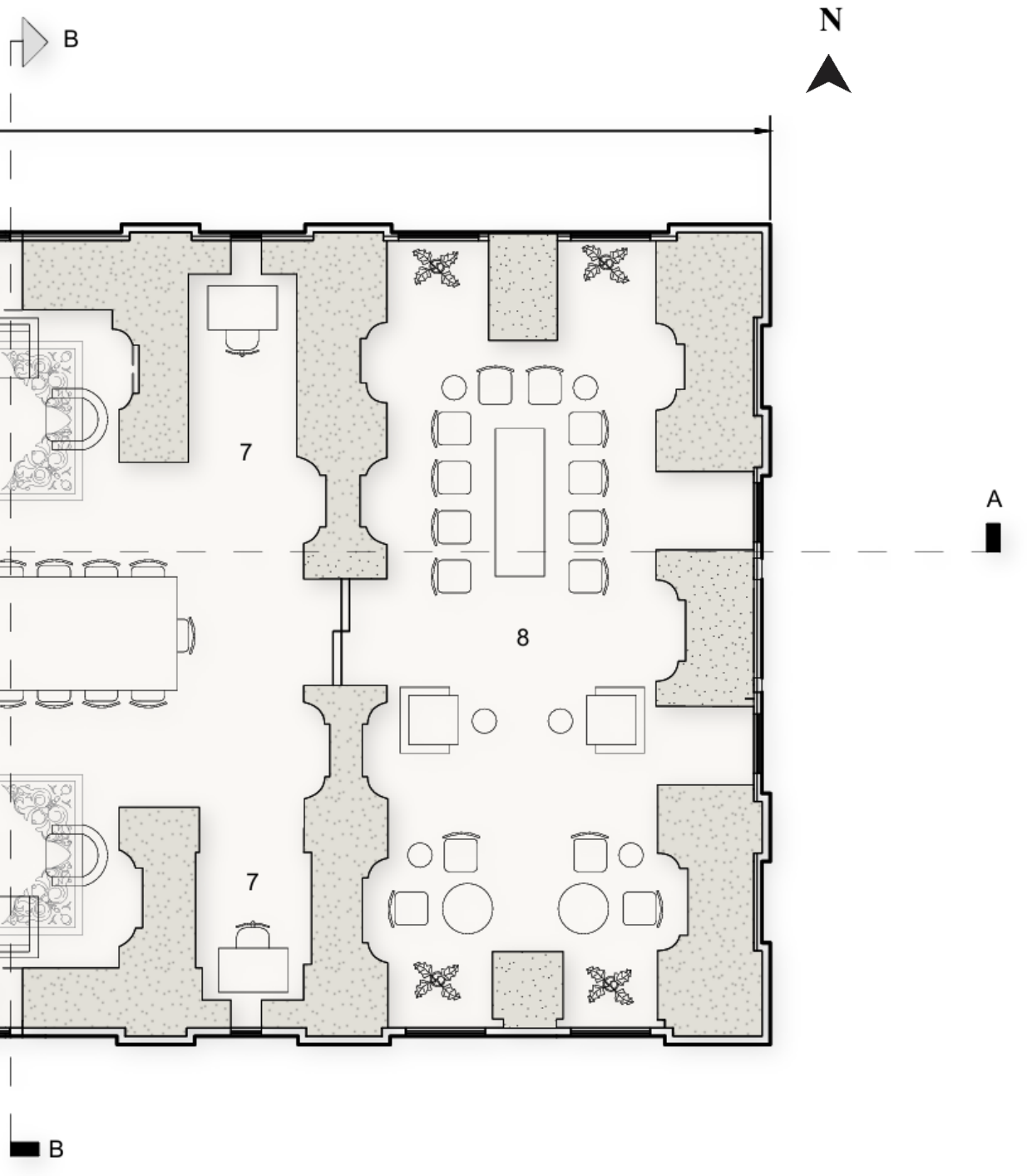


The first floor accommodates flexible work and learning activities. This level is more controlled than the ground floor but remains accessible to users and visitors of the coworking facility. The central hall is used as a shared work area, while the peripheral rooms support activities that require more concentration and acoustic separation. No load-bearing walls are removed; the programme follows the existing spatial logic of the building.

