

Nomination of

# The Jantar Mantar, Jaipur

for inclusion on World Heritage List

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# EXECUTIVE SUMMARY

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**State Party:** Archaeological Survey of India (ASI)

**State, Province or Region:** India

**Name of Property:** The Jantar Mantar, Jaipur

**Geographical coordinates to the nearest second:** N 26° 55' 27.4" E 75° 49' 18.7"

## **Textual description of the boundary (ies) of the nominated property**

The site of Jantar Mantar at Jaipur has a clearly defined boundary with controlled access to the site through two gates in the northern wall. The total site area measuring to about 1.86 hectares is almost a rectangle with the north-western end cut off at right angles.

This astronomical observatory is located within the central sector, namely Chowkdi Sarhad of the sectoral divisions within the 18<sup>th</sup> century planned city of Jaipur. The nominated site of Jantar Mantar lies towards the south in the Chowkdi. The City Palace and the Jaleb Chowk – a large almost square open space surrounded by double storey structures, are significant components of the Chowkdi, lying to the north-west and north-east of the site, respectively. The Anand Bihari Krishna Temple (originally part of the site) defines the western boundary of the site; while the Police Headquarters building (originally the stables) divided by an arcaded wall with pointed arches facing the observatory side forms the eastern edge. The wall continues from the eastern to the southern edge of the site. The Hawa Mahal and the Naya Mahal (Vidhan Sabha) building are other important landmarks within the Chowkdi Sarhad that lie to the east of the Police Headquarter building.

The Buffer Zone for the Jantar Mantar site includes the Hawa Mahal, the Police Headquarters and the Anand Bihari Temple along with some ancillary structures along the northern and southern boundaries of the site.

## **Justification**

### **Statement of Outstanding Universal Value**

India represents five observatories that belong to the same historico-cultural group, within the framework of the thematic initiative "Astronomy and World Heritage". The Jantar Mantar sites in India are the most significant in being the best preserved conglomerate of pre-telescopic masonry astronomical instruments. Functioning both as scientific and educational institutions and as historico-cultural monuments of the same group, they have extraordinary significance to the level of the world heritage.

The site of Jantar Mantar, Jaipur amongst this group is the most extant, best preserved and has maximum number of observational instruments in functional condition. The Jantar Mantar, Jaipur is an icon that has



contributed significantly to astronomy, architecture, urban planning, political history and cultural distinctiveness of India.

It is an outstanding architectural expression reflecting the intention to inculcate contemporary findings of astronomy within the late medieval cultural context in India. It represents the culmination of Zij astronomy and an ambitious expression of large scale pre-telescopic masonry observatories as a result of the interchange of ideas across the Indian, Central and West Asian and European cultures. It thus reflects the culmination of the astronomical knowledge base from precedent observatories and instruments constructed in Samarkand, Maragheh, and Ray that only exist as archaeological remains today. The Brihat Samrat Yantra at Jantar Mantar, Jaipur is the largest existing equinoctial sun-dial in the world.

This unique architectural ensemble of Jantar Mantar, Jaipur is an amalgamation of science and religion to facilitate measurement of celestial position and movement. The scale and proportions of this architectural masterpiece in stone introduced geometrical systems that further got translated into planning principles in the making of the renowned 18<sup>th</sup> century city of Jaipur. Thus the significance of Jantar Mantar extends beyond the scientific and architectural value to the field of urban design.

Besides representing the integration of astronomy and astrology for the first time, it also marks an important phase in Indian history where such codified knowledge base became more accessible to the general public through monumental expressions. Being a subject of continuous research by astronomers, architects and historians since centuries, the Jantar Mantar, Jaipur remains pivotal in understanding the development of astronomy and architecture.

**Criteria under which property is nominated (itemise criteria)**

Cultural criteria (ii), (iv) and (vi)

**Name and contact information of official local institution/agency**

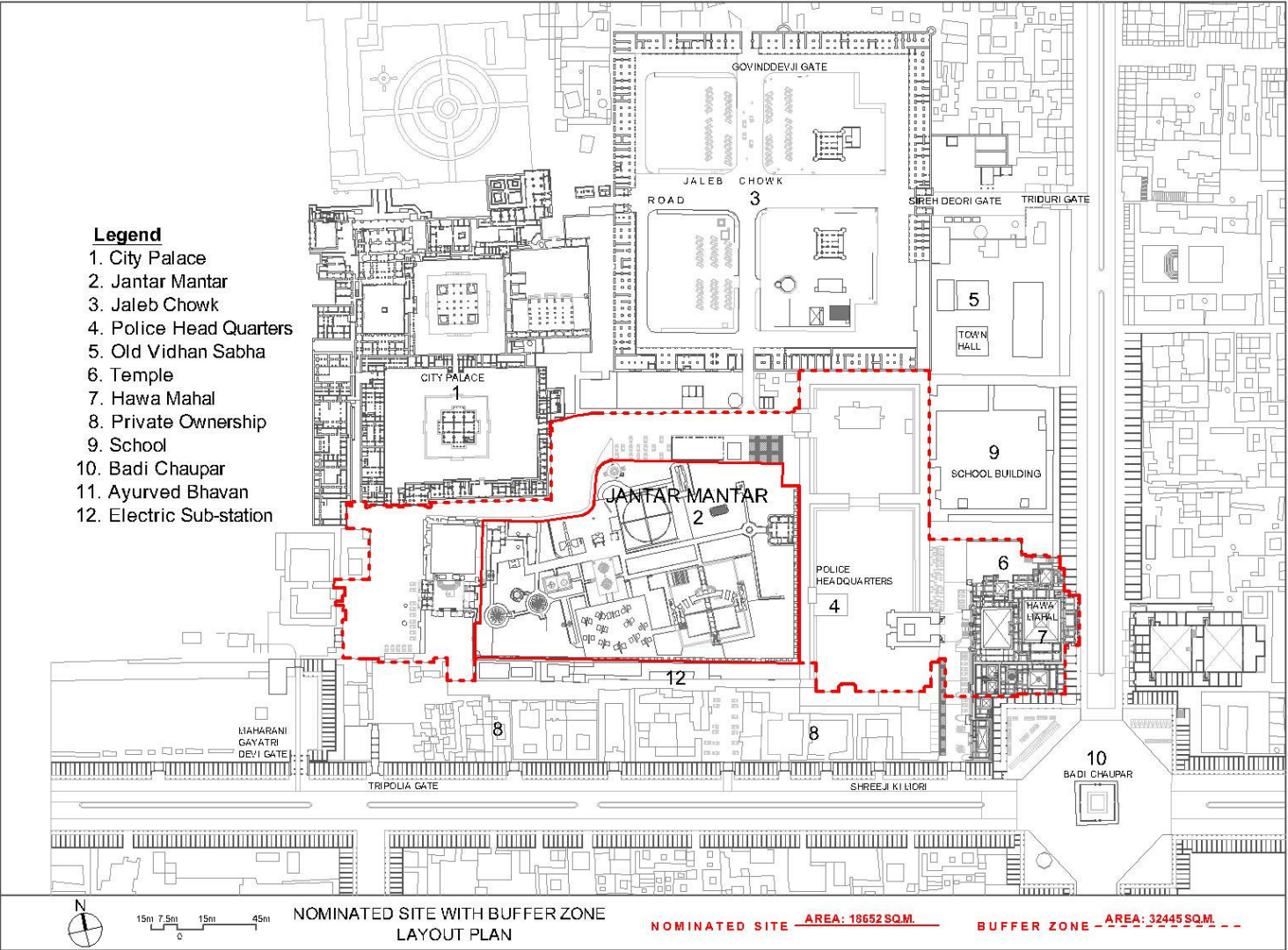
Organisation: Department of Art and Culture, Government of Rajasthan

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Part A, B and C



Identification



## 1. Identification of the property

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1.a Country: India

1.b State, Province or Region: Jaipur, Rajasthan

1.c Name of Property: The Jantar Mantar, Jaipur

1.d Geographical coordinates to the nearest second: N 26° 55' 27.4" E 75° 49' 18.7"

1.e Maps and plans, showing the boundaries of the nominated property and buffer zone

List of Maps and Plans annexed (Refer Annexure I)

1. India Map marking the State of Rajasthan and city of Jaipur. Scale: 1: 80,00,000
2. Topographic Map of Jaipur and its Surroundings. Scale: 1:2,50,000
3. Site Plan with Important landmarks such as Jaleb Chowk, Hawa Mahal and City Palace marked along with buffer zone. Scale: 1:1500
4. Plan of Jantar Mantar with the Yantras marked. Scale: 1:750

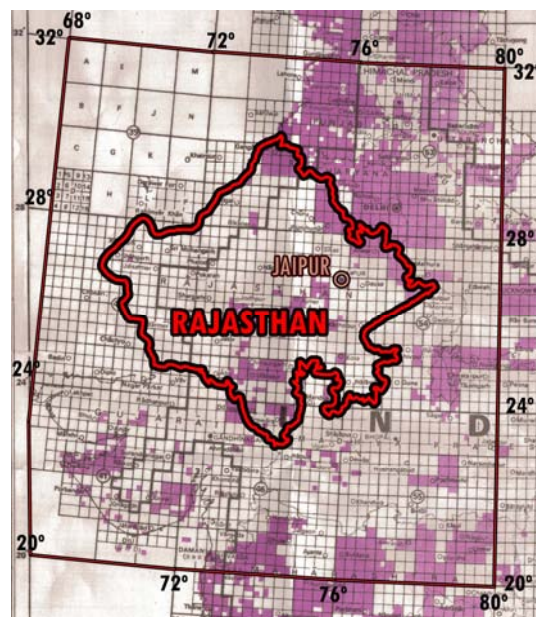
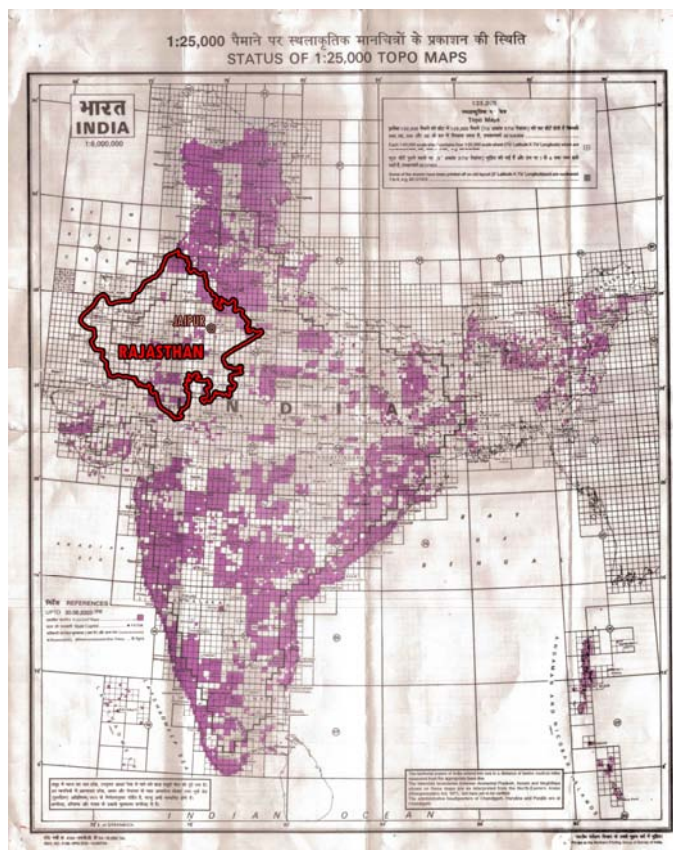


Fig 2. The State of Rajasthan with Jaipur marked

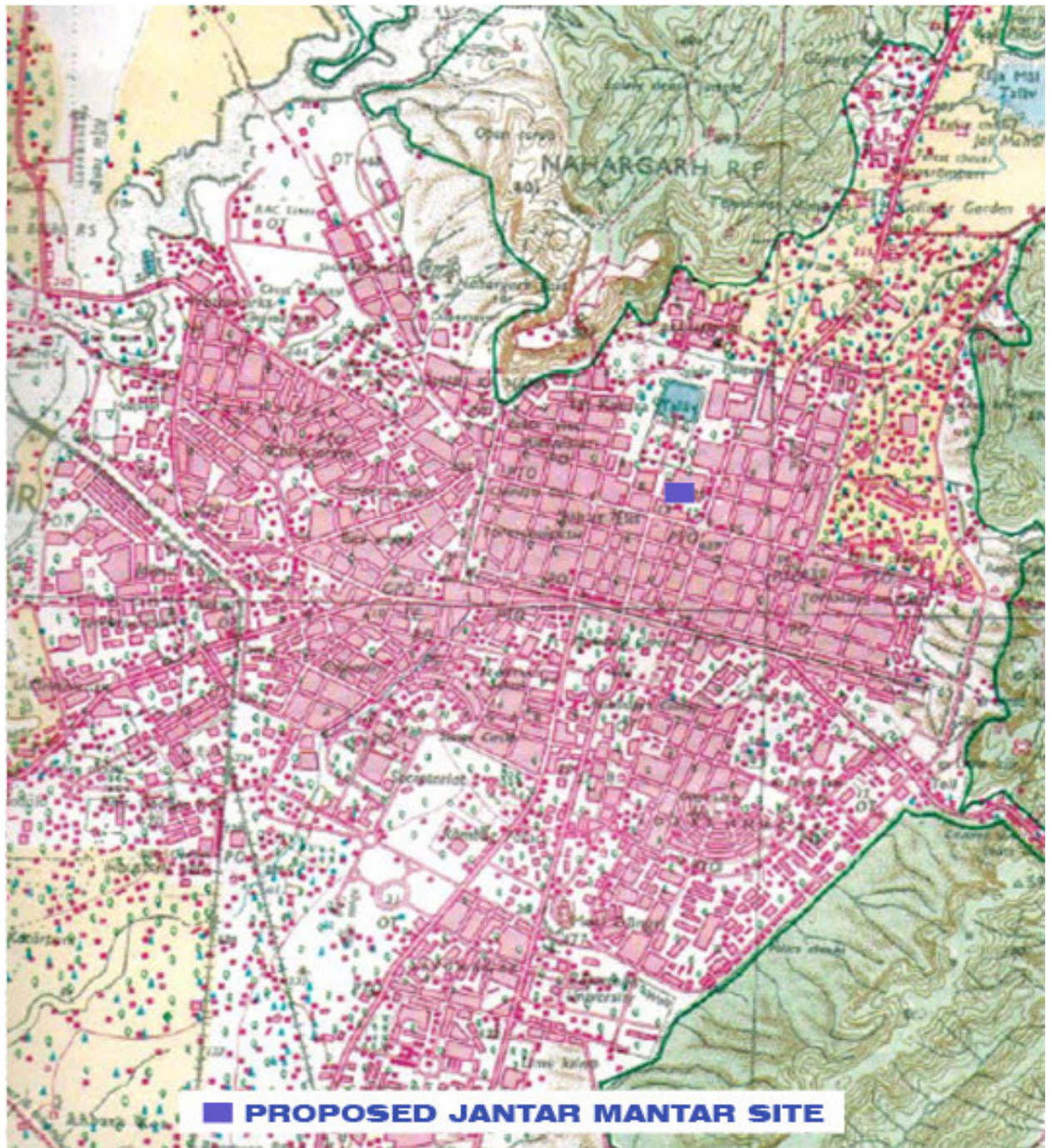
Fig 1. Reduced Map of India with Rajasthan and Jaipur marked. (For true scale map, refer Annexure I)







## Identification of the property



*Fig 4. Reduced part Topographical Map of Jaipur with location of the nominated site of Jantar Mantar marked. The grid plan of the walled city (historic core) is discernable, with the nominated site as part of the central sector. Source: Survey of India. (This map is out of print and this part plan is the only available copy from the original that is at the scale of 1:25000)*

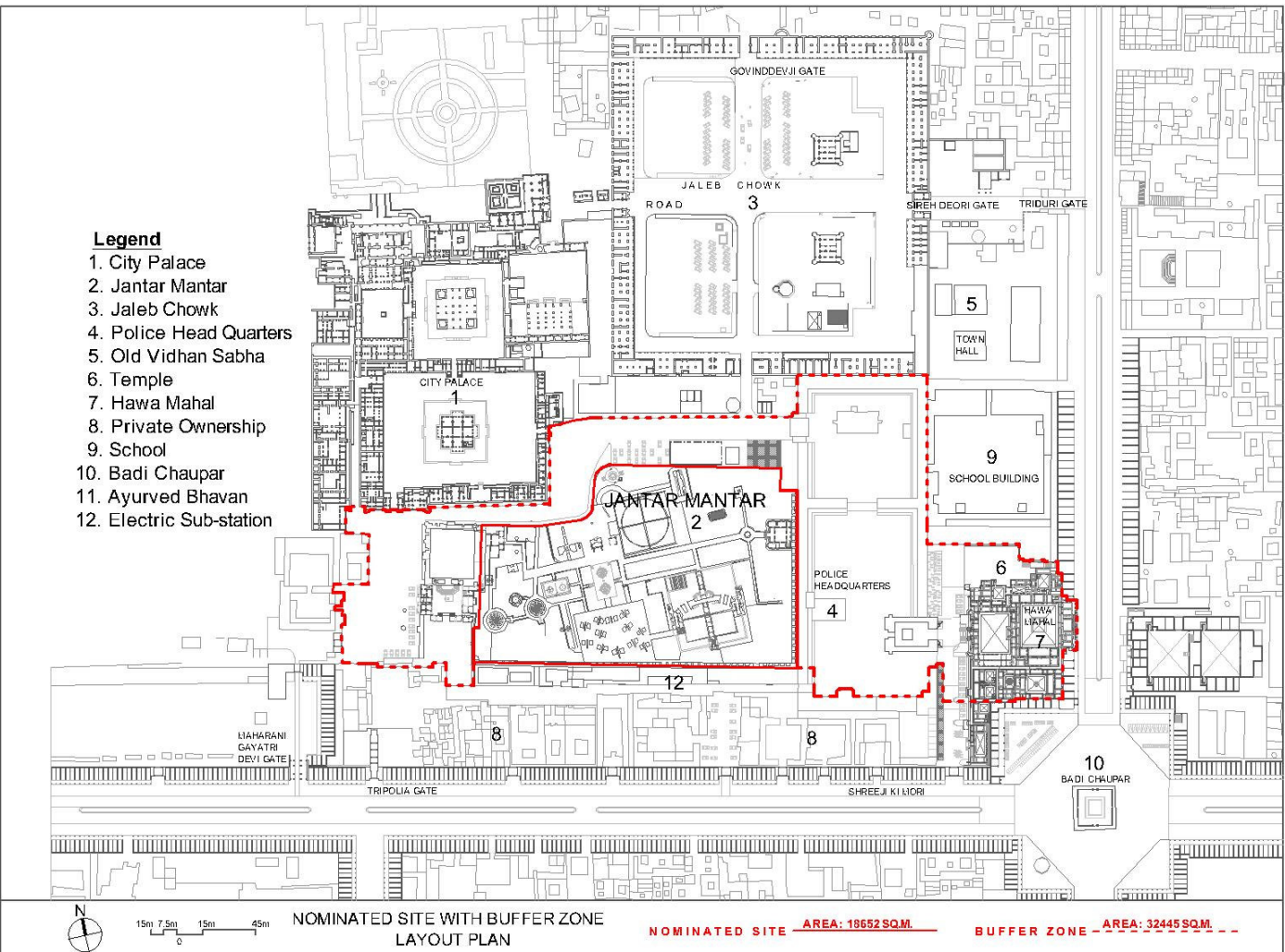


Fig 5. Plan of the Jantar Mantar, Jaipur and its surroundings with the nominated site boundary and buffer zone boundaries marked. (For true scale drawing, refer to Annexure 1)



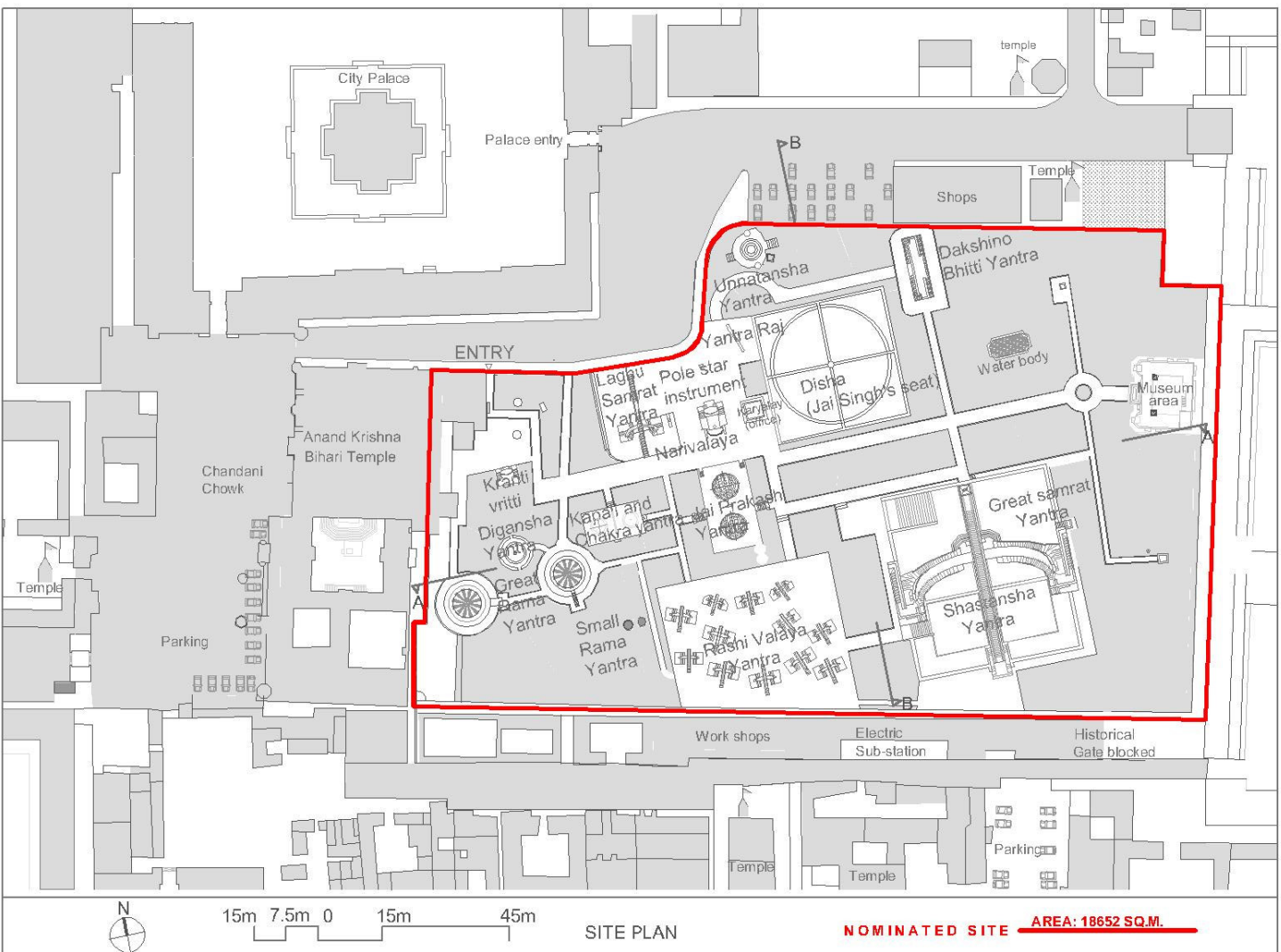


Fig 6. Plan of the Jantar Mantar, Jaipur with the significant components marked.  
(For true scale drawing, refer to Annexure I)

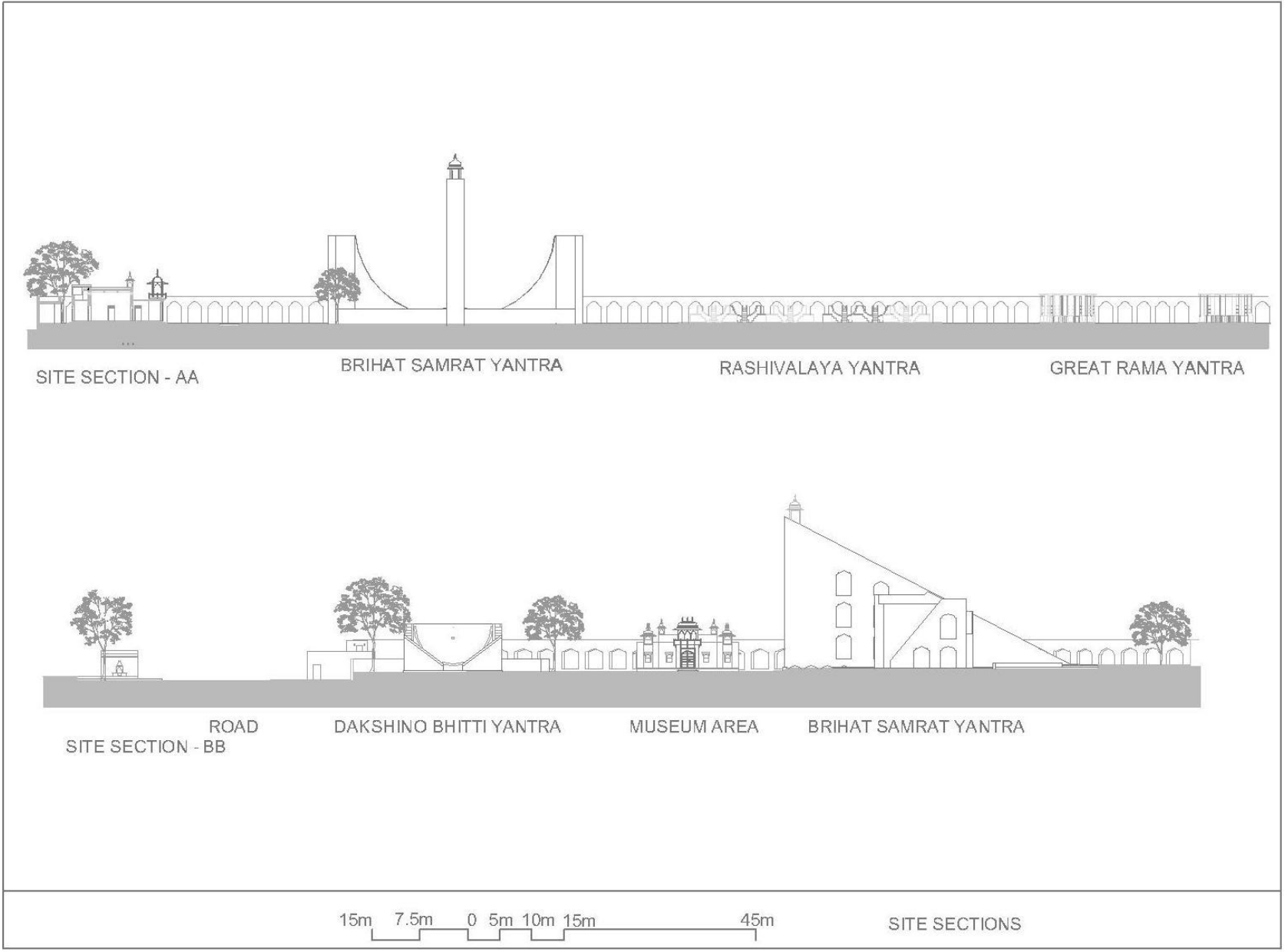


Fig 7. Site sections of the Jantar Mantar, Jaipur with the significant components marked.

Identification of the property

**1.f Area of nominated property (ha.) and proposed buffer zone (ha.)**

Area of nominated property: 1.8652 ha

Buffer zone 3.2445 ha

Total 5.1097 ha





Description



## 2. Description

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### 2.a Description of Property

#### 2.a.(i) Site context

The construction of Jantar Mantar, Jaipur by the ruler Sawai Jai Singh II in the central core of the city possibly began as early as 1718, had substantial number of instruments by 1728 and continued till 1738. Being part of the central sector called Chowkdi Sarhad, it is surrounded by architectural landmarks such as the City Palace and the Hawa Mahal (a pleasure wind palace used as viewing gallery) that are important tourist destinations today. (Refer Annexure I)

#### 2.a.(ii) Site components

The observatory is an architectural ensemble of astronomical instruments of varied sizes, set in an enclosure on a flat ground. The site at present comprises of 18 distinguishable historic structures that incorporate the observational instruments in stone and metal interlinked by paved pathways and intermittent soft areas developed as lawns. Amongst the structures, some are individual instruments such as the Digamsa Yantra, some are complimentary sets that form one instrument such as the Ram Yantras while others are multiple instruments in one composite structure such as the four quadrants in the Sasthamsa Yantra combined with the Brihat Samrat Yantra. Hence, the total number of observational instruments incorporated in the structures counts to 35. An enclosure referred to as the Astronomer's House (next to the Nadivalaya Yantra) and a square platform called Disha Yantra/Jai Singh's Seat, the function of which is not clear are two structures clearly not used for observations. (Refer Annexure I for plan of the site)

#### 2.a.(iii) Site planning

The 18<sup>th</sup> century stone observatory is a unique exemplary example of planning and architectural form of the period. While the rest of the city is planned along axes at an angle of about 15 degrees, the orientation of its astronomical instruments is primarily along the cardinal directions. The superimposition of the two axial systems is reflected in the site with the plot boundary aligned to the axes of the city plan of Jaipur and the instruments along the cardinal directions. In the placement of the instruments within the site, two axial arrangements exist along the north-south axis. One is between the Nadivalaya, Jai Prakash and Rasivalaya Yantras and one between the Dakshinottara Bhatti Yantra and the Brihat Samrat Yantra. The order of placement of the rest of the instruments is a matter of further speculation based on architectural principles and the functionality of the instruments.

While the Brihat Samrat Yantra is set in a rectangular excavation 3.5 metres below ground level, rest of the instruments stand either on combined platforms as in the case of the Rasivalaya Yantra and the Chakra and Kapala Yantra or on individual plinths. Presently, the instruments are surrounded by hard paving and connecting pathways in red stone and intermittent soft areas developed as lawns.

(Refer Annexure I)

#### **2.a.(iv) Architectural form**

In contrast with the character of the built fabric around the site, the instruments are distinct sculptural statements with the use of basic geometric forms and being devoid of any surface ornamentation except for the recurring pointed arches. The Brihat Samrat Yantra is the largest sundial in the world and dominates the skyline rising up to about 19 metres above the ground level. A pavilion at the top of the Yantra crowning the highest point of the observatory acts as a visual focal point, with its traditional architectural elements such as surface stucco pattern, stone sunshade, typical cupola roof form and pinnacle with, characteristic of the period, unlike the rest of the site. For details specific to each instrument refer to table 2.2.

#### **2.a.(v) Construction material**

The construction material of the instruments is essentially stone masonry plastered with lime. Certain parts of the structures in the observatory are engraved with scales for measurements and engraved and filled with lead. These are lined and overlain with *araish* (fine lime plaster finish) and marble with the intent of providing a level, smooth surface for accurate astronomical readings. The use of Ashlar stone masonry in quartzite and surface cladding in red and white quartzite is observed in the Rasivalaya, Nadivalaya, Dakshinottara Bhatti, Laghu Samrat and Ram Yantras, the instruments that underwent restoration and rebuilding from the late 18<sup>th</sup> century to early 20<sup>th</sup> century. There are few structures on site with metal observational instruments such as the Unnathamsa Yantra, Chakra Yantra, Krantivritta II, and the Yantra Raj. Besides, there are three other small metal instruments, i.e., one Krantivritta and two Samrat Yantras located on the site. For details specific to each instrument refer to table 2.2.

#### **2.a.(vi) Function as observational instruments**

The Krantivritta Yantra has been interpreted to be incomplete due to the lack of a metal superstructure. The function of the Disha Yantra and the purpose of metal disc in the Yantra Raj is not clear. The rest of the 33 instruments are functional till date and can be used for measuring time,

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positions of celestial objects in horizon and equatorial and ecliptic co-ordinate systems. For details specific to each instrument refer to table 2.2.

While the metal instruments are not given much merit in their observational capacities, the masonry instruments have been categorised as being of high, medium and low precision (Sharma, 1997) - refer to table 2.1.

**Table 2.1: Level of precision of the instruments at Jaipur**

S. No.	Instrument	Level of Precision in masonry instruments	Metal Instruments
1	Brihat (Great) Samrat Yantra	High	
2	Sasthamsa Yantra	High	
3	Jai Prakash Yantra	Medium	
4	Great Ram Yantra	Medium	
5	Small Ram Yantras	Medium	
6	Dhruva Darsaka Yantra	Low	
7	Nadivalaya Yantra	Low	
8	Horizontal sundial atop Nadivalaya	Low	
9	Krantivritta Yantra	Not clear	
10	Krantivritta II		
11	Dakshinottara Bhatti Yantra	High	
12	Yantra Raj		
13	Chakra Yantra		
14	Digamsa Yantra	Medium	
15	Unnathamsa Yantra		
16	Rasivalaya Yantra	Medium	
17	Kapala Yantra	Medium	
18	Laghu (Small) Samrat Yantra	High	
19	Disha Yantra/ Jai Singh's Seat	Not clear	

According to their functional aspect, the instruments/ structures on site can be categorised as (Volwahren, 2001, p. 39):

- Instruments that enable measurements relating to the horizon and the zenith to be taken, like the Ram Yantra and Digamsa Yantra
- Instruments that enable relating to the equator and the earth's axis to be taken as in the Samrat Yantra.
- Instruments that allow measurements to be taken actually in the ecliptical system, like the Rasivalaya Yantras.

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- Instruments/ structures not used directly for measuring purposes, like the Disha Yantra (open to speculation) and the Astronomer's House.

The following table 2.2 gives details specific to each instrument regarding their function, form and construction material:





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**Table 2.2: Description of the instruments at Jaipur (Refer to Appendix I for images of the instruments)**

S.No	Instrument	Function	Form	Construction Material
1	<p><b>Brihat (Great) Samrat Yantra</b></p> 	<p>Three fold – to tell time during day or night (scale divided up to calibration of 2 seconds), to measure the hour angle and to determine the declination of a celestial object. Time of the day measured with the sun and that of the night measured with stars. On a clear day, as the sun journeys from east to west, the shadow of the Samrat gnomon sweeps the quadrant scales below from one end to the other.</p> <p>The declination and meridian altitude of the sun can be measured once a day on this instrument, as the sun transits the Meridian. There is the issue of penumbra (lack of sharp edge of shadow due to finite size of the disc of the sun) in the day that can be eliminated by superimposing on the penumbra the shadow of a thin object to achieve an accuracy of <math>\pm 3</math> seconds</p>	<p>Rises out of a 44.15metres long and 40.3metres wide excavation, 3.5metres below ground. Consists of a gnomon (2.85metres wide, 22.62metres high triangular wall with a 44.58metres base and 50.09 metres long hypotenuse) with a series of pointed arch openings and a gate opening to a flight of steps on the hypotenuse leading to the top of the gnomon marked by a pavilion (<i>chhatri</i>). Quadrants (radius <math>15.15 \pm 0.01</math> metres, 2.84 metres wide) on either side of the gnomon with stairs running parallel (combined width of quadrants and stairs is 5.23metres)</p> <p>A network of water channels at its base served as a reference plane to adjust the measuring scales.</p>	<p>Excavation lined with masonry plaster</p> <p>Quadrant surfaces and gnomon edges in marble with scales engraved. Rest of the structure - stone masonry in lime mortar, surfaces with lime plaster.</p> <p>Aggregate of bright red mortar, not crushed brick but very rough red sand stone with small amount of lime material as binder.</p>
2.	<p><b>Sasthamsa Yantra</b></p> <p>Comprises of four independent instruments, two in each chamber.</p> 	<p>Four units of a meridian dial in a dark chamber over which a pinhole image of the midday sun indicates its declination and zenith distance. Declination scale inscribed for measuring angles 23.30 N to 23.30 S and zenith scale engraved for measuring angles from 0 to 60 degrees.</p>	<p>Located within lofty chambers on both sides of the Great Samrat Yantra, the quadrants of the Samrat resting against these chambers.</p> <p>Instruments within chambers accessible through doors on north and south. The chambers enclose two units of Sasthamsa or 60 degree scales each along the two east and west walls. The walls are separated by a 2metres wide aisle. At height of 9metres from ground, above the scales' south end, a metal plate with pin hole is embedded.</p>	<p>Stone masonry with lime plaster. Scales are surfaced with marble</p>

Description





S.No	Instrument	Function	Form	Construction Material
3.	<p><b>Jai Prakash Yantra</b> Comprises of a set of two complementary instruments</p> 	<p>Innovations in the previous designs so that night time observations could be made. In practice, when the shadow of the sun cast by the crosswire, or the coordinates of a celestial body observed at night moves past the edge of one of the engraved surfaces, the observer walks to the other instrument and continues the observation there.</p>	<p>Two complementary hemispherical bowls of 5.44mts diameter aligned to the north south axis constructed on a platform 20.5mts by 11.22mts, partly above and partly below ground level. The area of the concave surface between alternate hour circles was removed and steps provided for the observer to move around freely to take readings. The second instrument built next to the first, is identical in all respects except that the hour circles corresponding to the steps in the first have a solid, engraved surface, and the hour circles corresponding to the engraved surface of the first are removed to provide steps. Seen in the plan view, the instruments are exact complements of each other, and if the engraved surfaces (tinted red) of one were to be transposed above the other, they would represent a single complete surface.</p>	<p>Marble scales of southern Jai Prakash have marble braces shaped like a double T instead of iron ones.</p>
4.	<p><b>Great Ram Yantra</b> Comprises of a set of two complementary instruments</p> 	<p>Its primary function is to measure the altitude and azimuth of celestial objects, including the sun. The procedure for measuring the coordinates at night with a Rama Yantra is similar to the one employed for the Jai Prakash.</p>	<p>The Great Ram Yantra is a set of two cylindrical structures with radial sectors of 12 and 18 degrees, respectively, cut out in the vertical surface and horizontal surface that occurs at a height of 1.12 mts from the base platform. The two complementary structures are 4.48 mts tall with an inside diameter of 6.95 mts. They are open at the top, with a ring joining the alternating gaps in the sectors and the height of the cylinder (excluding the 1.12 mt support structure) equals its radius. A flight of stairs leads to the top of the cylinder. Scales are inscribed on the entire internal surface. On the inside of each yantra stands a vertical pole about 8cms in dia. and of roughly the same height as the height of the drum. There are a set of three horizontal notches on either side of the radial surface of the drum wall, to enable insertion of wooden planks for an observer to sit on to take night time readings.</p>	<p>Circular platform in quartzite blocks laid in the fashion of the vedic altar – first east west axis, then north south axis, then the circle marking boundary, followed by blocks filling in the quadrants in alternate east west and north south strips. Plinths of pillars in coursed stone masonry (without mortar), layer of tall blocks followed by header course of thin flat stone slabs. Horizontal stone sectors are Quartzite.</p>

Description




S.No	Instrument	Function	Form	Construction Material
5.	<b>Small Ram Yantras</b> 	Same as the Great Ram Yantras Comprises of a set of two complementary instruments	Same design as the Great Ram Yantra, though much smaller, radius – 0.865 metres, one fourth of that of the larger Yantra. Possibly as model for the Great Ram Yantra, though the 20 <sup>th</sup> century plan (Kaye, 1918) does not show them.	
6.	<b>Dhruva Darsaka Yantra</b>	To show the pole star to a lay person	Small trapezoidal structure whose upper surface points to the pole star, on a 3.07metres long and 54 cms wide masonry base. Its lower end is about 76cms above the ground and upper end 2.32metres.	
7.	<b>Nadivalaya Yantra</b> 	An equal hour sundial built in two halves, indicating the apparent solar time of the place. It can ascertain the arrival of the sun at equinox with an uncertainty of a few hours if the event occurs in daylight hours. Northern face illuminated for six months after March 21 and southern face illuminated for the rest of the six months after September 21.	Two large circular discs or plates of stone embedded in masonry, facing north and south respectively. Diameter of north facing plate is 3.70metres; diameter of south facing plate is 3.74metres, both oriented parallel to the plane of the equator. Space between plates serves as a storage chamber. This is the only instruments where the scales are labeled in English as else where, the Devanagri script has been used.	South plate has three concentric scales in red stone and marble, north plate has singular marble scale and a projecting metal rod.
8.	<b>Horizontal sundial atop Nadivalaya</b> 	Horizontal sundial, comparable in principle to the Palabha Yantra at Ujjain. The gnomon angle is off by more than a degree from the latitude of Jaipur, nearer to that of Delhi, so could have been fabricated for Delhi.	Accessible through a steep stairway on either side of the north facing plate of the Nadivalaya Yantra. The sundial has a 13 cm high right triangle gnomon with 24.2 cm long base, and a 27.5 cm long diagonal at an angle of 28.15 with the horizontal. Scales are marked on either side of the gnomon on the horizontal platform that the gnomon rises from.	The sundial has been constructed on a red stone slab resting on a 40cm high circular platform rising out of the roof of the Nadivalaya Yantra, towards the southern end. The gnomon is fashioned out of a brass plate.
9.	<b>Krantivritta Yantra</b> 	To work as a torquetum, incomplete, as does not have the mobile superstructure mounted on the central rod.	A circular plate of diameter 3.39metres resting against a support, oriented in a plane parallel to the equator, with a metal rod at its centre.	Masonry structure, red sandstone plate, metal rod at centre. Aggregate of bright red mortar is very rough red sand stone with small amount of lime material as binder.





Description

S.No	Instrument	Function	Form	Construction Material
10.	<b>Krantivritta II</b> 	To measure directly the celestial latitude and longitude of an object in the sky.	A graduated circle/ ecliptic scale, inclined at 23.27 degrees with the plane of the equator. A bar with a quadrant each (with sighting strips) at its two ends mounted over the scale that rotates about a perpendicular axis through the centre of the ecliptic scale.	Two pivoted brass circles on a masonry base.
11	<b>Dakshinottara Bhatti Yantra</b> Comprises of two independent instruments. 	To measure the altitude of an object It can measure the zenith distance of objects within 3 degrees of the horizon. Most suitable for measuring the meridian altitude or zenith distance of the sun.	Two separate Dakshinottara Bhatti units inscribed in white marble on two 5.41metres long and 7.22metres high parallel walls of a narrow north-south chamber. Width of entire building is 4.68metres, including the stairs on its sides leading to the roof. East facing wall has two quadrants intersecting at the bottom and two iron bars near the upper end where the centre of the arcs are located. West facing wall has a semicircle inscribed with iron bar fixed at its centre near the top edge of the wall.	Scales inscribed in marble. Aggregate of bright red mortar of very rough red sand stone with small amount of lime material as binder. Fine red plaster applied in two layers in internal rooms of the instrument.
12.	<b>Yantra Raj</b> Comprises of two independent instruments. 	One of the discs functions as an astrolabe - to measure altitude, zenith distance, declination longitude, local time, ascendant, 4 <sup>th</sup> , 7 <sup>th</sup> and 10 <sup>th</sup> house of the zodiac etc; while the use of the other one is not clear. The astrolabe is engraved to work for a place having a 27° latitude. The other disc could possibly have been meant to be the back support of another astrolabe that was never completed (Sharma, 1977).	Three round pillars 3.3 metres high, supporting two beams that carry two discs. One is an astrolabe, the largest instrument of its kind in the world, measuring 2.43 metres vertically, including the crown and 2.115 metres horizontally, with engravings on the front and an unfinished, rough back side. The second is a circular plate of 2.1 metres diameter, roughly the same dimension as the astrolabe, with a hole at the centre, possibly for a sighting tube. The pillars are aligned to an angle of 23 degrees with the plane of the meridian.	The pillars are in masonry, the beams are wooden and of the metal discs, the astrolabe is fabricated from a single piece of molded brass patched up in places with lead. The other plate is made of 55-60 sheets of rusting iron, ¼ to ¾ centimetres thick and riveted together. The astrolabe weighs over 400 Kg.
13.	<b>Chakra Yantra</b> Comprises of two independent instruments. 	To measure the declination and hour angle of a celestial object. Duplicate instruments to enable comparison of their readings. Also uses a sighting tube with pointer to take readings. The declination is read off the circular scale on the ring while the hour angle through the circular plates at the southern pivot ends.	These are two ring instruments mounted between the Kapalas on three vertical posts aligned along the north-south axis. The rings are pivoted to rotate freely about a diameter parallel to the earth's axis. There is a circular plate of diameter 51 cms at the southern pivot ends of both the rings, parallel to the plane of the equator and divided into degrees.	The rings are made of heavy molded brass and the posts are of stone. The circular plates are also of brass.

Description

S.No	Instrument	Function	Form	Construction Material
14.	<b>Digamsa Yantra</b> 	<p>To measure the angle of azimuth of a celestial body, measuring up to 6' of arc. The observer uses one or more strings with one end tied to a knob on the pillar and the other end to weights (stone pebbles) suspended over the wall. The angular distance of the vertical plane from the north point, read on the scales indicates the azimuth of the body.</p>	<p>A 96cms high pillar surrounded by two coaxial walls. The height of the inner wall is 96 cms, and the outer wall is 1.95 metres. The pillar is 1.04 metres in diameter. Passageways have been provided at the cardinal points of the wall for movement of the observer. Cross wires are stretched between the cardinal points marked over the outer wall.</p>	<p>Top horizontal surfaces are slabs of marble with engraved scales. Rest of the structure is stone masonry with lime plaster.</p>
15.	<b>Unnathamsa Yantra</b> 	<p>To measure the altitude of the celestial bodies. The measurement can be made by mounting a sighting tube at the intersection of the cross beams of the circle and aligning the sighting tube with the celestial body in question and reading off the circular scale on the circumference of the ring through a pointer attached to the sighting tube</p>	<p>A large circular ring with outer diameter of 5.35 metres suspended from a beam resting on two huge pillars about 7metres tall and 1.5metres wide. The ring has two cross beams, one vertical and the other horizontal.  The pillars stand along an axis inclined at an angle of 12 degrees to the north-south direction.  The pillar base is a circular pit, with radial descending steps on the inside, for an observer to move around freely for taking readings.  The ring with its lower part in the pit can rotate freely about a vertical axis.</p>	<p>The circular ring is fabricated out of molded sections of brass of 6 X 4.5cm square. The total mass of the instrument is estimated to be over 600 Kg.  The pillars and the circular pit are in masonry while the beam from which the metal ring is suspended is wooden.</p>
16.	<b>Rasivalaya Yantra</b> Comprises of 12 independent instruments. 	<p>To measure the latitude and longitude of a celestial object (each unit referring to a particular zodiac), when the first point of the sign approaches the meridian.</p>	<p>12 instruments based on the principle of the samrat yantra set on a 41 metres long and 39 metres wide masonry floor.  Lengths of gnomons vary from 4.22 metres for Gemini to 6.21 metres for Aries. Radius of quadrants is either 1.24 metres or 1.68metres. Orientation and inclination of each unit varies. The Cancer Rasivalaya has double round arches punctured in the gnomon while the rest have pointed arches.</p>	<p>Surface of gnomons and of quadrants where scales have been inscribed are white marble slabs.  Cancer Rasivalaya stands out due to use of unplastered Ashlar stone masonry.</p>

Description

S.No	Instrument	Function	Form	Construction Material
17.	<p><b>Kapala Yantra</b> Comprises of a set of two complementary instruments</p> 	<p>The western bowl designed to measure the coordinates of the sun in the horizon and the equator systems and to indicate the local time. The eastern bowl is not meant for observing, but to transform graphically the horizon system of coordinated in to the equatorial system and vice versa for the latitude of Jaipur, eliminating the need for lengthy spherical trigonometric calculations.</p>	<p>Two hemispherical concave bowls laid out on the east west axis on a common platform. At the bottom of each bowl there is a drainage hole. Cross wires stretched between cardinal points marked on the rim now replaced by a small circular plate with a hole in the middle.</p>	<p>Stone masonry platform, the bowl surfaced with marble</p>
18.	<p><b>Laghu (Small) Samrat Yantra</b></p> 	<p>As a small equatorial dial to measure time, meridian pass time, zenith distance, latitude at noon and the declination of angles of objects in the sky above the northern horizon in theory. The surrounding buildings, particularly the City Palace to the north, limit the observation close to horizon. Smallest division on quadrant scales measures 20 seconds.</p>	<p>Two gnomon walls of uneven height joined together back to back. Triangular meridian wall 1.29metres wide, 6.9metres tall and 19.75metres long at its base. South facing gnomon is <math>14.725 \pm 0.005</math>metres long, inclined at angle of 27.30 with the horizontal. North facing gnomon is smaller, <math>8.58 \pm 0.02</math>metres long, making an angle of 41 degrees with the horizontal. Three archways cut in to the wall, a flight of stairs runs in the idle of the gnomon diagonals. The quadrants on either side of gnomon have radius 2.780metres, are 98cms wide with lower ends about 71cms above the floor.</p>	<p>Quartzite cladding with lot of iron hydroxide pigment, white outlines of quartzite, marble scales. Engravings of gnomon filled with lead, not of quadrants. Lining slabs put together using joint on edge of slabs. Evidence of stone masons using carpentry techniques. Red cladding is alternate thick layers and thin layers of stone slab, the thin layers are horizontal slabs that as headers go deep in to the quarry stone masonry. Aggregate of bright red mortar is rough red sand stone with small amount of lime material as binder.</p>
19.	<p><b>Disha Yantra/ Jai Singh's Seat</b></p>	<p>Function not clear, referred to as a horizontal dial, earlier mentioned as large building for the water machine, said to be used to measure marble pieces for the cladding of the quadrants of the Brihat Samrat Yantra, that have the same radius as that of the circle in Disha Yantra. The function of the recently revealed concentric stone rings is open to speculation, could be a possible means of leveling the ground as water channels are known to have been used for leveling</p>	<p>A large circular engraving on 30cms wide red stone slabs neatly arranged in a circle of approximately 30metres diameter. It is inscribed on a level platform 15 to 35 cms above ground level.</p>	<p>During recent restoration process, stone concentric rings revealed below the lime mortar surface.</p>



## **2.b History and Development**

### **2.b.(i). Phase I - Foundation of the Observatory to 1771 AD**

The Jantar Mantar observatory was established by Sawai Jai Singh II in the early part of the 18<sup>th</sup> century. The date of the foundation of the observatory is hypothesised by some historians<sup>1</sup> as being as early as 1718, a decade before the foundation of the city of Jaipur. The next possible period of the initiation of the observatory is at the time the foundation of the city was laid, in 1727, and by 1728 some of the instruments certainly had been in place. The most widely accepted date by when the observatory is said to have been completed is 1734, though according to VN Sharma (1977, p. 28), the construction continued on till 1738 and the construction activity was at its peak around 1734-35 with over 23 astronomers and a large number of masons and engravers employed at daily wages.

In 1729, Portuguese Jesuit astronomers, including Padre Manuel Figueredo and Fidalgo, and Padre Xavier De Silva visited Jaipur to meet Sawai Jai Singh II and see his astronomical complex. In 1734 two French Jesuits from Chandernagore, one being Father Boudier are recorded to have visited the observatory to take observations for determining the longitude and latitude of the observatory itself. From the mid 1730's, the Jantar Mantar, Jaipur became the centre of astronomical activities for Sawai Jai Singh II and remained so till the death of Sawai Jai Singh II in 1743.

The first phase of development of the Jantar Mantar, Jaipur was essentially under Sawai Jai Singh II. The earliest description is recorded by Father Joseph Tieffenthaler, a French Jesuit who traveled in India from 1743 to 1786 described it as situated on a plain surrounded by walls, close to the King's palace. According to the analysis of his account of the instruments (Volwahren, 2001, pg. 69), the Rasivalaya Yantra, Brihat Samrat Yantra, Sasthamsa Yantra, Nadivalaya Yantra, Dakshinottara Bhatti Yantra, Unnathamsa Yantra and Jai Singh's seat/Disha Yantra were present on site. The reference to 'various sections of the astronomical sphere' (Tillotson, 2006, p. 36), is probably the Kapala and the Jai Prakash Yantras, while three large metal astrolabes suspended by iron rings are also mentioned. After Sawai Jai Singh II's reign, the first proof of intervention is a plaque on the southern face of the Nadivalaya Yantra that defines the date of the

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<sup>1</sup> Vibhuti Sachdev and Giles Tillotson (2002), Remi Papillault (2008).

## Description

second restoration of the instrument as 1771. While the southern face was definitely added, the entire instrument may have been rebuilt or restored at that time.

### **2.b.(ii). Phase II - From 1778 AD to 1876 AD**

This period covers the reign of Sawai Pratap Singh (1778- 1803) and Maharaja Ram Singh II (1835 – 1880), two rulers responsible for substantial intervention to the observatory, across the century.

A number of instruments situated in the western part of the observatory compound such as Agra and a Sara Yantra, were dismantled to make room for a temple, the Anand Bihari Krishna Temple during the reign of Sawai Pratap Singh. According to VN Sharma (1997, p. 29),

During Pratap Singh's reign astronomical activity at the observatory ceased, and the observatory itself was turned in to a gun factory for casting and boring cannon. A large well with steps down to the water level (*Bavadi*) was dug up and a furnace built immediately to the west of the Great Samrat for melting the gunmetal. Between the Jaya Prakasa and Kapala, somewhat to the south, another well (*Bavadi*) was dug up and a second furnace erected. Next to the furnace, and to the south of the Kapala, an elaborate machine for boring gun barrels was constructed.<sup>2</sup>

The first major repair of the observatory took place during the reign of Maharaja Ram Singh II (1835 – 1880), completed around 1876 AD. As a part of this restoration effort, many useful apparatus were repaired and lead filling in engraved scales was carried out. The Laghu Samrat Yantra was surfaced in red stone and additions were made the north scale of its gnomon.<sup>3</sup> One major intervention was the road that was created on the northwest corner of the site, due to which the Dakshinottara Bhatti Yantra that was earlier located to the north of the Laghu Samrat Yantra had to be moved piece by piece to another location and had to be positioned in axial arrangement with the Brihat Samrat Yantra. Besides, in Jai Singh's seat/Disha Yantra, the original scales in stucco were replaced with marble scales. Guards were posted at the observatory.

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<sup>2</sup> This observation is supported by a historic map dated to 18<sup>th</sup> century by Sachdev and Tillotson, that Sharma (1997) associates with being from the period of Sawai Pratap Singh. This can be corroborated by the fact, that in 1786-1787, Mahadji Sindhia as the Imperial Regent and Commander-in-Chief of the Mughal Empire invaded Jaipur and in 1787, Sawai Pratap Singh shut himself up in his capital and prepared to stand a siege (Sarkar, 1984, pp. 271, 273). This political situation could have inspired the setting up of the gun factory on the Jantar Mantar site.

<sup>3</sup> Though a number of references mention that the Laghu Samrat Yantra was built by Maharaja Ram Singh, the historic map that has been inferred to be from the period of Sawai Pratap Singh (1778-1803) shows the Laghu Samrat Yantra, hence, the restoration and repair may have been referred to, and credit for construction of the Yantra given to Maharaja Ram Singh.

### **2.b.(iii). Phase III - From 1880 to 1947**

During this period the observatory remained in a state of abandon and decay<sup>4</sup> up to 1891. However, under Maharaja Madho Singh (1880-1922) some additions were made, such as the restoration of the Ram Yantra in stone. In 1901-02, a major restoration of the observatory was undertaken, headed by Lieutenant AH Garrett, Resident Engineer posted at Jaipur. A Brahmin from Banaras visiting the city of Jaipur in 1902 quotes (Tillotson, 2006, pp. 170, 176),

“.....when I saw it for the first time in 1882 it was in a very sorry condition and almost dilapidated. ....the Maharaja has had the observatory fully restored. From an inscription I understand that it was repaired in 1901. The instruments have been reconstructed so well that they look as if they have just been made today.”

The instruments were completely restored during the period with local masons, materials and workmanship. Their scales were redrawn and in some cases, the instruments were also altered, as in the case of the Rasivalaya Yantra where the angles were altered by Lieutenant Garrett with a maximum alteration 0° 29' in Azimuth and 2° 28' in Altitude (Kaye, 1918). There is a conflict of opinion as to whether the scales were redone in plaster or replaced by marble ones at this time.<sup>5</sup> According to VN Sharma (1997), the replacement of plaster scales with marble in the Brihat Samrat Yantra was carried out in 1945 and in other instruments such as the Sasthamsa and the Kapala at later dates. Volwahren (2001, p. 67) states that ten staircases that led from the platform to the underground rooms and corridors in the Jai Prakash Yantra were walled up, and two new staircases added to the east and west of the platform during this restoration process. However, Kaye's plan of the observatory when he visited Jaipur in 1915-16 shows all 12 staircases, indicating that the closing of stairs is probably a later intervention.

### **2.b.(iv). Phase IV - Post Independence up to 2005**

The Jantar Mantar, observatory came under the jurisdiction of the Government of Rajasthan and became a protected monument under the Ancient Monuments and Antiquities Act. It has been maintained by the Department of Archaeology and Museums since 1968. The intervention during

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<sup>4</sup> In the winter of 1887, Rudyard Kipling traveled to Jaipur and noted the Jantar Mantar to be one of the quieter places of the city, in a condition of abandon and decay (Tillotson, 2006, pp. 166, 170).

<sup>5</sup> While Sharma (1997, p. 30) says that as the scales were redone in lime plaster during these repairs, they soon began to erode and were redone in 1945 or later, Volwahren (2001, p. 66) mentions that during the 1901 works the plaster scales were replaced by marble ones.



## Description

this period has not been recorded well. The earlier site photographs (Volwahren's pictures from 1969) reveal that the changes made to the instruments include paving of the base of the Great Samrat Yantra (earlier lime) in red stone and addition of signage.

The rest of the interventions involved overall site and its landscape. Entry in south wall was closed; a toilet block and a museum building were added. A ticket office building was constructed and extended up to Anand Bihari Temple wall on west. The entry from Anand Bihari temple and in north wall next to Unnathamsa Yantra as in Kaye's plan were closed and the road to the north-west was extended to include part of the site, with the site line running closer to the Unnathamsa Yantra with rounded corners. Other interventions included addition of lawns, red sandstone paved pathways, railings, hedges and shrubs.

### **2.b.(v). Phase V - From 2005-2008**

The most recent phase of intervention is attributed to the Department of Archaeology and Museums, Government of Rajasthan. The department decided to sponsor the preparation of a Master Plan for the Conservation and Development of the Jantar Mantar and Hawa Mahal and a separate one for the Jantar Mantar in early 2005. The report was prepared by the end of the year and according to the proposals of the conservation plan, restoration works were taken up in 2007 by the Department of Archaeology and Museums, with the use of matching traditional materials and techniques. (Refer Annexure VII: Conservation Plan)

Lime plaster and lime wash (*khamira*) was redone on a number of the instruments and lime terracing/paving (*dhar*) was redone on the platforms of the instruments as per recommendations of the condition assessment in the conservation plan. Lead filling in the engraving was redone in Kapala Yantra, Laghu Samrat Yantra and Nadivalaya Yantra, and plinth protection of Jai Prakash Yantra platform base was re-laid to prevent the existing water seepage. The stone plinth (*dasa*) of the Rasivalaya Yantra was replaced in parts and the wooden beams supporting the metal instruments in the Yantra Raj was also replaced. The larger wooden beam in the Unnathamsa Yantra, though suffering from structural sagging, could not be replaced due to unavailability of a matching wooden beam. Hence it was just consolidated. Later in fills in the Sasthamsa Yantra were removed to reveal the original pointed arches. (Refer to images, Annexure II)

All previous railings on site were removed and replaced with new ones to open up the restrictive visual and physical movement pattern within the site. Newly designed low height railings have

## Description

been added at the entry points to the instruments to restrict the access of the lay visitor. The boundary wall along the north-west edge is increased in height and the entrance gateway in to the site is enhanced, through increase in width and height and addition of traditional architectural elements. The ticket office too is enhanced visually with traditional architectural vocabulary such as stone shades introduced in the structure. Toilets are relocated in the Museum block along the east wall within the site.

The following table (Table 2.3) lists in detail the possible date of construction and transformations that each instrument has undergone over time.

