Conservation Management and Maintenance plan for *Jharna*, Mehrauli, Delhi

Department of Architectural Restoration and Conservation
Department of Housing Development and Management
Lund University, Sweden
and
Swedish International Development Cooperation Agency (Sida)

Prepared by~

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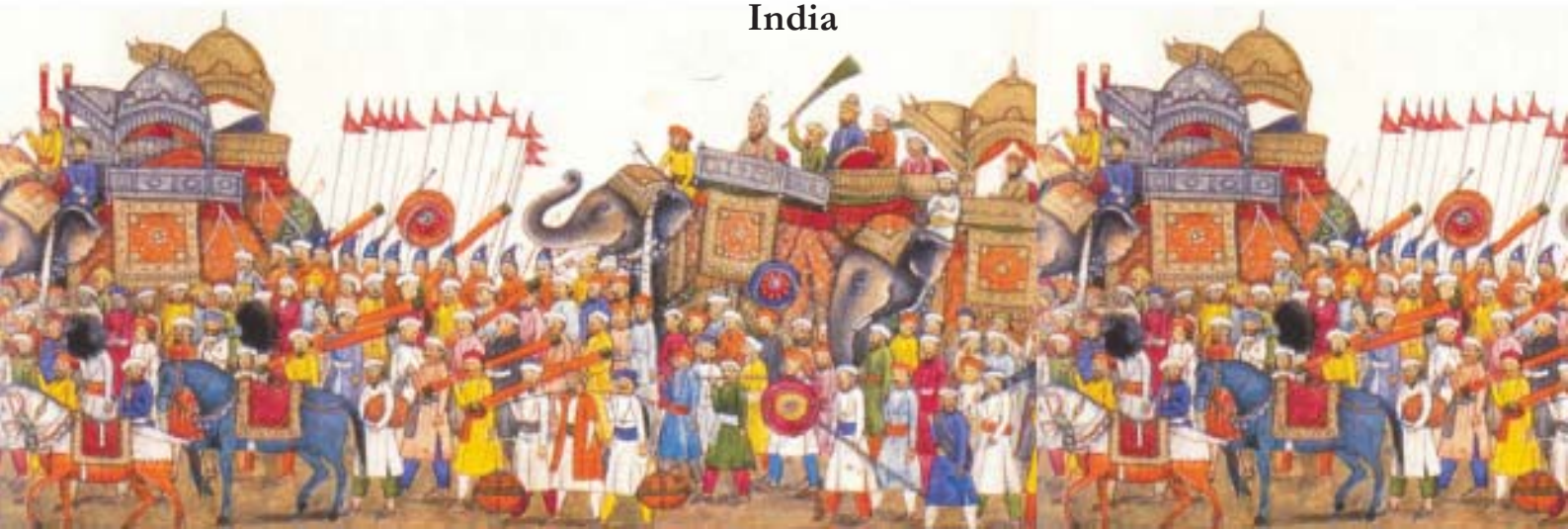

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1. Introduction:

India has a very rich and distinct historical and cultural heritage which is reflected in the physical form as the built heritage of our historic towns and cities. These historic settlements provide continuity of time and culture. It is desirable therefore that we make an effort to conserve and protect these which link to the past.

The historic settlement contains structures and institutions of high cultural value which are facing survival crisis and ruins from decay and obsolescence. In recent times this threat has been compounded by the pressure of urbanization which has considerably hastened the process of erosion. Lack of design controls and regulations for new development, along with an absence of a sense of responsibility among stakeholders have produced incoherent and fragmented town forms which are destroying the structures and identity of the old. So, as these towns grow they increase the danger of losing their existing image.

Hence, conservation is necessary to soften the impact of modernization on historic areas and preserve, restore and rehabilitate the architectural heritage which forms the basis for the continuity and integrity of cultures. Here the gap between conservation and planning needs to be bridged as the two are inseparable.

Traditional settlements in India present a physical fabric, truly responsive to social, cultural and climatic requirements. In addition to these, there is a naturally evolving balance between the built and open spaces, between community and personal needs.

Background of the project:

The settlement at Mehrauli is characterized by a continuity of over 900 years. It is one of the most 111 significant and traditional settlements in the history of the Delhi region. The World Heritage Site of Qutab Complex, a major tourist attraction, lies in Mehrauli. Owing to this, Mehrauli has been undergoing rapid urbanization in the last few decades. Besides the Qutab complex, numerous other historic structures are set within the cultural landscape of Mehrauli, most of which remain unexplored and unprotected today.

This project provides an opportunity to conserve and develop one part within this larger area with the aim of conserving the natural and cultural heritage, tangible and intangible, and revitalizing it in a manner which is socially, environmentally and economically sustainable.

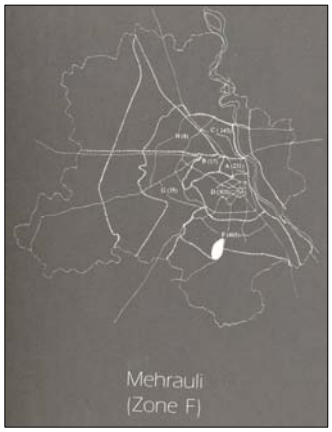
The objective of this project, as envisaged by the Delhi Development Authority, is to undertake conservation and revitalization of a segment of the settlement of *'Mehrauli'*- one of the 111 traditional settlements in Delhi. This comprises of the *'Jharna'*- a later Mughal garden and Hauz-i-Shamsi- water body which used to be a recreational area for the Late Mughals (18th century) and

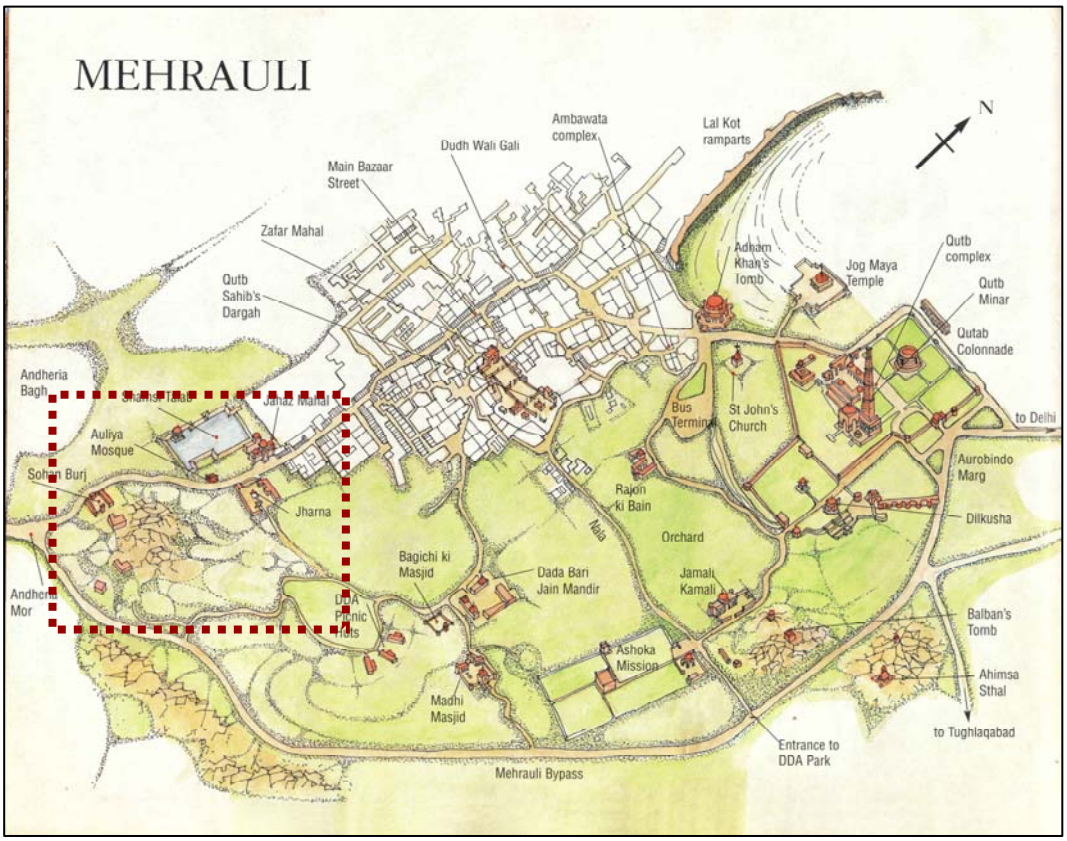
other historic structures through an integrated approach, addressing both the natural and the cultural components of the area.

More specifically, the project aims to:

To Develop a model for conservation of the natural and manmade environment in the identified area within Mehrauli in a manner that is culturally sustainable and expressive, through an inter-disciplinary approach, drawing upon the internal strength of the local community.

This is proposed to be done by engaging the various sections of the community in the development of the area, through conducting participatory training workshops and programs so as to equip the people with the required skills. This would ensure capacity-building for undertaking the project at the local level, and its management and post-completion upkeep. The ground level activities, discussions, consultations and networking with the stakeholders undertaken during the project would contribute towards developing a model for other similar sites in Delhi, which is extremely rich in both natural and cultural heritage.




MEHRAULI
N
Ambawata complex
Lal Kot ramparts
Dudh Wali Gali
Main Bazaar Street
Zafar Mahal
Qutb Sahib's Dargah
Adham Khan's Tomb
Jog Maya Temple
Qutb complex
Qutb Minar
Qutab Colonnade
Andheria Bagh
Auliya Mosque
Sohan Burj
Jharna
Bus Terminal
St John's Church
to Delhi
Aurobindo Marg
Rajon ki Bain
Nala
Orchard
Dilkusha
Bagichi ki Masjid
Dada Bari Jain Mandir
Jamali Kamali
Andheria Mor
DDA Picnic Huts
Balban's Tomb
Ashoka Mission
Ahimsa Sthal
Madhi Masjid
to Tughlaqabad
Entrance to DDA Park
Mehrauli Bypass

2. Development and conservation principles:

Methodology:

Focus:

The whole study is based on the study of the built heritage and the socio- cultural pattern, physical fabric, economic base and eco-system of traditional settlements of Mehrauli.

The study has been initiated with the Settlement level to understand the geographical setting and historic evolution of the area, which led to the different style of architecture in different periods in the region. Due to the rapid urbanization, and external pressures, this settlement is undergoing changes, which is disturbing the relation between nature and man., affecting the identity of the traditional settlements.

Guidelines have been recommended for conservation method in order to sustain the character of the region.

Study through the secondary sources

The secondary sources include the following information:

- Literature survey:

Aspects covered:

- Historic evolution of Mehrauli region, growth of the area, and who were involved in the development process.
- Study of different myths and their relation to the areas.
- Study of different reports for this area-
- INTACH[1] report, for documentation of the area. (1989)
- Development plans for the area

Maps collected from different offices:

- Survey of India map for the region, scale~1:50000
- Area map was generated by CRCI[2] from the

This was used

[1] Indian National Trust for Art and Cultural Heritage (INTACH) is a NGO working in INDIA for Architectural Heritage

[2] Cultural Resource Conservation Initiatives-a leading conservation Firm working as a consultant for this project.

- To build up the data base for the primary survey.
- Criteria for selecting settlement for detail study.
- Preparation of the lists for heritage components.

Primary survey:

The site survey has been carried out:

- Survey of settlement pattern, building material, construction techniques, linkages.
- Survey of community structure.

Primary survey was also conducted to understand:

- Cultural significance
- Architectural significance
- Commercial significance
- Ecological significance
- To find out the reasons for transformations.

Preparation of base maps:

The whole study is divided in to 2 parts:

- Settlement level, and
- Building level.

So the base maps are prepared at every level. All the base maps are prepared by overlapping surveyed information, and collected information from various sources like the maps published by survey of India, city survey maps prepared by the city survey, collected data through primary surveys.

Making of inventories:

Inventories are prepared to get a clear idea about the built heritage of the area. They are helpful for analyzing a specific structure in terms of its locations, builder, use, significance, construction techniques and material of construction, architectural styles and influences. It also helps to understand present condition of these.

The most significant building was selected from the area to prepare a Maintenance plan as a pilot project for the area.

Architectural documentation:

Architectural drawings for the selected building were created. It contains the required drawings for the preparation of the maintenance plan for the particular building.

Condition Documentation:

The condition documentation was done on site after preparation of the architectural drawings which helped to understand the decay pattern, amount of decay and quantity of work to be done on site.

Data management:

- Recording all the information
- List of secondary sources
- List of administrative bodies and organization
- Numbering and coding of photographs
- Preparation of maps and transferring all the information in the base maps
- Classified list

Analysis:

All collected data, through primary and secondary sources are analyzed mainly in 3 levels:

- Settlement level
- Individual building level
- Analysis at settlement level data is helpful for the understanding of historical significance and location importance, built heritage of the settlement, architectural significance, commercial significance, ecological significance, present status.
- Analysis at building level data is helpful for clear understanding of the architectural style, construction techniques, construction materials. socio-economic condition, influences on the built heritage, development of local architecture in different phases and identification of responsible factors. Condition Documentation/Assessment is helpful in detail analysis of the building.

Issues:

After analyzing the collected data various problems have been identified and reviewed at settlement level, individual building level, which needs immediate attention to maintain the traditional identity and for the development of the region.

Conservation strategy:

- Guidelines and recommendations are put forward for the conservation and sustainable development of the settlement of Mehrauli.
- The guidelines and recommendations are formed in such a way so that they may control the transformations of traditional architecture of the region.
- At Building level, items of work to be carried out on site are listed. On this basis of the above study, a maintenance plan is created for the selected building.

Scope:

- The region of Mehrauli is not identified as the cultural region of utmost importance. This is loosing its value due to the absence of administrative guidelines. Therefore formulation of guidelines is required for conservation of built heritage and development of this area.
- Providing guidelines will help to control the extent and limit of urbanization in the historic areas.
- The study is expected to bring out the typical character for architectural linkages. Studied as an integrated approach, the symbolic relationship between the built form and various intangible factors are documented, thus redefining the cultural heritage of Mehrauli.
- At building level, this study is expected to be a pilot project for the whole settlement of Mehrauli.

Findings:

- After analyzing the collected data various factors have been enlisted which are significant for the region and gives a unique identity to the region. These factors need a special consideration for preparing the guidelines for the development.

These factors include:

- Various cultural resources like style people, fairs and festivals
- Traditional building materials

- Traditional occupation pattern and economic base of the region.
- Ecological balance in the traditional settlements of the region

Issues:

- Urbanization has been impending on to the settlement fabric, destroying the character. The settlement are becoming in to the monotonous form. To meet the growing demands of the market areas the plot have been changed on to the new form. There are no guidelines to control this growth.
- Government programmes have brought in development in the fabric. They do not consider the traditional built heritage of the area.
- Increasing population growth leading to the deforestation, conversion of agricultural areas into habitable lands. Water bodies are getting vanished which used to be a refines water sources to the settlements.
- The heritage structures of Mehrauli are converting into the ruins due to lack of the awareness and governemnt policies. No documentation has been done for the heritage structure of the region. There are no guidelines for the protection and conservation of these structures.
- Inadequate infrastructure facilities hindering the overall development of the region.

Recommendations:

The recommendations are focused on the development of the area. The guidelines are prepared for the overall development of the historic settlement of Mehrauli.

The guidelines are prepared at 2 levels

1. Delineated cultural region of Mehrauli
2. Most significant heritage area of Mehrauli region.

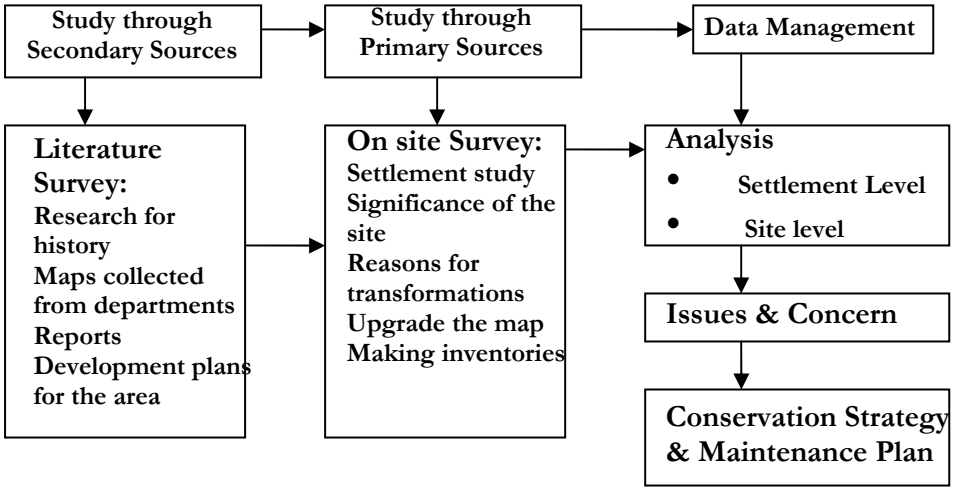
At the time of preparing the guidelines following things have been considered:

- Geographical location
- Heritage components
- Local architecture
- Present status of tourism
- Infrastructures of the settlements various different govt development schemes.

Methodology:

Focus:

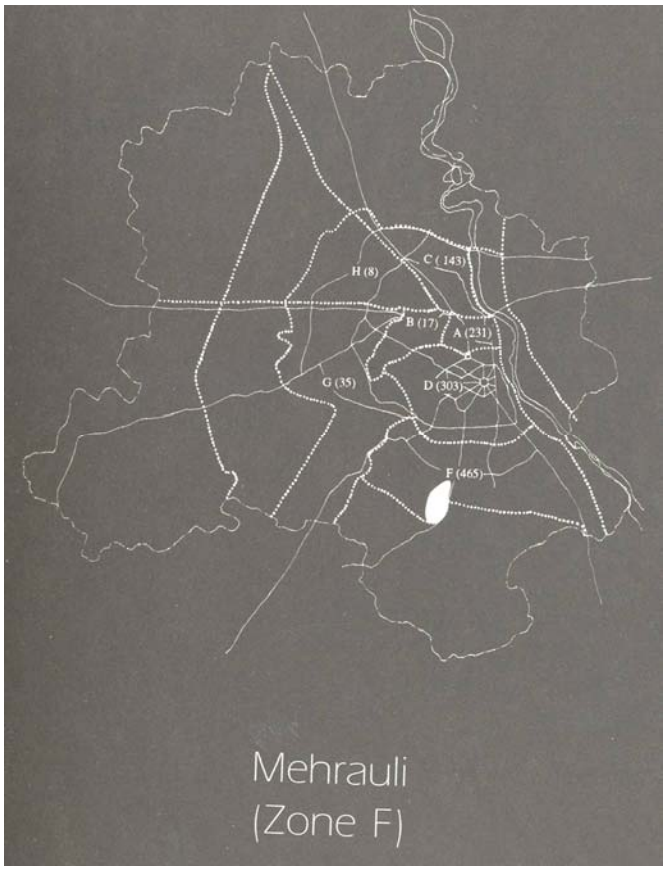
Study of the built heritage and the socio- cultural pattern, physical fabric, economic base and eco-system of traditional settlement of Mehrauli.

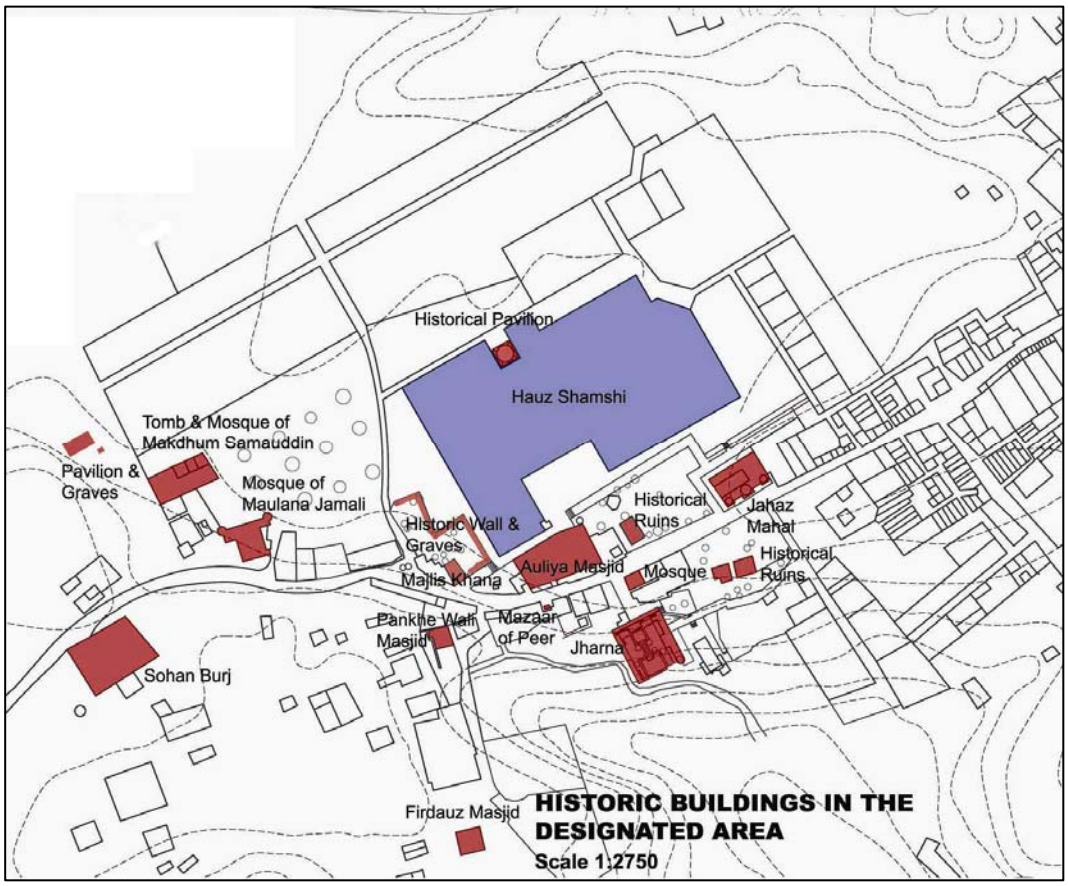


3. Current status of the site area:

Location:

Mehrauli is situated in the South Delhi Planning Zone F-15. It is located on the spur of the Aravalli range of mountains, which lie on the west of the Qutab complex. Mehrauli is referred to as an 'urban village' and is one of the 111 traditional settlements within the urban area of Delhi, which have been urbanized in the last few decades. With reference to modern Delhi, Mehrauli is situated in a fast developing segment of the city, which includes the mini-townships of Vasant Kunj and the Qutab Enclave.





Significance of the settlement:

Mehrauli, which could be described as the site of the abandoned capitals of Delhi, has evolved continuously over the last 1200 years. It represents one of the oldest continuous settlements in the history of Delhi. The surviving late Mughal settlement of Mehrauli came up besides the abandoned settlements of Lal- Kot and Qila Rai Pithora. It not only played the role of a market town, but also that of a Sufi religious centre. Further, it has a unique geographical location on an attractive natural spur of the Aravallis, making it the 'other' experience to the life in the city, beautifully assimilating the religious, social and recreational.

Selection of the study area:

The Historic Building –*Jharna* has been selected for the study and preparation of a Maintenance plan. This is one of the most significant buildings in the area of Mehrauli.

Methodology

The first step taken was the architectural documentation of the site and the buildings thereon. The documentation comprised preparation of the floor plans, reflected ceiling plan, terrace plan, and sectional elevations of all the internal and external walls. On these drawings, was marked the decay of the historic buildings. On the basis of on site visual observations, the most probable causes of

the decay were identified. Subsequently, based on an analysis of the condition documentation the conservation strategy intervention has been planned[3]. Items of work have also been identified.

The sequence of work and a maintenance plan has been developed after studying the site conditions.

Limitations:

It is important to note here that the condition documentation is based on a visual survey, without using any destructive techniques. The observations have led to the development of the conservation plan which can alter when the building parts are closely examined and certain incongruous interventions are removed.

Statement of Significance

Historical significance

This structure was built by Sultan Shamsuddin Illtutmish in 1229 A.D. the pavilions and the water tanks were constructed by Nawab Ghiyasuddin emporar in 1600 A.D. Further improvements were done by the Last Mughal Emporar Bahadur Shah Jafar.

It has earned its name from a waterfall which once drained off surplus water from the Hauz-i-Shamsi. This walled garden can be said to be the only late Mughal garden of Delhi and therefore a very significant site.