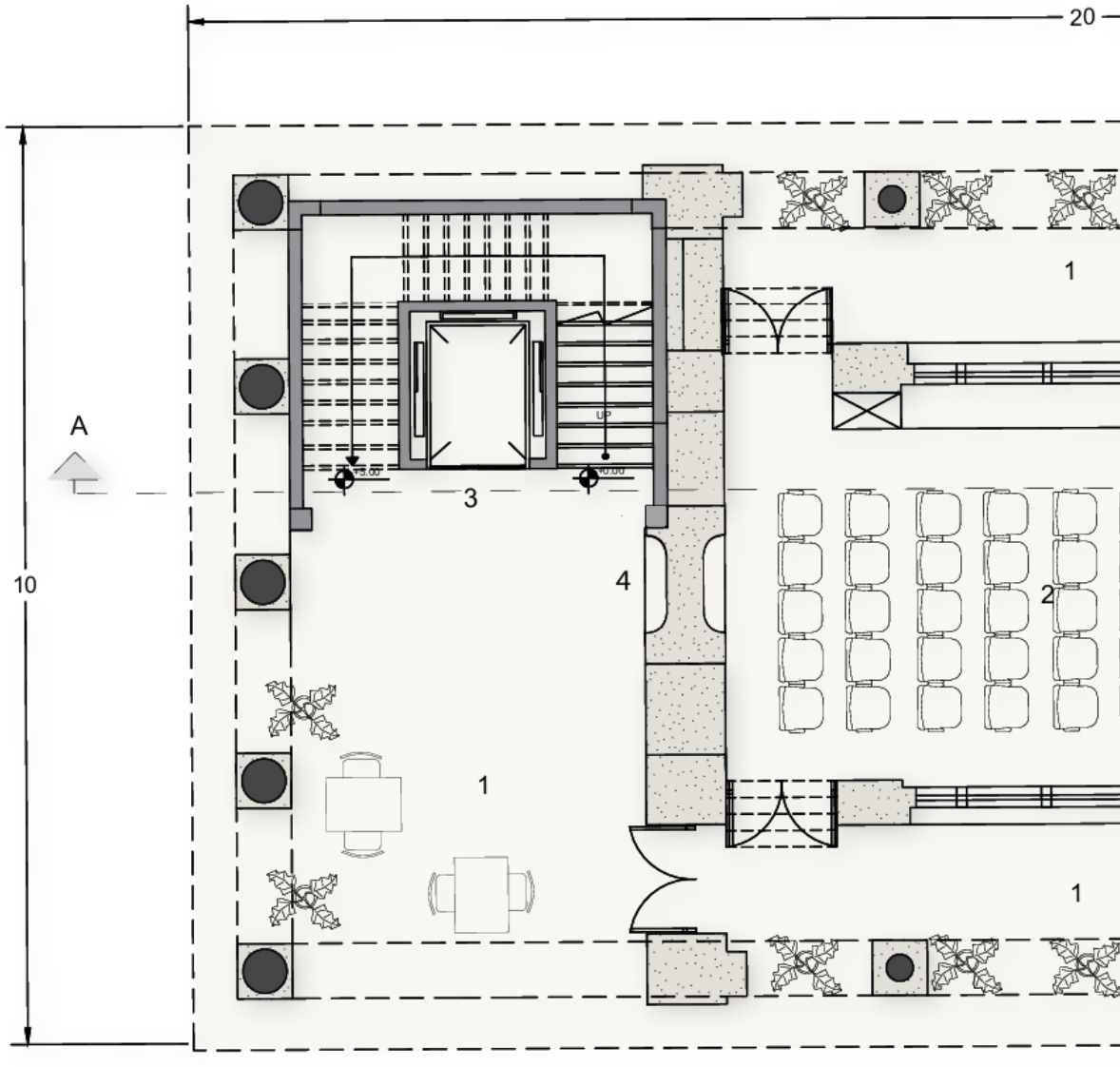


Second Floor	
1	Reception
2	Hot desks
3	Stair and lift core
4	WC
5	Entrance
6	Shared coworking space
7	Small meeting room
8	Conference room

Fig 43 : CO WORKING PUBLIC, Second Floor , scale 1:75

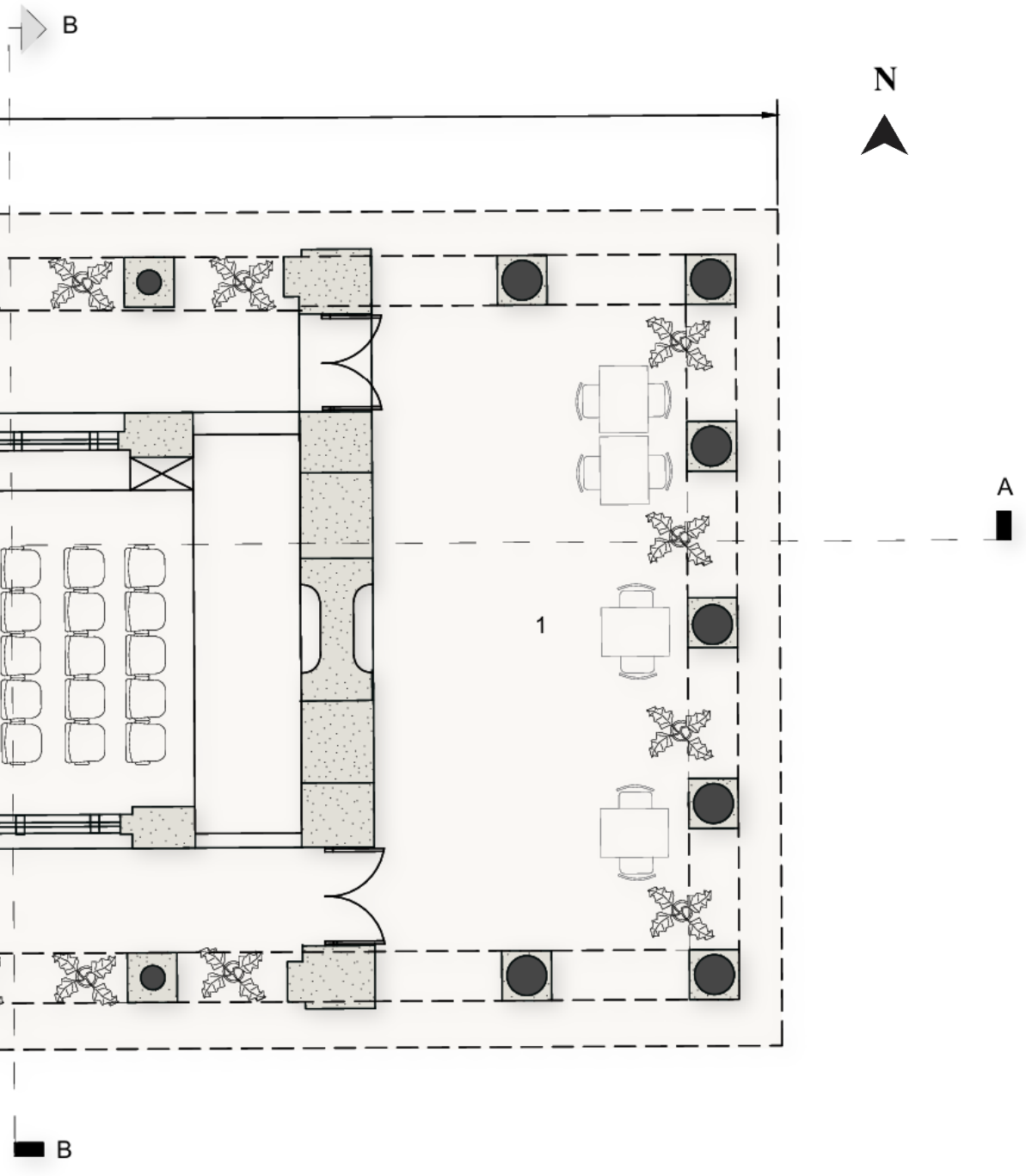


The second floor is designed as the main coworking level. It combines individual workstations with spaces for collective discussion and short meetings. The central hall supports shared work and community interaction, while the peripheral rooms accommodate quieter or more private functions. The layout allows different modes of work to coexist without introducing permanent partitions into the historic plan.



Third Floor	
1	Terrace
2	Conference room
3	Stair and lift core
4	Entrance

Fig 44 : CONFERENCE ROOM, Third Floor , scale 1:75



The third floor is conceived as the quietest level of the building. Its distance from the entrance and the more active lower floors makes it suitable for conferences, research meetings and focused work. The terrace is treated as a seasonal extension of the interior programme and provides a shaded outdoor area with views towards the restored garden and the surrounding city.

