

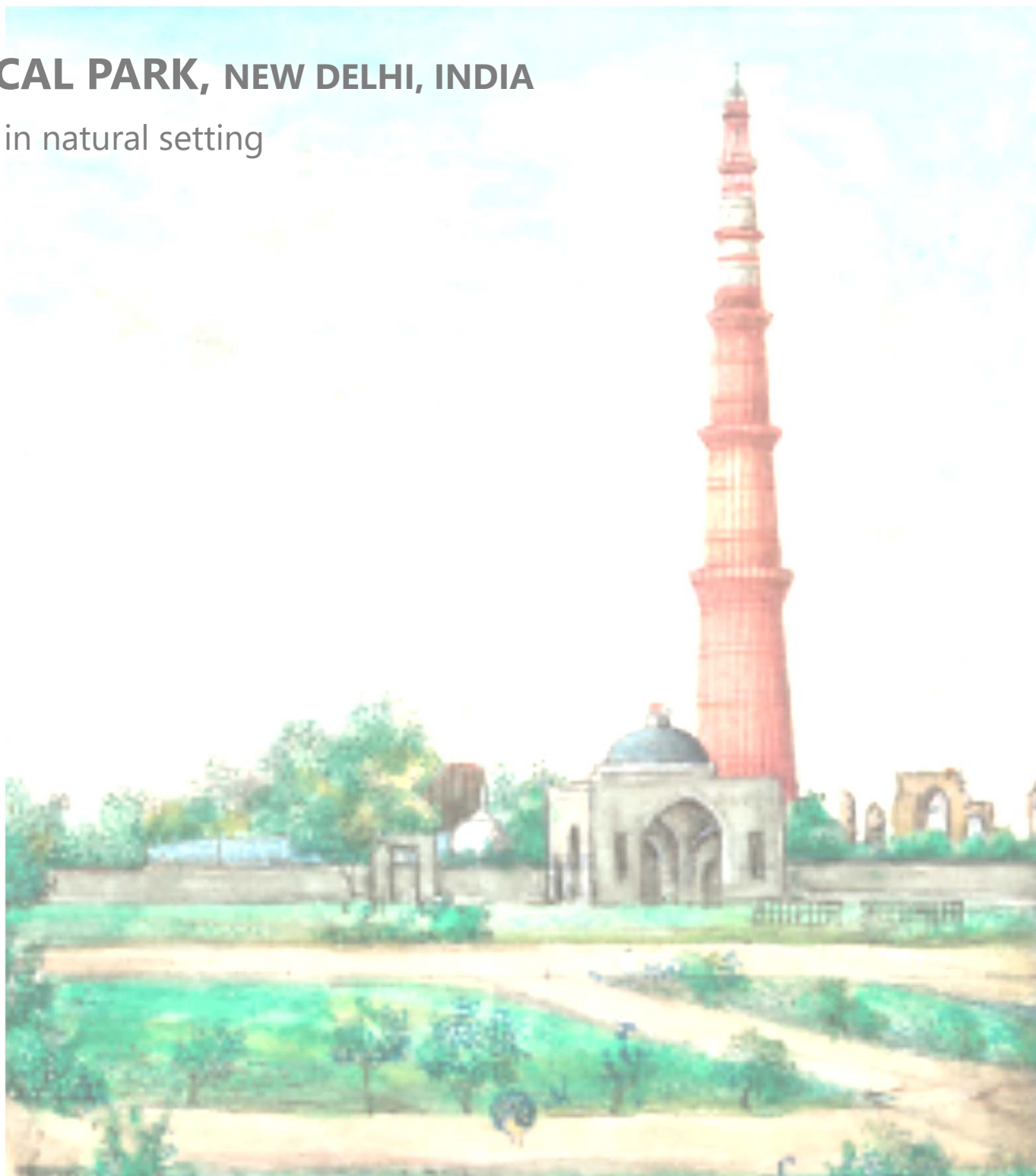
MEHRAULI ARCHAEOLOGICAL PARK, NEW DELHI, INDIA

Interpreting historical built heritage in natural setting

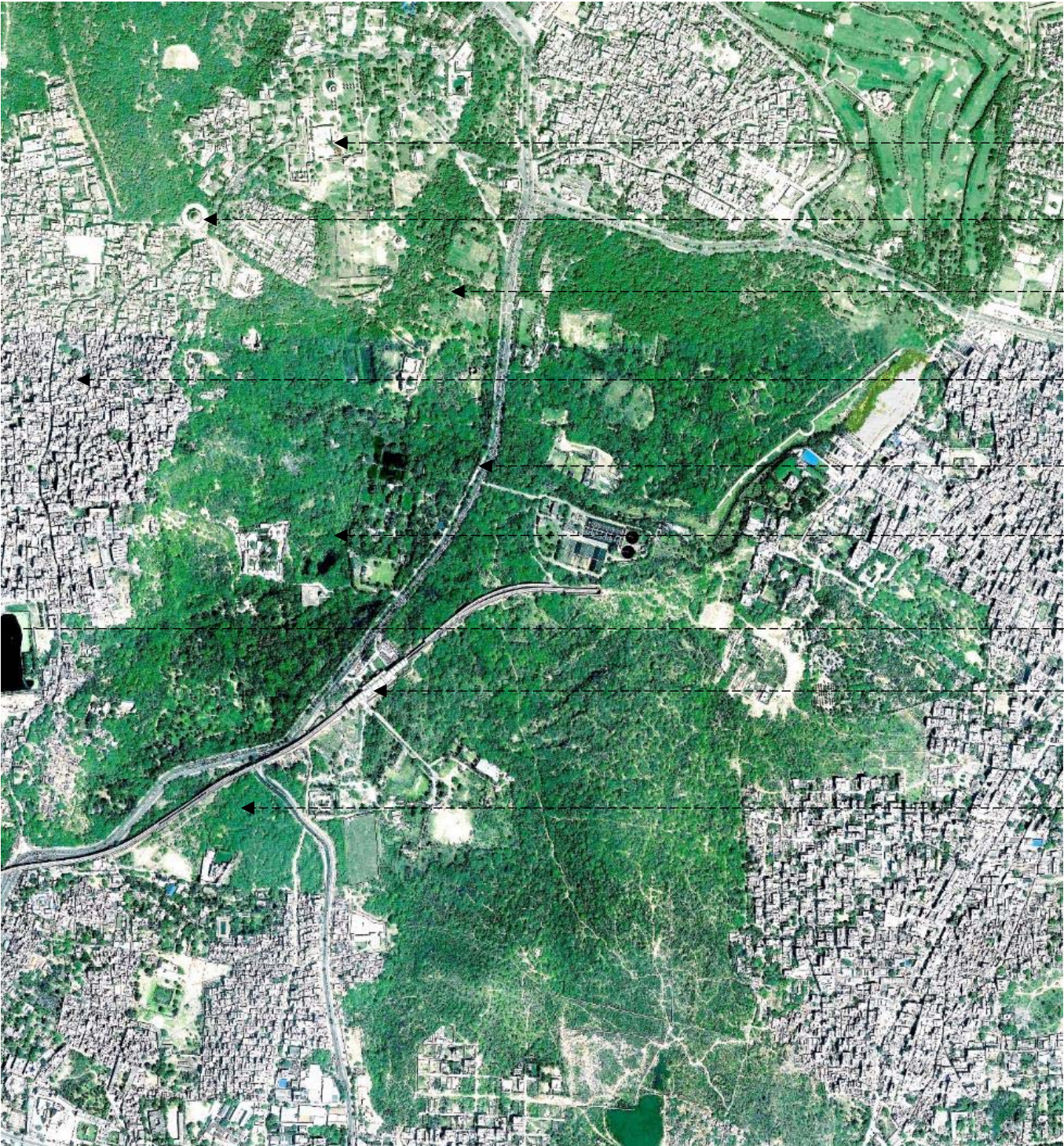
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Landscape Architect | Ph.D Scholar

Design with Nature, Online Seminar
Le: Notre Institute | ECLAS

November 14, 2018



CONTEXT AND SETTING



- Qutab Minar
- Adam Khan's Tomb at Hillock
- Flower garden
- Historical Rural settlement
- Mehrauli-Gurgaon Road
- Archaeological Park
- Hauz-e-Shamsi – water Tank
- Metro Station
- Ladha Sarai- historic Resting hub