[3] Material analysis needs to be undertaken to arrive at the composition of the mortars, plasters and concrete. It has been observed that there is extensive pulverisation of the plaster inside the building while the exterior has plaster decay but not as much pulverization of the plaster inside the building while the exterior has plaster decay but not as much pulverisation. Such aspects require scientific examination, so that the reasons for the decay can be identified.

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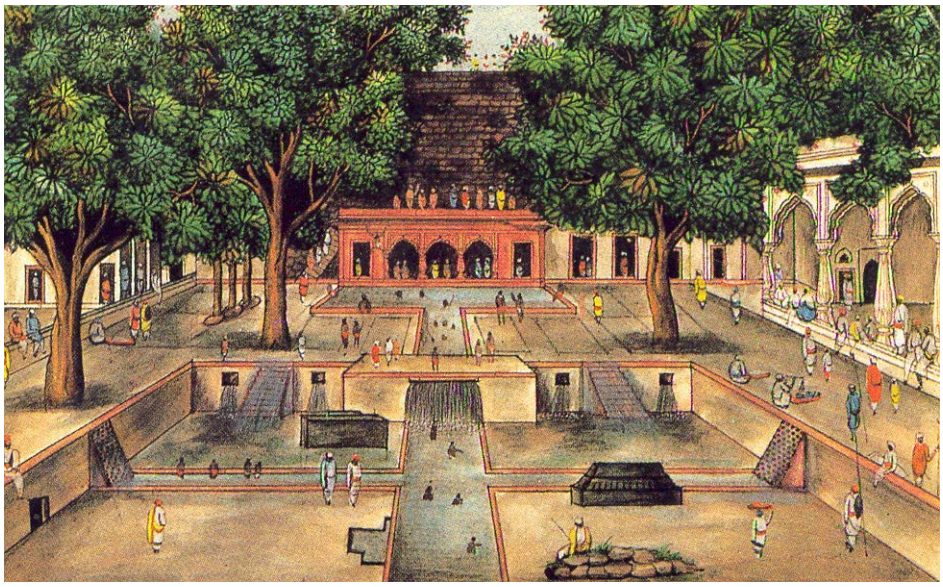
Bahadur Shah Jafar (Late 18th Century)



17th century painting of Jharna

Architectural significance:

The site has three architecturally significant buildings. The *Baradari* at the center, the pavilion at the west and north end of the site, and the pavilion on the west side.

The central *Baradari* is a later addition. As one can see in the historical painting one cannot find it.

The pavilion on the west and north side is a rectangular structure with fluted columns. These structural arches represent the technique of construction of that period.

Reminiscent of columns and arches of the Mughal period, the pavilions rest on a platform. While it has a floral designed band- locally known as -*Panpatta* at the lower level, petals form the pinnacle of the dome. The water tank and channels starting from the southern pavilion shows typical feature of a *Mughal Garden*[4]*-Charbagh.*

[4] Mughal Gardens were constructed on the concept of "Paradise". These usually were constructed around the tombs of the royal family members. It was a belief that after death, one is buried at a place equivalent to the Paradise. The basic concept of Paradise transformed was with 4 rivers of Water, Wine, Milk and Honey surrounded by Trees of Fruits and Flowers with fragrance. This later lead to the Mughal Gardens –*Charbagh .Examples of these are Garden infront of Taj Mahal, Agra, Humayun's Tomb, Delhi etc.*

Part-I: Architectural documentation of the site

The Jharna is located on the South-western part of the Mehrauli.

The site is located on the very significant gradient in between the Hauz-i-shamsi and a stream. The level difference from the road to the Jharna is prominent and is connected by a long flight of stairs on the northern side of the site. The entrance to the site is on the north side. This is an arched shaped entrance not so inviting, but very much similar to entrance of any other residential complex of that period.

The Jharna complex comprises various buildings. As one enters the complex, is a prominent feature of the complex i.e. a Baradari situated on a high plinth within a courtyard. Baradari is a rectangular structure on high platform. There are columns on all the sides of the baradari. This is an open structure without any walls. The decorative columns are very much special as theyare the typical feature of this period.

On the west side of the Baradari is a pillared pavilion. There is a water tank in front of this pavilion and connected to the Baradari by a water channel. On the east side of the Baradari is a watertank with four channels. All these buildings lie on the East west axis of the site. The centrally aligned features are a typical character of a Mughal Garden.

On the east side of this tank is boundary wall constructed in much later period may be late 19th century. There was an outlet from this water tank towards the exterior of the site.

On the North side of the complex are various chambers on the both sides of the entrance. Starting from the north-east corner to the north-west corner of the site, these chambers show various architectural characters from different period of construction.

There is a high platform on the south side of the site.

There is a staircase on the west side of the site on the either sides of the pavilion. This leads to the terrace.

The large open space on the north and south side of the *Baradari* and water channels is covered with PCC flooring at some places.

Architectural significance:

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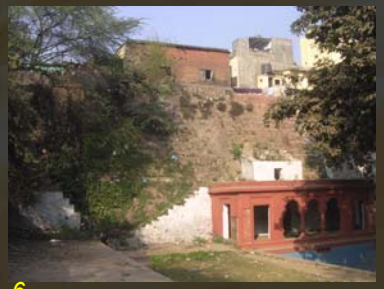

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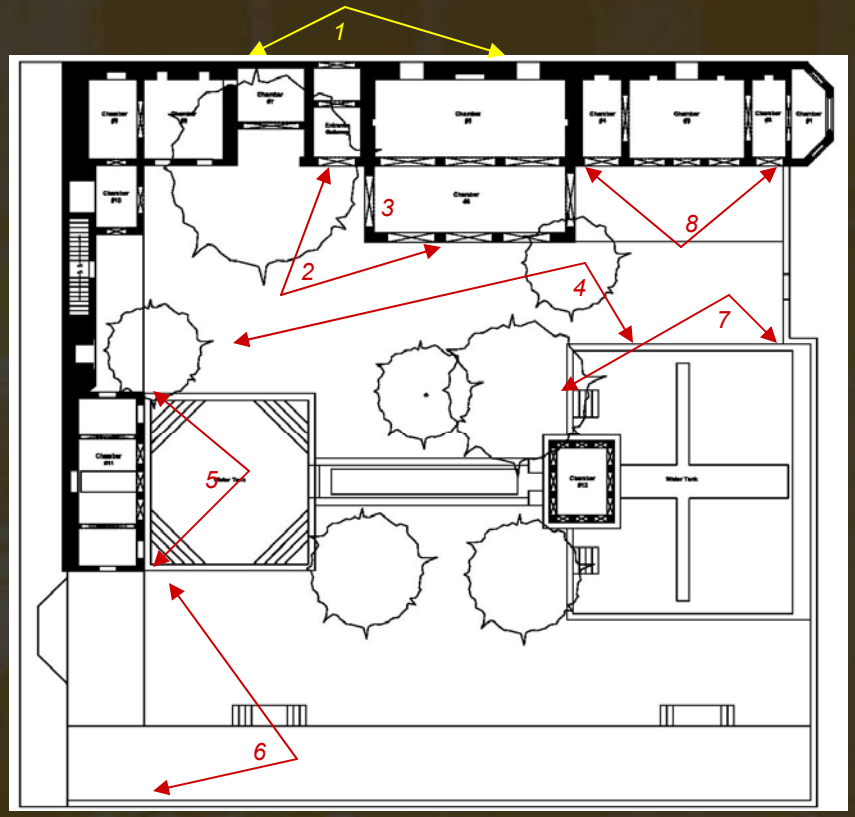


Photo-Plan

3

7

8

Photo Documentation:

Entrance steps for the Jharna

Entrance to the Jharna

West side pavilion and the court

Baradari in the centre of the court

Water tank in front of the Baradari

Water Channels

Chambers on north side of the site

Open space around the Baradari and the court

Pavilion on the North side

First floor structures

Roof pattern in some of the rooms

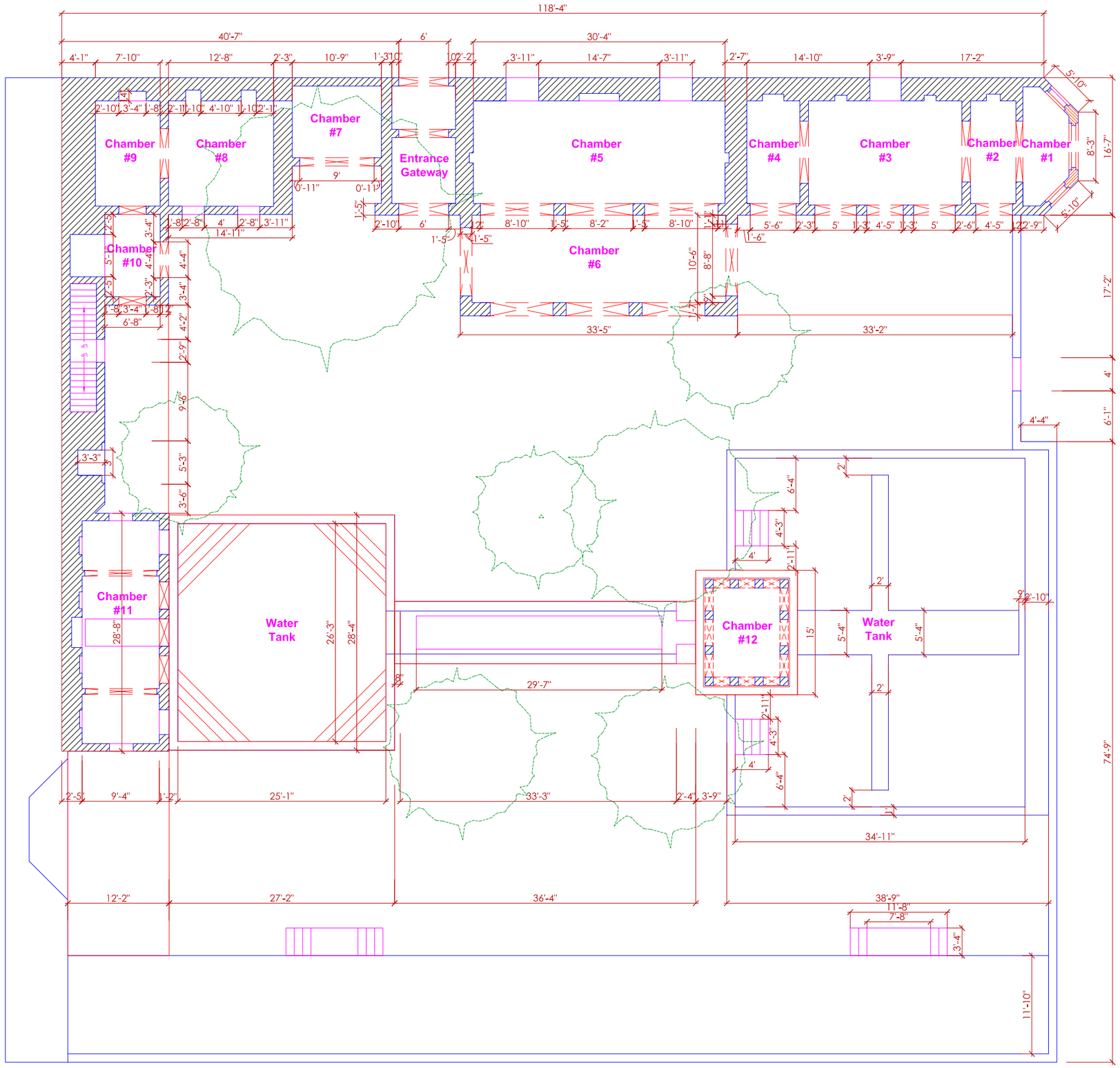
Roof in the North West corner chamber of the site

Terrace on the West side

Staircase on the West side

Stream behind the site-On the East side of the site

East surroundings of the site



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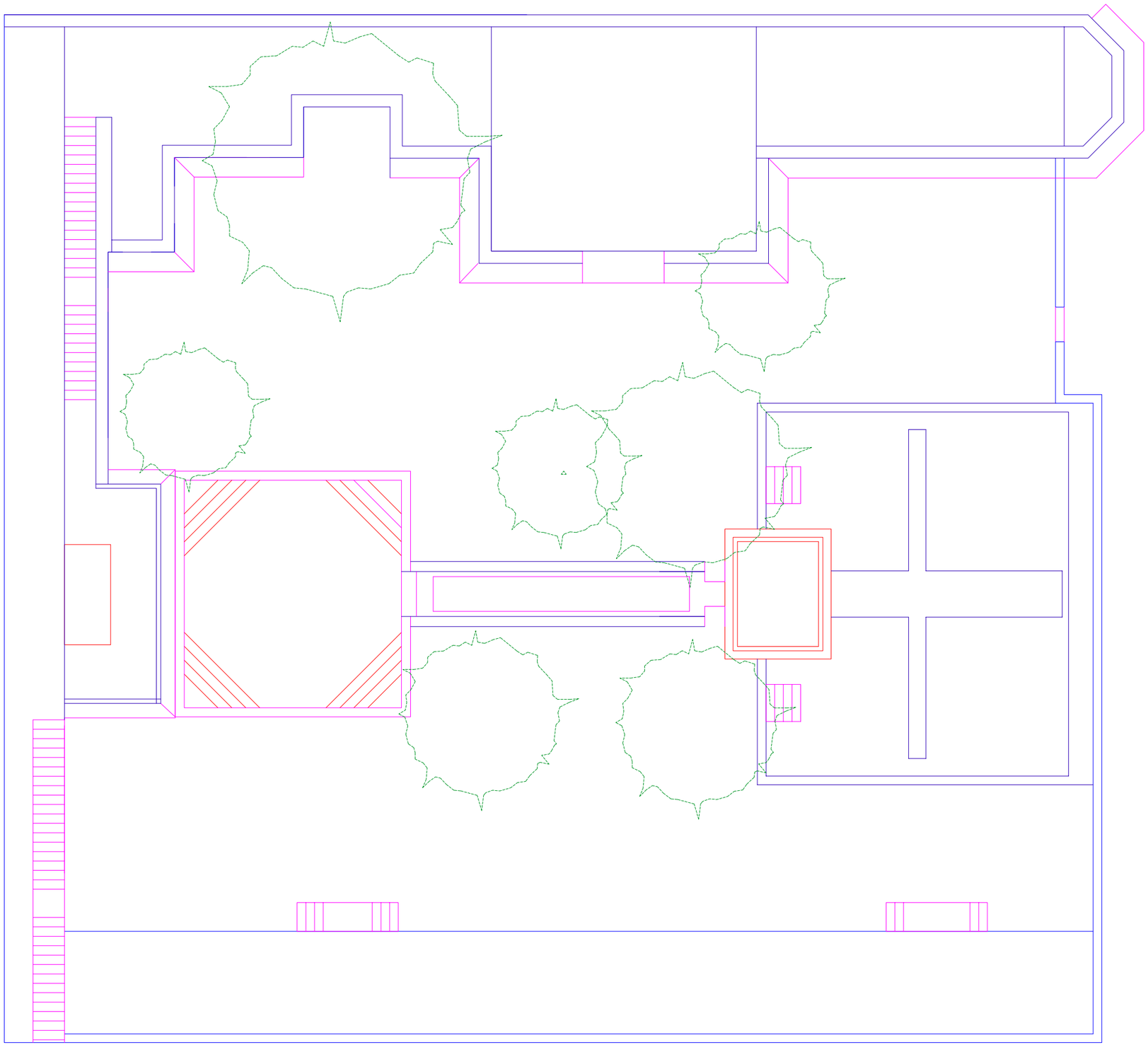

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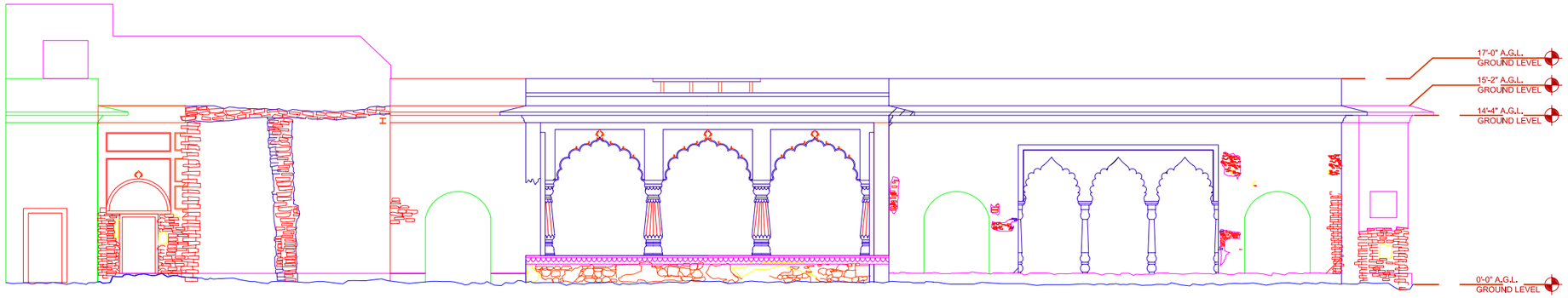

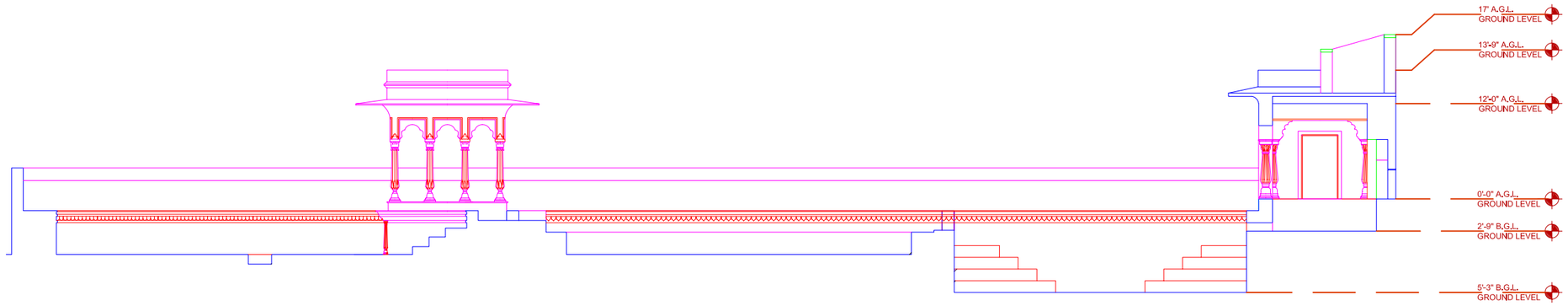

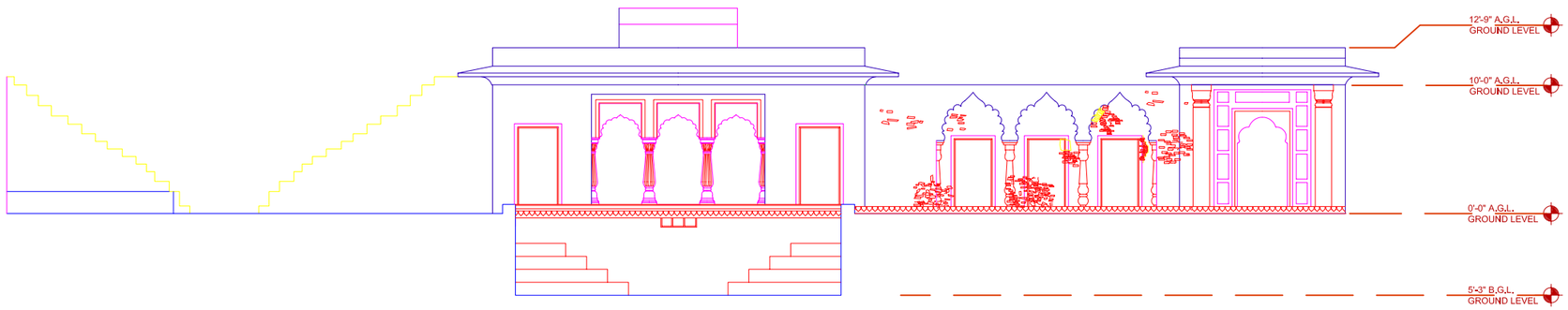

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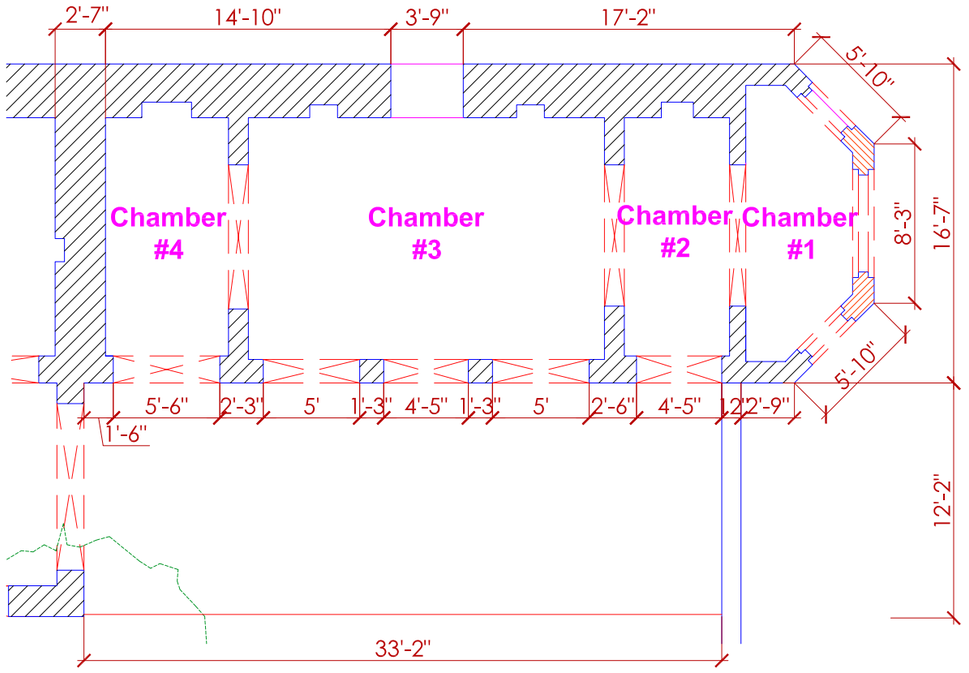

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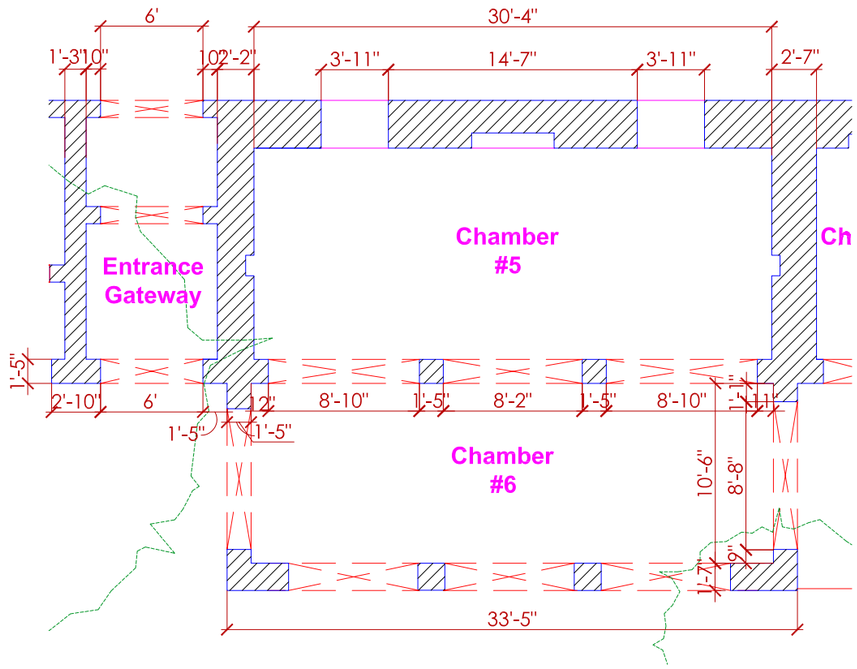