4.3.4 Contemporary Studios on the Footprints of the Lost Peripheral Pavilions

Archival photographs of Eshratabad show a series of small peripheral pavilions arranged around the circular basin. These buildings were an important part of the spatial identity of the royal garden, but they no longer survive. Their loss has weakened the connection between the main pavilion, the basin and the surrounding landscape. The project does not propose an exact reconstruction of the lost buildings. An exact reconstruction would require complete and reliable information about their dimensions, materials, interiors and decorative details, which is not currently available. Instead, the proposal introduces a series of contemporary[1] studio units arranged according to the approximate rhythm inferred from archival photographs. Their exact positions remain provisional until archaeological and archival investigation becomes possible. Their number, rhythm and relationship to the basin refer to the former spatial organisation, while their architectural language remains simple and contemporary. The new units do not imitate Qajar ornament, decorative tilework or historic facades. The studios are intended for visiting researchers, university teachers, heritage professionals and small creative teams. Their programme supports the social and economic sustainability of the complex, while their limited scale helps to reduce construction impact. The units are conceived as low-impact structures using reclaimed brick[2] where possible, lime mortar, timber roof elements and passive shading devices. The intervention should therefore be understood as a contemporary interpretation of lost spatial memory rather than a reconstruction. It makes the historic landscape easier to understand while remaining honest about what belongs to the present period.

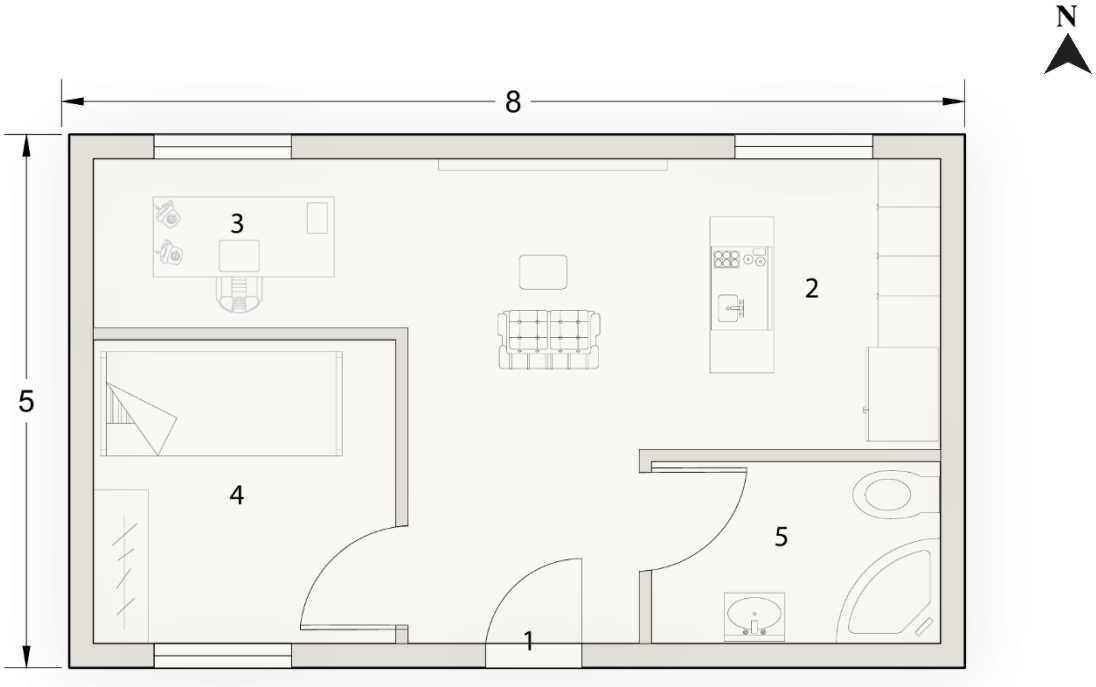


Fig 45 : The houses of the Shah's wives, Golestan Palace Photographic Archive.

1. ICOMOS, 1994; Dezzi Bardeschi, 2005
2. Foster, 2020; European Commission, 2021

4.3.4.1 Typical Contemporary Studio Unit

The typical studio unit is designed as a compact and flexible workspace for one or two users. It can support short-term academic residence, individual research, small creative practice or temporary start-up activity. The plan combines a work area with basic facilities while keeping the footprint limited. Natural ventilation, daylight, external shading and low-impact materials are prioritised in the design.



Small Studios around the pool	
1	Entrance
2	Living and kitchenette area
3	Workspace
4	Sleeping area
5	wc

Fig 46 : PRIVATE STUDIOS , scale 1:75

The 8 × 5 metre dimensions produce an approximate gross floor area of 40 m² per unit. These dimensions belong to the design proposal and do not represent verified dimensions of the former pavilions.

4.3.5 Proposed Sections

The proposed section illustrates the relationship between the historic structure and the new programme. Existing load-bearing masonry, timber floors and roof geometry are retained. New furniture, technical systems and the lift core are introduced as separate layers. The section also shows the vertical organisation of public, shared and quieter activities across the four levels.