**Table 2.3: Transformations in the instruments over time**

S.No	Instruments at Jaipur observatory	Date of construction/ transformations
1	Brihat (Great) Samrat Yantra	Planned around 1732, completed around 1735. Repaired in 1901–1902 with plaster scales of quadrants redrawn and gnomon edges engraved in red stone. Scales surfaced with marble in 1945 Red sandstone lining replaced the earlier masonry plaster surface after 1969 (Volwahren, 2001) Lime plastered in 2007 and storm water collection was channelised <a href="#">Refer to images B1, A1, B2, A2, B3, A3, B6, A6, B9, A9, B12, A12, B14, A14 in Appendix II</a>
2.	Sasthamsa Yantra	Constructed with the Brihat Samrat Yantra. Initially, scales inscribed on smooth lime plaster surface, as also followed in 1901-1902 restoration. Marble scale introduced later. Pointed arches on surface of the eastern Sasthamsa filled up and affixed with doors. This infill removed in 2007 restoration to reveal the original arches. <a href="#">Refer to images B13, A13, B32, A32 in Appendix II</a>
3.	Jai Prakash Yantra	Constructed under Sawai Jai Singh II (before 1743). During later restorations, ten staircases leading to the underground rooms and corridors were walled up. Scales of plaster replaced with marble ones – after 1945 or in 1901-1902. Plinth protection in stone re-laid during 2007 restoration. <a href="#">Refer to images B33, A33, in Appendix II</a>
4.	Ram Yantra	The original structure in plaster from the period of Sawai Jai Singh II (before 1743), was restored in stone in 1891 under Sawai Madho Singh II. No intervention in 2007 except pointing of joints with lime mortar. <a href="#">Refer to images B8, A8, B15, A15 in Appendix II</a>
5.	Small Ram Yantras	Date not known, could have been from Sawai Jai Singh II's time or constructed as models for the rebuilding of the Great Ram Yantras in 1891. No work carried out in 2007. <a href="#">Refer to images B19, A19, in Appendix II</a>
6.	Dhruva Darsaka Yantra	Mentioned in 1902 account by visitor from Varanasi (Tillotson, 2006, pp. 170, 176).
7.	Nadivalaya Yantra	Only northern part (Uttari Gola) built originally, southern part and the

Description

		<p>storage chamber added before the reign of Maharaja Pratap Singh, when the whole building was rebuilt (1771). Inscription on plaque on southern plate mentions date of second restoration to be January 25, 1771. First restoration possibly under Sawai Madho Singh. In 2007, damaged calibrations were refilled with lead and the structure was plastered with lime. The access door was replaced.</p> <p><a href="#">Refer to images B22, A22, B24, A24, B25, A25 in Appendix II</a></p>
8.	Horizontal sundial atop Nadivalaya	<p>Possibly constructed with the second restoration in 1771, when the southern face and chamber were added to the Nadivalaya Yantra. A cage added on top to protect it, though that prevents its use for observational purposes. The cage was removed during the 2007-2008 restoration work to reveal the instrument.</p> <p><a href="#">Refer to images B18, A18, in Appendix II</a></p>
9.	Krantivritta Yantra	<p>Said to have been built according to instruction of Pandit Jagannath (under Sawai Jai Singh II, before 1743). Said never to have been completed, with superstructure missing. Superstructure not built during 1901-1902 restoration either, as it was assumed to have been too heavy for the support. No work carried out in 2007 as it is in good condition.</p> <p><a href="#">Refer to images B11, A11, B23, A23 in Appendix II</a></p>
10.	Krantivritta II	<p>Built in 1901-1902 by Garrett, to demonstrate the function of the Krantivritta Yantra as the original yantra was left incomplete. . No work carried out in 2007 as it is in good condition.</p> <p><a href="#">Refer to images B28, A28, in Appendix II</a></p>
11.	Dakshinottara Bhitti Yantra	<p>Demolished from original location and rebuilt stone by stone at present site. Present instrument built in 1876 with marble scales with lead filled engravings, as a replacement for the dilapidated one built by Sawai Jai Singh II in 1728 to the north of the Small Samrat Yantra. Originally, internal rooms were stuccoed with a thin layer of white plaster, red layers applied later. In 2007, the damaged lime plaster was replaced and it was finished with lime wash. A damaged wooden door was replaced and the plinth protection was re-laid in lime.</p> <p><a href="#">Refer to images B17, A17 in Appendix II</a></p>
12	Yantra Raj	<p>No record, though Tieffenthaler (1750's) mentions three large metal astrolabes suspended on iron rings. In 2007, the masonry was repaired and damaged timber beams were replaced with matching timber.</p> <p><a href="#">Refer to images B26, A26, B29, A29 in Appendix II</a></p>
13.	Chakra Yantra	<p>No records of construction date. In 2007, the plinth protection was relaid in lime and lead was refilled in the calibrations.</p> <p><a href="#">Refer to images B27, A27 in Appendix II</a></p>
14.	Digamsa Yantra	<p>Constructed under Sawai Jai Singh II (before 1743). The marble scale would be later additions. Only damaged lime plaster was replaced in 2007</p> <p><a href="#">Refer to images B20, A20 in Appendix II</a></p>
15.	Unnathamsa Yantra	<p>Under Sawai Jai Singh II (before 1743). In 2007, the timber beam was consolidated, lime plaster redone and decorative elephant brackets revealed.</p> <p><a href="#">Refer to images B30, A30, B31, A31 in Appendix II</a></p>
16.	Rasivalaya Yantra	<p>Constructed before 1750's (Tieffenthaler's visit), though not part of initial lists from Sawai Jai Singh's time. Repaired in 1870's under Maharaja Ram Singh. Angles altered by Garrett during 1901-1902 restorations – maximum alteration: 0° 29' in Azimuth and 2° 28' in Altitude. In 2008, the damaged plinth stone on edges were replaced and broken edges of instruments repaired with lime mortar.</p>

Description

		<a href="#">Refer to images B7, A7, B10, A10, B16, A16 in Appendix II</a>
17.	Kapala Yantra	Constructed under Sawai Jai Singh II (before 1743). Surfacing with stone done in 20 <sup>th</sup> century. In 2007, the plinth protection was relaid in lime and lead was refilled in the calibrations. <a href="#">Refer to images B21, A21, B34, A34 in Appendix II</a>
18.	Laghu (Small) Samrat Yantra	Possibly constructed under Sawai Jai Singh II (before 1743). Clad in red and white quartzite under Maharaja Ram Singh in 1876. In 2007, the damaged plaster was replaced and lead was refilled in the calibrations. <a href="#">Refer to images B4, A4, B5, A5 in Appendix II</a>
19.	Disha Yantra/ Jai Singh's Seat	Present in 1750's when Tieffenthaler visited Jaipur. Circular engraving possibly from 1870's. Recent attempt at repairing the damaged plinth in 2008 has revealed concentric masonry rings below the plinth and experts are trying to decipher the purpose of these rings (possibly to level ground by filling water).





Justification for inscription

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### 3. Justification for Inscription

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#### 3.a Criteria under which inscription is proposed (and justification for inscription under these criteria)

The Jantar Mantar, Jaipur is nominated under the criteria for cultural properties set out in the Operational Guidelines for the Implementation of the World Heritage Convention. The inscription is proposed under Cultural Criteria (ii), (iv) and (vi)

**Cultural Criterion (ii): *exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design***

The monumental composition of Jantar Mantar, Jaipur is an 18<sup>th</sup> century expression of the cosmological order devised by Sawai Jai Singh II with himself as the appointed guardian and a desire to overcome space, time and all other conditions of human existence, the precedents of which date to Maragheh and Ulugh Beg observatories from the 13<sup>th</sup> and 15<sup>th</sup> centuries.

The primary intentions in creating Jantar Mantar are outlined by Sawai Jai Singh II in his writings of 1732 AD. Firstly, he built the observatories with the intention to provide more precise readings of the positions and movements of the known planets, the fixed stars, the sun and the moon, so as to construct almanacs in the service of astronomy and the state. He simultaneously recognised the religious significance of astrological considerations in India where these aspects were central to all important activities and events from marriages to military maneuvers. Secondly, Sawai Jai Singh II built large masonry instruments as he thought experiments with small ones had produced inaccurate readings. His keen interest in astronomy, mathematics, and accurate instruments had already found expression, well before the 18<sup>th</sup> century, in personal observations of the skies using instruments of brass constructed according to the Persian-Arabic school of astronomy. When he found that axes of these brass instruments rapidly wore down, displacing the centre and shifting the planes of reference, he took to personally designing model-instruments of stone and masonry. Apparently, Sawai Jai Singh II constructed at least 13 different types of astronomical instruments, ranging in height from a few centimetres to 22.6 metres. These were used for his calculations, particularly at the observatories that were built by him at Delhi, Jaipur, Varanasi, Ujjain and Mathura amongst which Jaipur has the maximum number of astronomical instruments that are functional till date.

## Justification for inscription

The observatories of Sawai Jai Singh II were constructed as a result of an interchange of the principles of observational astronomy across the Eurasian Continent. The Jantar Mantar at Jaipur reflects the culmination of the integrated knowledge base and precedents of observatories and instruments of large scale constructed in Samarkand, Maragheh, and Ray. The theoretical foundation for European, Indian and Arabic astronomy is from the Ptolemy and Hipparchus. The Greeks used a sun-dial adopted from the Babylonians. A modified version of the same is the Jai Prakash Yantra at the Jantar Mantar, Jaipur. The Romans used only the northern part of the hemisphere – Berossos sun-dial- for observations, known as Chamilah by Arabian astronomers. Ptolemy was the first person to use small movable quadrants. These were improved by medieval astronomers, and became the focal point of many observatories in the east. A quadrant with radius 20 metres was used at Ray Observatory in 994 AD. According to Al Battani, the Arabs made the quadrant larger to increase its accuracy and, the same principle was used by Sawai Jai Singh II. Al Biruni constructed an enlarged fixed Ptolemaic quadrant with radius of about 7.5 metres. A stone quadrant was used first at Maragheh Observatory along with an Indian teak quadrant. The instruments of the Samarkand observatory and astronomical tables of Ulugh Beg formed the base for the tables and the observatories developed by Sawai Jai Singh II. The formal vocabulary of Jantar Mantar, Jaipur and the other four Jantar Mantar sites in India, were inspired from this 15<sup>th</sup> century Ulugh Beg's observatory at Samarkand, Uzbekistan. Sawai Jai Singh II used his vast reading and knowledge about astronomical instruments from other lands, to modify, innovate and create his own instruments and observatories. He was influenced by idea of making large scale masonry instruments of Arab and Turk predecessors. He first constructed brass instruments as per the Islamic books, found Arabic and Persian astrolabes from the time of Mughal Emperor Shah Jahan and, used the astrolabe called Yantra Raj for observations.

A number of translated Islamic and European texts were consulted by Sawai Jai Singh II along with the instruments used at Maragheh and Ulugh Beg's Observatory at Samarkand through emissaries sent for explorations. The British at Surat sent globes and maps of the universe to help Sawai Jai Singh II in his studies, at the ruler's request. Jesuit priests came to Jaipur in 1728 and 1734 to visit the astronomical observatory. Sawai Jai Singh II wrote to the King of Portugal for an advisor on astronomy, as a result of which Padre Manuel Padre was sent to Jaipur from Goa, whom the Jaipur ruler sent to Europe, to get the latest tables in around 1728 or 1729, when seven years of observations had been taken from the Delhi Observatory. By this time, the Uraniborg (1576), Leiden (1632), Paris (1667), Greenwich (1675), Berlin (1705), St Petersburg (1725) and Upsala (1730) Observatories were known to have been built.

The intense academic and cultural exchange among Central and West Asian countries, India and Europe that took place with the Jantar Mantar observatories as the focal points of the same, influenced the development of science in India. The Jantar Mantras of Sawai Jai Singh II represent the culmination of Zij astronomy and an ambitious expression of large scale pre-telescopic masonry type observatories as a result of this interchange of ideas across the Indian, Central and West Asian and European cultures.

The scale and proportions of Jantar Mantar also introduced geometrical systems that further got translated into urban planning principles to design the renowned 18<sup>th</sup> century city of Jaipur. In recent research works, it has come forth that the Brihat Samrat Yantra facilitated the city planning of 18<sup>th</sup> century. On extending the Yantra's axis towards the south and the north, significant markers exist that were used in identifying the north south axis of the city. Thus beyond the scientific and architectural value, the Jantar Mantar, Jaipur also holds significance at the urban planning level.

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

The Jantar Mantar, Jaipur as a unique example of amalgamation of science and religion and as a monumental architectural ensemble to facilitate measurement of celestial position and movement is unparalleled cultural heritage of India. It is an architectural masterpiece in stone. The astronomical instrument of the Brihat Smarat Yantra in Jaipur is the largest equinoctial sun-dial in the world. It is the most extant site amongst the observatories of Sawai Jai Singh II that represent the pre-telescopic masonry type observatories of the medieval period, marking the last and the most ambitious attempt of creating such architectural ensembles for observational astronomy at a large scale.

The creation of Jantar Mantar marks a significant phase that shows new ideas in architecture, science and town planning. Prior to Sawai Jai Singh II's time, observational instruments were not interpreted architecturally either singly or in groups. Astronomers in India like their counterparts in the Near East and Europe relied on astrolabes and other hand-held instruments of smaller proportions.

The Jantar Mantar, Jaipur is a monument with significant scientific, historical and architectural values. It is a collection of architectural astronomical instruments, built by the ruler Sawai Jai Singh



II. He had constructed a total of five observatories at different locations, including Delhi, Jaipur, Mathura, Varanasi and Ujjain. Amongst these, the observatories in Delhi, Jaipur and Varanasi are still functional to an extent. However, it is the Jaipur observatory that is most significant and extant with a wide range of astronomical instruments in all their architectural grandeur.

The contextual significance of Jantar Mantar, Jaipur is well comprehended by scholars and stated (MacDougall, 1996,p.33) as “The programme of Sawai Jai Singh II's observatories was unique in the Hindu experience because it set aside the iconographic subtext in architecture of scale. At the observatories, monumental architecture remained a method of apprehending cosmological order, but the programme substituted divinely revealed mathematics and geometry as a privileged form of understanding.”

The amount of expenditure on the Jaipur observatory is estimated to be 100000-150000 Indian Rupees in the 18<sup>th</sup> century. The expense on the Brihat Samrat Yantra (Jaipur) alone was 50000 Rupees. This reflects the historic significance of the construction of these observatories by Sawai Jai Singh II. They were built with an enormous sum for the budget of a principality that could be only surpassed by the Mughal Emperor.

The Jantar Mantar sites of Sawai Jai Singh II were instrumental in the preparation of the *Zij-i-Muhammad Shahi*, by the ruler, the basis of which was the *Zij* of Ulugh Beg completed in 1436 AD that was followed for close to three centuries, when it was supplanted by telescopic data.

While the accuracy of the masonry instruments at Jantar Mantar, Jaipur may be argued by several scholars in context of the contemporary western developments in astronomy, there is no doubt that it stands as a monumental testimony to the pre telescopic astronomical knowledge and discourses thus contributing to the overall development of astronomy, science and architecture across the world.

**Cultural Criterion (vi): *be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.***

The Jantar Mantar sites of Sawai Jai Singh II were instrumental in the preparation of the mathematical tables *Zij-i-Muhammad Shahi*, the basis of which was the *Zij* of Ulugh Beg completed in 1436 that held sway for close to three centuries, before it was supplanted by telescopic data. After

the 16th century, there appears to have been little concern for theoretical astronomy, Muslim and Hindu astronomers continued to make advances in observational astronomy and produced nearly a hundred Zij treatises. The Zij period began in Baghdad under the Abbasid Caliphate and continued, gaining importance in the medieval period. Medieval astronomy for the same reason can be referred to as 'Zij astronomy', as the main occupation of the astronomers in this phase was the preparation of Zijes ie the mathematical tables.

The medieval Islamic observatories were the earliest institutions to emphasise group research (as opposed to individual research) and where theoretical investigations went hand in hand with observations. The instruments and observational techniques used at the Jantar Mantar, Jaipur were mainly derived from the Islamic tradition, and the computational techniques from the Hindu tradition. The integration of astronomy and astrology was represented for the first time through the observatories that Sawai Jai Singh II built. The Jantar Mantar, Jaipur had become an arena of astronomical conferences and seminars where many astronomers and astrologers from all over the country would assemble to exchange their views on the subject. Jantar Mantar, Jaipur was intended to serve for regular, daily, observations, even when Sawai Jai Singh II himself was away from Jaipur. As such, it was constantly used by experts. The Jaipur State records tell us that in 1734 AD, Sawai Jai Singh II gave regular wages to 20 astronomers at the Jaipur observatory. This marks a point in Indian history where the codified astronomical knowledge base became more accessible to the public through monumental expressions at the Jantar Mantar.

The astronomical studies of Sawai Jai Singh II with Pandit Jagannath focused on the Arabic and the Indian traditions. Earlier Hindu works referred by Jai Singh II on the subject are the *Brhat Jataka*, *Brhat Samhita* and *Panca Siddhantika* of Varahamihira (born 505 AD), *Arya Bhatiya* of Aryabhata (born 476 AD), *Brahmasphuta Sidhanta* of Brahmagupta (born 598 AD), *Siddhanta Siromani* of Bhaskaracharya (born 1114 AD), *Yantra Raja* of Mahendra Suri (born 1370 AD), *Vedanga Jyotisa* and *Surya Siddhanta*. These Hindu works from ancient period and early medieval period mentioned a number of instruments for observation. Though they focused on theoretical astronomy, there is reference to the preference of a broad massive gnomon, unaffected by wind by Bhaskara I (seventh to eighth century) and the mention of Bhaskaracharya II (medieval period) as a practical astronomer who would verify the existing theories with the help of instruments. The first reference to an astrolabe in Hindu astronomy was made by Mahendra Suri in his work, *Yantra Raja* in the 14<sup>th</sup> century.

## Justification for inscription

Sawai Jai Singh II had familiarity with classical European ideas (Ptolemy and Euclid) that had long been incorporated within Arabic Scholarship and he also had access to modern European works of John Flamsteed and Philippe La Hire. His advisor, Pandit Jagannath translated the *Almagest* to Sanskrit as *Samrat Siddhanta*, another translation is known as *Siddhanta Kostubha*. Pandit Kewal Ram translated Latin and other catalogues into Sanskrit known as *Vibhaga Sarini*, *Drak Paksha Sarini* and *Drak Paksha Ganita*. Translation of Ulugh Beg's works are known as *Tara Sarini* and *Jai Vinod Sarini*. A number of treatises on the astrolabe, La Hire's works – *Tabulae Astronomicae* (1702) and another one published in 1682 were referred by Sawai Jai Singh II along with Euclid's *Elements* and Flamsteed's *Historia Coelestis Britannica* published in 1725. The European tables were analysed by Sawai Jai Singh II and in the preface to the *Zij-i-Muhammad Shahi*, he mentions that they were found to be inaccurate, due to use of small metal instruments for observations further validating his faith in large masonry instruments.

Thus Jantar Mantar, Jaipur is associated with several 18<sup>th</sup> century publications on astronomy in India and the translation of relevant 18<sup>th</sup> century Islamic and European literature on astronomy to Sanskrit. The exhaustive scholarship on astronomy associated with Jantar Mantar is of immense value.

### **3.b Proposed Statement of Outstanding Universal Value**

India represents five observatories that belong to the same historico-cultural group, within the framework of the thematic initiative "Astronomy and World Heritage". Amongst these, the four existing Jantar Mantar sites at Jaipur, Delhi, Ujjain and Varanasi in India are the most significant in being the best preserved conglomerates of pre-telescopic masonry astronomical instruments. Functioning both as scientific and educational institutions and as historico-cultural monuments of the same group, they have extraordinary significance to the level of the world heritage.

The site of Jantar Mantar, Jaipur amongst this group is the most extant, best preserved and has maximum number of observational instruments in functional condition. It records the development of large and small architectural forms used in astronomy in the 18<sup>th</sup> -20<sup>th</sup> centuries. The Jantar Mantar, Jaipur is an icon that has contributed significantly to astronomy, architecture, urban planning, political history and cultural distinctiveness of India. It stands as a testament to the development of astronomy, theoretical discourses, political regime and rituals, a unique architectural vocabulary and an exemplary application in the urban planning of Jaipur.

## Justification for inscription

It is an outstanding architectural expression reflecting the intention to inculcate contemporary findings of astronomy within the late medieval cultural context in India. It represents the culmination of Zij astronomy and an ambitious expression of large scale pre-telescopic masonry observatories as a result of the interchange of ideas across the Indian, Central and West Asian and European cultures.

This unique architectural ensemble of Jantar Mantar, Jaipur is an amalgamation of science and religion to facilitate measurement of celestial position and movement. The scale and proportions of this architectural masterpiece in stone introduced geometrical systems that translated into 18<sup>th</sup> century urban planning principles as observable in the plan of Jaipur city. The significance of Jantar Mantar thus extends beyond the scientific and architectural value to create benchmarks in the field of urban design.

Besides representing the integration of astronomy and astrology in the Indian context, the Jantar Mantar sites also mark an important phase in Indian history where such codified knowledge base became more accessible to the general public through monumental expressions. Being a subject of continuous research by astronomers, architects and historians since centuries, the Jantar Mantar, Jaipur remains pivotal in the understanding the development of astronomy and architecture.

### **Development in science and astronomy**

Sawai Jai Singh II's major contribution to India was the compilation of the *Zij-i Muhammad Shahi*, a set of astronomical tables based on his own observations at the Jantar Mantar in Jaipur and Delhi. The scholars of India who were trained according to the Islamic school of astronomy readily adopted the *Zij-i Muhammad Shahi*. They wrote commentaries on it. To the world at large the Zij was of little value, but to traditional Islamic scholars of India, to whom Western science was out of reach, the Zij served a valuable need. These scholars prepared almanacs with its aid for more than 100 years. Hindu astronomers also might have embraced the parameters of the Zij and prepared their *panchangas* (Hindu calendar) with it.

The Jantar Mantar, Jaipur reflects the culmination of the astronomical knowledge base from precedent observatories and instruments constructed in Samarkand, Maragheh, and Ray that only exist as archaeological remains today. The Brihat Samrat Yantra at Jantar Mantar, Jaipur is the largest existing equinoctial sun-dial in the world.



### **Astronomical researches and greater awareness of the subject**

Sawai Jai Singh II approached his astronomical researches with an open mind and the Jantar Mantar, Jaipur corroborates this fact. Before embarking upon the construction of the astronomical instruments, he studied all that was available to him on the subject through various resources in India and across the world. Moreover, during his investigations, he kept this attitude alive. His search for better and more accurate instruments continued even much after his observatories had been built. According to DuBois, Sawai Jai Singh II was ready to modify or let go of his own tables in case better ones were available anywhere in the world. Though few historians believe that his accomplishments remained medieval in retrospect because he could not access the most contemporary telescopic instruments, but his outlook was modern and commendable in the medieval context of India. He went beyond religion to seek knowledge about science. Astronomers of all faiths participated in his researches and his efforts were truly secular and futuristic for his times.

Jantar Mantar, marked the beginning of creating observational instruments as monumental architectural expressions in India where readings could be taken conveniently in groups. The medieval Islamic observatories were the earliest institutions to emphasise group research (as opposed to individual research) where theoretical investigations went hand in hand with observations. The instruments and observational techniques used at the Jantar Mantar, Jaipur were mainly derived from the Islamic tradition, and the computational techniques from the Hindu tradition.

The Jantar Mantar, Jaipur was historically, an arena of astronomical conferences and seminars where astronomers and astrologers from all over the country would assemble to exchange their views on the subject. Being the largest of the observatories built by Sawai Jai Singh II, it was intended to serve for regular, daily, observations. As such, it was constantly used by experts in earlier time and continues till date to be a fascinating subject of ongoing research in architecture and astronomy.

### **A marker of political rituals**

The site of Jantar Mantar, Jaipur occupies a strategic central position in the city planning of Jaipur and is an icon of important political rituals and announcements in the history of the city. Researchers (MacDougall, 1996, p.32) have mentioned that the site of Jantar Mantar served as a setting for rites associated with the passage and control of time. It has also been symbolic of cosmic rejuvenation and the orchestration of solar kingship in Jaipur expressed in political rituals such as the marshaling of the sun at the time of vernal equinox. During the reign of Sawai Jai Singh II, the eclipses were announced to the citizens by the beating of drums under the *chhatra* (cupola) of the Brihat Samrat Yantra.

Even today, on the full moon day of the Hindu month of Ashadha (June- July) on the onset of monsoon season, the local pundits of Jaipur gather at the Jantar Mantar to conduct rites connected with ensuring the return of the rains. Besides the religious rituals, prayers and offerings, they also hoist a flag on the summit of the Brihat Samrat Yantra at sunset to determine the direction of the prevailing winds and predict the nature of monsoon. The marking of the passage of time was also projected at the Jantar Mantar in an auditory form through the beating of the drums and recitations by the pundits. These traditional rituals in the observatory that combined the intangibles of the sound (mantra) and the tangible astronomical instruments (yantra) are probably responsible for the origin of its name as Jantar Mantar.

### **Contribution to architecture and urban planning**

This unique architectural ensemble of Jantar Mantar, Jaipur is an amalgamation of science and religion to facilitate measurement of celestial position and movement. Besides being a monumental sculptural expression, the architecture of the observatory is ideationally linked to the city planning of historic Jaipur. The scale and proportions of this architectural masterpiece in stone introduced geometrical systems that further got translated into planning principles in the making of the renowned 18<sup>th</sup> century city of Jaipur.

The Jantar Mantar site with its instruments of time keeping was strategically located within the centre of the city. These instruments were interpreted architecturally and became fixtures within the cosmography of the city itself. Thus Jantar Mantar contributes significantly to the field of urban design and city planning in India.

### **3.c Comparative analysis (including state of conservation of similar properties)**

#### **Comparison with astronomical observatories across the world**

Ancient observation structures such as the obelisk, pole casting shadow (gnomon), pyramid and sundial of the Egyptians and the most famous groups of megaliths in the world of the Stonehenge that consist of circles of menhirs arranged in a pattern whose astronomical significance is still being explored are few examples dating from around 3100 BC to 2600 BC that are the earliest precedents of stone structures for astronomical observations. From 2<sup>nd</sup> to the 10<sup>th</sup> centuries, we find examples of temples and observation towers used by priests for ritual and astronomical purposes across Latin America, The Babylonians and the Greeks certainly had rudimentary observatories, but the greatest of

## Justification for inscription

the early observatories were those in Islamic North Africa and the Middle East - Baghdad, Cairo and Damascus. The great observatory at Baghdad had a huge 6 metre quadrant and 17 metre stone sextant. It might have looked similar to the observatory at Jantar Mantar, Jaipur, the only one of this type of observatory to remain relatively intact. The first known mural sextant was constructed in Ray, Iran, by Abu-Mahmud al-Khujandi in 994 AD.

The significant observatories to which the Jantar Mantar, Jaipur can be compared are:

*(i) Observatory of Nasir-ud-din Al Tusi at Maragheh, Iran*

The observatory Rasad Khaneh, is located in the city of Maragheh in northern Iran, East Azarbaijan Province. Maragheh was the capital of the Ilkhanate Empire during the period 1217-1265 AD. The observatory was constructed in 1259 AD for Sultan Bulagu at the request of the astronomer Nasir-ud-din Al Tusi.

Astronomers from across Persia, Syria, Anatolia and even China were gathered at the observatory. It is also believed that several Chinese astronomers worked at the observatory and that they introduced Chinese methods of computation. The Maragheh observatory was also reported to have had over a hundred students studying under al-Tusi at the observatory.

The Maragheh observatory was the largest observatory of its time with a series of buildings occupying an area of 150 metres in width and 350 metres in length. One of these buildings was a dome which allowed the sun's rays to pass through. There was also a library consisting of 400,000 volumes, which were plundered by the Mongol Empire during its invasions across Persia, Syria and Mesopotamia. The mural quadrant to observe the positions of the stars and planets was aligned with the meridian that served as Prime meridian for the tables in the *Zij-i Ilkhani* compiled here. The observations influenced Copernicus and the remains inspired Ulugh Beg to construct his observatory in Samarkand. An emissary was also sent by Sawai Jai Singh II to view this observatory.

The observatory was abandoned in the middle of 14th century. It turned into ruins as a result of frequent earthquakes and lack of funding by the state. Considerable parts of the groundwork are now preserved in the ruins. To save the installation from further destruction, Iran's Cultural Heritage and Tourism Organisation (ICHTO) built a dome-framed brass shelter and it plans to hold an exhibit of astronomical devices used at Maragheh observatory. According to an announcement by the Maragheh governor in July 2008, the Maragheh Observatory will be turned into a research and tourism centre in

near future as per the plan made by Maragheh Astrophysics Research Center and Maragheh Cultural Heritage, Tourism and Handicrafts Department.

*(ii) Gaocheng Astronomical Observatory, China*

The observatory is located on an ancient observational site at Gao Cheng Zhen about eight miles from Dengfeng, in Henan Province of China. It was built in 1276AD in the early Yuan Dynasty by the astronomer Guo Shoujing on the order of the Mongol Kublai Khan, the elder brother of Sultan Bulagu and was used by Guo Shoujing and Wang Xun (1235-1281) to observe the movement of the sun, the stars and record time.

Built of stones and bricks, it was designed originally for use in predicting the time of the solstice each year. It has two parts: the body (gnomon platform) and *shigui* (chinese sundial - also called the ruler to measure the sky). It is 9.46 metres high by itself and 12.62 metres high if the 2 cabinets on the top are included. The somewhat unconventional gnomon is a bar mounted horizontally between the 2 cabinets. The *shigui* extending to the far north is 31.19 metres long and 0.53 metres wide. It is made up of 36 square stones with two parallel waterways on it to check its levelness. The location of *shigui* is in accordance with the direction we take today to measure the meridian. During measurement, a beam is put across the grooves. Jingfu (an instrument with many holes) on the waterways is used to measure the shade, whose precision is within 2 millimeters.

At winter solstice, the length of the shadow at noon is nearly as long as the *shigui*. The very precise observations served for the new Shoushi calendar (Season-Granting Calendar) of 1281AD, which was in use for 364 years. The length of the tropical year was determined to 365 d 5 h 49 m 20 s, a value in accord with the value of the Gregorian Calendar, but obtained 300 years earlier. In 1787 AD, Laplace applied these measurements to check his calculations on the secular changes of the obliquity of the ecliptic and the eccentricity of the earth's orbit.

It is the first in a series of 27 observatories built in the early Yuan-Dynasty (only one known to have survived) and oldest surviving observatory in China. Presently, there is a small museum next to the observatory with auxiliary structures to demonstrate the functioning of the instrument.

*(iii) Ulugh Beg's Observatory at Samarkand, Uzbekistan*

The observatory was built in around 1425 AD on a hill 2 kilometres to the north-east of Samarkand, Uzbekistan, a part of Persia at that time. The observatory at Maragheh was



probably the most important direct influence on the Samarkand observatory. Ulugh Beg was one of the first to advocate and build permanently mounted astronomical instruments.

At the observatory that came in to being two centuries before the telescope was invented, Ulugh Beg constructed the Fakhri Sextant, which had a radius of approximately 36 metres. The arc was finely constructed with a staircase on either side to provide access for the assistants who performed the measurements. The sextant would have been used to measure the angle of elevation of major heavenly bodies, especially at the time of the winter and summer solstices. Light from the given body, passing through a controlled opening, would have shone on the curved track, which is marked very precisely with degrees and minutes (a principle also used in the Sasthamsa Yantra at Jaipur observatory). Using the sextant, Ulugh Beg compiled the *Zij-i-Sultani* of 994 stars, in 1437 AD, generally considered the greatest of star catalogues between those of Ptolemy (ca. 170 A.D.) and Tycho Brahe, alongside Abd al-Rahman al-Sufi's *Book of Fixed Stars*.

Using the largest instrument of its type in 16<sup>th</sup> century, a 50 metre high gnomon, in 1437 AD, Ulugh Beg determined the length of the sidereal year, the value of which was improved by 28 seconds 88 years later in 1525 AD by Nicolaus Copernicus (1473-1543). The observatory was equipped with a variety of other instruments, which probably accounted for the largest part of its scientific measurement. While only written lists (not the actual instruments) have survived, one can assume them to be similar to the instruments in the Ancient Beijing Observatory in China (among them armillary spheres).

One of the most important measurements carried out by Ulugh Beg's astronomers was the obliquity of the ecliptic. The ecliptic is the circular path described by the sun in the course of a year, and its obliquity is the angle at which it cuts the equator. Establishing this precisely is important for a variety of other astronomical measurements and calendrical calculations. The astronomers in the classical world had errors on the order of 7'-10'. Arab astronomers achieved for the most part much greater precision; in the case of Ulugh Beg, the error was only -0'32". His results for the calculation of the movement of the planets are also impressively close to those obtained by modern means.

His work eventually became known in Europe, with the publication of a Latin translation of his "Chronology" in London in 1650 AD and fifteen years later the first of many European editions of his star tables. The Samarkand observatory was important for its influence on astronomy in Mughal India. Babar described the observatory as a three storied structure and mentioned that by the means of the observatory, Mirza Ulugh Beg worked out the Gurkhani Tables that came to be used all over the

world instead of earlier such compilations. The observatories of Sawai Jai Singh II are said to be directly inspired by the observatory of Samarkand.

The above-ground portion of Ulugh Beg's observatory was destroyed shortly after his death in (1449). By the twentieth century no one knew its exact location. The surviving underground chamber was excavated in 1908 by primary school teacher and amateur archaeologist Vladimir Viyatkin, later Samarkand's director of antiquities. All that remains of the building after the excavations are the foundations and the lower part of the largest of its scientific instruments, the huge sextant. The Ulugh Beg observatory is one of the major monuments of the historic city of Samarkand that is on the World Heritage List, reference number 603rev. There is a small museum with exhibits about Ulugh Beg and his scientific achievements at the site.

*(iv) Beijing Ancient Observatory, China*

Beijing Ancient Observatory is located in the main city of Beijing, high up on the top of a fort-like building at Jianguo Gate. The current observatory was completed in 1442 AD, the seventh year of Zhengtong of the Ming Dynasty. It is the most significant pre-telescopic observatories of China. It served the Ming and Qing astronomers in their star-gazing reports for the Emperor. Another function was to assist sea navigation, and apparently Muslim scholars were also recruited for this expertise. In the mid 1600s, after winning an astronomy contest, the Jesuit Ferdinand Verbiest was awarded complete charge of the astronomy observatory by the emperor. In 1673 AD, he supervised the rebuilding of some of the instruments. He and other Jesuits helped to further develop the observations of the stars and the planets.

It is about 14 meters high with 8 bronze astronomical instruments made in Qing Dynasty. It has an observation history of nearly 500 years from Ming Dynasty to 1929 A.D. It is also famous for its intact and integrated instruments. The 8 instruments were equipped with western technology and Chinese local art design, and demonstrate the exchange between the west and the east. Situated on the platform, the huge astronomic instruments include the armillary sphere constructed of two bronze disks, ecliptic armillary and equatorial armillary, a celestial globe built in 1673, a quadrant from 1673, a theodolite from 1715, a sextant, an azimuth theodolite and a new armillary sphere from 1744. After 1949, Beijing Ancient Observatory became a part of Beijing Planetarium. It is the key national relics protection unit now. The ancient observatory is one of the components of the complex with a planetarium, museum and exhibition and is in a good state of conservation. The Ancient Beijing Observatory is a part of the Tentative World Heritage List, reference number 128.

(v) *Istanbul Observatory of Taqi al-Din, Turkey*

The Istanbul observatory of Taqi al-Din was built under the Ottoman Empire, as a result of a petition from the Empire's chief astronomer, to finance the building of a great observatory to rival those in Europe, in competition with those of his contemporary Tycho Brahe. It was one of the largest astronomical observatories to be built in the Islamic world and was completed in 1577 AD with a giant armillary sphere and an accurate mechanical astronomical clock.

The observatory consisted of two large structures perched on a hill overlooking the European section of Istanbul and offering a wide view of the night sky. Much like a modern institution, the main building was reserved for the library and the living quarters of the staff, while the smaller building housed a collection of instruments built by al-Din. These included a giant armillary sphere and an accurate mechanical astronomical clock for measuring the position and speed of the planets. With these instruments, al-Din had hoped to update the old astronomical tables describing the motion of the planets, sun, and moon. He used his observational clock to produce the *Zij* – ‘Unbored Pearl’ and astronomical catalogues more accurate than his contemporaries.

Taqi al-Din wrote an important treatise on astronomical instruments entitled the *Observational Instruments of the Emperor's Catalogue*, which describes the astronomical instruments used in the Istanbul observatory of al-Din. These included ancient instruments such as the armillary sphere, paralactic ruler and astrolabe; medieval Muslim instruments such as the universal astrolabe, azimuthal and mural quadrants, and sextants; and several instruments he invented himself, including the *mushabbaha bi'l manattiq*, a unique sextant with cords for the determination of the equinoxes similar to what Tycho Brahe later used, and a wooden quadrant for measuring azimuths and elevations. His most important astronomical instrument, however, is the observational clock. This was the first clock to measure time in seconds, and he used it for astronomical purposes, specifically for measuring the right ascension of the stars. This is considered one of the most important innovations in 16th century practical astronomy, as previous clocks were not accurate enough to be used for astronomical purposes. This was also the first astronomical clock to be powered by springs. He further improved the observational clock, using only one dial to represent the hours, minutes and seconds.

A remarkably modern-looking terrestrial globe of the Earth, one of the earliest of its kind, was constructed by Taqi al-Din at the Istanbul observatory of al-Din. Although Taqi al-Din had also invented a rudimentary telescope some time before 1574, it is unknown whether or not he employed the instrument for his later astronomical observations at the Istanbul observatory of al-Din.

#### Justification for inscription

Tragically, the observatory did not survive to advance the development of astronomy in the Muslim world, as it was destroyed in 1580 AD.

#### *(vi) Tycho Brahe's Observatories at Uraniborg and Stjerneborg, Sweden*

The observatories of Tycho Brahe are located on the island of Hven that measures about 4.5 by 2.4 kilometres, part of Denmark in the late 16<sup>th</sup> century when the observatories were established and part of Sweden presently. It is a plateau with steeply rising shores, 20 - 40 meters high.

The Uraniborg observatory was started in 1576 AD and completed in 1581 AD, on the highest point, in the middle of the island, 45 meters above the sea. Uraniborg was surrounded by 5.5-meter high walls, 75 meters in square. The corners were very accurately orientated in the north-south and east-west directions. The building was in the centre of a circular place, and the space between this and the outer walls was occupied by a garden of Tycho's own design. The inner garden had a strict geometric layout, and there were cultivated flowers and in particular herbs for medical and household purposes. The outer garden consisted of fruit trees.

The size of Uraniborg was rather modest: the square central body of the building was 15 by 15 metres. Uraniborg was the first building ever designed with astronomical observations as its primary design criteria. The purpose of all the towers and balconies was that they should serve as instrument platforms. The orientation of the building was chosen for maximum coverage of the sky with the instruments, and to simplify the precise alignment of the great mural quadrant. The great mural quadrant was a masterpiece of simplicity and precision. It served to measure the arc height above the horizon (altitude) when the celestial objects passed the meridian plane, i.e. culminated due south. Since Uraniborg itself was aligned exactly north-south, the fine alignment of the quadrant and the stability of the alignment were greatly simplified. With an almost 2 metre radius of the brass arc, combined with Tycho's innovative aiming device and the transversally graded scales, the instrument had a resolution of a sixth of an arc minute, i.e. 10 arc seconds. This is the absolute limit for visual readings, and only using optics is it possible to surpass this.

To further improve the accuracy of the position measurements, Tycho found that it was necessary to shield the instruments from disturbing wind gusts, and to have the instruments on solid fundaments. This led him to design a new observatory in 1584 AD, Stjerneborg. Located partly underground, and with hatches to open in the observation direction only, a new level of accuracy was obtained. At the same time temperature fluctuations were suppressed, further improving the accuracy.

#### Justification for inscription

The five crypts of Stjerneborg housed each one a permanently installed instrument. The central square room was the hypocaustum, i.e. a heated room where Tycho and his assistants could prepare observations, study results or simply wait for the clouds to break up. The entrance was from north, i.e. from right on the plan. The fence had the same shape as the outer walls of Uraniborg. The biggest crypt housed the great equatorial armillary sphere. It was a very big one, made of steel and brass. The declination circle visible on the picture had a diameter of 2.72 meter, and the equatorial circle to the left of it had a diameter of 3.50 meter. Due to an innovative bearing arrangement it could also be pointed towards all directions of the sky. Tycho's aiming devices and transversal scales permitted a resolution of a quarter of an arc minute, i.e. 15 arc seconds. This made it, next to the mural quadrant, to Tycho's most precise instrument.

Tycho abandoned Uraniborg in 1597 AD, and it was destroyed in 1601 AD. The grounds are currently being restored. A large wall, 75 meters on a side and 5.5 meters high was planned to surround Uraniborg, but never built, instead a high earth mound was constructed and lasted until today being the only remain of the observatory still in place. The Stjerneborg observatory was also destroyed shortly after Tycho Brahe's death (1601). The observatory was the subject of archaeological excavations during the 1950s, resulting in the restoration of the observatory. Today, the exterior of Stjerneborg is reconstructed. The foundations for the instruments that Tycho Brahe used for his observations are visible and a multimedia show is hosted on the site. Both the sites come under the well interpreted Tycho Brahe Heritage, with a museum in the direct vicinity of the Uraniborg site, the underground observatory of Stjerneborg, the reconstructed Renaissance Garden of Uraniborg and a Science centre. Two of the instruments used by Tycho Brahe in Stjerneborg, the large steel quadrant and the astronomical sextant have been reconstructed by Czech craftsmen.

#### *(vi) Royal Greenwich Observatory, UK*

The most well known observatory in the world is the Royal Greenwich Observatory in the United Kingdom, founded in 1675. The observatory was inscribed in the List of the World Heritage as Maritime Greenwich, ref. 795 in 1997. It is the most significant observatory of the world as the meridian passing through the observatory has been accepted as the Prime Meridian – the centre of world time and space. The line itself divides the eastern and western hemispheres of the Earth. Flamsteed was appointed the first Astronomer Royal in March 1675 and took observations resulting in his catalogues referred to by Sawai Jai Singh II after he had established his observatories. This observatory is a post-telescopic one with metal instruments and for the same reason deviates from the other observatories compared with Jantar Mantar.



**Table 3.1: Comparison of Identifiable Observatories up to the 18<sup>th</sup> century**

Name of Observatory	Present Status	Emphasis on large scale instruments	Construction Material			Type of Observatory		Date of Origin							
			Megaliths	Masonry	Metal	Pre-Telescopic	Post-Telescopic	Pre 13th Cent.	13th Cent.	14th Cent.	15th Cent.	16th Cent.	17th Cent.	18th Cent.	
Stonehenge, United Kingdom	Megaliths on site. On WHL as Stonehenge, Avebury and associated Sites							3100 BC							
Observatory of Nasir-ud-din Al Tusi at Maragheh, Iran	Archeological remains								1259						
Gaocheng Astronomical Observatory, China	Well preserved								1276						
Ulugh Beg's observatory at Samarkand	Archeological remains present. On WHL as part of Samarkand										1425				
Beijing Ancient Observatory, China	Well preserved, on Tentative World Heritage List										1442				
Istanbul observatory of Taqi al-Din, Turkey	Destroyed in 1580											1577			
Tycho Brahe's Observatories, Sweden	Destroyed in early 1600's. Archeological remains											1580-1584			
Royal Greenwich Observatory, United Kingdom	Well preserved												1675		
Observatories of Sawai Jai Singh II, India	Well preserved instruments														1718-1734

 On World Heritage List/ Tentative List

The Stonehenge has been added as an exception due to its historicity, emphasis on scale, significance and inclusion in the World Heritage List. Similarly, the Royal Greenwich Observatory is an exception in being the only post-telescopic observatory while the rest of the observatories are pre-telescopic, again included due to its significance and inclusion in the World Heritage List. The emphasis on scale is seen in all the observatories before the Greenwich and continued in the observatories of Sawai Jai Singh II.

**From the comparative analysis in table 3.1, it is evident that the observatories of Sawai Jai Singh II are extant examples of pre-telescopic masonry type observatories with few metal instruments. Besides these, the masonry type observatory that still exists is the Gaocheng Astronomical Observatory, China and other historical observatories such as Maragheh and Samarkand are essentially archaeological remains, having been destroyed at various points in history. Hence, the astronomical observatories of Sawai Jai Singh II are the best preserved representations of the pre-telescopic masonry type observatories, that are functional to date.**

#### **Comparative Analysis amongst the Indian Observatories**

In India, before the time of Sawai Jai Singh II, there was no precedent of observatories in the country. Though a number of instruments are described in the Hindu school of astronomy, there is no trace of any early Hindu observatory. Also, though there is reference in history to an observatory constructed by Humayun near Delhi, it is not corroborated by any physical evidence to date. Hence, the observatories at Jaipur, Varanasi, Delhi and Ujjain are the only existing pre-telescopic masonry type historic observatories in the country, of which the Jaipur one is the largest, with maximum number of instruments in the best state of conservation. Other observatories of Sawai Jai Singh II located in Delhi, Ujjain and Varanasi belonging to the same historico-cultural group will also be part of the serial nomination as expressed in the Tentative List submitted to UNESCO. The following table compares the instruments at the Jantar Mantar, Jaipur with those at the other three extant observatories in India.

**Table 3.2: Comparison of Instruments amongst Observatories of Sawai Jai Singh II and precedents of each instrument**

S.No	Instruments	Comparative analysis amongst the extant observatories of Sawai Jai Singh II (Jaipur, Delhi, Ujjain and Varanasi)	International and national precedents in history and evolution
1	<b>Samrat Yantra</b>	All observatories have Samrat Yantra in several sizes with varying degrees of accuracy. The smallest unit with a least count of one minute is located at Varanasi and the largest one, almost ten times as big in size and with the least count of 2 seconds is the Brihat Samrat Yantra at Jaipur.	Considered to have evolved from the hemisphere of Berosus. Sibtal Mardini (1423-1495) from Damascus, Sebastain Munster from Germany (1489-1552) and Johann Shroner, were first people to use sundials with gnomon.
2.	<b>Sasthamsa Yantra</b>	Present at Jaipur and Delhi. The Delhi one built in the chamber supporting the east quadrant of the large Samrat, now in ruins, with radius of arc speculated to be around 8 metres. Four functional identical units of the Sasthamsa at Jaipur with radius 8.65 metres are in good condition	Derived from Sads Fakhri, mural quadrant as at Samarkand though the Samarkand one had a much larger radius of 40.20 metres.
3.	<b>Jai Prakash Yantra</b>	Present at Jaipur and Delhi. The one at Delhi has a diameter of 8.33 metres and that at Jaipur, 5.4 metres. The Jaipur Jai Prakash halves are built on common platform and the ones at Delhi have individual platforms.	The Jai Prakash is based on concepts dating to as early as 300 B.C. when the Greco-Babylonian astronomer Berosus is said to have made a hemispherical sundial. Though hemispherical dials were found in European Church architecture during the Middle Ages and at the observatory in Nanking, China in the late 13th-century; the Jai Prakash Yantra is much more elaborate, complex, and versatile than any of its predecessors. Could also have been based upon the Muslim instrument al-Masatarah or Shamalah/ Chamilah. An evolution of the armillary sphere.
4.	<b>Ram Yantra</b>	Present at Jaipur and Delhi. The inner diameter of the Delhi instrument is 16.65 metres and that of Jaipur is 6.9 metres. Jaipur also has a smaller set, possibly as model for the larger ones at Delhi.	Upright azimuthal quadrant that could be rotated on its perpendicular axis of Tycho Brahe at Uraniborg. Utsuwani – an instrument named by al-Biruni to an astrolabe as a cylindrical projection he devised.
5.	<b>Dhruva Darsaka Yantra</b>	Only at Jaipur. It used to be present at Varanasi as per account of visitor from Varanasi in 1902 (Tillotson, 2006, pp. 176).	
6.	<b>Nadivalaya Yantra</b>	Present at Jaipur, Varanasi, Ujjain and also known to be present at Mathura observatory which does not exist now.	Equatorial sun-dial. Bhaskaracharya II- medieval Hindu astronomer mentions celestial equator as Narivalaya in his work Siddhanta Siromani.
7.	<b>Horizontal sundial atop</b>	A horizontal sundial is present at Ujjain as Sanku Yantra, much larger in scale	Earliest mention of Sanku by Varahamihira (500-1000 AD). Sanku

Justification for inscription

	<b>Nadivalaya</b>	(6.8 metres diameter), though it may be a recent addition.	Yantra and Sanku Chhaya Yantra mentioned by Brahmagupta (7 <sup>th</sup> -8 <sup>th</sup> century Indian astronomer) and his contemporary Bhaskara I.
8.	<b>Krantivritta Yantra</b>	Only at Jaipur observatory. Jaipur also has a functional Krantivritta II with metal superstructure erected later in 1902 to demonstrate the function of the Yantra.	Ecliptic instrument
9.	<b>Dakshinottara Bhatti Yantra</b>	Present at Jaipur, Delhi, Ujjain and Varanasi observatories, also known to be present at Mathura. The diameters of the arcs varied from less than a metre to more than six metres.	Mural quadrant used at Ray and Maragheh and by Ulugh Beg and Tycho Brahe at Samarkand and Uraniborg respectively.
10.	<b>Yantra Raj</b>	Only at Jaipur, possibly brought from Delhi	Arabic and Persian astrolabe used from 10 <sup>th</sup> century to 17 <sup>th</sup> century.
11.	<b>Chakra Yantra</b>	Present at Jaipur and Varanasi. The Varanasi instrument made out of iron with a brass plate that has scales engraved has a diameter of one metre and the scale at pivot point is a circular stone slab of 29.5 cms diameter. Jaipur has two units in brass and brass circular plate scales at pivot ends. The rings and the plates are larger than the Varanasi instrument.	Possibly Zat-al-Halqa, that is, brass ring instrument at Samarkand. Bhaskaracharya II- medieval Hindu astronomer mentions Cakar Yantra (circle instrument) in his work Siddhanta Siromani.
12.	<b>Digamsa Yantra</b>	At Jaipur, Varanasi and Ujjain, all of comparable size with diameters of outer wall varying between 8.3 metres for Jaipur and 11.3 metres for Ujjain.	Enlargement in masonry of the azimuth and combined azimuth and altitude instruments of the Muslims. Variant of the Ram Yantra, overcoming its shortcomings in determining azimuthal angles. Upright azimuthal quadrant that could be rotated on its perpendicular axis of Tycho Brahe at Uraniborg.
13.	<b>Unnatamsa Yantra</b>	Only at Jaipur	Mentioned by Varahamihira (Indian astronomer, 500-1000 AD).
14.	<b>Rasivalaya Yantra</b>	Only at Jaipur observatory	Derived from the Samrat Yantra.
15.	<b>Kapala Yantra</b>	The Kapala invented specially in Jaipur observatory, absent in the others.	Kapala Yantra and Khagola Yantra (armillary sphere) mentioned by Varahamihira (Indian astronomer, 500-1000 AD).
16.	<b>Disha Yantra/ Jai Singh's Seat</b>	Only at Jaipur	Cannot be commented upon as true function is open to debate.

These observatories are the only pre-telescopic masonry type observatories in India. Later significant observatories were the Madras Observatory set up in 1786 AD and the Kodaikanal Observatory which boasts of one of the world's oldest extant telescopes, established in 1899 AD, both being telescopic observatories that are a different group entirely and, not directly comparable with the pre-telescopic ones.

### **Conclusion to the Comparative analysis:**

- **The group of Jantar Mantar observatories in India is the first and last example of pre-telescopic astronomical establishments in India, the later ones being post-telescopic observatories.**
- **Amongst the observatories of Sawai Jai Singh II, the one at Jaipur is the most significant in having the largest number of instruments in a good state of conservation.**
- **The Brihat Samrat Yantra at the Jantar Mantar, Jaipur is the largest equinoctial sun-dial in the world.**
- **In the international context, the only other historic masonry observatory remaining is the Gaocheng Astronomical Observatory, China that has a single structure used for observational purposes. The Indian observatories are the most significant in being the best preserved conglomerate of pre-telescopic masonry astronomical instruments in functional condition. All the other such observatories were abandoned and destroyed during the course of history, while the observatories of Sawai Jai Singh II, especially the Jaipur one underwent various phases of restoration, under the successors of the ruler till the 1960's and by the state government since then.**
- **The Jantar Mantar observatories are the only example of pre-telescopic astronomical establishments from the 18th century, expressed on a monumental scale, the culmination of the principles of medieval observational astronomy that stressed on the use of large scale instruments for better accuracy.**

### **3.d Integrity and/or Authenticity**

The Jantar Mantar, Jaipur retains its authenticity to a large extent since there has been a concerted preservation effort for the site since the early 20<sup>th</sup> century. This left important intricacies intact for the accurate analysis required for the astronomical incline in this work. There is however, a debate that the markings on few instruments were during the 20<sup>th</sup> century restoration were based on the western units of time measurement. Presently, this becomes part of the historic layers and provides an interesting comparison with other instruments that show calibrations in the Indian units of time measurement. During the works carried out in 1901-1902, it is recorded that local materials, techniques and workmanship were used for restoration. The transformations that the instruments underwent are evident in the later interventions of ashlar stone masonry, stone cladding and use of marble scales. The original structures are known to be in lime plastered stone



masonry with scales marked on the plaster as well. The introduction of the round arch in the Cancer Rasivalaya Yantra is attributed to the 1901-02 restoration, as in the original construction only the pointed arch was used.

There are a number of documents related to development, creation and status of the Jantar Mantar during their history and astronomical usage such as old maps of the site and Jai Singh's own almanac compilation, known as the *Zij-i-Muhammad-Shahi* (which was named after the Mughal Emperor Muhammad Shah). The *Samrat Siddhanta*, a translation of the Almagest (Syntaxis of Ptolemy in Arabic) to Sanskrit carried out by Pandit Jagannath during the reign of Sawai Jai Singh II included the views of the ruler on astronomy and mentioned the significant instruments that can be correlated to on site ones at Jaipur. The restoration of 1901-1902 was recorded by Lieutenant Garrett under whom the work took place. The site was visited by GR Kaye in 1915-16, whose records on the observatories were published in 1918 and 1920 AD. After this, the significant works on the observatories are works by VN Sharma (1995 &1997) and Andreas Volwahren (2001) which are relevant records for conservation works.

More recent conservation works carried on site in 2007 have been able to retain the site's authenticity in a) form and design and, b) material. (Refer table 3.3 for instruments). The location of the site remains unchanged, physical fabric of the instruments is restored with traditional materials and, a number of scholars continue to take readings of the instruments. Since landscaping of the site was modified in the early 20<sup>th</sup> century and the same has been retained in the recent conservation initiative, aspects of authenticity associated with 'spirit and feeling' might require an appraisal. There is no documentary evidence about the original historic landscape till now. The landscape elements both pre and post restoration have no relation to the original except that at present the soft landscape, defined pathways and street furniture introduced facilitate tourist movement and comfort. The authentic landscaping of the site is addressed in the Management Plan and will be restored to the original once enough existing evidence is available.

The visual axis linking the Jantar Mantar and the palace complex have been affected by the late 19<sup>th</sup> century intervention of the access road and later 20<sup>th</sup> century structures such as the boundary wall, but the Management Plan foresees remedial measures to modify the walls so as to reinstate the visual axis, if required. The integrity of Jantar Mantar, Jaipur is presently weakened due to later interventions and development pressures surrounding the site. However, these interventions are reversible and are being addressed through the Management Plan and Buffer Zone Development.

**Table 3.3: Authenticity of Instruments**

S.No	Instrument	Function	Form	Construction Material
1	<b>Brihat (Great) Samrat Yantra</b>	Retained	Retained	Retained except marble scales added in 20 <sup>th</sup> century.
2.	<b>Sasthamsa Yantra</b>	Retained	Retained	Retained
3.	<b>Jai Prakash Yantra</b>	Retained	Retained except blocking of staircases in 20 <sup>th</sup> century	Retained except marble scales added in 20 <sup>th</sup> century
4.	<b>Great Ram Yantra</b>	Retained	Retained	Altered in late 19 <sup>th</sup> century
5.	<b>Small Ram Yantras</b>	Retained	Retained	Retained
6.	<b>Dhruva Darsaka Yantra</b>	Retained	Retained	Retained
7.	<b>Nadivalaya Yantra</b>	Retained	Altered in late 18 <sup>th</sup> century	Retained since 18 <sup>th</sup> century
8.	<b>Horizontal sundial atop Nadivalaya</b>	Retained	Retained	Retained
9.	<b>Krantivritta Yantra</b>	Retained	Retained	Retained
10.	<b>Krantivritta II</b>	Retained	Retained	Retained
11	<b>Dakshinottara Bhatti Yantra</b>	Retained	Altered in late 19 <sup>th</sup> century	Altered in late 19 <sup>th</sup> century
12.	<b>Yantra Raj</b>	Retained	Retained	Retained
13.	<b>Chakra Yantra</b>	Retained	Retained	Retained
14.	<b>Digamsa Yantra</b>	Retained	Retained	Retained except marble scales added in 20 <sup>th</sup> century.
15.	<b>Unnathamsa Yantra</b>	Retained	Retained	Retained
16.	<b>Rasivalaya Yantra</b>	Altered in early 20 <sup>th</sup> century	Altered in early 20 <sup>th</sup> century	Altered in early 20 <sup>th</sup> century
17.	<b>Kapala Yantra</b>	Retained	Retained	Retained except marble scales added in 20 <sup>th</sup> century.
18.	<b>Laghu (Small) Samrat Yantra</b>	Retained	Retained	Altered in late 19 <sup>th</sup> century – clad in stone
19.	<b>Disha Yantra/ Jai Singh's Seat</b>	Not clear	Retained	Retained except marble scales added in 20 <sup>th</sup> century.





Present state of conservation  
and factors affecting the site



## 4. State of conservation and factors affecting the property

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### 4.a. Present state of conservation

The Jantar Mantar observatory complex at Jaipur is presently in a good state of conservation. According to the Conservation Plan prepared in 2005, the Department of Archaeology and Museums, Government of Rajasthan carried out repair and restoration works in 2007-08. As a result of the same, with the use of matching materials and traditional techniques, the instruments were restored and the landscaping and circulation pattern modified (refer to section 2d). However, the current landscaping needs to be reviewed in lieu of its historic context and the present use of the site.

None of the instruments at Jantar Mantar show any structural damage or deterioration in the current situation. The foundations and below ground parts of the instruments had suffered water seepage due to over watering of the lawns. The water seepage in Jai Prakash Yantra has been rectified by relaying the surrounding plinth protection. The brass instruments showed signs of deterioration in the form of pitting as did the iron astrolabe in the Yantra Raj. The timber beams in the Yantra Raj were replaced. (Refer images B26, A 26 and B 29, A 29). However, the timber beam in Unnathamsa Yantra that was diagnosed as structurally unsound was just consolidated since the replacement beam of required size was unavailable. (Refer images B31, A31).

The finishes of a number of instruments have been redone with works such as lead refilling in scales, lime plaster and lime wash on surfaces and lime terracing on the roof. Conservation work is currently being carried out on the Rasivalaya Yantras. For details of works carried out refer table 2.3.

### 4.b. Factors affecting the property

#### (i) Development pressures (e.g., encroachment, adaptation, agriculture, mining)

The site does not face any adverse development pressures, as it is under the ownership of the State Government and managed by the same. The over watering of the lawns has caused water seepage problem in to the foundations of the instruments, an issue that needs careful monitoring with regards to the maintenance of the site.

Some incongruous ancillary structures had been added to the site in the last few decades. One of them, the toilet block has now been pulled down and new toilets are now incorporated in the

Museum Building in the eastern part of the site. The ticket office building on the north-west corner has also been visually enhanced as part of the conservation works carried out in 2007-08. Though, usage is planned and controlled within the site, but the informal activities in the buffer zone to the north and south of the site need to be managed for better experience of the site.

**Refer Annexure VI – Management Plan - Part 4 for details**

**(ii) Environmental pressures (e.g., pollution, climate change, desertification)**

The site faces environmental pressures in terms of air and noise pollution, but no exceptional direct impact on the components of the site is evident. The roads just outside the buffer zone area have maximum intensity of noise and air pollution in the city due to connection of these roads directly to commercial areas.

**(iii) Natural disasters and risk preparedness (earthquakes, floods, fires, etc.)**

Jaipur lies in the Seismic Zone II, which is the least to moderate category, the highest risk zone being Zone V and the least active zone being Zone I. A light earthquake on December 24, 2006 was the last that the city suffered. Since the site essentially comprises of individual structures spread on the ground, with none of the surrounding structure more than four storeys high, it is not under any major threat with regard to seismicity. However, the tall instruments such as the Brihat Samrat Yantra (27 metres high) may face potential threat from horizontal load of the seismic activity and this aspect needs to be assessed.

The site components themselves are not highly prone to damage due to their layout and construction materials. Initiatives towards risk preparedness are lacking on site and have been now been addressed as a part of the Management Plan.

**Refer Annexure VI – Management Plan - Part 4 for details**

**(iv) Visitor/tourism pressures**

The visitor/ tourism pressure is the most evident threat that the site faces, as the number on tourist averages to 3500 people per day and, on a given peak day it can even go up to 10,000. The instruments were earlier facing wear and tear and vandalism by tourists. This has been addressed presently by introduction of railings that bar access to any of the instruments. But, both physical and intellectual access to tourists and researchers is an important management issue that needs to be addressed properly. This aspect has been elaborated in the Management Plan.

**Refer Annexure VI – Management Plan - Part 4 for details**



**(v) Number of inhabitants within the property and the buffer zone**

There are no inhabitants in the nominated site, though the adjoining sites in the Buffer Zone, the Anand Krishna Bihari Temple and the Police Headquarters have few residents.

Estimated population located within:

Area of nominated property - No permanent residents,

Average 2000 floating population per day

Buffer zone - 50 residents, 2000 floating population per day

Total - 50 permanent residents, 2000 floating population per day

Year - 2007-08



Protection and management  
of the property

## **5. Protection and management of the property**

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### **5.a Ownership**

Jantar Mantar, Jaipur including all movable and immovable properties of the site are owned by the Department of Archaeology and Museums, Government of Rajasthan under the Department of Art, Literature and Culture, Rajasthan

### **5.b Protective designation**

Jantar Mantar, Jaipur is protected under the Rajasthan Monuments Archaeological Site and Antiquities Act, 1961 under Section 3 and Section 4. It was declared as a monument of state level importance on 16th September 1968, and is protected by the Department of Archaeology and Museum, Government of Rajasthan under the Department of Art, Literature and Culture, Rajasthan

### **5.c Means of implementing protective measures.**

The management and ownership of the entire site is under Department of Archaeology and Museums. The Department subleases certain parts of the site such as the book shop and snacks counter on a yearly lease which is reviewed annually. However, the maintenance of the leased portions are the responsibility of the Department of Archaeology and Museums.

Within this Department, a society called RSMMDMS 'Rajasthan State Museum & Monuments Management & Development Society' has been constituted under the Chairmanship of the Chief Minister for proper upkeep and maintenance of Government Museums and Monuments. This society has been registered under Rajasthan Societies Registration Act 1958. This society was responsible for commissioning the Conservation Plan for Jantar Mantar in 2005 and its subsequent implementation by the Department of Archaeology and Museums.

The Department is administrated by the Director, Archaeology and Museums under the Department of Art and Culture, Rajasthan headed by the Principal Secretary, Art and Culture. The Department of Art and Culture makes all final decisions regarding the site and its activities.

The engineering wing of the Department of Archaeology and Museums is responsible for the implementation of the decisions of the Department. The electrical and telecommunication

accounts wing of the Department is responsible for revenue collection from the site activities and for disbursement of funds for site maintenance.

Specialised tasks such as preparation of a Conservation Plan or Management Plan are accomplished by recruiting professional consultants and technical staff, as and when required.

A daily, weekly and annual maintenance schedule for the site is being charted out as per the monitoring of conservation works and proposed programmes in the Management Plan. Furthermore, the department is drafting specific plans for risk management, visitor management and interpretation.

**Refer Annexure VI – Management Plan, Part 4 and Part 5**

#### **5.d Existing plans related to municipality and region in which the proposed property is located (e.g., regional or local plan, conservation plan, tourism development plan)**

There are a range of agreed plans which relate to the site directly or indirectly. These range from strategic planning documents at national, regional and local level to overarching strategies guiding tourism, transport, economy or heritage, integrated conservation plans and management plans. Refer to table 2 for the status of agreed plans.

Explanation of the status and content of some of these plans is provided below:

- (i) The Master Plan for Jaipur which is the primary Development Plan for the city categorises land use of old Jaipur under residential walled city area with special byelaws that restrict the floor space index and control the heights of the buildings.
- (ii) City Development Plan for Jaipur is prepared as a visionary document to guide development projects in the city under the Jawahar Lal Nehru Urban Renewal Mission supported by the central government. This plan identifies the Jantar Mantar site area and the surrounding buffer zone as an important historic area that needs to be developed under a special urban renewal project with improved infrastructure.

**Refer Annexure V – City Development Plan, Chapter 8**

- (iii) The Heritage Management Plan, Jaipur prepared by the Jaipur Heritage Committee identifies the site as listed in Grade 1 and provides a brief status and action plan for the site.

**Refer Annexure V – Excerpts from Heritage Management Plan, Jaipur**

- (iv) Urban Renewal Proposal for walled city of Jaipur under the Jawahar Lal Nehru Urban Renewal Mission partially funded by the Ministry of Urban Development, Government of India is the renewal project identified under the City Development

Plan. It provides parking and urban renewal proposals for the historic areas in the buffer zone of the site and beyond that for the main commercial streets of Jaipur.