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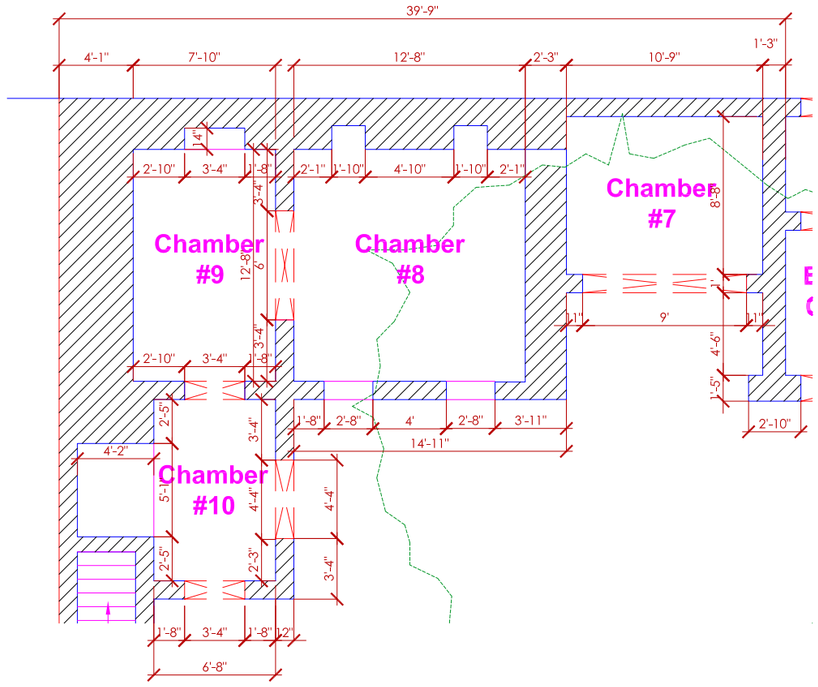

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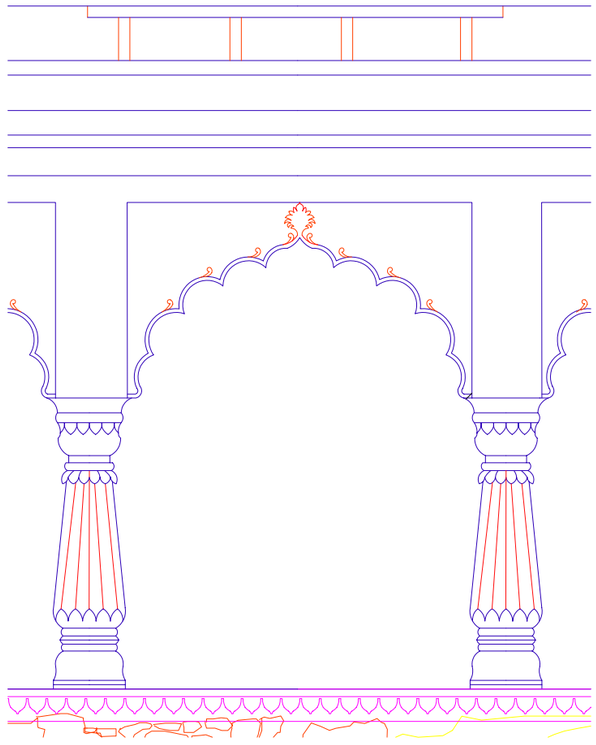

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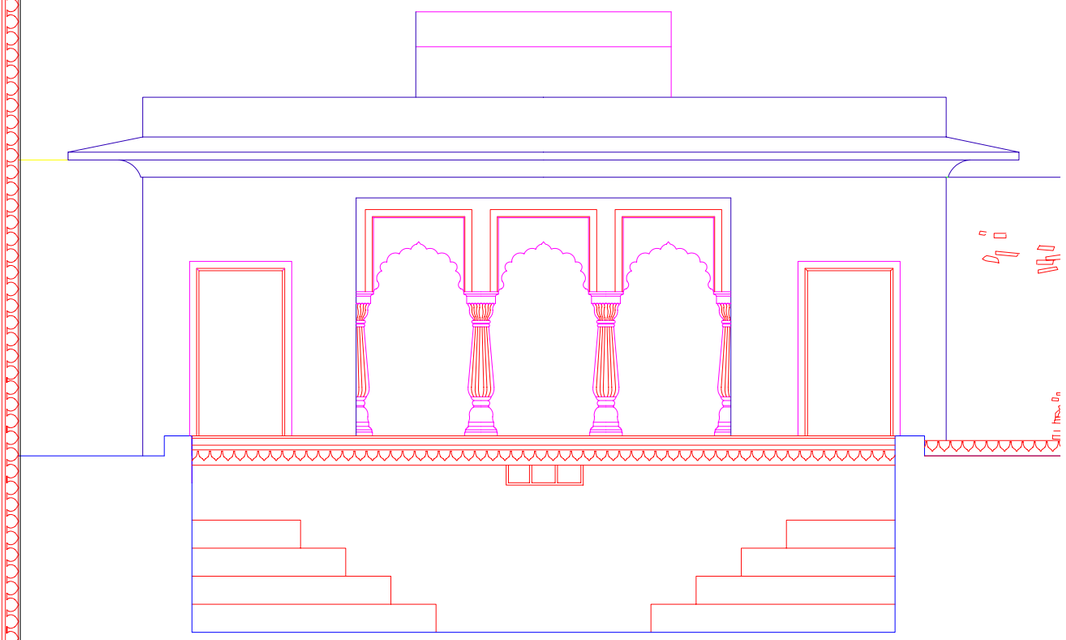
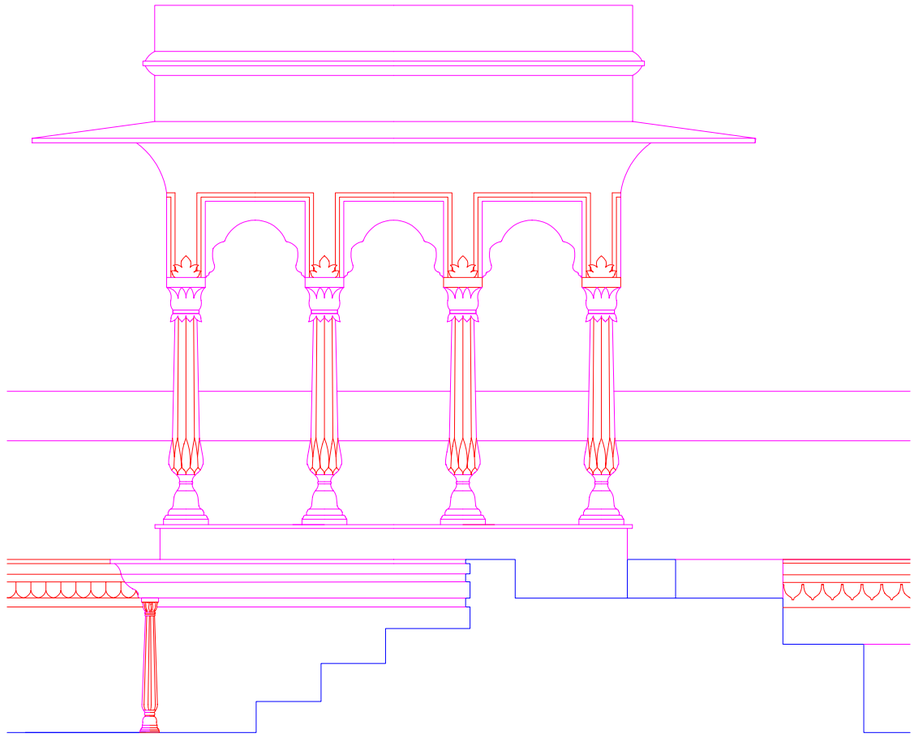


Elevation



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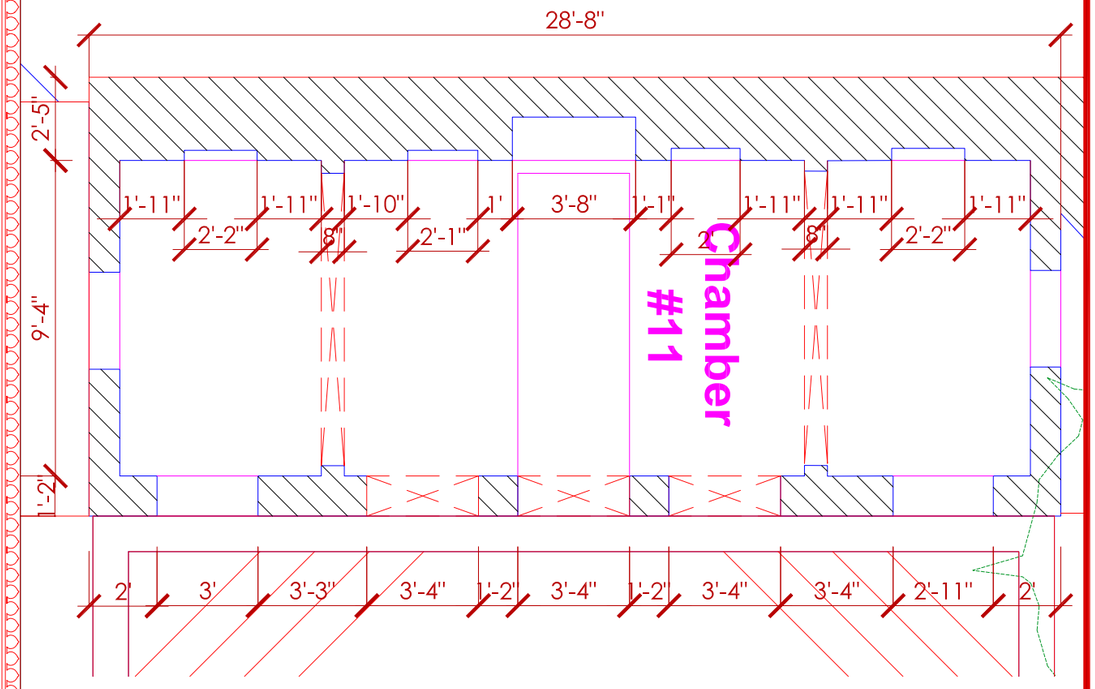
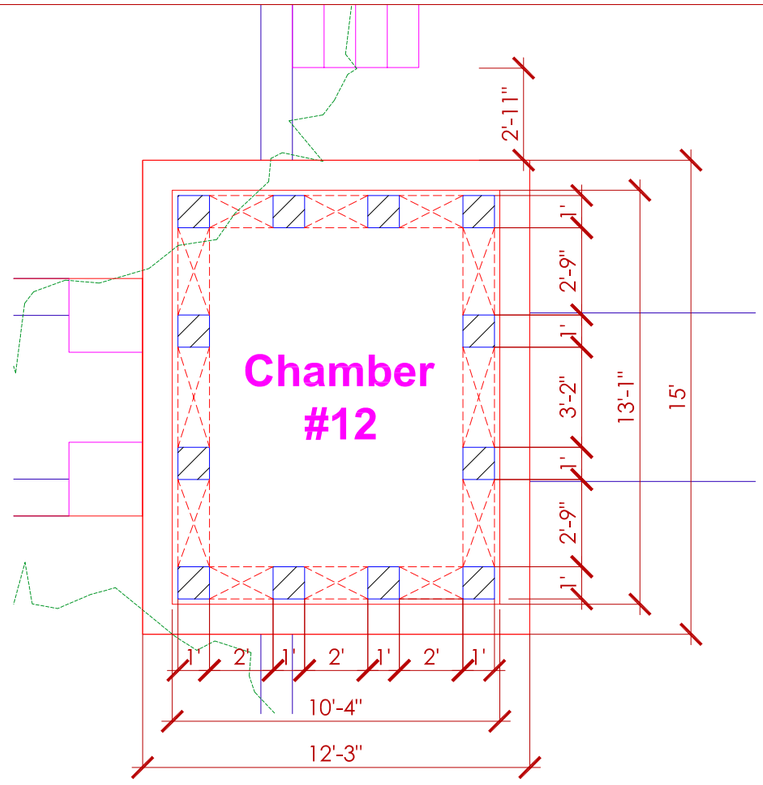


Plan: Chamber #11



Plan: Chamber #12

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Lund University, Sweden
and
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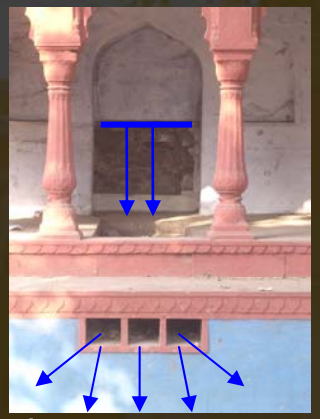
N ⊕ Scale ~	
PREPARED BY	
DATE:	
Drawing No.	

Traditional Water System for Jharna:



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3

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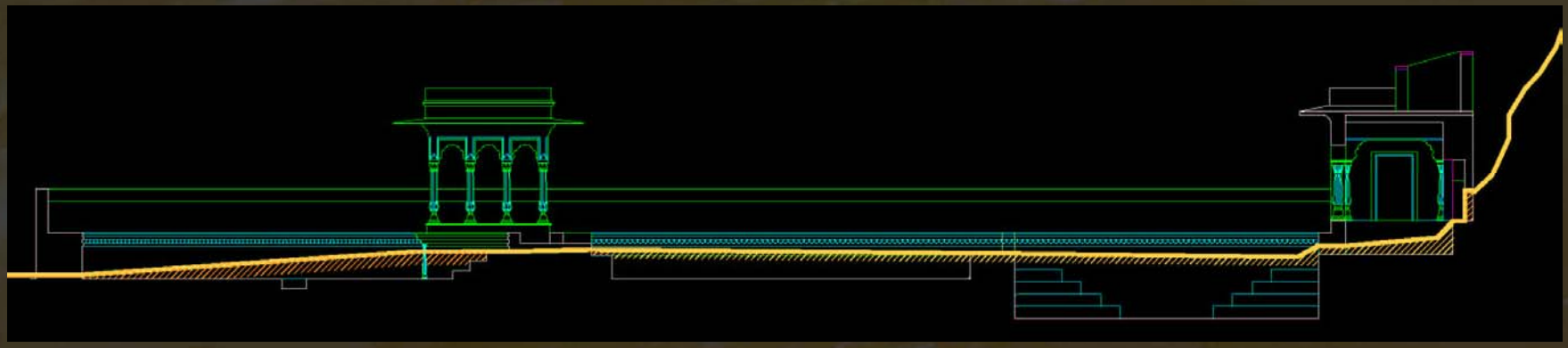
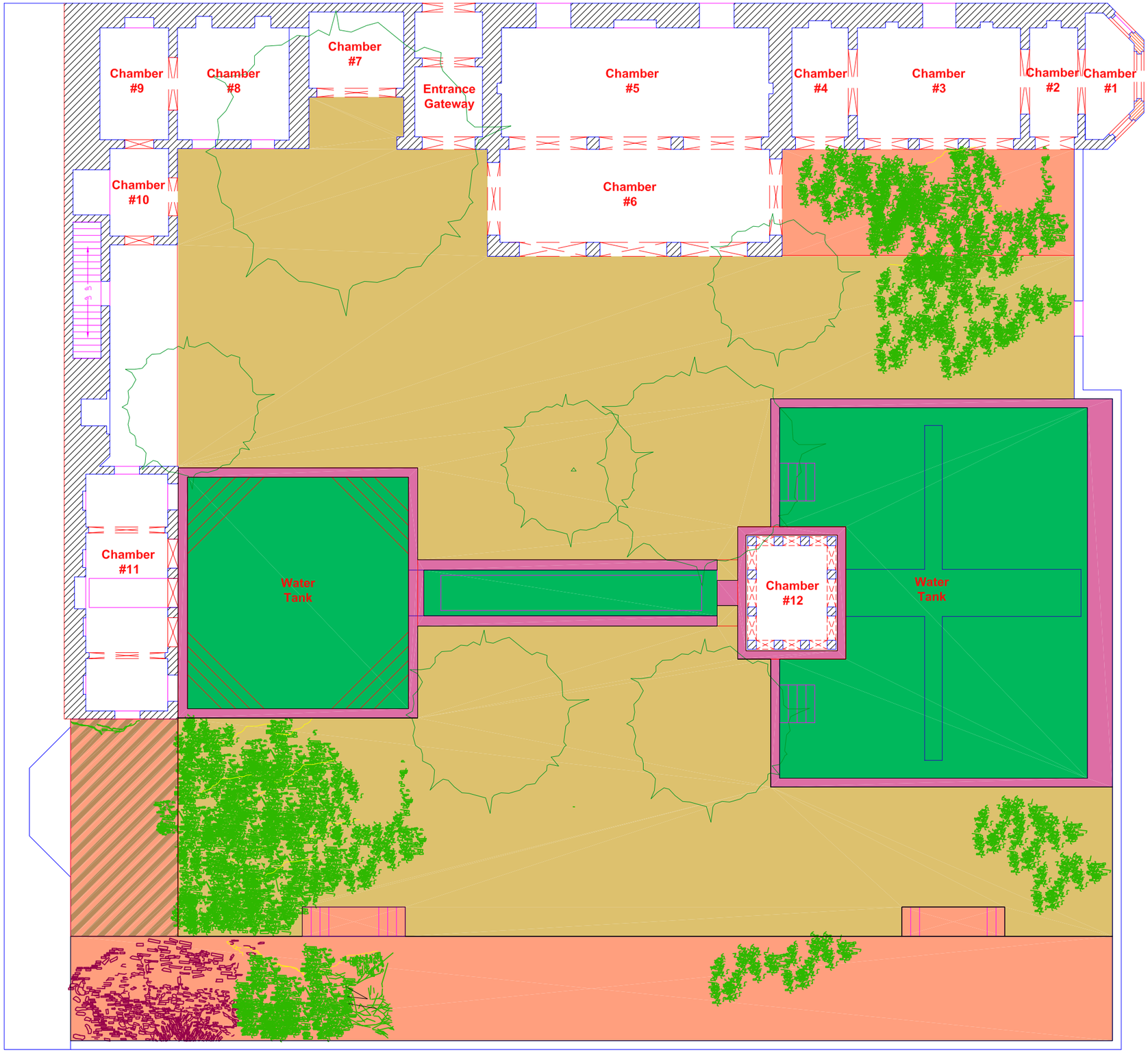


Part-II: Condition Documentation

The Jharna is situated in the South eastern part of Mehrauli near to *Andheria mod*. The entrance to the complex is through a staircase which starts from the are highly encroached. The staircase downwards goes to the entrance of the Jharna. The fluted arch of the entrance is damaged at some places and the masonry is visible as plaster has peeled off from the surface. This small entrance has a newly added gate. This is highly incongruent to the overall character of the complex.
The gateway inside is damaged severely. The masonry is broken.
The open court is covered with grass and PCC flooring. The red coloured Baradari and the pavilion on the west side are very much prominent features of the site. This red colour is enamel paint. The water tank and the channels are painted in blue colour in front of the pavilion. The water channel which used to come from the pavilion is in a bad condition.
The water tank are filled with contaminate water which are generating an unhygienic condition. The channels are filled with garbage, tree leaves and plastic bags. The system once created to flow water in the channels is totally destroyed due to lack of maintenance.
The cambers on the northern edge of the site are in dilapidated condition. The centrally located chamber of these has fluted large columns. But some of them are broken at some parts. The masonry is extensively damaged. The chhajja is damaged at various places. Stones are missing.
The exterior walls are in a serious state of deterioration. Cement plastering has been done at the lower level on all the walls. Above these cement- plastered areas, the masonry is exposed, damaged in places. Bricks are missing. All theses walls show that the new bricks were put while repairing the structure earlier.
In some places, pointing has been done in cement mortar. None of the arches on any side show their original profile completely. . Lime plaster still exists at the level above the arches.
There are multiple layers of paints on the outer facades where lime plaster is still visible. The paint is flaking all over the surface.
The flooring inside the building has patches of cement over the original lime concrete flooring. At some places is the original floor is damaged. The niches on all sides have cement flooring, slightly higher than the central flooring. An ornate masonry sculptural form marks the centre of the structure. This has multiple layers of lime wash.
The walls inside are almost without plaster. The brick masonry is visible and damaged. Most of the lower level bricks are dislodged.
The stairs and terraces are filled with garbage as not in use. The whole site is abundant and shows signs of decay at all the places.



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MATERIALS : LEGEND:

- KOTA STONE SLABS
- MODERN BRICK
- OLD LIME WASH LAYERS
- ORIGINAL LAKHORI BRICK
- LIME MORTAR
- CEMENT MORTAR
- SAND STONE
- ENAMEL PAINT
- WATER
- ALGAE
- LIME CONCRETE SURFACE
- MODERN BRICK

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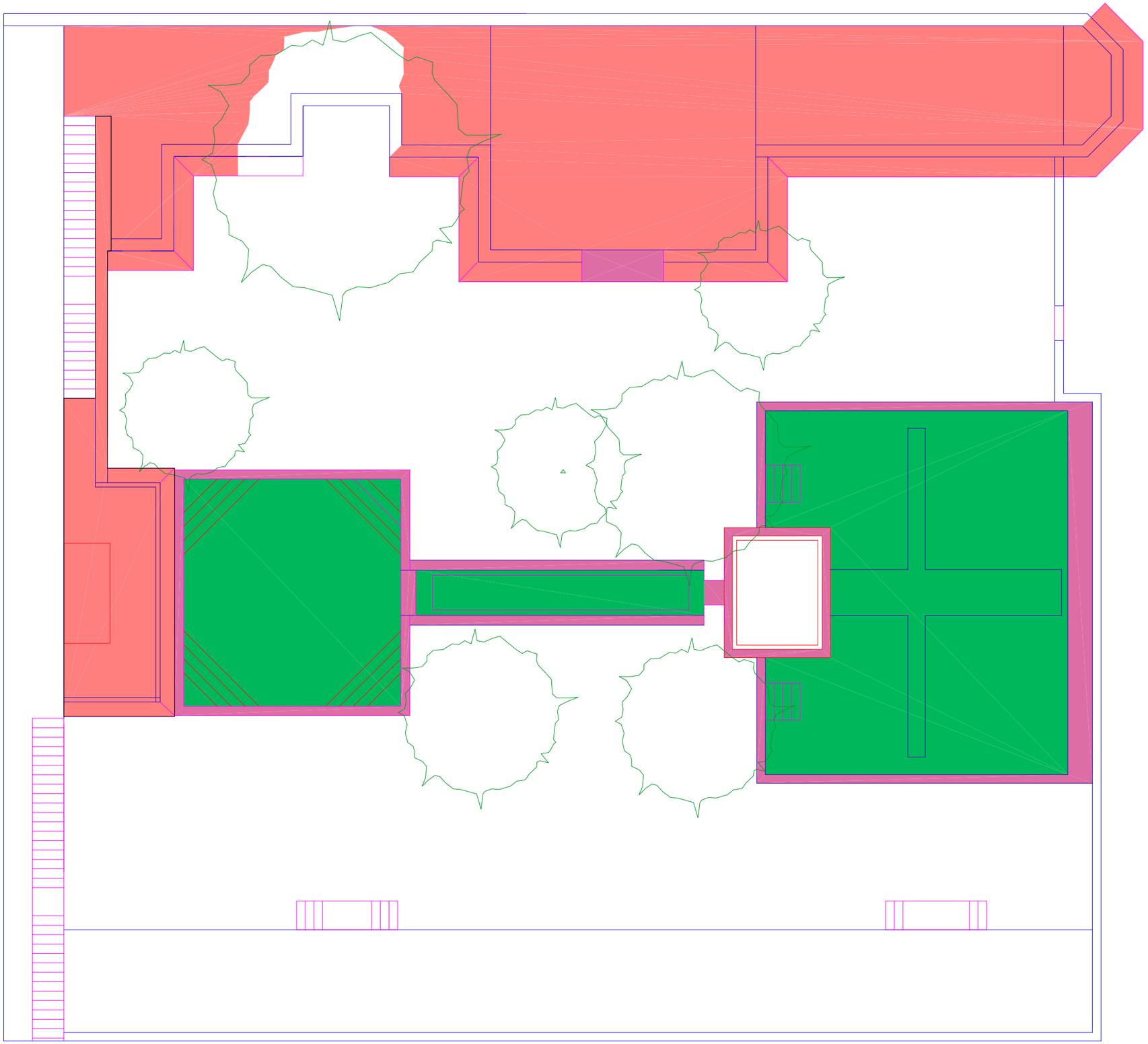
N / Scale ~ 1:200	MATERIALS SITE PLAN
PREPARED BY	UJJWALA
DATE:	FEBRUARY-2006
Drawing No.	6