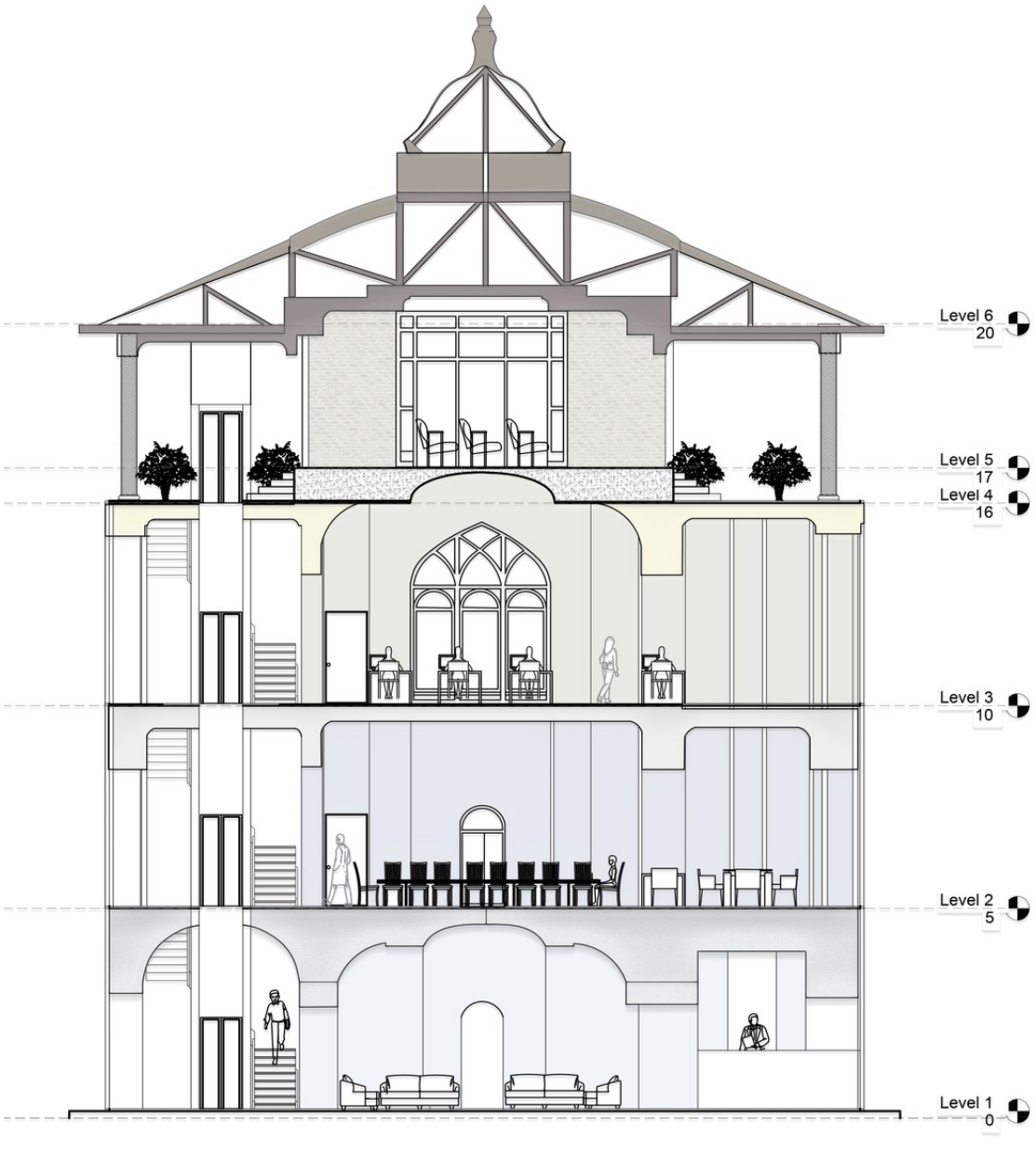


Fig 47 : section A-A , out of scale

4.3.5 Proposed Sections

The second section focuses on the upper levels of the pavilion. The restored loggia provides shaded outdoor space, while the new vertical core supports accessibility and controlled natural ventilation. The intervention remains visually distinct from the historic structure and seeks to minimise direct structural connection with the original masonry wherever possible.

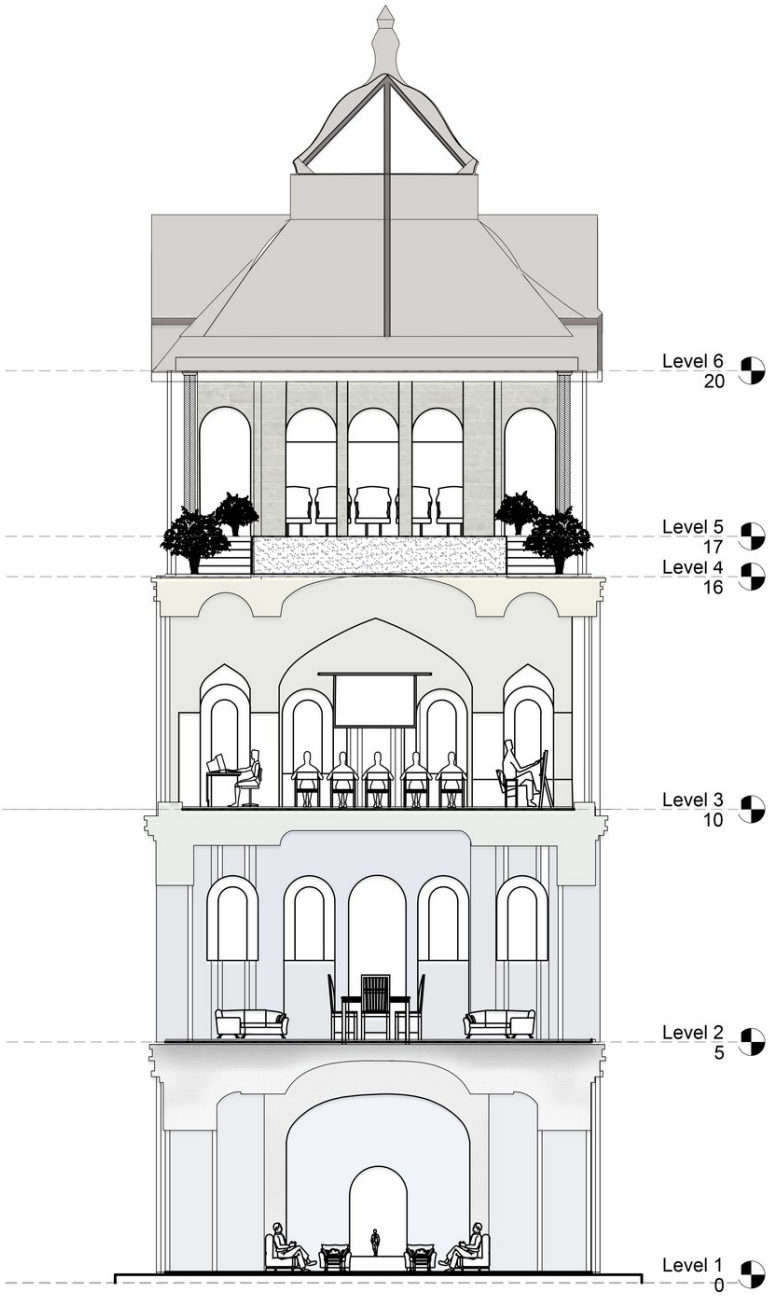


Fig 48 : section B-B , out of scale

4.4 Conservation and Restoration of the Selected Facade

The conservation of the selected facade follows the principles established in Section 4.2: investigation before treatment, repair before replacement, compatible materials before modern substitutes, and distinguishable reintegration[1] where new work is necessary. The first stage is documentation. Before any physical intervention, the facade should be recorded through rectified photography, close-range photogrammetry, material mapping and a coded atlas of decay. Cracks, mortar loss, detached decorative fragments, damaged brickwork and areas of staining should be identified and mapped. This documentation will make it possible to distinguish between general weathering and areas requiring urgent intervention. The second stage is water control. Roof elements, gutters, flashings and drainage points must be repaired before cleaning or mortar repair begins. Water infiltration is likely to be one of the main causes of continuing deterioration, and surface restoration without water management would not provide a long-term solution[2]. The third stage is cleaning and consolidation.