- (v) Integrated Conservation Plan for Jantar Mantar and Hawa Mahal - specifically proposes an integrated plan for the site along with the immediate landmark of Hawa Mahal.

**Refer Annexure VII – Integrated Conservation Plan, Jantar Mantar and Hawa Mahal**

**Table 5.1: Status of agreed plans**

S. No.	Plan	Year of preparation	Agency responsible	Status
1	Master Plan of Jaipur	1991	Jaipur Development Authority	under revision
2	City Development Plan	2006	Jaipur Municipal Corporation	approved and identified detailed project reports under preparation
3	Heritage Management Plan	2007	Jaipur Heritage Committee	is being integrated in the revised master plan
4	Urban Renewal Proposal for walled city of Jaipur	2008	Jaipur Municipal Corporation	under implementation as one of the identified projects in the city development plan.
5	Integrated conservation plan for Jantar Mantar and Hawa Mahal	2005-06	Department of Archaeology, Rajasthan	implemented for site but not for buffer zone.

#### 5.f Sources and levels of finance

The annual turnover of the fee in 2007-08 amounts to an average of Rs. 285, 38,695 (Indian Rupees) primarily derived from the daily visits by tourists. In the last two years tourism in Rajasthan has increased considerably thus helping the overall income of the site. However, this income is not retained by the Department of Archaeology and Museums but it has to be deposited in the State Treasury on a daily basis. The expenditure for upkeep and maintenance of the site is substantially low and comes from the total annual budget that is sanctioned to the Department of Archaeology and Museums for the upkeep and maintenance of all protected monuments in Rajasthan. Special works such as the preparing of the Conservation Plan in 2005-06 and its subsequent implementation in 2007-08 was supported by a centrally sponsored grant from the Ministry of Tourism, India.

The Management Plan proposes to achieve the economic sustainability for the site through strategic planning. It will look at aspects such as regulating the incoming tourism revenue, disbursing and balancing funds under each identified heads and integrating more tourism revenue



generating options to ensure effective implementation of the Conservation Plan and the Management Plan.

**Table 5.2 – Income for Jantar Mantar, Jaipur**

<b>S. No.</b>	<b>Year</b>	<b>Total Tourist</b>	<b>Total Received Income (In Indian Rupees)</b>
1.	2001-02	440523	5157816
2.	2002-03	418105	5129475
3.	2003-04	509106	7226930
4.	2004-05	612908	10376000
5.	2005-06	654615	11285875
6.	2006-07	727063	12525750
7.	2007-08	738457	28538695
8.	2008 (April 08 – Dec 08)	474050	21276080

Refer Annexure VI – Management Plan, Part 4 and Part 5

### **5.g Sources of expertise and training in conservation and management techniques**

The Department of Archaeology and Museums has developed a strong engineering department that is well conversant in carrying out onsite conservation works. The Department has a comprehensive schedule of rates charted out for onsite conservation works in each specific zone and region within Rajasthan.

Through RSMMDS i.e. the 'Rajasthan State Museum & Monuments Management & Development Society', the Department has empanelled 20 conservation architects to prepare conservation plans for various sites and recruits these architects as per the project requirement.

The Department of Archaeology and Museums is further facilitated by the State Institute of Heritage Conservation, Rajasthan which is a government initiative at state level to provide required training in conservation works to contractors and masons working on heritage sites. The engineering wing of the department actively participates in all workshops and training programmes of the institute. Currently, they are involved in making revisions to the existing conservation manual followed by the Archaeological Survey of India so that it may be used as a guideline for the conservation works in Rajasthan.

The senior officials and engineers within the department keep themselves well informed about conservation trends and regularly participate in National level workshops and training programmes held by organisations such as the UNESCO New Delhi Office and the Archaeological Survey of India.

### 5.h Visitor facilities and statistics

Within India, the government has accepted tourism as an important national industry. This is marked by the focus on improving infrastructure at recognised tourist destinations as an important agenda. Rajasthan, with its magnificent palaces and Jaipur in particular receives a very high number of tourists. Being the capital of the state, and also its romantic image of the Pink City has made Jaipur the most sought after destination. Most of the visitors to Jaipur visit the central core of the city and Amber Palace on the outskirts.

The tourists on the site of Jantar Mantar, Jaipur have increased from an average of 1990 per day from the year 2006 -07 to 2025 in 2007-08. At certain peak days in winter, the number of tourists on the site can rise to 8,000. Since the historic monument has a limited area of 1.86 hectare, it is extremely important to control and channelise the tourist traffic. It needs to be ensured that the site does not admit more visitors than its carrying capacity.

Ticketing is a part of the public facilities and has recently been reorganised with adequate shaded waiting area. There are two windows that function during peak periods. There needs to be also a system of parking and movement around the Jantar Mantar site. The toilet areas, bookshop, snack counter, waiting area and signage have recently been redesigned to facilitate the visitor and the visitor circulation is also reworked. However, other aspects such as site interpretation, museum and a restaurant area are in the planning process and will be implemented soon within the framework of the Management Plan.

**Table 5.3: Visitor statistics for Jantar Mantar, Jaipur**

S. No.	Year	National Tourists	International Tourists	Students	Total Tourist
1.	2001-02	329580	93000	17943	440523
2.	2002-03	310258	87000	20847	418105
3.	2003-04	383797	101801	23550	509106
4.	2004-05	409370	174500	29038	612908
5.	2005-06	416323	211285	27007	654615
6.	2006-07	433854	251656	35544	727063
7.	2007-08	422669	276270	39518	738457
8.	2008 (April 08 – Dec 08)	287815	151749	34486	474050

### 5.i Policies and programmes related to the Presentation and promotion of the property

A commitment to the World Heritage Convention Article 4 and Article 5 is integrated in the vision and aims for Jantar Mantar, Jaipur.

The Jantar Mantar, Jaipur is a testimony to the astronomical knowledge of medieval India and marks the point of dissemination of this knowledge to general public through its monumental existence.

“Our vision is to conserve, protect and enhance the Outstanding Universal Value of the Jantar Mantar, Jaipur in order to celebrate astronomy and its contribution to society and culture. The Jantar Mantar, Jaipur will continue to exist in the spirit with which it was built by Sawai Jai Singh II: to invite and inspire the widest range of visitors and scholars across the world, to encourage engagement with its astronomical instruments and to contribute to the cultural distinctiveness of the city of Jaipur.”

In order to achieve this vision, we aim at the following objectives:

- Conservation of the Outstanding Universal Value of the nominated site
- Continue the reuse of site for astronomical studies and research
- Facilitate all range of visitors with appropriate interpretation to understand its significance

The Conservation Plan also suggests the development of an astronomy society in Jantar Mantar. Along with tourism, educational purposes can also be served as detailed in part B of the Conservation Plan.

**Refer Annexure VII – Conservation Plan**

The Government of Rajasthan and the Archaeological Survey of India also intend to participate in the thematic initiatives organized by UNESCO in the Year of Astronomy 2009 in order to communicate the significance of the various Jantar Mantar sites across India that are intended to be a part of a serial nomination, beginning with this nomination of the Jantar Mantar, Jaipur.

#### **5.j Staffing levels (professional, technical, maintenance)**

The site of Jantar Mantar, Jaipur has a total of eleven staff members for regular upkeep and maintenance of the Jantar Mantar site. These include one Superintendent who has knowledge of the astronomical instruments and can record the readings, two office assistants, one person for ticketing, seven employees for maintenance works and one guard. An engineer conversant with conservation work periodically monitors the site. The cleaning of the site and toilet areas is given on an annual contract. Besides this, the maintenance of landscape and gardens is also given on an annual contract amounting to a monthly expenditure of Rs. 11,000/- (Indian Rupees) per

## Protection and management of the property

month. The security of the area is also handed over to a security agency on contract basis. Below is a summarization of the Staffing:

### *Permanent Staff*

- i. Superintendent - 1 (Specialised in the field)
- ii. Office Assistant - 2
- iii. Monument Attendants - 7
- iv. Sweeper - 1

### *Contractual Services*

- i. Maintenance of garden and dry sweeping of the Complex - 15 persons
- ii. Upkeep of toilets - 3 persons
- iii. Security services - 10 persons
- iv. Tourist Assistance Force - 3 Police Constables  
(Stationed outside the site)

The monument attendants take care of the instruments during the visitor hours. Toilets are washed on an hourly basis along with the replacement of toiletries. For horticulture maintenance, the concerned agency waters the garden through a sprinkler system daily and trimming of hedge/grass is done at an interval of 10 days. The sweeping of the monument areas is done five times a day.





Monitoring



## 6. Monitoring

### 6.a Key indicators for measuring state of conservation

A detailed Conservation Plan for the site was prepared in 2005-06 and a Management Plan is prepared in 2008 along with the nomination file. These two plans outline means of monitoring works on the site which will be followed. The status of the site and fabric should be recorded regularly for monitoring purpose. The images (before and after) as recorded by the Department of Archaeology and Museums are provided in the Annexure.

**Table 6.1: Monitoring indicator**

Objective	Indicators	Periodicity	Location of records
Planning and Policy	Amendment in the 'Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961'.	Once	Department of Archaeology and Museums
	Joint planning projects for the buffer zone	As appropriate	Various departments like the Jaipur Municipal Corporation
Conservation	Site Inspection by Project Engineer to observe the state of built structures	Daily	Engineering Wing, Department of Archaeology and Museums
	Site inspection by engineer to oversee ongoing conservation works	Daily when the works are ongoing	Engineering Wing, Department of Archaeology and Museums
	Site Inspection by superintendent to inspect the functions of instruments or take readings	Weekly	Department of Archaeology and Museums
	Before and After photographs of the site and instruments to record changes	Before and after the Conservation works are carried out on site	Engineering Wing, Department of Archaeology and Museums
Access	Update of facilities improved as per visitor demands	Quarterly	Tourism Department and the Department of Archaeology and Museums
	Interpretive media checklist as per interpretation plan	To be outlined in the Interpretation Plan	
	Increased no of visitors as per visitor survey	Daily record	
Roads and Traffic	Traffic studies	quarterly	Jaipur Municipal Corporation
Research	Review of research projects and publications on Jantar Mantar	annually	Research Wing, Department of Archaeology and Museums
Risk Management	Keeping a record of accidents in and around the site Checking security, emergency plans etc,	weekly	Contracted agency reports to the Department
Buffer Zone Management	Change in land use / improved traffic	As appropriate	Varies
Financial Resources	Monitoring incoming revenue and funds	monthly	RSMMMDS and State Treasury

**Refer: Annexure II, Annexure VI: Management Plan and Annexure VII: Conservation Plan**

### **6.b Administrative arrangements for monitoring property**

Currently, the administrative arrangements for monitoring the property include periodic site checking by an engineer who is well conversant with conservation aspects of the site and weekly readings of the instruments. Besides this, regular cleaning and maintenance is as explained in the Management Plan.

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Department of Archaeology and Museums,

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E-mail: [dirarch\\_raj@rediffmail.com](mailto:dirarch_raj@rediffmail.com)

### **6.c Results of previous reporting exercises**

A detailed chronological inventory of past interventions is desirable which includes referring archival records, referring old drawings and research works for better understanding of the building. The Conservation Plan of 2005-06 reports the status of the site in 2005-06 and most of the conservation works outlined in this plan have been implemented on site in 2006-07. For more details refer section 2.b (v)

**Refer: Annexure VII: Conservation Plan**





Documentation



## 7. Documentation

### 7.a Photographs, slides, image inventory and authorisation table and other audiovisual materials

Refer to Appendices I and II for the recent photographs and before after comparison. The authorisation letters are attached as Appendix III.

**Table 7.1: Image inventory and photograph authorisation form  
(For Appendices I and II)**

<b>Id. No</b>	<b>Format (slide/ print/ video)</b>	<b>Caption</b>	<b>Date of Photo (mo/yr)</b>	<b>Photographer/ Director of the video (Same as Copyright)</b>	<b>Non exclusive cession of rights</b>
Image 1	Print (Appendix I) and jpeg format images	Aerial view of the Jantar Mantar	12/08	DRONAH	Yes
Image 2	Print (Appendix I) and jpeg format images	Marble scales of instruments in filled with lead	12/08	DRONAH	Yes
Image 3	Print (Appendix I) and jpeg format images	Nadivalaya Yantra and Laghu Samrat Yantra	12/08	DRONAH	Yes
Image 4	Print (Appendix I) and jpeg format images	Rasivalaya Yantra with ashlar stone masonry	12/08	DRONAH	Yes
Image 5	Print (Appendix I) and jpeg format images	The Brihat Samrat Yantra dominating the skyline. A current view with tourists flocking the site.	12/08	DRONAH	Yes
Image 6	Print (Appendix I) and jpeg format images	Great Ram Yantra	12/08	DRONAH	Yes
Image 7	Print (Appendix I) and jpeg format images	Contrasting dark and light segments in the Jai Prakash Yantra	12/08	DRONAH	Yes
Image 8	Print (Appendix I) and jpeg format images	Small Ram Yantras with Rasivalaya Yantras and the arcaded boundary wall in the background	12/08	DRONAH	Yes
Image 9	Print (Appendix I) and jpeg format images	The Astonomer's House with Laghu Samrat Yantra in background and the northern boundary wall with increased height.	12/08	DRONAH	Yes
Image 10	Print (Appendix I) and jpeg format images	Laghu Samrat Yantra with tourist traffic	12/08	DRONAH	Yes
Image 11	Print (Appendix I) and jpeg format images	Cancer Rasivalaya Yantra with round arches	12/08	DRONAH	Yes

Documentation

Image 12	Print (Appendix I) and jpeg format images	The Sasthamsa Yantra, the later infilled pointed arches of which were opened up during the 2007-08 restoration works	12/08	DRONAH	Yes
Image 13	Print (Appendix I) and jpeg format images	Krantivritta Yantra II constructed during the 1901-02 restoration work by Lieutenant Garrett.	12/08	DRONAH	Yes
Image 14	Print (Appendix I) and jpeg format images	The engravings on marble scales filled with lead, labelled in the Devnagri script	12/08	DRONAH	Yes
Image 15	Print (Appendix I) and jpeg format images	Zodiac Sign painted on to the Virgo Rasivalaya Yantra	12/08	DRONAH	Yes
B1	Print (Appendix II) and jpeg format images	Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A1	Print (Appendix II) and jpeg format images	Brihat Samrat Yantra – with repaired plaster and lime wash ( <i>khamira</i> )	12/08	DRONAH	Yes
B2	Print (Appendix II) and jpeg format images	Steps along hypotenuse of gnomon in Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A2	Print (Appendix II) and jpeg format images	Steps along hypotenuse of gnomon in Brihat Samrat Yantra – after lime wash	12/08	DRONAH	Yes
B3	Print (Appendix II) and jpeg format images	The Brihat Samrat Yantra, view from north	09/05	Department of Archaeology and Museums	Yes
A3	Print (Appendix II) and jpeg format images	The Brihat Samrat Yantra, view from north	12/08	DRONAH	Yes
B4	Print (Appendix II) and jpeg format images	Laghu Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A4	Print (Appendix II) and jpeg format images	Laghu Samrat Yantra	12/08	DRONAH	Yes
B5	Print (Appendix II) and jpeg format images	Laghu Samrat Yantra in foreground, Brihat Samrat Yantra in background	09/05	Department of Archaeology and Museums	Yes
A5	Print (Appendix II) and jpeg format images	Laghu Samrat Yantra in foreground, Brihat Samrat Yantra in background	12/08	DRONAH	Yes
B6	Print (Appendix II) and jpeg format images	Pinnacle of Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A6	Print (Appendix II) and jpeg format images	Pinnacle of Brihat Samrat Yantra after restoration	12/08	DRONAH	Yes
B7	Print (Appendix II) and jpeg format images	Rasivalaya Yantra	09/05	Department of Archaeology and Museums	Yes
A7	Print (Appendix II) and jpeg format images	Rasivalaya Yantra	12/08	DRONAH	Yes

Documentation

B8	Print (Appendix II) and jpeg format images	Aerial view showing Great Ram Yantras, Chakra Yantra and Digamsa Yantra	09/05	Department of Archaeology and Museums	Yes
A8	Print (Appendix II) and jpeg format images	Aerial view showing Great Ram Yantras, Chakra Yantra and Digamsa Yantra, the boundary defined by Anand Krishna Bihari temple has been repaired and given lime wash	12/08	DRONAH	Yes
B9	Print (Appendix II) and jpeg format images	Quadrant of Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A9	Print (Appendix II) and jpeg format images	Quadrant of Brihat Samrat Yantra	12/08	DRONAH	Yes
B10	Print (Appendix II) and jpeg format images	The 12 Rasivalaya Yantra on a common platform	09/05	Department of Archaeology and Museums	Yes
A10	Print (Appendix II) and jpeg format images		12/08	DRONAH	Yes
B11	Print (Appendix II) and jpeg format images	Chamber under the Krantivritta Yantra	09/05	Department of Archaeology and Museums	Yes
A11	Print (Appendix II) and jpeg format images	Chamber under the Krantivritta Yantra – after cleaning, plaster repair and lime wash	12/08	DRONAH	Yes
B12	Print (Appendix II) and jpeg format images	Steps leading to base of the Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A12	Print (Appendix II) and jpeg format images	Steps leading to base of the Brihat Samrat Yantra after pointing in lime	12/08	DRONAH	Yes
B13	Print (Appendix II) and jpeg format images	Sasthamsa Yantra	09/05	Department of Archaeology and Museums	Yes
A13	Print (Appendix II) and jpeg format images	Sasthamsa Yantra after lime plaster repair and lime wash	12/08	DRONAH	Yes
B14	Print (Appendix II) and jpeg format images	Brihat Samrat Yantra	09/05	Department of Archaeology and Museums	Yes
A14	Print (Appendix II) and jpeg format images	Brihat Samrat Yantra	12/08	DRONAH	Yes
B15	Print (Appendix II) and jpeg format images	Great Ram Yantra	09/05	Department of Archaeology and Museums	Yes
A15	Print (Appendix II) and jpeg format images	Great Ram Yantra	12/08	DRONAH	Yes
B16	Print (Appendix II) and jpeg format images	Quadrant of Rasivalaya Yantra	09/05	Department of Archaeology and Museums	Yes
A16	Print (Appendix II) and jpeg format images	Quadrant of Rasivalaya Yantra	12/08	DRONAH	Yes



Documentation

B17	Print (Appendix II) and jpeg format images	Dakshinottara Bhitti Yantra	09/05	Department of Archaeology and Museums	Yes
A17	Print (Appendix II) and jpeg format images	Dakshinottara Bhitti Yantra	12/08	DRONAH	Yes
B18	Print (Appendix II) and jpeg format images	Horizontal dial atop Nadivalaya Yantra	09/05	Department of Archaeology and Museums	Yes
A18	Print (Appendix II) and jpeg format images	Horizontal dial atop Nadivalaya Yantra with metal cage removed	12/08	DRONAH	Yes
B19	Print (Appendix II) and jpeg format images	Small Ram Yantra	09/05	Department of Archaeology and Museums	Yes
A19	Print (Appendix II) and jpeg format images	Small Ram Yantra with low height railings	12/08	DRONAH	Yes
B20	Print (Appendix II) and jpeg format images	Digamsa Yantra	09/05	Department of Archaeology and Museums	Yes
A20	Print (Appendix II) and jpeg format images	Digamsa Yantra after re plastering and lime wash	12/08	DRONAH	Yes
B21	Print (Appendix II) and jpeg format images	Kapala Yantra	09/05	Department of Archaeology and Museums	Yes
A21	Print (Appendix II) and jpeg format images	Kapala Yantra with railing introduced	12/08	DRONAH	Yes
B22	Print (Appendix II) and jpeg format images	Northern dial of Nadivalaya Yantra	09/05	Department of Archaeology and Museums	Yes
A22	Print (Appendix II) and jpeg format images	Northern dial of Nadivalaya Yantra	12/08	DRONAH	Yes
B23	Print (Appendix II) and jpeg format images	Krantivritta Yantra	09/05	Department of Archaeology and Museums	Yes
A23	Print (Appendix II) and jpeg format images	Krantivritta Yantra	12/08	DRONAH	Yes
B24	Print (Appendix II) and jpeg format images	Nadivalaya Yantra, southern dial	09/05	Department of Archaeology and Museums	Yes
A24	Print (Appendix II) and jpeg format images	Nadivalaya Yantra, southern dial	12/08	DRONAH	Yes
B25	Print (Appendix II) and jpeg format images	Nadivalaya Yantra	09/05	Department of Archaeology and Museums	Yes
A25	Print (Appendix II) and jpeg format images	Nadivalaya Yantra	12/08	DRONAH	Yes
B26	Print (Appendix II) and jpeg format images	Yantra Raj – with wooden beams under structural distress	09/05	Department of Archaeology and Museums	Yes

Documentation

A26	Print (Appendix II) and jpeg format images	Yantra Raj – with wooden beams replaced and new railings added	12/08	DRONAH	Yes
B27	Print (Appendix II) and jpeg format images	Chakra Yantra on the platform of Kapala Yantra	09/05	Department of Archaeology and Museums	Yes
A27	Print (Appendix II) and jpeg format images	Chakra Yantra on the platform of Kapala Yantra	12/08	DRONAH	Yes
B28	Print (Appendix II) and jpeg format images	Krantivritta II	09/05	Department of Archaeology and Museums	Yes
A28	Print (Appendix II) and jpeg format images	Krantivritta II	12/08	DRONAH	Yes
B29	Print (Appendix II) and jpeg format images	Yantra Raj – wooden beam supporting the metal astrolabe	09/05	Department of Archaeology and Museums	Yes
A29	Print (Appendix II) and jpeg format images	Yantra Raj – with the wooden beam supporting the astrolabe replaced	12/08	DRONAH	Yes
B30	Print (Appendix II) and jpeg format images	Unnatamsa Yantra – stepped depression	09/05	Department of Archaeology and Museums	Yes
A30	Print (Appendix II) and jpeg format images	Unnatamsa Yantra – stepped depression, with lime plaster repaired and lime wash redone.	12/08	DRONAH	Yes
B31	Print (Appendix II) and jpeg format images	Unnatamsa Yantra – wooden beam supporting the metal instrument under structural distress	09/05	Department of Archaeology and Museums	Yes
A31	Print (Appendix II) and jpeg format images	Unnatamsa Yantra – wooden beam supporting the metal instrument that has been consolidated	12/08	DRONAH	Yes
B32	Print (Appendix II) and jpeg format images	Quadrant and steps of Brihat Smarat Yantra leading to the rook of the Sasthamsa Yantra	09/05	Department of Archaeology and Museums	Yes
A32	Print and jpeg format images	Quadrant and steps of Brihat Smarat Yantra leading to the rook of the Sasthamsa Yantra	12/08	DRONAH	Yes
B33	Print (Appendix II) and jpeg format images	Graduations on the marble surface of the Jai Prakash Yantra	09/05	Department of Archaeology and Museums	Yes
A33	Print (Appendix II) and jpeg format images	Graduations on the marble surface of the Jai Prakash Yantra	12/08	DRONAH	Yes
B34	Print (Appendix II) and jpeg format images	Platform of Kapala Yantra	09/05	Department of Archaeology and Museums	Yes
A34	Print (Appendix II) and jpeg format images	Platform of Kapala Yantra with railings added	12/08	DRONAH	Yes

*Contact details of copyright owner*

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**7.b Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property**

Refer to Annexure III, IV, V, VI and VII

**7.c Form and date of most recent records or inventory of property**

The most recent record/inventory of the property is a photographic documentation carried out by the Department of Archaeology and Museums, Jaipur, Rajasthan. This documentation is a comparative before and after record with photographs of the site before the restoration work was begun and after the work was completed in 2007.

The record is attached as Annexure - II

**7.d Address where inventory, records and archives are held**

- Department of Art and Culture, Government of Rajasthan, Jaipur Rajasthan  
Tel: +91 141 2227400  
Fax: +91 141 2227210  
E-mail: dirarch\_raj@rediffmail.com
- City Palace Museum Archives, Jaipur, Rajasthan

## 7.e Bibliography

### *Books and Journals:*

1. Anand, MR, 'Jantar Mantar: Time, Space and Deity', *Homage to Jaipur*, Marg Publications, Bombay.
2. Kaye, GR 1918, *The Astronomical Observatories of Jai Singh*, Superintendent Government Printing, Calcutta.
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10. Tillotson, G 2006, *Jaipur Nama*, Penguin Books, New Delhi.
11. Volwahren, A 2001, *Cosmic Architecture in India*, Mapin Publishing Pvt. Ltd., Ahmedabad.

### *Websites/ Web-links References:*

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<http://cascoly.com/trav/china/astronomy.asp>.

<http://www.chinatoday.com/culture/abo/abo.htm> and

<http://www.chinapage.com/friend/goh/beijing/observatory/observatory.html>

<http://www.jantarmantar.org/>

<http://www.nmm.ac.uk/about/history/world-heritage-site/>

<http://www.planetquest.org/learn/chinese.html>

<http://sunearthday.nasa.gov/2005/locations/gaocheng.htm>

[http://www.tychobrahe.com/eng\\_tychobrahe/index.html](http://www.tychobrahe.com/eng_tychobrahe/index.html)

<http://depts.washington.edu/silkroad/cities/uz/samarkand/obser.html>





Contact information



## 8. Contact information of responsible authorities

---

### 8.a Preparer

**Name:** Dr. Shikha Jain

**Title:** Director, DRONAH

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**E-mail:** dronah@gmail.com

### 8.b Official Local Institution/Agency

**Organisation:** Department of Archaeology & Museums,

**Address:** Albert Hall, Ram Niwas Bagh,

**City, Province/State, Country:** Jaipur 302004 Rajasthan, India

**Tel:** +91 141-5182929

**Fax:** +91 141-2565124

**E-mail:** dirarch\_raj@rediffmail.com

**Website:** museumsrajasthan.gov.in

### 8.c Other Local Institutions

#### State Level Museum

- Government Central Museum (Albert Hall), Jaipur

#### Division Level Museums

- Government Museum, Udaipur
- Government Museum, Jodhpur
- Government Museum, Bikaner
- Government Museum, Kota
- Government Museum, Ajmer
- Government Museum (Hawa Mahal), Jaipur
- Government Museum, Bharatpur

#### District Level Museums

- Government Museum, Alwar

## Contact information of responsible authorities

- Government Museum, Dungarpur
- Government Museum, Chittorgarh
- Government Museum, Jaisalmer
- Government Museum, Pali
- Government Museum, Jhalawar
- Government Museum, Sikar

### **Local Museums**

- Government Museum, Ahar - Udaipur
- Government Museum, Mandor - Jodhpur
- Government Museum, Mt. Abu - Sirohi

### **Art Galleries**

- Art Gallery, Viratnagar - Jaipur

### **8.d Official Web address**

Currently not present, is proposed to be added as part of interpretation in the management plan.



Signature

---

*S. Ahmad*  
Principal Secretary



45, Secretariat, Jaipur-302 005 (Rajasthan)

Tel.: (Off.) 2227400, (Resi.) 2700606

Art, Literature & Culture  
Government of Rajasthan

9. Signature on behalf of the State Party

Signed (on behalf of State Party) —

**Principal Secretary,**  
**Art, Literature & Culture,**  
**Government of Rajasthan, Jaipur**

Full Name SALAHUDDIN AHMAD

Title PRINCIPAL SECRETARY,  
ART, LITERATURE & CULTURE  
DEPARTMENT, GOVT. OF RAJASTHAN,  
JAIPUR.

Date 29.12.2008





# Appendix I



General photographs of the site





Image 1

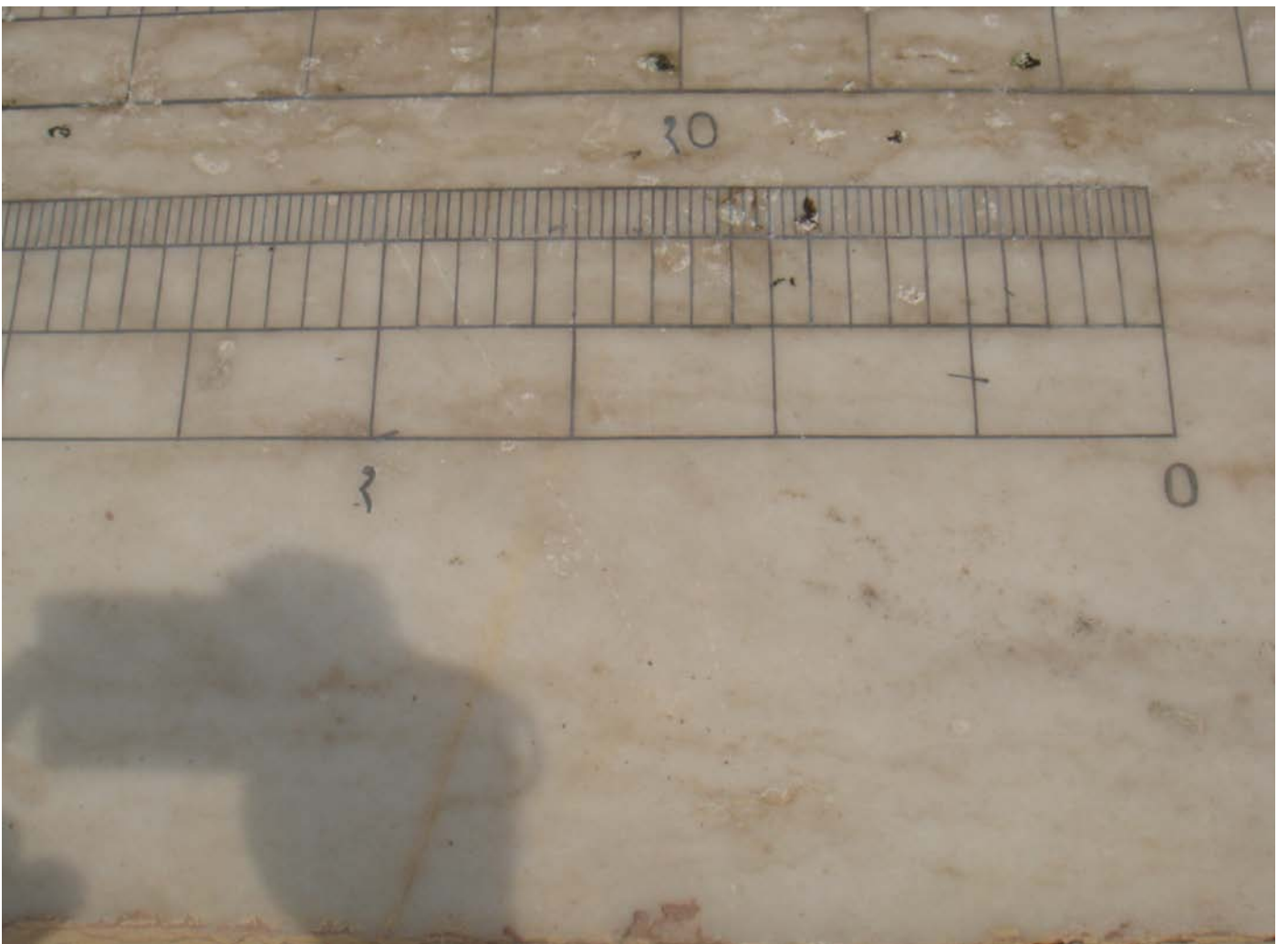


Image 2



Image 3



Image 4





Image 5



Image 6





Image 7



Image 8



Image 9



Image 10





Image 11



Image 12



Image 13



Image 14





Image 15

^ 28° 24



# Appendix II

Before after photographic documentation





**B1**



**A1**



**B2**



**A2**



**B3**



**A3**



**B4**



**A4**





**B5**



**A5**



**B6**



**A6**



**B7**



**A7**



**B8**



**A8**





**B9**



**A9**



**B10**



**A10**



**B11**



**A11**



**B12**



**A12**





**B13**



**A13**



**B14**



**A14**



**B15**



**A15**



**B16**



**A16**





**B17**



**A17**



**B18**



**A18**



**B19**



**A19**



**B20**



**A20**





**B21**



**A21**



**B22**



**A22**



**B23**



**A23**



**B24**



**A24**





**B25**



**A25**



**B26**



**A26**



**B27**



**A27**



**B28**



**A28**





**B29**



**A29**



**B30**



**A30**



**B31**



**A31**



**B32**



**A32**





**B33**



**A33**



**B34**



**A34**



# Appendix III

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Letters of authorisation for photographs



*S. Ahmad*  
Principal Secretary



सत्यमेव जयते

45, Secretariat, Jaipur-302 005 (Rajasthan)

Tel.: (Off.) 2227400, (Res.) 2700606

Art, Literature & Culture  
Government of Rajasthan

**AUTHORISATION**

1. I, **SALAHUDDIN AHMAD** the undersigned, hereby grant free of charge to UNESCO the non-exclusive right for the legal term of copyright to reproduce and use in accordance with the terms of paragraph 2 of the present authorization throughout the world the photograph(s) and/or slides(s) described in paragraph 4.
2. I understand that the photographs (s) and/or slide(s) described in paragraph 4 of the present authorization will be used by UNESCO to disseminate information on the sites protected under the World Heritage Convention in the following ways:
  - a) UNESCO publications;
  - b) co-editions with private publishing houses for World Heritage publications: a percentage of the profits will be given to the World Heritage Fund.
  - c) postcards – to be sold at the sites protected under the World Heritage Convention through national parks services or antiquities ( profits, if any, will be divided between the services in question and the World Heritage Fund);
  - d) slide series – to be sold to schools, libraries, other institution and eventually at the sites (profits, if any, will go to the World Heritage Fund);
  - e) exhibitions, etc.
3. I also understand that I shall be free to grant the same rights to any other eventual user but without any prejudice to the rights granted to UNESCO.
4. The list of photograph(s) and /or slide(s) for which the authorization is given is attached. (Please describe in the attachment the photographs and give for each a complete caption and the year of production or, if published, of first publication.)
5. All the photographs and or/slides will be duly credited. The photographer's moral rights will be respected. Please indicate the exact wording to be used for the photographic credit.
6. I hereby declare and certify that I am duly authorized to grant to the rights mentioned in paragraph 1 of the present authorization.
7. I hereby undertake to indemnify UNESCO, and to hold it harmless of any responsibility, for any damages resulting from any violation of the certification mentioned under paragraph 6 of the present authorization.
8. Any differences or disputes which may arise from the exercise of the rights granted to UNESCO will be settled in friendly way. Reference to courts or arbitration is excluded.

JAIPUR  
Place

9 JAN. 2009

date

Signature, title function of the duly authorized



## dronah



### **Development and Research Organization for Nature, Arts and Heritage**

A-258, South City-1, Gurgaon 122001 Haryana  
Tel: (0124) 2381067, 4082081 Fax: (0124) 4269081

email: [dronah@rediffmail.com](mailto:dronah@rediffmail.com), website: <http://www.dronah.org>

### **Letter of Authorisation**

1. I, Dr. Shikha Jain the undersigned, hereby grant free of charge to UNESCO the non-exclusive right for the legal term of copyright to reproduce and use in accordance with the terms of paragraph 2 of the present authorisation throughout the world the photograph(s) and/or slide(s) described in paragraph 4.

2. I understand that the photographs (s) and/or slide(s) described in paragraph 4 of the present authorisation will be used by UNESCO to disseminate information on the sites protected under the World Heritage Convention in the following ways:

- a) UNESCO publications;
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- c) Postcards - to be sold at the sites protected under the World Heritage Convention through national parks services or antiquities (profits, if any, will be divided between the services in question and the World Heritage Fund);
- d) slide series - to be sold to schools, libraries, other institution and eventually at the sites (profits, if any, will go to the World Heritage Fund);
- e) Exhibitions, etc.

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Dr. Shikha Jain  
Director, DRONAH



# Appendix IV

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Letters of support

95 Madison Avenue  
New York, NY 10016  
Telephone: 646 424 9594  
Fax: 646 424 9593  
www.wmf.org

# WORLD MONUMENTS FUND

January 12, 2009

To Whom It May Concern,

World Monuments Fund wishes to record its strong support for the nomination of Jantar Matar, Jaipur as a World Heritage Site by the Government of India.

Jantar Mantar, Jaipur represents the contribution of India to the field of astronomy and consequently to the world's astronomical heritage. Being unique, with one of the largest masonry sun dials in the world, it is also one of the most accurate pre-modern observatories and stands as a testimony to the medieval understanding of planetary and other cosmic movements.

The Government of Rajasthan has recently taken commendable initiatives to conserve and protect this site. A few of the important astronomical instruments have been meticulously restored since the site was declared on the World Monuments Watch List. We appreciate the conservation efforts made to enhance the cultural significance of Jantar Mantar, Jaipur and strongly believe that its nomination as a World Heritage Site will further help in protecting its Outstanding Universal Value.

Sincerely,



Bonnie Burnham  
President





January 9, 2009

To,  
The Director General,  
Archaeological Survey of India

**Jantar Mantar, Jaipur**

I write in support of the nomination of the Jantar Mantar site at Jaipur, India, to UNESCO's list of World Heritage sites. The Jantar Mantar at Jaipur is a unique ensemble of pre-telescopic masonry astronomical instruments. It was built in the early eighteenth century by Maharaja Jai Singh II as part of his interest in and contribution to the study of Zij astronomy. Besides, it represents the realization of an experimental approach that was the result of an interchange of ideas across South Asian, Central and West Asian and European cultures. This observatory was developed from precedents and instruments from places like Samarkand, Maragheh and Ray, some of which exist today, but only as archaeological remains.

The Jantar Mantar at Jaipur is one of five such ensembles of astronomical instruments patronized by Jai Singh II, the remaining four being at Delhi, Varanasi, Mathura and Ujjain. It was at Delhi that Jai Singh II began his experiments in astronomy. Indeed, historians believe that it was at the Jantar Mantar at Delhi that Jai Singh formulated some of his ideas for observation and instrumentation that were further deployed at Jaipur. But it was at Jaipur that these ideas were perfected. For instance, the Brhat Samrat Yantra at the Jantar Mantar at Jaipur is the largest existing equinoctial sun-dial in the world.

The Jantar Mantar at Jaipur functions both as a scientific as well as an educational institution, uniquely situated to measure celestial position and measurement. It is also a historico-cultural monument with a significance that extends well beyond astronomy into the realm of urban design. Some historians believe that when the new city of Jaipur was planned, its orientation was derived on the basis of observations conducted at instruments at the Jantar Mantar in Jaipur.

Designation of this site as a World Heritage Site would further facilitate interdisciplinary historical research in the fields of architecture and astronomy. I strongly believe that the Jantar Mantar at Jaipur has extraordinary significance as world heritage.

Sincerely,

A handwritten signature in cursive script, reading "Madhuri Desai", written in black ink on a white background.

Madhuri Desai

# ANNEXURE – I

MAPS

India Map

Topographic Map of Jaipur and its Surroundings

Site Plan with Surroundings

Plan of Jantar Mantar







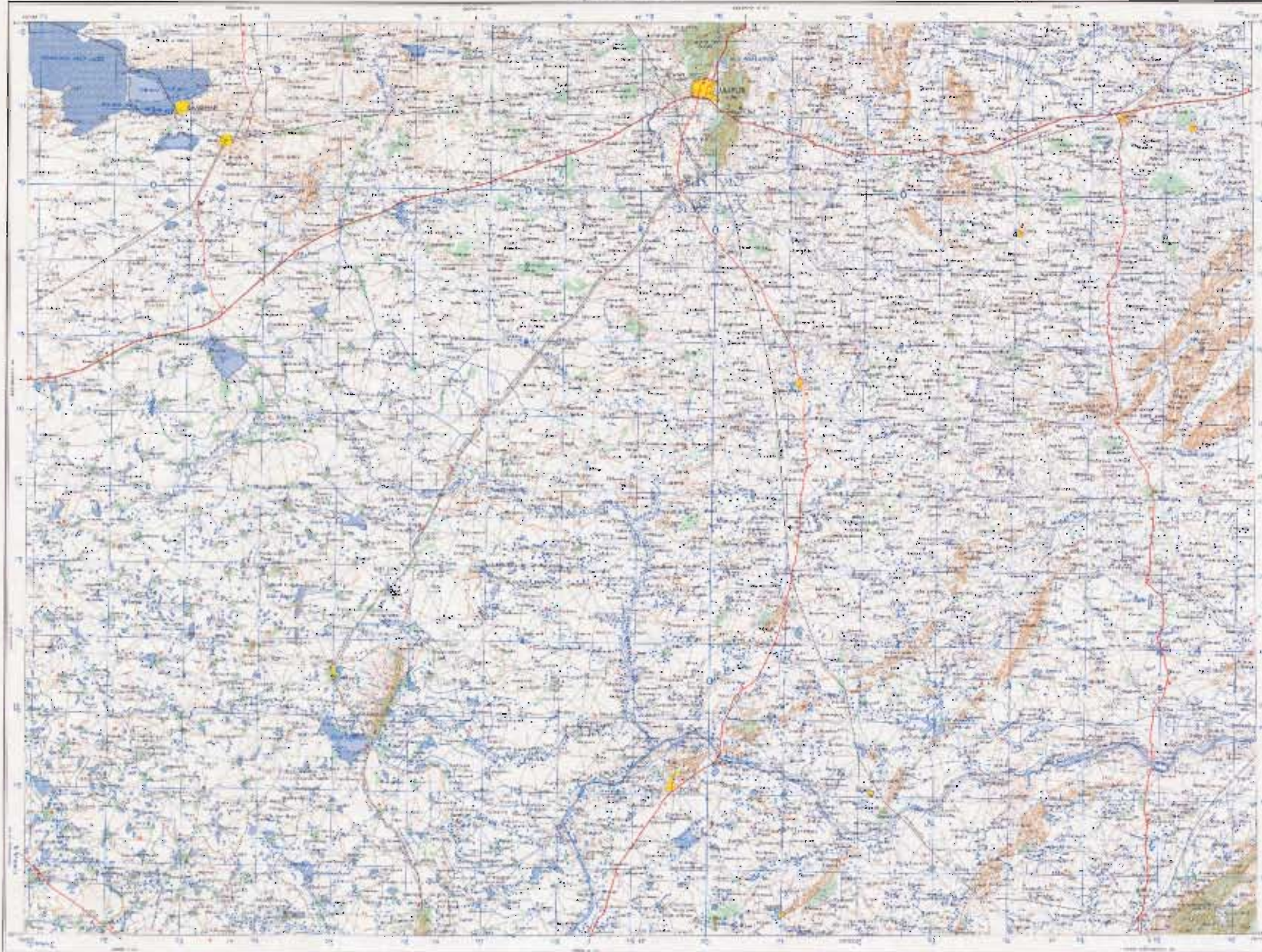


TABLE OF COORDINATES

UTM Zone	Easting	Northing
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000

**LEGEND**

Water: Blue

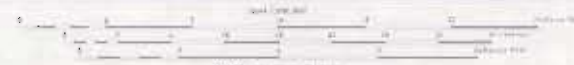
**ROADS**

- Expressway
- Highway
- Main Road
- Other Road

**RAILWAYS**

- Double Track
- Single Track
- Other

**Other symbols for buildings, vegetation, etc.**



CONTROLLER GENERAL OF THE SURVEY OF INDIA  
NEW DELHI

7  
2500  
4220  
95  
10 11 12 13 14  
10 11 12 13 14  
E 5 1 2 3 4  
306

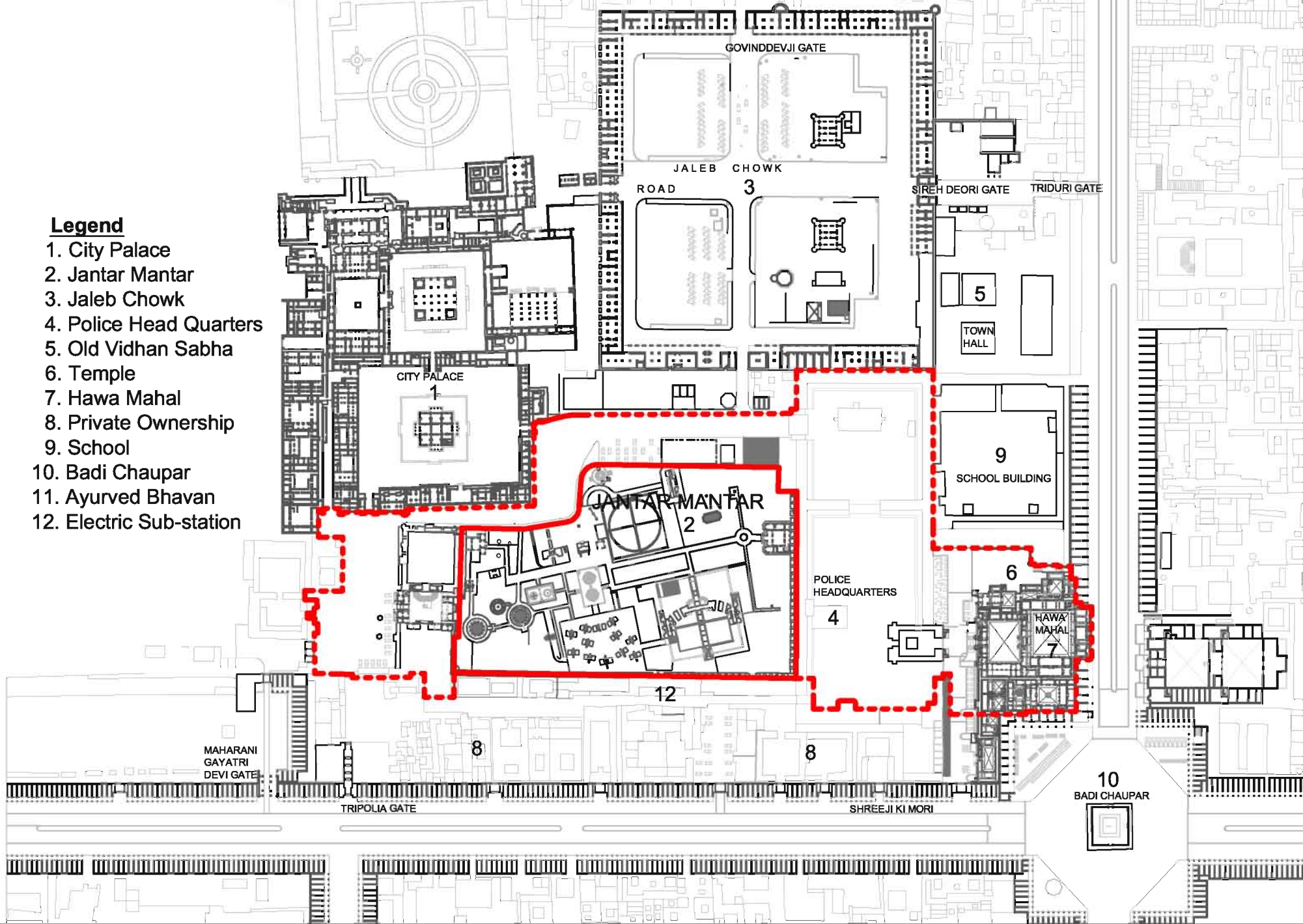
TABLE OF COORDINATES

UTM Zone	Easting	Northing
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000
43Q	100000	2000000



**Legend**

- 1. City Palace
- 2. Jantar Mantar
- 3. Jaleb Chowk
- 4. Police Head Quarters
- 5. Old Vidhan Sabha
- 6. Temple
- 7. Hawa Mahal
- 8. Private Ownership
- 9. School
- 10. Badi Chaupar
- 11. Ayurved Bhavan
- 12. Electric Sub-station

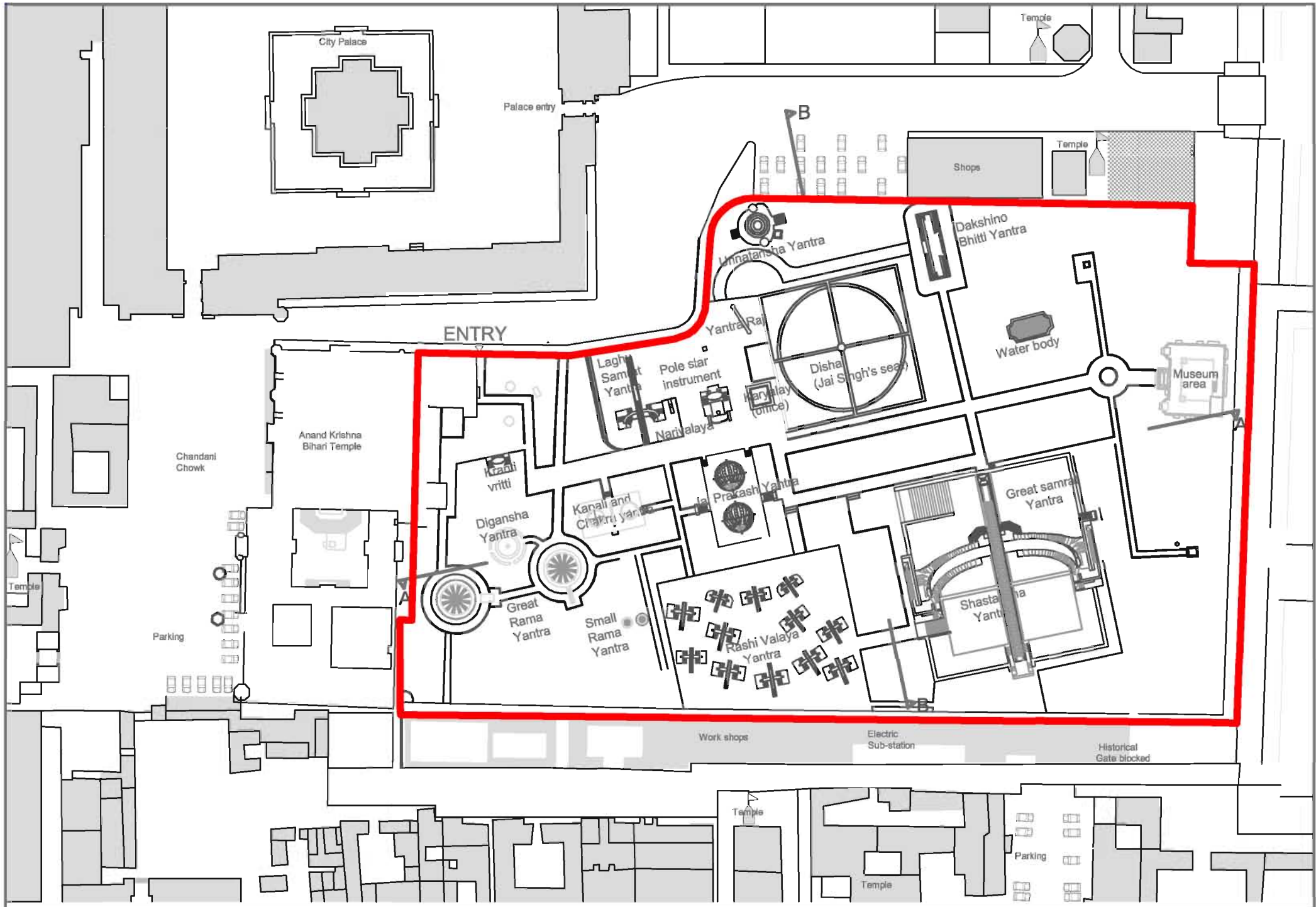


SCALE 1:1500

NOMINATED SITE WITH BUFFER ZONE  
LAYOUT PLAN

NOMINATED SITE AREA: 18652 SQ.M.

BUFFER ZONE AREA: 32445 SQ.M.



1:750

SITE PLAN

**NOMINATED SITE** AREA: 18652 SQ.M.

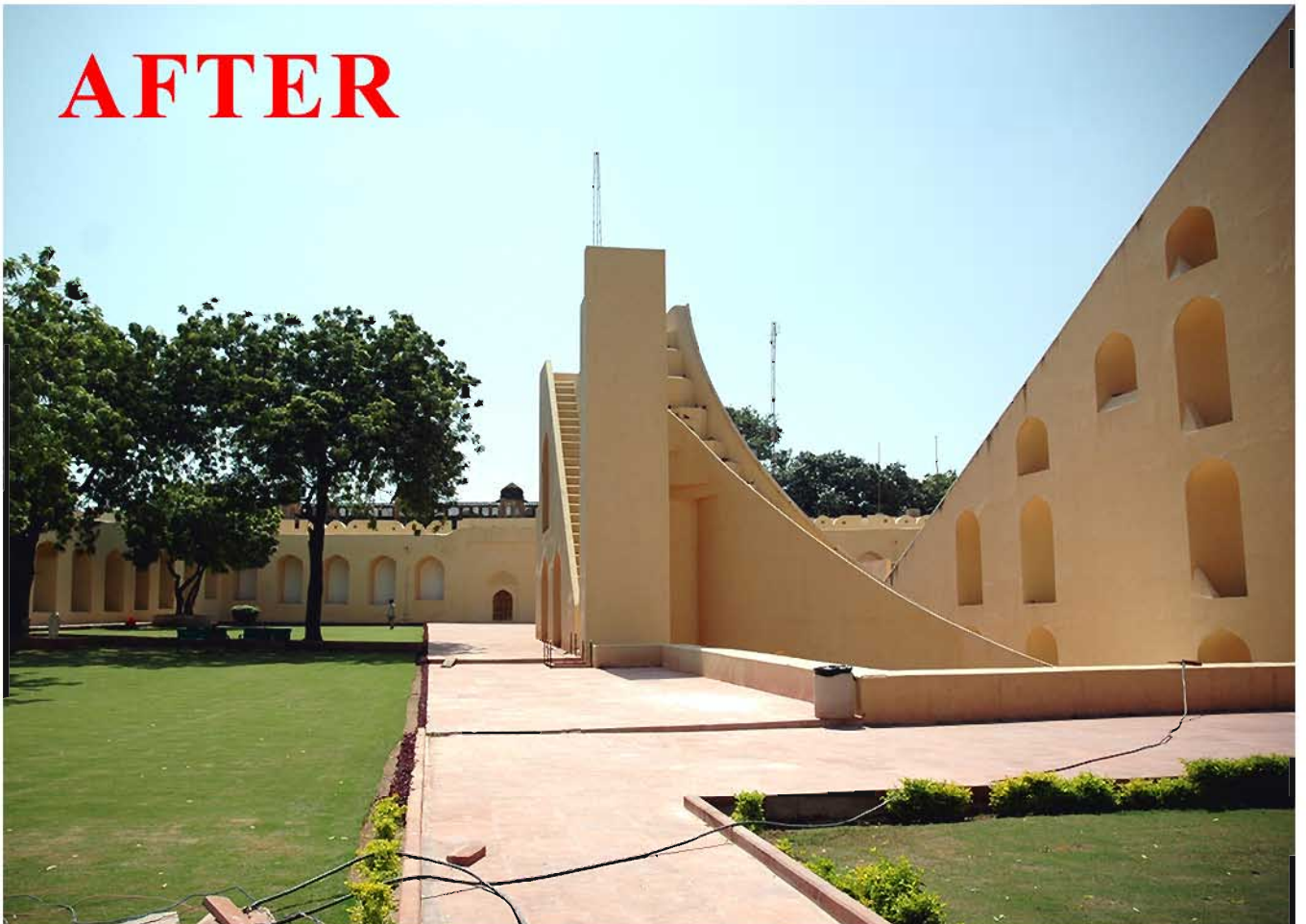


# **ANNEXURE – II**

Photographic Documentation Record by Department of Archaeology  
and Museums













**BEFORE**



**AFTER**



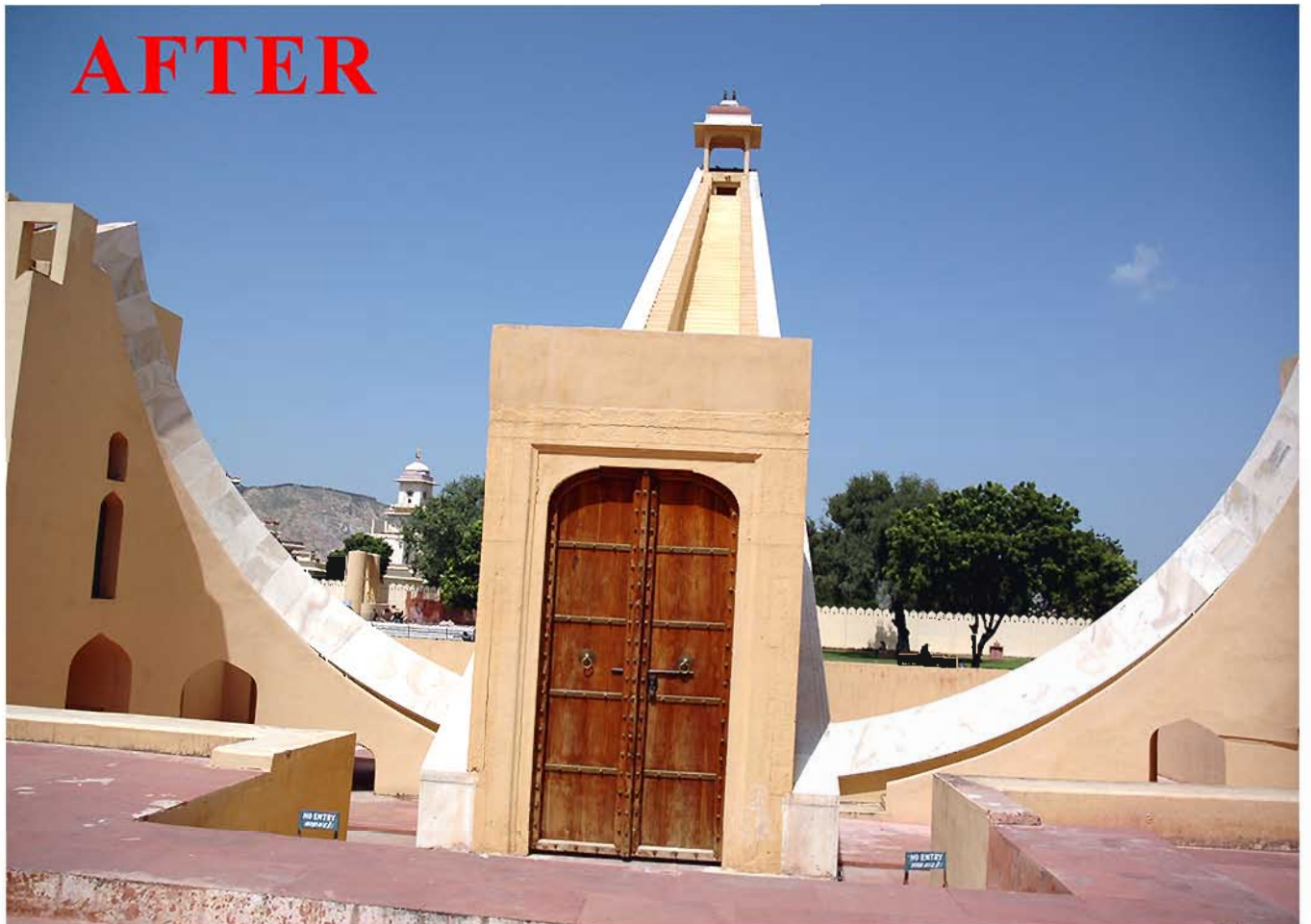
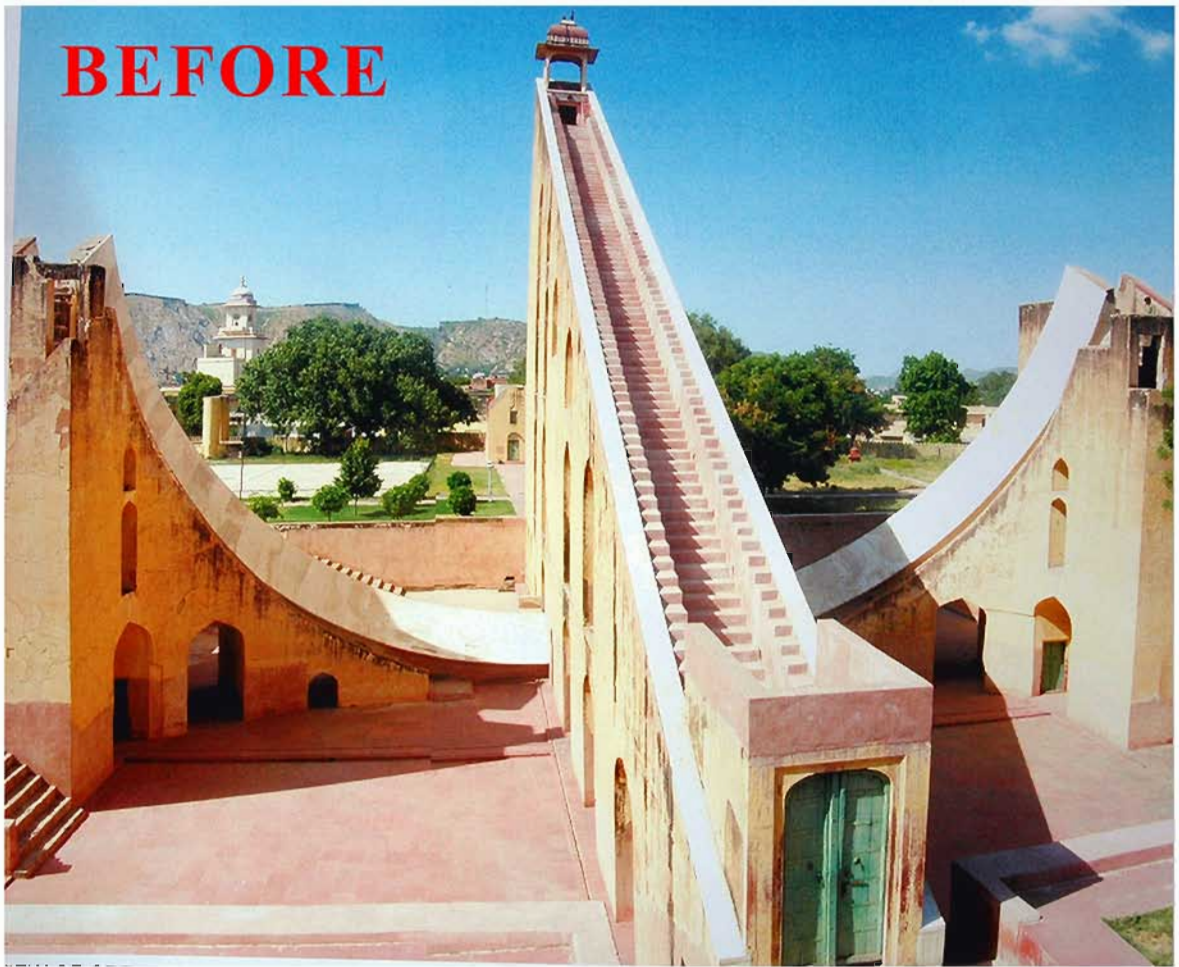






















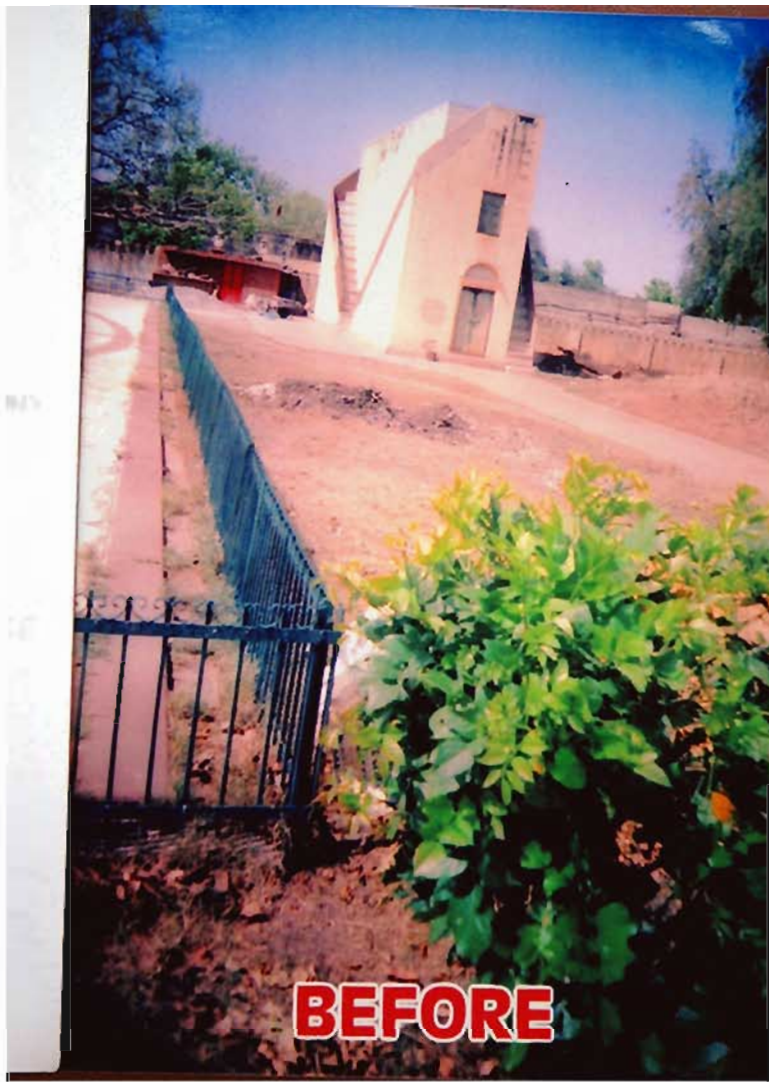
**BEFORE**



**AFTER**



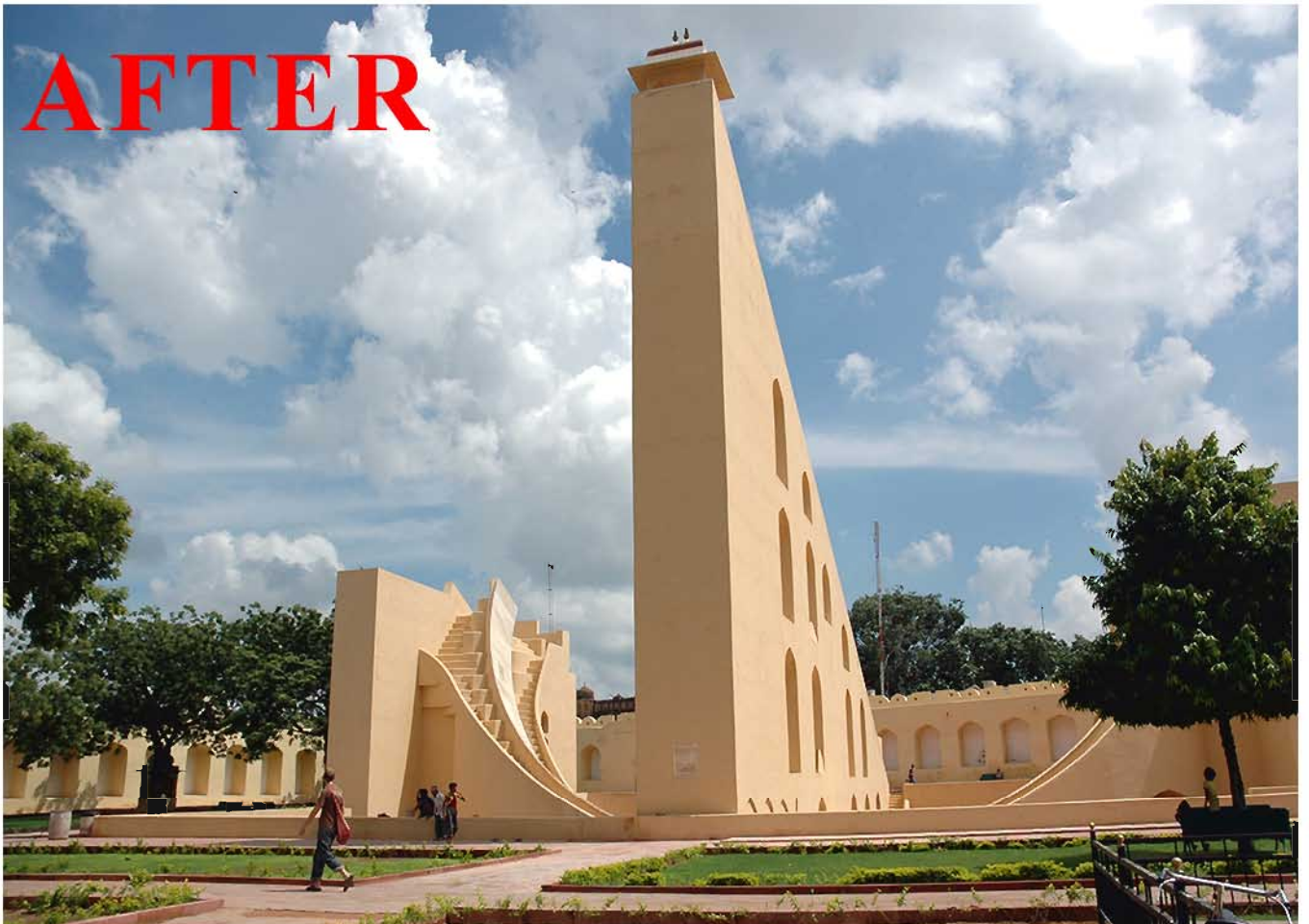


























**BEFORE**



**AFTER**



**BEFORE**



**AFTER**







**BEFORE**



**AFTER**





# **ANNEXURE – III**

The Rajasthan Monuments, Archaeological Sites and Antiquities (Act,  
1961)

–including ‘The Rajasthan Monuments Archaeological Sites and  
Antiquities Rules, 1968’

**(First published in the Rajasthan Gazette, Extraordinary, dated July 17, 1961, Part IV-A.)**

**LEGISLATIVE (I) DEPARTMENT  
NOTIFICATION  
Jaipur, July 13, 1961.**

No. F.4(36)LJ/A/57 – The following Act of the Rajasthan State Legislature received the assent of the President on the 22<sup>nd</sup> day of June, 1961, and is published for general information :-

**THE RAJASTHAN MONUMENTS, ARCHAEOLOGICAL SITES AND  
ANTIQUITIES (ACT, 1961)**

**(Act No. 19 of 1961)**

(Received the assent of the President on the 22<sup>nd</sup> day of June, 1961)

An

Act

to provide for the preservation, protection, upkeep, maintenance, acquisition and regulation of, and control over, ancient and historical monuments, archaeological sites and antiquities in the State of Rajasthan.