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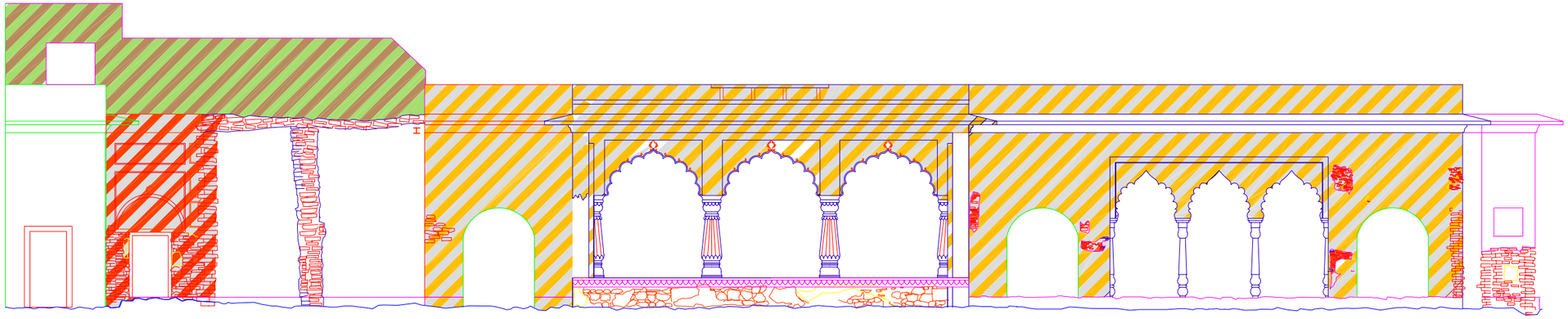

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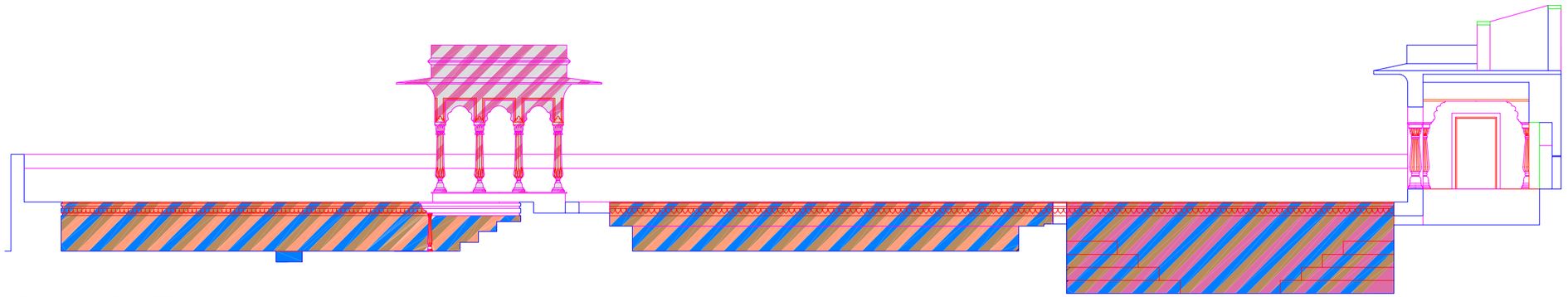
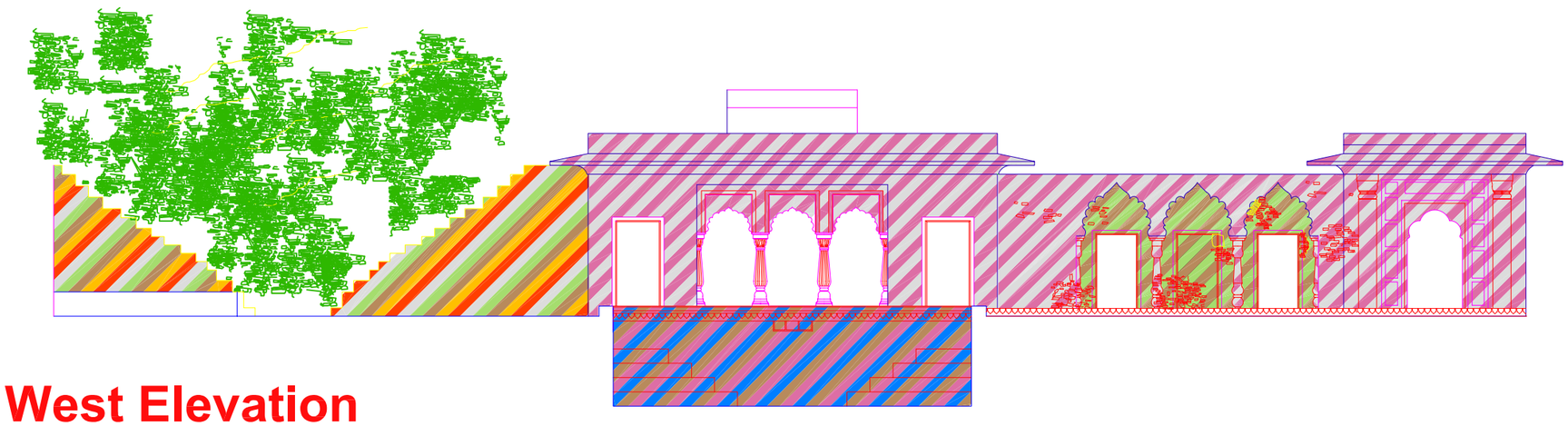


South Elevation



West Elevation

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Part-III: Conservation Plan

A. Conservation of the building

As the bulk of the work involved in the conservation of the *Pavilions, Water tanks* and *Batradari* is related to civil works, close coordination is required between structural repairs and the chemical/art conservation measures to be employed.

1. Civil Works:

The work involves clearing of the site of the vegetation and garbage and the removal of all the inappropriate additions which have been made to the heritage building.

The cement concrete flooring which had been provided in the recent past around the Water tank after the court was filled with earth filling is recommended to be removed. The pulverised bricks on the façade of the pavilions and entrance need to be replaced. On the external façade, in many areas, the bedding mortar of the bricks has decayed leading to the dislodging of the bricks. Over time multiple layers of limewash had been applied which is pealing. The chajja[5] is damaged in many places although major part of the element is intact. The problems include missing tiles of the structural system of the chajja, decayed lime concrete, decayed lime plaster, multiple coats of lime washes, algae, stains possibly due to salts along the underside of the chajja.

It is evident through visual survey that the outermost layer of lime concrete which has been applied to give the final form to the columns has separated in places from the inner masonry.

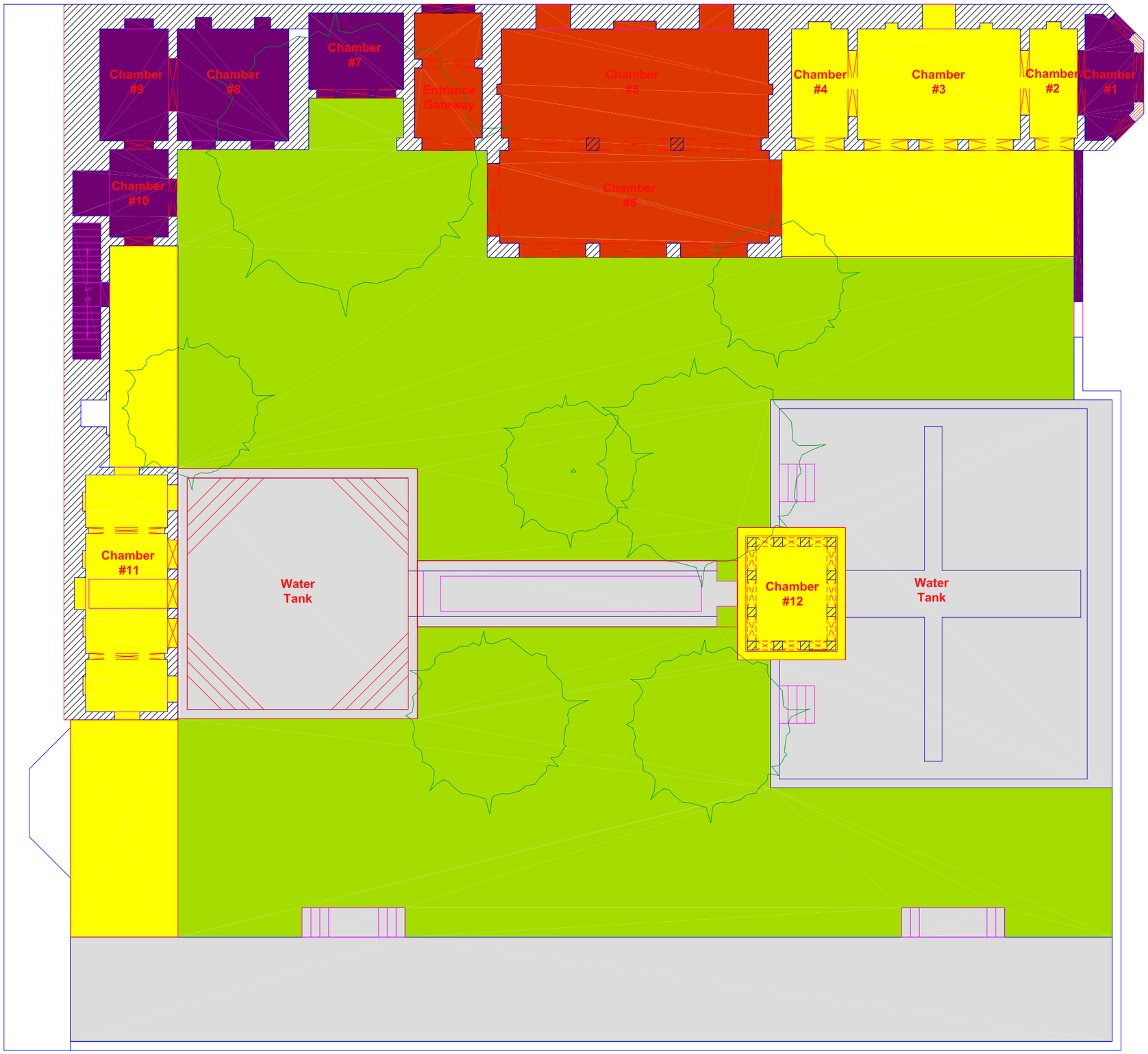
Inside the buildings, the floor of the chambers have cement concrete repair work. It is not evident whether the cement concrete has been provided to repair patches in the original flooring or has been provided as a completely new floor. The plaster is pulverized in large areas and in places the masonry is damaged above the level of cement plaster. Brick masonry is exposed at some parts and the plaster is pulverized in many places. In many places on tapping it is evident that the plaster has separated from the masonry. The walls have multiple coats of lime wash. This paint is flaking above the level of the pulverizing plaster.

The open space has extensive vegetation in the form of ground cover, shrubs and local trees. Waste building material as well as garbage is strewn around. Rain water spouts are not in working condition. Boundary wall is damaged at various places. The intent of the intervention appears to have been for the purpose of public use. This intervention has negatively impacted the state of

[5] A architectural feature of the building generally used as a shading devise. In historic buildings, these are the members used above the lintel level below the parapet wall of the structure, generally constructed of stone

conservation of the Historic structure. This floor traps moisture in the court therefore making the historic wall most vulnerable to decay due to rising damp and lateral water penetration.

Condition Documentation
Damage Categories



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INTENSITY OF DAMAGE

- CATEGORY 1
- CATEGORY 2
- CATEGORY 3
- CATEGORY 4
- CATEGORY 5

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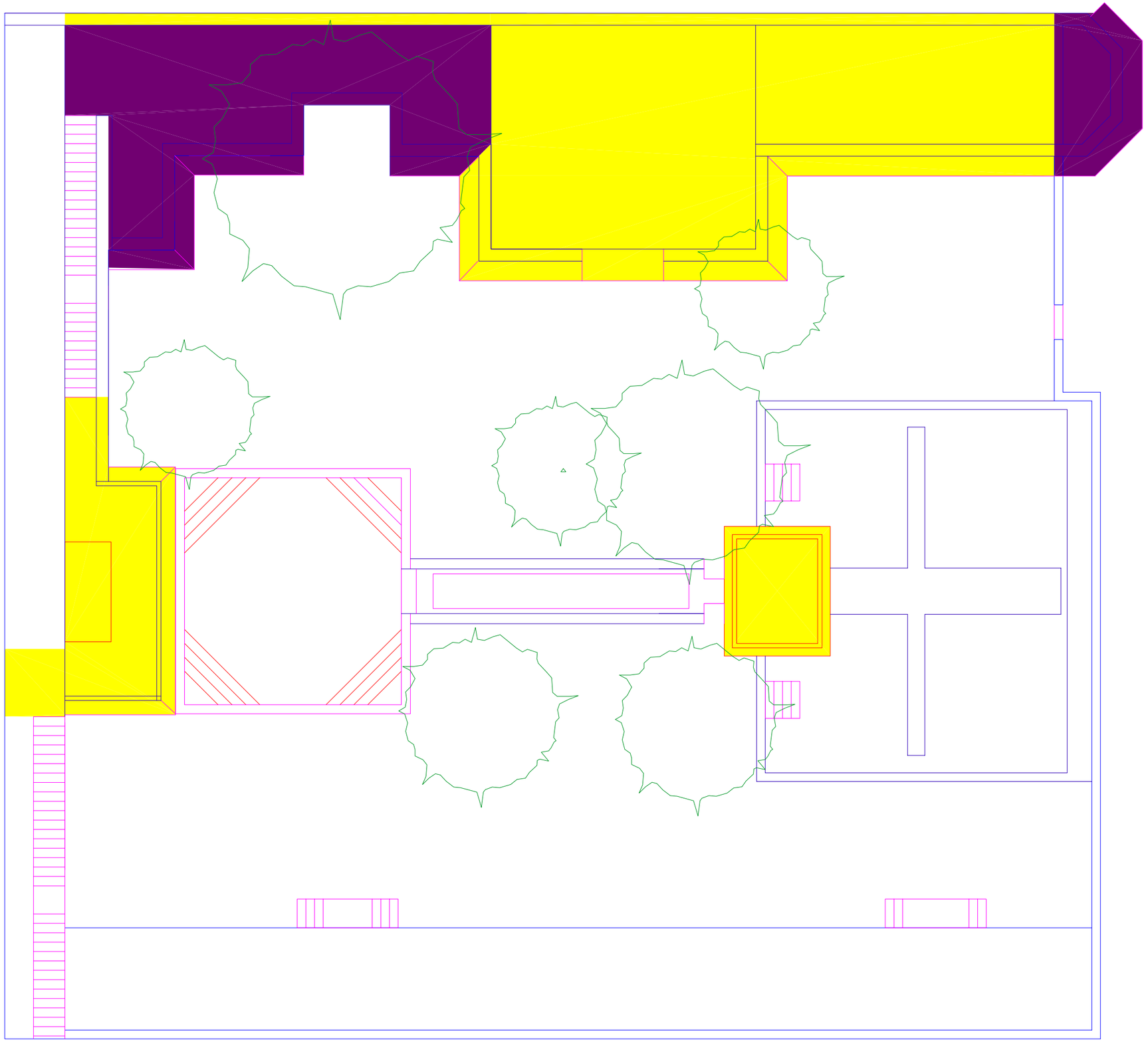

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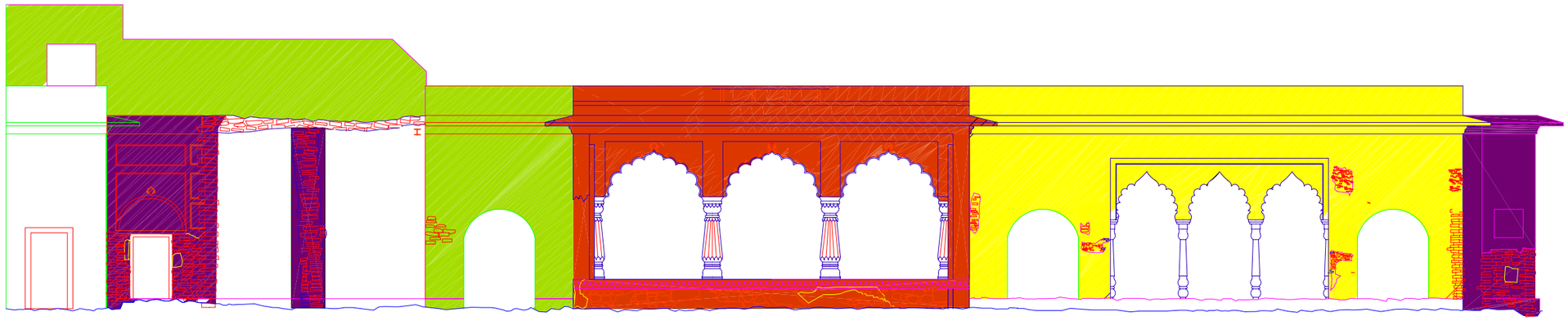
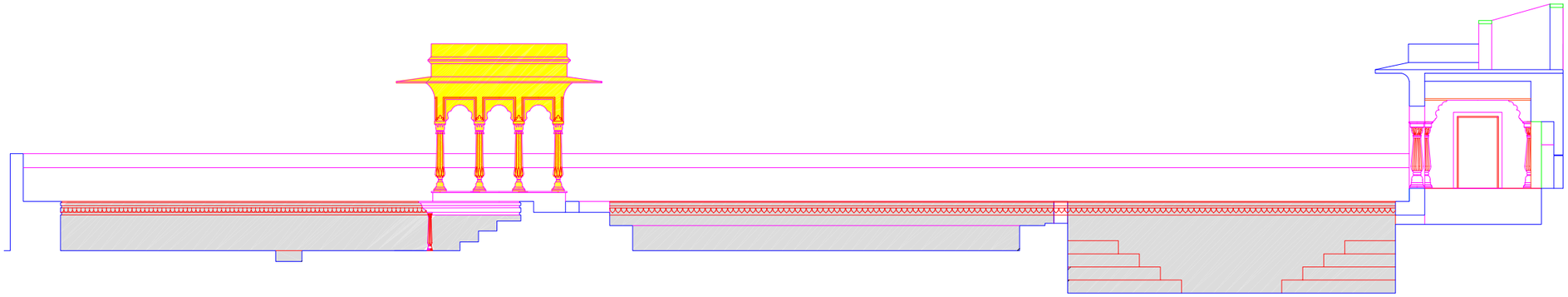


North Elevation



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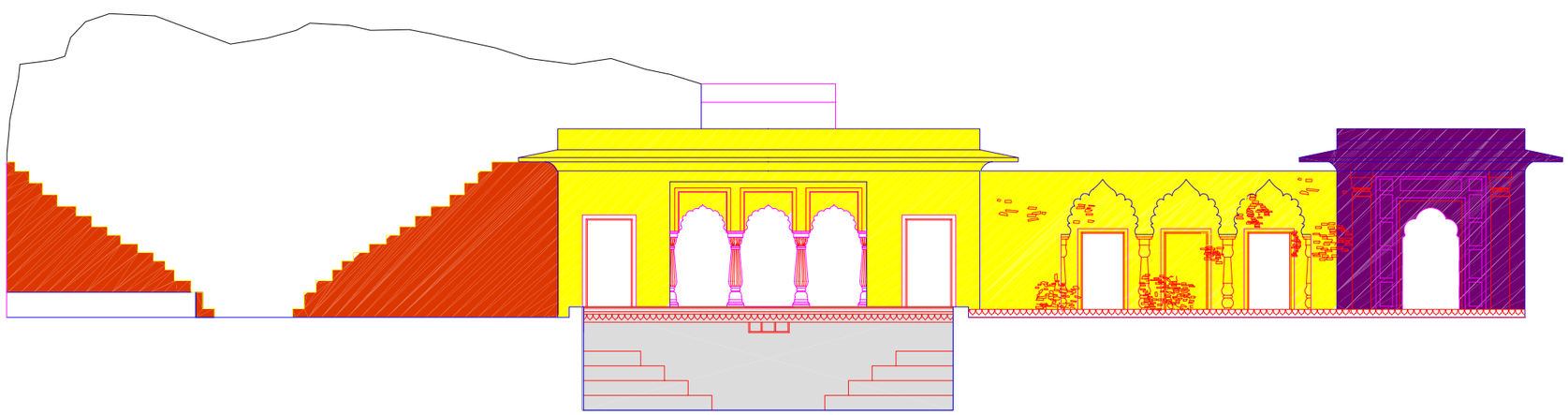

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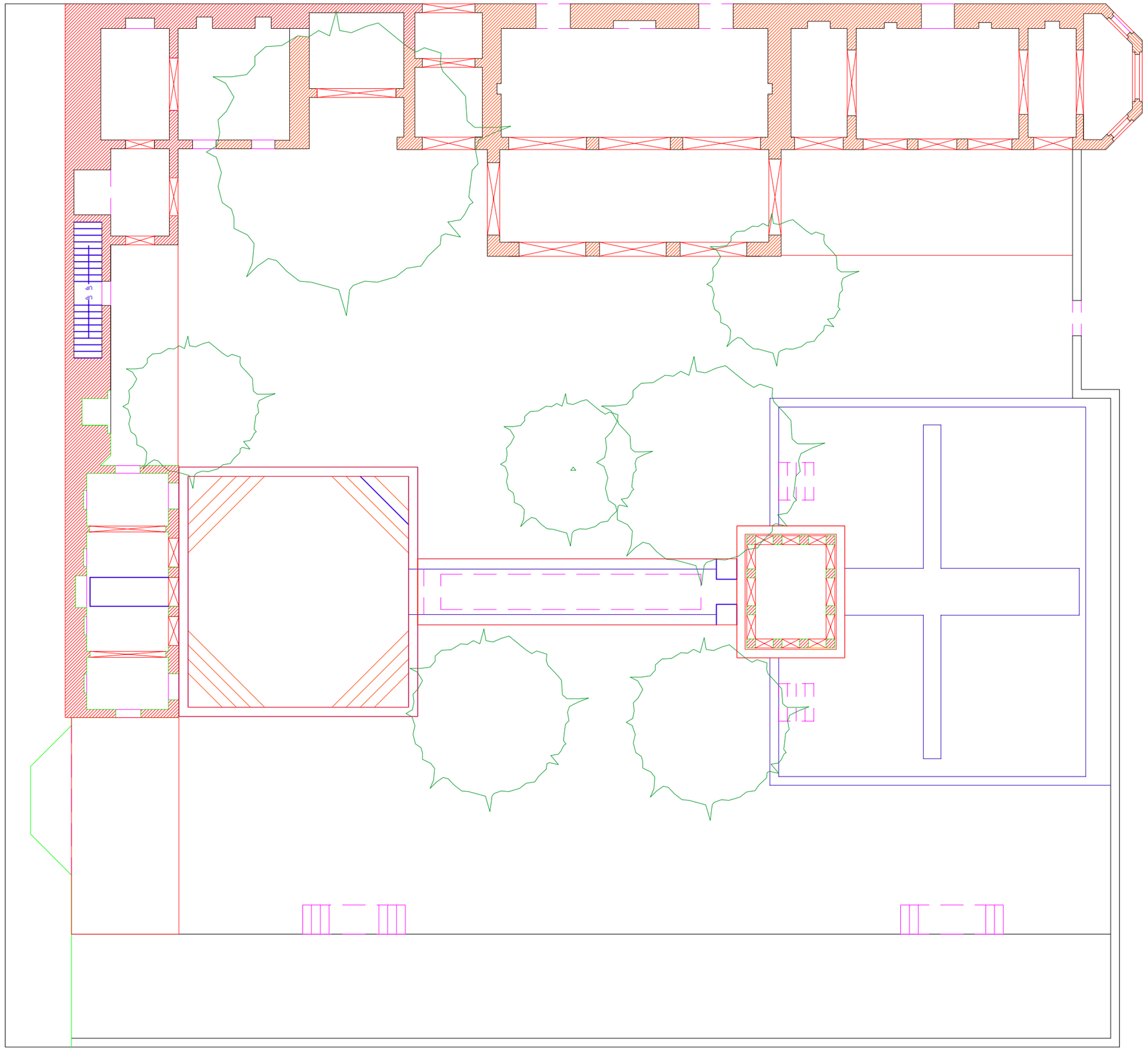
Restitution