CONTEXT OF THE PARK



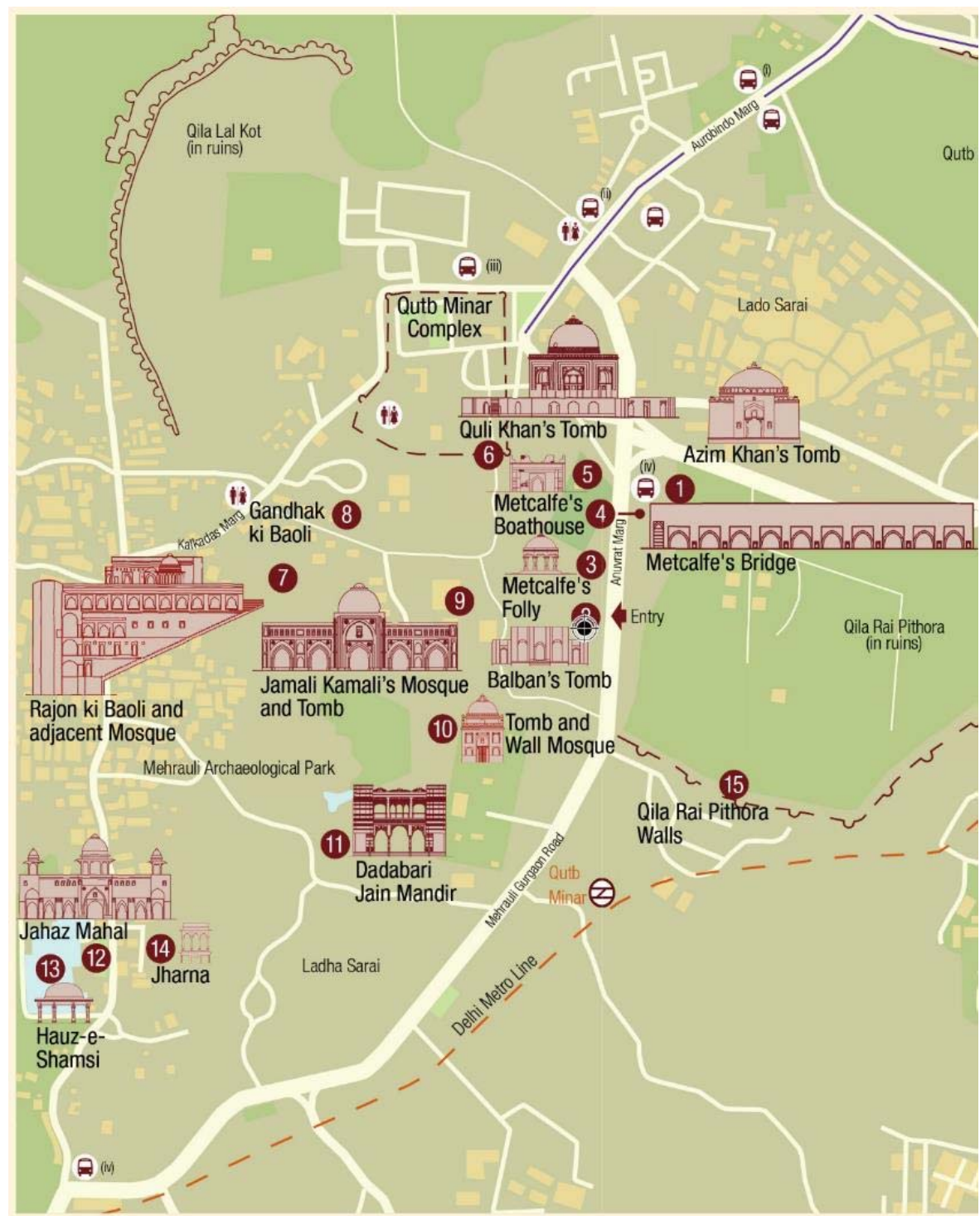
CONTEXT OF THE PARK



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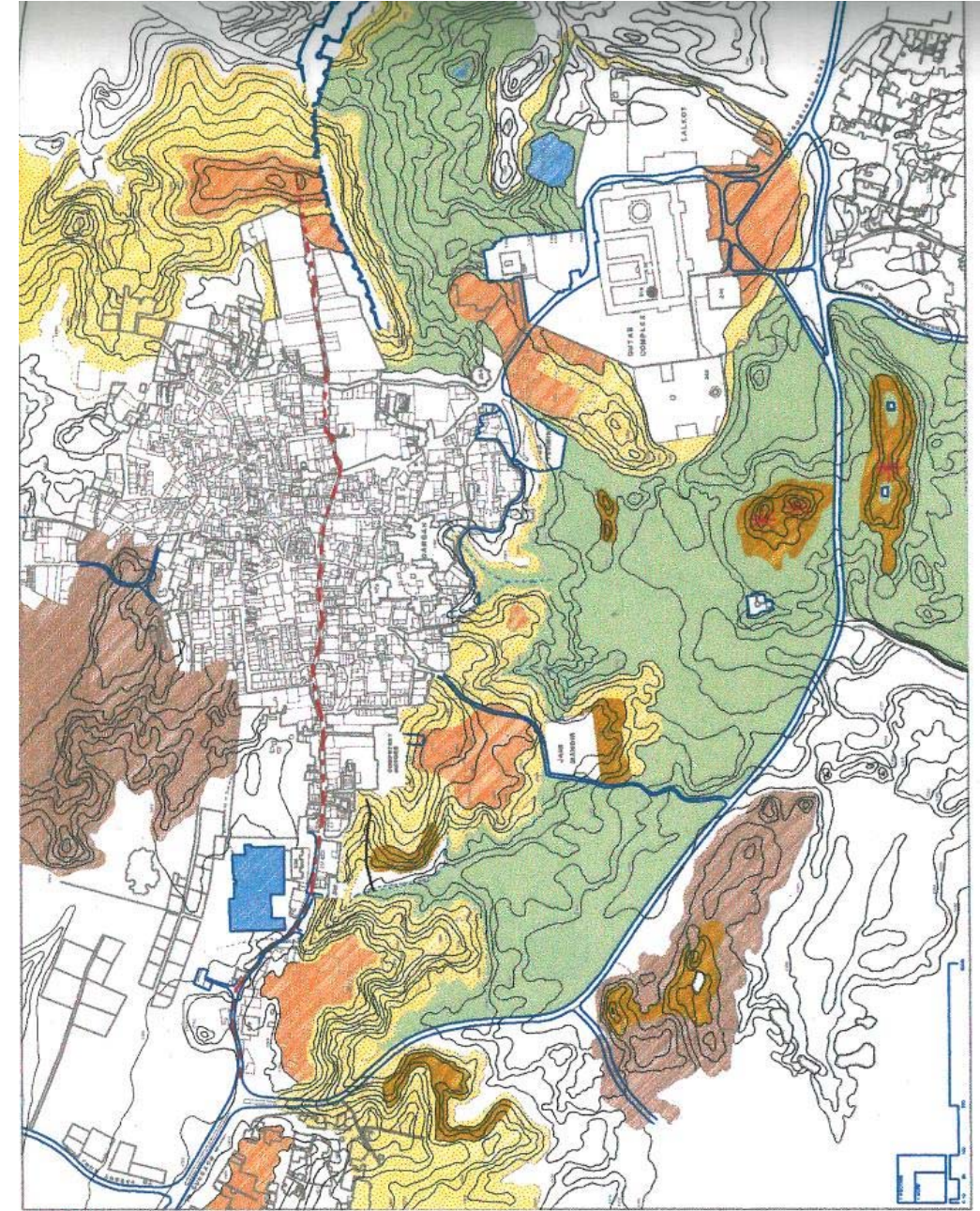


THE UNEXPLORED PLETHORA



1. Azim Khan's Tomb
2. Balban's Tomb (1266 – 87)
3. Metcalfe's Folly (1835 – 1853)
4. Metcalfe's Bridge (1835 – 1853)
5. Metcalfe's Boat House (1835 – 1853)
6. Quli Khan's tomb (1840)
7. Rajaon Ki Baoli (1506)
8. Gandhak Ki Baoli (1506)
9. Jamali Kamali's Mosque and Tomb (1528)
10. Tomb and Wall Mosque
11. Dadabari jain Mandir
12. Jahaz Mahal (1700)
13. Hauz-e-Shamsi (1230)
14. Jharna (1700)
15. Qila Rai Pithora (1100)

INTERPRETATION OF NATURAL RESOURCE AND BUILT SETTING THROUGH REDUCTIVE ANALYSIS – PHYSIOGRAPHIC FEATURES



LEGEND -

- | | | |
|-------------------------|------------------------|--------|
| PLATEAUS AND PEAKS | IRRGULAR ROCKY SLOPES | PLAINS |
| WATER BODIES | RIDGE | |
| ROCK OUTCROPS | SMALLER PEAKS/HILLOCKS | |
| CONTINUOUS FOLDED SLOPE | VALLEY/LOW POINTS | |

RIDGE: a long linear ridge runs roughly north south, on which is situated the settlement of Mehrauli.

CONTINUOUS FOLDED SLOPE: this is seen on the east face of the north south ridge. The continuous moderate slope is not running smoothly. This has a rocky character in most parts.

PLATEAUS AND PEAKS: along the continuous slope are several high points, which are peaks or plateaus. These have been exploited for the views they offer.

SMALLER PEAKS/HILLOCKS: away from the continuous slopes, these are rocky outcrops on which structures and tombs have been sited.

EXPOSED ROCK: some portions of the spur are entirely rocky in addition to scattered rocky outcrops

GENTLE SLOPES: to the east, beyond the continuous slope, are the gentler slopes. These are less rocky in character and have extensive historic remains.

VALLEYS/LOW POINTS: as a result of the above folding, valleys are formed. The Jharna valley is a major area in depression. The bus terminal is also located in a valley. Another big valley is located to the southern end of the park near the old picnic huts.

PLAINS: these are low areas in which are located mango orchards and Hauz Shamshi, below irregular rocky slopes.