Be it enacted by the Rajasthan State Legislature in the Twelfth Year of the Republic of India as follows :-

**CHAPTER I**

**Preliminary**

1. Short title, extent and commencement.-

- (1) This Act may be called the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961.
- (2) It extends to the whole of the State of Rajasthan.
- (3) It shall come into force on such date as the State Government may, by notification in the Official Gazette, appoint.

2. Definitions-In this Act, unless the subject or context otherwise requires,-



- (i) "ancient or historical monument" means any archaeological building, structure, erection or monument or any tumulus, tomb or place of interment or any cave, rock-sculpture, rock-painting or sculpture of or on stone, metal, terracotta or other immovable object or any inscription or monolith, which is of historical, archaeological or artistic importance, interest or value, and includes –
- (a) any remains thereof,
  - (b) the site thereof,
  - (c) the portion of land adjoining such site which may be necessary or required for the preservation, protection, upkeep and maintenance of the same, and
  - (d) the means of access thereto and of convenient inspection and repairs thereof;
- but does not include an ancient monument as defined in the Central Act, to which the provisions of that Act apply for the time being;
- (ii) "antiquity" means –
- (a) any coin, sculpture, epigraph, manuscript, record, document, picture, painting, printed matter or other work of art or craftsmanship,
  - (b) any article, object or thing of historical, archaeological or artistic importance, interest or value, detached from a protected monument or collected from or discovered in a protected area;
  - (c) any article, object or thing illustrative of science, art, crafts, literature, religion, customs, morals or politics in bygone ages, and
  - (d) any other article, object or thing of historical, archaeological or artistic importance, interest or value,
- and includes any article, object or thing which the State Government may, by notification in the Official Gazette, declare, by reason of its historical or archaeological association, to be an antiquity for the purposes of this Act but does not include an antiquity as defined in the Central Act, to which the provisions of that Act apply for the time being;
- (iii) "archaeological officer" means an officer, of the Department of Archaeology of the State Government not below such rank as the State Government may from time to time prescribe;
- (iv) "archaeological site" means any mound indicating ancient habitation or any area which contains or is reasonably believed to contain ruins or relics of historical or archaeological importance, interest or value and includes –
- (a) any remains thereof,
  - (b) the site thereof,
  - (c) the portion of land adjoining such site which may be necessary or required for the preservation, protection, upkeep and maintenance thereof, and

- (d) the means of access thereto and of convenient inspection, repairs and excavation thereof,  
but does not include an archaeological site and remains as defined in the Central Act, to which the provisions of that Act apply for the time being;
- (v) "Central Act" means the Ancient Monuments and Archaeological Sites and Remains Act, 1958 (Central Act 24 of 1958) as amended from time to time ;
- (vi) "Director" means the Director of Archaeology and Museums of the State and includes any officer appointed by the State Government to perform the duties of the Director under this Act ;
- (vii) "maintain", with its grammatical variations and cognate expressions, includes the fencing, covering in, repairing, restoring and cleaning of an ancient or historical monument, an archaeological site or an antiquity or the doing of any act which may be necessary for the preservation, protection, upkeep or regulation of such monument, site or antiquity, or for securing convenient access thereto;
- (viii) "owner" used with reference to an ancient or historical monument, archaeological site or antiquity includes –
- (a) a joint owner invested with powers of management of or over such monument, site or antiquity on behalf of himself and other joint owners and the successor-in-title of any such owner, and
  - (b) any manager or trustee exercising powers of such management and the successor-in-office of any such manager or trustee;
- (ix) "Prescribed" means prescribed by rules made under this Act;
- (x) "Protected" when used with reference to an ancient or historical monument or an archaeological site, means such monument or site which may be declared by the State Government under section 3 to be a protected monument or a protected area; and
- (xi) "Protected antiquity" means an antiquity declared by the State Government under section 3 to be a protected antiquity and includes any article, object or thing referred to in sub-clause (b) of clause (ii).

### 3. Power to declare monuments etc. to be protected -

- (1) The State Government may declare for the purposes of this Act –
- (i) any ancient or historical monument to be a protected monument, or
  - (ii) any archaeological site to be a protected area, or
  - (iii) any antiquity to be a protected antiquity.
- (2) Before making any such declaration as is referred to in sub-section (1), the State Government shall, by notification in the Official Gazette give two month,s notice of its intention to do so and a copy of such notification along with a statement of the reasons for which such declaration is proposed to be made, shall be affixed in a conspicuous

place at or near the ancient or historical monument or the archaeological site which is proposed to be declared as protected or on or near the place where or in which such monument or the antiquity proposed to be declared as protected is for the time being.

- (3) Any person interested in any such monument, archaeological site or antiquity may, within two months after the publication of such notification in the Official Gazette, object to the proposed declaration.
- (4) On the expiration of the said period of two months the State Government may, after considering the objections, if any, received by it, declare by notification in the Official Gazette -
  - (i) an ancient or historical monument to be a protected monument, or
  - (ii) an archaeological site to be a protected area, or
  - (iii) an antiquity to be a protected antiquity.
- (4A\*) Notwithstanding anything contained in Sub-Sections (2) and (3), where the State Government is satisfied with respect to any monument, archaeological site or antiquity, that there is immediate danger of its removal or destruction, it may instead of proceeding under the said sub-sections, by Notification in the official Gazette and for reasons of its satisfaction to be recorded in such notification, forth with make a declaration under clauses (i), (ii) or (iii), as the case may be, of sub-section (4) in respect of any such monument, archaeological site or antiquity :

Provided that any person interested in any such monument, archaeological site or antiquity may within two months after the publication of such notification object to the declaration so made and the State Government after giving to such person an opportunity of being heard, may by order in writing dismiss the objection or withdraw the notification."; and (ii) in sub-section (5), after the expression "under sub-section (4)", the expression "or under sub-section (4A)" shall be inserted.

#### 4. Repeal and savings –

- (1) The Rajasthan Monuments, Archaeological Sites and Antiquities (Amendment) Ordinance, 1975 (Rajasthan Ordinance No. 29 of 1975) is hereby repealed.
- (2) Notwithstanding such repeal, anything done or action taken under the principal Act as amended by the said Ordinance shall be deemed to have been done or taken under the principal Act as amended by this Act.

---

\* Inserted by Law Department Notification No. F.2(48)Vidhi/75 dated 24 January, 1976. (Published in Exo. Gazette dt. 24.1.1976.

\* This Act may be called the Rajasthan Monuments, Archaeological Sites and Antiquities (Amendment) Act, 1976.



5. A notification published under sub-section (4) shall, unless and until it is withdrawn, be conclusive evidence of the fact that the ancient or historical monument, archaeological site or antiquity to which it relates is a protected monument, a protected area or a protected antiquity for the purposes of this Act.

## **CHAPTER II**

### **Protected Monuments.**

4. Acquisition of rights in or guardianship of a protected monument-
  - (1) The director may, with the sanction of the State Government, purchase or take a lease of, or accept a gift or bequest of any protected monument.
  - (2) Where a protected monument is without an owner, the Director may, by notification in the Official Gazette, assume the guardianship of such monument.
  - (3) The owner of any protected monument may, by written instrument, constitute the Director to be the guardian of such monument and the Director may, with the sanction of the State Government, accept such guardianship.
  - (4) When the Director has accepted the guardianship of a protected monument under sub-section (3), :-
    - (a) The owner shall, except as expressly provided in this Act, have the same estate, right, title and interest in or to the monument as if the Director had not been constituted a guardian thereof; and
    - (b) the provisions of this Act relating to agreements executed under section 5, shall apply to the written instrument executed under the said sub-section.
  - (5) Nothing in this section shall affect the use of any protected monument for customary religious observances.
5. Preservation of protected monument by agreement –
  - (1) The Collector, when so directed by the State Government, shall propose to the owner of a protected monument to enter into an agreement with the State Government within a specified period for the maintenance and upkeep of the monument.
  - (2) An agreement under this section may provide for all or any of the following matters, namely :-
    - (a) the maintenance and upkeep of the monument;
    - (b) the custody of the monument and the duties of any person who may be employed to watch it;
    - (c) the restriction of the owner's right –
      - (i) to use the monument for any purpose, or
      - (ii) to charge any fee for entry into, or inspection of, the monument, or

- (iii) to destroy, injure, mutilate, deface, alter, repair, remove or disperse the monument or to allow it to fall into decay, or
  - (iv) to build on or near the site of the monument;
- (d) the facilities of access to be permitted to the public or any section thereof or to archaeological officers or to persons deputed by the owner or any archaeological officer or the Collector to inspect or maintain the monument.
  - (e) the notice to be given to the State Government in case the land on which the monument is situated or any adjoining land is offered for sale by the owner, and the right to be reserved to the State Government to purchase such land, or any specified portion of such land, at its market value;
  - (f) the payments of any expenses incurred by the owner or by the State Government in connection with the maintenance and upkeep of the monument;
  - (g) the proprietary or other rights which are to vest in the State Government in respect of the monument when any expenses are incurred by the State Government in connection with the maintenance and upkeep of the monument;
  - (h) the appointment of an authority to decide any dispute arising out of the agreement; and
  - (i) any matter connected with the maintenance and upkeep of the monument which is a proper subject of agreement between the owner and the State Government.
3. The terms of an agreement under this section may be altered from time to time by the State Government with the consent of the owner.
  4. The State Government or the owner may, at any time after the expiration of three years from the date of execution of an agreement under this section, terminate it on giving six month's notice in writing to the other party:

Provided that, where the agreement is terminated by the owner he shall pay to the State Government the expenses, if any, incurred by it on the maintenance and upkeep of the monument during the five years immediately preceding the termination of the agreement or, if the agreement has been in force for a shorter period, during the period the agreement was in force.

5. An agreement under this section shall be binding on any person claiming to be the owner of the monument to which it relates, from, through or under a party by whom or on whose behalf the agreement was executed.
6. Owners under disability-

- (1) In case of the owner of a protected monument being unable, by reason of infancy or other disability, to act for himself, the person legally competent to act on his behalf, and, in case of village property, the lambardar or other village-officer exercising powers of management of or over such property, may exercise the powers conferred upon an owner by section 5.
  - (2) Nothing in this section shall be deemed to empower any person not being of the same religion as the person on whose behalf he is acting to make or execute an agreement relating to a protected monument which or any part of which is periodically used for the religious worship or observances of that religion.
7. Failure or refusal to enter into agreement-
  - (1) If any owner or other person competent to enter into an agreement under section 5 for the maintenance and upkeep of a protected monument refuses or fails to enter into such an agreement, the State Government may make an order providing for all or any of the matters specified in sub-section (2) of section 5.
  - (2) No order under sub-section (1) shall be made unless the owner or other person has been given an opportunity of making a representation in writing and being heard against the proposed order.
  - (3) Every order made under sub-section (1) shall be binding on the owner or such other person and on every person claiming title to the monument from, through or under the owner or such other person.
  - (4) When an order made sub-section (1) provides that the monument shall be maintained by the owner or other person competent to enter into an agreement, all reasonable expenses for the maintenance and upkeep of the monument shall be payable by the State Government.
8. Application of endowment to repair protected monument-
  - (1) If any owner or other person competent to enter into an agreement under section 5 for the maintenance and upkeep of a protected monument refuses or fails to enter into such an agreement, and if any endowment has been created for the purpose of keeping such monument in repair or for that purpose among others, the State Government may institute a suit in the court of the district judge, or, if the estimated cost of repairing the monument does not exceed one thousand rupees, may make application of such endowment or part thereof.
  - (2) On the hearing of an application under sub-section (1), the district judge may summon and examine the owner and any person whose evidence appears to him necessary and may pass an order for the proper application of the endowment or of any part thereof, and any such order may be executed as if it were a decree of a civil court.



9. Enforcement of agreements-

- (1) If an owner or other person who is bound by an agreement for the maintenance and upkeep of a protected monument under section 5 refuses or fails, within such reasonable time as the Director may fix, to do any act which in the opinion of the Director is necessary for the maintenance and upkeep of the monument, the Director may authorise any person to do any such act, and the owner or other person shall be liable to pay the expenses of doing any such act or such portion of the expenses as the owner may be liable to pay under the agreement.
- (2) If any dispute arises regarding the amount of expenses payable by the owner or other person under sub-section (1), it shall be referred to the State Government whose decision shall be final.

10. Power to make order prohibiting contravention of agreement-

- (1) If the Director apprehends to the owner or occupier of a protected monument intends to destroy, injure, mutilate, deface, alter, disperse, remove, imperil or misuse the monument or to allow it to fall into decay or to build on or near the site thereof in contravention of the terms of agreement under section 5, he may, after giving such owner or occupier an opportunity of making a representation in writing, make an order prohibiting any such contravention of the agreement :

Provided that no such opportunity may be given in any case where the Director, for reasons to be recorded, is satisfied that it is not expedient practicable to do so.

- (2) Any person aggrieved by an order made under sub-section (1) any appeal to the State Government within such time and in such manner as may be prescribed and the decision of the State Government shall be final.

11. Purchasers and persons claiming through owner bound instrument- Every person who purchases any land on which is situated a protected monument in respect of which any instrument has been executed by the owner for the time being under section 4 or section 5, and every person claiming any right, title or interest to or in a monument from, through or under an owner who executed any such instrument, shall be bound by such instrument.

12. Acquisition of protected monument –

- (1) If the State Government apprehends that a protected monument is in danger of being destroyed, injured, mutilated, defaced, altered, dispersed, removed, misused or allowed to fall into decay, the State Government may acquire it under and in accordance with the provisions of the Rajasthan Land Acquisition Act, 1953 (Rajasthan Act 24 of 1953) as if the

preservation, maintenance and upkeep of the monument were a public purpose within the meaning of that Act.

- (2) No protected monument shall be acquired under sub-section –
- (a) If such monument or any part of it is periodically used for religious observances, or
  - (b) If such monument is the subject of a subsisting agreement executed under section 4 or section 5, and
  - (c) unless the owner or other person competent to enter into an agreement under section 5 has failed to enter into an agreement proposed to him by the Collector under sub-section (1) of section 5 within the period specified in such proposal, or
  - (d) unless such owner or other person has terminated or given notice of his intention to terminate an agreement made under section 5.
13. Maintenance of certain protected monuments –

(1) The State Government shall maintain every monument which has been acquired under section 12 or in respect of which any of the rights mentioned in section 14 have been acquired.

(2) When the Director has assumed or accepted the guardianship of a protected monument under section 4, he shall, for the purpose of the maintenance and upkeep of such monument, have access to the monument at all reasonable times, by himself and by his agents, subordinates and workmen, for the purpose of inspecting and repairing the monument and for the purpose of bringing such materials and doing such acts as he may consider necessary or desirable for the maintenance and upkeep thereof.

**"13A. Power to enter into agreement for the maintenance of certain monument.-** (1) The State Government may, for the purposes of maintenance of a monument falling under section 13, enter into an agreement with any person, firm or trust on such terms and conditions, not inconsistent with the provisions of this Act, as may be specified in the agreement.

(2) Notwithstanding anything contained in section 20A, the person, firm or trust referred to in sub-section (1) shall be entitled to collect and retain the whole or such portion of the fee leviable under section 20A and for such period, as may be agreed upon between the State Government and such person, firm or trust, having regard to the expenditure involved in the maintenance of the monument and collection of fee, interest on the capital invested, reasonable return on the investment and the volume of visitors".

14. Voluntary contributions –

The Director may receive voluntary contributions towards the cost of maintaining a protected monument and may give orders as to the management and application of any funds so received by him :

Provided that no contribution received under this section shall be applied to any purpose other than the purpose for which it was contributed.

15. Protection of place of worship from misuse, pollution or desecration –
- (1) A protected monument maintained by the State Government under this Act which is a place of worship or shrine shall not be used for any purpose inconsistent with its character.
  - (2) Where the State Government has acquired a protected monument under section 12, or where the Director has purchased, or taken a lease, or accepted a gift or bequest or assumed or accepted guardianship of, a protected monument under section 4, and such monument or any part thereof is used for religious worship or observances by any community, the Collector shall make due provision for the protection of such monument or part thereof from pollution or desecration –
    - (a) by prohibiting the entry therein, except in accordance with the conditions prescribed with the concurrence of the persons, if any, in religious charge of the said monument or part thereof, of any person not entitled so to enter by the religious usages of the community by which the monument or part thereof is used, of
    - (b) by taking such other action as he may think necessary in this behalf.
16. Relinquishment of rights in a protected monument- With the sanction of the State Government, the Director may :-
- (a) Where rights have been acquired in respect of any monument under this Act by virtue of any sale, lease, gift or will, relinquish, by notification in the official Gazette, the rights so acquired to the person who would for the time being be the owner of the monument as if such rights had not been acquired; or
  - (b) relinquish any guardianship of a monument which he has accepted or assumed under this Act.
17. Penalties –
- (1) Whoever –
    - (i) destroys, injures, mutilates, defaces, alters, removes, disperses, misuses, imperils or allows to fall into decay a protected monument, or
    - (ii) removes from a protected monument any sculpture, carving image, bas-relief, inscription or other like object,shall be punishable with imprisonment for a term which may extend to six months with fine which may extend to five thousand rupees or with both.
  - (2) Whoever –



- (i) being the owner or occupier of protected monument, contravenes an order made under section 7 or section 10, or
- (ii) contravenes any other provision of this chapter for which contravention no punishment is provided for elsewhere therein, shall be punishable with the like punishment.

18. Power to control mining etc. near protected monuments –

- (1) If the State Government is of opinion that mining, quarrying, excavating, blasting and other operations of a like nature should be restricted or regulated monument, the State Government may, by notification in the Official Gazette, make rules –
  - (a) fixing the boundaries of the area to which the rules are to apply,
  - (b) forbidding the carrying on of mining, quarrying, excavating, blasting or other operation of a like nature except in accordance with such rules and otherwise than under and in accordance with terms of a license, and
  - (c) prescribing the authority by which, and the terms on which licenses may be granted to carry on any of the said operations.
- (2) A rule made under this section may provide that any person committing a breach thereof shall be punishable with fine which may extend to two hundred rupees.

19. Preservation of amenities of or to protected monuments –

- (1) If the State Government is of opinion that for the purpose of preserving amenities to or of any protected monument it is necessary so to do, the State Government may, by notification in the Official Gazette, in respect of any area comprising or adjacent to the site of such monument and specified in such notification (hereinafter referred to as the controlled area).
  - (a) prohibit or restrict the construction, erection or execution of buildings, structures and other works above ground within the controlled area, or the alteration or extension of any such buildings, structures or works in such manner as materially to affect their external appearance ;
  - (b) prescribe the position, height, size, design, materials, colour and screening, and otherwise regulate the external appearance, of buildings, structures and other works above ground within the controlled area ;
  - (c) require any local authority –
    - (i) to construct any approach road to any protected monument, or
    - (ii) to demolish any place of public convenience vesting in it, that is to say a latrine, urinal, dustbin and the like, located close to in the vicinity of any protected monument ;
  - (d) prohibits or restrict the falling of trees with in the controlled area;
  - (e) otherwise restrict the user of land within the controlled area to such extent as may appear to the State Government to be expedient for the purpose of preserving the amenities to or of the protected monument;

- (f) provide for such matters as appear to the State Government to be incidental to or consequential on the foregoing provisions of this section or to be necessary for giving effect to those provisions.
- (2) Not less than forty-five days before issuing a notification under sub-section (1) the State Government shall cause to be published in the Official Gazette, in the controlled area and in the village and as the headquarters of the tehsil in which the controlled area is situated a notification stating that it proposes to issue a notification in terms of sub-section (1), together with a notice requiring all persons affected by such notification, who wish to make any objections to the issuing of such a notification, to submit their objections in writing to the State Government or to appear before any officer duly authorised in that behalf to hear objections on behalf of the State Government, within one month of the publication of the notification in the Official Gazette or within fifteen days from the date of the publication of the notification in the controlled area, whichever period expires later.
- (3) If, before the expiration of the time allowed by sub-section (2) for the filling of objections, no objections has been made, the State Government shall proceed at one to issue the notification under sub-section (1) If any such objection has been made, the State Government, after all the objections have been considered or heard, as the case may be, may either –
- (a) abandon the proposal to issue the notification (1), or
- (b) issue the notification under sub-section (1) with such modification as it thinks fit.
- (4) In considering the objections, the decision of the State Government on the question of issuing the notification under sub-section (1) shall be final and conclusive.
- (5) Nothing contained in any notification under sub-section (1) shall affect any building, structure or other work above ground or any alteration or extension thereof, if it was constructed, erected or executed before the date when notice of intention to issue a notification was given under sub-section (2), and for the purpose of this provision a building, structure or other work and any alteration or extension thereof shall be deemed to have been constructed, effected or executed before that date –
- (a) if its construction, erection or execution was begun before that date, or
- (b) if and so far as its construction, erection or execution was necessary for the purpose of performing a contract made before that date.
- (6) If any person contravenes any of the provisions of a notification issued under sub-section (1), he shall, on conviction, be punished with fine not exceeding one hundred rupees for every day on which the contravention occurs or continues.
- (7) If, after any person has been convicted under sub-section (6) by reason of the fact that any building, structure or other work is not in conformity with

the provisions of the notification issued under sub-section (1), the contravention continues after the expiration of such period as the court before whom he was convicted may determine, the State Government shall have power to do all such acts as in its opinion are necessary for removing so much of the building, structure or work as is not in conformity with the provisions of the notification aforesaid for making it conform with the provisions of the notification and any recoverable as an arrear of land revenue from the person convicted.

20. Right of access to protected monuments –

- (1) Subject to any rules made under this Act, the public shall have a right of access to every protected monument.
- (2) In making any rule under sub-section (1) the State Government may provide that a breach of it shall be punishable with fine which may extend to one hundred rupees.

**"20A. Power to entrance fee.-** (1) The State Government may, by notification in the Official Gazette, levy entrance fee in respect of such protected monuments, and at such rates not exceeding two thousand five hundred rupees per head, as may be specified in such notification :-

Provided that if the State Government is of the opinion that it is expedient in the public interest so to do, it may by like notification, exempt, wholly or partly, any class of persons from the payment of entrance fee.

(2) Such entrance fee when so levied shall be collected in accordance with the rules made under this Act".

## **CHAPTER III**

### **Protected Areas**

21. Acquisition of a protected area –

If the State Government is of opinion that any protected area contains an ancient or historical monument or antiquities of historical, archaeological or artistic importance, interest or value, it may acquire such area under and in accordance with the provisions of the Rajasthan Land Acquisition Act, 1953 (Rajasthan Act 24 of 1953) as if the acquisition thereof were for a public purpose within the meaning of that Act.

22. Restrictions on property rights in protected areas -

- (1) No person including the owner or occupier of a protected area, shall construct any building within the protected area or carry on any mining, quarrying, excavating, blasting or any operation of like nature in such area, or utilise such area or any part thereof in any other manner without the permission of the State Government;



Provided that nothing in this sub-section shall be deemed to prohibit the use of any such area or part thereof for purposes of cultivation if such cultivation does not involve the digging of not more than one foot of soil from the surface.

- (2) The state Government may, by order, direct that any building constructed by any person within a protected area in contravention of the provisions of sub-section (1) shall be removed within a specified period and, if the person refuses or fails to comply with the order, the Collector may cause the building to be removed and the person shall be liable to pay the cost of such removal.

23. Excavations for archaeological or historical purposes –

- (1) An archaeological officer or an officer authorised by him in this behalf or any person holding a license granted in this behalf in the prescribed manner under this Act (hereinafter referred to as the licensee) may, after giving notice in writing to the Collector and the owner, enter upon and make excavations in any protected area.
- (2) Where an archaeological officer has reason to believe that any area not being a protected area contains ruins or relics of historical or archaeological importance, he or an officer authorised by him in this behalf may, after giving notice in writing to the Collector and the owner, enter upon and make excavations in the area.

24. Restrictions on excavations –

- (1) Notwithstanding anything contained in section 23, no excavation or other like operation for archaeological or historical purposes shall be undertaken or authorised to be undertaken in any area except with the previous approval of the Central Government and in accordance with such rules and directions, if any, as the Central Government may make or give in this behalf.
- (2) Where, in the exercise of the power conferred by section 22, the rights of any person are infringed by the occupation or disturbance of the surface of any land, the State Government shall pay to that person compensation for such infringement.

25. Disposal of Antiquities etc. discovered during excavations –

- (1) Where, as a result of any excavations made in any area under section 23, any antiquities are discovered, the archaeological officer or the licensee, as the case may be, shall –
  - (a) as soon as practicable, examine such antiquities and submit a report to the State Government in such manner and containing such particulars as may be prescribed, and

- (b) at the conclusion of the excavation operations, give notice in writing to the owner of the land, from which such antiquities have been discovered, of the nature of such antiquities.
  - (2) All such antiquities shall be deemed to be protected antiquities and, until orders of the State Government as to the disposal or compulsory purchase thereof are received, the archaeological officer of the licensee as the case may be, shall keep them in such safe custody as he may deem fit.
  - (3) On receipt of a report under sub-section (1) the State Government may make an order for the compulsory purchase of any such antiquities at their market value.
  - (4) When an order for the compulsory purchase of any antiquities is made under sub-section (3), such antiquities shall vest in the State Government with effect from the date of the order.
26. Contraventions of chapter – Whoever does any act in contravention of the provisions of this chapter, for which contravention no punishment is provided for elsewhere therein, shall be punishable with imprisonment for a term which may extend to six months or with fine which may extend to five thousand rupees or with both.
27. Regulation of excavations in protected areas –
- (1) The State Government may make rules –
    - (a) prescribing the authorities by whom licenses to excavate for archaeological and historical purpose in a protected area may be granted ;
    - (b) regulating the conditions on which such licenses may be granted the form of such licenses and the taking of security from licensees;
    - (c) prescribing the manner in which antiquities found by a licensee shall be disposed of; and
    - (d) generally to carry out the purposes of this chapter.
  - (2) Such rules may be general for all protected areas for the time being or may be special for any particular protected area or areas and may provide that any person committing a breach of any rule or of any condition of a license shall be punishable with fine which may extend to five thousand rupees, and may further provide that, where the breach has been by the agent or servant of a licensee, the licensee himself shall be punishable.

## CHAPTER IV

### Protected Antiquities

28. Power of Government to control movement of protected antiquities –
- (1) If the State Government considers that any protected antiquities or class of protected antiquities ought not to be moved from the place where they are without the sanction of the State Government, the State Government may, by notification in the Official Gazette, direct that any such protected antiquity or any class of such protected antiquities shall not be moved except with the written permission of the Director.
  - (2) Every application for permission under sub-section (1) shall be in such form and contain such particulars as may be prescribed.
  - (3) Any person aggrieved by an order refusing permission may appeal to the State Government whose decision shall be final.
  - (4) Any person who moves any protected antiquity in contravention of a notification issued under sub-section (1) shall be punishable with fine which may extend to five hundred rupees.
  - (5) If the owner of any property proves, to the satisfaction of the State Government, that he has suffered any loss or damage by reason of the inclusion of such property in a notification issued under sub-section (1), the State Government may –
    - (a) exempt such property from the said notification, or
    - (b) purchase such property at its market value, or
    - (c) pay compensation for any loss or damage sustained by the owner of such property.
29. Purchase of protected antiquities by Government –
- (1) If the State Government apprehends that any antiquity mentioned in a notification issued under sub-section (1) of section 28 is in danger of being destroyed, injured, mutilated, defaced, altered, removed, dispersed, misused or allowed to fall into decay or is of opinion that by reason of its historical or archaeological or artistic importance it is desirable to preserve such antiquity in a public place, the State Government may make an order for the compulsory purchase of such antiquity at its market value and the Collector shall thereupon give notice to the owner of the antiquity to be purchase.

Provided that the power of purchase given by this sub-section shall not extend to any image or symbol actually used for bonafide religious observations.



- (2) Where a notice of compulsory purchase is issued under sub-section (1) in respect of any antiquity such antiquity shall vest in the State Government with effect from the date of the notice.

## **CHAPTER-V**

### **Miscellaneous**

30. Constitution of an Advisory Board –
  - (1) For the purpose of advising the State Government in the matter of the preservation, maintenance, upkeep, protection, acquisition, regulation and control of ancient or historical monuments, archaeological sites and antiquities in the State, the State Government may constitute an Advisory Board under the name of the Rajasthan Board for ancient Monuments, Archaeological Sites and Antiquities.
  - (2) The constitution of the Advisory Board and the procedure regarding its work shall be such as may be prescribed.
31. Compensation for loss or damage – Any other or occupier of land who has sustained any loss or damage or any diminution of profits from the land by reason of any entry on, or excavations in, such land or the exercise of any other power conferred by this Act shall be paid compensation by the State Government for such loss, damage or diminution of profits.
32. Assessment of market value or compensation –
  - (1) The market value of any property which the State Government is empowered to purchase at such value under this Act or the compensation to be paid by the State Government in respect of anything done or any property acquired under this Act shall, where any dispute arises in respect of such market value or compensation, be ascertained in the manner provided in the provisions of the Rajasthan Land Acquisition Act, 1953 (Rajasthan Act 24 of 1953) in so far as those provisions can be made applicable :

Provided that, when making an inquiry under that Act, the Collector shall be assisted by two assessors, one of whom shall be a competent person nominated by the State Government and the other a person nominated by the owner, or, in case the owner fails to nominate an assessor within such reasonable time as may be fixed by the Collector in this behalf, by the Collector.

- (2) Notwithstanding anything contained in sub-section (1) or in the Rajasthan Land Acquisition Act, 1953 (Rajasthan Act 24 of 1953), in determining the market value of any antiquity in respect of which an order for compulsory purchase is made under sub-section (3) of section 25 or under sub-section (1) of section 29, any increase in the value of the antiquity by

reason of its being of historical, archaeological or artistic importance, interest or value shall not be taken into consideration.

33. Delegation of powers – The State Government may, by notification in the Official Gazette, direct that any power exercisable by it under this Act may be exercised subject to such conditions, if any, as may be specified in such notification, by the Director or by any other officer not below the rank of a Collector as may be specified in the notification.
34. Jurisdiction of Courts – No court inferior to that of a Magistrate of the first class shall try any offence under this Act.
35. Special procedural provisions –  
Notwithstanding any thing contained in the Code of Criminal Procedure, 1898 (Central Act 5 of 1898) –
  - (a) an offence under sub-section (1) of section 17 shall be deemed to be a cognizable offence within the meaning of that code and
  - (b) it shall be lawful for any Magistrate of the first class specially empowered by the State Government in this behalf to pass a sentence of fine exceeding two thousand rupees on any person convicted of an offence which under this Act is punishable with fine exceeding two thousand rupees.
36. Recovery of amount due to Government – Any amount due to the State Government from any person under this Act may, on a certificate issued by the Director or an archaeological officer authorised by him in this behalf, be recovered in the same manner as an arrear of land revenue.
37. Protection of action taken under the Act – No suit for compensation and no criminal proceeding shall lie against the State Government or any public servant in respect of any act done or intended to be done in good faith in the exercise of any power conferred by this Act.
38. Power to make rules –
  - (1) The State Government may, by notification in the Official Gazette and subject to the condition of previous publication, make rules for carrying out the purposes of this Act.
  - (2) In particular and without prejudice to the generality of the foregoing power such rules may provide for all matters which, under any provision of this Act, may be or are required to be prescribed or provided for by rules.
  - (3) Any rule made under this section may provide that a breach thereof shall be punishable with fine, which may extend to five thousand rupees.
  - (4) All rules made under this section shall be laid before the House of the State Legislature as soon as possible after they are made and shall be subject to such modifications as that House may make during the session in which they are so laid or the session immediately following.
39. Repeal and savings –  
The Ancient Monuments Preservation Act, 1904 of the Central Legislature as adapted to the pre-reorganisation State of Rajasthan or as extending to the Abu and Ajmer areas and other corresponding laws of any State Legislature for the

time being in force in any part of the State shall cease to have effect upon the coming into force of this Act, except as respects things done omitted to be done before the commencement of this Act.

**D.C. SHARMA**  
Secretary to the Government

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Rajasthan Gazette**

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**EDUCATION DEPARTMENT  
NOTIFICATION**

**Jaipur, December 31, 1968**

G. S. R. 3. – In exercise of the powers conferred by section 38 of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961 (Rajasthan Act 19 of 1961) and the supersession of the Notification of even number dated 28<sup>th</sup> September, 1966, published in the Rajpatra, Part 4 (c), dated 28<sup>th</sup> September, 1966, the State Government hereby makes the following Rules (the same having been previously published in the Rajasthan Rajpatra, Part-II(B), dated the 28<sup>th</sup> January, 1965), namely :-

**THE RAJASTHAN MONUMENTS ARCHAEOLOGICAL SITES  
AND ANTIQUITIES RULES, 1968**

**CHAPTER I  
Preliminary**



1. Short title and extent :-
  - (1) These rules may be called the Rajasthan Monuments, Archaeological Sites and Antiquities Rules 1968.
  - (2) They shall extend to the whole of the State of Rajasthan.
2. Definition – In these rules, unless the context otherwise requires-
  - (a) 'construction' means that construction of any structure and includes additions or alternations in an existing building;
  - (b) 'copying' means the preparation of copies by drawing or by photography or by mould or by squeeing and includes the preparation of a cinematography film with the aid of a hand camera which is capable of taking films of not more than eight millimeters and which does not require the use of a stand or involve any special previous arrangements;
  - (c) 'document' means any record on stone, lead or copper plate etc. which is a work of art or craftsmanship and is of historical value;
  - (d) 'filming' means the preparation of a cinematographic film with the aid of a camera which is capable of taking films of more than eight millimeters and which requires the use of a stand;
  - (e) 'form' means a form set out in Schedule III;
  - (f) 'manuscript' means any hand-writing, in a book form or on a paper or leaf, which is a work of art or historical value;
  - (g) 'mining operation' means any operation for the purpose of searching for or obtaining of any mineral;
  - (h) 'record' means engraved letters on stone, lead, terracotta or copper plate etc.;
  - (i) 'section' means a section of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961;
  - (j) 'schedule' means a schedule to these rules; and
  - (k) words and expressions not defined but used in these rules shall have the meanings respectively assigned to them under the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961.

## **CHAPTER II**

### **Access to protected monuments.**

3. Monuments governed by agreements etc. -
  - (1) Access to protected monuments, in respect of which an agreement has been entered into between the owner and the State Government under section 5, or in respect of which a suit has been instituted in the Court of the District Judge under section 8, shall

be governed by the provisions of the agreement or, as the case may be, the suit, and nothing in rules 4,5,6 or 7 shall be construed as affecting any such agreement or suit.

- (2) A copy of the relevant provisions of every such agreement or suit shall be exhibited in a conspicuous part of the monument.
4. Parts of monuments not open. – The Director may by order direct that any specified part of a protected monument shall not be opened permanently or for a specified period, to any person other than an Archaeological Officer, his agents, subordinates and workmen and any other Government servants on duty at such part.
  5. Monuments when kept open –
    - (1) The protected monument specified in Schedule I shall remain open during the hours specified against them in that schedule. Protected monuments which are not specified and to which neither rule 3 nor rule 4 applies shall remain open from sun-rise to sun-set, provided that an archaeological officer may by notice to be exhibited in a conspicuous part of the monument direct that a protected monument or a part thereof shall be closed temporarily for such period as may be specified in the notice.
    - (2) Nothing in this rule or in rule 4 shall apply to an archaeological officer his agents, subordinates and workmen or to any other Government servant on duty at a protected monument.
  6. Entrance fee –
    - (1) Every visitor shall required to pay the fee as mentioned in Part I of Schedule II for admission into Amber Palace, Nahargarh Fort, Jaipur and Mardana Palaces, Udaipur. The fee shall be payable in cash at the gate of entry into the Palaces and Fort. No fee shall be chargeable from children up to the age of 7. Parties of students coming under the guidance of their teachers shall have entrance into the palaces and fort on payment of a fee of ten Paisa only, provided that the Director may, by order, direct that on such occasions and for such period as may be specified in the order, no fee shall be charged for entry into the palaces and fort or part thereof.
    - (2) The fee shall be recovered from each visitor by a representative of the Directorate of Archaeology and Museums, Rajasthan, Jaipur who shall issue a ticket in the form specified in part II of the

Schedule II, to each visitor authorizing entry into Amber Palace, Nahargarh Fort and Mardana Palaces, Udaipur.

- (3) Any visitor going up to the Jaleb Chowk of Amber Palace and Nahargarh otherwise than on foot, shall pay the fee as in Part II of Schedule II for animals and conveyance. No conveyance other than specified in this part of Schedule II shall be plied on the route to Jaleb Chowk of Amber Palace and Nahargarh fort.
- (4) The following persons shall not be charged admission and conveyance fees for entry into the palaces on production of a permit granted by the Director in the form specified in Part IV of Schedule II, namely :-
  - (i) The Governor of Rajasthan, members of his family and Raj Bhawan guests.
  - (ii) Rulers of Covenanting States of Rajasthan and the members of their families;
  - (iii) Union Ministers and State Ministers including Deputy Ministers;
  - (iv) Ambassadors;
  - (v) Speakers and Dy. Speakers of Parliament and State Assemblies;
  - (vi) State Guests;
  - (vii) Officials holding permanent passes from the Director for performance of their normal duties; and
  - (viii) Stall holders and shopkeepers who have been licensed by the Director to run their shops inside Jaleb Chowk of Amber Palace and Nahargarh Fort.

7. Holding of meetings etc. in monuments \_

(1) No protected monument shall be used for the purpose of holding any meeting, reception party, conferences or entertainment except under and in accordance with a permission in writing granted by the Government of Rajasthan.

(2) Nothing in sub rule (I) shall apply to any meeting, reception, party, conference or entertainment which is held in pursuance of a recognized religious usage or custom.

8. Prohibition of certain acts within protected monument – No person shall within a protected monument –

(a) do any act which causes or is likely to cause damage or injury to any part of the monument; or

(b) discharge any fire-arms; or



- (c) cook or consume food except in areas, if any, permitted to be used for that purpose; or
- (d) hawk or sell any goods or wares or canvass any cystinger for such goods or wares or display any advertisement in any form show a visitor round for monetary consideration, except under the authority of or under and in accordance with the conditions of a licence granted by the Director or the Superintendent of Archaeology, Government of Rajasthan; or
- (e) beg for alms; or
- (f) violate any practice, usage or custom applicable to or observed in the monument; or
- (g) bring, for any purpose other than the maintenance of the monument –
  - (i) any animal, or
  - (ii) any vehicle except in the areas reserved for the parking thereof.

9. Licence required for copying certain monuments –

The Director may, by order, direct that no person other than an archaeological officer or an officer authorised by him in this behalf shall copy any specified protected monument or any class of protected monuments or any part thereof except under and in accordance with the terms and conditions of a licence granted by an Archeological Officer.

10. Conditions for copying other monuments –

- (1) Any person may copy a protected monument other than such monuments in respect of which an order has been made under rule 9.
- (2) Nothing in sub-rule (1) shall be construed as authorizing any person other than an Archeological Officer or an officer authorised by him in this behalf, while copying any such monuments, to –
  - (a) bring into or use, within the precincts of such monuments, a camera-stand, stool, chair, table, large drawing desk board, or any such appliance, or
  - (b) erect any scaffolding within such precincts, or
  - (c) use within such precincts any artificial light other than a flash light synchronized with the exposure of a camera, or
  - (d) apply any extraneous matter, such as water, oil, grease or any moulding material on such monument or part thereof, or
  - (e) prepare a direct tracing or mould or squeeze of such monument or part thereof.

except under and in accordance with the terms and conditions of licence in writing granted by an archaeological officer.

11. Licence required for filming – No person shall undertake any filming operation at a protected monument or a part thereof except under and in accordance with the terms and conditions of a licence granted under rule 13.
12. Application for licence – An application for licence under rules 9,10 and 11 shall be accompanied by the licence fee specified in Schedule IV and shall be made to the Director in Form I at least one month before the proposed date of the commencement of any such operation.
13. Grant or refusal of licence – On receipt of an application under rule, the Director may grant a licence in Form II or, if he is satisfied that the licence asked for should not be granted, he may after recording the reasons therefore refuse to grant a licence.
14. Terms and conditions for the grant of a licence –
  - (1) Nothing shall be done by the licence which has or may have the effect of exposing any part of the protected monument and the lawns and gardens attached thereto, to the risk of any damage.
  - (2) No extraneous matter such as water, oil etc. shall be applied on any part of the monument.
  - (3) The generating plate for electric power, wherever required, shall be placed away from the monument and the attached lawns and gardens.
  - (4) There shall be no noise or unseeingly behavior on the part of the performers.
  - (5) There shall be no request for closing down the monument or any part thereof to the public even for a short period either to facilitate the operation or for opening the monument beyond the normal hours.
  - (6) Nothing shall be done, which may hamper the free movement of the visitors to the monument.
  - (7) Each number of the party shall be allowed free entrance and conveyance at monument, where no such fees are charged from visitors.
  - (8) No employee of the Department of Archaeology shall be expected to render any assistance beyond the normal attention paid by such employees to the visitors.
  - (9) The licence shall observe the provisions of rules 3 to 8.

- (10) Nothing shall be done to violate the customary rules prevailing at the monument or to use it for any purpose that may be inconsistent with his character.
- (11) Nothing which is likely to offer public sentiment shall be done.
- (12) All the provisions of the Rajasthan Monuments, Sites and Antiquities Act 1961 shall be observed.
- (13) In the event of the licence having been cancelled under these rules, no claim for the refund of the fee or any part thereof shall be entertained.
- (14) If however, under any circumstances the party fails to undertake the operation at the monument on the date specified in the application submitted earlier for the grant of licence or if it does not wish to keep the monument engaged for the period for which fee stands already deposited (after having once begun the shooting operation at the monument), no fee or part thereof shall be refunded in either case.
- (15) The above rules shall not apply to bonafide visitors in possession of 8 mm. Cine-camera, not requiring the use of stands, who want to film a monument for the simple purpose of taking record films and with no intention of utilizing the monument as a part of any scene, provided that the prohibition contained in rule 3 above are observed and the use of artificial light including flash-light synchronizers shall not be allowed in the interior of a monument.

15. Cancellation of licence – The Director may, by order and, after giving notice to the licensee, cancel any licence granted under rule 13, if he is satisfied that any of the terms and conditions of the licence has been contravened.

16. Appeal – Any person aggrieved by an order of the Director under rule 13 or rule 15 may prefer on appeal to the State Government and the decision of that Government on such appeal shall be final.

17. Penalties – Whoever –

- (i) Unlawfully enters any protected monument or part thereof at a time when under these rules, it is not to be kept open; or
- (ii) Unlawfully enters such monument in respect of which an order has been made under rule 4 or rule 5; or
- (iii) contravenes any of the provisions of rules 6,7 and 8; or



- (iv) copies or films of any protected monument or does any act in contravention of the provisions of rules 9,10 and 11 or the terms or conditions of any licence granted under rule 13;

Shall be punishable with fine which may extend to one hundred rupees.

18. Particulars of buildings, structures and other works controlled under section 19 – Within the controlled area of a protected monument, the position, height, size, design, material, colour and screening etc. of the building, structures and other works above the ground shall be regulated by the following conditions :-

- (a) the new construction or structure shall not be in such a place and of such a height as might obstruct the external view of the protected monument;
- (b) the size of the new building or structure or works shall not be greater than that of the monument;
- (c) the design of the new construction or structure or works shall not allow any incongruities so as to be a patch work in the vicinity, when compared with the style used in the monument;
- (d) the materials used in the new construction shall not be different in quality from those used in the old building, structure or work;
- (e) the colour of the new construction, structure or works shall be in conformity with the one used in the monument;
- (f) the style of screens used, if any, in the new construction or structure or works would conform to the type used in the monument; and
- (g) the internal appearance of the building, structures and other works above ground within the controlled area of the monument shall fall in line with the external appearance of the protected monument, in the regulated area of which the alteration or extension of any buildings or structures or works take place.

### **CHAPTER III**

#### **Constructions and other operations in protected area etc.**

19. Application for permission for construction or excavation etc. in protected areas – Every application for permission for –

- (i) Construction of any building;
- (ii) Carrying out any mining, quarrying, blasting; or
- (iii) excavating for archaeological or historical purposes; or

- (iv) undertaking any other operation of the like nature, under section 22, in any protected area, shall be made in Form II at least three months before the date of commencement of the proposed construction, operation excavation, etc. as aforesaid.

20. Grant or refusal of licence –

- (1) On receipt of an application under rule 19 :-

- (i) If such an application is for excavations for archaeological or historical purposes in any protected area, the Director shall obtain the previous approval of the Central Government with regard to the proposed excavation and may thereafter grant a licence in Form IV for such purposes, subject to such rules and directions of the Central Government, if any, as the Central Government may make or give in this behalf in each case or generally, if the Director is satisfied that the applicant is competent by training and experience, to undertake the excavation and has adequate means, equipment and staff for the purpose;

- (ii) If such an application is for excavation for purposes other than archaeological or historical purposes, or for construction of any building or for carrying on any mining, quarrying, blasting or any operation of a like nature, the Director may grant, a licence in Form V, if he is satisfied that the construction of any building or carrying on any such operation is not likely to damage any protected monument or affect that value thereof, and the applicant has adequate training and means for the purpose for which he has applied.

- (2) Notwithstanding anything contained in sub-rule (1) and subject to the provision of rule 23, no licence shall be granted under this rule unless the applicant has paid the licence fee specified in Schedule IV and furnished security of such amount not exceeding one thousand rupees as the applicant has adequate training and means for the purpose for which, he has applied.

- (3) The Director may for reasons to be recorded in writing refused to grant a licence in any particular case.

21. Conditions for licence – Subject to such rules or directions, if any, as the Central Government may make or give in this behalf, as provided under section 24, every licence granted under rule 20 shall be subject to the following conditions –

- (i) it shall be non-transferable;
- (ii) it shall be in force for such period not exceeding two months as maybe specified in the licence:

Provided that the Director may, on application made to him at least on month before the expiry of the licence, extend the period of such licence by such time as he considers proper, subject to the condition that the total period including the period originally, fixed and the period so extended six months;

- (iii) the licence shall give to the Director, the Collector of the district and the owner of the land to be excavated or in respect of which any operation as stated in rule 19 is to be carried on at least fifteen days notice in writing for the excavation or such operations;
- (iv) the licensee shall have to be present at site for at least 3/4<sup>th</sup> period of the aforesaid operation, unless the Director by order exempts him from such presence;
- (v) the licensee shall not, without the permission of the Director, dismantle or disturb any structures or antiquities found during his operation under the licence and shall make adequate arrangements for the safety of structure or antiquities till they are taken charge of by the Director. The licensee shall inform the Director or the owner of the land of the discovery of any such structure or antiquities. He shall also inform the Director or the owner of the land of the discovery of any such structure or antiquities. He shall also inform the Director of the discovery of any antiquity in Form VI.
- (vi) the licensee shall not subject to any antiquities discovered during his operations under the licence, to any chemical or electrical appliances of mining, without the permission of the Director;
- (vii) the licensee shall not impose any restriction on the inspection by any Archaeological Officer of his operations under the licence or the structures or antiquities discovered during such operation. The licensee shall not also object to the taking of notes on or the filming of, the structures or antiquities so discovered, by an Archaeological Officer;
- (viii) the licensee shall give at least 15 days notice in writing to the Director before he discontinues his operations under the licence unless the discontinuance of such operation is caused by causes beyond the control of the licensee or on account of the expiration of the period of licence;



- (ix) the licensee shall within three months of the completion of his operation under the licence, submit to the Director a summary of the result of the operations carried on by him and where the operations continue for more than three months, such report shall be submitted every quarter and it shall be open to the Director to publish the contents of the report in his reports or reviews.

22. Disposal of antiquities –

- (1) Where, as a result of any excavation or operation carried on in any protected area, any antiquity is discovered, the Archaeological Officer or the Licensee, as the case may be, shall submit a report of such discovery to the State Government through the Director, personally or by post in Form VII.
- (2) Unless the State Government make an order under sub-section (3) of section 25 of the Act, such antiquities shall be disposed in the following manner :-
  - (i) antiquities other than rare antiquities shall be divided into two parts, one share shall go to the licensee and the other to the State Archaeological Department.
  - (ii) rare antiquities shall be preserved in the Museum of the area or locality;
  - (iii) all human relics of historical importance or antiquities, which are of National importance, shall be transferred to the Central Archaeological Survey.

23. Exemption from security and other cognate matters –

- (1) The Director may by order exempt a person or institution engaged in excavating or mining, blasting or quarrying operation, if such a person or institution is an expert in this line and is recognized by the Central Archaeological Survey as competent to carry on the work.
- (2) On the expiry of the excavations or operations under the licence granted under rule 20 or the cancellation of such licence under these rules, the security deposited by the licensee or the balance thereof in cases where some deduction or recovery has been made under these rules, shall be returned to him.
- (3) The Director may by order direct the deductions or recovery from the security amount furnished by the licensee under these rules.
  - (i) of the value of any antiquities recovered as a result of an excavation or operation carried on by a licensee under his licence, if such antiquity is lost or destroyed while in the custody of the licensee;

- (ii) of any compensation payable to the owner or occupier of the land in which the licensee has carried on any excavation or operation under his licence.
  - (4) When during the currency of a licence, any amount has been deducted or recovered under this rule, the Director may require the licensee, within such time as he may specify; to deposit a further sum as equivalent to the amount deducted or recovered.
24. Control of mining etc. to protect or preserve protected monument –
- (1) The Director may by order fix the boundaries of the area in or near which any protected monuments stand, for the purpose of regulating or restricting mining, quarrying, excavating, blasting and other operations of like nature, in order to protect or preserve any protected monument.
  - (2) No person shall carry on any mining, quarrying, excavating, blasting or any other operation of like nature in the area fixed under sub rule (1), except in accordance with the terms and conditions of a licence granted under sub-rule(3).
  - (3) An application for the grant of licence required under sub-rule (2) shall be made to the Director, in Form VIII at least three months before the proposed date of commencement of any such operation.
  - (4) On receipt of the application and the fees prescribed in Schedule IV, the Director may grant the licence in Form IX containing the terms subject to which any such operation, as aforesaid, may be carried on in any such area fixed under sub-rule(1). The provision of sub-rule (2) of rule 20 and of rules 21 and 23 shall apply, as far as may be, to the grant of licence under this sub-rule.
  - (5) The Director may, if he is satisfied that the carrying on of any such operation is dangerous to any protected monument, he may, after recording the grounds of his opinion, refuse to grant the licence applied for or he may cancel the same, if granted.
25. Cancellation of a licence –The Director may by order cancel of licence granted under rule 20 or rule 24, if he is satisfied that the conduct of any construction or as the case may be, of any operation has not been satisfactory or in accordance with the terms and conditions of such licence or is dangerous to any protected monument:

Provided that no licence shall be cancelled, unless the licensee has been given an opportunity of being heard.

26. Appeal – Any person aggrieved by an order of the Director, under rule 20 or 24 or rule 25 may, prefer an appeal to the State Government, the decision of the State Government on such appeal shall be final.
27. Penalties –
- (1) Whoever undertaken any construction, mining quarrying, blasting or any operation of a like nature or any excavation, in any protected area otherwise than under a licence granted under rule 20 or contravenes any of the terms and conditions of such licence, shall be punishable with a fine which may extend to five thousand rupees.
  - (2) Where the breach of any rule or condition of a licence has been committed by the agent or servant of a licensee, the licensee himself shall be punishable as if he has himself committed such breach.
  - (3) Whoever commits any breach of sub-rule (2) of rule 24 or of any terms and conditions of the licence granted under sub-rule (4) thereof shall be punishable with fine which may extend to two hundred rupees.

## **CHAPTER IV**

### **Protected Antiquities**

28. Declaration antiquities – Every owner of a coin; sculpture; epigraph, illustrated manuscript, picture, painting or any other work of art or craftsmanship, which is an antiquity, shall make a declaration to the effect that he or she has with him or her any one or more of the above types of antiquities such a declaration would contain all relevant particulars pertaining to the size, material, title and chronology of the object. A photograph of each of these objects shall have to be kept by every owner together with a register of all such objects, in which all particulars relating there to would be maintained. The declaration of his assent of the type mentioned by the owner would not mean that these would be confiscated or acquired compulsorily but that these would be placed within the knowledge of scholars and art critics, if they desire to do so. This would be done in order to see the art and archaeological material of Rajasthan interpreted properly. Copies of photographs may be supplied by owners to scholars against cash payment but one set of such photographs may be supplied free of charge to the Director, for his record in such cases where it is not possible for the party to supply such



photographs, the owner would send information to the Director that he has no objections if his objects are photographed by the department of Archaeology and Museums, the department shall arrange to have the objects photographed for reference. Purposes after a list of such antiquities is received and photographic record of the objects are available, the State Government may declare them as "Protected" under the Act, after issuing a notification in the official gazette in Form X and a copy of it would be sent to the respective owners.

29. Application for moving antiquities – Every application for permission to move any antiquity or any class of such antiquities in respect of which a notification has been issued under sub-section (1) of section 28 shall be made in Form XI to the Director at least three months before the proposed date of the moving of such antiquity.

30. Grant or refusal of permission – On receipt of an application under rule 20, the Director may after making such enquiries as he may deem necessary, grant permission for the moving of all or any of the antiquities or; for reasons to be recorded, refuse such permission.

31. Penalty – Any person –

(i) who fails to declare any antiquity under his ownership as required by rule; or

(ii) who moves any protected antiquity except with the written permission of the Director as required by sub-section (i) of section 28.

shall be punishable with fine which may extend to five hundred rupees.

## CHAPTER V

### 32. Composition -

- (1) The Board shall consist of the following member -
  - (i) The Minister of Education;
  - (ii) The Deputy Minister of Education;
  - (iii) Director General of Archaeology in India or his nominee;
  - (iv) Secretary to the Government, Education Department or his nominee;
  - (v) Chief Engineer Public Works Department, Rajasthan
  - (vi) Not more than two persons possessing special knowledge of archaeology or keenly interested in the preservation of the cultural heritage, to be completed by the Board, as members; and
  - (vii) The Director of Archaeology & Museums.
- (2) The Minister of Education, Rajasthan shall be ex-office Chairman of the Board and when he is absent or for any other reason he is unable to act, the Dy. Minister of Education, Rajasthan, shall act as Chairman. The Director shall be the member Secretary of the Board.
- (3) The Vice-Chairman of the Board shall be elected by the Board and carry out the functions of the Chairman when the Chairman is absent or for any reason he is unable to act.

### 33. Terms of office -

- (1) the terms of office of the members of the Board shall be three years.
- (2) Only the co-opted members shall be eligible for re-appointments by co-option.

### 34. Meeting -

- (1) The Board shall meet as and when considered necessary by the Chairman :

Provided that there shall be at least one meeting in a year.

- (2) Special meetings may be called by Secretary on requisition by at least one third members of the Board, if such requisition is addressed to the Secretary and is accompanied by a clear statement of the business to be transacted thereat, the Secretary shall, upon receipt of the requisition, call the special meeting as soon as may be practicable.

### 35. Notice of meeting -

The Secretary shall send the notice of meeting, together with the agenda, to the members at least 15 days before the date of the meeting, except in the case of a special meeting wherefore such short

notice, as may be practicable under the circumstances of the case, may be given.

**36. Quorum -**

(1) At least one half of the members shall be present to constitute quorum at any meetings.

**37. Procedure of business at a meeting -**

(1) All questions shall be decided by a majority of votes of the members including Chairman or the Vice-Chairman, as the case may be, present and voting.

(2) In all cases of equality of votes, the Presiding authority shall have a record vote.

(3) Votes shall be taken by a show of hands.

**38. Standing and ad-hoc committees. -**

(1) The Board shall be at liberty to form standing or ad-hoc committees and shall have power to appoint on an ad-hoc committee persons who are not members of the Board but who possess special knowledge and experience of the problems which the committees is required to examine.