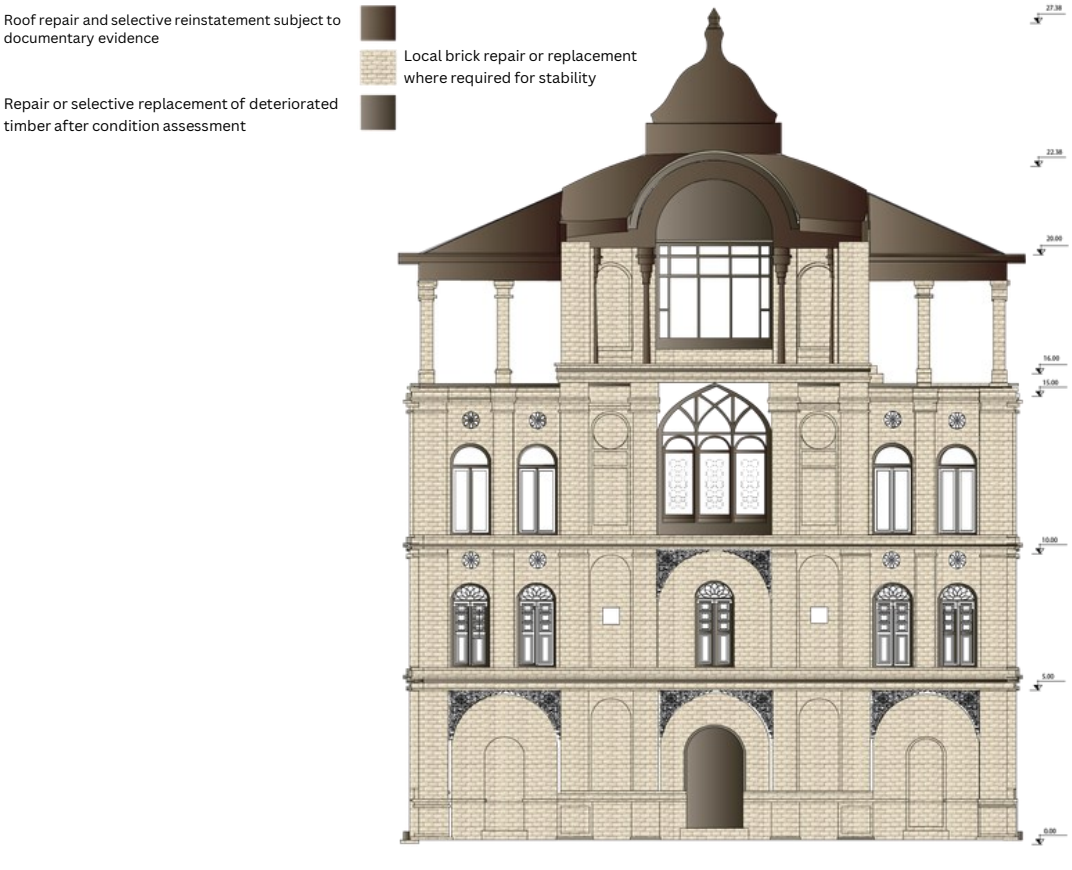


Fig 49: Restoration of Selected Facade, by author

1. Brandi, 2005; Carbonara, 1997
2. Feilden, 2003; Torraca, 2009

Cleaning methods should be tested on small areas before they are applied to the facade. Aggressive mechanical methods and high-pressure water should be avoided[1]. Detached fragments of plaster, tilework and brick should be stabilised using compatible conservation techniques. Damaged mortar joints should be repaired with lime-based mortar selected after analysis of the existing material. The fourth stage is local reintegration. Missing bricks or small decorative fragments may be replaced only where their absence affects stability or readability. New material should be compatible in colour, texture and behaviour, but should remain recognisable on close inspection[2]. Large-scale reconstruction of missing ornament is not proposed unless it is supported by reliable archival evidence. The final stage concerns the conservation of timber windows and openings. Existing Orosi elements should be repaired wherever possible, retaining original joinery and coloured glass. Where improved thermal performance is needed, a secondary internal glazing system can be added as a reversible layer behind the historic windows. The purpose of the intervention is not to make the facade appear new. It is to stabilise the material fabric, reduce the causes of future decay and preserve the visible evidence of the building's age and historical transformation.

- Roof repair and reinstatement of missing weatherproofing elements
- Local repair of damaged timber elements
- Lime-based repointing of eroded mortar joints
- Local brick replacement where material loss threatens stability
- Consolidation of detached decorative fragments
- Repair and conservation of historic window joinery
- Reversible internal secondary glazing where required
- Crack monitoring and local structural assessment before consolidation