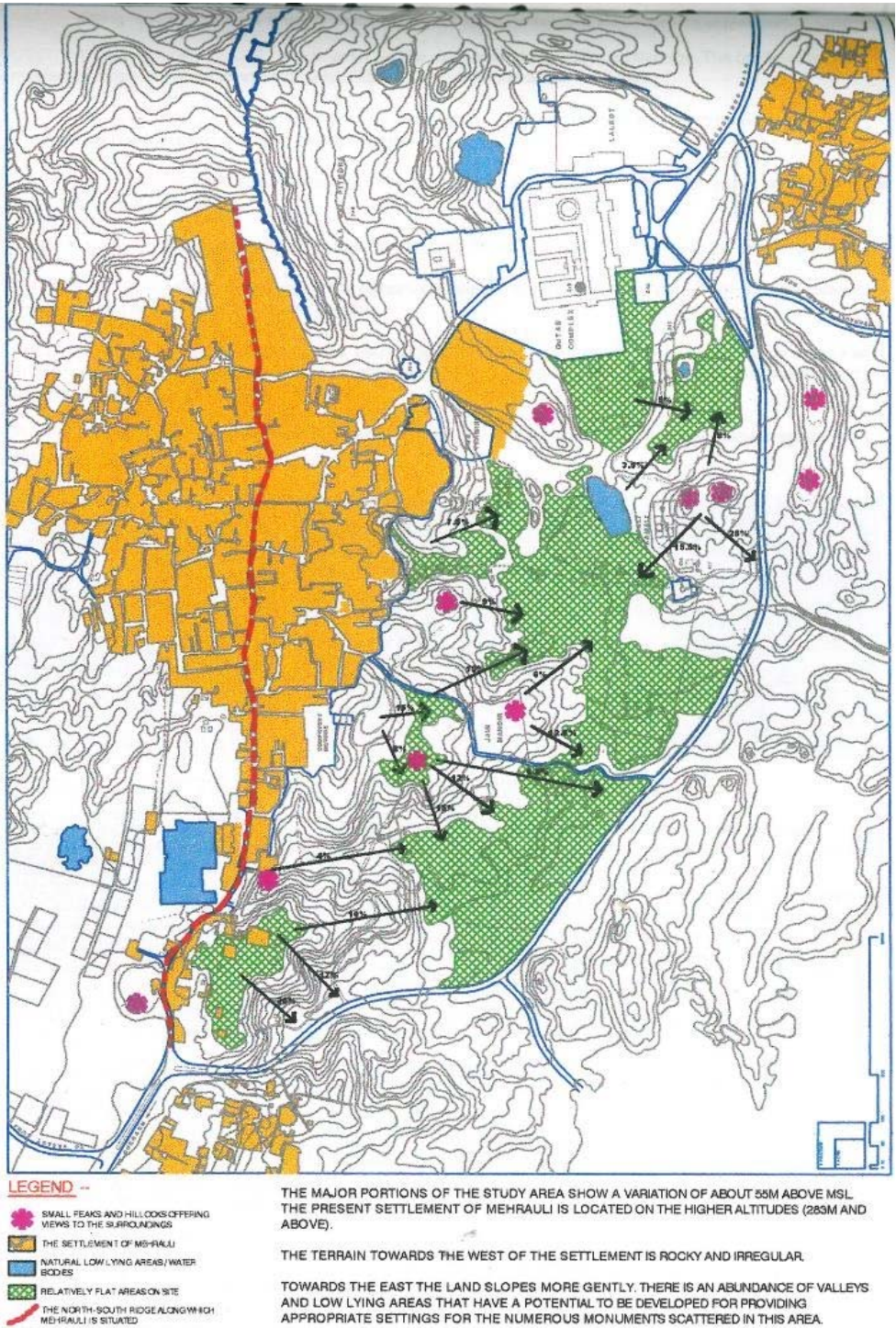
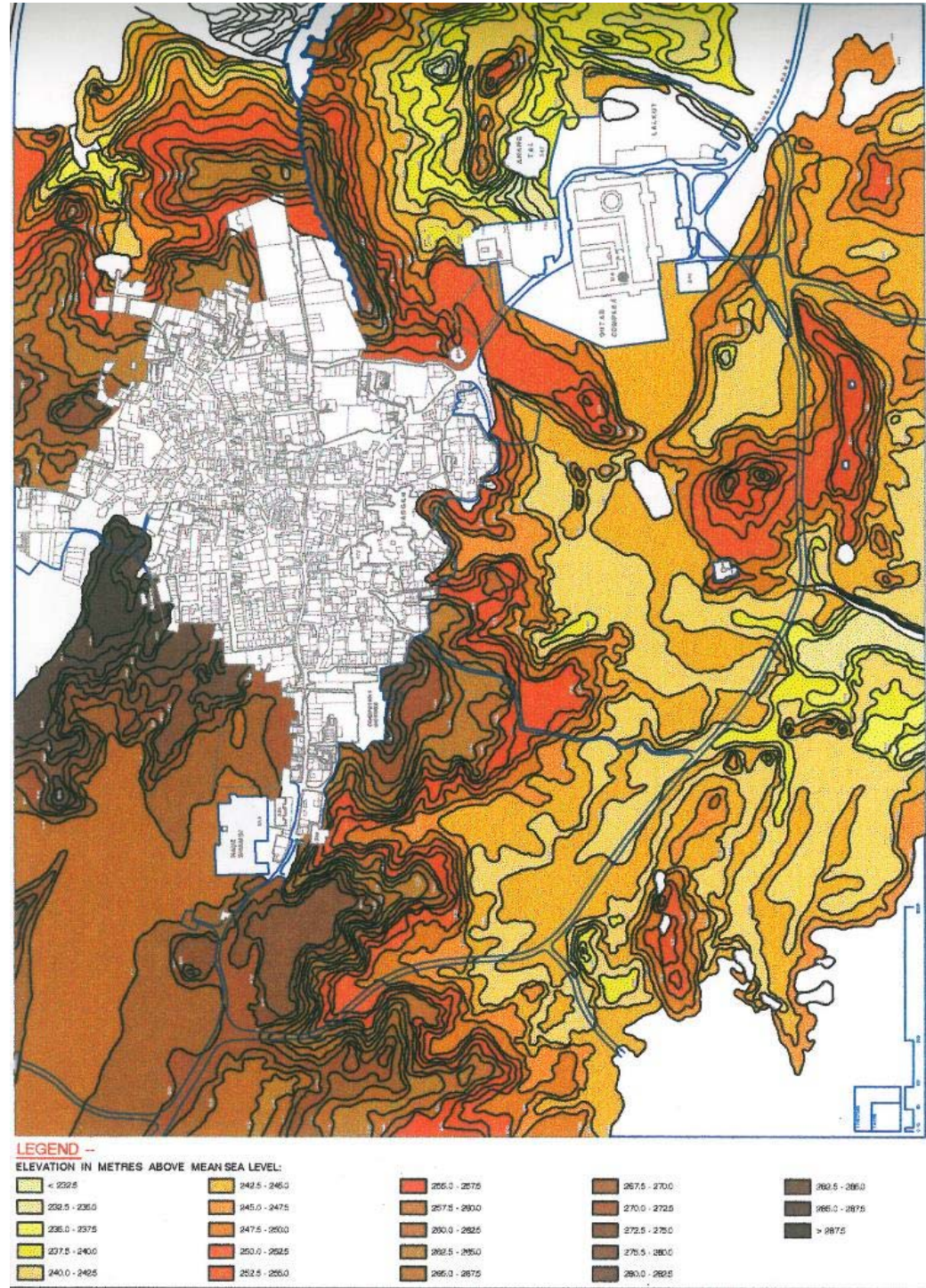
GEOLOGY --

The Delhi system, of lower Cuddapah age, is endowed with a variety of excellent building materials. The system is composed of ferruginous and lime quartzites, grits and schistose rocks intruded by large bodies of granite and amphibolites.

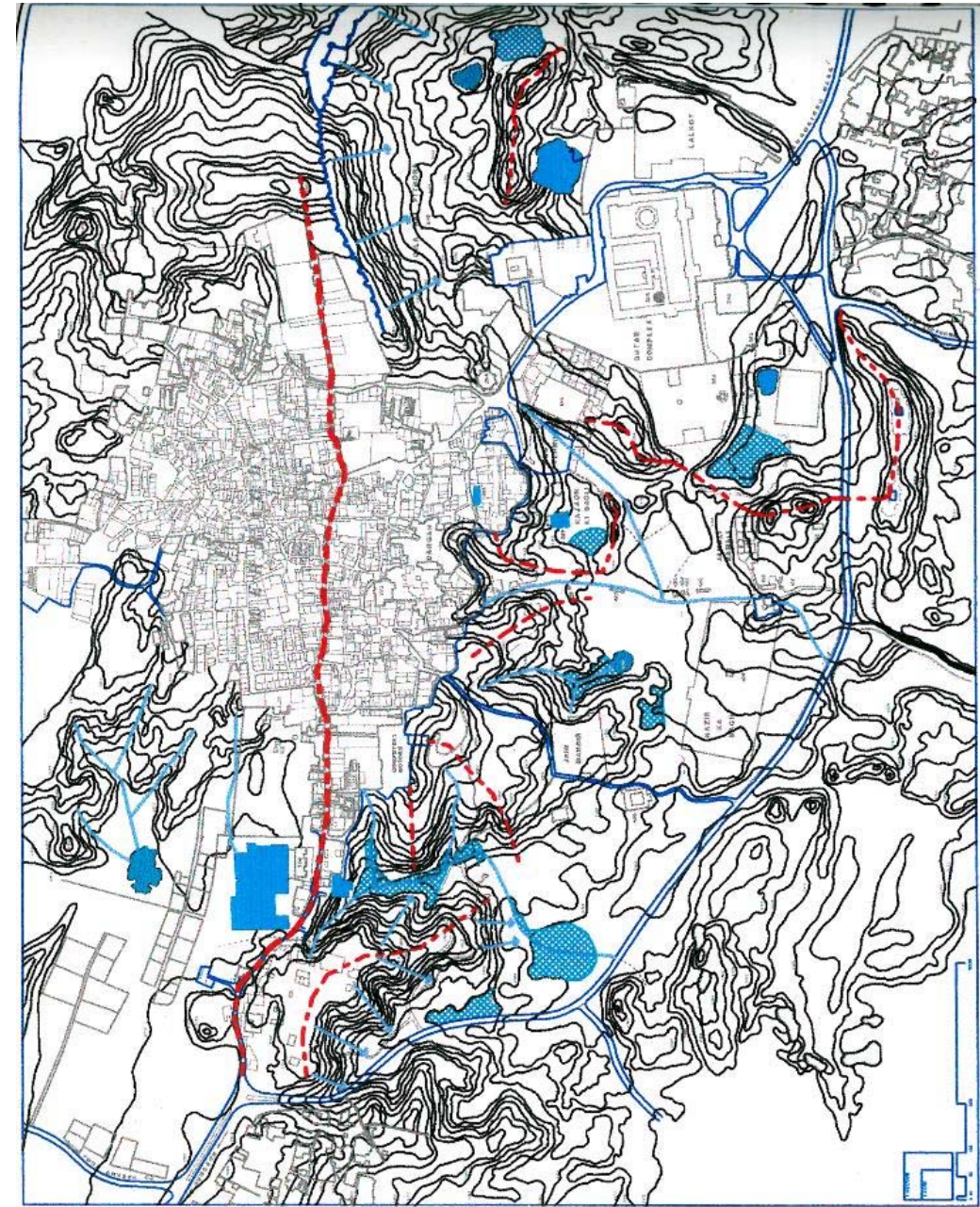
The Delhi quartzite possesses a vitreous lustre. They are found to contain 50% brown tourmaline, besides appreciable quartzites of clourless mica and limonite.

The reddish or brownish-red appearance of the hilly tracts may be due to a dehydrated form of iron oxide - turgite or haematite.