(2) Each standing or ad-hoc committee shall consist of three to six members who shall be appointed by the Board.

(3) The quorum at any meeting of such committee shall be two third at the total number of its members, present thereat. If such a quorum is not present at any meeting, it shall be adjourned on any convenient date and no quorum shall be necessary at the adjourned meeting.

(4) The members shall elect amongst themselves a person as the President of their Committee at a meeting specially convened for the purpose.

(5) The term of office of the members of such Committee shall be co-extensive with the term of office of the Advisory Board.

(6) The procedure of business at a meeting of the Board as stated in rules 34 shall apply 'Mutatis mutandis' to a meeting of such committee.

**39. Power of the State Government to dissolve and reconstitute the Advisory Board -**

(1) If, at any time, the State Government is satisfied that the Advisory Board is not competent to perform its duties or has abused its powers or its continuance is not likely to serve any purpose, it may by order published in the official gazette and dissolve the Board.



- Provided that no action shall be taken under this sub-section unless the Board has been afforded a reasonable opportunity submitting explanation and of being heard, if the Board so desires.
- (2) The Board dissolved under sub-section (1) may be reconstituted by the State Government by order published in the official gazette.
  - (3) The consequences of the dissolution of the Board under sub-section (1) shall be as if the term of the Board has expired under these rules.

## **CHAPTER VI Miscellaneous**

### **40. Manner of preferring an appeal -**

- (1) Every appeal to the State Government under the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 61 or under these rules shall be in writing and shall be preferred within one month of the date of receipt of the order appealed against.
- (2) Every such appeal shall be accompanied by a copy of the order appealed against.

### **41. Service or orders and notices -** Every order or notice made or issued under these rules shall -

- (a) In the case of any order or notice of a general nature or affecting a class of persons, be published in the official gazette; and
- (b) in the case of any order or notice affecting corporation or firm, be served in the manner provided for the service of summons in rule 2 of order XXIX or rule 3 of order XXX, as the case may be, in the First Schedule to the Code of Civil Procedure, 1908; and
- (c) in the case of any order or notice affecting an individual person, be served on such person -

by delivering or tendering it to the person concerned, or

- (i) if it cannot be so delivered or tendered, by delivering or tendering it to any adult male member of the family of such person or by affixing a copy thereof on the outer door or some conspicuous part of the premises in which that person is known to have last resided or carried on business or personally worked for gain, or
- (ii) by sending it by registered post, acknowledgement due.

**(No. F. 6(39)Edu./B/56-C.IV)**

**By Order,  
t- flag esgrk]**

**Secretary to Government**

**SCHEDULE I**  
**See Rule 5.**

Hours during which certain monuments of part three will remain open.

S.No.	State	District	Locality	Name of Monument	Part of monument which shall remain open during hours noted against	Hours of opening
1	Rajasthan	Jaipur	Amber	Palaces as whole	Ist Apl. to 31st August 7.00 A.M. to 12.00 P.M. 3.00 P.M. to 6.00 P.M. Ist Sept. to 31st March, 8.00 A.M. to 6.00 P.M.	
2	Rajasthan	Jaipur	Jaipur	Nahargadh Fort	Whole except a room in charge of H.H. Jaipur 9.00 A.M. to 5.00 P.M.	
3	Rajasthan	Udaipur	Udaipur	Palaces	Part Know as Mardana Palaces only 9.00 A.M. to 5.00 P.M.	

**SCHEDULE II**

**See Rule 6.**

- (1) For student under the guidance of teachers and representing any educational institutions and on production of Identity cards -10 P.  
(2) Others-15 P.

**PART II (FORM FOR TICKET).**

10/15 Paise.

The bearer is authorised to enter Amber Palace/Nahargadh Fort/ Maradana Palaces. The admission fee of 10/15 Paise has been recovered in cash.

**Director**  
**Archaeology & Museums,**  
**Rajasthan, Jaipur.**

**PART III**



Fee for horse	1/- (in case of Amber Palaces)
Fee for Elephant	2/- (Amber Palace only)
Fee for Jeep	5/- (in case of Amber Palaces only)

**PART IV**

No.

Dated the

Admit Shri .....(Address)  
 ..... into  
 Amber Palaces/Nahargadh Fort/Mardana Palaces without payment of  
 admission and conveyance fee.

**Director  
 Archaeology & Museums,  
 Rajasthan, Jaipur.**

**FORM II  
 (See Rule 13)**

License for copying or filming operation at protected monument.

M/s ..... is hereby allowed to undertake  
 the copying operation or filming operation of his/their film entitled  
 .....as per script and details of scenes attached  
 .....hereto in and .....around  
 .....District .....State Rajasthan for a period of .....days  
 commencing with the .....days of .....

The license is granted subject to the provision of the rules and is  
 further subject to the following conditions, namely :-

The requisite fee of Rs. .... has been charged from  
 his/them. The license is not transferable. It shall be valid for the period, it  
 has been issued.

***Seal and signature of the  
 Director, Archaeology, Raj. Jaipur.***

**FORM III  
 (See Rule 19)**

Application for permission for construction, quarrying, blasting and mining operation within a protected area . . . . .

1. Name and address of applicant.
2. Name of the protected area within which construction/mining/Excavating/quarrying/blasting operation is proposed .....locality.
3. Nature and details of the proposed construction, quarrying, blasting and excavating and operation in respect of which permission is sought.  
(A site plan in triplicate showing in red outline the extent of the operation in relation to the protected area should be attached; and details regarding the depth down to which the operation is to be carried out, the mode of the operation, the method of the suffling of sound, the kind and charge of blasting material and the depth and number of blast holes to be fired at a time should be specified.)
4. Purpose of the proposed construction/ blasting/quarrying/ excavating or mining operation .....
5. Approximate duration and date of commencement of the proposed construction/blasting/quarrying/excavating/mining operation .....
6. Approximate expenditure on the proposed operation etc. ....

I declare that the above information is correct. I also undertake to observed the provisions of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961 and the rules made thereunder.

Seal of the Organisation

State

Signature of the Applicant.

Note- 1. If the application is on behalf of an organization, the name of thereof should be given.

If the application is on behalf of an organization, the signature should be that of the head of that organization.

**FORM IV**  
**(See rule 20)**

Form for license of excavations for Archaeological or historical purposes in protected area.

Whereas -- -- -- -- -- has applied for a license for carrying out excavations for archaeological or historical purposes in the protected area known as . . . . . at . . . . . District.





- including the period originally fixed and the period so extended does not exceed six months;
- (iii) The license shall give to the Director, The collector of the District and the owner of the land to be excavated or in respect of which any operation as stated in rule 19 is to be carried on, at least fifteen days, notice in writing of the excavation of such operation;
  - (iii) The license shall have to be present at site for at least 3/4<sup>th</sup> period of the aforesaid operation, unless the Director by order exempts him for such presence;
  - (iv) the license shall not, without the permission of the Director dismantle or disturb any structures or antiquities found during his operations under the license and shall make adequate arrangements for the safety of structures or antiquities till they are taken charge of by the Director. The license shall inform the Director of the owner of the land of the discovery of any such structure or antiquities. He shall also inform the Director of the discovery of any antiquity in Form VI.
  - (v) The license shall not subject any antiquities discovered during his operations under the license, to any chemical or electrical appliances of mining, without the permission of the Director;
  - (vi) the license shall not impose any restrictions on the inspection by any Archaeological Officer of his operations under the license or the structures or antiquities discovered during such operation. The license shall not also object to the taking of notes on or the filming of the structures or antiquities so discovered, by an Archaeological Officer.
  - (vii) the license shall give at least 15 days notice in writing to the Director before he discontinues his operations under the license, unless the discontinuance of such operation is caused by causes beyond the control of the license or on account of the expiration of the period of license;
  - (viii) the license shall, within three months of the completion of his operation under the license submit to the Director a summary of the result of the operations carried on by him and where the operations continue for more than three months, such reports shall be submitted every quarter and it shall be open to the Director to publish the contents of the report in his reports or reviews.

#### **PART 'B'**

Rules and directions of the Central Government be observed by the license;

- 1.
- 2.

- 3.
- 4.
- 5.
- 6.

**FORM V.**  
**(See rule 20)**

License for construction/ quarrying/excavating/ blasting/mining/ operation in a protected area.

Whereas . . . . . he applied for a license for carrying out construction/quarrying/blasting/excavation/mining operations in protected area known as . . . . . at . . . . . District.

And whereas the said Shri . . . . . has undertaken to observe the provisions of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961 and the rules made thereunder and has further deposited the sum of Rs. . . . . (Rupees . . . . . only) as required by the rules.

I, . . . . . Director of Archaeology and Museums do hereby grant this license under sub-rule (ii) of rule 20 of the said rules to the said . . . . . to carry out operations in the area indicated in red outlines on the plan attached hereto.

The license is granted subject to the provisions of the said Act and rules and more particularly to the following conditions, namely :-

**PART 'A'**  
**Conditions of the License**

- (i) This license shall not be transferable;
- (ii) It shall be in force for such period not exceeding two months as maybe specified in the license :

Provided that the Director may, on applications made to him at least one month before the expiry of the license, extend the period of such license by such time as he considers proper, subject to the condition that the total period including the period originally fixed and the period so extended does not exceed six months;

- (iii) The license shall give to the Director, the collector of the District and the owner of the land to be excavated or in respect of which any operation as stated in rule 19 is to be carried on, at least fifteen days, notice in writing of the excavation of such operation;
- (iv) The license shall have to be present at site for at least 3/4<sup>th</sup> period of the aforesaid operation, unless the Director by order exempts him for such presence;



- (v) The license shall not, without the permission of the Director dismantle or disturb any structures or antiquities found during his operations under the license and shall make adequate arrangements for the safety of structures or antiquities till they are taken charge of by the Director. The license shall inform the Director or the owner of the land of the discovery of any such structure or antiquities. He shall also inform the Director of the discovery of any antiquity in Form VI.
- (vi) The license shall not subject any antiquities discovered during his operations under the license, to any chemical or electrical appliances of mining, without the permission of the Director;
- (vii) The license shall not impose any restrictions on the inspection by any Archaeological Officer of his operations under the license or the structures or antiquities discovered during such operation. The license shall not also object to the taking of notes on or the filming of the structures or antiquities so discovered, by an Archaeological Officer.
- (viii) The license shall give at least 15 days notice in writing to the Director before he discontinues his operations under the license, unless the discontinuance of such operation is caused by causes beyond the control of the license or on account of the expiration of the period of license;
- (ix) The license shall, within three months of the completion of his operation under the license submit to the Director a summary of the result of the operations carried on by him and where the operations continue for more than three months, such reports shall be submitted every quarter and it shall be open to the Director to publish the contents of the report in his reports or reviews.

.....*Day of.....20.....*

.....*Station.*

.....*Dated*

*Signature of the Director  
Archaeological, Rajasthan,  
Jaipur*

*Seal of the Deptt.  
of Archaeology & Museums  
Rajasthan.*

**FORM VI.**  
**(See Rule 21(v))**

Form of the information to be submitted by the licensee regarding discovery of antiquities.

To,

The Director,  
Archaeology & Museums,  
Rajasthan, Jaipur.

Dear Sir,

During the operations carried on under the License No. .... dated ..... granted by you, the following antiquities, particularized below have been discovered. Adequate arrangements have been made for their safe custody :-

Particulars of antiquities discovered: -

1. Class & antiquities.
2. Material.
3. No. of antiquities.
  - (a) Complete .
  - (b) Fragments.
4. Conditions at the time of discovery.
5. Nature of arrangements made for their safe custody, including name of the person in whose custody and the place where antiquities discovered are placed.
6. Remarks.

Dated .....  
Station .....

Signature of the licensee.

**FORM VII**  
**(See rule 22)**

Form of the report on the antiquities discovered as a result of excavation in a protected area.

Name of site

Locality

District

State

Report for the period

From

To

S.No.	Class of antiquities Material	No. of antiquities/ Complete fragmentary.	Approximate age	Remarks
-------	----------------------------------	---	--------------------	---------

Station .....  
.....

Signature of the licensee Dated  
or Excavator.

Note :- in the case of pottery the approximate number is to be stated.



**FORM VIII**  
**(See rule 24)**

Application for license for mining, quarrying, excavating, blasting etc. within  
a regulated area.

2. Name and address of the applicant.
3. Name of the monument near or adjoining which the regulated area is situated.  
Locality \_\_\_\_\_ District \_\_\_\_\_
4. Nature and details of the proposed mining operation/construction in respect of which permission is sought. (A site-Plan in triplicate showing in red outline the location of the building in relation to the monument and the regulated area and the plan and elevation of the building should be attached; and the colour, external appearance and method of the screening of the building and depth down to which the soil will be excavated for the appurtenances of the building should be specified.)
5. Purpose of the proposed mining operation/construction.
6. Approximate duration and date of commencement of the proposed mining operation/construction.

I declare that the above information is correct. I also undertake to observe the provisions of the Rajasthan Monuments, Archaeological sites and antiquities Act, 1961 and the rules made thereunder.

Seal of the Station  
organization

Signature of the applicant.

Date

**FORM IX**  
**(See rule 24)**

License for mining/quarrying/excavating/blasting operations etc. within a regulated area.

Whereas .. ... of .. ... has applied for a license for regulated area near adjoining.....at.....District and has undertaken to observe the provisions of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961 and the rules made thereunder.

I, .. ... Director of Archaeology, do hereby grant this license under sub-rule(4) of rule (24) of the said rules to the said for ..... in the area indicated in red outline on the plan attached hereto.

The license is granted subject to the provisions of the said Act and rules and is further subject to the following conditions, namely :-

**PART 'A'**  
**Conditions of the License**

- (i) The licence shall not be transferable;
- (ii) It shall be in force for such period not exceeding two months as maybe specified in the licence : Provided that the Director may, on application made to him at least one month before the expiry of the licence, extend the period of such licence by such time as he considers proper, subject to the condition that the total period including the period originally fixed and the period so extended does not exceed six months;
- (iii) The licence shall give to the Director, the collector of the District and the owner of the land to be excavated or in respect of which any operation as stated in rule 19 is to be carried on, at least fifteen days, notice in writing of the excavation of such operation;
- (iv) The licence shall have to be present at site for at least 3/4<sup>th</sup> period of the aforesaid operation, unless the Director by order exempts him for such presence;
- (v) The licence shall not, without the permission of the Director dismantle or disturb any structures or antiquities found during his operations under the licence and shall make adequate arrangements for the safety of structures or antiquities till they are taken charge of by the Director. The licence shall inform the Director of the owner of the land of the discovery of any such structure of the

owner of the land of the discovery of any such structure or antiquities. He shall also inform the Director of the discovery of any antiquity in Form VI.

- (vi) The licence shall not subject any antiquities discovered during his operations under the licence, to any chemical or electrical appliances of mining, without the permission of the Director;
- (vii) The licence shall not impose any restrictions on the inspection by any Archaeological Officer of his operations under the licence or the structures or antiquities discovered during such operation. The licence shall not also object to the taking of notes on or the filming of the structures or antiquities so discovered, by an Archaeological Officer.
- (viii) The licence shall give at least 15 days notice in writing to the Director before he discontinues his operations under the licence, unless the discontinuance of such operation is caused by causes beyond the control of the licence or on account of the expiration of the period of licence;
- (ix) The licence shall, within three months of the completion of his operation under the licence submit to the Director a summary of the result of the operations carried on by him and where the operations continue for more than three months, such reports shall be submitted every quarter and it shall be open to the Director to publish the contents of the report in his reports or reviews.

The licence shall be valid for .....commencing with .....day of .....

***Date  
Station***

**Seal of the Director**

***Signature of the Director  
of Archaeology &  
Museums, Rajasthan***



**FORM X**  
**(Gazette notification for declaring antiquities as protected).**

Whereas the Government of Rajasthan is of the opinion that paintings/sculptures, coins, ancient manuscripts (illustrated)/chart objects specified in the schedule before is of State importance. Now, therefore, in exercise of the powers conferred by sub-section (i) of section 3 of the Rajasthan Monuments, the Government of Rajasthan hereby gives notice of its intention to declare the antiquities specified in the schedule below to be of State importance. Any objection made within two months after the issue of this notification by any person interested in the same antiquity or antiquities will be considered by the Government.

**SCHEDULE**

<b>S.No.</b>	<b>Name and Description of the monument/Antiquity</b>	<b>Locality</b>	<b>District</b>	<b>Importance</b>
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*Signature and Seal of the Director,  
Archaeology & Museums, Rajasthan, Jaipur*

## FORM XI

### Application for moving of antiquities.

1. Name and address of the applicant.
2. Name of the place from which antiquities are to be moved.

Locality

District

State

3. Description of antiquities proposed to be moved (Photographs showing details of the antiquities should be attached).
4. Reasons for their removal.
5. Approximate date of moving.
6. Their present market value or recorded value.

I declare that the above information is correct.

Date .....

Station .....

Signature of the applicant.

### SCHEDULE IV (See rule 12,20 and 24)

#### Part A Fees payable under rule 12

S.No.	Name of the monument	Amount of fee	Remarks
1	2	3	4
1	Amber Palace, Jaipur		
2	Nahargarh Fort, Jaipur		
3	Mardana Palace, Udaipur		

**PART- B**

**PART- C**

**FORM OF FIRST NOTIFICATION**  
**(Under section 3 of the Act)**

Whereas the Monument/Sites/Antiquity named below is proposed to be declared as protected, the Government of Rajasthan in exercise of the powers conferred by sub-section(I) of section 3 of the Rajasthan Monuments Archaeological Sites and Antiquities Act, 1961 (Act No. 19 of 1961), hereby give notice of its intention to do so.

Any objection made by any interested person within two months from the date of affixing this notification shall be considered by the Govt.

**Secretary,**  
Education Department



राजस्थान राज-पत्र विशेषांक	RAJASTHAN GAZETTE <i>Extraordinary</i>
साधिकार प्रकाशित	<i>Published by Authority</i>
चैत्र 20, सोमवार, शाके 1928-अप्रैल 10, 2006 <i>Chaitra 20, Monday, Saka 1928-April 10, 2006</i>	

भाग 4 (क)  
राजस्थान विधान मंडल के अधिनियम।  
**LAW (LEGISLATIVE DRAFTING) DEPARTMENT**  
**(Group-II)**

**NOTIFICATION**

*Jaipur, April 8, 2006*

No. F.2 (16) Vidhi/2/2006.- The following Act of the Rajasthan State Legislature received the assent of the Governor on the 7<sup>th</sup> day of April, 2006 and is hereby published for general information :-

THE RAJASTHAN MONUMENTS, ARCHAEOLOGICAL  
SITES AND ANTIQUITIES (AMENDMENT) ACT, 2006  
(Act No. 6 of 2006)

(Received the assent of the Governor on the 7<sup>th</sup> day of April, 2006)

*An*

*Act*

*further to amend the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961.*

Be it enacted by the Rajasthan State Legislature in the Fifty-seventh Year of the Republic of India, as follows :-

**1. Short title and commencement :-** (1) This Act may be called the Rajasthan Monuments, Archaeological Sites and Antiquities (Amendment) Act, 2006.

(2) It shall come into force at once.

5(2) राजस्थान राज-पत्र, 10 अप्रैल, 2006 भाग 4 (क)

**2. Amendment of section 13, Rajasthan Act No. 19 of 1961 :-** In sub-section (1) of section 13 of the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961 (Act No. 19 of 1961), hereinafter referred to as the principal Act, for the existing expression "in section 14", the expression "in section 4" shall be substituted.

**3. Insertion of section 13A, Rajasthan Act No. 19 of 1961 :-** After the existing section 13, and before the existing section 14, of the principal Act, the following new section shall be inserted, namely :-

**"13A. Power to enter into agreement for the maintenance of certain monument.-** (1) The State Government may, for the purposes of maintenance of a monument falling under section 13, enter into an agreement with any person, firm or trust on such terms and conditions, not inconsistent with the provisions of this Act, as may be specified in the agreement.

(2) Notwithstanding anything contained in section 20A, the person, firm or trust referred to in sub-section (1) shall be entitled to collect and retain the whole or such portion of the fee leviable under section 20A and for such period, as may be agreed upon between the State Government and such person, firm or trust, having regard to the expenditure involved in the maintenance of the monument and collection of fee, interest on the capital invested, reasonable return on the investment and the volume of visitors".

**4. Insertion of section 20A, Rajasthan Act No. 19 of 1961 :-** After the existing section 20, and before the existing section 21, of the principal Act, the following new section shall be inserted, namely :-

**"20A. Power to entrance fee.-** (1) The State Government may, by notification in the Official Gazette, levy entrance fee in respect of such protected monuments, and at such rates not exceeding two thousand five hundred rupees per head, as may be specified in such notification :-

Provided that if the State Government is of the opinion that it is expedient in the public interest so to do, it may by like notification, exempt, wholly or partly, any class of persons from the payment of entrance fee.

(2) Such entrance fee when so levied shall be collected in accordance with the rules made under this Act".

गुमान सिंह,  
Secretary to the Government.

विधि (विद्यार्थी प्रारूपण) विभाग  
(ग्रुप-2)

अधिसूचना

जयपुर, अप्रैल 8, 2006

संख्या प.2 (16)विधि/2/2006 :- राजस्थान राजभाषा अधिनियम, 1956 (1956 का अधिनियम सं 47) की धारा 4 के परन्तुक के अनुसरण में "द्वि राजस्थान मोन्यूमेंट्स, आर्केलोजिकल साइट्स एण्ड एण्टीक्विटीज (अमेण्डमेंट) एक्ट, 2006 (एक्ट नं 6 ऑफ 2006)" का हिन्दी अनुवाद सर्वसाधारण की सूचनार्थ एतद्वारा प्रकाशित किया जाता है -  
(प्राधिकृत हिन्दी अनुवाद)

राजस्थान संस्मारक, पुरातत्वीय स्थल तथा पुरावशेष (संशोधन)  
अधिनियम, 2006

(2006 का अधिनियम सं. 6)

[राज्यपाल महोदय की अनुमति दिनांक 7 अप्रैल, 2006 को प्राप्त हुई]

राजस्थान संस्मारक, पुरातत्वीय स्थल तथा पुरावशेष अधिनियम, 1961 को और संशोधित करने के लिए अधिनियम।

भारत गणराज्य के सत्तानवें वर्ष में राजस्थान राज्य विधान-मण्डल निम्नलिखित अधिनियम बनाता है :-

1. संक्षिप्त नाम और प्रारम्भ :- (1) इस अधिनियम का नाम राजस्थान संस्मारक, पुरातत्वीय स्थल तथा पुरावशेष (संशोधन) अधिनियम, 2006 है।

(2) यह तुरत प्रवृत्त होगा।

2. 1961 के राजस्थान अधिनियम सं. 19 की धारा 13 का संशोधन :- राजस्थान स्मारक, पुरातत्वीय स्थल तथा पुरावशेष अधिनियम, 1961 (1961 का अधिनियम सं. 19), जिसे इसमें इसके आगे मूल अधिनियम कहा गया है, की धारा 13 की उप-धारा (1) में विद्यमान अभिव्यक्ति "धारा 14 में" के स्थान पर अभिव्यक्ति "धारा 4 में" प्रतिस्थापित की जायेगी।

3. 1961 के राजस्थान अधिनियम सं. 19 की धारा 13 क का अन्तःस्थापन :- मूल अधिनियम की विद्यमान धारा 13 के पश्चात् और विद्यमान धारा 14 के पूर्व निम्नलिखित नयी धारा अन्तःस्थापित की जायेगी, अर्थात् -

"13 क कतिपय स्मारकों को बनाये रखने के लिए करार की शक्ति :- (1) राज्य सरकार, धारा 13 के अधीन आने वाले स्मारकों को बनाये रखने के प्रयोजनों के लिए किसी भी व्यक्ति, फर्म या न्यास से ऐसे निबंधनों और शर्तों पर करार कर सकेगी जो इस अधिनियम के उपबन्धों से असंगत न हों और जो करार में विनिर्दिष्ट की जाये।

(2) धारा 20क में अन्तर्विष्ट किसी बात के होने पर भी, उप-धारा (1) में निर्दिष्ट व्यक्ति, फर्म या न्यास, स्मारकों को बनाये रखने और फीस के संग्रहण में अन्तर्वलित व्यय, विनिहित पूँजी पर व्याज, विनिधान पर युक्तियुक्त प्रत्यागम और दर्शकों के परिमाण को ध्यान में रखते हुए, धारा 20क के अधीन उद्ग्रहणीय संपूर्ण फीस या उसके ऐसे भाग को और ऐसी कालावधि के लिए, जो राज्य सरकार और ऐसे व्यक्ति, फर्म या न्यास के बीच करार पायी जाये, संगृहीत और प्रतिधारित करने का हकदार होगा।

भाग (क)

राजस्थान राज-पत्र, 10 अप्रैल, 2006

5 (5)

4. 1961 के राजस्थान अधिनियम सं. 19 में धारा 20क का अन्तःस्थापन :- मूल अधिनियम की विद्यमान धारा 20 के पश्चात् और विद्यमान धारा 21 के पूर्व निम्नलिखित नयी धारा अन्तःस्थापित की जायेगी, अर्थात् -

"20क. प्रवेश फीस का उद्ग्रहण करने की शक्ति :- (1) राज्य सरकार राज-पत्र में अधिसूचना द्वारा, ऐसी सरक्षित स्मारकों के संबंध में और ऐसी दरो से, जो प्रति व्यक्ति दो हजार पाच सौ रुपये से अधिक न हों और जो अधिसूचना में विनिर्दिष्ट की जाये, प्रवेश फीस का उद्ग्रहण कर सकेगी

परन्तु यदि राज्य सरकार की यह राय हो कि लोकहित में ऐसा किया जाना समीचीन है तो वह, व्यक्तियों के किसी भी वर्ग को, वैसी ही अधिसूचना द्वारा प्रवेश फीस सके सदाय से पूर्णतः या भागत छूट दे सकेगी।

(2) ऐसी प्रवेश फीस, जब इस प्रकार उद्ग्रहीत की जाये, इस अधिनियम के अधीन बनाये गये नियमों के अनुसार संग्रहीत की जायेगी।"

गुमान सिंह,  
शासन सचिव।

डवलपमेन्ट फण्ड फॉर एडोप्ट ए मोन्यूमेन्ट के अन्तर्गत वित्तीय वर्ष 2006-07 में स्वीकृत राशि रुपये 200.00 लाख में से राशि रुपये 180.00 लाख रुपये राजस्थान राज्य संग्रहालय एव स्मारक प्रबन्धन सस्था को दिये गये थे एव वर्ष 2007-08 में राशि रुपये 43.00 लाख रुपये राजस्थान राज्य संग्रहालय एव स्मारक प्रबन्धन सस्था को डवलपमेन्ट फण्ड फॉर एडोप्ट ए मोन्यूमेन्ट हेतु बजट मद आयोजना में रखा गया था जो कि वित्तीय वर्ष 2007-08 में नवीन मद के अन्तर्गत स्वीकृत हैं।

विभाग में वर्तमान में 225 सरक्षित स्मारक घोषित हैं। एडोप्ट ए मोन्यूमेन्ट योजना के तहत 60 स्मारकों का चयन किया गया है।



**THE RAJASTHAN MONUMENTS, ARCHAEOLOGICAL SITES AND ANTIQUITIES (AMENDMENT) ACT 2007  
(Passed by Rajasthan Legislative Assembly on 20.9.2007)**

An Act

Further to amend the Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961.

Be it enacted by the Rajasthan State Legislature in the Fifty Eighth Year of the Republic of India, as follows:-

**1. Short title and commencement-(1)** This Act may be called the Rajasthan Monuments Archaeological Sites and Antiquities (Amendment) Act, 2007.

It shall be deemed to have come into force on and from 25 may 2007.

**2. Amendment of section 2, Rajasthan Act No. 19** - In section 2 of the Rajasthan Monuments, Archaeological sites and Antiquities Act, 1961 (Act No. 19 of 1961) herein after referred to as principal Act,

(i) in clause (i) for the existing expression "to which the provision of that act apply for the time being ", the expression "which has been declared protected under that Act and stands so declared" shall substituted;

(ii) In clause (ii) for the existing expression "to which the provision of that Act apply for the time being ", the expression "which has been declared protected under that Act and stands so declared" shall be substituted;

(iii) In clause (iv) for the exiting expression" to which the provisions of that .Act apply for the time being", the expression

"which has been declared protected under that Act and stands so declared" shall be substituted.

- 3. Amendment of section 3, Rajasthan Act No. 19:-** In subsection (4A) of section 3 of the principal Act, the existing expression "And for reasons of its satisfaction to be recorded in such notification" appeared after the existing expression "official Gazette" and before the existing expression "forthwith " shall be deleted.
- 4. Amendment of section 12, Rajasthan Act No. 19:-** In subsection (1) of section 12 of the principal Act, after the existing expression. "Rajasthan land Acquisition Act, 1953 (Rajasthan Act No. 24 of 1953)", the expression " Land Acquisition Act, 1894 (Central Act No.1 of 1894)" shall be substituted.
- 5. Amendment of section 17, Rajasthan Act No. 19.-** in subsection (1) of section 17 of the principal Act for the existing expression "six month or with fine which may extend to five thousand", the expression "three years or with fine which may extend to one lac" shall be substituted .
- 6. Amendment of section 18, Rajasthan Act no. 19-** In subsection (2) of section 18 of the principal Act for the existing expression "two hundred", the expression "Five thousand" shall be substituted.
- 7. Amendment of section 19, Rajasthan Act No.19-** In subsection (6) of section 19 of the principal Act, for the existing expression "one hundred", the expression "three thousand" shall be substituted.
- 8. Amendment of section 20, Rajasthan Act No.19-** in subsection (2) of section 20 of the principal Act, for the existing expression "one hundred", the expression "three thousand" shall be substituted.
- 9. Amendment of section 21, Rajasthan Act No.19-** In section 21 of the principal Act, for the existing expression "Rajasthan

land Acquisition Act, 1953 (Rajasthan Act No.24 of 1953 )", the expression "Land Acquisition Act 1894(Central Act no 1 of 1894)" shall be substituted.

**10. Amendment of section 26, Rajasthan Act No.19-** In section 26 of the principal Act, for the existing expression "six months or with fine which may extend to five thousand", the expression "three years or with fine which may extend to one lac" shall be substituted.

**11. Amendment of section 28, Rajasthan Act No.19-** In sub section (4) of section 28 of the principal Act, for the existing expression "five hundred", the expression "fifteen thousand" shall be substituted.

**12. Amendment of section 32, Rajasthan Act No. 19. -** In section 32 of the principal Act, for the existing expression "Rajasthan land Acquisition Act, 1953 (Rajasthan Act No. 24 of 1953)" wherever occurring, the expression "Land Acquisition Act, 1894(Central Act No. 1 of 1984 )" shall be substituted.

**13 Insertion of new section 37-A, Rajasthan Act No. 19** After the existing section 37 and before the existing section 38 of the principal Act the following new section shall be inserted, namely:-

"37-A. Rectification of error.- Any clerical mistake, patent error or error arising from accidental slip or omission in the site or antiquity declared protected under this Act may, at any time, be corrected by the state Government by notification in the official Gazette."

**14. Amendment of section 38, Rajasthan Act No.19.-** In sub-section (3) of section 38 the principal Act, for the existing expression "five thousand", the expression "one lac" shall be substituted.

**15. Repeal and saving,-** The Rajasthan Monuments, Archaeological Sites and Antiquities Ordinance,2007 (ordinance No. 4 of 2007) is hereby repealed.



(2) Notwithstanding such repeal, all action taken or orders made under the principal Act as amended by the said Ordinance shall be deemed to have been taken or made under the principal Act as amended by this Act.

# **ANNEXURE – IV**

Rajasthan Tourism Unit Policy-2007

# **RAJASTHAN**

TOURISM UNIT POLICY – 2007

## **RAJASTHAN TOURISM UNIT POLICY- 2007**

In the year 2006, the Tourism Department had announced a New Hotel Policy of Rajasthan. This policy is proposed to be replaced by Rajasthan Tourism Unit Policy- 2007.

Rajasthan is one of the leading Tourism States of India. The Glorious Heritage and colorful culture of the state is a special attraction for Foreign Tourists. Heritage assets, found all over the state can be utilized for development of Tourism. During the last few years, there has been tremendous increase in the number of Tourists to the State. However the infrastructural facilities have not kept pace. Presently there are 36,000 rooms available for Tourists and by year 2012 an additional 20,000 Hotel rooms would be required for Tourists in the State. With this objective, the State Govt. had in 2006 announced a New Hotel Policy proposing several concessions. The concessions in the hotel Policy 2006 were to be extended to the Star category of Hotels only, whereas several other categories of hotels, heritage hotels and other tourism units such as camping sites, holiday resorts and restaurants etc. are also providing accommodation for tourists.

In this regard, Tourism unit as defined in rule 1AA of Rajasthan Land Revenue (Industrial Area Allotment) Rules, 1959, and Rule 2 (r) of Rajasthan Land Revenue (Conversion of Agricultural Land for Non-Agricultural purpose in Rural areas), Rule, 2007, includes all types of hotels, heritage hotel, holiday resorts etc. In view of the new definition of Tourism Unit, it has become essential for Tourism development not only to include classified hotels in the Hotel Policy but also to include all other



category of hotels, heritage hotels and other tourism units in the New Policy. With this objective Rajasthan New Tourism Unit Policy – 2007 is being announced. The following concessions and facilities have been made applicable for all types of Tourism Units :-

- In Rule 2(r)(d) of Rajasthan Land Revenue (Conversion of Agricultural Land for Non-Agricultural purposes in Rural areas), Rule, 2007, a restaurant having investment of Rs. 10.00 lacs or more, has been included. This investment will be increased to Rs. 1.00 crore.
- Considering the new developments taking place in the Tourism sector and the possible need for inclusion of new definitions in the policy to avail of the benefits, Principal Secretary, Tourism and Principal Secretary, Urban Governance would define and recommend to the concerned departments to include such activities as Tourism Units in applicable rules.
- Health Spa or other medical health related activities such as Yoga etc. attached with Tourism Units, Golf Academy, Golf Course, other Sports related activity would be included in the definition of Tourism Units in applicable rules.

As per the above definition and interpretation with regard to the Tourism Unit, the concerned departments would amend their respective rules, sub-rules and notifications accordingly.

## **1. Allotment of Land for Hotels and other Tourism Units**

For establishment and development of all types of Tourism Units, including all types of Hotels State Govt. would make available land as per following procedure:-

- a. Jaipur Development Authority, UIT, Municipal Bodies, Gram Panchayat and District Collectors would identify suitable land for the establishment of Tourism units in which hotels are also included. Such land bank will be reserved for all categories of Hotels and Tourism Units such as:-

1-Budget Hotels (1,2 & 3 Stars)

2-4 Star Hotels

3-5 Star & 5 Star Deluxe Hotels

4-Other Tourism Units

- b. Information of such Land Bank would be made available on the website of the Tourism Department and that of concerned Local Body/ District Collector.
- c. The maximum and minimum land area to be reserved for different categories of Hotels as well as other tourism units shall be as under:-

S. No.	Category	Minimum Land Area	Maximum Land Area
(1)	Budget Hotels (1, 2 & 3 Star)	Up to 1200 sq. mtrs.	Up to 4000 sq. mtrs.
(2)	4 Star Hotels	Up to 6000 sq. mtrs.	Up to 12000 sq. mtrs.

(3)	5 Star & Deluxe Category	upto 18000 Sq. mtrs.	Up to 40,000 sq. mtrs.
(4)	Other tourism unit	-	as per requirement / availability

2. (a) As specified at point no. (1)(a) Local bodies / Panchayats / District Collectors, shall identify and reserve land on Special Reserve Price for hotels and other tourism units. For hotels and other tourism units, special reserve prices will be fixed in relation to present commercial reserve price of the local area as under:-

<b>Hotel Category</b>	<b>Minimum Special Reserve Price</b>
(i) One Star	10 Percent of the commercial reserve price
(2) Two Star	20 Percent of the commercial reserve price
(3) Three Star	30 Percent of the commercial reserve price
(4) Four Star	45 Percent of the commercial reserve price
(5) Five Star	50 Percent of the commercial reserve price
(6) Other Tourism Unit	50 Percent of the commercial reserve price

This special reserve price shall be the base price for disposal of identified and reserved lands through a process of competitive bidding. The Local Bodies / District Collectors shall notify the special reserve price of various identified land sites for tourism unit projects on their websites and also on the website of Department of Tourism. But the special reserve price shall not be less than the residential reserved price of that specific area. In compliance of new policy, Urban Governance and Revenue Departments shall amend their respective rules as indicated above.

(b) The process of competitive bidding and allotment for such reserve Hotel lands with "Special Reserve Price" shall be as follows:-

- i. The Local Bodies shall notify through public advertisement for sale and disposal of lands identified and reserved for hotels and other tourism units through competitive bidding. The Special Reserve Price for sale / disposal shall be indicated in the advertisement and this price shall be the base price for disposal of land through competitive bidding.
- ii. Concerned Local Body / Panchayats / District Collectors shall regularly take action for the disposal of the available land, through public advertisement. In case more than one applicant applies for the land within the specified time period, the sale / disposal of land shall be done through competitive bidding. In case no application is received in the specified time period, than allotment of land, shall be made to the single bidder on special reserve price, as per the other provisions of the Tourism Unit Policy



- iii. In case of above 2 b (i) and 2 b (ii), the Local Body / Panchayats / District Collectors shall ensure applicability of pre-qualification of bidders who are allowed to bid for the hotel land or the single applicant / bidder who is considered for allotment of land at Special Reserve Price. The Local Bodies / Panchayats / District Collectors shall also ensure that the successful bidder in the competitive bidding process or the single bidder / applicant (who has been considered for allotment of the land on Special Reserve Price) shall provide a "Performance Guarantee" equivalent to 10% of the project cost. Commercial activities on such land shall be restricted to a maximum of 15% of constructed area.
- iv. The following eligibility criteria is laid down for being eligible for bidding and applying for hotel / tourism units land under this policy
1. No conditions for Budget Hotel ( for 1,2 and 3 Star Category hotels)
  2. For 4 Star and above – The bidder / applicant should be a Hotelier / Tour Operator / involved in the field of tourism. In case the applicant does not have the above eligibility, then a tie up with a consortium with one of the members having the desired eligibility conditions can be considered.
  3. Land made available under this policy cannot be used for any other purpose for 30 years.

**(3) Conversion of Agricultural Land in urban areas**

(i) Conversion of agricultural land in urban areas have been done under Section 90'B' of Rajasthan Land-Revenue Act, 1956. Required orders are passed by concerned Local Body viz Jaipur Development Authority / UIT / Municipal Bodies. Presently for the establishment of Hotel and other tourism units, since there is no separate category, conversion is done in the commercial category. Recently, State Government has launched a new Township Policy vide Notification No. F19(1)UD/3/2002 dt. 29.03.2007. As per para no. A(13), a provision has been made for conversion of agricultural land in to non-agricultural land for different proposes. In this Policy commercial conversion of agricultural land @ of Rs. 400 /- per sq.mtr. in Jaipur City and different rates for other cities, have been made applicable. There is no separate rate for Hotel and other Tourism Units. Generally hotels are considered to be in commercial category. As such it is proposed to assign a subcategory in the commercial category, for hotels and tourism units, so that there is no ambiguity in land conversion for commercial lands and Hotels.

(ii) The State Govt. intends to provide full relaxation to Hotels and other tourism units for conversion from agricultural land, therefore sr. no. 3 in the table given below para no. A(13) of the Township Policy, a new provision would be included by which conversion charges / fees would be exempted for establishment of hotels and other tourism units from agricultural land.

S. N.	Use	City (amount in rupees per sq. yard)			
		Jaipur	Divisional Head Qtrs. (Except Bharatpur)	Cities having population less than one lac +	Towns with population less than one lac
3.	Agricultural to Hotel (Tourism Unit) in a township or independent plot)	Nil	Nil	Nil	Nil

(iii) Similarly as per para no. C/6 of above notification, development fees are also imposed, which have been determined as Rs. 200/- per Sqr. yard in Jaipur and in other cities Rs. 150/100 per sqr. yard. Under this Tourism Unit Policy, provision for abolition of the charges are also being proposed by adding new proviso (iv) to para 6/c of the new Tourism Policy as under :-

(iv) Hotels and other Tourism Units - Nil

**(4) For conversion of agricultural land into non-agricultural land in Rural areas.**

Under Rule-7 of Rajasthan Land revenue (conversion of agricultural land for non-agricultural purpose in Rural areas) Rules, 2007, provision for conversion for different purpose has been made and Rule 8 mentions about provisions for relaxation. As per provisions of Sub Rule(2) & (4) of Rule 8 a maximum area of 2000

sqr. mtrs and 1200 sqr. mtrs for Tourism Units and Hotels has been made. Similarly in Sub-Rule (3) & (5) 50 % exemption in fees has been made. It is proposed that in rural areas for different types of hotels and other tourism units full exemption from agricultural land conversion fees will now be made, for which necessary amendment in Rule 8 will be made as under :-

The amended Rule-8 of the Rajasthan Land Revenue (Conversion of Agricultural Land for Non-Agricultural Purposed in Rural Areas) Rules, 2007 is proposed to be as under –

8. "Exemption of Conversion Charges –

- (1) No conversion charges shall be payable by any department of State Government or a local authority for conversion of land for non-agricultural purpose for any official use.
- (2) No conversion charges, as prescribed in Rule-7, shall be payable where a tenant desires to establish a hotel or any other tourism unit as defined in Rule 2 (r) on the land held by him, upto 31<sup>st</sup> March, 2010."

**5. Regarding conversion of residential land and heritage properties into Hotels and other tourism units**

In Rajasthan Municipal Corporation (Land-Utilization Conversion) Rule, 2000, provisions for conversion of residential land into commercial and other purposes, have been made and definition of commercial, residential and industrial land – utilization has been given. In Rule 12,



provision for conversion of non-commercial land for commercial purpose has been made on 40% of the reserve residential price. As per these provisions any residential land or building used for hotels shall be converted on the 40% residential reserve price. All such heritage properties forts, palaces are also covered in this category and in case of establishing hotels in such heritage properties, developer has to deposit conversion charges as per provision of the Rule-12.

In Rajasthan presently there are many havelis, forts and palaces in heritage category that can be developed into hotels, which would be of special attraction to tourists. This would not only increase the tourist arrivals in the state but also promote the culture of Rajasthan. Hence for this, in Rule-12(i) the following proviso shall be added :-

- (i) that any heritage property such as havelis, forts, palaces, hunting lodges etc, which have been constructed prior to 1950, and are proposed to be utilized for conversion / construction into heritage hotels having minimum of 10 rooms shall be exempted from above mentioned fees.
- (ii) provided further that if any residential land or residential building is proposed to be used for hotels or other tourism units, having minimum of 10 rooms, shall be exempted from above mentioned fees.

Provided further that for other tourism units and camping sites or tents etc, restriction of 10 rooms will not be applicable.

## 6. **Regularization**

There are some heritage properties and residential land and buildings which are running as hotels or other tourism units without permission and are also operational. Under new policy, new hotels and tourism units will be fully exempted from land conversion charges. If land and buildings are being used as Hotels and tourism units without prior permission, the same shall be regularized under Rule-12 of Rajasthan Municipality (Land-use conversion) Rule – 2000 on the basis of merits as per new clause of Rule-12 on payment of 25% of regularization fees.

## 7. **F.A.R.**

Presently there is provision of 1.75 FAR in JDA area and other urban areas, which has been doubled by Urban Governance Department order dt. 19.02.07 in new developed and New Township areas, subject to condition that overall FAR of the Township area shall not exceed 1 (one). FAR for Hotels already established would be increased from 1.75 to 2.0 to allow construction of an additional floor. But in both circumstances, land coverage area shall be similar to previous permissible area.

**But in such cases only rooms would be permitted for construction rather than restaurant, bar or banquet hall etc.**

8. Other such policy matters which are related to Hotels and other Tourism units and which are not covered in this Tourism Unit Policy-2007, will be put up through nodal department on the basis of merits to BIDI for appropriate decision.
9. All concessions available in Rajasthan Investment Policy Scheme 2003, shall also be available to all tourism units.

**10. Nodal Department**

For infrastructural development of all tourism units, Tourism Department shall work as Nodal Department.

11. **After the approval of the Tourism Unit Policy 2007 by the Cabinet, concerned departments would not be required to send to the cabinet amendments in their respective rules/ sub-rules and notifications. Concerned departments can make such amendments at the departmental level.**

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# **ANNEXURE – V**

EXTRACTS FROM PLANS RELATED TO MUNICIPALITY AND  
REGION

City Development Plan for Jaipur, April 2006  
Jaipur Heritage Management Plan, Built Heritage, February 2007



# 8. Heritage and Conservation


## 8.1. INTRODUCTION



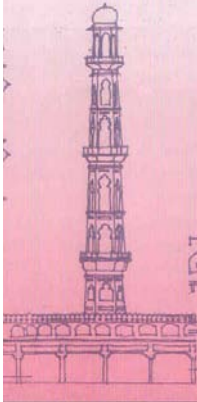
Heritage is a terminology that most truly expresses the character of Jaipur. The city is known as the “Pink City” and has a vast and rich heritage. The city was built by Sawai Jai Singh in 1727. The city was planned as per the ancient hindu treatise of Shilpa Shastra. The city continued to amalgamate new changes into it while preserving its old character. As part of the city development plan it was considered important to assess the heritage areas of the city, their present status and the status of their conservation. This chapter is organized into eight sections. An inventory of heritage areas has been given in section 2. The characteristics of the walled city, that is the predominant heritage area of the city has been detailed out in section 3. A review of conservation efforts of the city has been done as part of section 4. Section 4 describes the work of various agencies involved in the conservation of the heritage areas in the city. The issues related to heritage and conservation are summarized in section 6.




## 8.2. INVENTORY OF HERITAGE AREAS



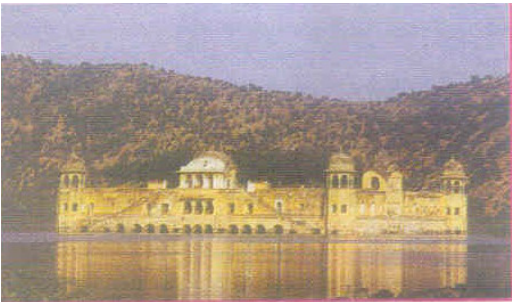

The heritage buildings in Jaipur can be broadly classified into three heads viz., royal palaces and forts, temples and museums. The largest concentration of the heritage buildings is within the walled city and the JMC area. 8 major heritage buildings are within the walled city while 10 are in the municipal area. The heritage areas in the city have been constructed at various points of time in history. Each has its own unique characteristics and is an architectural marvel in its own right. **Table 8-1** describes the salient characteristics of each of each of these heritage buildings. Figure 8-1 shows the locations of heritage sites in Jaipur.

**Table 8-1: Heritage Areas- Jaipur**

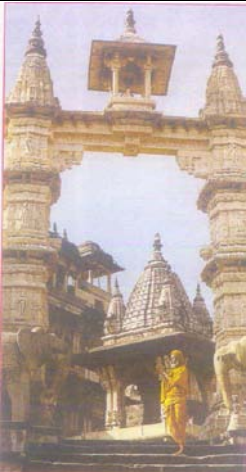

S. No.	Name	Description
<b>Walled City Area</b>		
1	<b>City Palace Complex</b>	<ul style="list-style-type: none"> <li>• 1729-1732, located in the heart of the city.</li> <li>• The palace occupies about one-seventh of the old city area.</li> <li>• It is popularly known as City Place to differentiate from ancient Amber Palace.</li> <li>• Palace complex comprises of many structures integrated into one like Ganesh pole, Diwan- e- Am, Diwan-e-Khas, Mubarak Mahal, Chndra Mahal, Diwan khaanacourtyards, gardens and other buildings.</li> <li>• Other striking features in the palace are the richly decorated doors and gateways guarded by sentinels decked in full royal livery of the legacy of the Kacchwahas.</li> </ul> 
2	<b>Hawa Mahal</b>	<ul style="list-style-type: none"> <li>• 1799, located at Sireh Deori Bazaar, in the walled city.</li> </ul>

S. No.	Name	Description
		<ul style="list-style-type: none"> <li>The palace is otherwise known as 'Palace of Winds' built by the poet king Sawai Pratap Singh.</li> <li>It was built for the royal ladies to enjoy the procession and day-to-day activities.</li> <li>Palace is a five storeyed stunning semi-octagonal monument resembles the crown of Lord Krishna.</li> </ul>  <ul style="list-style-type: none"> <li>Striking architectural features of the palace are 953 niches and 152 windows encrusted with lace fine screens with overhanging latticed balconies, curvilinear roofs, domes and spires.</li> <li>It has become the hallmark of Pink City, a part of the City place.</li> <li>At present it has been converted into a museum exhibiting a fine collection of ancient paintings, sculptures, handicrafts, coins and armoury.</li> </ul>
3	Jantar Mantar	<ul style="list-style-type: none"> <li>1728, located outside the gateway of City Palace Complex.</li> <li>It is an open-air observatory.</li> <li>Built by king Sawai Jai Singh II as astronomy was a life-obsession for him and to know time in that era.</li> <li>It comprises five open-air astronomical observatories being one of the largest and oldest observatories in India.</li> </ul> 
4	Nawab Sahib Ki Haveli	<ul style="list-style-type: none"> <li>18th Century, Located in Tripolia Bazaar. Haveli is rich in intricate carving.</li> <li>Famous for captivating and intricate carving.</li> <li>A panoramic view of the city can be enjoyed from the rooftop of the haveli.</li> </ul>
5	Swargasuli or Isar Lat	 <ul style="list-style-type: none"> <li>1749, Located on western side of Tripolia Bazaar.</li> <li>Also known as the 'heaven-piercing minaret' built by Sawai Ishwari Singh to commemorate a grand victory.</li> </ul>
6	Maharani Ki Chhatri	<ul style="list-style-type: none"> <li>The funeral place for royal ladies is located just before the Ramgarh road crossing, marked by some wonderfully carved cenotaphs.</li> </ul>
7	Ram Niwas Garden	<ul style="list-style-type: none"> <li>1868, located few meters away from Ajmeri Gate.</li> <li>Built by Maharaja Sawai Ram Singh.</li> <li>It sprawls across an area of 4 acres and was designed by surgeon Major De-Faback.</li> <li>Total cost was four lakhs rupees during that time.</li> <li>A well-laid out garden comprising zoo, a bird park, play ground, exhibition ground and a gymnasium.</li> </ul>

S. No.	Name	Description
		<ul style="list-style-type: none"> <li>• A century old Zoological garden is a part of this garden.</li> </ul>
8	<b>Albert Hall</b>	<ul style="list-style-type: none"> <li>• 1863, Situated in the Ram Niwas Garden.</li> <li>• The magnificent building is an excellent example of Indo-Saracenic architecture, designed by Sir Swinton Jacob.</li> <li>• It is oldest museum of the state and houses a large collection archaeological and handicraft pieces.</li> <li>• Architectural features are the arched verandahs and domed pavilions inspired by British models and Mugal style respectively.</li> </ul> 
<b>JMC Area</b>		
14	<b>Amber Fort</b>	 <ul style="list-style-type: none"> <li>• Built six Centuries back, the fort stands atop a range of craggy hills about 11 kms from Jaipur city, on the Delhi-Jaipur highway.</li> <li>• Amer was the capital of the Kachhawahs before old Jaipur.</li> <li>• The fort comprises of number of gardens, courtyards, palaces, diwn-e-am, Diwan-e- Khas, etc.</li> <li>• The most striking features in the whole complex are the Sish Mahal and Temple of Mata Sithala Devi, have become point of attraction till date.</li> </ul>
15	<b>Amber Palace</b>	<ul style="list-style-type: none"> <li>• 1558, is a part of Amber fort.</li> <li>• The palace was built by the Raja Bihar Mal and later his successor Raja Man Singh.</li> <li>• But now except few features, ruins of different structures exist in the Fort-palace.</li> </ul>
16	<b>Jaigarh</b>	<ul style="list-style-type: none"> <li>• 1726, hilltop fortress near Amber.</li> <li>• Built by Maharaja Jai Singh II.</li> <li>• It is one of medieval time fort, still well preserved.</li> <li>• It consists the Pride of Jaigarh the 'Jai Ban' canon, supposed to be the largest canon of its type.</li> <li>• It has also palaces, well maintained gardens, granary and a tall watchtower.</li> <li>• It is now famous for the legendary tales associated with treasures of Kachhawahs royal family protected by the Mina Tribes.</li> </ul> 

S. No.	Name	Description
17	<b>Nahargarh</b>	 <ul style="list-style-type: none"> <li>• Built in 1734, this hilltop fort guards the Jaipur city.</li> <li>• It is the third hilltop fort guarding the Jaipur city with its crenellated walls running along the ridge.</li> <li>• After the foundation of Jaipur as the new capital of Kacchwahas, royal families used the fort for summer excursions and picnics.</li> </ul> <ul style="list-style-type: none"> <li>• It is also said that it was planned as a place where the citizens could shelter in case of an invasion of Jaipur city.</li> <li>• There is a escape route that links the city to this fort.</li> <li>• Though the fort has many ruins but the also houses architectural beauties like Hawa Mandir and Madhavendra Bhawan that revives the grandeur of bygone era.</li> </ul>
18	<b>Motidoongari</b>	<ul style="list-style-type: none"> <li>• Little fortress perched on a hilltop on the southern horizon of the city.</li> <li>• It is a replica of a Scottish castle, the private residence of the fourth son of late Maharaja Man Singh and also home of famous Maharani Gayatri Devi.</li> </ul> 
19	<b>Jal Mahal Place</b>	 <ul style="list-style-type: none"> <li>• 1799, located in the midst of picturesque Man Sagar lake.</li> <li>• It lies on the way to Amber, 6km away from Jaipur.</li> <li>• It is also known as 'Water Palace', built by Sawai Pratap Singh as summer resort and pleasure spot.</li> </ul> <ul style="list-style-type: none"> <li>• A paved causeway leads up to the beautiful palace, which is noteworthy of its fascinating</li> </ul>
20	<b>Rambagh Place</b>	<ul style="list-style-type: none"> <li>• Built in the 1920's by Maharaja Sawai Man Singh II.</li> <li>• One of the most luxurious and finest palaces of the country.</li> <li>• Built in Indo-Saracenic style, designed by british architect.</li> <li>• The only private residence in the world having its own polo ground.</li> <li>• It has now been converted into a heritage hotel called 'Palace Hotel'.</li> </ul>
21	<b>Gaitor</b>	<ul style="list-style-type: none"> <li>• Royal crematorium located at the foothills of Nahargarh fort.</li> <li>• Famous for several spectacular cenotaphs and memorials built in the memory of various distinguished members of the royal families.</li> <li>• The prominent of the cenotaphs is that of Maharaja Jai Singh, built in white marble, comprising 21 ornately carved pillars depicting scenes and</li> </ul> 



S. No.	Name	Description
22	<b>Jagat Shiromani Temple</b>	<p>figures from hindu mythology.</p>  <ul style="list-style-type: none"> <li>• Built between 1656-1665, located in foothills of Amber hills.</li> <li>• It is one of the marvels of Indian temple architecture.</li> <li>• It houses black stone idol of Lord Krishna, which was worshiped by saint- poetess Mira Bai and was brought from Chitturgarh.</li> <li>• The temple has an elegant marble gateways guarded by neatly sculpted stone elephants.</li> <li>• Temple comprises of Garuda temple, Toran dwar with the main temple.</li> </ul>
23	<b>Ghat Ki Guni</b>	<ul style="list-style-type: none"> <li>• 1779, situated towards the south-eastern corner of the walled city along Agra road.</li> <li>• It is adorned with three beautiful gardens built during 18th &amp; 19th centuries.</li> <li>• Sisodia Rani Gardens &amp; Palace:</li> <li>• 6 kms from the city built by Sawai Jai Singh in 1779 for his Sisodia queen.</li> <li>• Comprises of terrace gardens equipped with fountains, cascades and water channels sprouting from natural springs.</li> <li>• Vidyadhar Garden:</li> <li>• Located on the way to Galta, about 8 kms away from city.</li> <li>• Built by Vidyadhar Bhattacharya, comprising terrace gardens with several galleries and pavilions exhibiting murals and wall paintings of Lord Krishna.</li> <li>• Kanak Vrindavan:</li> <li>• It is temple-garden complex, located on Delhi-Jaipur Highway, before Amber Fort.</li> <li>• The temples and gardens have recently renovated and regained its charm and splendour.</li> <li>• Provides scenic beauty of Jal Mahal and the surrounding hilly area.</li> <li>• Has become a favourite excursion and picnic spot of tourists and locals.</li> </ul> 

Besides these buildings, several components in the walled city have a distinct heritage value of their own. These include the bazaars, water tanks, small temples and the chabutras. These have been constructed more than 200 years ago. In order to address these components in greater detail, the subsequent section gives a description of the characteristics.

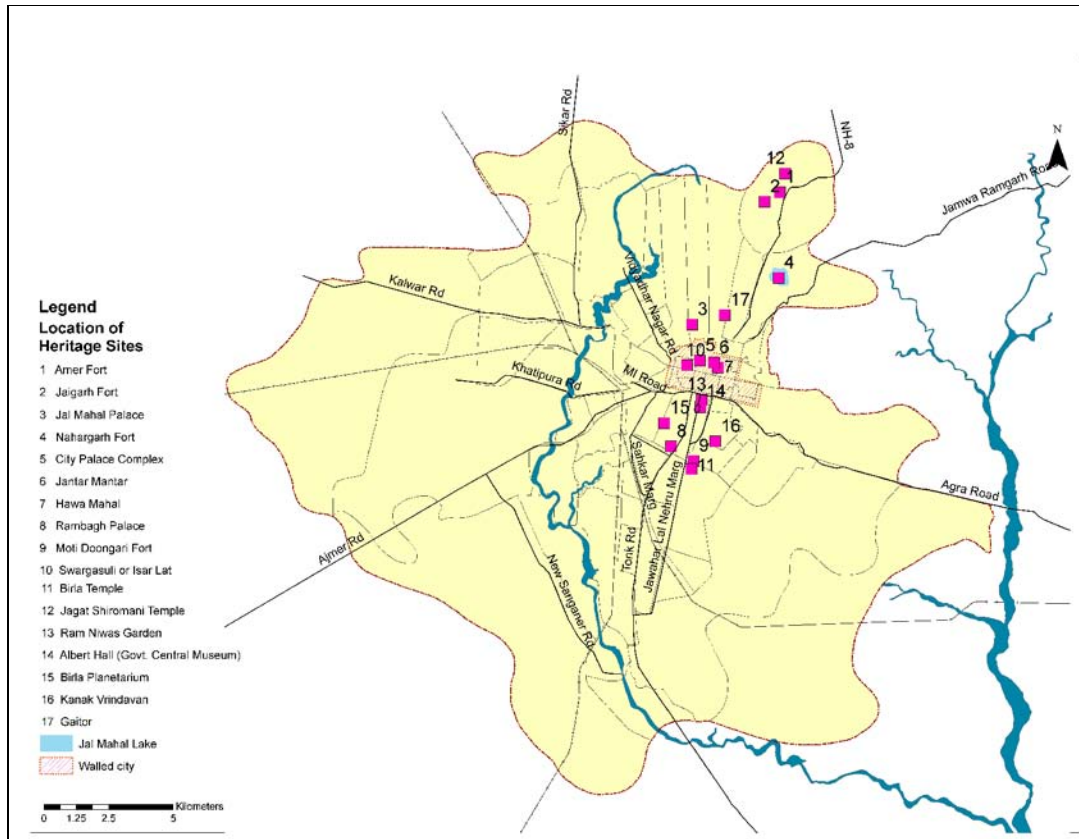


Figure 8-1: Locations of Heritage Sites in Jaipur

### 8.3. WALLED CITY

#### 8.3.1. Architectural and Design Principles

The walled city is planned in the valley to the north and east of the city. On the North of the walled city, was the old capital Amer while the southern boundary was determined by the ancient trade route of Delhi-Agra-Ajmer. The city has been planned on the basis of Prastara style, one of the ancient treatises on Hindu town planning with a size of 4 Km x 6 Km. The city has been designed as a nine square grid (residential sectors) in keeping with the Vastu Shastra, six of them as an orthogonal cluster. The main axis of the city followed the local topography along a ridge so that natural drainage could be made use of. The town was divided into four, nine or sixteen major wards with appropriate number of roads running east west and north south. Within the wards, roads are again planned on a chess-board pattern. The spacing of the roads is determined by the sizes of plots. The original pattern of wards was arranged with the royal palace situated in the center of the city and the serving in the peripheral areas.

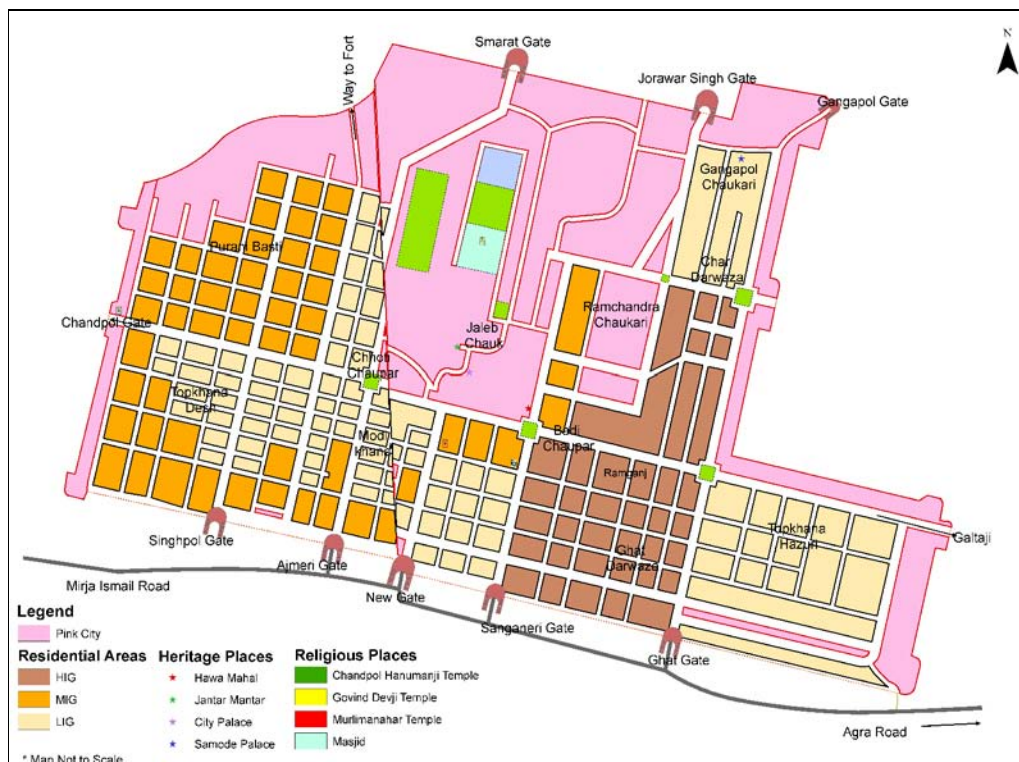
The central Square with the observatory accommodated the palace and its gardens, administrative offices, etc. covers a larger area merged with the square on its North. The Chowkri Sarhad was reserved for royal use including palaces, temples, gardens, other royal establishments and the observatory. The city was originally divided into four rectangular blocks or Chowkries like Sarhad, Purani Basti, Topkhana Desh and a block combining Modikhana and Visheshvarji. The Chowkri Ghat Darwaja and Ramchandrajai were added later and Chowkries Topkhana Hazuri and Gangapol subsequently. The major roads were abutted by building

facades with pinkish stone earned old Jaipur its name as Pink City. City was surrounded by 25 feet high and 9 feet thick crenellated masonry wall.