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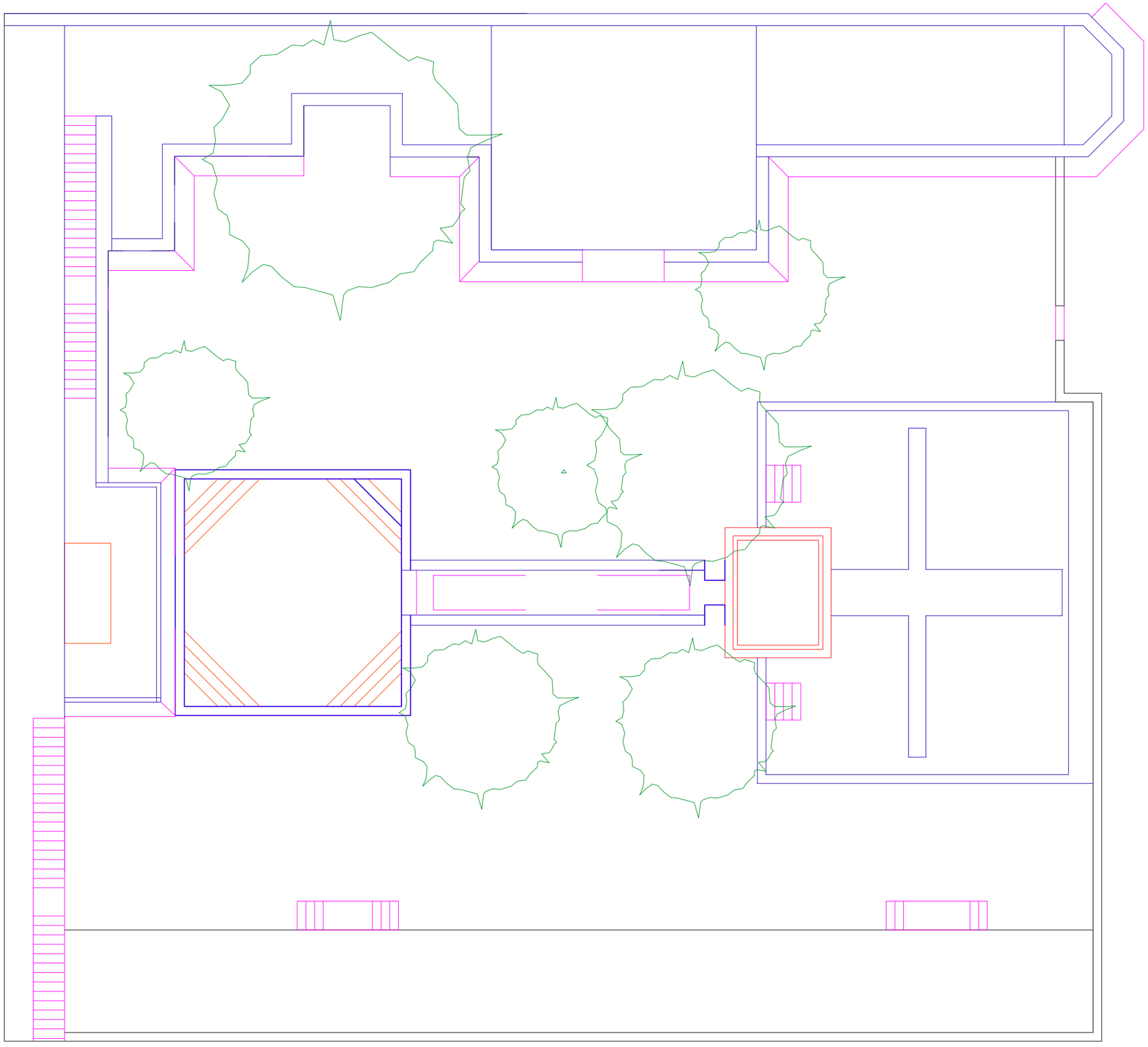

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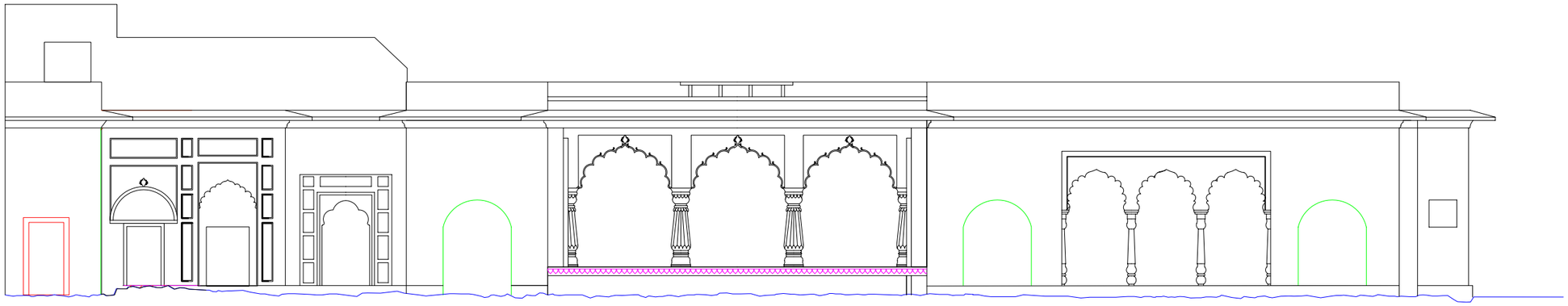
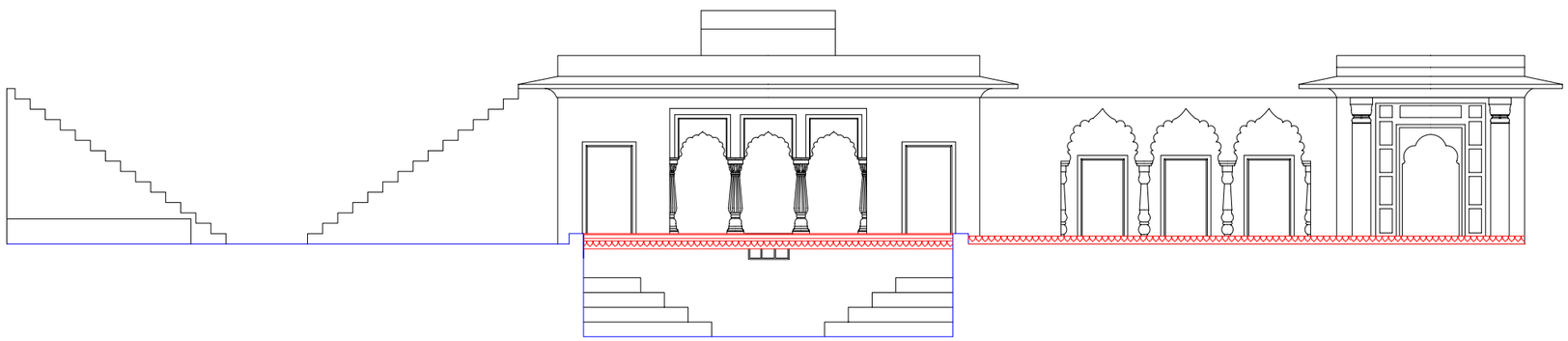


North Elevation

South Elevation



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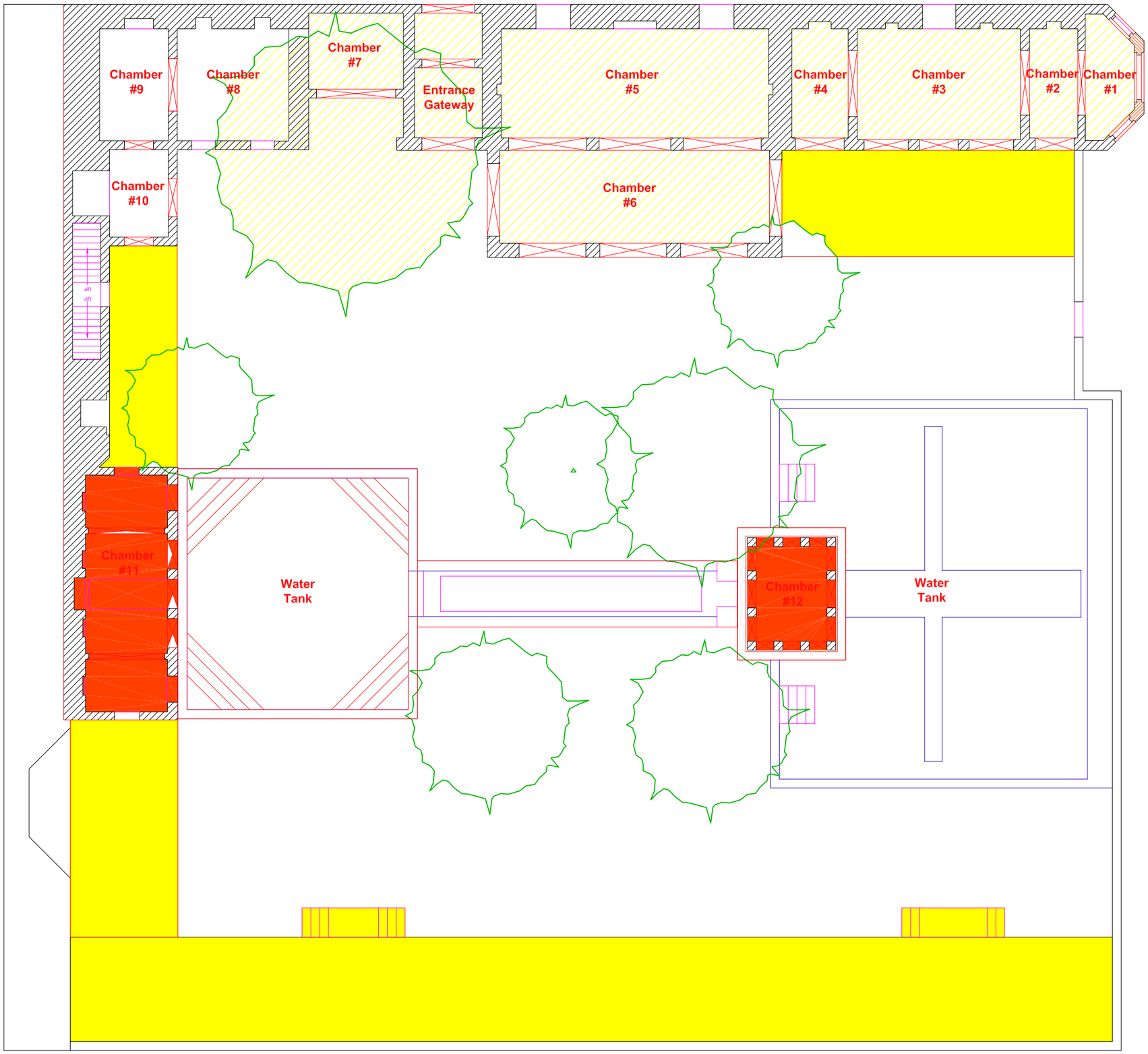

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OLD PHOTOGRAPHS

TRACES ON THE BUILDING

COMPARATIVE STUDY WITH

ELEMENTS OF THE BUILDING ITSELF

BUILDINGS IN THE VICINITY

BUILDINGS OF THE SAME ARCHITECTURAL FUNCTION AND SAME OR DIFFERENT PLAN TYPE

BUILDINGS OF SAME ARCHITECTURAL CHARACTER BUT DIFFERENT FUNCTION

ARCHITECTURAL NECESSITY

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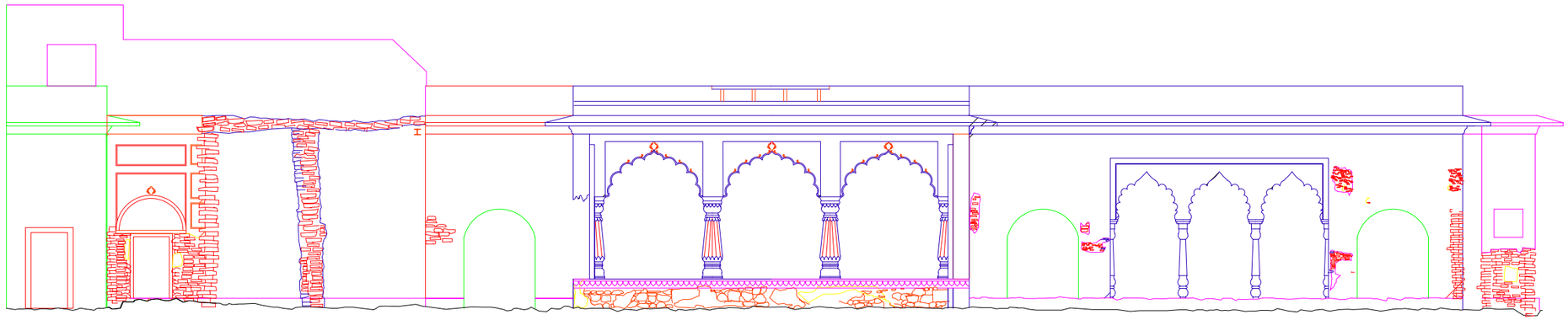

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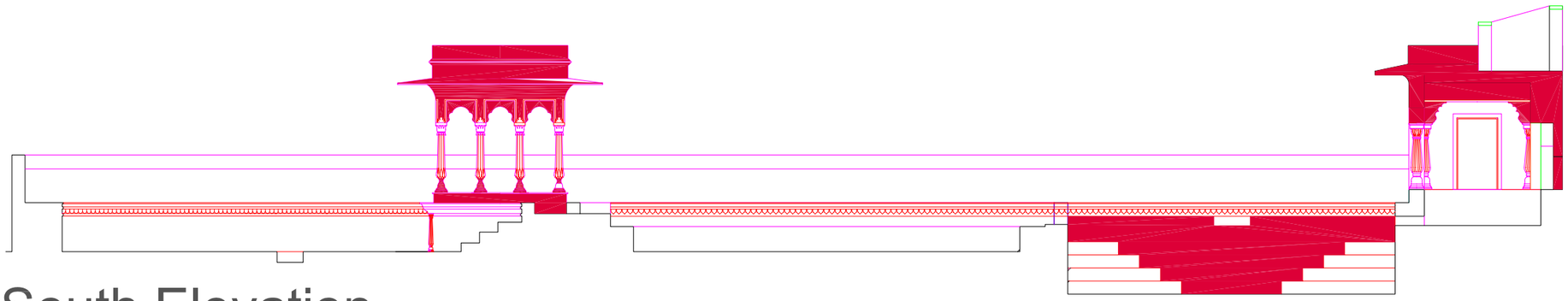

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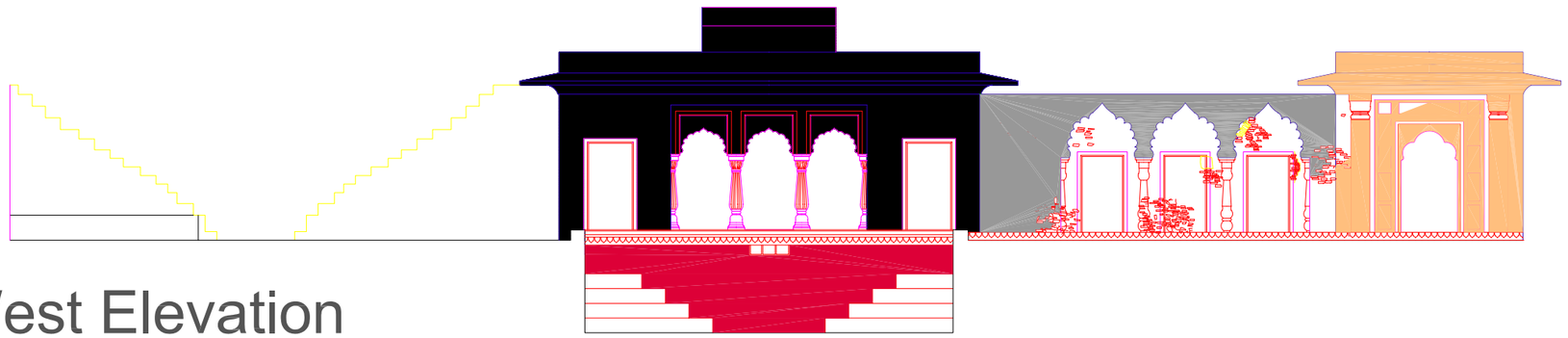

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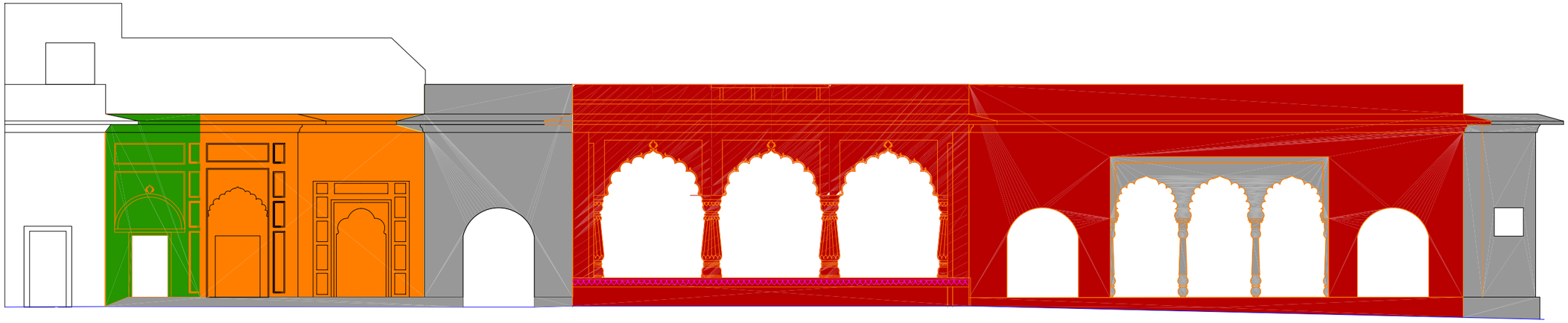
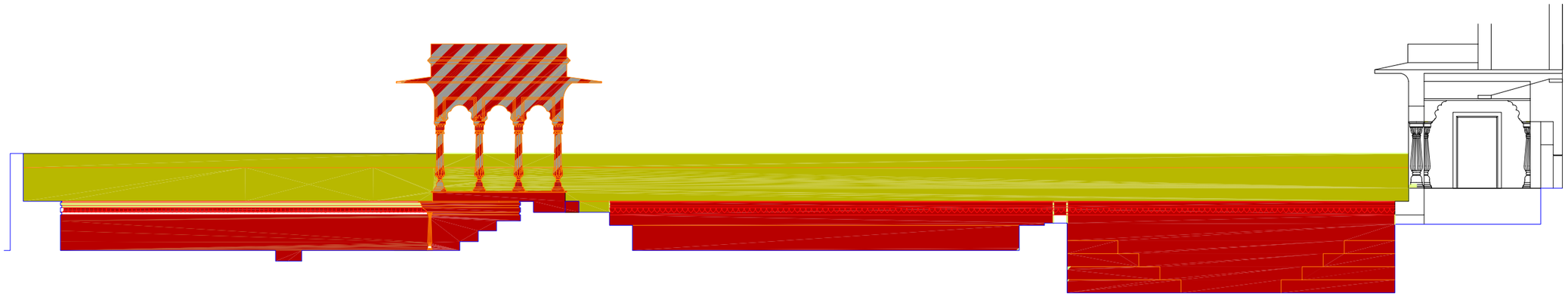
Drawing No.	

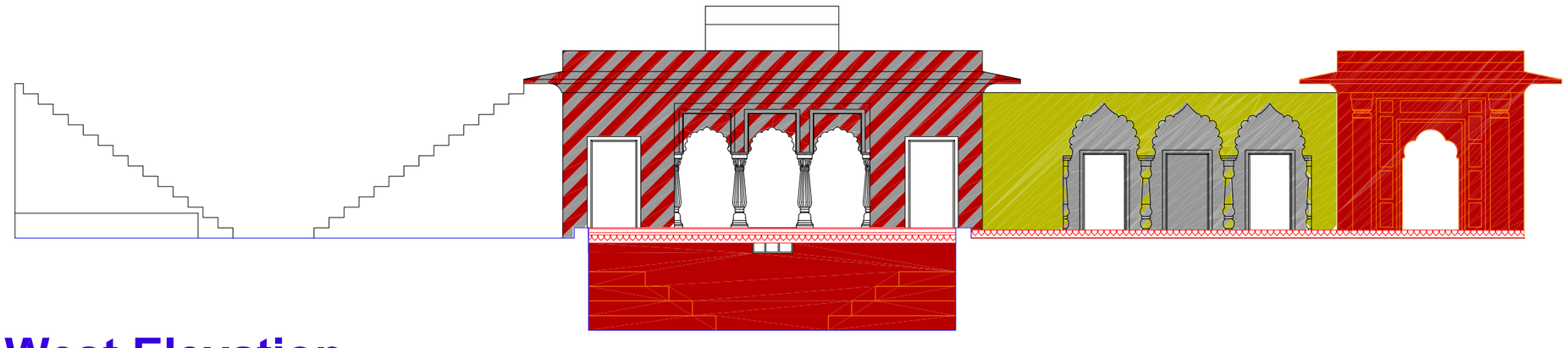
Determination of Restitution Validity



North Elevation



South Elevation



West Elevation

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5. ALL THE DIMENSIONS ARE IN FEET AND INCHES

DEGREE OF AUTHENTICITY OF RESTITUTED ELEMENTS

- EVERYTHING KNOWN, REMAINS AND TRACES ON THE BUILDING EXIST, SAMPLES FOUND.
- LOCATION, FORM, DIMENSION AND MATERIAL KNOWN, DECORATION DETERMINED THROUGH COMPARATIVE STUDY.
- LOCATION, FORM, DECORATION AND MATERIAL KNOWN, DIMENSIONS DETERMINED THROUGH COMPARATIVE STUDY.
- LOCATION, FORM AND MATERIAL KNOWN, PLANAR DIMENSIONS AND DECORATION UNKNOWN AND DETERMINED THROUGH COMPARATIVE STUDY.
- LOCATION AND MATERIAL KNOWN, FORM AND DIMENSIONS DETERMINED THROUGH COMPARATIVE STUDY. WHERE DECORATION UNNECESSARY, AND LOCATION AND MATERIAL KNOWN, FORM AND DIMENSIONS DETERMINED THROUGH COMPARATIVE STUDY.
- LOCATION IS KNOWN, OTHER INFORMATION DETERMINED THROUGH COMPARATIVE STUDY, TRACES MAY BE FOUND IN THE CASE OF AN EXCAVATION.
- LOCATION IS KNOWN, FORM AND MATERIAL ARE DETERMINED THROUGH COMPARATIVE STUDY, LITTLE POSSIBILITY OF GAINING INFORMATION FROM AN EXCAVATION.
- EVERYTHING DETERMINED THROUGH COMPARATIVE STUDY, THERE IS LITTLE POSSIBILITY OF GAINING INFORMATION FROM ANY EXCAVATION.

Project Title:
Conservation and Maintenance Plan for Jharna, Mehrauli

Advanced Training Programme
Conservation and Management of Historic Buildings

Department of Architectural Restoration and Conservation
Department of Housing Development and Management
Lund University, Sweden
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Swedish International Development Cooperation Agency (Sida)

N / Scale ~	
PREPARED BY	
DATE:	
Drawing No.	