REDUCTIVE ANALYSIS – PHYSIOGRAPHIC FEATURES - RELIEF MAP



REDUCTIVE ANALYSIS – PHYSIOGRAPHIC FEATURES – WATER REGIME



- LEGEND --
- ridge line
 - drainage lines
 - arrows indicating sheet flow
 - man made historic water bodies
 - natural depressions (seasonal water bodies)
 - poorly drained areas

THE DRAINAGE PATTERN IS CLOSELY RELATED TO THE LANDFORM. IT IS APPARENT THAT THE AREA NATURALLY DRAINS INTO SEVERAL LARGE AND SMALL PONDS WITHIN THE PRESENT DDA PARK (ON THE EAST OF THE RIDGE LINE) AND THE ORCHARDS AND HAUZ SHAMSHI ON THE WEST.

THE PRESENCE OF MAINLY KIKAR AND BER ON THE CONTINUOUS SLOPES, ALONG WITH GREATER DIVERSITY OF VEGETATION IN THE GENTLE SLOPES BELOW, SUGGESTS THAT THE ROCKY CONTINUOUS SLOPES ARE NATURALLY WELL DRAINED AREAS AND THE GENTLE SLOPES AND VALLEYS ARE AREAS WHERE WATER COLLECTS FOR A LONGER DURATION.

THE MAJOR DRAINAGE ELEMENTS OBSERVED IN THE SITE ARE:

NATURAL PONDS / SEASONAL WATER BODIES: THERE ARE SEVERAL PONDS OR SEASONAL WATER BODIES OBSERVED IN THE NATURAL DEPRESSIONS IN THE SITE. THESE ARE VERY CRITICAL AREAS REQUIRING CONSERVATION AND SUBSEQUENT MANGEMENT & MAINTENANCE OWING TO THE FAST DEPLETION IN THE GROUND WATER LEVEL IN THE AREA.

MAN MADE WATER BODIES: THESE ARE VARIED IN NATURE. THE ONES PROMINENT ON SITE ARE TANKS, BAOLIS, WELLS, PONDS AND JHARNA (THE CASCADE).

ANANG TAL - THIS TANK CONSTRUCTED IN THE 10TH CENTURY IS MERELY A DEPRESSION TODAY THAT HAS SILTED AND DRIED. IT NOW OVERGROWN WITH WEEDS.

THE **LARGE POND IN THE LOWER GARDEN OF THE QULI KHAN TOMB** IS ALSO DRY AND OVERGROWN WITH WEEDS. THIS POND HAS SOME PALM TREES REMAINING FROM THE HISTORIC PERIOD.

RAJON KI BAINS - A RECTANGULAR STEPPED WELL NOW SILTED UP WITH A DEEP WELL AT ONE END. IT IS A COMPLEX ON SEVERAL LEVELS CONSISTING OF A MASJID, CHHATTRI AND COVERED GALLERIES.

GANDHAK KI BAOLI - A SIMPLE AND ELEGANT RECTANGULAR STEPPED WELL FED BY A SULPHUR SPRING AND HAVING A DEEP WELL AT THE SOUTHERN END. THE WATER QUALITY IN THIS STRUCTURE IS DETERIORATING DUE TO MISUSE BY PEOPLE FROM THE SETTLEMENT.

HAUZ SHAMSHI - THIS IS A LARGE TANK BELIEVED TO BE PARTIALLY SPRING FED AND ALSO LARGELY BY THE RAIN WATER FLOWING DOWN FROM THE SURROUNDING SLOPES. THE RECENT DEVELOPMENT OF FARMHOUSES IN THE CATCHMENT OF THIS TANK, THE RUN-OFF HAS NOW STARTED TO BE INTERCEPTED BY A SMALLER POND WEST OF THE SHAMSHI TANK. THE WATER QUALITY IS DETERIORATING DUE TO THE MISUSE BY RESIDENTS OF THE AREA.

JHARNA GARDEN - IT IS A CASCADE THAT WAS FED BY A OUTLET DRAIN FROM THE HAUZ SHAMSHI. THIS LINK HAS GOTTEN BLOCKED AND HAS LED TO THE GARDEN CASCADE DRYING UP. THIS HAS LED TO THE SUBSEQUENT NEGLECT AND DAMAGE TO THE WHOLE GARDEN AREA.



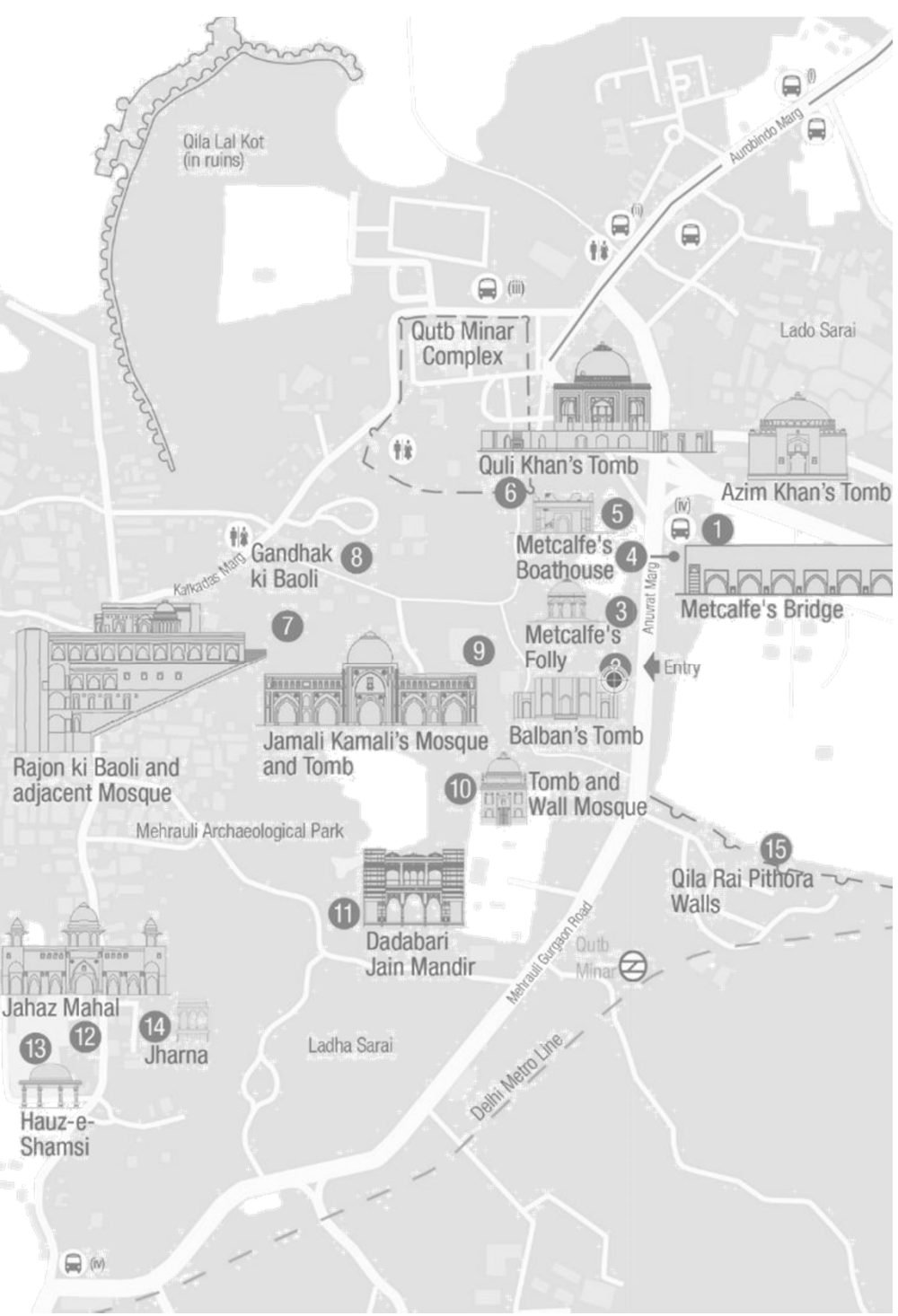
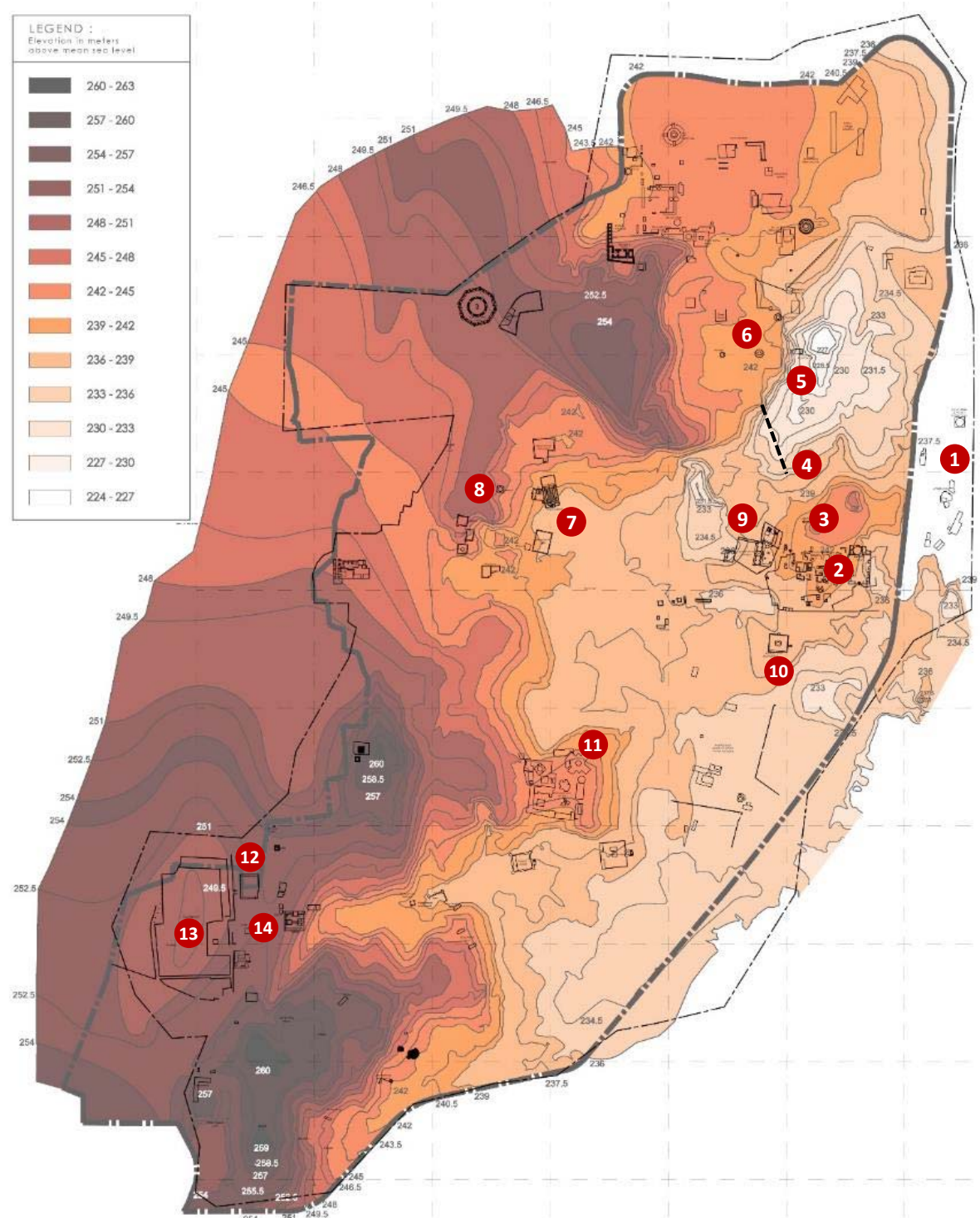
HAUZ SHAMSHI