1. Torraca, 2009; UNI, 2006
2. Brandi, 2005; Dezzi Bardeschi, 2005

4.5 Architectural Illustrations of the Proposed Intervention: Void and Cafe, Ground Floor



Fig 50 : Void and Cafe perspective, Ground Floor , by author



4.5 Architectural Illustrations of the Proposed Intervention: CO WORKING PUBLIC, First Floor

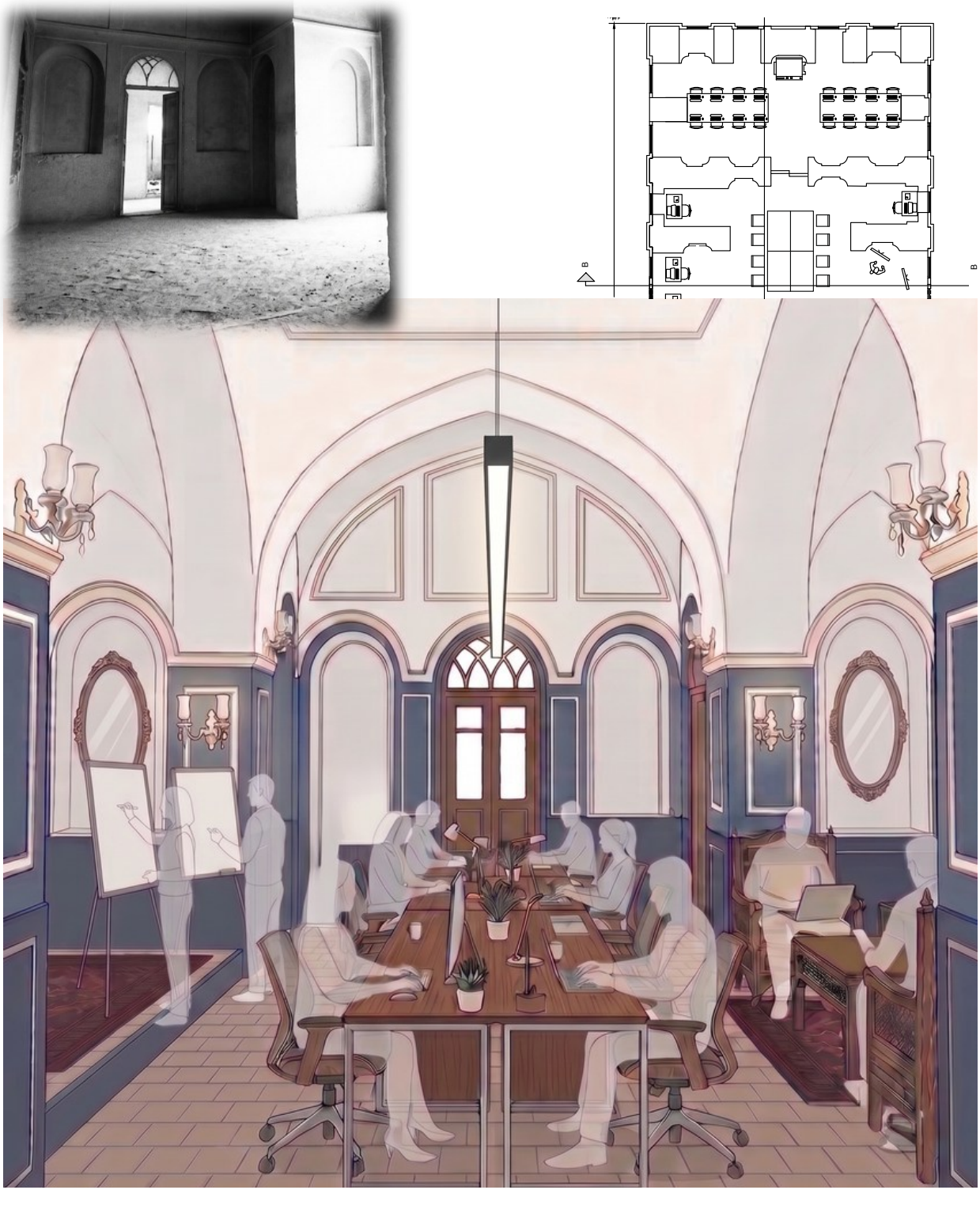


Fig51 : Co working public space perspective, First Floor , by author

4.5 Architectural Illustrations of the Proposed Intervention: CO WORKING PUBLIC, Second Floor

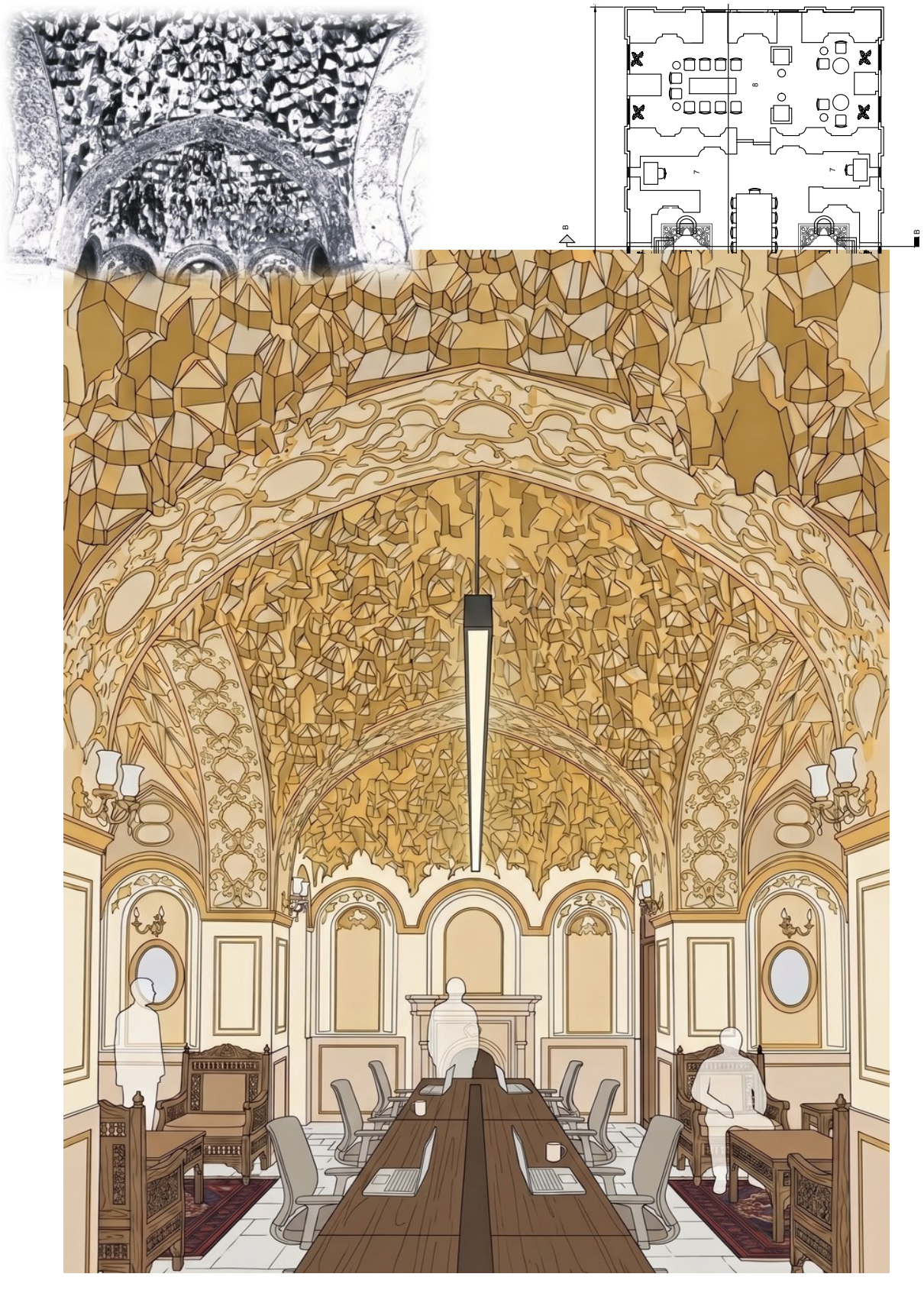


Fig 52 : Architectural illustration of the second-floor coworking and meeting area,by author

4.5 Architectural Illustrations of the Proposed Intervention: CONFERENCE ROOM, Third Floor



Fig 53 : Conference room perspective , by author



4.5 Architectural Illustrations of the Proposed Intervention: STAIRCASE AND ELEVATOR

The new lift and stair core is the most important contemporary intervention within the pavilion. Its role is not limited to vertical accessibility. It also provides a route for technical services and supports controlled natural ventilation. The core is designed as a visually distinct element, separated from the historic walls by a readable joint. Its material language should remain light and contemporary in order to avoid confusion between original and new construction.



Fig54 : STAIRCASE AND ELEVATOR perspective , by author

4.6 Sustainability Assessment of the Proposal

This section provides a qualitative and comparative assessment rather than a certified environmental study. Direct material sampling, energy monitoring and project-specific whole-life carbon calculation were not possible. The assessment therefore identifies likely benefits, design risks and the work required for later verification.

4.6.1 Environmental Sustainability: Why Keeping the Building Is the First Sustainable Act

Retaining the existing pavilion is the proposal's primary environmental strategy. Research on building reuse shows that continued use of existing structures can avoid demolition waste and reduce the need for new construction materials, although the scale of the benefit varies according to building type, condition and proposed intervention (Preservation Green Lab, 2011; Foster, 2020; RICS, 2023).