The Jaipur Development Authority has identified heritage buildings in the walled city. A total of 300 buildings have been identified in the various chowkhris of the walled city. These have been categorized into large, medium and small on the basis of area. The location of all the buildings in the various chowkris of the walled city has been given in **Table 8-2**. **Figure 8-2** shows the heritage areas within the walled city.

**Table 8-2: Heritage Buildings-Walled City**

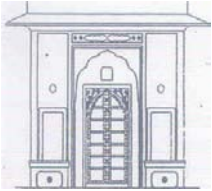
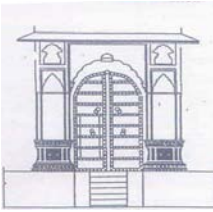
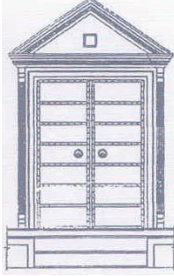
Chowkri	Large	Medium	Small	Total
Purani Basti	6	14	26	46
Top khana Desh	6	11	31	48
Modi Khana	9	21	22	52
Vishveshvarji	5	17	41	63
Ghat Gate	7	11	12	30
Top khana Hazuri	3	3	11	17
Ramchandrajji	9	9	5	23
Gangaploe	1	7	13	21
<b>Total</b>	<b>46</b>	<b>93</b>	<b>161</b>	<b>300</b>



**Figure 8-2: Heritage Characteristics of Walled City**

The architectural styles in the houses of the walled city can be categorized into four distinct categories. These include the Rajasthani style, Art Nouveau style and the colonial style. Each of these has a reflection in the various styles of doors, windows and balconies. **Table 8-3** shows gives a brief description of these styles with respect to each of the elements.

Table 8-3: Architectural Styles

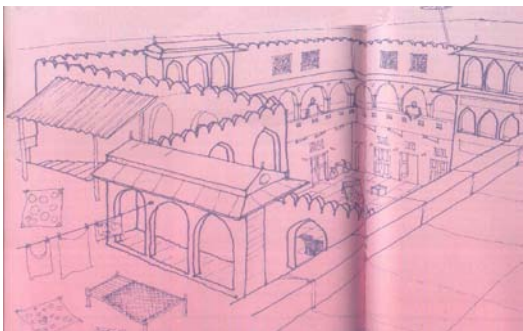



Elements	Rajsthani Style	Art Nouveau Style	Colonial Style
<b>Door</b>	 <ul style="list-style-type: none"> <li>• Elevation of three arch simple door</li> <li>• Pointed arch door</li> <li>• Three arch simple door</li> <li>• Three pointed arch door</li> <li>• Three fluted arch door</li> <li>• Fluted arch door</li> </ul>	 <ul style="list-style-type: none"> <li>• Elevation of Three arch decorative Doors.</li> </ul>	 <ul style="list-style-type: none"> <li>• Elevation of Colonial Door</li> <li>• Colonial typical door</li> <li>• Flat arch door</li> </ul>
<b>Windows</b>		<ul style="list-style-type: none"> <li>• Three-window organization.</li> <li>• Full height shutters.</li> <li>• Terrace parapet.</li> <li>• Projected balcony parapet.</li> <li>• Projected balcony with perforated parapet.</li> <li>• Cast iron parapet for projected balcony.</li> </ul>	<ul style="list-style-type: none"> <li>• Three windows with surface relief work and traditional organization.</li> <li>• Three Palladian windows.</li> <li>• Window with grill.</li> <li>• Wooden simple shutter.</li> <li>• Nine opening organization.</li> <li>• Paneled shutter with semi circular ventilator jail.</li> <li>• Projected room supported by bracket</li> <li>• Surface treatment moulds</li> <li>• Curved corners</li> </ul>
<b>Balcony</b>	<ul style="list-style-type: none"> <li>• Projected balcony with:</li> <li>• Chajjas</li> <li>• Bengal chatri</li> <li>• Three arches</li> <li>• Five arches</li> </ul>		

### 8.3.2. Existing Situation

The existing situation of the walled city has been assessed vis-à-vis its present status and condition. The walled city is currently in a state of degeneration. The traditional system of planning has no relevance to the present usage. The rules and regulations for conservation have been violated. **Table 8-4** compares the traditional system with the existing status of the walled city with respect to several elements that include road network, residential areas, commercial areas and architectural styles.



**Table 8-4: Existing Situation Assessment- Walled City**

Aspects	Traditional System	Present Status
<p><b>Residential Areas</b></p>	<ul style="list-style-type: none"> <li>Palaces<sup>4</sup> and havelis with two or more internal courtyards characterized the residential sectors.</li> <li>Havelis developed to make them conducive for extreme climates.</li> <li>Houses of middle-class people were two-storied building with one or two inner courtyards.</li> <li>Low-class people such as artisans, weavers, etc. had either semi-pucca or katcha structure.</li> <li>Two types of clustering patterns are seen in Jaipur as Street cluster<sup>1</sup> and Space cluster.</li> <li>Most striking features in the buildings are the courtyards, balcony and terraces.</li> <li>Each of the mohallas comprised of common facilities like drinking water- well, workshop area, temples, religious practices deities and festivals, used to symbolize a strong community feeling.</li> </ul> 	<ul style="list-style-type: none"> <li>City palace still used by the royal families;</li> <li>Some portions like the Diwan-e-aam, Diwan-e-Khas, Sish mahal, etc. kept open for the public and tourists.</li> </ul>  <ul style="list-style-type: none"> <li>35% of high-class houses demolished in 1971-81 and replaced by their owners.</li> <li>The middle-class houses have become very old, untransformed, three-storied structures with very small inner courtyards. These are not used for residential purposes.</li> <li>The courtyards are now used for different purpose parking, storage, utilities, etc. No sense of open space/ community feeling can be seen now.</li> <li>Implementation of building bye laws for conservation is poor/</li> <li>Cracks are seen in the 200 years buildings of the walled city that is a threat.</li> <li>Lack of awareness on heritage and conservation.</li> </ul>
<p><b>Markets</b></p>	<ul style="list-style-type: none"> <li>Original markets in city include Kishanpole bazaar, Gangauri bazaar, Johari bazaar, Sireh Deorhi bazaar, around 200 years old. These markets built on the original slope of the dunal crest.</li> <li>Markets developed in different stages of city development. Initial markets include the north-south<sup>2</sup> and east-west<sup>3</sup> markets that intersect at choti and badi chaupars.</li> <li>With the saturation of these, new markets grew into residential areas known as rastas that meet the main markets at right angles.</li> <li>The bazaars extend from the main gates of the peripheral fort wall, encircle the squares and extend again to define the principal streets.</li> <li>During Post-independence period markets developed both within and outside the walled city. These markets include Bapu bazaar, Nehru bazaar, Indira bazaar, Sanjay bazaar, developed subsequent to the main markets, Chaura rasta, Kishanpole bazaar and Johari bazaar respectively.</li> </ul>	<ul style="list-style-type: none"> <li>54% of city commercial area in walled city.</li> </ul>   <ul style="list-style-type: none"> <li>Residential areas converted into shops.</li> <li>New markets analogous to the drainage pattern of the city, eg Maniramji ki Kothi</li> </ul>

<sup>4</sup> Palaces consist private residential sectors similar to basic units of haveli a multistory building with rooms facing a system of courtyards and were inhabited by the royal families.

<sup>1</sup> Organization of houses around a space or a street and their connection to it show privacy notions of the people.

Aspects	Traditional System	Present Status
		<p>Ka Rasta and Thakur Pachewar Ka Rasta.</p> <ul style="list-style-type: none"> <li>• The footpaths of the Tripolia, Chandpol and Ramganj bazaars are occupied by wooden stalls, spoiling the beauty of the main market façade and increasing the traffic congestion on the streets.</li> <li>• Infrastructure facilities like drainage, road, etc insufficient in markets.</li> <li>• Residential apartments on either side of the bazaars like Tripolia bazaar, Chaura Rasta, Johri bazaar, Chandpol bazaar, Kishanpol bazaar, have been converted into shopping/ commercial areas and are choked with traffic.</li> </ul>
<b>Road Network</b>	<ul style="list-style-type: none"> <li>• Grid- iron pattern with seven gates<sup>4</sup>.</li> <li>• Wall around the city for defence.</li> <li>• On the main streets, strict control was exercised on the street facade, along which shops and arcades were located. All the buildings were one storey high beyond Chatries.</li> <li>• Four hierarchies of roads planned including:</li> <li>• Major roads Surajpol- Chandpol and the East- West roads called Rajmarg having width of 33 mts.</li> <li>• 16.5 mts wide road linking the internal areas of the sectors.</li> <li>• 8.25 mts prastara chessboard divides the sectors into mohallas<sup>1</sup>.</li> <li>• 4 mts lanes named inhabitants like Maniharon ka Rasta, Thatheron ka rasta, Ghee walon ka rasta, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Roads in walled city encroached by the street hawkers, rickshaw pullers, etc creating problems like insufficient parking space, drainage, etc.</li> <li>• Increased vehicular ownership has led to chaos in the walled city.</li> <li>• Traffic congestion in all areas of walled city.</li> <li>• Parking problem acute in bazaar areas. Rambagh garden is now used for parking of vehicles.</li> <li>• No distinct hierarchy of roads seen.</li> <li>• Absence of parking norms and regulations in the walled city.</li> </ul>
<b>Public Places</b>	<ul style="list-style-type: none"> <li>• Palace precinct hub of major public activities.<sup>2</sup></li> <li>• Chaupars were the open spaces at the intersection of the roads running in two major cardinal directions. Width of these squares was thrice the width of the major roads at the intersections.</li> <li>• City had three squares with capacity to hold 60000 population.</li> <li>• Large and small pockets of open spaces within each mohalla for informal gathering.</li> <li>• Temples and monuments were also used for the public gathering. Large temples were located at all the gates in the fort walls as well as Chaupar.</li> </ul>	<ul style="list-style-type: none"> <li>• Chaupars not used for public gathering.</li> <li>• Areas around the chaupars used for commercial purposes.</li> <li>• Open spaces near/around the mohallas used for commercial activities.</li> </ul>



<sup>2</sup> These include Kishanpole bazaar, Gangauri bazaar, Johari bazaar and Sireh Deorhi bazaar.

<sup>3</sup> These include Chandpole bazaar, Tripolia bazaar and Ramganj bazaar

• <sup>4</sup> These gates include Dhruvapool (Zoewar Singh Gate) on the North, Gangapol and Surajpol on the east, Rampol (Ghat Gate), Shivpol (Sanganeri Gate) and Kishanpol (Ajmer Gate) on the south, and Chandpol on the west.

<sup>1</sup> Mohallas are known as small residential clusters.

<sup>2</sup> It occupies two of the city sectors and has large squares and appropriate structures to deal with the administrative functions.

Aspects	Traditional System	Present Status
<p><b>Architectural Characteristics</b></p>	<ul style="list-style-type: none"> <li>• Architecture styles prevailing in Jaipur can be categorized as Rajasthani, Art Nouveau, Colonial and the Contemporary Style.</li> <li>• The layout of the city based on the nine square plan.</li> <li>• The plan comprises of three main parts as Chaupar or the square, Primary streets or the inner streets and Secondary streets or the inner streets.</li> <li>• The shops consisted of the three-sectioned structure:</li> <li>• Front portion for trading,</li> <li>• Second portion manufacturing and</li> <li>• Third portion for storage.</li> <li>• There was a height restriction for these arcaded buildings</li> <li>• A low parapet wall decorated with uniform motifs provided vantage points for viewing occasions of daily life, celebration, grandeur and death.</li> <li>• Each commercial chamber was lifted slightly above the street level. This commercial edge was disguised within a shade of terracotta- pigmented plaster.</li> <li>• The concept of inner courtyards or the private open spaces was very important. Havelis were surrounded with open spaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Some of the areas near and around Hawa Mahal have been encroached upon and used for commercial purposes.</li> </ul>  <ul style="list-style-type: none"> <li>• Encroachment on either side of the streets lead to traffic congestion.</li> <li>• Pressure on the road network due to increasing demand of population.</li> <li>• A number of monuments poorly maintained.</li> <li>• Violation of rules and regulations for the conservation of heritage buildings and their surroundings.</li> <li>• Lack of interests and awareness of the people towards heritage conservation has led to deteriorating condition of the heritage buildings.</li> </ul>  <ul style="list-style-type: none"> <li>• Excessive display of advertisements as a part of commercialization is deteriorating the aesthetics of Jaipur.</li> <li>• 25% of properties rented increasing the pressure on infrastructure. There is no solid waste management in the walled city area.</li> </ul>

**8.4. POLICY AND LEGAL FRAMEWORK**

The Rajasthan Conservation and Heritage Byelaws, 1961 guides the conservation of the cultural properties. Besides this, the master plan has building byelaws that restrict or control building activities in walled city and heritage buildings. The byelaws include:

- No permission for erection, re-erection, addition or alternations of any building without sanction from the Nagar Nigam;
- Prohibit construction of buildings in open spaces or over tanks;
- Regulate building line, corners buildings, drainage, plinth, chimneys, services, minimum areas for rooms, height of rooms and the building, etc.

The tourism policy of the Government of Rajasthan highlights the conservation of heritage buildings. The policies include:

- Proposes consolidation of facilities to make fairs and festivals more attractive;
- State Archaeology Department, Devasthan Department, Waqf Board etc. to support efforts at revival of traditional building arts, to offer to private individual or firms or voluntary organizations interested in preservation of individual monuments on settled terms and conditions, and to carry out studies to assess the carrying capacity of popular tourist destinations with a view to regulate tourist traffic in them.

## 8.5. AGENCIES INVOLVED IN CONSERVATION

The Department of Arts and Culture and the Department of Tourism are responsible for the maintenance of the heritage buildings. Both these departments undertake conservation works. However, besides these, several other agencies undertake maintenance and conservation works in the heritage buildings. Also, the Rajasthan Institute of Conservation of Cultural Properties is responsible for maintenance and conservation of cultural properties. In all, a host of agencies are at work for conservation of Jaipur. However, much remains to be done especially for conservation of walled city. **Table 8-5** gives the description of public and private sector agencies involved in the development conservation works.

**Table 8-5: Agencies in Heritage Conservation**

S.No.	Agency	Role
<b>Public Sector Agencies</b>		
1	<b>Department of Tourism</b>	<ul style="list-style-type: none"> <li>• DoT offers a number of incentives for heritage conservation.</li> <li>• It directly supports implementation of heritage projects by, for instance, INTACH and Avas Vikas Sansthan, The direct assistance is limited to individual buildings/monuments having tourism attraction.</li> </ul>
2	<b>Devasthan Department</b>	<ul style="list-style-type: none"> <li>• Nearly 1,000 temples in Rajasthan (including 62 in Jaipur district) fall in the jurisdiction of the state government's Devasthan Department. These include 393 temples directly administered by the Department and 400 registered with it but privately administered by trusts.</li> <li>• Based on religious importance, historical significance, location and building condition, the Department has identified 12 temples for renovation work, of which one is in the Walled City.</li> <li>• The Avas Vikas Sansthan does renovation work, while minor repairs, etc. are carried out by the department on its own or through tenders.</li> </ul>
3	<b>ASI</b>	<ul style="list-style-type: none"> <li>• 150 monuments are protected in Rajasthan by the Jaipur circle of A.S.I. Projects<sup>5</sup> up to 2 lakhs can be approved by the Jaipur circle office. Bigger estimates require approval from the Director General of ASI (Delhi). Upon approval, the ASI executes the work.</li> <li>• ASI protects one of the havelis in Chowkri Purani Basti and 23 buildings are protected by the State Department of Archeology and Museums.</li> </ul>
4	<b>Department of Archeology and Museums</b>	<ul style="list-style-type: none"> <li>• 26 monuments which were protected by the state during the Maharaja's time were handed over to the Department of Archaeology and Museums.</li> <li>• At present it looks after 218 monuments in the state (including 45 in Jaipur district). Conservation work on these monuments is carried out with funds from the State government and includes plastering, repair of Chajias and Railings, and repair of passage. In projects with large investments, the PWD does the work.</li> </ul>
5	<b>Public Works Department</b>	<ul style="list-style-type: none"> <li>• The P.W.D is responsible for the properties that were in its charge during the Maharaja's reign. These include Sisodia Rani Ka Bagh, Vidhyadhar</li> </ul>

<sup>5</sup> The usual process is followed and involves the preparation of an inspection note by the superintending engineer or architect, following which the Conservation assistant submits estimates.



S.No.	Agency	Role
		Ka Bagh, and the museum in Rambagh. Besides the routine maintenance, PWD has carried out restoration works in Sisodia Rani Ka Bagh.
6	Jaipur Nagar Nigam	<ul style="list-style-type: none"> <li>• It is responsible for: <ul style="list-style-type: none"> <li>○ Cleaning the Walled City;</li> <li>○ Painting public buildings and monuments;</li> <li>○ Enforcing building byelaws;</li> <li>○ Declaring buildings unsafe as and when necessary; and</li> <li>○ Repairing and maintaining roads and sewerage.</li> </ul> </li> <li>• Repair and repainting of the Hawa Mahal and revitalization of Jal Mahal through restoration of the monument, revival of the lake and provision of tourist facilities is being done by JNN.</li> <li>• It is also responsible for the restoration of the old water tanks in the walled city. Restoration of one tank is complete and the work on the other is going on.</li> </ul>
7	Institute for Revival of Traditional Building Arts	<ul style="list-style-type: none"> <li>• The Rajasthan Housing Board has setup an Institute for Revival of Traditional Building Arts (IRTBA) in June 1993 located at Parsuram Dwara, opp. Jal Mahal, Jaipur under the aegis of Avas Vikas Sansthan, with the specific intention to revive the dying traditional Building Art.</li> <li>• The Institute was closed in 1999 due to the closure of Avas Vikas Sansthan.</li> <li>• Identify and document details of the existing Master Craftsmen of different building traditions/ styles.</li> <li>• Impart the job on training to the artisans/ students of buildings craft under the close supervision of the master craftsmen and experts.</li> <li>• Document data of the construction materials and methodologies required for the restoration works.</li> <li>• Develop special machines/ equipments of use in traditional art works to speed up such works.</li> <li>• Act as reference centre to provide consultancy of restoration projects for built heritage and cultural properties.</li> </ul> <p><b>Achievements</b></p> <ul style="list-style-type: none"> <li>• Documented various building art.</li> <li>• Trained 175 artisans in different trades through out Rajasthan.</li> <li>• Prepared literature of various trades for training.</li> <li>• Prepared specifications, basic schedule of rates for conservation works first time in India.</li> <li>• Prepared many project reports and executed conservation works in the whole of the state.</li> <li>• One of the engineers was sent to UK for one year conservation degree through INTACH.</li> </ul> <p><b>Projects Executed</b></p> <ul style="list-style-type: none"> <li>• 8 temples for Devsthan Department.</li> <li>• Bagore Ki Haveli, Udaipur.</li> <li>• Gattore Ki Chhatri, Jaipur.</li> <li>• Bikaji Ki Tekri and Junagarh Motwall, Bikaner.</li> <li>• Rakt Talai, Ayed Complex, Ruthi Rani Ka Mahal, Udaipur</li> </ul>
8	RICULLP	<p>The institute created to conserve the properties of heritage importance as well as to provide basic infrastructure to these sites a decision was taken in the review meeting of State Urban Agenda of Rajasthan (SUARAJ) on 22nd September 2005. It was subsequently approved by Hon'ble Chief Minister, Rajasthan to establish an institute for Heritage Conservation and Management at Jaipur.</p> <p><b>Role of Institute</b></p> <ul style="list-style-type: none"> <li>• To document old traditional building art forms through a survey of buildings of historical and architectural importance and extensively to</li> </ul>

S.No.	Agency	Role
		<p>photograph the works done in such buildings. The cataloging will have to be done building wise and building art form wise.</p> <ul style="list-style-type: none"> <li>• Making out dimensioned patterns based on old traditional patterns photograph.</li> <li>• To locate master craftsmen of traditional building art form at various prominent cities/ towns and to catalogue them building art – form wise.</li> <li>• To select old places/ buildings which need restoration, reconstruction, revival etc.</li> <li>• Selection of artisans/ trainees for receiving training and to lay down minimum educational and experience standards.</li> <li>• To prepare curriculum for training in various art – forms indicating the period of training, theoretical and practical.</li> <li>• To prepare films, video films, slides and literature for being used as training material. This will have to be done separately for each building art – form which requires to be given training into.</li> <li>• To find out avenue of work for its trained artisans in the public and private sector, in the state and outside.</li> <li>• To conduct research and development in improving materials to be used in the traditional building arts, identify and use alternative materials and to find ways and means of reducing the time and the cost of executing traditional building art form so that they become more economical and acceptable to the public.</li> </ul> <p><b>Resource Generation</b></p> <ul style="list-style-type: none"> <li>• In order to ensure autonomous funding of the Institute it will be imperative that an adequate corpus fund be generated which can support on going recurring expenditure of the Institute.</li> <li>• Corpus contribution can be collected from variety of sources particularly from organizational associates related with the departments of Urban Development, Art and Culture, Tourism and Devasthan, which all will benefit from the establishment and operations of the Institute.</li> <li>• It can generate income through consultancy for conservation and restoration projects, training of crafts men and through undertaking works on contract for restoration and conservation of monuments. Other sources for generation of funds could also be tapped in course of time such as from marketing its expertise and facilities etc.</li> </ul>
<b>Private Sector Agencies</b>		
1	<b>INTACH<sup>6</sup></b>	It has carried out restoration works in Dalaram Bagh and Kesar Keyari in Amber (the latter with Nagar Nigam) and in Maharani hi Chatri and Nahargarh with funding from the Department of Tourism.
2	<b>Rajasthan Urban Infrastructure Development Project</b>	<p>The project aims at:</p> <ul style="list-style-type: none"> <li>• To transform the economy of Jaipur by understanding, conserving and developing Jaipur's rich Heritage Fabric within the parameters of democracy and sustainability.</li> <li>• Building awareness of heritage related issues among the people of Jaipur.</li> <li>• To reconstruct, repair, restore and refocus the historic built elements of the city.</li> <li>• To generate and focus other development activities to support, or in no way compromise, the central objective of gaining UNESCO World Heritage City status for Jaipur.</li> <li>• To generate a sustainable and substantial revenue for the city and the</li> </ul>

<sup>6</sup> INTACH became active in Jaipur in 1988-89, when the present convener, Mr. John Singh bought a haveli in Amber and restored it using traditional materials and craftsmen. The project demonstrated that such a restoration work was both more cost effective and more durable than conventional non- traditional alternatives. Since then INTACH has emerged has one of the key-implementing actors in heritage interventions by the way of restoration of major buildings.

S.No.	Agency	Role
		state, from crafts, culture and tourism. The INTACH chapter of Jaipur, along with the Nagar Nigam is taking up various innovative steps- like the organizing of the ' Jaipur Gift Fair', ' Jaipur Virasat', and the first Jaipur Annual International Festival. Several projects have been taken up that are described in detail in the next section.
3	<b>Asia Urbs Project</b>	The Nagar Nigam also is working for the Asia Urbs project in associating with the INTACH chapter. The main focus of the Asia Urbs Project is: <ul style="list-style-type: none"> <li>• Documentation</li> <li>• Exchange of knowledge and Capacity Building</li> <li>• Application of Appropriate Development Principles in a pilot area.</li> </ul> The Heritage Walk happening in the area is an effort in the direction of capacity building. Modikhana Chowkri has been selected as the Pilot Area. It comprises of 700 households, schools, temples, buildings, etc. The improvement work included restoration of the buildings, parking plan, infrastructure improvement, etc.
4	<b>Hindustan Charitable Trust</b>	A charitable organization supported by the Birlas, the HCT takes up variety of works including building and maintaining/ running temples, hospitals and schools, and undertaking or supporting renovation of historical places. The renovations interventions are carried out by a team consisting of an architect, a site supervisor and 20- 25 specially trained craftsmen. So far, the trust has completed work on the Kanak Vrindavan temple and garden complex and has been working on the Galta complex.
5	<b>Ford Foundation</b>	450 buildings were identified by Ford Foundation where JDA was the implementing agency but conservation could not be possible as absence of legal provisions in the act.

## 8.6. CONSERVATION EFFORTS

Several efforts for conservation have been made for protecting the various monuments. Some of these have been discussed below.

### 8.6.1. Department of Tourism

The Tourism development plan for Jaipur-Sawai Madhopur-Tonk Circuit, 1995 describes the list of conservation work done as mentioned in **Table 8-6**.

**Table 8-6: Budget Utilized for Heritage and Conservation, Jaipur**

Name of the Building	Nature of Work	Project Cost in Lakh	Year of Completion	Executing Agency
Jal Mahal	Repair of Chattris Restoration P & C	350	1996	Nagar Nigam
Baramal Chattri	Restoration Conservation	10.15		Nagar Nigam
Maharaniji Ki Chattri	Restoration, Repair	30.00	1995	INTACH
Fortwall Opposite Maota Lake	Repair	10.00		Nagar Nigam
Galtaji	Restoration	Already Spent 200		Private Trust

Source: Tourism development plan for Jaipur-Sawai Madhopur-Tonk Circuit, 1995.

Apart from these the department of tourism has also undertaken several other projects that include lighting of important monuments, development of Jal Mahal, training and capacity building, food streets, etc. The details of each of these along with the status have been in **Table 8-7**.

**Table 8-7: Projects Undertaken- Department of Tourism**

S. No.	Project	Time Frame	Status of the Project
1	Lighting of important heritage monuments during night for tourists	1 Year	So Far the work of Hawa mahal, Albert Hall and Amer Fort has been completed. The work of Nahargarh Fort and Isarlat is in progress and is likely to be completed within the time frame set for the work by JAAG.
2	Development of Jal Mahal	1 Year	The Jal Mahal Tourism Project is still under consideration of the State Government for approval. Once the lease agreement is signed with the private sector developer, the work will commence.
3	Training and capacity building programs	1 Year	RITMAN the Training Agency of Tourism Department has drawn up an annual calendar of training to taxi, coach, travel/hotel staff and other related persons in tourism sector. Copy of the proposed calendar is enclosed herewith.
4	Night Bazaars at Amber, Jawahar Kala Kendra, Jaleb Chowk etc.	1 Year	Tourism Department has already set up night bazaar at Amer and Jawahar Kala Kendra. The Department has also organized night Bazaar at Tripolia Bazaar and one night Bazaar is going in Albert Hall/Ramniwas Garden area. The Department shall continue to organize such night bazaar in future as well.
5	Food Street (Ideal location could be Jal Mahal Project Area)	1 Year	Department of Tourism has set up a Food Street in Jal Mahal area. It shall continue to set up such night bazaars in future also.

### 8.6.2. Rajasthan Urban Infrastructure Development Project

The Rajasthan Urban Infrastructure Development Project, has also undertaken conservation works for heritage structures and areas. **Table 8-8** gives a brief description of these.

**Table 8-8: Conservation Projects-RUIDP**

S. No.	Name of Package	Financial Outlay (Rs. Cr)	Status		Likely date of Completion
			Physical	Financial (Rs Cr.)	
1	Renovation and Conservation of Panna Meena Ka Kund, Amber	0.40	100%	0.68	Work completed
2	Renovation and Conservation of Galta gate, Ajmeri gate and Sanganeri gate and surroundings	2.64 1.50 (Revised)	98%	1.50	Work completed
3	Renovation and Conservation of Galta gate, Chandpol gate and Newgate and surroundings	0.89	100%	0.77	Work completed
4	Renovation and Conservation of Kundlab, Kheri, Mathura Gate, etc.	2.75	100%	1.1	Work completed
5	Conservation of Lake Edges and revival of water bodies Sagar Lake-I & II at Amber, Jaipur	2.18	90%	1.47	Work in progress
6	Renovation and Conservation of Surajpol, Zorawar Singh, Ghati Gate, etc.	2.25	85%	1.20	Work in progress

Source: SE PIU, RUIDP, Jaipur

## 8.7. ISSUES

The major issues with respect to heritage and conservation include excessive commercialization, insufficient infrastructure facilities, encroachment on streets by hawkers and vehicles, misuses of proposed walkways in the walled city, inadequate parking facility,



legislative and legal framework and lack of awareness. **Table 8-9** lists the major issues related to heritage and conservation.

**Table 8-9: Heritage Issues**

S. No.	Issues	Description
1	Excessive Commercialization	<ul style="list-style-type: none"> <li>Excessive, uncontrolled and unchecked commercialization of the inner streets in the walled city has led to problems such as traffic congestion during the peak hours.</li> <li>Haphazard construction of shops have spoiled the cultural fabric of the city.</li> </ul>
2	Insufficiency of Infrastructure Facilities	<ul style="list-style-type: none"> <li>Due to lack of infrastructure facilities people from walled city are moving out to the outskirts. The vacant houses are in turn converted into commercial areas.</li> <li>Building byelaws not enforced leading to lack of space for provision of infrastructure.</li> <li>Heavy pressure on infrastructure facilities has made the streets more dirty and problematic.</li> <li>An integrated approach is required to reduce the problems like drainage, solid waste management, etc.</li> <li>The infrastructure facilities such as water supply, public toilets, solid waste disposal, etc. are not sufficient for the tourists near and around the heritage sites.</li> <li>A proper integrated and comprehensive approach for infrastructure provision and their maintenance at a city level is necessary</li> </ul>
3	Encroachment on the streets	<ul style="list-style-type: none"> <li>The rickshawpullers, hawkers, etc encroach upon the major streets.</li> <li>Heritage buildings like Hawa Mahal have been encroached upon by commercial activities.</li> <li>Pedestrian movement is restricted.</li> </ul>
4	Heritage Walkways	<ul style="list-style-type: none"> <li>No rules and regulations proposed for maintenance of heritage walkways;</li> <li>Vehicular movement should be restricted/banned on these walkways.</li> </ul>
5	Parking	<ul style="list-style-type: none"> <li>Few areas designated for parking leading to high levels of on street parking;</li> <li>Traffic congestion in the walled city and around heritage structures spoils the character of the place.</li> </ul>
6	Heritage buildings	<ul style="list-style-type: none"> <li>Poor data base on heritage buildings. Different sources quote different number of heritage structures. Proper inventory of heritage buildings is required.</li> <li>Heritage buildings being converted into modern buildings by the owners thus spoiling the fabric of the city.</li> <li>Repair and maintenance of the old heritage buildings like Amer fort is essential as they are the main sources of tourism and trade and commerce.</li> </ul>
7	Awareness	<ul style="list-style-type: none"> <li>Urban sprawl, illegal encroachment, pressure on infrastructure system, etc are mainly the result of lack of awareness and civic sense amongst people.</li> <li>Lack of awareness on heritage conservation.</li> <li>Heritage buildings treated only as commercial spots with no emphasis on conservation and protection.</li> </ul>
8	Institutional Set Up	<ul style="list-style-type: none"> <li>Overlapping of duties and responsibilities among various departments and lack of clear-cut responsibilities has led poor management of heritage buildings.</li> <li>It is necessary to set up a nodal agency that should comprise of members from various departments. The role of the agency should be: <ul style="list-style-type: none"> <li>Management database regarding all projects related to heritage and the implementing agencies;</li> <li>Co-ordination among different departments;</li> <li>Increase awareness;</li> <li>Capacity building;</li> <li>Formulation of special legislative measures towards heritage; and</li> <li>Strict regulations and restriction in walled city area to maintain its heritage fabric.</li> </ul> </li> </ul>



Jaipur Heritage Management Plan  
**Built Heritage**

Prepared By DRONAH AND JVF

For JHERICO (Jaipur Heritage Committee)  
Government of Rajasthan, Jaipur  
February 2007

# Current Heritage Policies and Legislation

The laws, legislation and policies for protection and conservation of heritage structures in the city of Jaipur outlined in several documents can be briefly outlined as below -

- Heritage Protection as per 'The Rajasthan Monuments, Archeological Sites and Antiquities (Act 1961)
- Heritage Byelaws for properties within Walled City by JNN
- Heritage Tourism Policies of the Department of Tourism, Rajasthan
- Adopt a Monument Policy

## **HERITAGE PROTECTION AS PER 'THE RAJASTHAN MONUMENTS, ARCHEOLOGICAL SITES AND ANTIQUITIES (ACT 1961)**

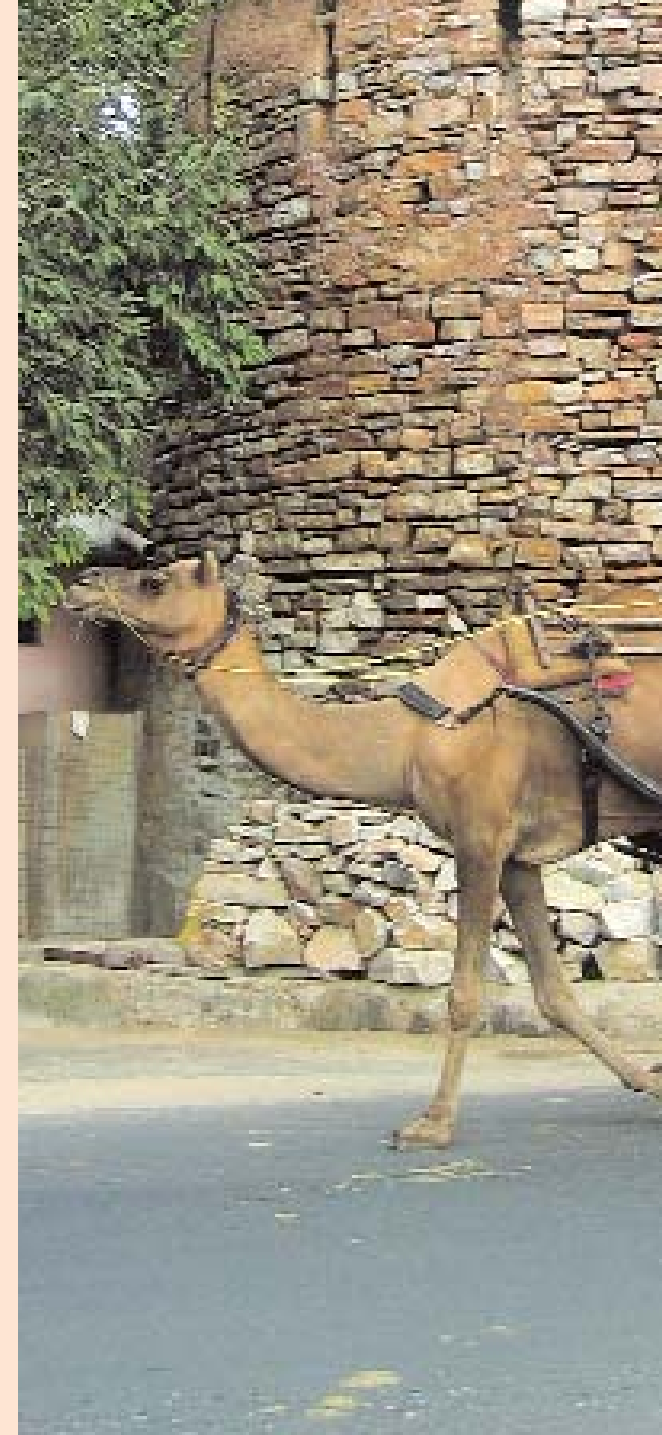
This act applies on any state protected monument that comes under the jurisdiction of the Department of Art and Archeology. JHERICO is in the process of revising the act into a comprehensively thought out and articulated state policy for heritage protection, preservation and promotion.

## **MASTER PLAN GUIDELINES AND BYELAWS FOR WALLED CITY**

The Master plan of Jaipur 2011 mentions

the policy for conservation of heritage and sets out building byelaws that restrict or control building activities in the walled city. These byelaws of JNN include:

- No permission for erection, re-erection, addition or alternations of any building without sanction from the Nagar Nigam;
- Regulate building use.
- Prohibit construction of buildings in open spaces or over tanks;
- Regulate Todas, Balconies, Jharokhas, Verandas and other projections in proportion to the street width
- Regulate building line, corners buildings, drainage, plinth, chimneys, services, minimum areas for rooms, height of rooms and the building, etc
- Regulate height of building in ratio of the road width.
- Prohibit construction near city walls
- Regulate alteration in the structural design, appearance, colour and other architectural features including Kangoora, panels, pillars, shutters, railings, parapet walls, balconies and jhaokhas and other structural listings of any building facing the main bazaars of the city or any portion of



such buildings as may be visible from the said bazaars

- Specify rules for each area of the walled city such as -
  - (a) In the Sireh Deodi Bagar, Johri Bazar, Tripolia Bazar, Ramganj Bazar, Kishanpole Bazar, Moti Katla, Gangori Bazar, Surajpole Bazar and Ghat Gate Bazar: - (i) Colours of walls of buildings including verandahs and their pillars shall be dark pink. (ii) Colour of shutters, doors and windows shall be pink or brown wood colour. (iii) Colour of railings, window grills, stenciling and decorations shall be white. (iv) Verandah in front of a shop shall remain open on the front and sides so as to form an open corridor throughout the length of the Bazaar and the opening shall be rectangular with flat lintel with a nameplate and Kangooras as per approved design.
  - (b) In Chaura Rasta: - (i) Colour of walls includ-

ing verandahs and their pillars, shutters of doors and railings window grills, stenciling and decorations shall be as prescribed in sub-clause (a) as in other bazaars while verandahs in front of shops shall have an arched opening as per approved design.

- (c) In Bapu Bazar and Nehru Bazar: - Openings of the verandah shall be rectangular with parapets or chajjas as per approved design and colour of walls shall be as given in sub-clause(a):
- (d) In Mirza Ismail Road:- Colour of the buildings shall be pink or cream or stone colour.
- (e) In Agra road from Ajmeri Gate to Ghat gate: - Colour of the building's shall be pink.
- (f) In Amer Road from Subhash Chowk to Jal Mahal:- Colour of the buildings shall be pink.

However, the present condition of the walled city shows that a number of the byelaws are





just on paper and it is the actual enforcement as well as enhancement of these byelaws that is essential for the preservation of the historic fabric.

### **TOURISM POLICY OF RAJASTHAN**

In keeping with the huge potential for tourism in the state, the Government of Rajasthan has adopted a strong tourism policy. One of the objectives of the Tourism Policy for the state with a focus on heritage is "Preservation of rich natural, historical, architectural and cultural heritage". In pursuance of this objective, a number of schemes outlined below, are underway:

- Under the Heritage Hotel scheme, concessions are offered for converting palaces, havelis and forts into hotels with a view to assist their preservation, and putting them to adaptive reuse. The Tourism Finance Corporation of India advances loans for Heritage Hotels projects for Rs. 50 lakhs and above. The Government of India gives an interest subsidy of 5% on loans advanced for conversion of the old properties into heritage hotels. The Government of Rajasthan has launched a scheme wherein it offers a capital subsidy of Rs.20 lakhs or 20% of eligible investment (whichever is less) for her-

itage hotels located in the rural areas along with a 10- year tax holiday.

- Under the scheme for development of Nazool properties of Heritage Values, historical buildings monuments not owned by the A.S.I or the State Archaeology Department, but owned by the State Government can be transferred to RTDC or RSHC for development into heritage hotels or tourist complexes in collaboration with private entrepreneurs.
- Under a scheme for land and property belonging to Devasthan Department, projects can be jointly RTDC, RSHC, Department of Tourism and Devasthan Department to utilize such land/ property (usually lying under utilized or in danger of encroachment) for Dharamshalas. Yatri Niwas, Tourist complexes for promotion of pilgrimage and cultural tourism.
- For expanding investment in tourism infrastructure, there are proposals for attracting institutional finance from the Tourism Finance Corporation of India, Department of Tourism, Rajasthan Tourist development Corporation, RIICQ and RFC and investment from non resident Indians, undertaking joint venture with private sector.



### **ADOPT A MONUMENT SCHEME**

The State aims to have 'Adopt a Monument' Scheme to encourage Public Private Partnership. The Government will encourage the preservation, conservation and upkeep of heritage properties like the 200 plus forts and palaces in Rajasthan and selectively open some of them for being developed into Hotels / Tourist Complex. The State will encourage private investment in developing ancient buildings and heritage properties as tourist resorts. The properties owned by the State government will be offered on easy terms to private entrepreneurs for conversion into hotels. Essential infrastructure, which is considered necessary, would be provided by the State on a selective basis. Corporate sector would be invited to join hands with the Government in conservation of historical heritage and monuments in the State.

The above acts and policies clearly indicate the initiatives taken by the GOR for the protection and conservation of the built heritage. The limitations of the above acts and policies are that :

- a. The Act 1961 can only protect a limited number of monuments.
- b. The byelaws within the walled city need to be enhanced as per typology and enforced on site.
- c. The Tourism Policy is well developed with great foresight but obviously with Tourism as the prime focus.

There is a clear need to evolve a well defined Heritage Policy parallel to the Tourism Policy with clear focus on heritage conservation, cultural tourism and economic regeneration.

# Heritage Area

## Public Buildings - Jantar Mantar and Hawa Mahal



### HERITAGE SIGNIFICANCE

The astronomical wonder of Jantar Mantar has extremely high historic, educational and architectural significance as the earliest structure in the city palace complex and is an interesting expression of astronomical pursuits in 18th century. Hawa Mahal is a unique architectural masterpiece of Jaipur with high urban form/architectural value. Both monuments are strongly linked with the global image and identity of Jaipur city.

*Universal Values*

- **Archeological**
- **Architectural**
- **Historical**
- Religious /Associational
- **Socio Cultural**
- Natural
- Economic/ Urban Regeneration

### LEVEL OF SIGNIFICANCE

- International**
- National
- State
- Local

### RISK ANALYSIS

#### **Natural Threats**

- **Insect/Animal Damage**  Geo-Technical Instability
- **Natural Aging**  Biological Attack
- Vegetation Ingress  Ground Water
- **Water Ingress**  Water Drainage
- Erosion

#### **Man-Made Threats**

- Pollution  Development Pressures
- Flooding / Dam Construction **■ Inadequate Planning**
- **Neglect and Inadequate Maintenance**  Industrialization
- Lack of Financial Resources  Lack of Public Awareness
- Negative Effects of Tourism  Obsolescence
- **Inappropriate Prior Conservation** **■ Vandalism / Graffiti**
- Other - Traffic Hazard

### RECOMMENDED ACTION STRATEGY

- Implementation of the Conservation Proposal that includes improved landscaping of existing complex/ Interpretation and more tourist facilities to be provided around.
- Heritage education programs linked to schoolchildren should be encouraged in the complex.

### PROJECT IMPACT

The conservation of the complex will showcase the most unique masterpieces of 18th century Jaipur. It will enhance tourism revenue.

### FUNDING POTENTIAL

International Organizations like the Smithsonian Institute; Ministry of Tourism, India



#### Ownership

Department of Archaeology & Museum, Rajasthan

### Status

Functioning with nominal entrance fee  
Proposal prepared by Department of Art and Archeology and is about to be implemented



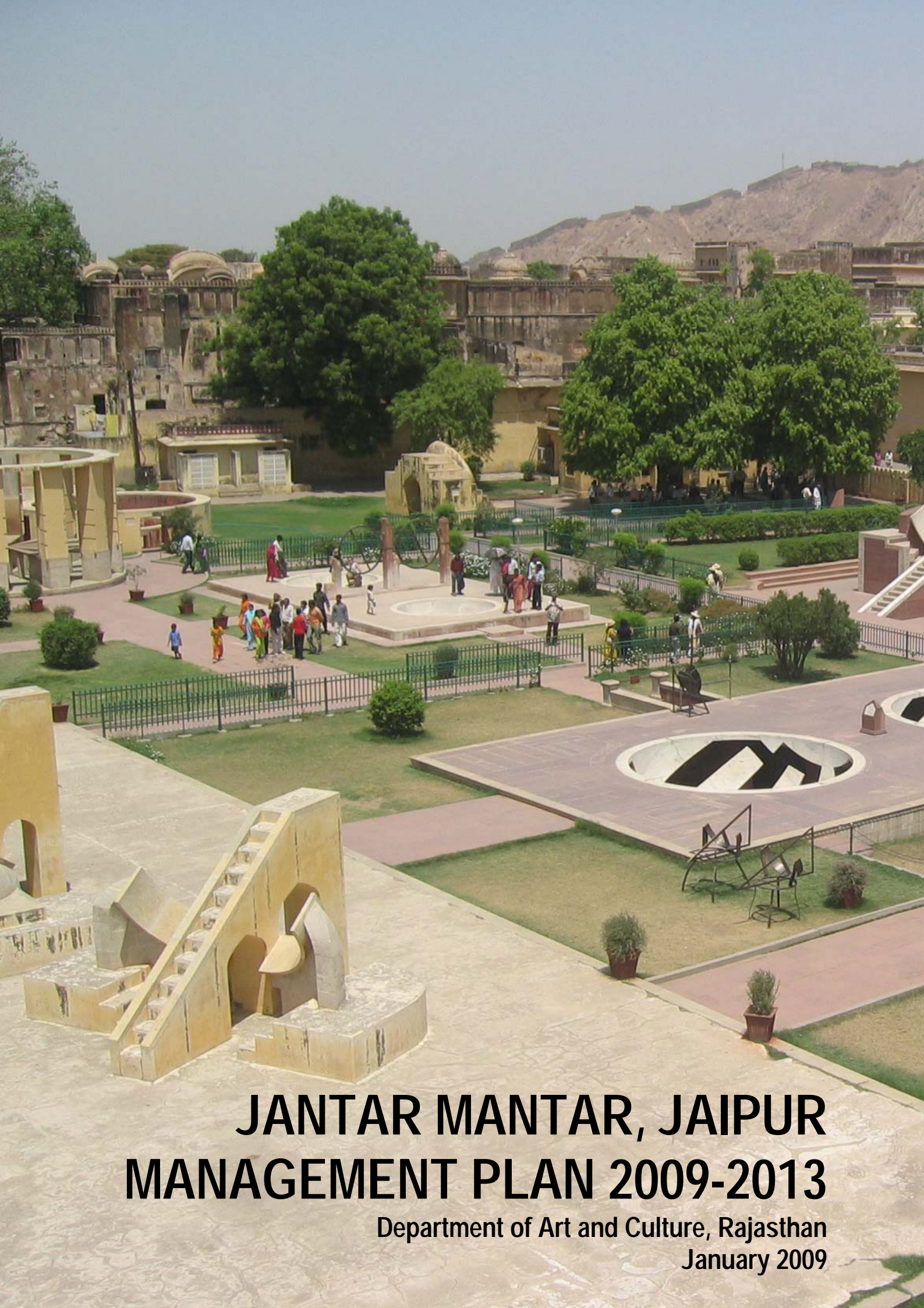
#### LEVEL OF PRIORITY

Very High High Medium Low



# **ANNEXURE – VI**

Jantar Mantar, Jaipur, Management Plan  
(2009 - 2013)



# **JANTAR MANTAR, JAIPUR MANAGEMENT PLAN 2009-2013**

Department of Art and Culture, Rajasthan  
January 2009

# **JANTAR MANTAR, JAIPUR MANAGEMENT PLAN 2009-2013**

**Department of Art, Literature and Culture, Rajasthan  
January 2009**

Prepared by:  
DRONAH

Development and Research organisation for Nature, Arts and Heritage, Gurgaon

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## Executive summary

India represents five observatories that belong to the same historico-cultural group, within the framework of the thematic initiative 'Astronomy and World Heritage'. Amongst the five, the four existing Jantar Mantar sites at Jaipur, Delhi, Ujjain and Varanasi in India are the most significant in being the best preserved conglomerates of pre-telescopic masonry astronomical instruments. Functioning both as scientific and educational institutions and as historico-cultural monuments of the same group, they have an extraordinary significance to the level of the world heritage. The nomination of Jantar Mantar, Jaipur is a first step in the serial nomination for all Jantar Mantar sites in India that represent the historic-cultural group of pre-telescopic masonry observatories from the 18<sup>th</sup> century. The submission of the Jantar Mantar, Jaipur as a World Heritage Site nomination in 2009 marks a point in time at which methods, policy and funding have combined to facilitate this momentous step forward to meet the enlisted objectives by UNESCO for this 'Year of Astronomy'.

### ***Statement of Outstanding Universal Value (OUV)***

*The site of Jantar Mantar, Jaipur is the most extant, best preserved amongst the group of pre-telescopic masonry observatories built by Sawai Jai Singh II in the 18<sup>th</sup> century, with maximum number of observational instruments in functional condition. The Jantar Mantar, Jaipur is an icon that has contributed significantly to astronomy, architecture, urban planning, political history and cultural distinctiveness of India; is a testimony to the astronomical knowledge of medieval India and marks the point of dissemination of this knowledge to general public through its monumental existence.*

A Conservation Plan for the site was prepared in 2005-06 and implemented in 2007-08. The plan identified several management issues and indicated the need of a comprehensive approach for the long term functioning and sustainability of the site that needs to be addressed through a Management Plan for the site. To ensure that the OUV of the site is maintained and to ensure a sustainable and integrated development of the site, the Management Plan has been formulated for a period of five years from January 2009 to December 2013.

### ***Vision statement***

*'Our vision is to conserve, protect and enhance the outstanding universal value of the Jantar Mantar, Jaipur in order to celebrate astronomy and its contribution to society and culture. The Jantar Mantar, Jaipur will continue to exist in the spirit with which it was built by Sawai Jai Singh II: to invite and inspire the widest range of visitors and scholars across the world, to encourage engagement with its astronomical instruments and to contribute to the cultural distinctiveness of the city of Jaipur.'*

In order to achieve this vision, the following objectives are aimed at:

1. Conservation of the Outstanding Universal Value of the nominated site
2. Continue the reuse of the site for astronomical studies and research
3. Facilitate all visitors with appropriate interpretation to understand its significance

The Management Plan is to work in conjunction with other conservation and tourism plans for the site surroundings and the historic core of the city of Jaipur. Along with articulating a Vision for the proposed World Heritage Site, this management plan has the following objectives:

- To identify and resolve all issues relating to the management of the site
- To formulate site management policies that will ensure the conservation, protection and enhancement of the Outstanding Universal Value
- To promote the site as an educational resource and to provide access to all
- To establish an action plan within a specific time frame in order to achieve these aims.

The Management Plan describes the current status of the site including stakeholders, its protection and legislation, conservation, visitor facilities, tourism, risk preparedness, marketing and economic condition. It establishes the baseline assessment from which the issues related to site management emerge. The key issues that directly impact site management at Jantar Mantar have been broadly categorised into eight main sections in the management plan. These are:

1. Planning and policy
2. Conservation
3. Tourism and visitor management
4. Traffic and parking
5. Research
6. Risk management
7. Buffer zone management.
8. Financial management

These main categories are used to assess the key issues and to develop policies and an action plan; identifying the stakeholders responsible for delivery, resources required and time frame for the implementation of the action plan spreading over a five year period. The plan concludes with outlining the arrangements for ensuring that the policies and strategic actions will be delivered and describing how the Management Plan will be implemented in the immediate future.



## Part 1

# Purpose of the management plan

---



## Part 1: Purpose of the management plan

This section presents the vision and aims for the Jantar Mantar, Jaipur and explains the purpose of the Management Plan. It provides the context for the nomination of the site as a World Heritage Site.

### 1.1 Vision and aims

The Jantar Mantar, Jaipur is a testimony to the astronomical knowledge of medieval India and marks the point of dissemination of this knowledge to general public through its monumental existence.

*‘Our vision is to conserve, protect and enhance the outstanding universal value of the Jantar Mantar, Jaipur in order to celebrate astronomy and its contribution to society and culture. The Jantar Mantar, Jaipur will continue to exist in the spirit with which it was built by Sawai Jai Singh II: to invite and inspire the widest range of visitors and scholars across the world, to encourage engagement with its astronomical instruments and to contribute to the cultural distinctiveness of the city of Jaipur.’*

In order to achieve this vision, we aim at the following objectives:

1. Conservation of the Outstanding Universal Value of the nominated site
2. Continue the reuse of the site for astronomical studies and research
3. Facilitate all visitors with appropriate interpretation to understand its significance

### 1.2 The need for and purpose of the management plan

The Jantar Mantar, Jaipur has been a protected site under the Department of Archaeology and Museums, Rajasthan since 1968. A Conservation Plan for the site was prepared recently in 2005-06 and implemented in 2007-08. The plan identified several management issues and indicated the need of a comprehensive approach for the long term functioning and sustainability of the site that needs to be addressed through a Management Plan for the site.

Following this conservation initiative for the site, the Department of Art, Literature and Culture Rajasthan that oversees the Department of Archaeology and Museums decided to nominate the site of Jantar Mantar, Jaipur as a World Heritage Site in 2008. The nomination of the site is strategically planned for 2009, since it is also declared as the 'Year of Astronomy' by UNESCO. One of the requirements of the UNESCO World Heritage Committee, as set out in the Operational Guidelines (UNESCO 2008), is to have an appropriate management plan or other management system which should specify how the Outstanding Universal Value of a World Heritage Site should be preserved. The purpose of such a management system is to ensure an effective protection of the site for present and future generations (UNESCO 2008, paragraphs 108-109). Hence, the Department of Art, Literature and Culture, Rajasthan decided to prepare a Management Plan for the Jantar Mantar, Jaipur to ensure the long term protection and conservation of its Outstanding Universal Value (OUV).

This Management Plan will work in conjunction with other conservation and tourism plans for the site surroundings and the historic core of the city of Jaipur. Along with articulating a Vision for the proposed World Heritage Site, this management plan has the following objectives:

- To identify and resolve all issues relating to the management of the site
- To formulate site management policies that will ensure the conservation, protection and enhancement of the Outstanding Universal Value
- To promote the site as an educational resource and to provide access to all
- To establish an action plan within a specific time frame in order to achieve these aims.

### **1.3 The structure of the plan**

The Management Plan is presented in six parts that are as follows:

Part 1: is the vision and long term aims for the site of Jantar Mantar

Part 2: is excerpted from the nomination file for the site and includes site description and site significance statement

Part 3: includes all aspects related to the current management and use of the site that are evaluated to identify all relevant management issues for the plan

Part 4: includes identification and assessment of the key management issues impacting the OUV of the site

Part 5: provides a policy framework and an action plan within a specified time frame to address the key management issues and to achieve the objectives of the Management Plan

Part 6: explains the ways of implementing, monitoring and reviewing the Management Plan

Supporting information for the Management Plan is provided as Appendices

## **1.4 Jantar Mantar, Jaipur as a World Heritage Site**

In recent years, India has seen significant development in conservation theory, practice and heritage management aspects that has also impacted the conservation and protection of cultural heritage in the state of Rajasthan. The Government of Rajasthan has taken several initiatives to bring forth its built heritage to the international front. The Department of Art, Literature and Culture, Rajasthan has recognised that a number of cultural and natural sites within Rajasthan possess the criteria requisite for the World Heritage Site status and has taken the initiative to identify, list and prepare reports for all such sites.

This Nomination of Jantar Mantar, Jaipur is built upon careful deliberation between the Department of Art, Literature and Culture, Rajasthan and the Archaeological Survey of India with periodic guidance from the UNESCO New Delhi Office. The selection is based on an evaluation of several cultural sites in India and reflects a strong commitment towards promotion of existing astronomical sites in the country. The nomination of Jantar Mantar, Jaipur is a first step in the serial nomination for all Jantar Mantar sites in India that represent the historic- cultural group of pre telescopic masonry observatories from the 18<sup>th</sup> century. The submission of the World Heritage Site nomination in 2009 marks a point in time at which methods, policy and funding have combined to facilitate this momentous step forward to meet the enlisted objectives by UNESCO for this ‘Year of Astronomy’. Special acknowledgements are due to those organisations and individuals who have contributed to the preparation of this document and the nomination of the site thus ensuring the long term future of the site.



## Part 2 Description and significance of the site

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## Part 2: Description and significance of the site

This section is excerpted from the nomination dossier for the site. It describes the physical attributes of the site and presents the Outstanding Universal Value of the site.

### 2.1 Location of the Site

Country: India

State, Province or Region: Jaipur, Rajasthan

Name of Property: The Jantar Mantar, Jaipur

Geographical coordinates to the nearest second: N 26° 55' 27.4~ E 75° 49' 18.7~

### 2.2 Description of Property

#### 2.2.1 Site context

The construction of Jantar Mantar, Jaipur by the ruler Sawai Jai Singh II in the central core of the city possibly began as early as 1718, had substantial number of instruments on site by 1728 and continued till 1738. Being part of the central palace sector called Chowkdi Sarhad, it is surrounded by architectural landmarks such as the City Palace and the Hawa Mahal (a pleasure wind palace used as viewing gallery) that are important tourist destinations today.



Fig. 1: The nominated site in old Jaipur plan

### 2.2.2 Site components

The observatory is an architectural ensemble of astronomical instruments of varied sizes, set in an enclosure on a flat ground. The site at present comprises of 18 distinguishable historic structures that incorporate the observational instruments in stone and metal interlinked by paved pathways and intermittent soft areas developed as lawns. Amongst the structures, some are individual instruments such as the Digamsa Yantra, some are complimentary sets that form one instrument such as the Ram Yantras while others are multiple instruments in one composite structure such as the four quadrants in the Sasthamsa Yantra combined with the Brihat Samrat Yantra. Hence, the total number of observational instruments incorporated in the structures are of varied scale and more than 18 in number. An enclosure referred to as the Astronomer's House (next to the Nadivalaya Yantra) and a square platform called Disha Yantra/Jai Singh's Seat, the function of which is not clear are two structures clearly not used for observations.

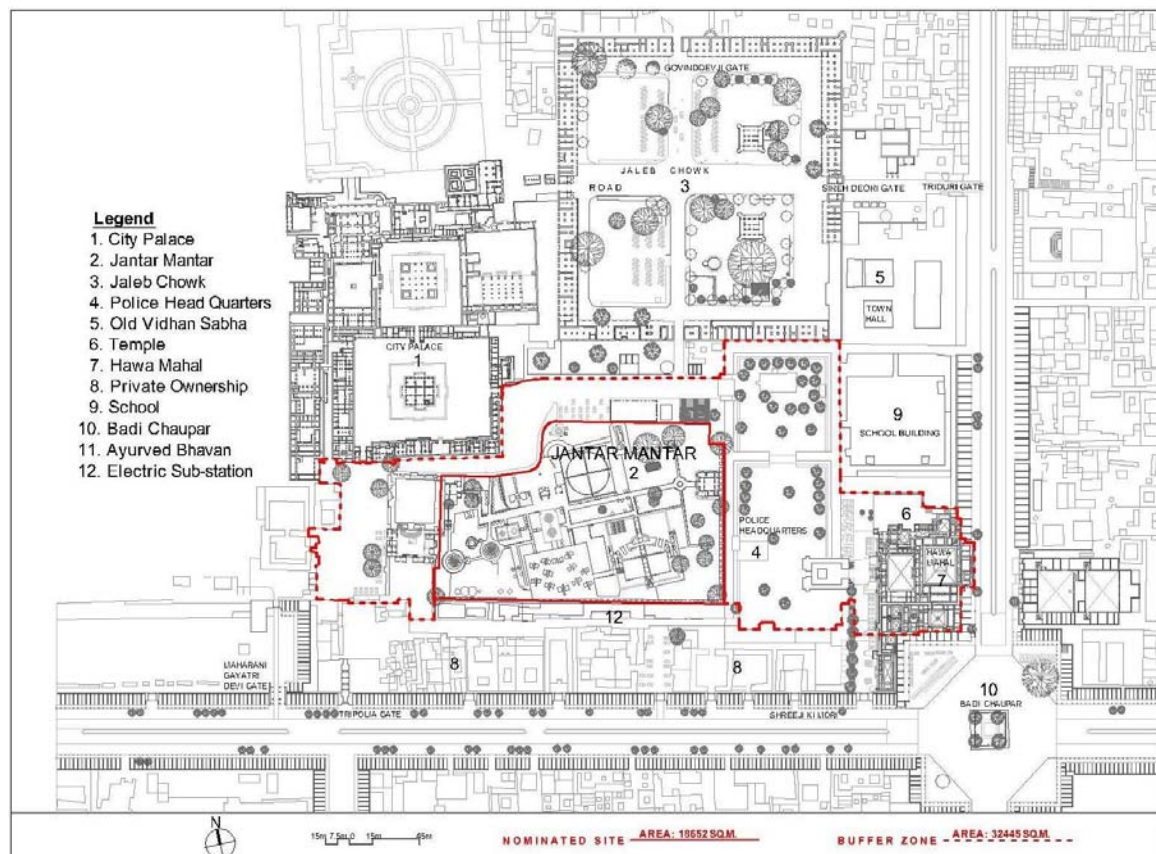


Fig. 2: The nominated site and buffer zone

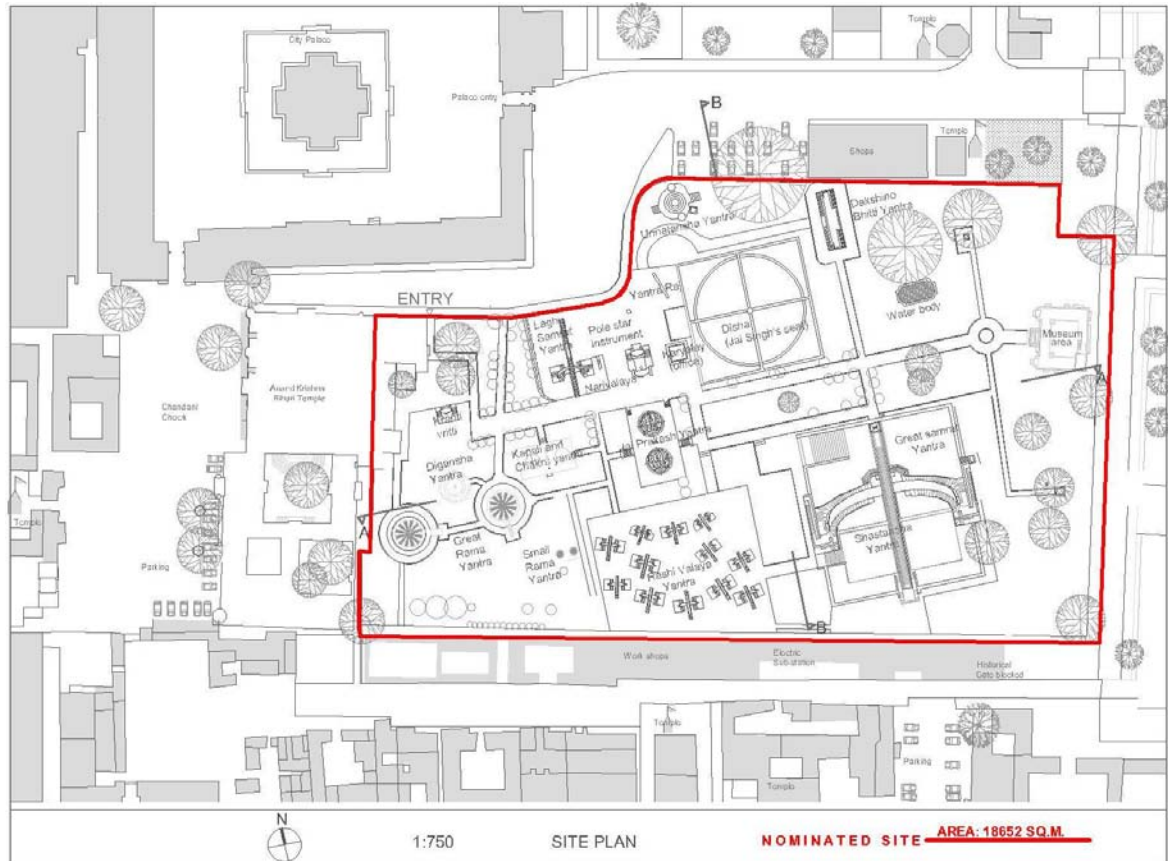


Fig. 3: Plan of the nominated site with the yantras or instruments

### 2.2.3 Site planning

The 18<sup>th</sup> century stone observatory is a unique exemplary example of planning and architectural form of the period. While the rest of the city is planned along axes at an angle of about 15 degrees, the orientation of its astronomical instruments is primarily along the cardinal directions. The superimposition of the two axial systems is reflected in the site with the plot boundary aligned to the axes of the city plan of Jaipur and the instruments along the cardinal directions.