A DRAIN PASSING FROM CLOSE TO A MONUMENT RESULTING IN PONDING NEAR IT AND ADDING TO THE FAST DETERIORATION OF THE STRUCTURE.

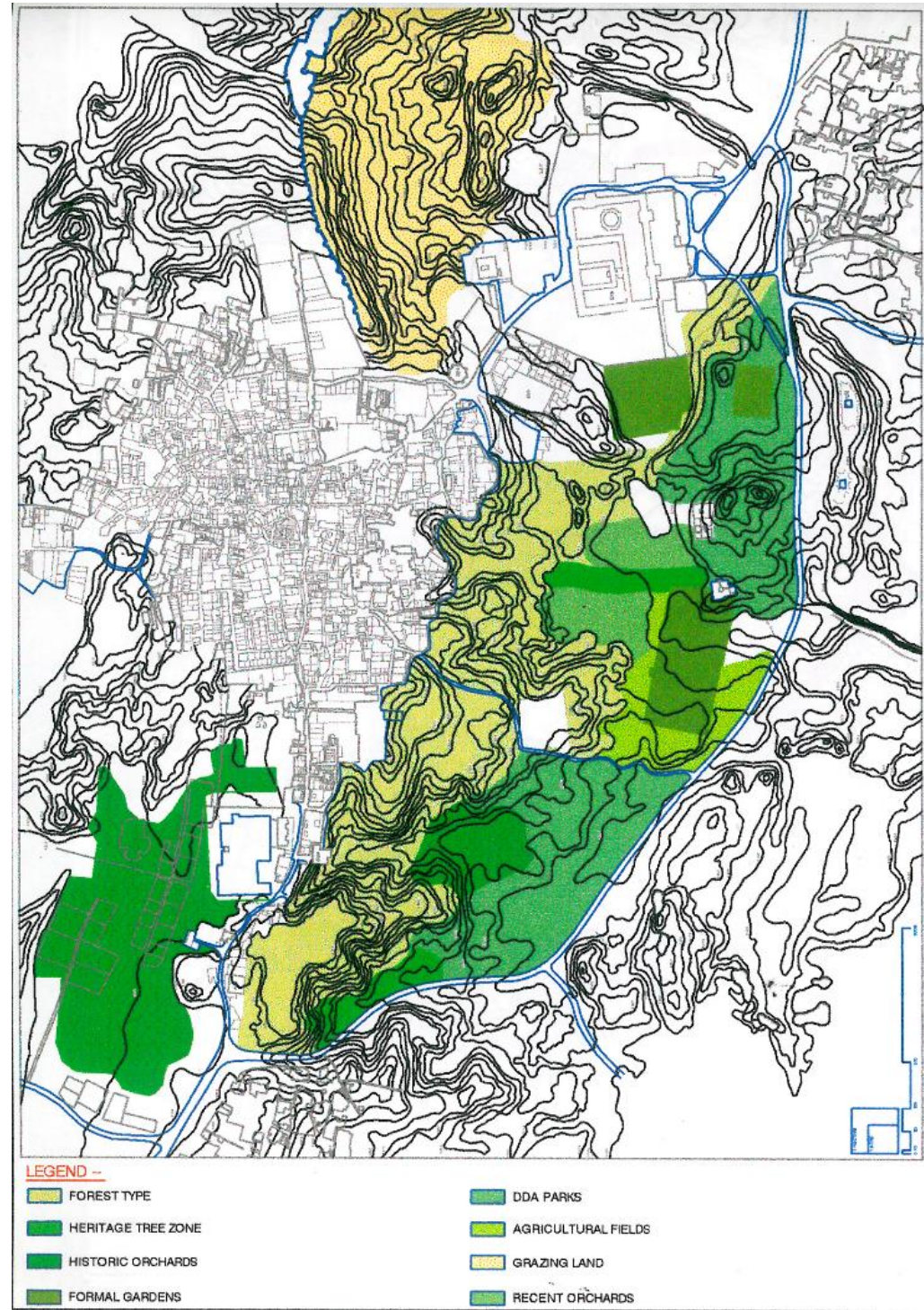


POORLY DRAINED AREAS: WATER LOGGING DUE TO POOR SURFACE DRAINAGE OF RAIN WATER IS OBSERVED IN MANY AREAS. THE MIXING OF SEWER FROM THE SETTLEMENT IN SOME AREAS RESULTS IN THESE SPACES BECOMING MARSHY AND USUSABLE DURING A LARGE PERIOD OF THE YEAR.

RESPONSE OF BUILT FORMS TO LANDFORMS



REDUCTIVE ANALYSIS – PHYSIOGRAPHIC FEATURES – EXISTING AND EXTANT VEGETATION



Mehrauli lies in the South Delhi Ridge vegetation zone. The characteristic natural flora is a tropical, thorny, secondary forest, commonly known as 'rakhs' or an arid, open, scrub forest. The bulk of the vegetation consists of co-dominant, spinous shrubs and trees, capable of great drought resistance. It may be classified under two categories: a) The permanent vegetation occurring throughout the year (summer and winter season), and b) The temporary vegetation consisting of the annuals growing mainly during the short, rainy season.

- The two broad vegetation types found in the site are:
1. Planted and maintained vegetation
 2. Forest type vegetation consisting of naturally regenerating vegetation

FOREST TYPE: the rocky spur has minimal vegetation cover; followed by the plateau, continuous slope, lower gentle slopes and banks of ponds in increasing order. The main constituents are:
Kikar - found in all areas. Dominant especially on the plateaus and rocky slopes
Kabuli, kikar, neem, babul and a few papri and lasora trees are found on the gentler lower slopes. A clump of neem is predominantly seen on the Jain Mandir plateau.
Ber, heens, kareel and ami - in rocky areas and growing out of ruined masonry.
Reenj - found intermixed with the above but predominates the rocky spur.
Chilbil - some trees observed, mostly on the higher areas at the settlement edge and a few in the lower flat areas.
White lantana - found on the lower slopes

HERITAGE TREES: long-lived trees are considered such. These are found as specimens in various locations such as within the settlement, in the forest area, survivors from historic gardens and orchards as well as in more concentrated zones.

HISTORIC ORCHARDS: these comprise a zone of scattered massive old khirni trees surviving near Bagichi ki masjid and in a small clump near the picnic hut, a guava orchard behind Masjid Jamali Kamali and a large mango orchard bordering Hauz Shamshi.

FORMAL GARDENS: virtually no historic/original vegetation remains in these areas. Those gardens identified so far are partially overgrown with weeds in varying degrees.

LANDSCAPE GARDENS: this type consists of open areas of grass intermixed with ornamental shrubs, some naturally regenerated trees and many planted trees. Landscape gardens are of two types - historic and recently laid out.
Historic landscape garden: not much of the original vegetation exists in the historic garden of Metcalfe. A few old palms are seen below Auli Khan's tomb at the pond. Extensive recent planting of flowering shrubs (chandni, Thevetia, kaner, bougainvillea, Poinciana) and trees (semul, teak, Peltophorum, amaltas, willow, champa, etc.) is seen.
Contemporary landscape garden: practically the entire DDA Park is a garden containing bougainvillea, flowering shrubs and trees. In the process the inherent characteristics of the spaces, overall appearance, integrity of historic orchards and features are being weakened. Bougainvillea and semul on the rocky spur, karanj in the valley and on slopes, jamun in the khirni orchard are the main cases.

GRAZING LAND: open land with few bushes forms the grazing land within the enclosed space of Lalkot.