Eshratabad contains a substantial quantity of brick masonry, timber and traditional mortar. Their exact quantities and environmental impacts were not calculated because wall dimensions and material properties could not be verified on site. [1]

A future whole-life carbon assessment should compare at least three scenarios: minimum conservation, conservation with adaptive reuse, and demolition followed by replacement.

The proposed studios constitute new construction and must be included in that assessment. Their use of reclaimed brick, timber and lime-based materials is intended to reduce environmental impact, but they should not be described as low-carbon until quantities, sourcing, transport and construction details have been evaluated.

1. Preservation Green Lab, 2011; Foster, 2020; RICS, 2023

The environmental conclusion does not depend on claiming an exact carbon figure that cannot be verified within the limits of this research. The existing pavilion contains a substantial quantity of brick masonry, timber and traditional mortar that would otherwise become demolition waste and would need to be replaced by new materials. Rebuilding an equivalent usable area would require additional extraction, manufacture, transport and construction. For this reason, the proposal treats retention and repair as the primary environmental strategy, while recognising that a future implementation phase should prepare a measured whole-life carbon assessment based on verified geometry, material quantities and construction specifications.

4.6.2 Passive Environmental Strategies: Working with What the Building Already Provides

The proposal begins by identifying environmental functions that the existing building may already support before specifying new mechanical systems.

Thermal mass. The substantial masonry may moderate short-term temperature fluctuations and delay part of the daytime heat flow. The extent of this benefit cannot be established without verified wall properties, occupancy data and dynamic thermal simulation.

Moisture-compatible finishes. Existing and new finishes should remain compatible with the wall's drying behaviour. Cement-rich mortars and impermeable synthetic coatings should be avoided unless material investigation demonstrates their suitability. Vapour permeability does not necessarily require exposed brick; historically appropriate lime plaster may provide both protection and compatibility [1]

Solar control. The upper loggia and facade projections may provide useful shade, particularly against high summer sun. A shading-mask and section-based solar analysis are required to determine the actual protected periods. The coloured glazing alters daylight distribution, but its effect on glare and visual comfort remains to be tested.

1. Torraca, 2009; UNI, 2006

Ventilation. Because the building does not contain a continuous internal void, the proposed circulation core is explored as a possible high-level exhaust path. Its effectiveness depends on inlet area, shaft geometry, roof outlet, wind pressure, fire separation and coordination with lift regulations. It is therefore presented as a hypothesis requiring airflow and fire-safety simulation.

Landscape. Permeable ground, planting and a managed basin may improve drainage, shade and outdoor comfort. Water consumption, evaporation, maintenance and Tehran's limited water resources must also be considered. The basin should therefore operate as part of a controlled water-management strategy rather than as a continuously replenished ornamental pool.

A maximum design scenario of thirty 40 m² studio units would create approximately 1,200 m² of new gross floor area. This is a design scenario rather than a reconstruction of verified historical dimensions.

4.6.3 Circularity, Compatibility and Reversibility

The proposed interventions are assessed against minimum intervention, partial reversibility, distinguishability and material compatibility. These conservation principles also support circular use of resources by extending material life, reducing unnecessary replacement and allowing future adaptation[1].

Intervention	Reversible	Distinguishable	Compatible with Historic Fabric	Main Purpose
Internal secondary glazing behind Orosi windows	Yes — mounted on independent frame	Yes	Yes	Thermal and acoustic comfort without altering the historic facade
Freestanding furniture and workstation systems	Yes — no fixings to historic fabric	Yes	Yes	Flexible coworking use without permanent alteration
New stair and lift core	Partially — structurally independent, separated by visible joint, but removal leaves a footprint	Yes	Subject to structural, fire-safety and hygrothermal verification	Accessibility, services and controlled ventilation
Lime-based mortar repointing	Partially — integrates with historic fabric	Yes, when documented	Yes — lime mortar is compatible with traditional masonry	Repair of eroded joints and moisture management
Local brick replacement	Partially	Yes on close inspection	Yes	Stabilisation of areas where material loss threatens structure
Contemporary studio units around basin	Partially — new construction on historic footprints	Yes — contemporary language, no imitation of Qajar ornament	Not directly applicable to the main historic fabric; archaeological impact requires assessment	Reoccupation of lost spatial rhythm with productive use
Permeable paving and planting	Yes	Yes	Yes	Drainage, microclimate improvement, outdoor comfort

Fig 55 : Assessment of Proposed Interventions Against Conservation Principle, by author

1. Foster, 2020; European Commission, 2021; Bullen and Love, 2011

4.6.4 Social Sustainability

Eshratabad currently has limited public visibility because it remains within a restricted perimeter. The proposal addresses this condition through controlled access, inclusive circulation and a programme combining work, research and cultural activity.

Access. A separate entrance from Shariati Street is proposed to connect the city with a defined heritage precinct. This remains dependent on institutional and security approval.

Inclusion. The proposed lift would provide access to the four levels, while the garden and ground-floor facilities would be approached at grade. Detailed compliance with accessibility, evacuation and fire-safety regulations must be demonstrated in the next phase.

Historical interpretation. The proposal presents the Qajar, military and contemporary phases as distinguishable layers rather than reconstructing a single idealised moment.

Community use. The mixed programme allows different groups to use the site for work, study, events and heritage interpretation[1]. Because no stakeholder consultation was undertaken, the social value of this programme should be tested through future participation with local residents, heritage professionals, potential users and the property owner.

1. Foster, 2020; European Commission, 2021; Bullen and Love, 2011

4.6.5 Economic Sustainability and Phasing

In my research, I consider long-term conservation as a continuous process that depends on regular monitoring and programmed maintenance rather than heavy periodic repairs[1] . By introducing an active cultural and academic use, the building receives daily care and systematic maintenance.
I structured the proposed intervention into four clear phases:

• Phase 1: Diagnostic Assessment and Urgent Protection: Detailed on-site survey, moisture testing, roof repair, drainage improvement, and breathable lime repointing.

- Phase 2: Controlled Vertical Core and Structural Reinforcement: Executing the narrow, localized incision in the secondary stair wall, installing the steel reinforcing frame for structural stabilization, and mounting the lightweight lift and stair structure.

• Phase 3: Interior Conservation and Reversible Fit-Out: Cleaning and consolidating original masonry and timber with compatible materials, and adding movable furniture for study and research.

• Phase 4: Garden Recovery and Landscape: Installing permeable paving, planting shade trees, and restoring the central evaporative water basin.