Observation table:

Surfaces		Observations/ Decay	Cause of decay	Strategy for intervention
Exterior	1	The original plinth is not visible due to PCC flooring		The cement concrete and the layers below will be carefully excavated to reveal the original plinth and the original ground level.
	2	Inappropriate materials has been used for repair in the past: Cement plaster is present in large areas on the walls up to an approximate height of 1.75m on all sides Deteriorating original plaster above the level of the cement plaster (approximately 1.50 metres). In some sections the bedding mortar as well as the brick has deteriorated In some areas the bricks are in good condition but due to the deteriorated mortar these original bricks have been dislodged.	Cement plaster does not allow the moisture in the masonry to dry out- traps water and this aggravates the decay in the walls. The moisture travels upwards and dries out through the lime plaster at the levels immediately above the cement plaster. This cycle of wetting and drying accentuates the decay process in the lime based material.	Cement plaster will be carefully removed. The damaged bricks will be carefully removed and replaced in a similar bedding mortar. The new bricks will match the original brick in size absolutely and close in texture, colour and therefore strength. The areas with the missing plaster will be carefully brushed with nylon bristle brushes without damaging the bricks. The surface may require gentle washing, the water will be judiciously sprayed and not poured. After cleaning, as mentioned above the dislodged bricks will be repositioned with matching mortar; joints of the masonry will be carefully and gently raked. These joints will be pre-wetted and re-pointed carefully. The walls will be re-plastered in matching mortar

		after the pointing has stiffened through drying and partial curing.
Deteriorating lime plaster- The plaster above the line of cement plaster is extensively pulverized.	The rising moisture in the masonry (with possible salts) has led to the deterioration of the plaster and subsequently mortar. Some of this plaster is in advanced stage of decay.	Following very close inspection by a trained conservator, the plaster which is extremely pulverized would be carefully removed. This treatment would be followed only for areas where the plaster is not decorative in nature. Detailed photo documentation will be undertaken before intervention.
Multiple coats of lime wash: Over the decades/ centuries the building façade has been provided with multiple coats of lime wash. While on one hand they have protected the original layer of plaster on the other hand obliterate the architectural details on the building. The lime wash layers are peeling off easily.	Local initiative as part of maintenance of the structure.	These multiple layers of lime wash are recommended to be carefully removed under the close scrutiny of trained art conservators. It is recommended that this should be done using simple mechanical techniques. Lime wash on a sample area of approximately 25 square inches would be undertaken and the lime wash would be removed in a manner so that the original layer is not damaged. This would help in ascertaining the level to which the lime wash is recommended to be removed.
Loss of detail: Some of the original architectural details have been lost. Some are reversible losses while other losses are irreversible in nature.	The loss is primarily due to the decay in the original plaster and the application of multiple coats of lime	As mentioned above, the layers of lime washes will be carefully removed. The final treatment of the external plaster surfaces will be ascertained after the application of the plaster, consolidation of the

		washes	original plaster through grouting etc, removal of the multiple layers of lime washes.
	Damaged chajja : The chajja is damaged in many places although major part of the element is intact. The problems include missing tiles of the structural system of the chajja, decayed lime concrete, decayed lime plaster, multiple coats of lime washes, algae, stains possibly due to salts along the underside of the chajja.		The chajja would be carefully repaired and conserved. The missing parts of the structural system would be fixed, lime concrete and plaster consolidated and missing areas filled, the algae and lime wash would be carefully removed.
Interior	Cement concrete on the flooring: The floor of the chamber has cement concrete repair work. It is not evident whether the cement concrete has been provided to repair patches in the original flooring or has been provided as a completely new floor Cement plaster on the walls: Cement plaster has been applied up to a height of 0.5m from floor level as part of the repair work		The cement concrete would be carefully removed with mechanical means. The technique and material for repair of the same would depend on the condition and specifications of the material found after the removal of the cement concrete. Cement plaster would be carefully removed through mechanical means. Utmost care will be taken to ensure that the brick is not damaged in the course of removal of the cement plaster. It is important to note that the cement plaster is extremely rich and therefore hard.
	The plaster is pulverized in large areas and in places the masonry is damaged above the level of cement plaster. Brick masonry is exposed at some parts and the plaster is pulverized in many places. In many places	The cement plaster traps moisture which leads to the traveling of moisture to higher levels. A process of	The extremely pulverized plaster which is not decorative in nature would be carefully removed. The plaster which is in a good condition but has separated from its base would be consolidated

	on tapping it is evident that the plaster has separated from the masonry	wetting and drying occurs which causes disintegration of the plaster. The movement of water also enables traveling of salts in the walls.	through grouting with lime slurry.
	The walls have multiple coats of lime wash. This paint is flaking above the level of the pulverizing plaster.	Rising damp results into flaking of the paint and gradually this process of decay leads to the pulverization of plaster and later mortar in the masonry.	The lime wash would be carefully removed by mechanical techniques. A small sample area would be undertaken to determine the depth and technique that should be used for lime wash removal. The final treatment of the surface would be determined after the limewash has been removed from the entire chamber and the surface closely examined.
Site Development	Plain Cement concrete flooring had been provided in the recent past around the Historic structure building after the court was filled with earth filling. The layers of material below the cement concrete flooring includes a earth fill topped by a layer of brick ballast, finished by cement concrete.	The intent of the intervention appears to have been for the purpose of public use. This intervention has negatively impacted the state of conservation of the historic structure. The internal floor level and the external floor level are approximately the same. This layer traps moisture in the court	The newly provided plain cement concrete flooring along with the sub floor would be removed and the original courtyard level will be achieved. A floor will be provided in the courtyard which has historic / contextual detailing and which would in function allow the rain water to seep into the ground as well as allow it to dry equally easily. The slope would be created in a manner to ensure that the rain water drains away from the historic building.

therefore making the historic wall most vulnerable to decay due to rising damp and lateral water penetration.

Site edges/ boundary conditions: The shape of the open space attached to the historic structure complex is oblong. Residential buildings have been built along its various edges. The masonry of these buildings is exposed brickwork mostly in mud mortar. Few of the boundary walls are showing structural distress.

Drainage from adjacent buildings: Rain water spouts from the terraces of some of the neighboring buildings drain into the open space.

Earth fill and building material, vegetation in the open space adjacent to the historic structure court:: The open space has extensive vegetation in the form of ground cover, shrubs and local trees. Waste building material as well as garbage is strewn around.

Entrance gateway: The entrance to the site is from the public square in the Munshi mohalla. The complex is entered through a gateway which has been in the recent past after demolishing the older gateway.

Observations:

Material Study:

More than 65% building shows the use of traditional materials.

Damage Categories:

47% of the total building shows Category 3 damage, which need to be repaired for stability of the structure.
33% is in Category-5 which needs urgent repairs

Change in the building:

28-29 % building has been transformed –materials

Sources of Restitution:

Major Sources of restitution depends on the Traces in the buildings itself.
Old painting gives the information about the building forms.

Determination of restitution Validity:

It is based on the degree of Authenticity of restituted elements.

Interventions:

Strategy for Interventions:

1. Respecting all the layers of history
2. Structural Stability
3. Effective maintenance
4. Adaptive reuse

Conservation plan for area:

Meditation & Yoga center

Therapeutic retreat

Children Park

OAT

History Museum

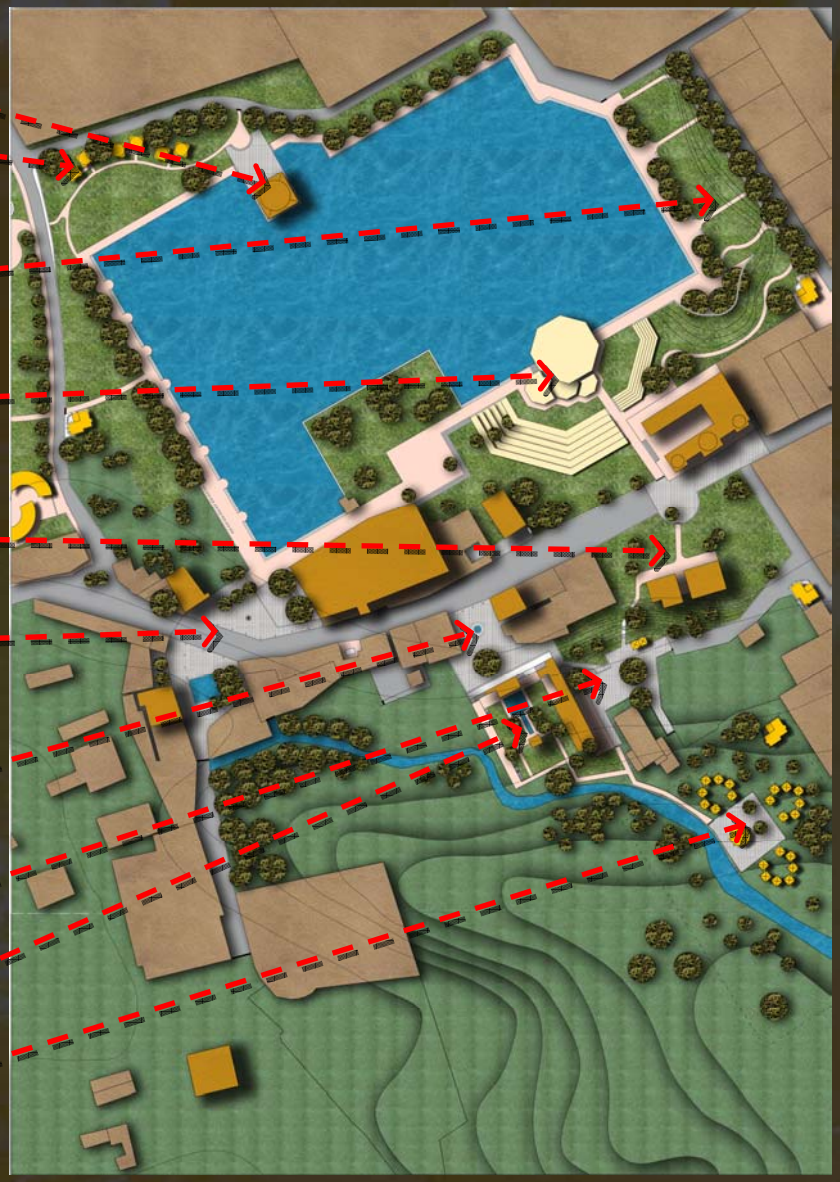
Sufi Chowk

Jharna Terrace Pause Point

Jharna Entrance Forecourt

Revitalized Jharna As a Cultural Node

Nature Camp



B. Methodology/Interventions

1. Civil works:

Cement plaster will be carefully removed from all the walls and the flooring carefully without damaging the masonry and will be redone in lime plaster as per the proportions at different places depending on the material analysis.

The damaged bricks will be carefully removed and replaced in a similar bedding mortar. The new bricks will match the original brick in size absolutely and close in texture, colour and therefore strength.

The areas with the missing plaster will be carefully brushed with nylon bristle brushes without damaging the bricks. The surface may require gentle washing; the water will be judiciously sprayed and not poured.

After cleaning, as mentioned above the dislodged bricks will be repositioned with matching mortar; joints of the masonry will be carefully and gently raked. These joints will be pre-wetted and re-pointed carefully.

The walls will be re-plastered in matching mortar after the pointing has stiffened through drying and partial curing.

The cement concrete and the layers below will be carefully excavated to reveal the original plinth and the original ground level.

2. Conservation of surfaces:

Documentation

Detailed documentation and condition mapping of the surfaces has been carried out. Photographic documentation has also been done but will need to be undertaken at all stages of intervention/treatment.

1. Civil works

2. Conservation of surfaces:

Removal of unwanted additions including cement and lime wash from the walls to ascertain the presence of decorative details below

The removal of lime wash and cement needs to be carried out mechanically by adequate softening and making test patches where necessary. Care would be taken to ascertain the presence of decorations below before commencing any treatment.

Removal of limewash from decorative stone and in the interior.

The basic principle of minimum intervention and minimum use of chemicals would be followed in the conservation treatment. The cleaning methodology would be arrived at after doing test patches on the surfaces using organic solvents/chemicals. Care would be taken to minimize the time of contact between the solvents/chemicals employed and the surfaces. Mechanical means would be

preferred in cleaning accretions; however, sufficient care would be taken to maintain the original condition and texture of the surface being cleaned.

Conservation of decorative plasterwork

The areas of decorative plasterwork would require a need-based intervention, the initial emphasis being on consolidating and grouting unstable areas to prevent further loss. Re-creation of lost areas would then be taken up with compatible material and followed by the final finish, including re-creation of the painted surface as per original colour scheme. Analysis of the plaster/pigments is proposed to be done as part of the overall material research exercise.

Conservation of external painted surfaces

Though the external painted surfaces seem to be limited to the dome area, a clearer picture will emerge only after removal of the limewash and algal growth. To begin with however, the focus in the initial part of the proposed treatment would be on revealing the painted areas as best as possible. The technique of execution of the paintings appears to be in fresco but a closer examination/study is necessary before arriving at any definitive conclusion. Restoration of the lost areas may be taken up in traditional technique and with compatible material to ensure a harmonious outcome.

Removal/Treatment of Algal/Tree Growth

Large-scale algal growth on the walls and eaves of the structures is hiding details and contributing to the deterioration of the plaster below. A detailed examination of the type of bio-growth is necessary to determine treatment measures. Also, periods of active and dormant growth need to be studied so that treatment is applied at the appropriate time. A sample treatment patch may be done before any major application. The algal growth would have to be removed very carefully so as to prevent further damage to the decorative areas below. The sample areas maybe conserved and reviewed from time to time to decide on the best possible treatment. Conventional tree killers would be employed for removal of the trees and care taken to remove the roots wherever possible from the exposed masonry to minimize any recurrence of growth.

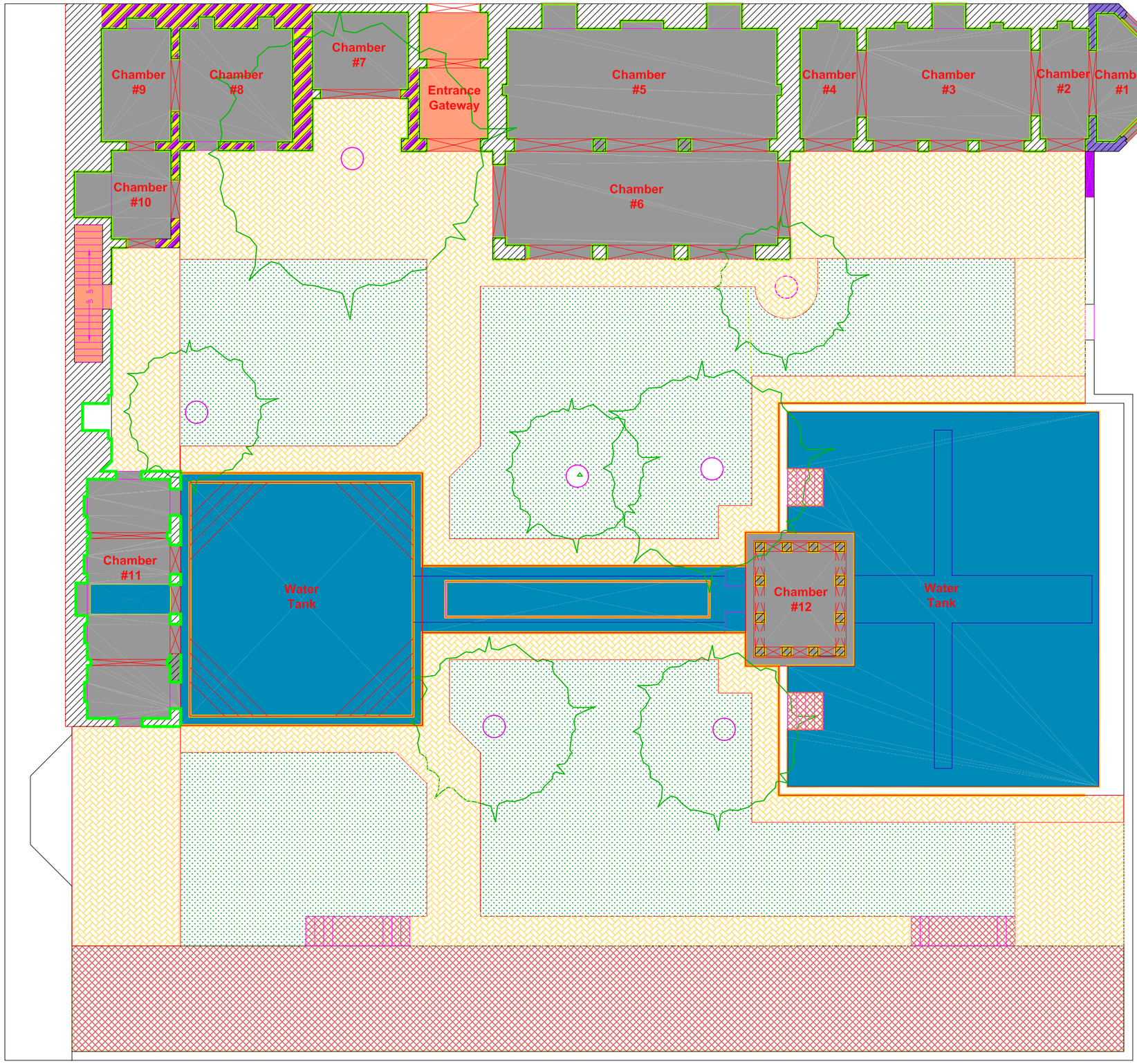
Material/Scientific Analysis

Material/Scientific analysis and research forms an important component of any conservation plan. It helps determine the right conservation procedures and provides a template and reference for future research. Samples of masonry, plaster and pigments would accordingly taken to develop the appropriate materials and techniques for conservation of the Jharna as also further build a document on the arts and crafts used at the site.

Part - IV- Site development plan

Concept for landscape plan:
The landscape development plan for the Historic structure of the founder ruler of Jharna envisages the restoration of the structure in a peaceful, contemplative garden setting for the public. The landscape will not only beautify the surroundings but also serve to tackle the environmental factors that may cause damage to the old and fragile structures.

The main challenge at this constrained site is inflow and outflow of the water into water tanks and, drainage of water in the tanks and the treatment of water. The water originally used to come from the overflowed *Hauz-i-shamsi* water tank but is no more the source of water for the *Jharna.* Restoring this source is the most important part which can be done at area level as a part of ecological up gradation plan.
The entire court will be paved with bricks (patterns made of laying bricks in different ways) lay on a sand bed. This will ensure that the entire surface of the court acts as a sponge to absorb rainwater. The edges of this court will be defined by planting flowering shrubs. The fragrant *champa* trees add to the serene and introspective atmosphere.



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INTERVENTIONS AT THE SCALE OF THE HISOTIC BUILDING

- COMPLETION OF LOST MASONRY
- LIME GROUT WITH SIMILAR BINDER COMPOSITION TO THE ORIGINAL MUD PLASTER, MIXED WITH APPROPRIATE RATIO OF BRICK AGGREGATE AND LIME PLASTER RENDER ON OUTER SURFACE
- GROUTING OF COPING OR OTHER PARTS WITH LIME-BASED GROUT
- STONE SET IN LIME MORTAR
- BRICK SET IN LIME MORTAR
- SACRIFICIAL LIME PLASTER LAYER
- COMPLETION OF MISSING STRUCTURAL ELEMENTS
- REMOVAL OF INCONGRUENT PAINT
- REPLACEMENT OF IRON ELEMENTS
- CLEANING OF EARTH/MUD DEPOSITS, AND GRBAGE
- LIME MORTAR POINTING WHERE NECESSARY
- CONSOLIDATION OF SEPARATING LIME PLASTER RENDER WITH INJECTION GROUTING USING LIME-BASED GROUT RENDERED WITH SACRIFICIAL LIME WASH
- NEW ROOF DRAINAGE SYSTEM
- RAINWATER DRIP EDGE
- INDICATION OF LOST OR CONJECTURED ARCHITECTURAL ELEMENTS
- NEW INTERIOR FLOORING
- BRICK PAVING
- SHALLOW SURFACE DRAIN
- UNDERGROUND PIPE
- GUTTER FOR SURFACE WATER DRAINAGE
- LIME-STABLIZED SURFACE LAID AND COMPACTED TO SLOPE FOR SURFACE DRAINAGE
- RETAINING WALL

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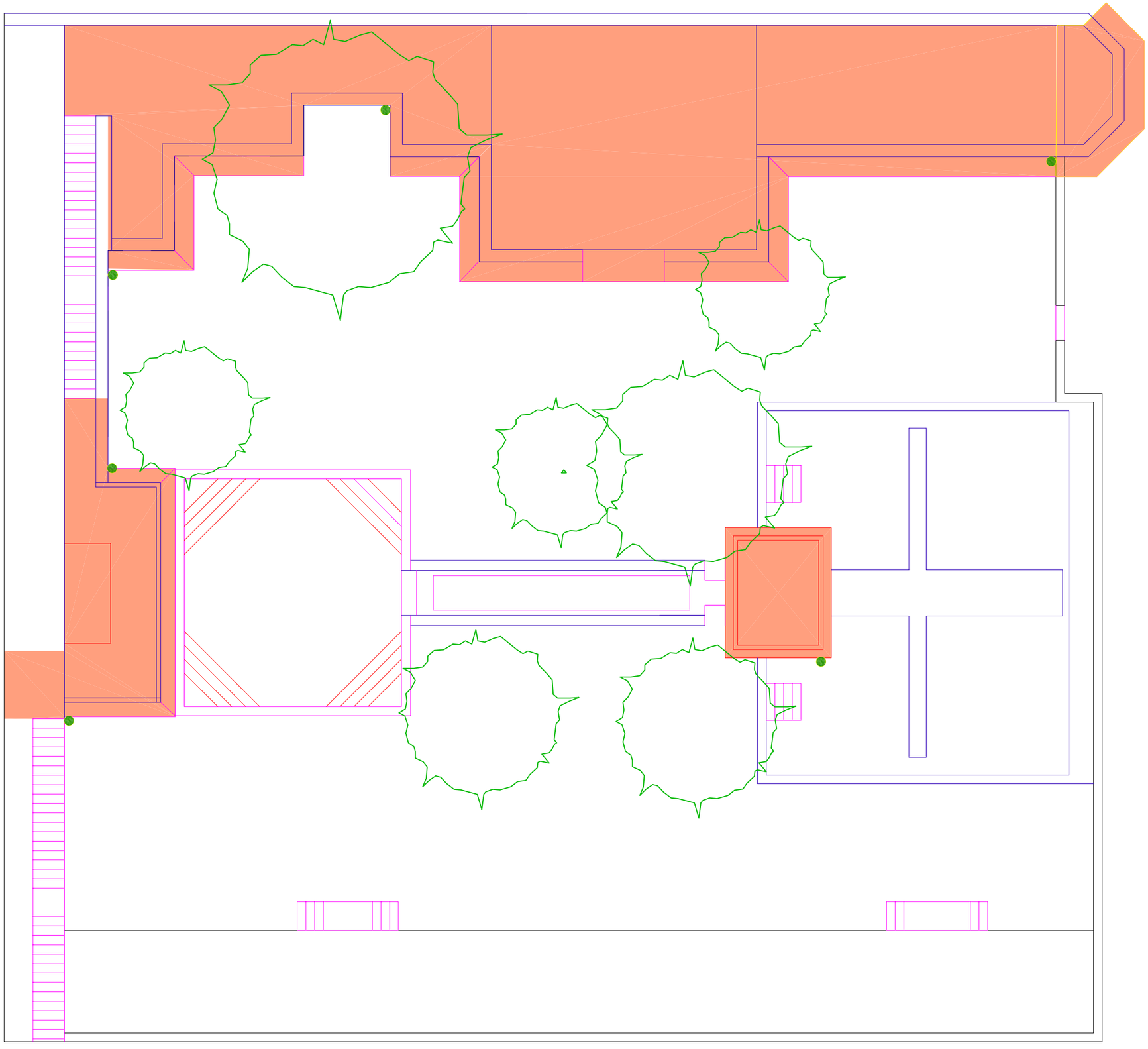
N / Scale ~1:200	INTERVENTIONS SITE PLAN
PREPARED BY	UJJWALA
DATE:	FEBRUARY-2006
Drawing No.	6



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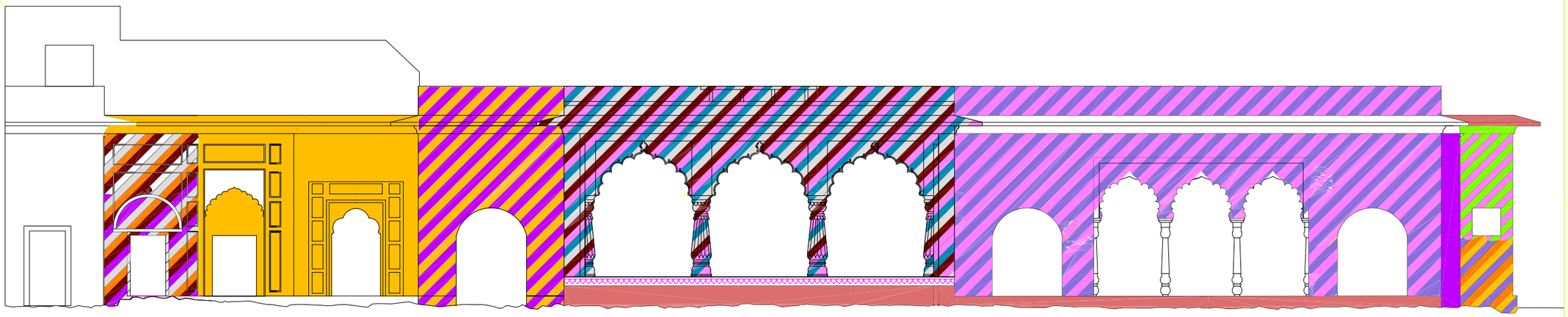