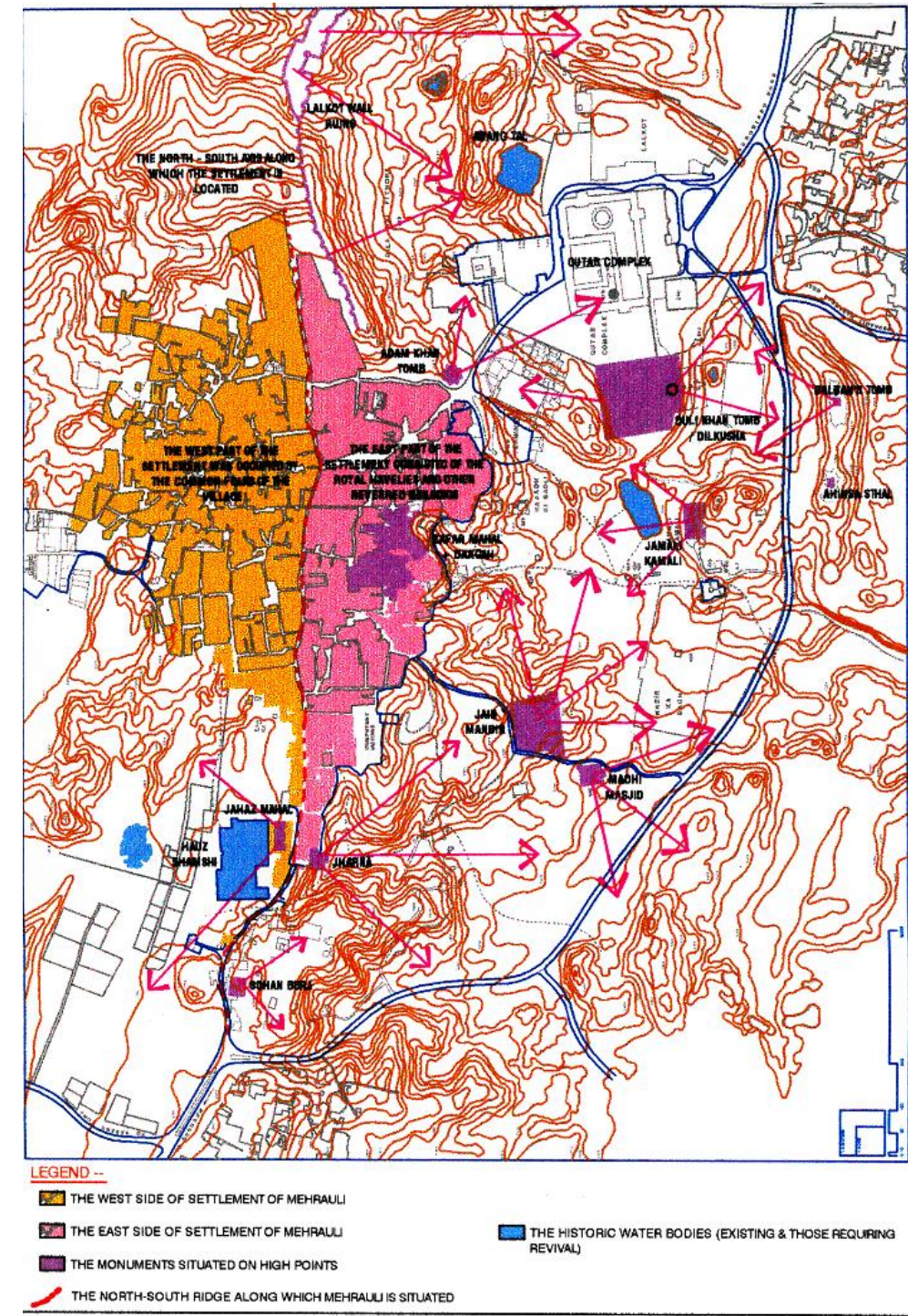


FOREST TYPE: This area consists of dense to sparse scrub vegetation which is of self-perpetuating, low maintenance type. This is in a state of degeneration due to the pressures of encroachment from settlement side and depleting water table. About 50% of the site is under this forest type vegetation. This area has educational opportunity for biologists and nature lovers.



DDA PARKS: The park is mainly comprised of a high maintenance landscape type with extensive lawns and planting of flowering shrubs such as bougainvillea, Thevetia, Chandni, etc. In about 100 acres of the park area, 40 acres is lawn only. These serve the recreational requirement of people living in the immediate neighbourhood.

BUILT FORMS RESPONDING TO NATURAL SETTING



RELATION OF BUILT FORM TO THE LANDFORM

OVERALL PLANNING:

The main **settlement of Mehrauli** is located along the North-South ridge; i.e. on relatively higher ground.

The gentle slopes are dotted with many monuments especially mosques and gardens.

SITES OF STRUCTURES:

Hauz Shamshi is located such that it gets the run-off from surrounding slopes.

The **Jhama** is also placed such that the views to the whole area can be observed from the edge of the valley.

Plateaus and peaks have been sensitively exploited:

- o The 'belvedere' at the high point seems to have been sited for the distant views, and possibly for the breeze.
- o **Jain mandir** is on another plateau.
- o Tombs namely those of **Adam Khan, Quli Khan, Azim Khan** and those near Sohan Burj are placed on eminent locations for prominence.

Smaller peaks have been used for siting **folies of Metcalf** to enhance the picturesque views.

The **service buildings of the Metcalf Estate**, the ruins of which can be seen near Jamali Kamali, are discreetly placed behind the hillock.

GARDENS AND ORCHARDS:

A characteristic of the location of the **historic gardens** identified is that they occupy well-defined spaces, which are suitable from the point of view of enclosure, shelter and availability of water.

- o In special defined spaces - Jhama garden and upper garden of Dilkusha
- o In gentle slopes - Nazir ka Bagh and Bagichi ki Masjid garden

In undulating land is the **extensive landscape garden of Thomas Metcalf**

The low plain to the SW has the **Hauz Shamshi and the old mango orchards**, sited here to utilise the pocket of soft soil with absence of rocks and slopes, and to take advantage of the seasonal runoff.

Similarly **guava and khirni orchards** are also located below slopes to maximise the water availability.



A VIEW OF THE ENTIRE VALLEY FROM THE JHAMNA GARDEN. THE VEGETATION SEEN IS A MIX OF DENSE WOODLANDS AND SCRUB TYPE.

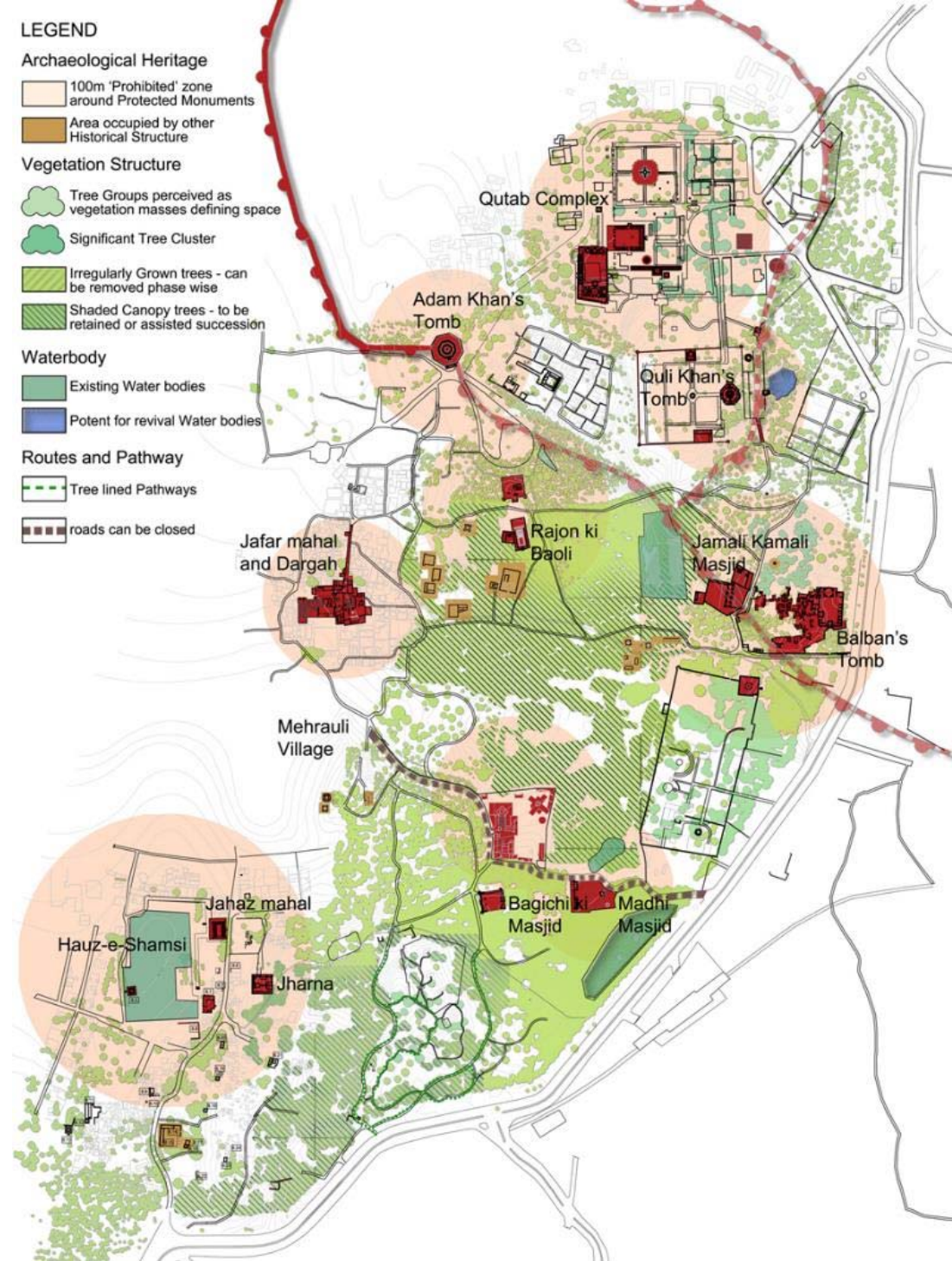


THE VIEW OF SITE FROM THE SOHAN BURJ. THIS AREA IS PREDOMINANTLY MODERATE TO SPARSE SCRUB VEGETATION TYPE.



THE VIEW OF SITE FROM THE DADA BARI JAIN TEMPLE. THERE IS A PREDOMINANCE OF MODERATE TO DENSE SCRUB IN THIS AREA.

MEHRAULI SITE ASSETS – TANGIBLE AND INTANGIBLE EXTANTS



HISTORIC MONUMENTS REGULATIONS IN INDIA

ASI 50M PROTECTED ZONE -

THIS IS AN AREA WITHIN 50M FROM THE MONUMENT.
NO CONSTRUCTION ACTIVITY IS PERMITTED IN THIS AREA.

ASI 100M RESTRICTED ZONE -

THIS IS AN AREA WITHIN 100M FROM THE PROTECTED ZONE.
ONLY DIGGING PERMISSIBLE UPTO 12 INCHES FROM THE SURFACE.
NO CONSTRUCTION OR INDUSTRIAL ACTIVITY ALLOWED.
NO VEHICLES ARE PERMITTED IN THIS AREA.