1. Carbonara, 1997; Feilden, 2003

Sustainability Objective	Proposed Strategy	Expected Contribution
Reduce demolition waste and embodied carbon	Retain and repair the main pavilion	Extension of building life and avoidance of replacement construction
Reduce operational energy demand	Thermal mass, shading, filtered daylight and ventilation through new core	Reduced reliance on mechanical cooling and artificial lighting
Improve water and microclimate conditions	Permeable paving, basin, planting and drainage	Reduced runoff and improved outdoor thermal comfort
Support circularity	Reversible core, freestanding furniture and repair before replacement	Future adaptability and reduced damage to historic fabric
Improve public inclusion	Controlled access route and lift	Access for visitors, workers and people with reduced mobility
Support long-term maintenance	Coworking, cultural and educational programme	Potential recurring income for maintenance and conservation

Fig 56 : Sustainability framework of the proposed intervention: environmental, social and economic dimensions,by author

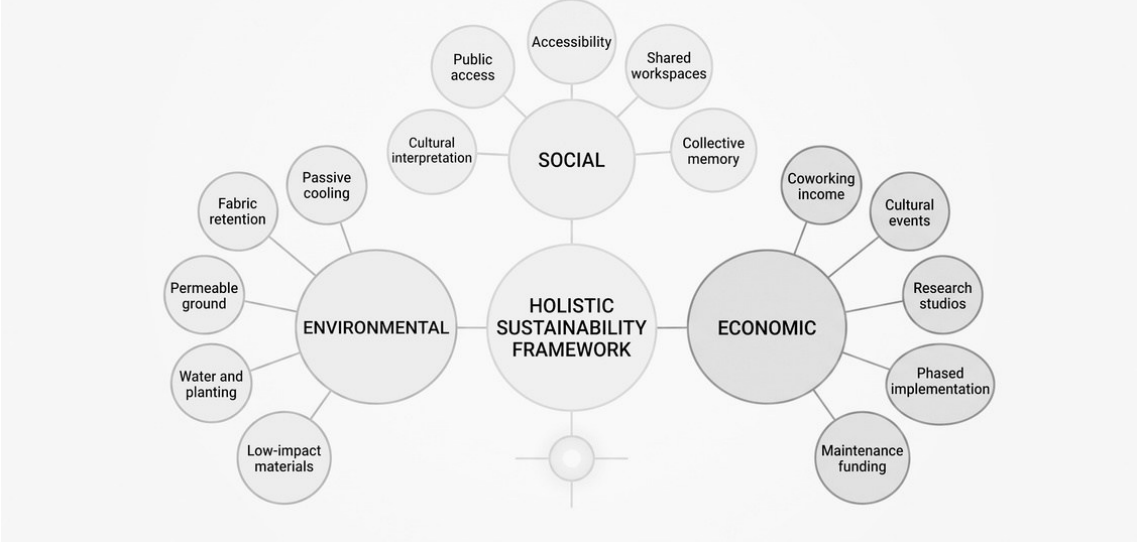


Fig 57 : Holistic sustainability framework diagram, by author

4.6.6 Confidence Limits

No in-site measurement, material testing, calibrated environmental simulation or financial feasibility study was undertaken. The conclusions of this chapter are therefore qualitative and comparative.

5. Conclusion

5.1 Research Conclusion

This thesis examined the restoration and adaptive reuse potential of Eshratabad Mansion, a Qajar pavilion that survives within a restricted military context in Tehran. The research began from the idea that the conservation of a heritage building cannot be separated from questions of use, accessibility, environmental performance and long-term maintenance.[1]

The first conclusion is that Eshratabad should not be understood as an isolated architectural object. Its significance comes from the relationship between the main pavilion, the former garden, the circular basin, the lost peripheral pavilions and the later military transformation of the site. A restoration strategy limited only to the facade of the main building would therefore be incomplete. The proposal addresses the monument as a landscape and as a sequence of historical layers.

The second conclusion concerns adaptive reuse. The existing organisation of central halls and surrounding rooms provides an appropriate spatial framework for coworking, research and cultural activities. This programme can be introduced with relatively limited physical intervention because it follows the existing room hierarchy rather than requiring an open-plan transformation. The coworking function is proposed not only because it is contemporary, but because it can bring regular use to the building and contribute to the financial continuity of maintenance[2].

The third conclusion concerns sustainability. The environmental value of the project begins with the retention of the existing building fabric. Repairing and adapting the masonry pavilion avoids the material waste associated with demolition and replacement. The project also reactivates passive environmental qualities already present in the building, including thermal mass, facade shading, filtered daylight through Orosi windows and the relationship between the building, water and vegetation.

1. Carbonara, 1997; Venice Charter, 1964
2. Foster, 2020; Historic England, 2019

The original historic stairs were too steep, narrow, and structurally deteriorated to safely support public use and emergency evacuation. To solve this problem, the old staircase within the secondary vertical zone was removed and replaced with a new, safe circulation core containing an accessible staircase and a lift. While this required a minimal, narrow incision in the local brick wall to fit the new core, the intervention is structurally compensated by introducing a localized steel reinforcing frame that secures the masonry opening and preserves the overall structural integrity of the building. Crucially, all primary monumental spaces, central halls, historic vaults, and original timber ceilings outside this service zone remain fully protected and intact. This demonstrates that necessary modern accessibility can be achieved through localized, clearly justified intervention and compatible structural reinforcement.[1] The fourth conclusion concerns the lost peripheral pavilions. Their proposed reoccupation is not presented as historical reconstruction. The new studios are contemporary structures that follow the historic rhythm and footprint of the former buildings while remaining visually and materially distinguishable. Their purpose is to make the lost spatial organisation of the complex understandable and to provide spaces that support research, creative work and cultural activities. Finally, this thesis suggests that Eshratabad can become a model for a wider category of neglected heritage in Tehran. Many historical buildings are protected in legal terms but remain outside public life, without a sustainable use or a regular maintenance strategy. The approach developed here shows that heritage conservation can become more effective when cultural value, environmental responsibility, public access and economic viability are considered together.

1. Brandi, 2005

5.2 Research Limitations and Prospects

The main limitation I faced during this research was the lack of direct physical access to the Eshratabad Mansion, as the building is currently located inside an active military garrison. Because I could not enter the site to take direct measurements or physically test the materials, my analysis and diagnosis rely primarily on historical archives[1], published documents, and remote observations.

For this reason, the structural and material assessments presented in this thesis should be understood as an initial study. Key technical details such as the true condition of the foundations, the concealed timber floor beams, and the stability of the visible cracks on the facade will naturally need direct on-site verification before any physical restoration takes place. Furthermore, realizing the proposed cultural and research hub will ultimately depend on future institutional dialogue between cultural heritage authorities and the military to allow safe civilian access.[2]

Despite these constraints, I believe this thesis provides a meaningful and transferable starting point. It demonstrates how forgotten and restricted heritage sites in Tehran can be approached through the lens of sustainability[3], cared for through continuous maintenance, and gradually reconnected with the cultural life of the city.

1. Feilden, 2003; Sarikhani, 2006
2. Torraca, 2009; UNI, 2006
3. European Commission, 2021; RICS, 2023

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