In the placement of the instruments within the site, two axial arrangements exist along the north-south axis. One is between the Nadivalaya, Jai Prakash and Rasivalaya Yantras and one between the Dakshinottara Bhatti Yantra and the Brihat Samrat Yantra. The order of placement of the rest of the instruments is a matter of further speculation based on architectural principles and the functionality of the instruments. While the Brihat Samrat Yantra is set in a rectangular excavation 3.5 metres below ground level, rest of the instruments stand either on combined platforms as in the case of the Rasivalaya Yantra,

Chakra Yantra and Kapala Yantra or on individual plinths. Presently, the instruments are surrounded by hard paving and connecting pathways in red stone and intermittent lawns.

#### 2.2.4 Architectural form and construction materials

In contrast with the character of the built fabric around the site, the instruments are distinct sculptural statements with the use of basic geometric forms and devoid of any surface ornamentation except for the recurring pointed arches. The Brihat Samrat Yantra is the largest sundial in the world and dominates the skyline rising up to about 19 metres above the ground level. A pavilion at the top of the Yantra crowning the highest point of the observatory acts as a visual focal point, with its traditional architectural elements such as surface stucco pattern, stone sunshade, typical cupola roof form and pinnacle, characteristic of the period, unlike the rest of the site.

The construction material of the instruments is essentially stone masonry plastered with lime. Certain parts of the structures in the observatory are engraved with scales for measurements and engraved and filled with lead. These are lined and overlain with *araish* (fine lime plaster finish) and marble with the intent of providing a level, smooth surface for accurate astronomical reading. The use of Ashlar stone masonry in quartzite and surface cladding in red and white quartzite is observed in the Rasivalaya, Nadivalaya, Dakshinottara Bhatti, Laghu Samrat and Ram Yantras. These instruments underwent restoration and rebuilding from the late 18<sup>th</sup> century to early 20<sup>th</sup> century. There are few structures on site with metal observational instruments such as the Unnathamsa Yantra, Chakra Yantra, Krantivritta II, and the Yantra Raj. Besides, there are three other small metal instruments, i.e., one Krantivritta and two Samrat Yantras located on the site.



Fig. 4: Lime plastered Brihat Samrat Yantra behind the sandstone clad structure in front





Fig. 5: Aerial view of the Jantar Manta showing Brihat Samrat Yantrar as viewed from the nearby site of Hawa Mahal

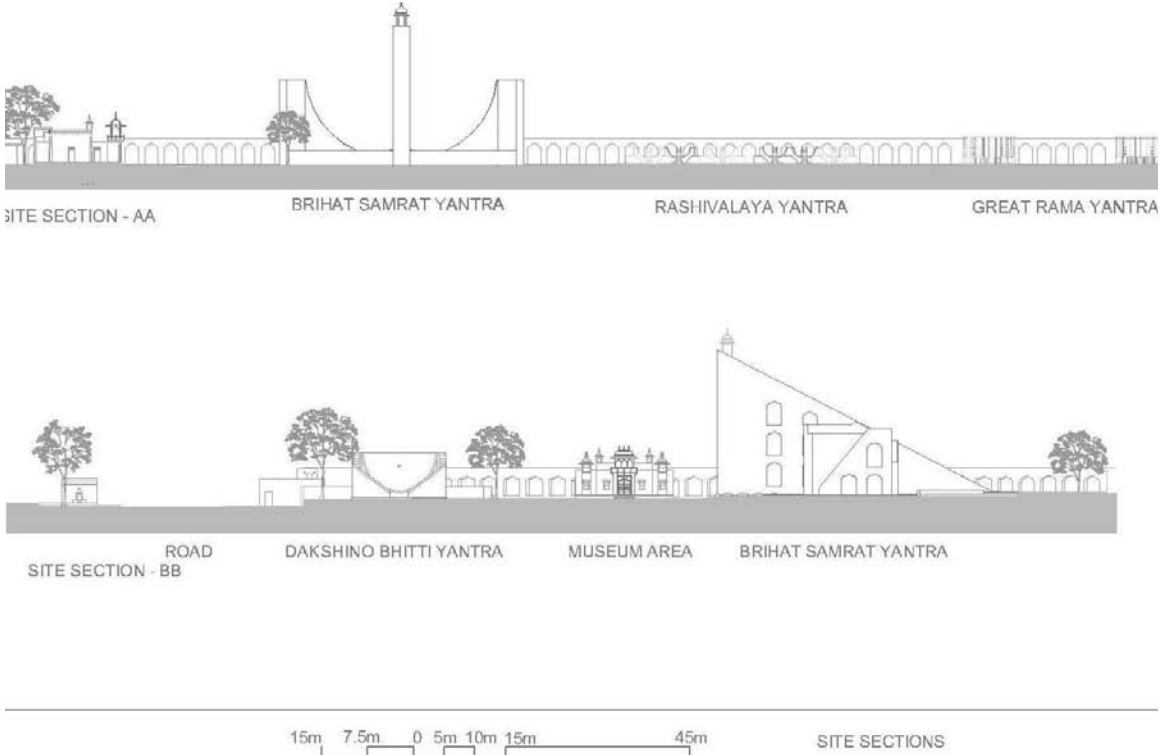


Fig. 6: Sections through the nominated site with the Brihat Samrat Yantra dominating the skyline

### 2.2.5 Function as observational instruments

The Krantivritta Yantra at Jantar Mantar, Jaipur has been interpreted to be incomplete due to the lack of a metal superstructure. The function of the Disha Yantra and the purpose of metal disc in the Yantra Raj is not clear. The rest of the 33 instruments are functional till date and can be used for measuring time, positions of celestial objects in horizon and equatorial and ecliptic co-ordinate systems.

While the metal instruments are not given much merit in their observational capacities, the masonry instruments have been categorised as being of high, medium and low precision. (Sharma, 1997)

Table 1: Level of precision of the instruments at Jaipur

S. No.	Instrument	Level of Precision in masonry instruments	Metal Instruments
1	Brihat (Great) Samrat Yantra	High	
2	Sasthamsa Yantra	High	
3	Jai Prakash Yantra	Medium	
4	Great Ram Yantra	Medium	
5	Small Ram Yantras	Medium	
6	Dhruva Darsaka Yantra	Low	
7	Nadivalaya Yantra	Low	
8	Horizontal sundial atop Nadivalaya	Low	
9	Krantivritta Yantra	Not clear	
10	Krantivritta II		
11	Dakshinottara Bhatti Yantra	High	
12	Yantra Raj		
13	Chakra Yantra		
14	Digamsa Yantra	Medium	
15	Unnathamsa Yantra		
16	Rasivalaya Yantra	Medium	
17	Kapala Yantra	Medium	
18	Laghu (Small) Samrat Yantra	High	
19	Disha Yantra/ Jai Singh's Seat	Not clear	

According to their functional aspect, the instruments/ structures on site can be categorised as (Volwahren, 2001, p. 39):

- Instruments that enable measurements to be taken relating to the horizon and the zenith like the Ram Yantra and Digamsa Yantra

- Instruments that enable measurements to be taken relating to the equator and the earth's axis as in the Samrat Yantra.
- Instruments that allow measurements to be taken actually in the ecliptical system, like the Rasivalaya Yantras.
- Instruments/ structures not used directly for measuring purposes, like the Disha Yantra (open to speculation) and the Astronomer's House.

## 2.3 Statement of Outstanding Universal Value

India represents five observatories that belong to the same historico-cultural group, within the framework of the thematic initiative "Astronomy and World Heritage". Amongst the five, the four existing Jantar Mantar sites at Jaipur, Delhi, Ujjain and Varanasi in India are the most significant in being the best preserved conglomerate of pre-telescopic masonry astronomical instruments. Functioning both as scientific and educational institutions and as historico-cultural monuments of the same group, they have an extraordinary significance to the level of the world heritage.

The site of Jantar Mantar, Jaipur amongst this group is the most extant, best preserved and has maximum number of observational instruments in functional condition. The Jantar Mantar, Jaipur is an icon that has contributed significantly to astronomy, architecture, urban planning, political history and cultural distinctiveness of India.

### 2.3.1 Development in science and astronomy

The Jantar Mantar, Jaipur an outstanding architectural expression reflecting the intention to inculcate contemporary findings of astronomy within the late medieval cultural context in India. It represents the culmination of Zij astronomy and an ambitious expression of large scale pre-telescopic masonry observatories as a result of the interchange of ideas across the Indian, Central and West Asian and European cultures. Sawai Jai Singh II's major contribution to India was the compilation of the *Zij-i Muhammad Shahi*, a set of astronomical tables based on his own observations at the Jantar Mantar in Jaipur and Delhi. The scholars of India who were trained according to the Islamic school of astronomy readily adopted the *Zij-i Muhammad Shahi*. They wrote commentaries on it. To the world at large the *Zij* was of little value, but to traditional Islamic scholars of

India, to whom Western science was out of reach, the *Zij* served a valuable need. These scholars prepared almanacs with its aid for more than 100 years. Hindu astronomers also might have embraced the parameters of the *Zij* and prepared their *panchangas* (Hindu calendar) with it.

The Jantar Mantar, Jaipur thus reflects the culmination of the astronomical knowledge base from precedent observatories and instruments constructed in Samarkand, Maragheh, and Ray that only exist as archaeological remains today. The Brihat Samrat Yantra at Jantar Mantar, Jaipur is the largest existing equinoctial sun-dial in the world.

### **2.3.2 Astronomical researches and greater awareness of the subject**

Sawai Jai Singh II approached his astronomical researches with an open mind and the Jantar Mantar, Jaipur corroborates this fact. Before embarking upon the construction of the astronomical instruments, he studied all that was available to him on the subject through various resources in India and across the world. Moreover, during his investigations, he kept this attitude alive. His search for better and more accurate instruments continued even much after his observatories had been built. According to DuBois, Sawai Jai Singh II was ready to modify or let go of his own tables in case better ones were available anywhere in the world. Though few historians believe that his accomplishments remained medieval in retrospect because he could not access the most contemporary telescopic instruments, but his outlook was modern and commendable in the medieval context of India. He went beyond religion to seek knowledge about science. Astronomers of all faiths participated in his researches and his efforts were truly secular and futuristic for his times.

Prior to the making of the Jantar Mantars, observational instruments were not interpreted architecturally either singly or in groups. The medieval Islamic observatories were the earliest institutions to emphasise group research (as opposed to individual research) where theoretical investigations went hand in hand with observations. The instruments and observational techniques used at the Jantar Mantar, Jaipur were mainly derived from the Islamic tradition, and the computational techniques from the Hindu tradition. The integration of astronomy and astrology significant in the Indian context was represented for the first time through these observatories built by Sawai Jai Singh II.



The Jantar Mantar, Jaipur was historically, an arena of astronomical conferences and seminars where astronomers and astrologers from all over the country would assemble to exchange their views on the subject. Being the largest of the observatories built by Sawai Jai Singh II, it was intended to serve for regular, daily, observations. As such, it was constantly used by experts. The Jaipur State records tell us that in 1734 AD, Sawai Jai Singh II gave regular wages to 20 astronomers at the Jaipur observatory.

Besides representing the integration of astronomy and astrology for the first time, it also marks an important phase in Indian history where such codified knowledge base became more accessible to through monumental expressions. Being a subject of continuous research by astronomers, architects and historians since centuries, the Jantar Mantar, Jaipur remains pivotal in understanding the development of astronomy and architecture.

### **2.3.3 A marker of political rituals**

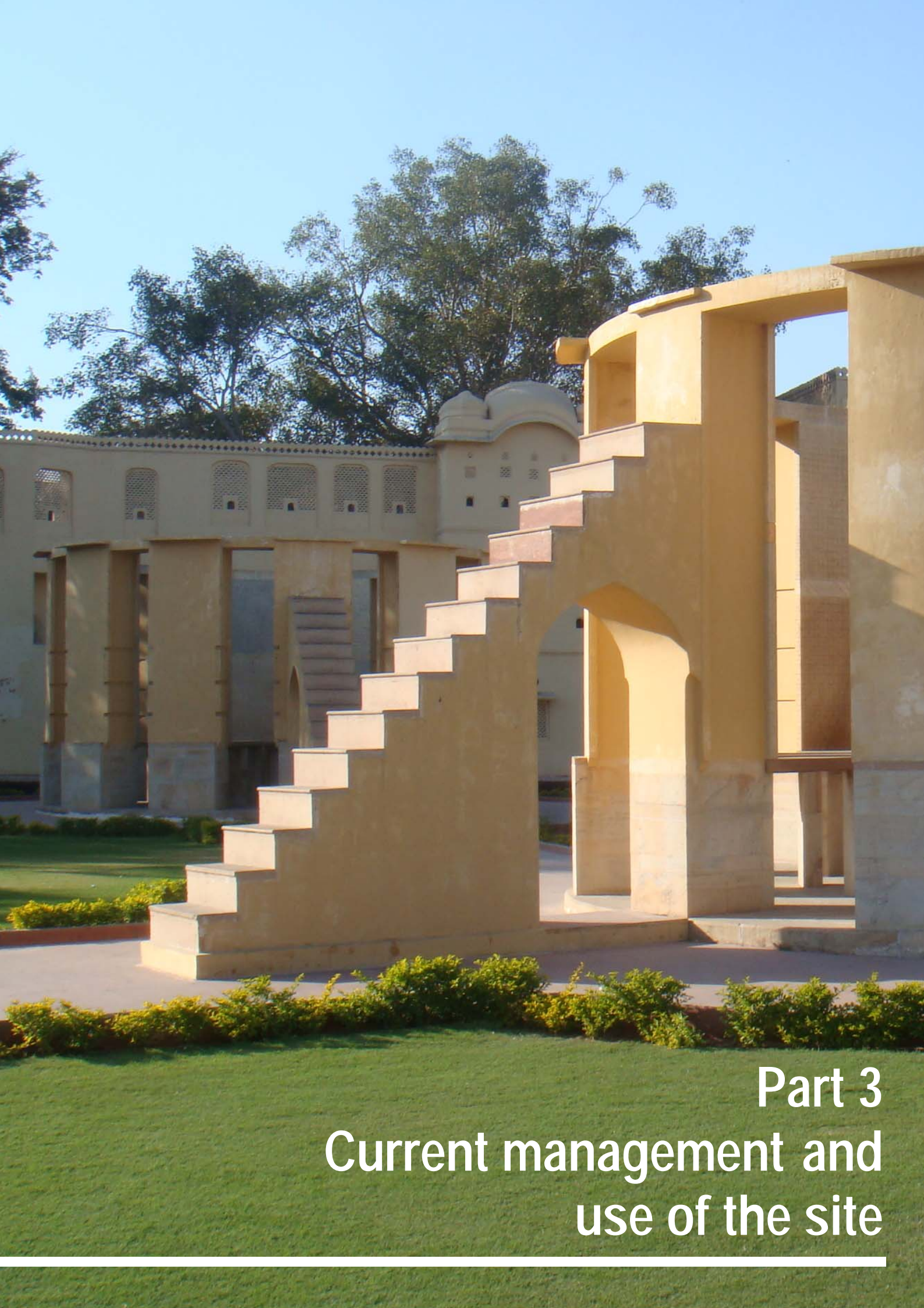
The site of Jantar Mantar, Jaipur occupies a strategic central position in the city planning of Jaipur and is an icon of important political rituals and announcements in the history of the city. Researchers (MacDougall, 1996, p.32) have mentioned that the site of Jantar Mantar served as a setting for rites associated with the passage and control of time. It has also been symbolic of cosmic rejuvenation and the orchestration of solar kingship in Jaipur expressed in political rituals such as the marshaling of the sun at the time of vernal equinox. During the reign of Sawai Jai Singh II, the eclipses were announced to the citizens by the beating of drums under the *chhatra* (cupola) of the Brihat Samrat Yantra.

Even today, on the full moon day of the Hindu month of Ashadha (June- July) on the onset of monsoon season, the local pundits of Jaipur gather at the Jantar Mantar to conduct rites connected with ensuring the return of the rains. Besides the religious rituals, prayers and offerings, they also hoist a flag on the summit of the Brihat Samrat Yantra at sunset to determine the direction of the prevailing winds and predict the nature of monsoon. The marking of the passage of time was also projected at the Jantar Mantar in an auditory form through the beating of the drums and recitations by the pundits. These traditional rituals in the observatory that combined the intangibles of the sound (mantra) and the tangible astronomical instruments (yantra) are probably responsible for the origin of its name as Jantar Mantar.

### **2.3.4 Contribution to architecture and urban planning**

This unique architectural ensemble of Jantar Mantar, Jaipur is an amalgamation of science and religion to facilitate measurement of celestial position and movement. Besides being a monumental sculptural expression, the architecture of the observatory is ideationally linked to the city planning of historic Jaipur. The scale and proportions of this architectural masterpiece in stone introduced geometrical systems that further got translated into planning principles in the making of the renowned 18<sup>th</sup> century city of Jaipur.

The Jantar Mantar site with its instruments of time keeping was strategically located within the centre of the city. These instruments were interpreted architecturally and became fixtures within the cosmography of the city itself. This strong link between the terrestrial and celestial world was further emphasised by the alignment of the instruments with the axial roads of the city, the city gates and important religious shrines. Thus the significance of Jantar Mantar extends beyond the scientific and architectural value to the field of urban design and city planning in India.



Part 3  
Current management and  
use of the site

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## **Part 3: Current management and use of the site**

This section of the Management Plan describes the current status of the site including stakeholders, its protection and legislation, conservation, visitor facilities, tourism, risk preparedness, marketing and economic condition. It establishes the baseline assessment from which the issues related to site management emerge, and are discussed later in Part 4 of this plan.

### **3.1 Stakeholders**

The site of Jantar Mantar, Jaipur has a wide range of people and organisations with an interest in it that are collectively identified as the stakeholders. The Department of Archaeology and Museums has a statutory responsibility for the land under Jantar Mantar and is responsible for the protection, upkeep and maintenance of the site. The access road to Jantar Mantar and parking areas are under the ownership of the Jaipur Municipal Corporation while the marketing of Jantar Mantar as a tourist destination is the responsibility of the Tourism Department, Government of Rajasthan.

Besides this, other stakeholders comprise of groups and individuals with tourism, conservation, education and research interest in the site. There are also a large number of guides and shopkeepers who are directly or indirectly dependent on the site for their income. The Management Plan needs to address this entire range of stakeholders for effective and long term management of the site.

### **3.2 Land ownership**

The site of Jantar Mantar extends across a small area of 1.86 hectares and is owned by the Department of Archaeology and Museums, Government of Rajasthan since 1968.

The immediate surroundings of the site including the buffer zone area has several landmark monuments as part of the original historic palace complex that now fall under varied ownership. The access road and the common parking area on the north of the site



is owned and maintained by the Jaipur Municipal Corporation and further north is the City Palace Museum under private ownership of the royal family of Jaipur. The land to the east of the site includes Police Headquarters owned by the State Police Department, Government of Rajasthan and further east is the important landmark of Hawa Mahal which is another protected monument under the Department of Archaeology and Museums. To the south of the site is a row of traditional courtyard houses or *havelis* which come under private ownership except for one plot of land housing the electricity board which is a government property. The properties to the west of the site include the Anand Bihari temple which is owned by the Devasthan Department, another department which is also under the Department of Art, Literature and Culture. Further west is the access road that comes under the jurisdiction of the Jaipur Municipal Corporation.

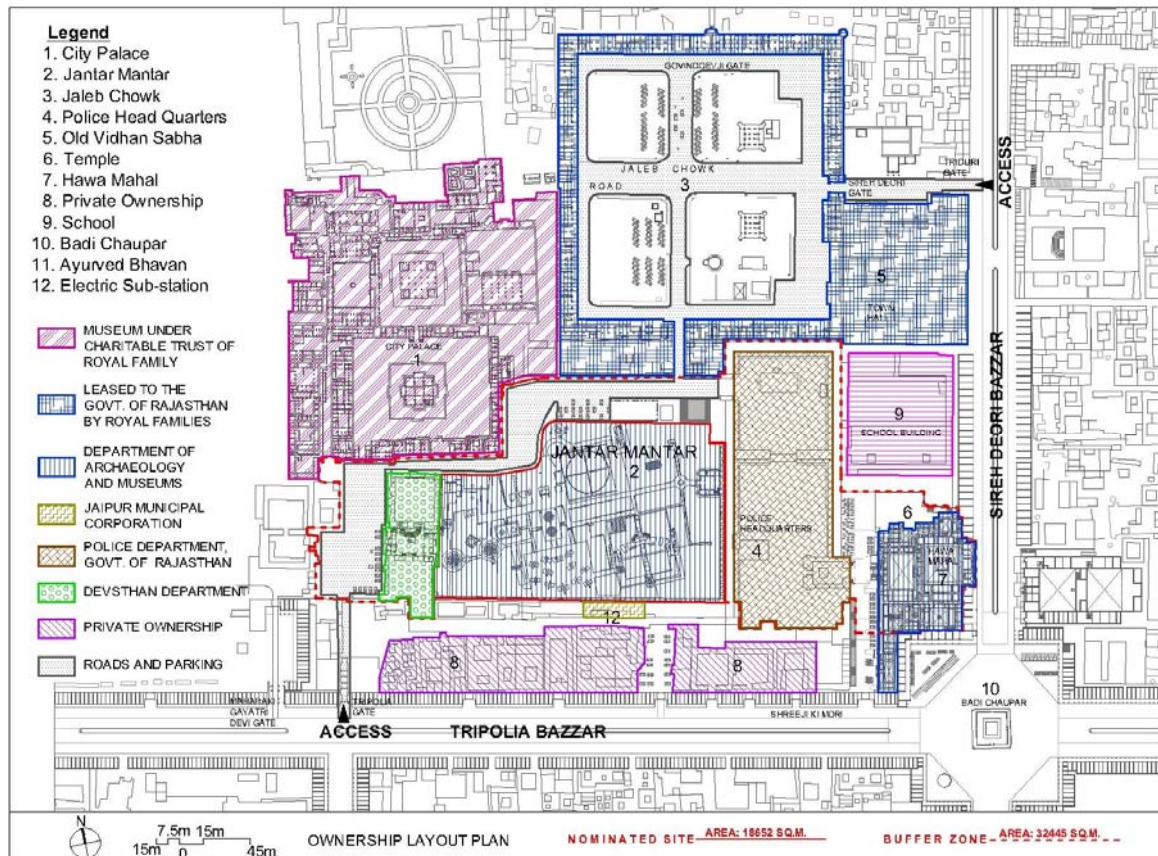


Fig 7: Plan showing ownership of site, buffer zone and surrounding areas

The multiplicity of ownership of the properties in the buffer zone has a direct impact on the site functionality. The conservation plan for the site prepared in 2005-06 proposes the

reuse of adjoining Anand Bihari Temple (owned by the Devasthan Department) as an interpretation and tourist amenities' area for the site. There is a similar proposal for reuse of the Police Headquarters area in the buffer zone. These issues need to be resolved at the planning level for better functioning of the site.

### **3.3 Statutory and non statutory protection**

#### **3.3.1 International**

India is party to the World Heritage Convention, and the Archaeological Survey of India is responsible for the protection of all Indian cultural properties included in the World Heritage List.

#### **3.3.2 National and state designation**

The Ancient Monuments and Archaeological Sites and Remains Act 1958 (No 24 of 1958) was established by the Archaeological Survey of India, which is responsible for the protection of all national level heritage sites in India. This act is applicable for all nationally protected heritage sites. The State of Rajasthan adopted this Act in 1961 and the Jantar Mantar, Jaipur is a state protected monument under this 'Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961.

#### **3.3.3 Local planning context**

The Jantar Mantar, Jaipur is marked as a key historic landmark in the master plan of the Jaipur city. The historic walled city of Jaipur is demarcated as a historic zone in the master plan of Jaipur with special byelaws applicable for the area. The Jantar Mantar, Jaipur is also ear marked as an important monument in the Heritage Management Plan of Jaipur prepared by the Jaipur Heritage Committee, Government of Rajasthan in 2007.

### **3.4 Legislative framework**

The management of the site will take place within an established framework of legislation and planning policy. This framework stems from the central, state and local government

policies and byelaws. Supporting the statutory system are conventions, codes of practice and guidance at various levels.

Some of these protective measures are administered by the state government and some by local authorities. The legislative framework and policies applicable at various levels and impacting the site are presented as follows:

### **3.4.1 International**

The World Heritage Convention (adopted by UNESCO in 1972) was ratified by India on November 14, 1977. The Convention provides for the identification, protection, conservation and presentation of cultural and natural sites of Outstanding Universal Value, and requires a World Heritage List to be established under the management of an inter-governmental World Heritage Committee. Implementation of the World Heritage Convention is overseen by UNESCO's World Heritage Committee. The Archaeological Survey of India is responsible for the India's general compliance with the Convention, and for nominating sites in India.

The Nara Document on Authenticity is conceived in the spirit of the Charter of Venice, 1964, and builds on it and extends it in response to the expanding scope of cultural heritage concerns and interests in our contemporary world. In a world that is increasingly subject to the forces of globalisation and homogenisation, and in a world in which the search for cultural identity is sometimes pursued through aggressive nationalism and the suppression of the cultures of minorities, the essential contribution made by the consideration of authenticity in conservation practice is to clarify and illuminate the collective memory of humanity.

This document is useful to determine parameters of authenticity in a diverse cultural context such as that of India.

### **3.4.2 National**

India does not have a national policy and legislation for heritage protection and management. All protected sites at national level adhere to the Ancient Monuments and Archaeological Sites and Remains Act 1958 enacted on August 28, 1958. This Act provides 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 like objects. Subsequent to this Act, the Ancient Monuments and Archaeological Sites and Remains Rules 1959 were also framed. The Act along with the Rules came into force with effect from October 15, 1959 for all nationally protected monuments

### **3.4.3 State and local**

The site of Jantar Mantar, Jaipur is protected as per ‘The Rajasthan Monuments, Archaeological Sites and Antiquities Act 1961’. This act applies on all state protected monuments that come under the jurisdiction of the Department of Archaeology and Museums, Government of Rajasthan.

Besides the protection under the above act, the site of Jantar Mantar is located within the historic walled city of Jaipur and the byelaws for this special zone apply to the site and the buffer zone. The master plan of Jaipur 2011 prepared by the Jaipur Development Authority mentions the policy for conservation of heritage and sets out building byelaws that restrict or control building activities in the walled city of Jaipur including the buffer zone area for the site of Jantar Mantar. The Government of Rajasthan has adopted a strong tourism policy. Heritage Tourism Policies of the Department of Tourism, Rajasthan respond to the huge potential for tourism in the state. One of the objectives of the Tourism Policy for the state with a focus on heritage is ‘Preservation of rich natural, historical, architectural and cultural heritage’. In pursuance of this objective, a number of schemes outlined below, are underway. Two of these that could impact the site of Jantar Mantar are listed below:

- (i) Under a scheme for land and property belonging to Devasthan Department, projects can be jointly undertaken by the Rajasthan Tourism Development Corporation, Rajasthan State Housing Corporation, Department of Tourism and Devasthan Department to utilize such land/ property (usually lying under utilised or in danger of encroachment) for Dharamshalas (rest houses for pilgrims). Yatri Niwas (budget rest houses), Tourist complexes for promotion of pilgrimage and cultural tourism. This particular scheme could be applicable on the adjoining property of Anand Bihari temple west of Jantar Mantar that belongs to the Devasthan Department.



- (ii) For expanding investment in tourism infrastructure, there are proposals for attracting institutional finance from the Tourism Finance Corporation of India, Department of Tourism, Rajasthan Tourist Development Corporation and Rajasthan Finance Corporation and investment from non resident Indians, undertaking joint venture with private sector. The Department of Archaeology and Museum has already availed this opportunity once in funding conservation works for Jantar Mantar in 2006- 2008 through a centrally sponsored scheme from the Ministry of Tourism.

The Rajasthan government has also launched 'Adopt -a- Monument' scheme as an instrument for public-private participation for preserving the State's rich heritage. Rajasthan 'Adopt - a- Monument Society' (non profit organisation) has been registered under Rajasthan Societies Registration Act of 1958.

### **3.5 Agreed plans and strategies**

There are a range of agreed plans which relate to the site directly or indirectly. These range from strategic planning documents at national, regional and local level to overarching strategies guiding tourism, transport, economy or heritage, integrated conservation plans and management plans. Refer to table 2 for the status of agreed plans.

Explanation of the status and content of some of these plans is provided below:

- (i) The Master Plan for Jaipur which is the primary Development Plan for the city categorises land use of old Jaipur under residential walled city area with special byelaws that restrict the floor space index and control the heights of the buildings.
- (ii) City Development Plan for Jaipur is prepared as a visionary document to guide development projects in the city under the Jawahar Lal Nehru Urban Renewal Mission supported by the central government. This plan identifies the Jantar Mantar site area and the surrounding buffer zone as an important historic area that needs to be developed under a special urban renewal project with improved infrastructure.

- (iii) The Heritage Management Plan, Jaipur prepared by the Jaipur Heritage Committee identifies the site as listed in Grade 1 and provides a brief status and action plan for the site.
- (iv) Urban Renewal Proposal for walled city of Jaipur under the Jawahar Lal Nehru Urban Renewal Mission partially funded by the Ministry of Urban Development, Government of India is the renewal project identified under the City Development Plan. It provides parking and urban renewal proposals for the historic areas in the buffer zone of the site and beyond that for the main commercial streets of Jaipur.
- (v) Integrated Conservation Plan for Jantar Mantar and Hawa Mahal - specifically proposes an integrated plan for the site along with the immediate landmark of Hawa Mahal.

*Table 2: Status of agreed plans*

S. No.	Plan	Year of preparation	Agency responsible	Status
1	Master Plan of Jaipur	1991	Jaipur Development Authority	under revision
2	City Development Plan	2006	Jaipur Municipal Corporation	approved and identified detailed project reports under preparation
3	Heritage Management Plan	2007	Jaipur Heritage Committee	is being integrated in the revised master plan
4	Urban Renewal Proposal for walled city of Jaipur	2008	Jaipur Municipal Corporation	under implementation as one of the identified projects in the city development plan.
5	Integrated conservation plan for Jantar Mantar and Hawa Mahal	2005-06	Department of Archaeology, Rajasthan	implemeted for site but not for buffer zone.

*(Refer to Annexure V of Nomination Dossier of Jantar Mantar, Jaipur, for 'Extracts from agreed plans related to municipality and region' and Annexure VII for the 'Integrated conservation plan for Jantar Mantar and Hawa Mahal')*

### **3.6 Management responsibilities**

The management and ownership of the entire site is under the Department of Archaeology and Museums. The Department subleases certain parts of the site such as the book shop and snacks counter on an yearly lease which is reviewed annually. However, the maintenance of the leased portions are the responsibility of the Department of Archaeology and Museums. The Department is administrated by the Director, Archaeology and Museums under the Department of Art, Literature and Culture, Rajasthan headed by the Principal Secretary, Art, Literature and Culture. The Department of Art, Literature and Culture makes all decisions regarding the site and its activities.

The Department of Archaeology and Museums was established to manage the cultural heritage of Rajasthan through conservation, restoration, research, publication, survey, documentation, excavation, exploration, acquisition, exposition and to promote cultural tourism. It has the following branches:

- i. Technical branch
- ii. Excavation branch.
- iii. Art survey branch
- iv. Architecture survey branch
- v. Engineering branch
- vi. Chemical branch
- vii. Establishment branch
- viii. Numismatic branch
- ix. Accounts branch
- x. Photography branch
- xi. Library

The engineering branch of the Department of Archaeology and Museums is responsible for the on site implementation of the decisions of the Department. The accounts wing of the Department is responsible for revenue collection from the site activities and for disbursement of funds for site maintenance.

RSMMMDS 'Rajasthan State Museum and Monuments Management and Development Society' is a society constituted under the Chairmanship of the Chief Minister for proper upkeep and maintenance of Government Museums and Monuments. This society has been registered under Rajasthan Societies Registration Act 1958. This society was responsible for commissioning the conservation plan for Jantar Mantar in 2005 and its subsequent implementation by the engineering wing of the Department of Archaeology and Museums.

The Jantar Mantar, Jaipur has a total of 11 staff members for regular upkeep and maintenance of the site. These include one superintendent who has knowledge of the astronomical instruments and can record the readings, two office assistants, one person for ticketing, seven employees for maintenance works and one guard. An engineer conversant with conservation works monitors the site on a daily basis. The cleaning of the site and toilet areas is given on an annual contract. Besides this, the maintenance of landscape and gardens is also given on an annual contract amounting to a monthly expenditure of Rs. 11,000/- (Indian Rupees) per month. The security of the area is also handed over to a security agency on contract basis. Below is a summarisation of the staffing:

*Permanent Staff*

- i. Superintendent - 1 (Specialised in the field)
- ii. Office Assistant - 2
- iii. Monument Attendants - 7
- iv. Sweeper - 1

*Contractual Services*

- i. Maintenance of garden and dry sweeping of the Complex - 15 persons
- ii. Upkeep of toilets - 3 persons
- iii. Security services - 10 persons
- iv. Tourist Assistance Force - 3 Police Constables  
(Stationed outside the site)

The monument attendants take care of the instruments during the visitor hours. Toilets are washed on an hourly basis along with the replacement of toiletries. For horticulture



maintenance, the concerned agency waters the garden through a sprinkler system daily and trimming of hedge/ grass is done at an interval of 10 days. The sweeping of the monument areas is done five times a day.

Presently 11 guides are licensed by the Department of Archaeology and Museums while other licensed guides may be from the Department of Tourism under Government of Rajasthan or the Government of India. The main languages are Hindi, Gujrati and Bengali for the Indian visitors, and English, French, Italian and German for foreigners. The audio guide for the site is optional and is operational since 2007.

The management structure needs to take into consideration the diverse tasks identified under heads such as conservation, use, interpretation and outreach, tourism and maintenance. The management personnel will be responsible for all day to day maintenance, small repairs, publications, interpretation, dissemination etc.

Specialised tasks such as major conservation plan etc. are accomplished by recruiting consultants and technical staff. Jantar Mantar, Jaipur does not have any risk management plan. Considering the recent 2007 bomb blasts in the city of Jaipur, it is essential that such a highly visited tourist site should have a risk management plan.

A daily, weekly and annual maintenance schedule for the site needs to be charted out as per the monitoring of conservation works and proposed programs. Furthermore, the department should draft specific plans for risk management, visitor management and interpretation. It is also important that a regular maintenance schedule is prepared, regular training is provided to the employees and the maintenance work is periodically monitored by a conservation expert.

### **3.7 Present state of conservation**

#### **3.7.1 State of conservation**

The Jantar Mantar observatory complex at Jaipur is presently in a good state of conservation. According to the Conservation Plan prepared in 2005, the Department of Archaeology and Museums, Government of Rajasthan carried out repair and restoration

works in 2007-2008. As a result of the same, with the use of matching materials and traditional techniques, the instruments were restored and the landscaping and circulation pattern modified. The current landscaping requires to be reviewed in lieu of its historic context and the present use of the site.

None of the instruments at Jantar Mantar show any structural damage or deterioration in the current situation. The foundations and below ground parts of the instruments had suffered water seepage due to over watering of the lawns. The water seepage in Jai Prakash Yantra has been rectified by relaying the surrounding plinth protection. In 2005, the brass instruments had shown signs of deterioration in the form of pitting as did the iron astrolabe in the Yantra Raj. The timber beams in the Yantra Raj that were structurally unsound were replaced in the conservation works of 2007. However, in case of the Unnathamsa Yantra, though the beam was diagnosed as structurally unsound, it was simply consolidated as the replacement beam of required size was unavailable.

The finishes of a number of instruments have been restored with works such as lead refilling in scales, lime plaster and lime wash on surfaces and lime terracing on the roof of certain instruments. Conservation work is currently being carried out on the Rasivalaya Yantras.



*Fig.8: The Yantra Raj with replaced wooden beam*



*Fig.9: The Unnathamsa Yantra with consolidated wooden beam*

### **3.7.2 Resources and training**

The Department of Archaeology and Museums has developed a strong engineering department that is well conversant in carrying out onsite conservation works. The Department has a comprehensive schedule of rates charted out for onsite conservation

works in each specific subregion within the state of Rajasthan. Through RSMMMDS i.e. the 'Rajasthan State Museum and Monuments Management and Development Society', the Department of Archaeology and Museums has empanelled about 20 qualified conservation architects for preparation of conservation plans for various heritage sites and monuments in the state. The Department recruits these consultants as per specific project requirements.

The Department of Archaeology and Museums is further facilitated by the State Institute of Heritage Conservation, Rajasthan which is a government initiative at the state level to provide required training in conservation works to contractors and masons working on heritage sites. The engineering wing of the Department of Archaeology and Museums actively participates in all workshops and training programmes of the Institute. Currently, they are involved in making revisions to the existing conservation manual followed by the Archaeological Survey of India so that it may be updated and used as a guideline for the conservation works in Rajasthan.

The senior officials and engineers within the department keep themselves well informed about conservation trends and regularly participate in national level workshops and training programmes held by organisations such as the UNESCO New Delhi Office and the Archaeological Survey of India.

### **3.8 Extent of existing records and documentation**

The Department of Archaeology and Museums has its own library section which has a good collection of well researched publications on the Jantar Mantar, Jaipur. Besides this, the archival records in the department have letters related to changes made and works done to the monuments since 1968. Official records before this period are available in the State Archives of Bikaner.

Besides this, the royal library located in the City Palace of Jaipur is run by a public charitable trust formed by the royal family of Jaipur. This library or *pothikhana* (royal library of historic Jaipur) is now open for public and has invaluable resources such as old maps, travel records and old photographs of Jaipur city. It also has an important map of

Jantar Mantar from the 18<sup>th</sup> century that is a useful record of changes made to the site in that period.



*Fig.10: An 18<sup>th</sup> century map of the Jantar Mantar, Jaipur*

It is essential to systematically compile these existing records about the site from such resources and use them in the conservation and interpretation of the site.

### **3.9 Public access - physical and intellectual**

Public access to the site comprises of both physical and intellectual aspects. While physical access includes aspects such as directional signage, transport links, site orientation and ancillary facilities, for example toilets, car parking etc., intellectual access involves site information, interpretation, education and outreach programmes.

#### **3.9.1. Physical access**

The site of Jantar Mantar is located in the centre of the city and can be accessed via two major commercial streets of Jaipur. One access is via the north south axial street from the



Sireh Deodi gate and Jaleb chowk to the north of the site while the second access is via the east west axis of the city through the Tripolia Gate and Chandni Chowk to the west of the site. In both cases, the roads being main commercial areas of Jaipur have excess traffic and the parking areas located in the buffer zone north to the site is limited. Though the roads of the city are wide, the mixed use and heavy traffic cause congestion. Most of the tourist parking is located in the Jaleb Chowk, where open space is available. But, haphazard parking and large tourist vehicles like buses cause congestion, adding to which are the many cycle rickshaws that wait to collect passengers from Jantar Mantar and the surrounding monuments.

These issues related to physical access of the site are further elaborated under section 4.5 on roads and parking.

### **3.9.2 Intellectual access - interpretation and education**

The unique astronomical site of Jantar Mantar requires specialised interpretation to explain the significance of the instruments to the visitors. For many years, the site did not even have basic signage required to explain the function of each instrument. The guides at Jantar Mantar often mix facts with stories to engage the public and cannot be relied on for authentic information. Hence, it became essential to develop proper signage and during the course of conservation works in 2007-2008 the Nehru Planetarium was engaged by the Department of Archaeology and Museums for this purpose. As per the proposals in the conservation plan, the Department also plans to develop the museum block in the east side of the site and an interpretation centre at the entrance on the west side. The Department of Archaeology and Museums has also started an audio guide recently which is a useful interpretive medium for the site.

Currently, there is a small book shop at the entrance of Jantar Mantar which provides all publication material about the site, postcards and brochures etc. The ticketing counter of Jantar Mantar also functions like a tourist information centre.

Several local astronomers visit the site regularly to take readings of the instruments and on special occasions such as the onset of monsoon, certain rituals are still observed on the site such as placing the flag on top of the cupola of the Samrat Yantra to check the wind direction for predicting monsoons. However, more group and educational activities

disseminating knowledge about the use of instruments needs to be integrated as part of the site development. There is also a plethora of international research on Jantar Mantar, Jaipur that needs to be encouraged and incorporated with site development.

### **3.10 Marketing**

While the Department of Archaeology and Museums owns and protects the site of Jantar Mantar, it is the Department of Tourism of the Government of Rajasthan that promotes and markets the site as an important tourist destination. In addition, there are key organisations whose activities at a national level are of direct relevance to the site such as the promotion by Ministry of Tourism and the studies conducted by the Nehru Planetarium.

The nomination of the site for a World Heritage Site should lead to a marketing strategy that sits within the context of existing international, national, regional and local marketing priorities.

### **3.11 Academic interest in Jantar Mantar**

Because of its unique values, the Jantar Mantar has been a site of academic interest amongst historians, astronomers, architects, scholars and travelers since centuries and continues to be a subject of great academic interest for the local, national and international community. For centuries, Jantar Mantar sites of India have been visited and researched extensively by academicians, historians, astronomers and keen amateurs, resulting in a vast edifice of work that covers many of the architectural and astronomical aspects of the site. There has been a plethora of publications on the making of Jantar Mantar and deciphering its usage. Several noteworthy books have been published, while numerous articles in national and international journals have been published (refer bibliography for details).

This scholarship has helped to ensure that Jantar Mantar, Jaipur is acknowledged as one of the vanguard of astronomical observatories in the history of India.

### **3.12 The local community**

The local community has a strong association with the site of Jantar Mantar and there are several local astronomers who visit the site till date to take astronomical readings of the instruments. For the average citizen of Jaipur, the site of Jantar Mantar is a significant icon of the city and the locals take considerable pride in the location of this monument within the city. The architectural forms of Jantar Mantar are a great source of inspiration for contemporary designers and have featured as inspirations for new buildings. This formal play is evident in the design of the logo as well as the new office building façade of the Jaipur Municipal Corporation.

### **3.13 Economic conditions and current revenue**

The annual turnover of the tourist fee from the site of Jantar Mantar in 2007-2008 amounts to an average of Rs. 285, 38,695 (Indian Rupees). It is primarily derived from the daily visits of the tourists. In the last two years, tourism in Rajasthan has increased considerably, thus helping the overall income of the site. However, this income is not retained by the Department of Archaeology and Museums but it has to be deposited in the State Treasury on a daily basis. The expenditure for upkeep and maintenance of the site is substantially low and comes from the total annual budget that is sanctioned to the Department of Archaeology and Museums for the upkeep and maintenance of all protected monuments in Rajasthan. Special works such as the preparing of the Conservation Plan in 2005-06 and its subsequent implementation in 2007-08 are often supported by special schemes such as the centrally sponsored grant from the Ministry of Tourism, India.

The Management Plan proposes to achieve economic sustainability for the site through strategic planning. It will look at aspects such as regulating the incoming tourism revenue, disbursing and balancing funds under each identified head and integrating more tourism revenue generating options to ensure effective implementation of the Conservation Plan and the Management Plan.

Appendix I provides details about the fee applicable for the tourists, photo shoots, video shoots, documentaries and movie shooting on the site. The following table 3 provides details of the annual income collected from the site since 2001 and table 4 provides the annual expenditure details of the department.

*Table 3 - Income for Jantar Mantar, Jaipur, from tourist entry tickets*

S. No.	Year	Total Tourist	Total Received Income (In Indian Rupees)
1.	2001-02	440523	5157816
2.	2002-03	418105	5129475
3.	2003-04	509106	7226930
4.	2004-05	612908	10376000
5.	2005-06	654615	11285875
6.	2006-07	727063	12525750
7.	2007-08	738457	28538695
8.	2008 (April 08 – Dec 08)	474050	21276080

*Table 4 - Annual expenditure on maintenance of Jantar Mantar, Jaipur*

S. No.	Item	Average Expenditure
1.	Payment Expenses	20,00,000.00
2.	Office Expenses	2,00,000.00
3.	Security Expenses	3,50,000.00
4.	Gardening Maintenance Expenses	1,45,000.00
5.	Cleaning Arrangements	1,30,000.00
	Total Average Expenditure	28,25,000.00

Though the income generated from the site is much higher than the annual expenditure but it does not go to the Department of Archaeology and Museums and hence, it cannot be utilised in the conservation or other works related to the site. The Department is in the process of working out a better arrangement with the Government of Rajasthan where RSMMDMS shall retain 2/3<sup>rd</sup> of the revenue collection and utilise it in developing the site.





## Part 4 Key management issues

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## Part 4: Key management issues

### 4.1 Identification of key management issues

Amongst the various management aspects described in the earlier section, the key issues that directly impact site management at Jantar Mantar can be broadly categorised into eight main sections. These are:

1. Planning and policy
2. Conservation
3. Tourism and visitor management
4. Traffic and parking
5. Research
6. Risk management
7. Buffer zone management.
8. Financial management

These main categories are used in this Management Plan to assess the key issues in this section and to develop policies and an action plan in the next section.

### 4.2 Planning and policy

#### 4.2.1 International

With the inscription of the Jantar Mantar, Jaipur as a World Heritage Site, it will be bound to follow the guidelines of the World Heritage Convention and adhere to its definition of authenticity.

Besides, subsequently the site will be a part of the serial nomination of all Jantar Mantar sites, and it has to be ensured that all the Jantar Mantar sites follow the same management regime as per the Operational Guidelines provided by UNESCO.

#### 4.2.2 Central government and state government

For the protection of the Outstanding Universal Value of the site of Jantar Mantar, Jaipur it is essential that all national level and state level policies and rules are taken into consideration for the development of the site. Special planning schemes such as the Jawaharlal Nehru Urban Renewal Mission at the central level and Tourism policies at central and state level can be strategically utilised in the development and conservation of the site.

#### 4.2.3 Local government

Since the buffer zone, access road to the site and parking areas fall under the Jaipur Municipal Corporation, local planning and byelaws play a crucial role in site enhancement. It is important to ensure that the local byelaws governing the site surroundings are enforced and enhanced to control the development around the site and to stop unwanted encroachments around the area.

*Issue 1: Conform to the guidelines as prescribed in the World Heritage Convention*

*Issue 2: Coordination of national and state level policies and planning schemes*

*Issue 3: Enhancement of byelaws to control buffer zone development*

### 4.3 Conservation

#### 4.3.1 Planning and landscape

The Jantar Mantar, Jaipur historically existed as an observatory with the instruments placed on a single plane of the site devoid on any landscaping. It was probably developed into a garden with pathways during the renovations in the 19<sup>th</sup> century along with the construction of the access road to the site. With increasing tourism, there is an attempt to control visitor movement within the monument through more regularised pathways.

These pathways are made by paving with red sandstone and then curbed with concrete curb blocks or with railings. Unfortunately, these pathways have become a strong distinct pattern in the ground disturbing the floorscape and view of the yantras or instruments. Some of the larger paved areas allow tourists to experience these yantras from many

desired locations and angles. However, the existing landscaping is in conflict with the historic ambience of the place and the landscaping definitely requires to be reviewed both in the context of its past and present use. As also specified in the Conservation Plan, the yantras cannot be seen as individual buildings that need to be connected by pathways. They need to be seen as existing on a single ground plane. The paving should thus be an element that brings them together rather than bring a mere connection between the instruments. It should also be as unobtrusive in character as possible. Sound historic research is required to review and redesign the site landscaping.

There are nice mature trees existing on the site. They may have been absent historically, but they do provide some relief to the stark landscape and also shade some areas. If their existence does not disturb the reading of the instruments or harm the built fabric, they should be retained.

The pathways in the landscape have been recently repaired and resurfaced with red sandstone. However, the excess watering of gardens seems to spill over the pathways next to the instruments and can lead to deterioration. This becomes critical, especially in monsoon, since a lot of seepage is already taking place from the existing gardens.

The railings at the site were redesigned and replaced in 2007 to ensure a safe viewing distance from the instruments..

#### **4.3.2 Condition of built fabric**

The yantras have by and large do not show major structural damages. The reasons for the structural damages depend upon:

- (i) Ageing of materials: At places, wooden structural elements have been used to support some yantras like the wooden beams in the Unnathamsa Yantra. These beams had deteriorated over time and the brass instruments were precariously positioned. These were replaced with matching beams in the conservation works in 2007.
- (ii) Differential movement in foundation due to water seepage: The yantras are surrounded by gardens all around them. These are watered very frequently and therefore a lot of water percolates into the ground. Since these foundations would not have been designed for this kind of water seepage, they tend to



settle unevenly depending upon the soil conditions. These aspects were addressed in instruments such as the Jai Prakash Yantra by relaying the plinth protection in lime in 2007. Underground historical drainage system below the yantra was also opened up and cleaned to make it functional.

However continuous care of the historic built fabric is essential and a proper management and conservation regime for the site should be developed and adhered to for long term conservation.

### **4.3.3 Functioning of instruments**

It is important that the instruments at Jantar Mantar are regularly used for observations to ensure the long term functionality of the instruments. In this context, expert astronomers should be consulted to check the status of the instruments and to maintain a regular record of the readings. Any damage to the functioning of instruments should be immediately addressed.

*Issue 4: Existing landscaping of the site needs to be reviewed in context of its past ambience and, its present and future use as a tourist monument*

*Issue 5: The conservation of built fabric of the instruments should be of primary importance*

*Issue 6: The functioning of astronomical instruments is crucial for protecting the OUV of the site*

## **4.4 Tourism and visitor management**

### **4.4.1 Public access**

Jaipur is the gateway of Rajasthan, and also the capital of the state. Several parts of the city are developing very well. But the heart of the capital lies in the old city. It is imperative that any further growth in tourism must be supported by improved infrastructure and a cleaner city. The traffic in and around the old city calls for better management and comprehensive measures for pollution control. The entrance to Jantar Mantar site falls on a main thoroughfare and gets cluttered by vehicles coming to drop off or pick up visitors.

#### 4.4.2 Visitor management

Within India, the government has accepted tourism as an important national industry. This is marked by the focus on improving infrastructure at recognised tourist destinations as an important agenda. Rajasthan, with its magnificent palaces and Jaipur in particular receives a very high number of tourists. Since a major part of the state has been a desert, and thus, removed from the focus on agriculture, tourism in Rajasthan has been an important generator of revenue. Being the capital of the state, and also its romantic image of the Pink City has made Jaipur the most sought after destination.

Heritage and culture tourism is a key growth sector in Rajasthan and India. Tourism provides opportunities to enhance understanding between the visitor and the local community, and promote respect for different cultures. With appropriate marketing, a World Heritage Site Inscription will result in increased visitor usage. This needs to be seen in the context of existing targets for growth of the tourism sector in Jaipur, as the site could make a significant contribution to strategies to manage the impact of tourism on the environment. Table 5 shows the increasing growth of visitors on site since 2001. However, with inscription as a World Heritage Site there would be a need to revise tourist projections and strategise visitor management.

The tourist numbers on the site have increased from an average of 1800 per day from the year 2006 -07 to 2025 in 2007-08. At certain peak days in winter, the number of tourists on the site rises to 10,000. Since the historic monument has a limited area of 1.86 hectare, it is extremely important to control and channelise the tourist traffic. It should be ensured during the peak tourist season, that the movement of tourists is specially guided/assisted by employing extra staff. Care should be taken to ensure that the site does not admit more visitors than its carrying capacity. An optimum number of tickets within a specific time period should be fixed for the busy tourist season to ensure this.

Drainage, water supply and electricity are services which need to be improved. They have to be concealed such that they do not mar the beauty of the monuments. Tourist facilities have to be provided, not only in terms of facilitation centres, but amenities like toilets, street furniture, lighting, proper roads and pathways etc. These would contribute towards an overall ambience of the site. Careful listing of the monuments, their use and the

manner of their preservation, conservation or adaptive reuse needs to be taken up for the site surroundings including buffer zone.

Table 5: Tourism statistics for Jantar Mantar, Jaipur

S. No.	Year	National Tourists	International Tourists	Students	Total Tourist
1.	2001-02	329580	93000	17943	440523
2.	2002-03	310258	87000	20847	418105
3.	2003-04	383797	101801	23550	509106
4.	2004-05	409370	174500	29038	612908
5.	2005-06	416323	211285	27007	654615
6.	2006-07	433854	251656	35544	727063
7.	2007-08	422669	276270	39518	738457

#### 4.4.3 Interpretation

Though several initiatives have been taken in the last year or so to improve interpretation of the site such as audio guide and improved signage but a comprehensive interpretation plan needs to be developed for Jantar Mantar to ensure proper interpretation. The interpretation plan also needs to address the other Jantar Mantar sites which will be part of the serial nomination to Jantar Mantar, Jaipur.

#### 4.4.4 Visitor facilities

Most of the visitors to Jaipur visit the central core of the city and Amber Palace. Visitors to the monument district in Jaipur are categorised in three broad categories in the Conservation Plan. One is the international visitor. These visitors come to Jaipur out of an awe and appreciation of the beauty of the heritage properties. They may visit for a short time or may have a research or academic interest in the place. They come in search of the enigma of bygone eras. While the monuments attract visitors and will continue to do so, travellers world over are becoming more aware and a discerning lot. There is an expectation of basic standards of maintenance of the monuments as well as supporting facilities and basic infrastructure. Thus, for Jaipur to attract more visitors, it becomes imperative to carefully assess the overall ambience of the place and supporting facilities for increased traffic. The second category of the people is Indian tourists. With the increased availability of information they too are more aware of international tourism standards. The third category of visitors who come to the central monument district are

the pilgrims. The area around Jantar Mantar has several small and large temples, some of which have great significance locally as well as nationally. Topping the list of temples in the central sector is the Govind Dev Mandir. This particular temple is the most significant temple for the city thus contributing to a great amount of traffic of pilgrims in the surrounding areas of the site. Visitors park their vehicles, either in Jaleb Chowk or along the road leading to the temple. The road through Jaleb Chowk which is also part of the parking lot used for the site, has thus become an important thoroughfare.

Ticketing is an important aspect of any heritage monument. However, all activities related to ticketing and checking must be streamlined. Ticketing is part of the public facilities and has recently been reorganised at Jantar Mantar with adequate shaded waiting area. There are two windows that function during peak periods. Entry and exit to the complex is now through two separate gates to ensure easy flow of tourists and to avoid congestion.

The Conservation Plan proposes a tourist facilitation centre, an information centre, some souvenir shops, cafe, waiting areas, and amenities to be located at the site of the present ticketing office. Though this proposal has not been implemented yet, it might be taken up once the adjoining property of Anand Krishna Bihari temple on the west is added to the Jantar Mantar site.

#### **4.4.5 Education and outreach**

It is important that this site of scientific value should serve as an educational resource. Hence, the annual calendar of the site should incorporate educational programmes and activities. The Jantar Mantar at Delhi has already taken this initiative with support from the Archaeological Survey of India.

To highlight the intimate connection between astronomy and heritage, Nehru Planetarium in collaboration with the Archaeological Survey of India, the Amateur Astronomers' Association, Delhi, the Science Popularisation Association of Communicators and Educators and Astronomica conducted a fair titled 'Khagol Mela' at Jantar Mantar Delhi in January 2009 with the aim is to make astronomy more accessible, useful and knowledgeable to ordinary citizens, particularly children. This event marked the beginning of astronomy related activities for the International Year of Astronomy. It



highlights usage of the ancient Jantar Mantar observatory instruments in the spirit of creating wider public awareness about astronomy and global heritage.

Similar programmes need to be extended to the site of Jantar Mantar, Jaipur.

#### **4.4.6 Infrastructure**

The water supply and drainage in the site is at two levels. One is for the gardens where water connections have been given at several points to facilitate watering. The other part of the service goes to two buildings on the site, namely the ticketing and toilets and the museum. The piping and resultant junctions had caused problems that are now rectified. The installation of the electrical services in the complex may have been functional, but was not done in a manner respectful of the monument. Electric boxes were left open and may become hazardous. The electric poles are visible from everywhere and disturb the experience. Some are also redundant and have not been removed. Part of the issues with services have been rectified during the conservation works of 2007. However, a strong maintenance and management regime is required for this purpose.

***Issue 7:** The approach to Jantar Mantar needs to be reviewed in context of the traffic congestion and ease of access for tourists visiting the site*

***Issue 8:** The site has improved on visitor management and visitor facilities in 2007-08. However, considering the increased tourism after the inscription of the site, it will need to rework a more comprehensive visitor management plan, review existing circulation and add facilities such as the museum and more toilet blocks, ticketing counters etc. A restaurant as proposed in the Conservation Plan with reuse of adjoining property should be developed. This will require transfer of property from the Devasthan Department*

***Issue 9:** A comprehensive interpretation plan including a detailed message media matrix for the site needs to be developed to define all interpretive mediums including audio visuals, interpretation centre, signage, publications, brochures and website*

***Issue 10:** Integration of educational and outreach programmes should be a strong segment in the development of the site*

## **4.5 Roads and parking**

### **4.5.1 Road traffic and safety**

This area is also the most important commercial area of the city. Most of the retail shopping of the city happens here. There is a large movement of people and materials. This requires parking for large numbers, both for shopkeepers and shoppers. It also requires service area for loading and unloading, public transport vehicles ply the route regularly and they require proper stops. Many visitors come to Jantar Mantar on cycle rickshaws. These rickshaws keep waiting for passengers. They also ferry visitors between monuments, especially to Hawa Mahal. There needs to be a system of their parking and movement.

### **4.5.2 Public transport and access**

As mentioned earlier, there are two ways in which the tourists primarily approach Jantar Mantar. The first brings them to Jaleb Chowk in front of the city palace. They move into the City Palace and after that cut across Jaleb Chowk on foot through Nagarkhana ki mori to the entrance of Jantar Mantar. While cars and smaller vehicles can be driven right to the entrance of the site, buses have to park in the Jaleb Chowk. The other route to the site is through the Maharani Gayatri Devi Gate, next to the Tripolia, across Chandni Chowk. The adjoining site of Hawa Mahal is mostly experienced from viewing across the east facade on the Hawa Mahal road which is also the main north south axis and commercial street of Jaipur. This adds to the congestion. Those tourists interested in going to the top of Hwa Mahal have to go to the lane on the western side of the property. This road is also the entrance for the Police Headquarter. This causes problems to both the properties since both are functions with high traffic. These routes are also actively used by local people either as thoroughfare or as a way to go to the Govind Dev Ka Mandir. The site is a part of a dense urban fabric which has several landmark monuments and, where most of the retail commerce of the city occurs. This adds to the traffic problems and the mixed traffic contributes to further confusion.

### **4.5.3 Parking facilities**

Tourism related parking in the buffer zone area of the site needs to be consolidated. This would reduce the load on the roads and stop the mixed traffic movement in the area.

Serious action against encroachment of the sidewalks must be taken. The Conservation Plan suggests that Jantar Mantar, Hawa Mahal and the City Palace and other monuments of the sector may be looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss-cross movements and having a single parking. It is highly desirable that the route between the two monuments be pedestrian through the Police Headquarter building. That function may be relocated and the space be utilised to create an enhanced tourist experience through museum or centre for performing arts. A route at the terrace level connecting the two monuments can also be made. Visitor parking should be restricted to one or two areas and most of the movement between monuments should be pedestrian. This will reduce short duration parking and therefore cut down the load on the roads.

***Issue 11:** The congestion on access roads and approach to the site needs to be resolved in relation to the local municipal planning for traffic in that area*

***Issue 12:** There is no specific parking for the site as all parking lots are common to the adjoining monuments such as the Hawa Mahal and the City Palace Museum. With additional traffic in the area and new Museums planned in the vicinity, the parking will be a major problem and needs to be resolved using areas in buffer zone and beyond such as the Jaleb Chowk and the Police Headquarters*

## 4.6 Research

Several opportunities for conducting more research into Jantar Mantar exist, both as Site initiated projects and through working in partnership with research focused organisations such as international universities that are doing academic research on Jantar Mantar and have developed special websites on the site. The research programme should cover all aspects of managing the site, including the conservation of the architectural value, scientific value, the use of instruments, and the economic and social impacts of implementation of the Management Plan. These initiatives provide opportunities for communicating the Outstanding Universal Value of the site to a wide range of audiences, at all stages and levels of education, both in India and internationally. They also provide an outlet for much of the research already gathered and to be undertaken in future, and

opportunities for a wide range of people to contribute to these. It also appeals to self directed and informal learners wishing to increase their knowledge of astronomy and architecture.

*Issue 13: The Jantar Mantar has served as an important point of national and international research for a wide range of professionals, historians and astronomers. It is important that this scholarly research is encouraged and facilitated in all possible ways to ensure the long term protection of its OUV*

#### **4.7 Risk management**

The Department of Archaeology and Museums needs to undertake a risk assessment of its own strategic and operational functions relating to the Management Plan. Risk management begins with identifying risks, evaluating their potential consequences and determining the most effective methods of managing or responding to them. This might include producing fire action plans, checking disaster plans and preparing emergency evacuation plan. Even though the majority of Jantar Mantar structures are constructed of stone, but a small number of particularly important elements such as two of the Yantras incorporate timber beams that are vulnerable to fire. Theft or damage to instruments also needs to be addressed in risk management.