THE BASIC INTENT FOR THIS AREA IS TO PRESERVE ANY ARCHAEOLOGICAL REMAINS UNTIL SUCH A TIME THAT AN ARCHAEOLOGICAL INVESTIGATION CAN BE CARRIED OUT.

ASI 200M REGULATED ZONE -

THIS IS AN AREA WITHIN 200M FROM THE EDGE OF THE RESTRICTED ZONE.
DEVELOPMENT CAN HAPPEN WITH PERMISSION FROM THE ASI.
MAXIMUM HEIGHT FOR CONSTRUCTION TO NOT EXCEED THE MAXIMUM HEIGHT OF THE MONUMENT.

THE BASIC INTENT FOR THIS AREA IS TO AVOID VISUAL AND FUNCTIONAL INCOMPATIBILITY.

ANCIENT MONUMENTS AND ARCHAEOLOGICAL SITES AND REMAINS ACT 1958 -

THIS IS AN ACT TO 'PROVIDE FOR THE PRESERVATION OF ANCIENT AND HISTORICAL MONUMENTS AND ARCHAEOLOGICAL SITES AND REMAINS OF NATIONAL IMPORTANCE, FOR THE REGULATION OF ARCHAEOLOGICAL EXCAVATIONS AND FOR THE PROTECTION OF SCULPTURES, CARVINGS AND OTHER INLAY OBJECTS'.

THIS ACT HAS SPECIFIED THE PROTECTED AREA, RESTRICTED AREA AND THE REGULATED AREA WHICH ARE 50M, 100M AND 200M RESPECTIVELY AS DEFINED IN A COURT ORDER OF 1992. IT IS IMPORTANT TO UNDERSTAND THAT IN NO SITUATION SHOULD THESE AREAS LIMIT THE MAJOR AGENDA FOR THE PROTECTION OF THE HERITAGE.

AS PER THE MASTER PLAN, DELHI MEHRAULI AREA HAS BEEN IDENTIFIED AS A HAERITAGE ZONE. IT THUS NEEDS TO BE CONSERVED BECAUSE OF ITS RICH URBAN HERITAGE AND HIGH TOURIST POTENTIAL.
THE AREA AROUND THE MONUMENTS (FALLING IN THE ZONE - F) MAY BE SUITABLY LANDSCAPED.

RIDGE AREA GUIDELINES:

THE SITE FALLS UNDER THE DESIGNATED SOUTH-CENTRAL RIDGE WHICH IS A REGIONAL PARK AS PER THE MASTER PLAN, DELHI. THE MPD RECOMMENDS THAT THE 'RIDGE' BE CONSERVED WITH UTMOST CARE AND MAINTAINED IN ITS PRISTINE FORM. IT SHOULD BE AFFORESTED WITH INDIGENOUS SPECIES AND MINIMUM OF ARTIFICIAL LANDSCAPE.

CONSERVATION AND RESTORATION OF THE PLACES OF RICH URBAN HERITAGE AND HIGH TOURIST VALUE FALLING IN THE RIDGE NEED TO BE TAKEN UP ON PRIORITY.
PERMITTED ACTIVITIES IN THE RIDGE ARE WILDLIFE SANCTUARY, SHOOTING RANGE, GOLF COURSE, OR GARDEN.

THE ENVIRONMENT (PROTECTION) ACT, 1986 -

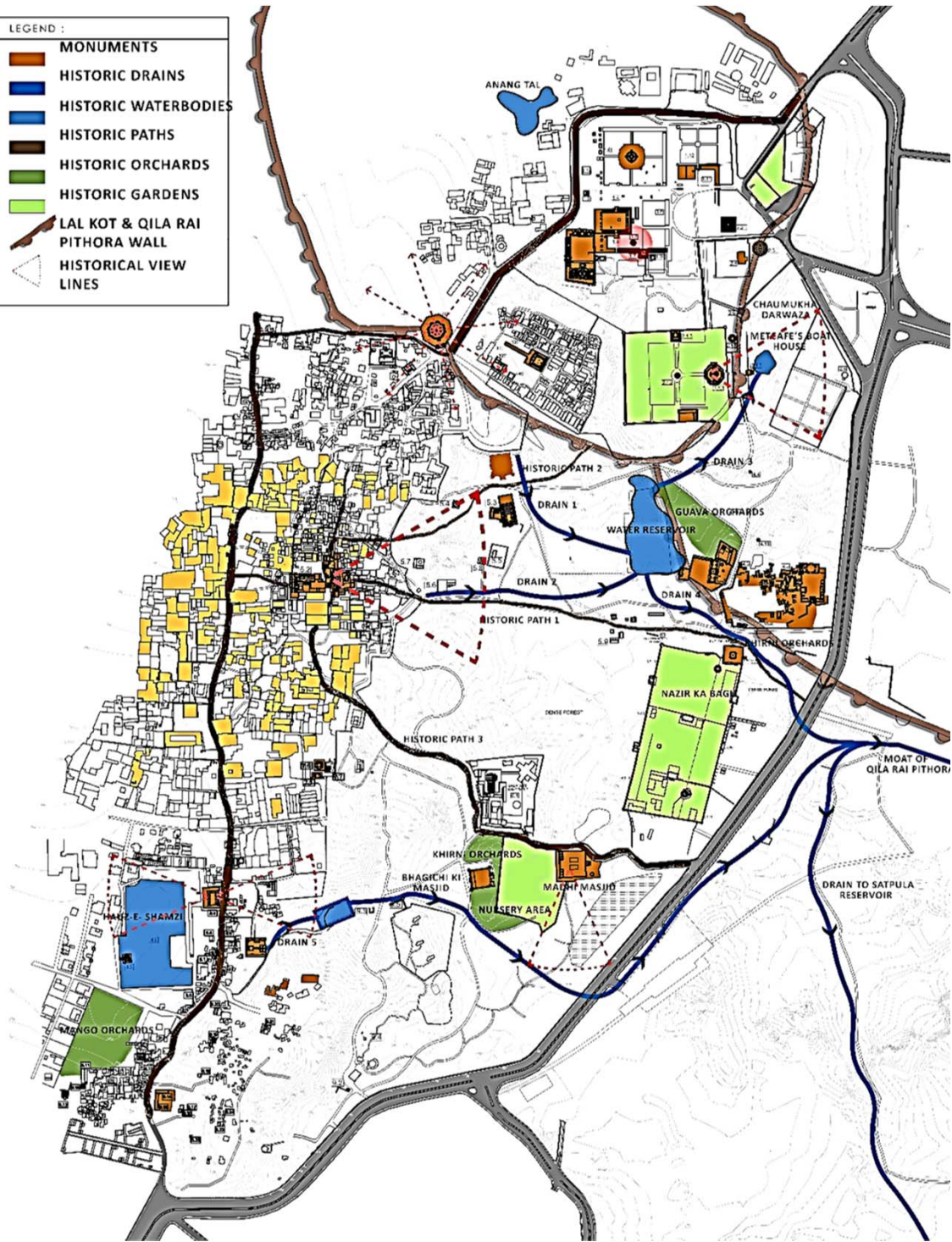
ACCORDING TO THIS ACT 'ENVIRONMENT' INCLUDES WATER, AIR AND LAND AND THE INTER-RELATIONSHIP THAT EXISTS AMONG AND BETWEEN WATER, AIR, LAND AND HUMAN BEINGS, OTHER LIVING CREATURES, PLANTS, MICRO-ORGANISMS AND PROPERTY.

IT IS AN ACT FOR THE 'PROTECTION AND IMPROVEMENT OF ENVIRONMENT AND MATTERS CONNECTED THEREWITH'.

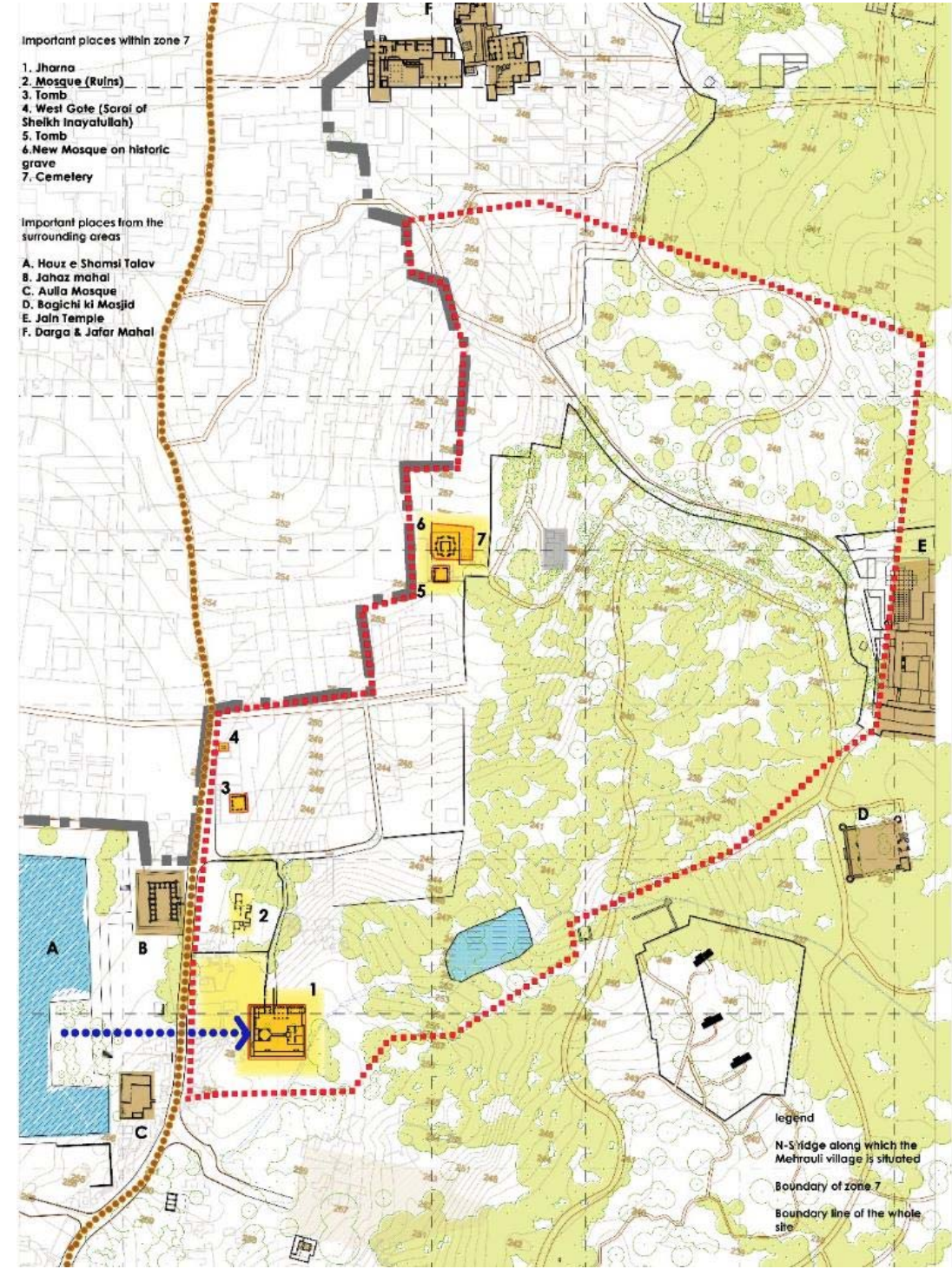
IN CLAUSE 5 OF THIS ACT, IT STATES THE 'PROHIBITION AND RESTRICTION ON THE LOCATION OF QUARRYING AND MINING INDUSTRIES IN CLOSE PROXIMITY TO A PROTECTED MONUMENT'.