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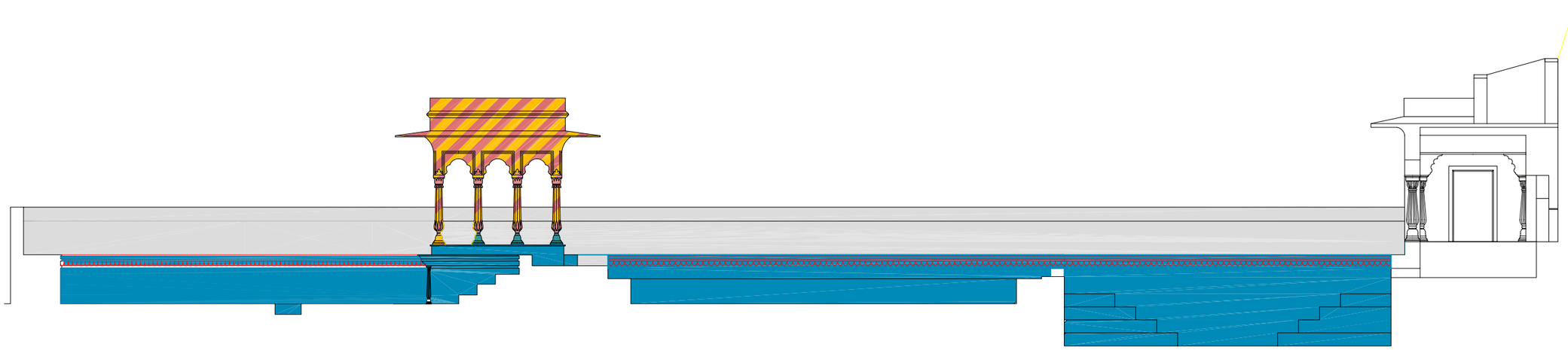
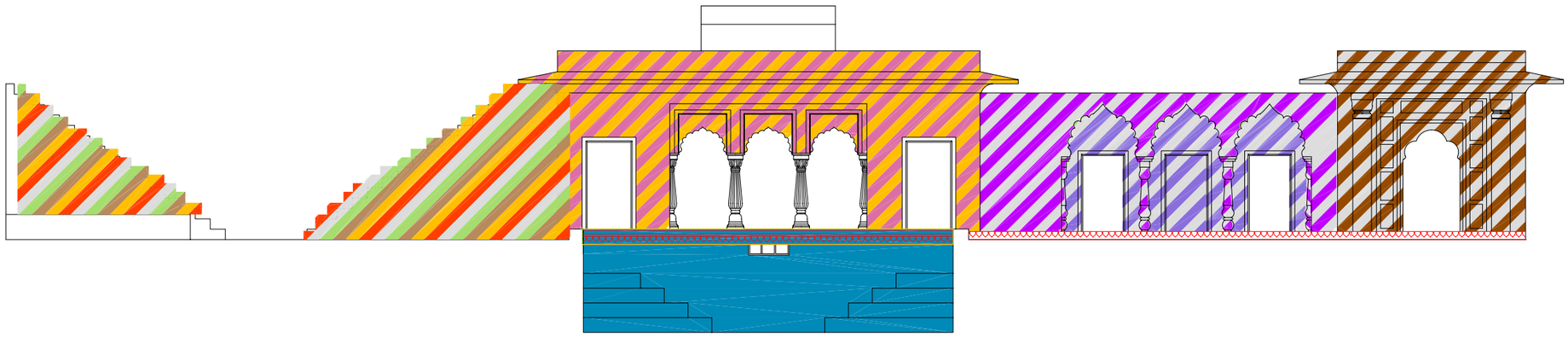


South Elevation



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N ⊕ Scale ~1:200	INTERVENTIONS ELEVATIONS
PREPARED BY	UJJWALA
DATE:	FEBRUARY-2006
Drawing No.	

Jharna After Interventions

Maintenance Plan

Part-VI - Maintenance plan for the Jharna:

Maintenance of a building is a work done to keep an existing building in, or restore it to, a condition where it can perform its intended function.

This section is divided into main three parts.

Part-I gives the Emergency Maintenance plan for the site.

Part-II gives the Preventive Maintenance plan for the site- yearly maintenance

Part-III gives the Corrective Maintenance plan for the site – Half yearly maintenace

These plans are prepared taking into consideration the historic use of the building, present condition of the site and proposed use for the building. As the abundant as well as misused buildings are the most vulnerable for decay, precautions have to be taken in deciding upon the use of the building. The conservation plan takes care of the structural stability of the historic structures. Site development incorporates the up gradation of the site to make it live.

As mentioned earlier, the study site is a pilot project which is a part of a larger perspective for the area of Mehrauli. In larger site planning proposal, Jharna is proposed to become an activity node with different cultural activities & events taking place within the complex.

Emergency Maintenance Plan for Jharna

It is a Maintenance plan necessary for a building to avoid serious consequences. The section gives the items of work to be carried out for the historic structure in order to make it structurally safe. One of the important objective of this is to upgrade the building to bridge the gap of time of lack of maintenance. This stage forward, building can be taken for a re maintenance.

Item no	Description	Quantities	Persons Required	Time Required in Weeks					Time Required in Weeks					Time Requ Week		
				1	2	3	4	5	6	7	8	9	10	11	12	13
1.0	**Clearing of site**															
1.1	Removal of debris, malba, building rubbish by mechanical means including loading, unloading and disposing away from the site but within 500 meter lead as per direction of the engineer in charge.	13435 Sq Ft.	3													
1.2	Removal of garbage by mechanical means including loading, unloading and disposing away from the site but within 500 meter lead as per direction of the engineer in charge.	13435 Sq Ft.	3													
1.3	Removal of garbage from the Water Tanks by the mechanical means including loading, unloading and disposing away from the site but at a planned garbae disposal site.	2400 Sq.Ft.	1													
2.0	**Removal of vegetation**															
2.1	Clearing of jungle, grass and rubbish from the east side site surroundings	4245 Sq. Ft.	2													
2.2	Removing of vegetation, bushes, large trees etc from and removal of rubbish from the PCC surfaces on the West side surroundings and disposing away from site at a lead of 500 m.		3													
2.3	De-vegetation from the historic structure in consultation with Art Conservators.	2400 Sq.Ft	3													
2.4	De-vegetation from the Tank and the water channels in consultation with the Art Conservators.	875 Sq Ft	3													
3.0	**Earthwork**															
3.1	Earthwork in excavation over other areas covered with vegetation in the surroundings, including disposal of excavated earth, lead up to 500m disposed earth to be leveled and neatly dressed as per instructions given by Landscape architect.	11000 Sq Ft	4													
3.2	Earthwork in excavation in the PCC areas adjacent to the historic strcuture 1.5 m in width and depth as per instructions of conservation architect, including disposal of dismantled PCC flooring, excavated earth, lead up to 500m and disposed earth to be leveled and neatly dressed as per the instructions of landscape architect.	800 Sq Ft	4													
4.0	**Dismantling and Demolishing works**															
4.1	Demolishing P.C.C. flooring around the Historic Structure under supervision of conservation architect.	800 Sq Ft	3													
4.2	Dismantling cement plaster from the walls of Historic Structure carefully using chisel or any appropriate tool without damaging masonry surface including disposal of rubbish to the dumping ground within 500 meters lead as per directions of the engineer in charge.	439 Sq Ft	4													
4.3	Careful removal of deteriorated /pulverised lime plaster using appropriate tool without damaging masonry surface including disposal of rubbish to the dumping ground within 500 meters lead under supervision of conservarion architect	18749 Sq Ft	4													
4.4	Dismantling inappropirate additions of brick masonry in cement mortar using appropriate tools without damaging the surrounding origianl masonry surfaces under supervision of conservation architect.	697 Sq ft	4													
4.5	Demolishing cement flooring including PCC inside the Historic Structure, carefully in layers without damaging sub-floor and adjacent walls with appropriate tools under supervision of conservation architect.	1200 Sq Ft	4													

4.6	Raking out joints and preparing the surface for repointing and replastering using appropriate tools, including disposal of rubbish to the dumping ground within 500 meters lead.	21000 R Ft	5 Skilled Lbours														

5.0	**Brick work**															
5.1	Brick masonry with appropriate matching bricks in lime mortar in proportion similar to the existing traditional lime mortar after removing damaged and relaying the out of plumb masonry in the Historic Structure.	350 Sq Ft														
5.2	Underpinning brick work in matching/ best lime mortar matching with the brick courses of the historic structure.	400 Sq Ft	2													
5.3	Moulding and cornices with brick masonry,matching in courses and profile in columns at corners etc. using lime mortar as per traditional proportions	187 Sq Ft	3 Skilled masons													
5.4	Brick paving in front of the pavillions and staircase on the west side by using traditional paving patterns in the area.	1400 Sq Ft														
5.5	Construction of a retaining wall outside the boundary on the east side.	130 R Ft	3													
6.0	**Repair works**															
6.1	Stitching the cracks in brick masonry using bricks and lime mortar matching the traditional lime mortar and bricks as existing in historic structure, after raking, cleaning and washing the cracks.	300 r ft	5													
6.2	Grouting the gaps in the masonry with lime based grout in appropriate mix after raking, cleaning and washing the cracks.		3													
6.3	Repairing the stone masonry of chhajja with stones and lime mortar matching the original stones and lime mortar.	100 sq ft														
6.4	Repairing the water channels with the trditionally used material.	2400 Sq Ft														
7.0	**Flooring**															
7.1	Providing and laying 20mm flooring with lime concrete in appropriate ratio as in traditional practice over the existing sub-floor including preparation of surface, giving proper slopes, ramming and curing.(the quality of subfloor will be ascertained after removal of PCC flooring.)	3000 Sq Ft														
7.2	Repairing old flooring in patches wherever damaged with lime mortar matching the best mortar existing on site, includes removing the damaged areas in patches and filling up the patches with lime mortar and leveling, curing.															
7.3	Brick on edge flooring in lime mortar/ subfloor in sand and brick ballast rammed)	1400 Sq Ft														
8.0	**Finishing works**															
8.1	Repointing in lime mortar matching the traditional lime mortar including sufficient curing of masonry surface after re-pointing.	21000 R Ft														
8.2	Careful Mechanical removal of multiple layers of lime wash / algae/ soot from lime plaster surfaces gently using wooden knife, blade, soft brushes, scotch brite or other appropriate tools etc and preparing the surface smooth including necessary repairs to scratches etc. under supervision of art conservators.	21000 Rft														
8.3	Lime plaster as per proportions original and compatible in multiple layers and tamping, beating, curing till shrinkage cracks disappear. The work is to be done with all leads and lift as the work is of restoration nature as per practice. Thickness and coats of plaster as existing in traditional lime plaster on site, including removal of all old loose and decayed plaster, each coat to be done after 3 days of previous coat. This includes raking and cleaning of joints and re-pointing the surface before application of plaster and curing for at least 20 days.The mortar to be prepared in teh specified method by teh conservation architect.	21000 Rft														

8.4	Ornamental lime plaster on pillars and cornices at corners etc in lime mortar in different layers to match with the original lime mortar including finishing the top layer with appropriate traditional admixers with the help of highly skilled masons.	4000 R Ft															
8.5	Coloured lime wash as per traditional practice to prepare the colour. Lime should be slacked at least for 7-10 days and regularly stirred by adding appropriate traditional admixtures.	21000RFt															
9.0	Lime concrete on terrace with coping and proper slopes	!2650 SqFt															
10.0	**Miscellaneous works**																
10.1	Making plinth protection depth 300mm,width 1m including finishing the top smooth with adequate slope to drain water from historic structure.	2000 R Ft															
10.2	Electrical works																
10.3	Plumbing Works																
Notes	1. All the items of work are based on visual inspection and are subjected to change after detail investigation and during execution.																
	2. Proportions of the lime mortar can be specified after testing existing lime mortar from the Historic Structure building.																
	3. Preparation of lime mortar:- Lime mortar will be prepared in lime chakki constructed on site. The proportions and proper mixing of lime, sand and other admixtures used traditionally can be achieved by this method of lime mortar preparation. This will ensure the quality of lime mortar as found in traditional lime mortars existing on site.																

Corrective Maintenance plan for Jharna

This Maintenance plan is necessary for the upkeep of the historic structure. This is specifically prepared for the areas which are mostly vulnerable to the damages. The duration to follow this plan is one year i.e. this is a **Yearly Maintenance Plan.**

Items of Work	
Item No	**Description**
1.0	**Removal of vegetation**
1.1	Clearing of jungle, grass and rubbish
1.2	Removing of vegetation, bushes, large trees etc from and removal of rubbish from the PCC surfaces on the West side surroundings and disposing away
1.3	De-vegetation from the historic structure in consultation
2.0	**Finishing works**
2.1	Careful Mechanical removal of layer of lime wash / algae/ soot from lime plaster surfaces gently using wooden knife, blade, soft brushes, scotch brite or other appropriate tools etc and preparing the surface smooth including necessary repairs to scratches etc. under supervision of art conservators.
2.2	Lime plaster wherever damaged as per proportions original and compatible in multiple layers and tamping, beating, curing till shrinkage cracks disappear. The work is to be done with all leads and lift as the work is of restoration nature as per Punjab practice. Thickness and coats of plaster as existing in traditional lime plaster on site, including removal of all old loose and decayed plaster, each coat to be done after 3 days of previous coat. This includes raking and cleaning of joints and re-pointing the surface before application of plaster and curing for at least 20 days.The mortar to be prepared in teh specified method by teh conservation architect.
2.3	Coloured lime wash as per traditional practice to prepare the colour. Lime should be slacked at least for 7-10 days and regularly stirred by adding appropriate traditional admixtures.

Preventive Maintenance plan for Jharna

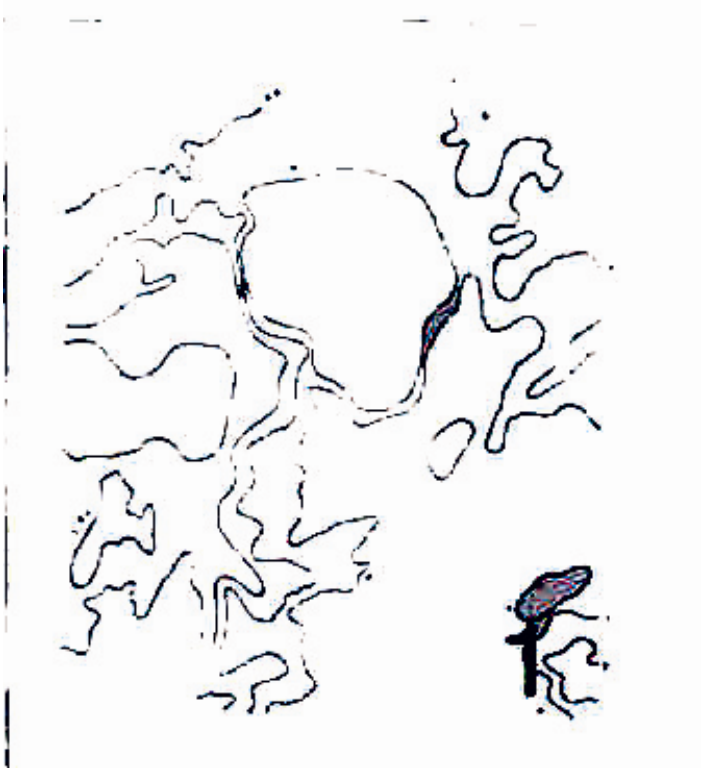
This Maintenance plan is necessary for the upkeep of the historic structure. This is specifically prepared for the areas which are mostly vulnerable to the damages. The duration to follow this plan is one year i.e. this is a **Half Yearly Maintenance Plan.**

Daily maintennace Schedule	
1.0	**Cleaning of the site**
1.1	Cleaning of the site open space within the boundaries
1.2	Watering the plants in the site boundaries
1.3	Collection of garbage and disposal at the new garbage disposal Sites
Weekly Maintenance Schedule	
1.0	**Cleaning**
1.1	Cleaning of the walls from dust and dirt
1.2	Cleaning of the staircases and terraces

Annexure-I

Chronological development of the area:

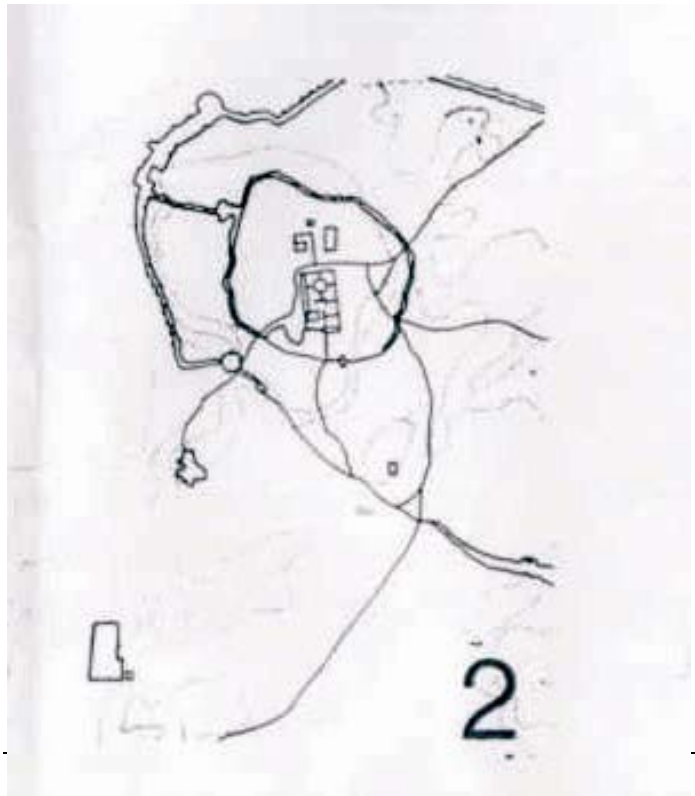
1. Layer 1: Geographical location and mythical times:



Mehrauli is situated on a spur of the *Aravali* hills and has an undulating land form. The natural land form itself is of heritage significance.

The Puranic layer is evident by the existence of the *Jog Maya Temple* associated with Hindu Mythology.

2. Layer 2: Hindu and Muslim Capitals



In 10th century, a part of the area was the capital of *Tomar* king *Anang Pal*. The exact location of the capital can be inferred from the remains of *Anang Tal* near the *Jog Maya* temple. *Lalkot* is credited to have been built by the *Tomars*. The name "*Lalkot*" is derived from the red bricks which were originally used in its construction of which there is still some evidence. The area covered by this capital extended to the *Qutb Complex* inferring from the reused remains of the capital.

The Hindu Capital- *Quila Rai Pithora* - is attributed to Prithviraj Chauhan. The citadel area was situated on high ground and the town was below. Notion of security was the most important factor.

The place was healthy as it allowed water to drain off with ease. Water supply and management was an important consideration of settlement planning. The utilization of land form for water storage and distribution is to be specially noted. This relationship was able to provide water in an effective manner by judicious location such as *Hauz Shamsi.*

Significant buildings of this period are:

~ Qutb Complex

~ Jama Masjid of Lalkot

~ Aulia Masjid

~ Water structures- Hauz Shamsi

~ Rajao ki Bain

3. Layer 3: from Khalji dynasty to Mughal era (10th century to 17th century)

After the slave dynasty this area was stopped being used as capital from 13th century as Allaudin Khilji founded his own capital at Siri some distance to the north. The gently sloping site was inhabited and the ridge has few buildings.

As the main entrance constructed by Allaudin – Alai Darwaza on the south side of Qutb Complex, infers that the settlement was on that side.

Many buildings were constructed in the area of *Rai Pithora* in the valley till the middle of 16th century. The numerous wall mosques also reinforce the fact that the main township was on that side. *Hauz Shamsi* still provided the water storage and main waterline was down the Jharna Valley. The

tank was itself was the recreational place where many people came to enjoy themselves in the evenings. This has been inferred from the structures- similar to the mosques in the form but oriented north- south-dotting the area which range from tombs of holy men and those such as *Sohan Burj*. These structures may have been temporary residences of the prevailing gentry, as it was the environmentally prime site.

4. Layer 4: The Late Mughals (17th century to late 18th century)

Mehrauli as a Mughal retreat was solely confirmed to the ridge, it can be divided into two parts- the west where the common people lived and the east which was monopolized by the Mughal family and the Dargah.

Apart from occupying the better eastern side it also nestles around the Dargah which constitutes the most sacred area within Mehrauli, a privilege only possible for the most important.

Water supply was reinforced by the numerous wells found to this day. The most famous being Badshah Pasand, so called because of its sweet water.

The principle building was the palace of the Mughals- Zafar Mahal. A small part of it is protected giving an underestimated impression of the glory and pomp associated with the Mughal Dynasty even their territory was extended from Delhi to Palam.

5. Layer 5: Colonial Mehrauli (Late 18th century to 1947 A.D.)

It is the phase that follows the banishment of Mughal monarch *Bahadur Shah Zafar* to *Bangoon* in 1858. As it was a relatively large and established settlement, Mehrauli became a "Tehsil[6]" headquarters after the first war of Independence (1856 A.D.). This resulted in many offices and other government buildings being set up here.

The main central spine is a creation of this period.

Most of the development was within the settlement itself.

The charm and other positive aspects were not lost to the British. It was popular among the new rulers.

[6] Tehsil- is administrative area larger than a village but smaller than a District.

Annexure-II - Experience value: Cultural significance of the site

Cultural Routes and Festivals:

Urs~

Aulia Masjid, the first mosque constructed in Delhi, is a place of religious importance. The dargah of Khwaja Qutb-ud-din Bhaktiar kaki, are the two structures of Muslim faith make Mehrauli an important pilgrimage centre for the Muslims visiting Ajmer Sharif.

Phool Walon ki Sair- "A fair of Flowermen"

The contemporary and historical elements converge at several points. There are two axes that are significant, these are the paths of the 'waterways' and the Phool Walon Ki Sair. The drains of a large part of the Mehrauli settlement empty into the Hauz Shamsi. The system of waterways that connects the *hauz* to the *jharna* has become a playground for children. Overlapping this pathway is the route of the Phool Walon Ki Sair. It begins from the Auliya Masjid, which is next to the *hauz*, goes on to the Dargah and then finally goes to the Yog Maya Mandir.

The well-known Phool Walon ki Sair, or the procession of the flower-sellers, led by *shehnai* players and dancers, which is held after the monsoons every year, begins from this *jharna,* a beautiful garden with cascades and fountains built by Feroz Shah Tughlak. It passes through the brilliantly lit Mehrauli Bazaar leading to the Yog Maya Mandir. The next day, another elaborate procession takes shape and weaves its way to the tomb of Khwaja Bakhtiyar Kaki. It is said that flower vans decorated with flowers are taken to Dargah Qutab Sahib and Yog Maya for blessings. The main function is held at the Jahaz Mahal. The festival was instituted in the 1720s as a tribute to the Mughal ruler by the Hindu as well as Muslim flower sellers of Mehrauli. It is known that the last Mughal Emperor, Bahadur Shah Zafar always attended this procession of *pankhas* (fans), which was held in the month of August in those days. The festival was revived after India attained independence in 1947.

This is one of the few festivals in which both Hindus and Muslims participate with equal fervour. In olden times, the king used to go to the tomb of Khwaja Bakhtiyar and to the Yog Maya Temple followed by Muslims and Hindus alike. Referring to the secular nature of the festival, the famous poet, Mirza Ghalib said, "In this city, is a festival called the flower men's festival. Everyone in the city from the nobles to the artisans goes off to the Qutab Minar. There they stay for two or three weeks. All the shops in the city of Muslims and Hindus alike stay closed throughout this time."

Phool walon-ki-Sair is also known as the Sair-e-Gulafroshan. The three-day festival, celebrated by everyone in Mehrauli. *Kathak* dances, *qawwalis*, a blaze of lights, huge *pankhas* (fans) made of palm leaves, decorated with tinsel and flowers, and acrobats delight a vast audience.

The cultural programme takes place at Jahaz Mahal, which was built by the Lodhis on the banks of the *Hauz*.