INTERPRETED HISTORIC ECOLOGY

- LEGEND :
- MONUMENTS
 - HISTORIC DRAINS
 - HISTORIC WATERBODIES
 - HISTORIC PATHS
 - HISTORIC ORCHARDS
 - HISTORIC GARDENS
 - LAL KOT & QILA RAI PITHORA WALL
 - HISTORICAL VIEW LINES



DESIGN WITH NATURE EXEMPLAR – HAUZ-E-SHAMSI & JHARNA



hauz e samshi

overflow of water

retreat

Jharna

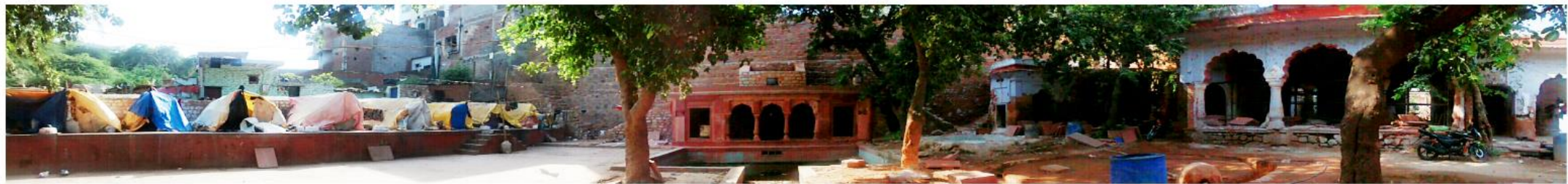
Introduction

Jharna was the water fall emanating from the Hauz-i-Shamsi.

It is located on the South-western part of the Mehrauli, close to the Jahaz Mahal. It is identified as a significant water structure that had developed by Nawab Ghaziuddin around 1700 AD as a pleasure garden during the Mughal rule.

Jharna is a cascade which is now damaged and dry. An underground pipe (still visible in ruins) supplied the runoff to the Jharna from Hauz-i-Shamshi. This was in addition to an open channel close by that carried the overflow of the tank to Tughlaqabad fort to enhance the drinking water supply.

HAUZ-E-SHAMSİ & JHARNA – EXTANT LAYERS
ALL THE MAJOR ELEMENTS OF JHARNA



FOREST ADJACENT TO THE JHARNA AREA



AREAS ARE ENCROACHED AND SOMETIMES USED TO KEEP CONSTRUCTION MATERIALS



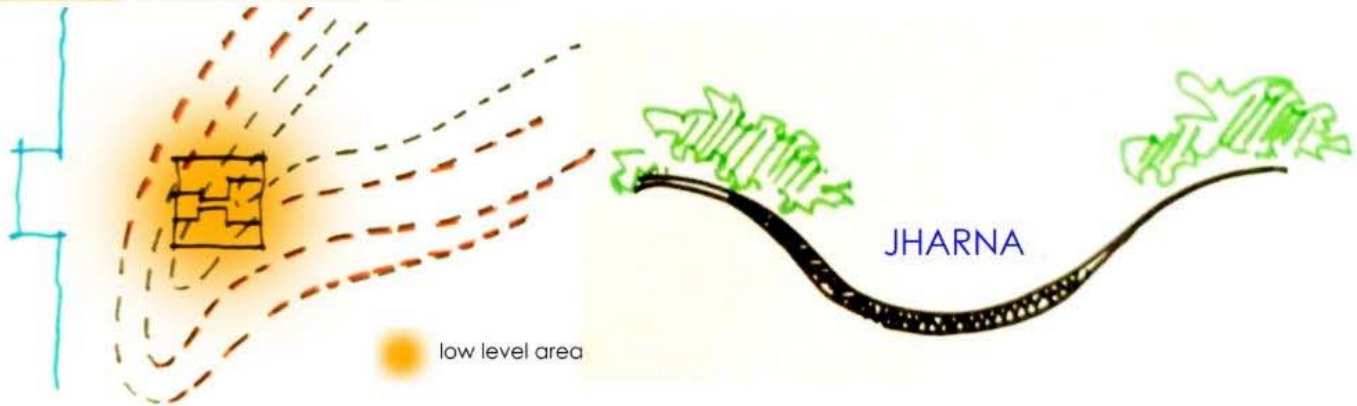
CANAL FLOWING JUST ADJACENT TO THE JHARNA

JHARNA – LANDSCAPE PLANNING PRINCIPLES

Site planning Principles -

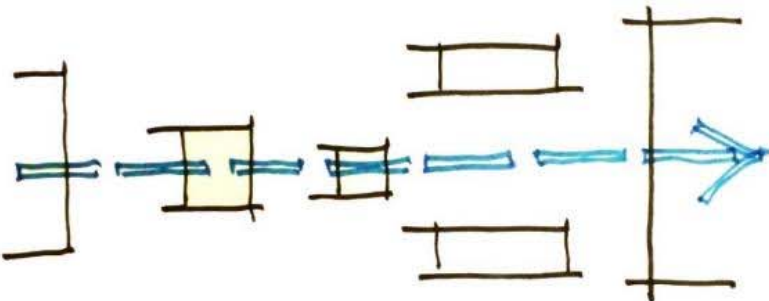
Siting of Jharna

- Hauz e Shamsi is strategically located to collect the runoff from surrounding slopes and also exploits the subterranean water system.
- The end of the valley has been cleverly utilized to place the 'Jharna'
- It is built below the edge of the ridge inside the mouth of the valley - to take the overflow of Hauz e Shamsi.

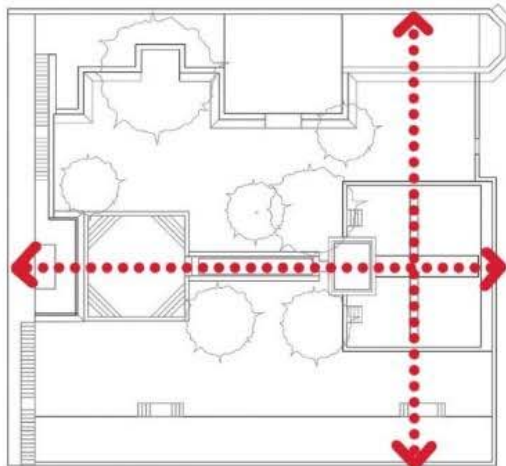


Organisation and Order

- The organisation of Jharna respects and accentuates the direction of natural flow of water from Hauz e Shamsi.



accentuating the direction of natural flow of water



1229 A.D.

1600 A.D.

1700 A.D.



Function

- It was the mughal retreat and highlight of the three day festival of the 'phul-walon ki sair'
- The jharna was there to catch the overflow of hauz e shamsi tank.
- Today it is in ruins and surrounding area is encroached by twenty five families, waterfall has become a drain.



JHARNA – LANDSCAPE PLANNING PRINCIPLES

Ownership

- 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 (1700 A.D.)

Symbolism

- This place is the archetypal grove from the Islamic mythology. It is an introverted place stating the royal pleasure principle – appropriating the first right to the resource of water in a dry hilly landscape and by implication asserting its right over the orchards and agricultural lands down the valley.
- Inscribed down the middle of the platform is a channel which rhythmically widens and contracts, creating shallow square pools, as it carries the overflow of the Hauz Shamsi into the valley. Delicate pavilions, typical of late Mughal architecture sit on this play of water.

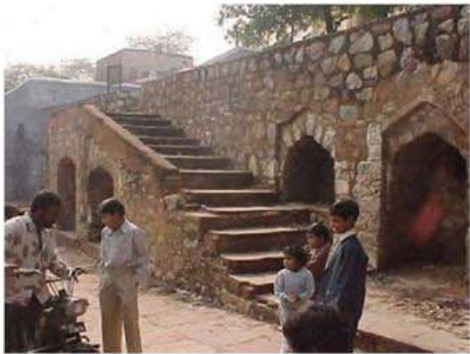
Scale

- In Jharna, the built form is of a human scale, not dominating over the surroundings. Since nature was to be given predominance, the structure is placed very subtly into the natural setting and terrain of the area.

Use of Land, Water and Vegetation

- This is an example of the ingenious way in which hydrology and landform were utilised
- The site is located on the very significant gradient in between the Hauz-i-shamsi and a stream.
- The natural flow of water is cleverly utilized
- Trees on the ridge limit the amount of sky over the platform – providing the optimum amount of sense of enclosure

Present Condition



Entrance area



Entry gate



Baradari at the centre

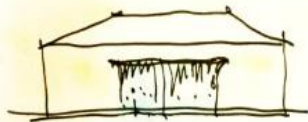
Water used in various ways as a design element in Jharna



Rhythmic contraction & expansion of water



Char bagh - water flowing from four corners of the world



Falling and breaking of water



Chaddar - religious belief symbolism

Thank you