History of the Fair:

The history of Phool walon-ki-Sair goes back to the days of the Mughal Emperor Akbar Shah II in the 19th century. Bahadur Shah Zafar was the prince chosen by the British to succeed Akbar Shah II. But, the latter was persuaded by his favourite Queen, Mumtaz Mahal, to change his decision in favour of her son, Mirza Jahangir. The British did not agree. Mirza Jahangir was a spirited but spoilt boy who to show his resentment against the British, took a shot at Seton, the British resident in the Mughal court. The attempt failed and only Seton's hat was knocked off, but the British, annoyed with Mirza Jahangir, exiled him to Allahabad. His grieving mother then took a vow that if her son was allowed to return to Delhi, she would make an offering of a four-poster flowerbed at the holy shrine of Khwaja Bakhtiyar Kaki at Mehrauli. Khwaja Qutub Sahib earned the title 'Kaki' at the Auliya Masjid. It is said that here he meditated for long hours and in appreciation of his prayers wheat cakes '*kak'* came down from above into his hands. Thus he was called '*kaki'*. He was the disciple of Khawaja Moinuddin of Ajmer, the Chishtiya order of Sufis.

After some time, the British agreed to Mirza Jahangir's return to Delhi but only if the King guaranteed his good behaviour and agreed not to question Zafar's status as the heir apparent. Mirza Jahangir returned amidst great fanfare and his mother began elaborate preparations to fulfill her vow. A beautiful flower canopy was created to which the flower-sellers added an elaborate flower *pankha* at their own cost. Both these were then ceremoniously carried in a large procession to the saint's tomb.

However, Mirza Jahangir, an incurable alcoholic, did not change his ways. He was exiled again and finally died in Allahabad at the age of 31. But, the pilgrimage of the court and the people of Delhi to Mehrauli became an annual event.

The popularity of the festival reached its peak during Bahadur Shah Zafar's reign. The King, Queen and the entire court would leave Delhi in palanquins a few days before the festival. They visited the tombs of Humayun, Safdarjung, and Hazrat Nizamuddin Auliya and then moved on to Mehrauli to accredit a reception. The Jahaz Mahal, near the dargah of Khwaja Bakhtiyar Kaki, now a protected monument, was richly decorated with carpets and chandeliers for the occasion in those times. The King went to the *jharna* the next day where in the seclusion of tented enclosures and curtains, the court ladies relaxed. Whenever there was drizzle, the royal party moved to the Amarian, a mango grove to the east of the Jhama, a beautiful picnic spot. Here, the royal ladies themselves prepared delicacies of the season.

Phool walon-ki-Sair became an annual celebration and something that the people looked forward to every year in the months following the monsoon. In 1942, at the time of the Quit India Movement, the British suspended the festival for reasons of security. But Pandit Jawaharlal Nehru,

who responded instinctively to its beauty and gaiety, re-instituted the festival in 1962. Since then, history is beautifully re-enacted every year in the form of this procession of flower-sellers.

Thus, Mehrauli has the distinction of possessing a range of assets in the form of natural and manmade heritage, both of which have continued to have significant influence on the lives of the people through the ages. This site is characterized by a unique geographical setting coupled with a multiplicity of socio-cultural forces, which evolved through different periods of political and economic history. This is reflected in the built structures and remains belonging to different periods, in and around the Mehrauli settlement as well as in the continuing tradition of indigenous festivals. Therefore Mehrauli carries natural, architectural, archaeological, and historical heritage value.

Conservation of these pathways is most crucial. Not only does it bring together different faiths, it also highlights an important principle that conservation is not only concerned with looking after the physical structure but also with the idea and the message that these built structures communicate.

Annexure-III - Mehrauli Today

This section gives a brief profile of the settlement and place within contemporary Delhi.

Part-1 – Regional context

Part-2 – Statistics of the settlement, people, their occupation, festivals

Part-3 – Study of contemporary planning and development interventions in Mehrauli

• Mehrauli is situated in the South Delhi planning zone F-15

• It is located on the spur of *Aravallis* immediately behind the famous landmark of Delhi – the Qutb Complex.

Regional Context:

It has two different regional contexts:

1 – Traditional role as rural distribution centre

2 – As a part of Modern Delhi

This duel role within the city demonstrates the confusion that is prevalent within the settlement and becomes apparent in the term – 'Urban Village'

Delhi, has grown rapidly around rural settlement and in the process engulfing them and their countryside.

One of the unique characteristics of Delhi is the existence of over 300 villages within the city area. Mehrauli was part of this regional pattern and functioned as an important nucleus for the southern zone. Gradually with planned development and expansion of Delhi into a metropolis, many traditional settlements were destroyed or transformed to fit the new situation. For the indigenous settlement this transition from the rural to the urban has been abrupt and brutal. As a part of modern Delhi, Mehrauli is situated in a fast developing segment of the city within which is located the minitownships of Vasant Kunj and Qutb Enclave. This trend of large development, in which the DDA, Haryana State Government and private initiatives are equal participants, has shown an alarming rate of change that is affecting the physical structure and traditional character of the settlement.

Mehrauli is one of the 111 traditional settlements within the urban area of Delhi which have been urbanized within the last 3 decades.

It still remains as an agricultural land even though the soil is not so fertile.

Animal husbandry is a major source of income to a large no of people.

Settlement pattern ~

The area of urban village of Mehrauli today is 185 acres. This comprises of following land use:

Commercial -	11.8%
Residential –	38.5%
industrial –	2.3%
Warehouses –	3.5%
Vacant Land –	18%
Monuments –	4.7%
Public/ Semipublic -	10.7%
Roads –	9.7%
Others -	1.3 %

In addition 30 acres of Mango orchards are collectively owned by the village.

Economy~

Within Mehrauli, commercial activities have spread and increased along the main spine. Retailing is the main commercial activity. Industry includes- welding workshops, lathe machine shops, manufacturing of agricultural hand tools, canvas good, slaughter houses.

Though the soil is not so fertile, farming is one of the main occupation of the people.

Community ~

Many families have migrated into the settlement from neighboring states of Rajasthan. A large no people have also migrated from Pakistan in 1947. Even among those from Punjab and Uttar Pradesh are many families who were originally from Pakistan.

Occupation ~

In the years following Independence, the occupation in trade and commerce increased rapidly while manufacture and household industries and crafts have lessened considerably.

In recent years, there seems a major shift to service sector. Hardly any people are engaged in tourism related activity associated with historic structures.

There are few families of hereditary priests who are associated with Dargahs.

Annexure-IV - Planning and development policies:

The development process in Mehrauli is outcome of the two plans prepared by government.

First- the Delhi Master Plan prepared in 1962

Second- The village Development plan prepared specially for Mehrauli in 1984

Delhi Master plan:

Limitations of the plan:

1. Main broad decisions at a scale which do not cover detailed physical, sociological, and economic aspects. They do not provide for a physical expressions based on a traditional foundation while considering the complexities of modern urban land use.
2. For the development of any urban village, master plan standards are adopted with regard to utilities, services and public facilities. However in most cases, it has not be possible to earmark sites for community facilities as per standards. Also the standards for providing the community facilities have been reduced to the standards adopted in the unauthorized regularized colonies.

The Village Development Plan (1984):

1. The village development does not treat Mehrauli as a cultural artifact with 1200 years of history and ignores the natural and built environment.
2. Historic water structures have not been identified. The resource potential of the site is not been utilized in the plan
3. The plan gives same status to the institutions and the monuments. It does not consider the built heritage separately.
4. Land use proposals are too general and need to be more specific and precise.
5. Traffic and parking proposals are too drastic and not taking into consideration the landforms.
6. New development proposal do not take into consideration the adaptive re-use possibility of historic structures.
7. Infrastructure proposals cannot reach to the people due to problems in implementation, departmental organization, and short sighted measures.

Recent Developments ~

Inspite of the development controls there have been many interventions within the historic area of Mehrauli. These interventions are termed as planned when they result from official decision making and unplanned when they happen in spite of official decision making.

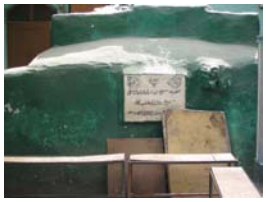
Recent development –planned and unplanned both -

1. New Bus Terminus
2. Picnic huts by DDA
3. Beautification and construction of a wall around Hauz Shamsi by DDA
4. Revival of *Phool Walon ki Sair* - a 19th century festival
5. Housing at Vasant Kunj area by DDA
6. Abnormal expansion of Jain temple
7. Demolition of historic structures
8. Quarrying
9. Unauthorized additions, modifications to existing historic structures to accommodate the growing populations
10. Unauthorized colonies to house new immigrants

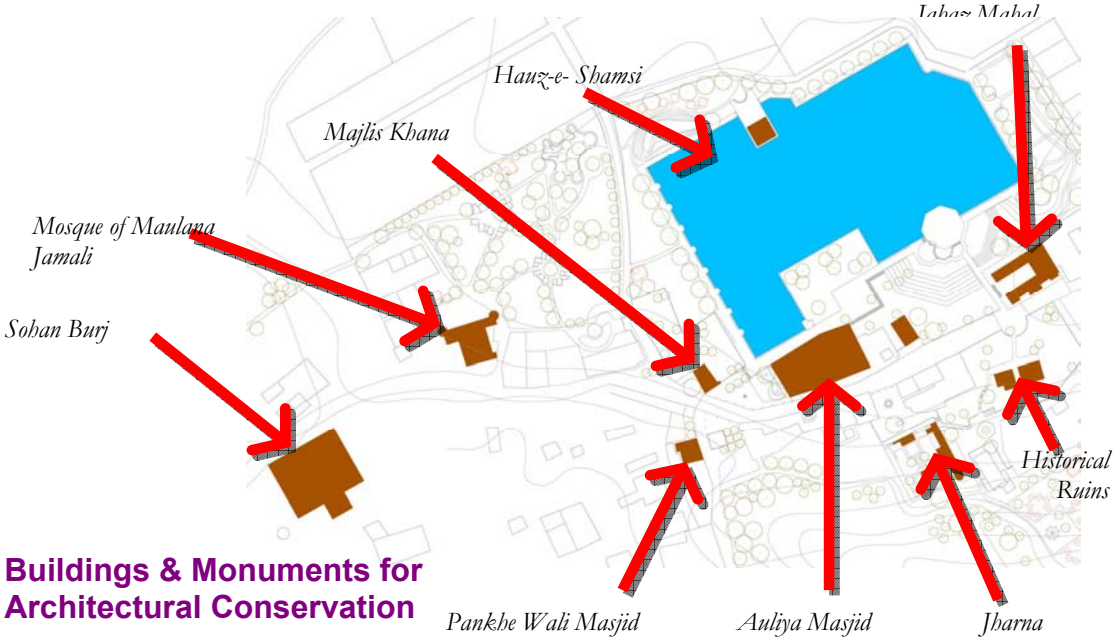
Annexure-V- Cultural Heritage Assets

Following is a list of DDA, Delhi Tourism, INTACH and Citizens of Delhi led to conservation of many unprotected historic buildings in recently designated archaeological park.

Sr. no	Building Name	Construction Period	Dynasty	Photographs	Significance
1	*Hauz-i-Shamsi.*	1230 A.D.	Iltutmish		*Hisotircal Architectural Cultural Ecoloical*
2	*Jharna*	*1700 A.D. followed by the later additions of Baradari The water fall used to operate from the overflow from the Hauz*	Late Mughals		*Historical Architectural Religious Cultural Ecological Recreational-Economical*
3	*Jahaz Mahal*	*15th Century A.D.*	Lodhi Dynasty		*Historical Architectural Religious Recreational Cultural Economical*
4	*Auliya Masjid*	*1191 Century A.D.*	Slaves Dynasty		*Historical Architectural Religious Cultural*
5	*Mosque opposite the Ruins*	*14th Century A.D.*	*Lodhi Dynasty*		*Historical Architectural Religious Cultural*
6	*Mosque opposite the ruins*	*!4th Century A.D.*	*Lodhi Dyansty*		*Historical Architectural Religious Cultural*

					
6	*Mazaar of a Pir*	*Not Known*	*One of the earliest structures in Mehrauli*		*Historical Architectural Religious Cultural*
7	*Pankhe Wali Masjid*	*14th Century A.D.*	*Lodhi period*		*Historical Religious Cultural*
8	*Firdauz Masjid Also known as Baliyon Ka Mahal*	*Approximately 15th Century A.D.*	*Lodhi Period Religious functions like qawwalis, feasts are held at this site during 17th day after Moharrum*		*Historical Religious Cultural*
	Sohan Burj Complex	*1496 A.D.*	*Numerous enclosures & historic structure believed to be raised by the followers of Sufi Maqdum Samauddin*		*Historical Architectural Religious Cultural*
	Tombs & Graves	*14th century A.D.*	*Lodhi period octagonal chattri type tomb structure*		*Historical Architectural Religious Cultural*
	Tomb & Mosque of Makhdum Samauddin	*15th- 16th century A. D.*	*Built in memory of Sheikh Samauddin, Suhrawardi sect Inside the complex is high concentration of tombs, graves & mosques*		*Historical Architectural Religious Cultural*
	Mosque of Maulana Jamali	*14th century A.D.*	*Mosque with 5 mihrabs & fluted turrets with a large court*		*Historical Architectural Religious Cultural*

					
	Shops (Majlis Khana) wall remains	*14th Century A.D.*	*Lodhi period structure. Single storey structure, have had three bays used as assembly hall Only the rear south portion*		*Historical Architectural Cultural*
	Graves and historic walls		*Graves on the southern edge of the Hauz*		*Historical Religious*



Location map of the Architecturally Significnat Structures.

The built heritage ranges from archaeological to architectural in the form of religious, recreational, residential, utility, and community structures.

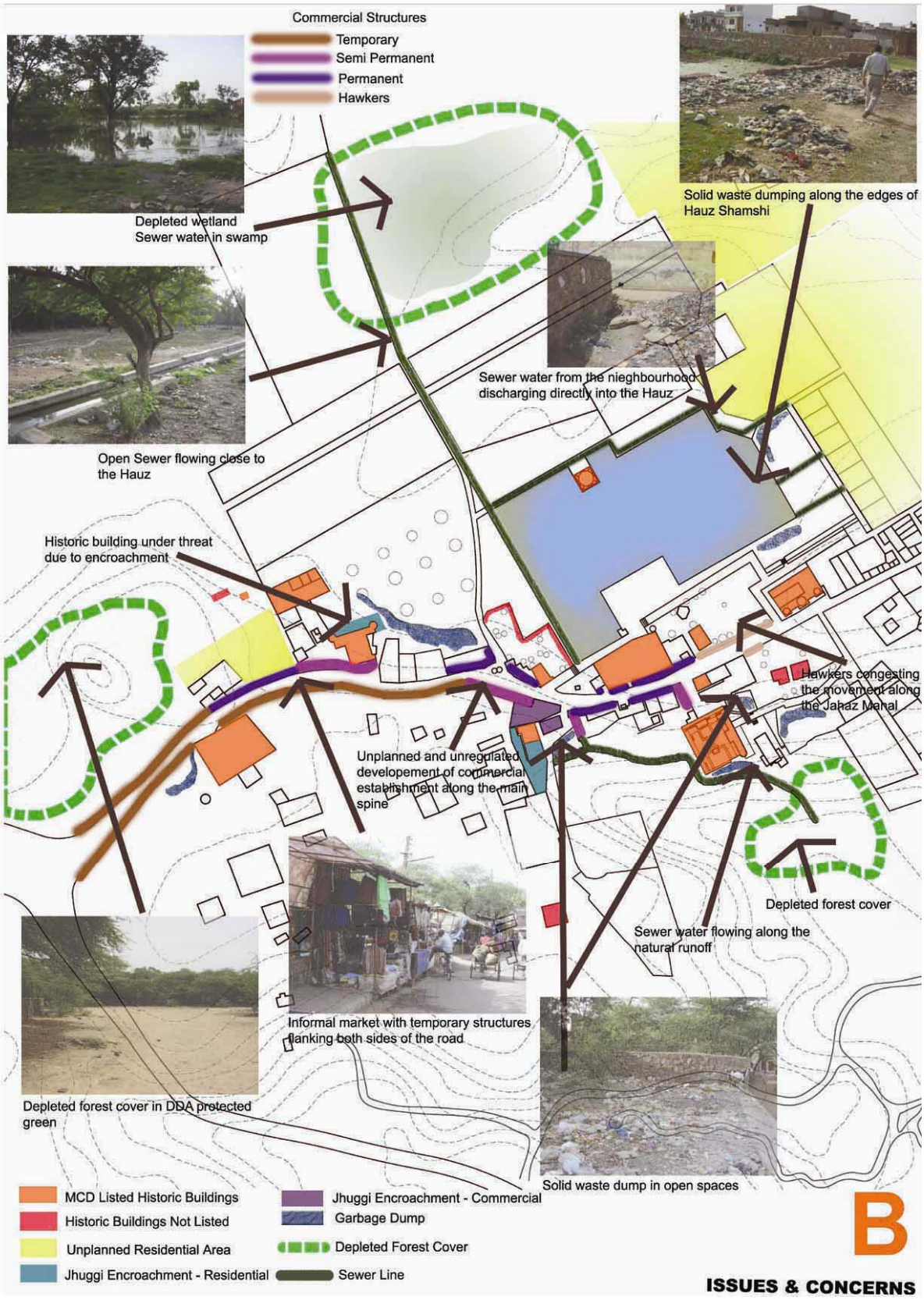
The rich natural heritage of Mehrauli has also greatly influenced its built forms. Mehrauli had an immensely well developed traditional water system including *baolis*, wells and water tanks, the construction of which was apparently guided by the natural flow of water on Mehrauli's terrain.

There are significant areas on the landscape, which provide information on different periods in the history and evolution of the settlement.

For the management of this heritage, DDA[1] has delineated a large area consisting of the ridge between the settlement and the highway as an Archaeological Park.

[1] Delhi Development Authority

Threats: Issues and Concerns



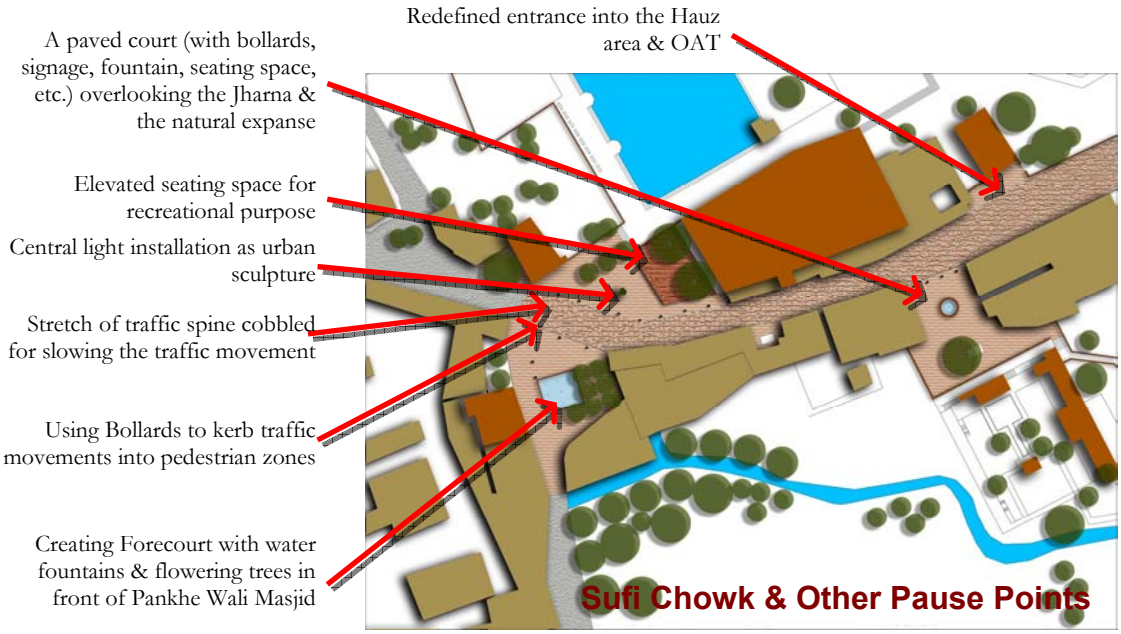
1. Decay of historic buildings
2. Loss of historic fabric due to encroachments
3. Lack of clarity on historic building ownership status and therefore protection
4. Environment Degradation:
    - Loss of forest cover
    - Waste management:
    - Solid waste dumps in open land and Hauz –i-Shamsi
    - Sewage in open natural drains and in Hauz-i- Shamsi
    - Falling water table
5. Public health
6. Encroachments within the forest area.
7. Encroachments of historic buildings
8. Encroachments around historic buildings
9. Loss of access due to encroachments
10. Loss of open spaces due to encroachments of public land.
11. Lack of adequate visitor amenities
12. Lack of site interpretation
13. Under-utilization of the cultural resource
14. Inadequate outreach programs to generate awareness about the site among the citizens of Delhi, especially the youth and children.
15. Visual noise due to chaotic signage on streets and other public spaces
16. Inadequate byelaws for building activity.
17. Lack of appreciation of the historic character of the setting due to unplanned growth
18. Lack of regulations for open public space utilization (informal sector)
19. Lack of traffic regulations
20. Inadequate parking facilities
21. Fragmented development approach of the multiple organizations
22. Lack of a collective vision for the rich inheritance amongst the stakeholders
23. Apathy of the local community

24. Need to integrate the plan for the identified area for this project within the larger plan for Mehrauli and further the city of Delhi.

Annexure-VI - Site Planning Proposals

Themes of the Project ~

- Architectural Conservation
- Traffic & Circulation Planning
- Solid Waste Management
- Waste Water Management
- Revitalization Plan
- Environmental Up gradation (issues related to ecology)
- Socio- cultural Programmes & Visitor Experience



Concept Development Plan:

The salient features of the Concept Development Plan

1. Mehrauli is rich in *cultural and natural heritage* and has an entire range of resources for conservation and promotion.
2. The site has an advantage over many other cultural nodes within the entire area due to its *easy* vehicular *access* from Andheria Mor and pedestrian access from the forest.
3. There is a need in the area for *recreational* spaces for the local citizens of Mehrauli.
4. The intervention for recreation spaces needs to address the needs of the various segments of the local *community* which include the children, youth, women as well as the elders.
5. The Mehrauli heritage zone needs a dedicated site for *cultural heritage interpretation* for the visitors.
6. This site with all its various cultural and natural components provides an ideal setting for heritage interpretation which is recommended to be *integrated* within a revitalization plan for the whole area.
7. This project provides the opportunity to have an interpretation plan integrated into site planning through landscape design, open space structures, food and cuisine in traditional bazaar like built forms, activities and programs such as a *son- et -lumiere* show etc.
8. *Heritage awareness programs* especially for the children should be through their play areas, visual elements which form part of the landscape garden, creative activities as well as foods etc. The project program should address the children of all economic sections of the society.
9. The project program needs a balanced approach between projects which are largely for public good with others which contribute meaningfully to the program and are also revenue generating to ensure financial sustainability and maintenance without depending on continued support form the state.
10. This is an ideal site to demonstrate an integrated approach for conservation of both manmade and natural resources through public private participation where the involvement of both, the people of Mehrauli as well as Delhi is sought.
11. This integrated approach is necessary for both socio-cultural and financial sustainability of the program.
12. Such an approach would ensure economic regeneration of the area; it is however necessary to ensure that the local community derives economic benefits from the program.
13. This project calls for an integrated conservation plan in which the conservation of the cultural resources as well as environmental issues are handled in a coordinated manner. The waste water and solid waste management issues need to be addressed urgently as they are serious health hazards for the local community.

14. This project calls for support and coordinated effort from all the Government agencies which have a stake in the various aspects of the management of the city, namely the DDA, MCD, ASI, State Department of Archaeology, Wakf Board, Forest Department, Delhi Tourism, Jal Board, DESU, Delhi Police etc.

The project is envisaged as comprising of the following components:

I. Architectural Conservation and Revitalization Plan
    i. Architectural Conservation
    ii. Reuse and Revitalization program (including building program and design, landscape plan, site interpretation, son et lumiere, signage, lighting etc.)
    iii. Development and building guidelines (streetscape, building regulations including façade control, street infrastructure e.g. lighting, street furniture and drainage.)

II. Solid Waste Management

III. Waste water Management

IV. Environment up gradation (issues related to ecology)

V. Traffic and Circulation planning

VI. Social programs (public health, consultation, capacity building and awareness programs related to heritage, publications, participation in waste management etc.)

VII. Cultural program/s and event planning (programming, promotion, marketing)