*Issue 14: The Jantar Mantar needs to develop a Risk Management Plan to counter all possible hazards such as fire, disaster and emergency situations on the site*

#### **4.8 Site setting and buffer zone management**

Any historic area or core has to be handled sensitively and carefully since there are many complexities involved in it that would be different from dealing with an individual monument. There are issues of ownerships, authorities, implementing agencies as well as public sympathy and/or apathy. There are shared memories and significance in the socio-



political and cultural milieu. Important to this is also the economics of the area and the market development. The area around Jantar Mantar site has similar issues.

The use of Police Headquarters in a building that lies exactly between Jantar Mantar and Hawa Mahal is entirely inappropriate in the historic surroundings. The Government of Rajasthan is in the process of relocating the Police Headquarters so that the area can be utilised better to serve both these monuments.

Much of the surrounding areas such as the Jaleb Chowk lies unused and in a dilapidated condition. Similarly in the area south of the Jantar Mantar, there is a small street abutting the Jantar Mantar. Some of the properties on this street are used for small scale industries. There is also an electrical substation. However, large chunks of residential *havelis* in this area are lying completely dilapidated and unused. Deteriorating Devasthan Department properties abut both the Hawa Mahal and Jantar Mantar and can be reused in the area development.

From the land use patterns it is obvious that the properties of the area come under different holdings from government to semi government, private and public trusts, private ownerships etc. The problem of a holistic development is hindered by this but an overall master plan with guidelines and suggestions can become a means of control. Its implementation can improve the ambience, infrastructure, and experience.

Adaptive reuse of unused and dilapidated properties would increase the liveliness of the area. This reuse must be congruent to the general tourism related activities. The properties adjoining the Jantar Mantar and the Hawa Mahal which are lying unused and in a decaying condition should be brought into the precinct of these monuments and used for visitor facilitation and other related activities. It will increase the dwell time of these monuments without having to make significant additions that may not be congruent to conservation guidelines. Use of the properties will also arrest the decay and help in their upkeep and maintenance.

Private properties must be used, with adherence to conservation related guidelines and regulations. The use must be congruent to the surrounding. Any kind of change in the

character of the built form must be reviewed critically and approval from appropriate authorities must be procured.

Integral urban development and heritage conservation plans should be devised and agreed by all planning teams, such as Jaipur Municipal Corporation, Town Planning Department, Traffic Administration, Police Department, Legal Department etc. Coming to a common ground of understanding is most crucial. Development plan must be separately made for this historic area and land records updated for the legal and illegal land, open space, road, islands, *chaupars*, footpaths occupancy etc. and integrated with the over all plan.

The setting of the site is those sites, monuments, buildings and landscape components which provide additional historical context and a physical space in which events could affect the visual appreciation of the site. The proper conservation of the site and its setting will be achieved through policies in strategic planning documents (including the Development Plans), a suite of existing strategic documents for landscape conservation and the measures contained in existing statutory designations. The issue is in ensuring that strategic plans and programmes take account of the setting of the site as well as the site itself. The setting of the site includes a physical space in which events could adversely affect the visual appreciation or understanding of the site. Historic landscape characterisation is a vital tool in determining the appropriateness of development or land use change. Physical distance, scale, mass and materials may also be factors to take into account. Skyline is a very important aspect of this area and all efforts must be made to preserve it.

***Issue 15:*** *The buffer zone areas such as the Anand Krishna Bihari temple and its proposed land use and the Police Headquarters and its proposed land use will play a crucial role in the functioning of the site and need to be integrated with site planning and development. The ownership issues and transfer of these properties to the Department of Archaeology and Museums is crucial for long term protection and development of the site. The visual appreciation of the site needs to be respected in all surrounding development.*

## 4.9 Financial management and marketing

Department of Archaeology has no specific funds for regular maintenance of the site. The present income of the site is deposited with the State Government and only a part of the departmental funds are given for regular maintenance of the site. For the implementation of Conservation Plan and Management Plan of the site, substantial funds and support is required. The Department has already availed of a centrally sponsored scheme for the preparation and implementation of the Conservation Plan. Similar funding strategies need to be developed to sustain long term conservation of the site. The Department is already in the process of working strategies with the State Government so that part of the income earned by the site can be directly utilised in the maintenance and development of the site. Inscription as a World Heritage Site will help perpetuate success in attracting funding for conservation and enhancement from a range of sources due to the importance and prestige associated with an internationally important site.

The Management Plan sets out a framework of policy principles and individual actions that were identified as the necessary first steps in steering the development of the site towards the established Vision over the next five years. Implementation of these policies and actions will inevitably require investment of resources. The Inscription of this proposed World Heritage Site and the adoption of this Management Plan provide a real opportunity to establish a formal agreement of the importance of Jantar Mantar and its contribution to the cultural distinctiveness, and to achieve a coordinated approach to its management and conservation.

This Management Plan establishes a strategic framework for the site but the conservation and management of the site can not take place in isolation. The conservation of the site needs to be embedded in a range of strategic plans and programmes.

The marketing of the site is important and should focus on aspects such as:

- i. Public relations.
- ii. Marketing and strategic product development for education groups.
- iii. Branding issues.
- iv. Website development.

- v. Interpretation strategy.
- vi. World Heritage Site-specific training (e.g. awareness raising amongst front-line staff).
- vii. Shared promotional tools (e.g. World Heritage Site official guide and leaflet).
- viii. Establishing partnerships with organisations for marketing campaigns to specific market segments identified as priorities.

Devising appropriate interpretation and education strategies requires an understanding of current and potential audiences and visiting patterns. A collective audience research needs to be commissioned to underpin further marketing and interpretation initiatives.

The existing economic activity derived from the conservation and interpretation of Jantar Mantar and the potential impact resulting from Inscription as a World Heritage Site needs to be studied.

***Issue 16:*** *Since the income from the site does not come directly to the Department of Archaeology and Museums, the funds for regular maintenance of the site are limited and additional funds for conservation plan, management plan, interpretation plan etc. have to be sourced from outside. It is important that the site develops a self sustainable mechanism for its regular maintenance and additionally develops a funding and marketing strategy to target more funds and resources for all essential activities*



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Part 5  
Policies and actions

## Part 5: Policies and actions

This part of the Management Plan presents specific policies as per the key management issues identified in the earlier section. The strategic policies are then translated into strategic actions and these jointly ensure that the Vision and Aims identified for Jantar Mantar are achieved. While the Action Plan is time specific, the Policies might be more long term and some of them can go beyond the five years of this plan to be integrated in the later revisions of the Management Plan.

### *Vision and Aims*

The Jantar Mantar, Jaipur is a testimony to the astronomical knowledge of medieval India and marks the point of dissemination of this knowledge to general public through its monumental existence.

***“Our vision is to conserve, protect and enhance the Outstanding Universal Value of the Jantar Mantar, Jaipur and thus celebrate astronomy and its contribution to society and culture. The Jantar Mantar, Jaipur will continue to exist in the spirit with which it was built by Sawai Jai Singh II: to invite and inspire the widest range of visitors and scholars across the world, to encourage engagement with its astronomical instruments and to contribute to the cultural distinctiveness of the city of Jaipur.”***

In order to achieve this vision, we aim at the following objectives:

- Conservation of the Outstanding Universal Value of the nominated site
- Continue the reuse of site for astronomical studies and research
- Facilitate all visitors with appropriate interpretation to understand its significance

## 5.1. Policies 2009-2013

Based on the exploration of the key management issues affecting the site (Part 4) a series of strategic policies have emerged for the site. These strategic policies will be used to guide and influence the partnership and stakeholders. These policies are a means of measuring actions, a statement of commitment by the Department of Archaeology and Museums, and a tool to lobby and persuade all those who may affect the proposed World Heritage Site.

*Issue 1: Conform to the guidelines as prescribed in the World Heritage Convention*

**Policy 1(a):** Government departments, agencies and other statutory bodies responsible for making and implementing national policies and for undertaking activities that may impact on the WHS and its environs should recognise the importance of the proposed WHS as a whole and its need for special treatment and a unified approach.

*Issue 2: Coordination of national and state level policies and planning schemes*

**Policy 2(a):** All relevant strategic planning documents should make provision for the protection, conservation and enhancement of the site and its setting.

**Policy 2(b):** Planning authorities should ensure that new development protects, conserves and enhances the site and its setting.

**Policy 2(c):** The review of statutory protection within the site will continue through national and state designations.

*Issue 3: Byelaws to control buffer zone development*

**Policy 3(a):** Local authorities and other agencies should make full use of the powers available to them for the protection and conservation of the site and its buffer zone.

**Policy 3(b):** The relevant policies of the Management Plan should where appropriate be formally incorporated within the local development framework and within other statutory plans for the site setting and the buffer zone areas.

*Issue 4: Existing landscape of the site to be reviewed in context of its past ambience and its present and future use as a tourist monument*

**Policy 4(a):** Landscape planning should have regard for the authenticity and values of the site.

**Policy 4(b):** The landscape planning should be a balanced approach so as to resolve conflicts between historical planning and present use of the site.

**Policy 4(c):** Landscape fabric of cultural relevance should only be used as per availability of direct historical evidence about the original plant types. In the absence of any historic evidence, landscape fabric of indigenous nature may be selected.

**Policy 4(d):** Interpretation of the earlier historic landscape should be incorporated as per historical evidence. (this policy also refers to Issue 9)

**Policy 4(e):** Landscape planning should be in conformation with other conservation policies and adhere to minimal intervention.

**Policy 4(f):** Proper slopes and drainage should be ensured in the landscaping of the site.

*Issue 5: The conservation of built fabric of the instruments should be of primary importance*

**Policy 5(a):** The conservation and continuing maintenance of the historic fabric of the site should be undertaken to the highest standards to ensure authenticity and integrity.

**Policy 5(b):** The historic character and distinctiveness of the Jantar Mantar should be maintained.

**Policy 5(c):** Traditional building practices of the region should be followed in all preservation and restoration work to retain authenticity and promote traditional skills.

**Policy 5(d):** The integrity of the structure should be maintained while respecting the successive layers of intervention.

**Policy 5(e):** Where the historic fabric within the site has been lost or compromised through non-authentic materials, inappropriate details and poor workmanship, historic character and detail will be reintroduced wherever and whenever possible.



**Policy 5(f):** Any major restoration if essential, should be identifiable on close inspection or through additional documentation and interpretation.

**Policy 5(g):** A maintenance regime for proper repairs as per authentic building practices should be established. Appropriate conservation techniques should be determined as per a detailed documentation and analysis of the existing historic layers by experts.

**Policy 5(h):** An inventory of all the instruments and the state they are in should be maintained with digital photographs and descriptions, which should be checked at regular intervals, updated and acted upon.

**Policy 5(i):** A clear Do's and Don'ts guidelines specifying monthly, quarterly, half yearly and annual tasks of maintenance works should be charted out.

**Policy 5(j):** The traditional workers should be identified and a directory of craftsmen and workers for specific tasks shall be created to address this need

**Policy 5(k):** Regular maintenance of the premises and built fabric should include daily cleaning of all areas, periodic checking of services such as drainage and electrical and periodic removal of excess vegetation.

**Policy 5(l):** Electrical wiring that is defunct should be removed from all places on site. Wiring that is detrimental to fabric should be carefully removed and re-laid in a manner that it does not affect the fabric.

*Issue 6: The functioning of astronomical instruments is crucial for protecting the OUV of the site*

**Policy 6(a):** The distinctiveness of the site and its Outstanding Universal Value rests in the astronomical instruments and it should be ensured that the instruments are functional and the calibrations and accessories for recording in the instruments are intact in their original position.

**Policy 6(b):** Regular recordings from the instruments should be taken by astronomers to ensure their functional status.

*Issue 7: The approach to Jantar Mantar needs to be reviewed in context of the traffic congestion and ease of access for tourists visiting the site*

**Policy 7(a):** The physical access to the site should be sustainable to the environment and consistent with the values of the site.

**Policy 7(b):** Care should be taken to accommodate a complete range of disabilities in coherence with other policies in the conservation plan.

*Issue 8: Enhancement of visitor management and visitor facilities*

**Policy 8(a):** The site should develop an ample range of visitor facilities to ensure that visitors of all gender, age group and nationalities have the best experience of the site.

*Issue 9: Interpretation of site*

*Issue 10: Education and outreach*

**Policy 9(a):** Visitors should be encouraged to explore and learn about the physical, scientific and cultural aspects of the Jantar Mantar site.

**Policy 9(b):** The values and significance of the site should be communicated to a wide range of educational audiences.

**Policy 9(c):** The site should be interpreted and presented as a distinctive, evolving, living site.

**Policy 9(d):** The local citizens should be engaged in the enjoyment, benefits and management of the site.

**Policy 9(e):** Enjoyment of the site should be available to all regardless of ability or income.

**Policy 9(f):** Research into Jantar Mantar and its worldwide linkages should be facilitated and encouraged, published and disseminated.

**Policy 9(g):** Interpretation of the site should be based on sound historic research and a thorough visitors' analysis.

**Policy 9(h):** Facilities to increase intellectual access to the site will cater to the widest range of visitor community including the local residents, domestic and international visitors. Intellectual access should consider special segments as per gender, age and abilities of visitors.

**Policy 9(i):** Messages to be conveyed in interpretation should be developed in consultation with all involved in developing, managing and delivering that interpretation.

**Policy 9(j):** The approach to interpretation should extend beyond the site itself, providing an understanding of the place in its historical, geographical and social context.

**Policy 9(k):** Interpretation programmes and messages should have primary regard for the OUV of the site. They should be undertaken in a manner that minimises impact on the historic fabric.

**Policy 9(l):** Regular research and evaluation should continue to inform all interpretive activities.

**Policy 9(m):** The complex should continue to serve as a venue for educational training workshops for professionals and as an educational resource for school children and college students.

**Policy 9(n):** Special training to guides should be given and special brochures that narrate authentic, historic information should be made available to the tourists.

*Issue 11: The congestion on access roads and approach to the site*

*Issue 12: Parking for the site*

**Policy 10(a):** The traffic and parking around the site should be organised in the best possible manner to ensure a hassle free experience for the visitors

**Policy 10(b):** The traffic and parking for the site should be resolved in reference to the surrounding monuments and buffer zone areas. An integrated traffic and parking plan for the entire area should be worked out by the local authorities.

*Issue 13: Scholarly research on the site*

**Policy 11(a):** The Jantar Mantar, Jaipur should continue to be a site for further research, discourses and debates on astronomy, architecture, town planning and cultural constructs in order to promote its Outstanding Universal Value.

**Policy 11(b):** The site should develop an annual calendar of events for thematic studies and workshops during 2009, the Year of Astronomy to celebrate astronomical heritage of India.

**Policy 11(c):** The existing scholarship on Jantar Mantar should be systematically compiled and made available to the visitors; existing websites on Jantar Mantar should be linked with a special website to be created on Jantar Mantar.

*Issue 14: Risk preparedness*

**Policy 12(a):** The risks to the site and its management should be regularly assessed and actions taken to these risks.

**Policy 12(b):** The site should implement a high security system to facilitate its functioning.

**Policy 12(c):** The entire site should follow safety and fire fighting norms. Disaster Preparedness Plan in response to fire, accidents and overcrowding is essential.

*Issue 15: Buffer zone management and land use*

**Policy 13(a):** Developments outside the site that will adversely affect its Outstanding Universal Value should be resisted.

**Policy 13(b):** New development should add to the quality and distinctiveness of the site by being of high quality design and respectful of setting.

**Policy 13(c):** There should be a presumption in favour of retaining and re-using historic buildings which are important components of the buffer zone for the site.

**Policy 13(d):** The management should dialogue with the owners of the properties in the buffer zone area and collectively resolve issues of land use, traffic, parking and encroachments in the buffer zone area.

*Issue 16: Financial resources for the site*

**Policy 14(a):** The Department of Archaeology and Museums with RSMMDMS will collectively and individually, identify and secure resources to implement the Management Plan.

**Policy 14(b):** The Management Plan for the proposed World Heritage Site will be delivered through an accountable and effective partnership with clear responsibilities, in order to achieve the Vision and Aims.

**Policy 14(c):** The marketing and interpretation of the site should be coordinated to ensure a consistent, responsible use of the World Heritage Site Inscription.

**Policy 14(d):** The economic impacts of the site should be monitored and quantified.



**Policy 14(e):** The distinctiveness of Jantar Mantar should be celebrated, promoted and propagated.

**Policy 14(f):** Distinct project accounts of revenue and expenditure should be maintained.

**Policy 14(g):** Long term and short term funding strategies should be developed for the site and its associated interpretation and outreach programmes.

## **5.2 Strategic Actions 2009-2013**

The policies have generated the following strategic actions to be achieved during the life of the Plan 2009-13 either as specific projects or in many cases ongoing and continuous action. The Department of Archaeology and Museums, Archaeological Survey of India and other stakeholders have a collective role in implementing these actions and in the success of the Management Plan in general. However, the table below assigns lead agency (ies) who will be pivotal in driving forward progress with each action. A timetable has also been assigned to identify those actions which are immediate, short term or long term. Progress on these actions will be provided annually and will contribute toward the monitoring of the implementation of the Management Plan. These strategic actions have a one to many relationship with the strategic policies; each action can often relate to more than one policy and in turn more than one issue.

Table 6: Action plan for implementation of policies

Objective	Policy	Action	Stakeholders responsible for delivery	Resources required	Time frame
Planning and Policy	Policy 2c	Amendment to the Rajasthan State Monuments and Antiquities Act, 1961 for protection to extend to unprotected heritage in the buffer zone areas of protected monuments and to declare a fresh list of inventory of protected monuments	Department of Art, Literature and Culture	Existing personnel and feedback from professionals and institutions in the field of conservation	In process
Conservation	Policy 4a-4f	Review of existing landscape scheme	Department of Archaeology and Museums	Existing staff and consultants	2 years
	Policy 5a-5i	Regular monitoring and maintenance	Engineering Wing, Department of Archaeology and Museums	Existing Staff	Ongoing
	Policy 6b	Review of authenticity of calibrations and markings on instruments Recording readings from various instruments	Department of Archaeology and Museums	Nehru Planetarium and Existing Staff	Ongoing
Visitor Management, Interpretation, Education and Outreach	Policy 7a-7b	Negotiating traffic solutions for the site and buffer zone	Jaipur Municipal Corporation	Existing Staff / Funding for developing adjoining sites for parking	5 years
	Policy 8	Improving visitor facilities as proposed in Conservation Plan	Department of Archaeology and Museums	Existing Staff	Ongoing
	Policy 9a-9k	Preparing a comprehensive Interpretation Plan	RSMMMDS through consultants	Funding for preparing and implementation	5 years
	Policy 9l-9m Policy 11a-11c	Preparing an Outreach Programme Calender	Department of Archaeology and Museums with ASI and the Nehru Planetarium/ Researchers	Existing staff and partner organisations  Individual researchers	1 year  Ongoing
Roads and Parking	Policy 10a-10b	Improved traffic management plan	Jaipur Municipal Corporation	JNNURM Scheme (Central government)	Ongoing
Risk Preparedness	Policy 12a-12c	Assessing risks on site and preparing plans accordingly	RSMMMDS through consultants	Funding for preparing and implementation	5 years
Buffer Zone Management	Policy 13a-13d	Negotiations for transfer of property of Anand Bihari temple and the Police Headquarters and proposed resale of the same to improve visitor facilities	Department of Art, Literature and Culture	Existing personnel	in process
Financial Resources	Policy 14a	Proposal for RSSMDS to retain 2/3rd revenue from the site for site development	Department of Art, Literature and Culture and RSMMMDS	Existing personnel	in process



# Part 6 Implementing the management plan



## Part 6: Implementing the Management Plan

This section outlines the arrangements for ensuring that the policies and strategic actions described in Part 5 will be delivered. It also describes how the Management Plan will be implemented in the immediate future.

### 6.1 Overseeing the plan

Responsibility for implementing many of the policies and strategic actions lies with the Department of Archaeology and Museums. However, some of the strategic actions and initiatives will require partnerships and associations with the Archaeological Survey of India and with other local bodies. Once the policies and priorities for appropriate care and management of the site have been agreed in the form of the Management Plan, these should be overseen through:

- i. Monitoring and measuring implementation of those policies and actions set out in Part 5.1 and 5.2 by following up with the stakeholders responsible for implementing the action plan
- ii. Direct delivery of some strategic projects affecting the site, e.g. commissioning surveys, strategies, or reports of the site
- iii. Agreeing relevant performance indicators and targets, where appropriate, and with regard to availability of resources
- iv. Agreeing on an annual forward work plan and programme budget for a World Heritage Site Office after the inscription of the site
- v. Receiving an annual report on Management Plan progress
- vi. Oversee and receive an appraisal on the options for post inscription governance and management structure, and agree on new arrangements.

### 6.2 Coordinating the management plan

Whilst some of the site policies and strategic actions will in some circumstances need to be applied with particular local circumstances in mind, e.g. the marketing strategy, this



will require consultation with subject or sector specialist. Hence, it is recognised that the structures created for implementing and monitoring the Management Plan should include opportunities for participation at all levels. The implementation of the Management Plan will be more efficient with creation of thematic panels each constituting of an expert professional and some experienced staff from the various branches within the Department of Archaeology and Museums. The thematic panels may include:

- i. Marketing panel
- ii. Interpretation panel
- iii. Technical panel to oversee conservation and astronomical studies

### **6.3 Implementing the management plan**

#### **6.3.1 Setting up a World Heritage Site Office**

For effective implementation of the plan, it is important to develop a World Heritage Site Office post inscription. This office should eventually be responsible for monitoring of all Jantar Mantar sites subsequently included in the serial nomination to this site. Resources for delivering the Management Plan will be drawn with help of the office from a range of partners, both in respect of the policies and actions.

#### **6.3.2 Monitoring indicators**

Monitoring is something that should be an integral part of management and performance against the indicators should be reviewed annually in order to inform annual action plans and keep track of the state of the site. The purpose of monitoring is to assess how the values of the WHS are being maintained over time and to measure whether the objectives of the Management Plan are being achieved.

Regular monitoring is necessary to re-assess priorities in view of new issues and progress made on the site. Monitoring indicators need to be firmly linked to the values and objectives identified in the Management Plan. The indicators used for the Jantar Mantar, Jaipur are identified under the eight broad categories that are used to identify the management issues, develop policies and action plan. Amongst the indicators listed below, some are already in place while others may require additional financial and human

resources to collect and analyse the data. The table 6 identifies periodicity of collecting the data and its location.

Monitoring should be an integral part of management and performance against the indicators should be reviewed annually in order to inform annual action plans and keep track of the state of the proposed WHS of the Jantar Mantar, Jaipur. The WHS Coordinator should use this information as the basis for the monitoring report produced every 6 years to inform the UNESCO periodic report and the review of the Management Plan. Both annual and periodic reports should be circulated to all interested parties.

#### **6.4 Reviewing the plan**

Progress and performance with this Management Plan will be reviewed annually using the indicators. This Management Plan has a five year life and will be reviewed in 2014. This process will involve public consultation and lead to the adoption of new or amended plan for a further five year cycle.

However, minor revisions to this plan will be made to integrate and synchronise with the management regimes of the other Jantar Mantar sites located at New Delhi, Varanasi and Ujjain which are proposed to be part of the serial nomination following the inscription of the Jantar Mantar, Jaipur.

Table 7: Monitoring Indicators

Objective	Indicators	Periodicity	Location of records
Planning and Policy	Amendment in the 'Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961'. Joint planning projects for the buffer zone	Once  As appropriate	Department of Archaeology and Museums  Various departments like the Jaipur Municipal Corporation
	Site Inspection by Project Engineer to observe the state of built structures  Site inspection by engineer to oversee ongoing conservation works  Site Inspection by superintendent to inspect the functions of instruments or take readings  Before and After photographs of the site and instruments to record changes	Daily  Daily when the works are ongoing  Weekly  Before and after the Conservation works are carried out on site	Engineering Wing, Department of Archaeology and Museums  Engineering Wing, Department of Archaeology and Museums  Department of Archaeology and Museums  Engineering Wing, Department of Archaeology and Museums
Access	Update of facilities improved as per visitor demands	Quarterly	Tourism Department and the Department of Archaeology and Museums
	Interpretive media checklist as per interpretation plan	To be outlined in the Interpretation Plan	
	Increased no of visitors as per visitor survey	Daily record	
Roads and Traffic	Traffic studies	quarterly	Jaipur Municipal Corporation
Research	Review of research projects and publications on Jantar Mantar	annually	Research Wing, Department of Archaeology and Museums
Risk Management	Keeping a record of accidents in and around the site	weekly	Contracted agency reports to the Department
	Checking security, emergency plans etc,		
Buffer Zone Management	Change in land use / improved traffic	As appropriate	Varies
Financial Resources	Monitoring incoming revenue and funds	monthly	RSMMMDS and State Treasury

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## Abbreviations

ASI	Archaeological Survey of India
RSMMMDS	Rajasthan Museum & Monuments Management & Development Society
OUV	Outstanding Universal Value
WHS	World Heritage Site

## Appendices

**Table: Fee collection for Jantar Mantar and other monuments**

**ENTRY FEE (Rates in Rs. per visitor per monument)**

Name of Monuments	Entry Fee		
	Students	Indian	Foreigner
Amber Palace	10	25	150
Jantar Mantar*	10	20	100
Hawa Mahal*	5	10	50
Nahargarh Fort*	5	10	30
Central Museum*	5	15	100

**STILL PHOTOGRAPHY (Rates in Rs. per day per monument)**

Name of Monuments	Indian	Foreigner
Amber Palace	5000	5000
Other Monuments	5000	5000

**T.V. DOCUMENTARY\*(Rates in Rs. per day per monument)**

Name of Monuments	Rajasthani	Indian	Foreigner
Amber Palace	50,000 # or 1,00,000 ##	1,00,000 # or 2,00,000 ##	1,00,000 # or 2,00,000 ##
Other Monuments	10,000	20,000	20,000

# Excluding Sheesh Mahal & Dewana-khas.

## Some portion of & Dewana-khas which is opened for public & outer of Sheesh Mahal.

\* 25% of total license fee for TV documentary, Video film fee will be charged as extra security deposit which is refundable

**FILM SHOOTING\*(Rates in Rs. per day per monument)**

<b>Name of Monuments</b>	<b>Rajasthani</b>	<b>Indian</b>	<b>Foreigner</b>
Amber Palace	1,00,000 # or 1,50,000 ##	2,00,000 # or 3,00,000 ##	2,00,000 # or 3,00,000 ##
Jantar Mantar	50,000	1,00,000	1,00,000
Hawa Mahal	50,000	1,00,000	1,00,000
Nahargarh Fort	50,000	1,00,000	1,00,000
Other Monuments	25,000	50,000	50,000

# Excluding Sheesh Mahal & Dewana-khas.

## Some portion of & Dewana-khas which is opened for public & outer of Sheesh Mahal.

\*25% of total license fee of Film Shooting fee will be charged as security deposit which is refundable.

**TIME SCHEDULE  
FOR MONUMENTS/MUSEUMS\***

Hawamahal, Jantar-Mantar	09.00 Am To 05.00PM
Other Govt. Museums	10.00AM to 05.00 PM
Amber Palace	8.00AM to 6.00 PM

\*Tickets are issued before 30 minutes of monuments closing time.

# **ANNEXURE – VII**

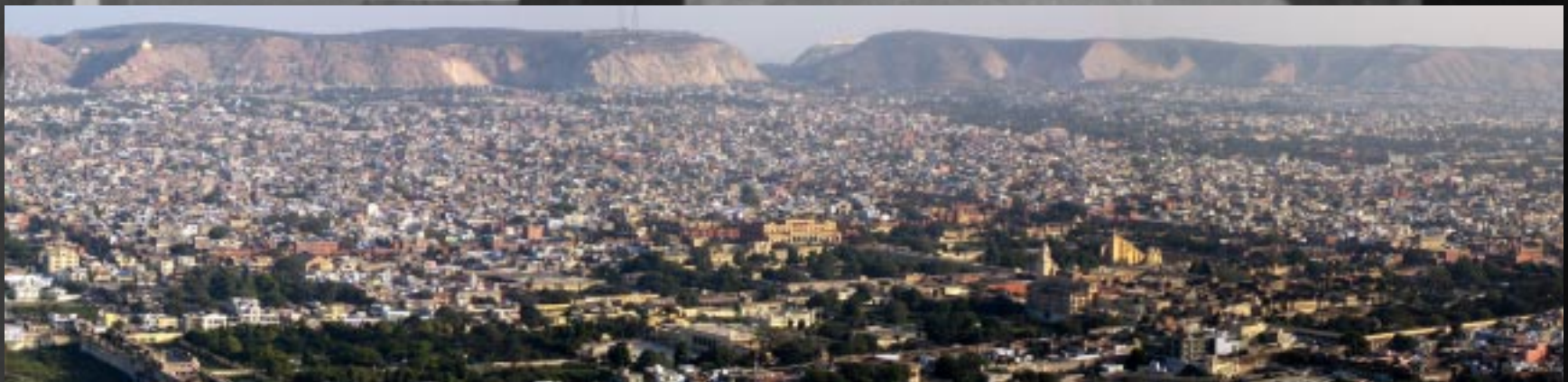
Conservation and Development of Jantar Mantar and  
Hawa Mahal Complexes

Part A, B and C



# CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR AND HAWA MAHAL COMPLEXES

MASTER PLAN REPORT, CENTRAL MONUMENT DISTRICT (PART A)



**RAJASTHAN STATE MUSEUMS MANAGEMENT AND DEVELOPMENT SOCIETY, JAIPUR**

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**The Honorable Chief Minister, Rajasthan,  
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## **MASTERPLAN DEVELOPMENT**

**I. TOURISM**

**II. LANDUSE**

**III. CIRCULATION AND PARKING**

**IV. ENVIRONMENTAL DEVELOPMENT**

**V. GUIDELINES FOR DEVELOPMENT**



## PREFACE

The visual and spatial enhanced qualities of the central royal district in Jaipur are unique. Unlike most city centres of medieval towns, this city centre is not a dense urban residential fabric but an amalgamation of some of the most important institutions of the time, secular, religious and royal. These combine to give a flavour, par excellence. The Jantar Mantar and Hawa Mahal are a part of this sector and are key buildings which give it the unique character.

Intensive mapping of the area in terms of movement patterns, historic landuses, present conditions and uses helps in understanding the position of these landmarks in today's context. Though elementary drawings of the area existed, a detailed and exhaustive documentation was carried out as part of this report. This study shows that the planning principles adopted more than 275 years ago took into account most of the urban processes and continue to cater to them even today. It is only the over population that is putting pressure on an otherwise beautifully designed city centre. Lack of respect and negligence from all concerned has resulted in a congested and confused situation.

Tourism in India is just beginning to acknowledge the significance of a proper management of heritage monuments for their longevity and sustenance. International heritage listings are particularly cognizant of these issues and that has played its part on an overall improvement endeavour. This report, along with issues of conservation, is perceptive of the fact that this is a very well visited site in the country. Therefore, all efforts towards conservation have to be inclusive and holistic. They have to take a broad perspective to include development of infrastructure and facilities. Simultaneously, to maintain the character and quality of the monument, all proposals follow a policy of minimum intervention. It must be kept in mind that any of the proposals envisaged in this report would have to be understood in conjunction with the provisions of law.

A master plan for the overall urban area, now being called monument district, is prepared with recommendations for some of the pressing issues like parking, appropriate use of spaces, tourist facilities, vehicular and pedestrian traffic. This is covered in part A of the report. A holistic approach where all owners work under a single umbrella is proposed for the overall ambience of the area. The primary objective is to prolong the life of these wonderful monuments towards which we have not only an emotional attachment, but also a connection with our history, culture and heritage.

Part B (Documentation - drawings, photographs) of the report deals with the Jantar Mantar Complex where an architectural study of the present status of the building is carried out. This is done with historic studies as background. Significance of the monuments, their strengths and weaknesses, tourism augmentation of the complex with development proposals, maintenance guidelines etc. have been considered while making the proposals.

Part C of the report deals with architectural conservation of the individual monument. A detailed condition and damage assessment is carried out. Recommendations to arrest the deterioration are proposed. Detailed Bills of quantities (B.O.Q) for the same are also provided.

The intentions of all the proposals and recommendations of these reports are to make the visit to this place meaningful and pleasant. Preparing this report has been an insightful as well as difficult process. The enigmatic monuments maintain their mystery while allowing certain understanding.





## EXECUTIVE SUMMARY

Jantar Mantar and Hawa Mahal sit in the heart of the city and are part of a large group of monuments that include the City Palace, Govindsinghji Temple, Jaleb Chowk, Anand Krishna Bihari Temple, Govind Deo ka Mandir and other temples and chowks. The conservation, development and the overall master plan of the area is based on field studies of movement patterns, circulation, facilities and land uses, architectural documentation and analysis. The key issues are presented in the three reports, with a broad summary of this part given below.

### PART A

1. Recommendations for a strategic approach to the conservation of a historic monument district based on regular upkeep, control and inspection.
2. Both, the Jantar Mantar and Hawa Mahal can be seen as a single total experience along with all the other historic monuments in the area. They are looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss crossing movements and having a single parking. The existing Police Headquarters and the Jaleb Chowk are proposed as a link, their occupants are recommended to be relocated. Alternative functions, suitable to converting the area into a monument district with tourist facilities have been allocated. The following is a list of the adaptive reuse proposal

No.	Name	Historic use	present use	Proposed use
i	Hawa Mahal	To view parades, experience the breeze	Tourist spot, offices, museum	Tourist destination Coin museum, Womenmuseum,Offices
ii	Govind deokaji Mandir	Temple	Temple	Temple
iii	Devasthan on north side of Hawa Mahal	Temple	Empty, filled with debris	Offices
iv	Ayurved bhavan on south side of Hawa Mahal	Not known	Partly empty, partly offices of Ayurved Department	Offices,sculpture courts Travelling museum for museum, cafeteria
v	Police headquarter	Garrison	Police headquarter	Indian food bazaar
vi	Goverdhannathji Temple on north of Devasthan/Hawa mahal	Temple	Temple	Temple
vii	School	Not known	School	Museum, library and book shops.
viii	Vidhan Sabha	Offices	Empty	Performing Arts Centre
ix	Jaleb chowk	Open space (army gathering)	Parking + government Offices	Crafts Bazaar and parking in the basement and landscaped open space.
x	City palace	Residence	Residence, Tourist destination	Residence, museum Tourist destination
xi	Anand Krishna Bihari Temple	Temple	Temple parts filled with debris	Tourist facilitation centre with Jantar Mantar
x	Jantar Mantar	Observatory	Tourist spot observations	Tourist destination, Astronomical research centre, museum, Tourist facilities

3. The report provides an overall master plan of the area with suggestions, recommendations and guidelines considering the historic landuses, present conditions and future requirements.
4. The report examines issues of visitor arrival, parking and connections to other monuments in the area and also makes recommendations for improvement and development.
5. Overall development guidelines taking into account increased requirements for infrastructure, controls, conservation of the fabric have been given. The emphasis is on the area to be alive and develop in accordance to its special features and qualities.
6. An overall management committee is proposed that should guide the development of this monument district.
7. Any successful proposal will depend upon implementation and strict enforcement.
8. Souvenir shops that have encroached upon public space must be removed.
9. Recommendations for signage, street furniture, public amenities have been made.









## I. TOURISM

Jaipur: The gateway to Rajasthan

India's position as an important tourist destination has been getting consolidated over the years. Yet, though there has been a significant increase in numbers, internationally, smaller countries have been making more of a mark than India. Aggressive marketing, good infrastructure, a clean environment and adequate facilities are recognised as contributing towards increased international tourists. Within India, the government has accepted tourism as an important national industry. This is marked by the focus on improving infrastructure at recognised tourist destinations as an important agenda. Rajasthan, with its magnificent palaces and Jaipur in particular receives a very high number of tourists. Since a major part of the state has been a desert, and thus, removed from the focus on agriculture, tourism in Rajasthan has been an important generator of revenue. Being the capital of the state, and also its romantic image of the Pink City has made Jaipur the most sought after destination.

Most of the visitors to Jaipur visit the central core of the city and Amber Palace. Visitors to the monument district in Jaipur can be categorised in three broad categories. One is the international visitor. These visitors come to Jaipur out of an awe and appreciation of the beauty of the heritage properties. They may be there for a short time or may have a research or academic interest in the place. They come in search of the enigma of bygone eras. While the monuments attract visitors and will continue to do so, travellers world over are becoming a more aware and discerning lot. There is an expectation of basic standards of maintenance of the monuments as well as supporting facilities and basic infrastructure. Thus, for Jaipur to attract more visitors, it becomes imperative to carefully assess the overall ambience of the place and supporting facilities for increased traffic.

a. Small shopping areas near the monument give a lively character. However, these have to be sensitively handled such that they do not disturb the experience.



d. The Amber Palace on the outskirts of Jaipur also is a great attraction for visitors enhancing the experience of Jaipur: a must on the tourist map of India



b. The shops, haphazard signage, parking and overall traffic take away the impact of the historic fabric.



c. An inside view of the city palace which forms the core of the central sector of Jaipur.



c. Ganesh Pol, entrance to the city palace through the Jaleb Chowk.







a. The entrance of a temple off the Hawa Mahal road is totally covered and hidden between the shops. Once cleared, it would make a beautiful variation in the streetscape.



b. Courtyard of the Anand Krishna Bihari Temple

c. A large number of visitors are already coming to the city centre. The basic issue is to provide a total experience rather than scattered monuments with adequate facilities.



d. Though not an institution of medieval times, the Vidhan Sabha was made as a part of this sector, consolidating its importance continued into modern times. The building now lies vacant. There are several such properties in the vicinity which can be put to significant use. Its access is from the Jaleb Chowk and it is an eclectic mix of Rajasthan architecture combined with the colonial.

The second category of the people are Indian tourists, who are also visiting the monuments for their beauty and magnificence. These visitors may also have an emotional connection with the places. With the increased availability of information the people are becoming a more aware lot and they also have exposure to international tourist spots. Their expectations of the places has consequently moved beyond the the physicality of the monument, to the other facilities that are available.

The third category of visitors who come to the central monument district is the pilgrim. This area has several small and large temples, some of which have great significance locally as well as nationally. In fact, the organisation of the city was greatly structured on some of the temples like the Surya temple at Galtaji. Topping the list of temples in the central sector is the Govind Deo Mandir. This particular temple is the most significant temple for the city thus contributing to a great amount of traffic of pilgrims, most of which are local. They park their vehicles, either in Jaleb Chowk or along the road leading to the temple. The road through Jaleb Chowk thus gains significance as an important thoroughfare. Two smaller temples mark the Badi Chaupar and Choti Chaupar. The other temples like the Anand Krishna Bihari Temple are haveli type temples, inserted into the urban fabric and following the typology of the city. For the pilgrims the temple is the focus, the other monuments a secondary destination. These visitors expect the temples and areas reaching to the temple to be clean.

#### Recommendation:

Jaipur is the gateway of Rajasthan, and also the capital of the state. Several parts of the city are developing very well. But the heart of the capital lies in the old city. It is imperative that any further growth in tourism must be supported by improved infrastructure and a cleaner city.

The traffic in and around the old city calls for better management and comprehensive measures for pollution control.

Drainage, water supply and electricity are services which need to be improved. They have to be concealed such that they do not mar the beauty of the monuments.

Tourist facilities have to be provided, not only in terms of facilitation centres, but amenities like toilets, street furniture, lighting, proper roads and pathways etc. These would contribute towards an overall ambience of the experience.

A thorough analysis of all elements that contribute towards making the central district special has to be undertaken. Careful listing of the monuments, their use and the manner of their preservation, conservation or adaptive reuse needs to be taken up. Urbanisation and modernisation must be consistent with the character of the place, and must also contribute towards the experience.







a. The ground level arcade contains the shops, while the upper levels are residences. What appears to be densely packed on the main streets has a porosity from within due to the presence of courtyards.



b. The character of commercial is basically retail shopping. This is enhanced by the display of goods along the facade, especially the handicraft and souvenir shops around the monuments. There is no significant guideline that controls the manner in which these shops are made. They spring up at any convenient location. While they add colour to the area, they need to be restricted and controlled to maintain the dignity of the monuments.



c. The Jaleb Chowk, once an impressive forecourt to the royal palace today represents a picture of neglect and left over space. Random growth of shrubs, broken railings, and buildings in need of repairs mark this chowk.

## II LANDUSE

The city of Jaipur is like any other traditional medieval city of India in its mixed use patterns. Commercial and residential areas are combined. The segregation is in section rather than in plan. A typical section of the street along Chauda Rasta, the Hawa Mahal Bazaar or the Johari bazaar has commercial on the ground floor facing the road and residences above. In fact, this is true of most of the primary roads of the old city of Jaipur. At ground level, thus, the entire stretch of roads appear to be commercial in use, though it is largely mixed use.

This kind of inhabitation pattern is then interspersed with important institutions. The hierarchy of the town emerges from a study of these institutions. In that sense, the central quarter becomes most important, housing the city palace, Jantar Mantar, Hawa Mahal and important temples like Govind Deo ka Mandir. These institutions are inwardly facing with none of their primary entrances falling on the main roads. This allows for a free moving traffic on the main roads. There are significant schools and colleges like the Sanskrit College and the Sangeet Mahavidyalaya also located within this sector. The Vidhan Sabha was also part of this block but has now been shifted out due to congestion.

The outer periferi of the central block presents a dense urban fabric while, within the block, it is very porous. This is primarily due to the large forecourts that were made in keeping with the nature of the institutions. The most important of these is the Jaleb Chowk. This was a forecourt for the palace and later the Vidhan Sabha. With the changed political system, the significance of the palace has reduced considerably. The building around the Jaleb Chowk was mostly occupied by government offices which have now moved with the shift in the Vidhan Sabha. At present much of this block is empty. It is partially occupied by police offices and some other government offices. There are two building in the middle of the chowk, one of which is a railway reservation office.

Another significant open space is the court of the police Headquarters which lies exactly between Jantar Mantar and Hawa Mahal. It is currently the State Police Headquarters. This occupation seems incongruent to the other institutions of the vicinity which were primarily related to the royal palace. Historically, it was a stable for the royal palace. Even today, it is incongruent to the rest of the area most of which comes under tourism related uses. The Chandni Chowk, to the south of the city palace is the other large Chowk. Current movement patterns through it have obscured its experience

d. typical section of main road with urban fabric



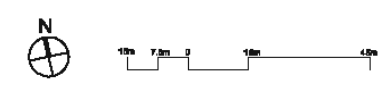
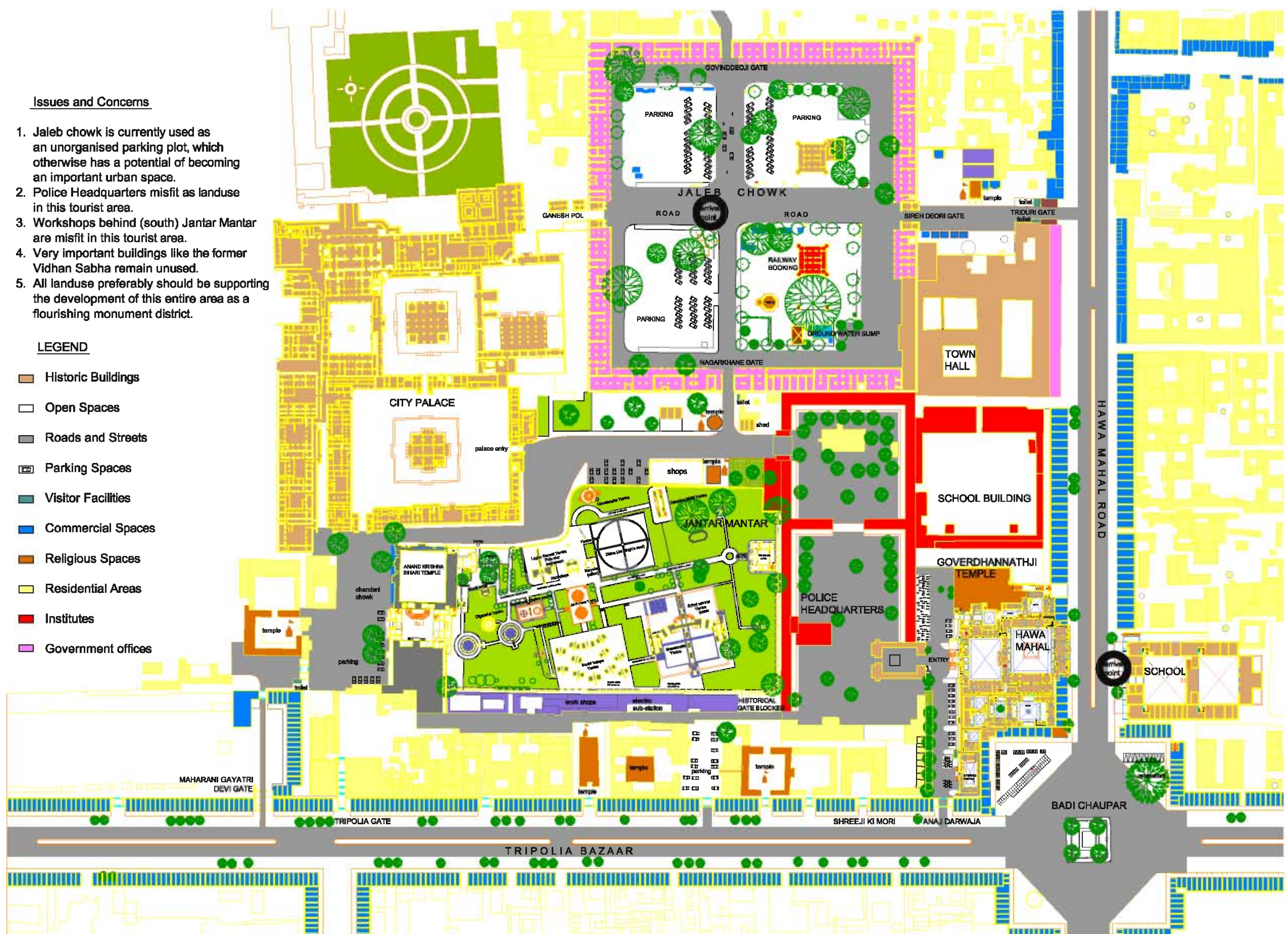


**Issues and Concerns**

1. Jaleb chowk is currently used as an unorganised parking plot, which otherwise has a potential of becoming an important urban space.
2. Police Headquarters misfit as landuse in this tourist area.
3. Workshops behind (south) Jantar Mantar are misfit in this tourist area.
4. Very important buildings like the former Vidhan Sabha remain unused.
5. All landuse preferably should be supporting the development of this entire area as a flourishing monument district.

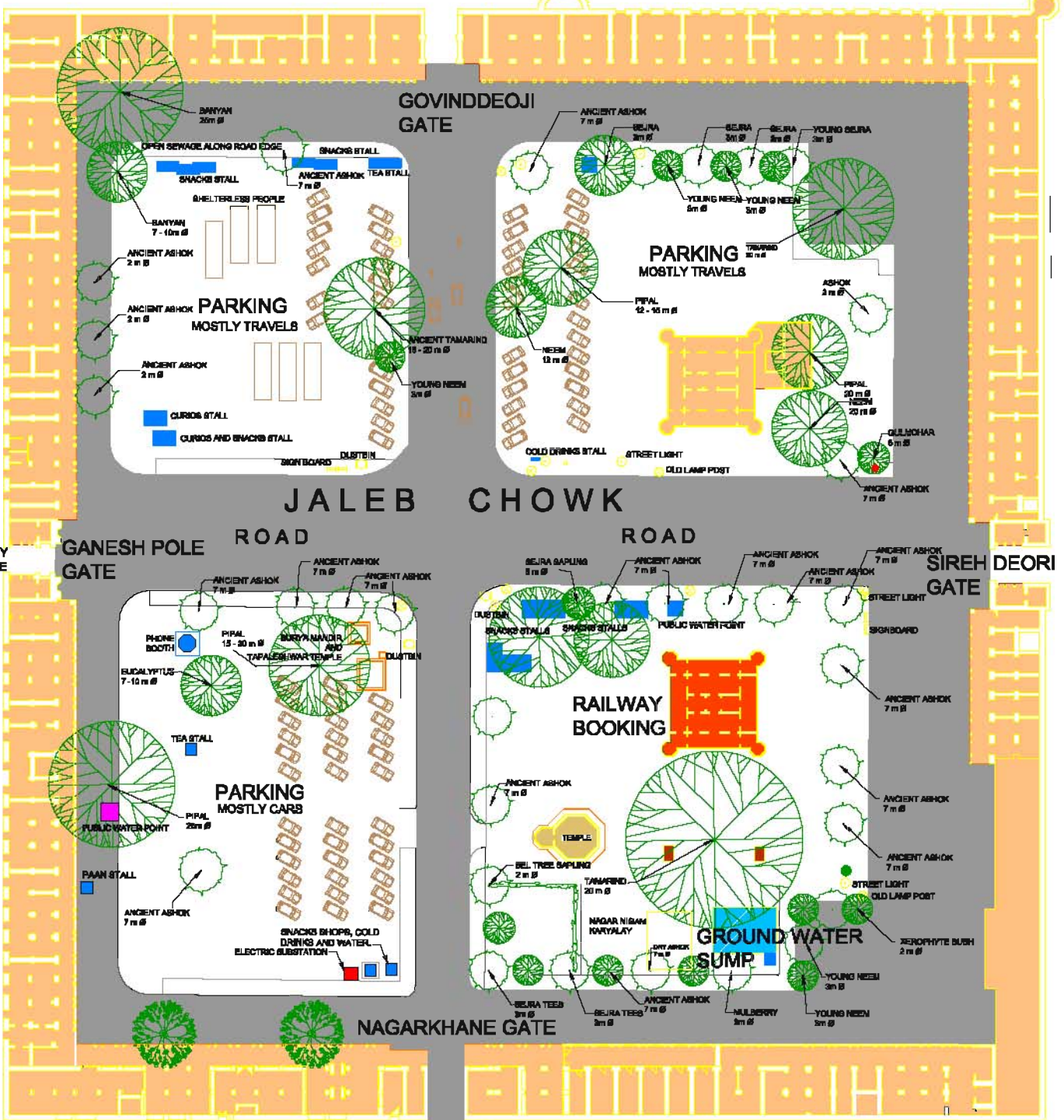
**LEGEND**

- Historic Buildings
- Open Spaces
- Roads and Streets
- Parking Spaces
- Visitor Facilities
- Commercial Spaces
- Religious Spaces
- Residential Areas
- Institutes
- Government offices





TO GOVINDDEOJI MANDIR

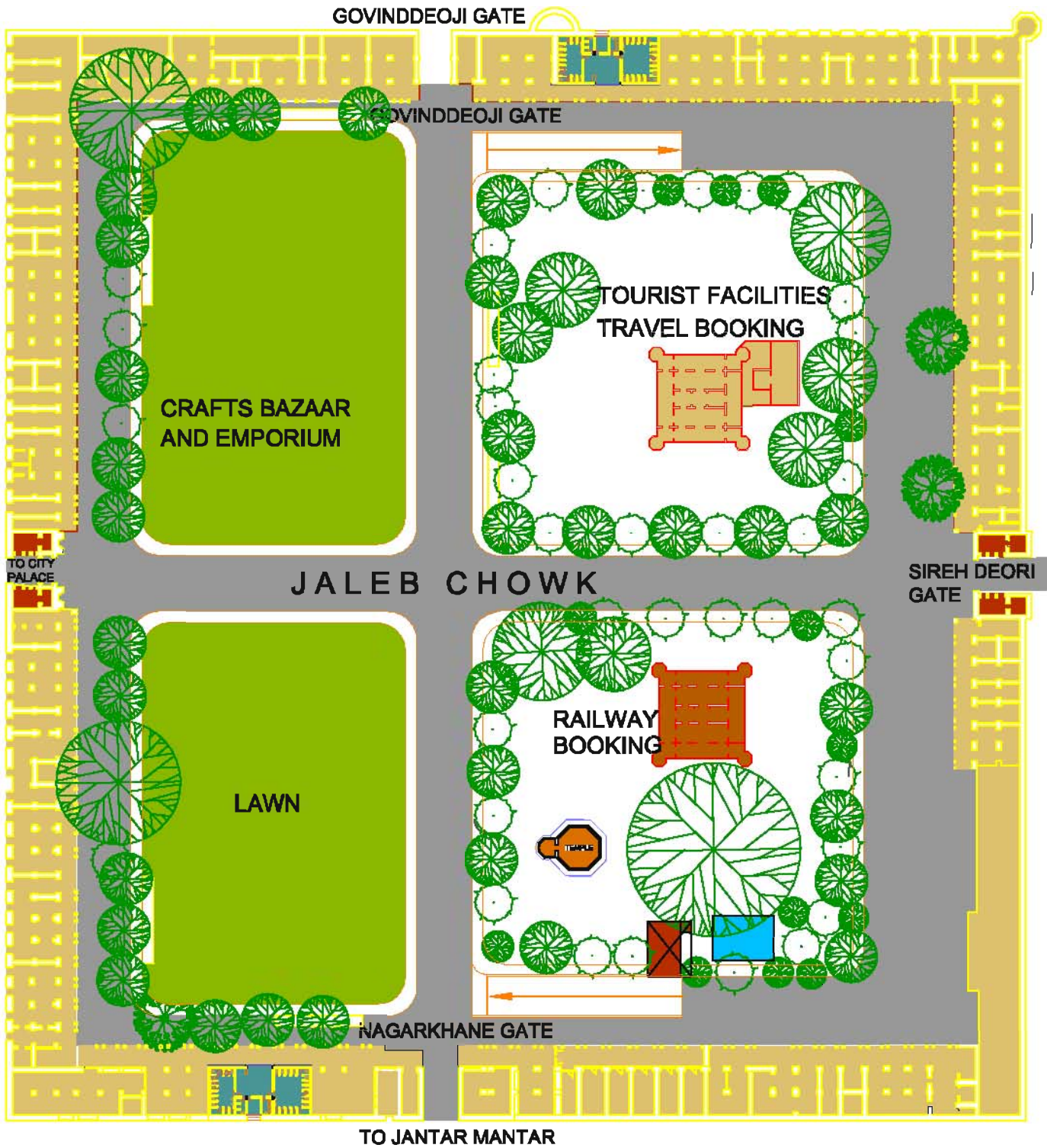


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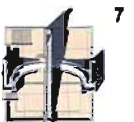




- PROPOSED TOILET FACILITIES
- PROPOSED CRAFT BAZAAR AND EMPORIUM
- RAILWAY BOOKING OFFICE



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a. The Police Headquarter building with its large courtyard lies between the Jantar Mantar and the Hawa Mahal. This used to be a stable for the palace. Its present function is not congruous to the character of the area. It can become the connection between the two monuments

Much of this sector lies unused and in a dilapidated condition. For example, in the area south of the Jantar Mantar, there is a small street abutting the Jantar Mantar. Some of the properties on this street are used for small scale industries. There is also an electrical substation. However, large chunks of residential havelis in this area are lying completely dilapidated and unused. Deteriorating devasthan properties abut both the Hawa Mahal and Jantar Mantar.

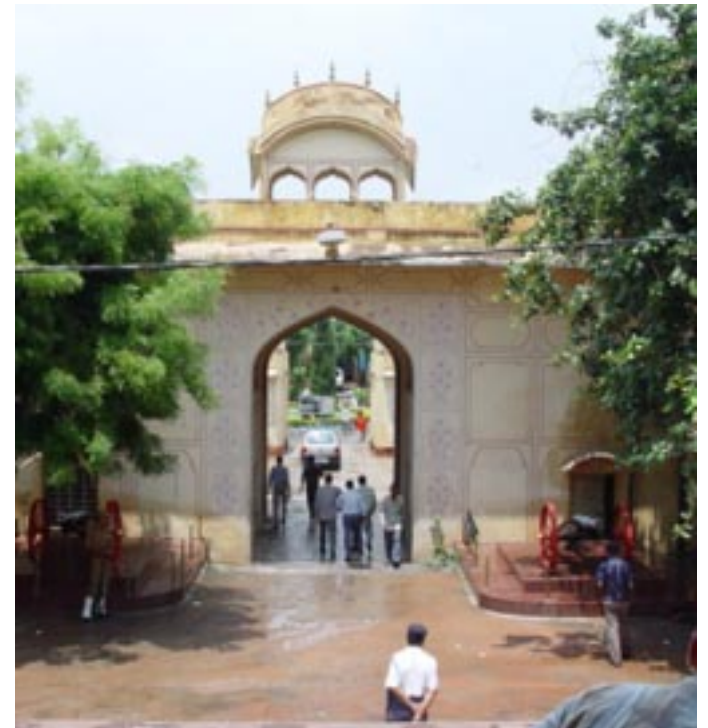
**Recommendations:**

From the landuse patterns it is obvious that the properties of the area come under different holdings from government to semi government, private and public trusts, private ownerships etc.. The problems of a holistic development is hindered by this but an overall masterplan with guidelines and suggestions can become a means of control. Its implementation can improve the ambience, infrastructure, and experience. Consistency of development can be attained.

Adaptive reuse of unused and dilapidated properties would increase the liveliness of the area. This reuse must be congruent to the general tourism related activities. The properties adjoining the Jantar Mantar and the Hawa Mahal which are lying unused and in a decaying condition should be brought into the precinct of these monuments and used for visitor facilitation and other related activities. It will increase the dwell time of these monuments without having to make significant additions that may not be congruent to conservation guidelines. Use of the properties will also arrest the decay and help in their upkeep and maintenance.

Private properties must be used, with adherence to conservation related guidelines and regulations. The use must be congruent to the surrounding. Using them for industry is not appropriate. Commercial use, in the nature of retail, cottage industry, crafts or other such activities for sustenance can be permitted. Small professional offices may be permitted. Any kind of change in the character of the built form must be reviewed critically and approval from appropriate authorities must be procured.

a. The Jaleb Chowk is like a backyard to all the monuments of the area, used for parking, by vendors, thoroughfare and other miscellaneous purposes. The central open space does not have any specific floorscape, most of it being earth and mud. This makes its cleaning difficult and always gives it a sense of being dirty.



b. The entrance to the police headquarter is right in front of the entrance to the Hawa Mahal. It makes a linear axis.

c. Random hoardings in terms of size, font, material, colour, exposed electrical lines, unorganised parking all contribute towards the chaos that one experiences in the area.





Proposals and recommendations for Jaleb Chowk



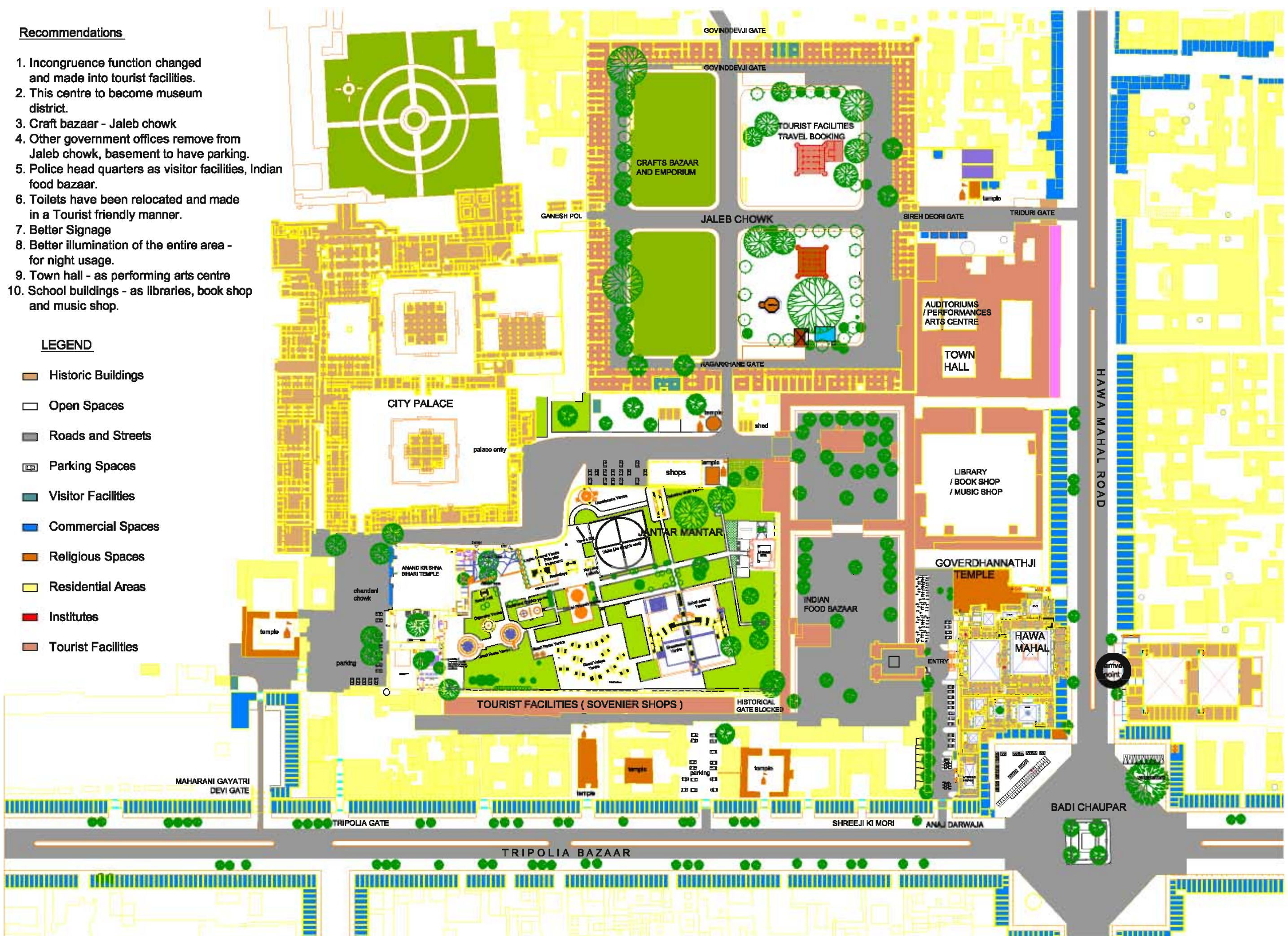


**Recommendations**

1. Incongruence function changed and made into tourist facilities.
2. This centre to become museum district.
3. Craft bazaar - Jaleb chowk
4. Other government offices remove from Jaleb chowk, basement to have parking.
5. Police head quarters as visitor facilities, Indian food bazaar.
6. Toilets have been relocated and made in a Tourist friendly manner.
7. Better Signage
8. Better illumination of the entire area - for night usage.
9. Town hall - as performing arts centre
10. School buildings - as libraries, book shop and music shop.

**LEGEND**

-  Historic Buildings
-  Open Spaces
-  Roads and Streets
-  Parking Spaces
-  Visitor Facilities
-  Commercial Spaces
-  Religious Spaces
-  Residential Areas
-  Institutes
-  Tourist Facilities





### III CIRCULATION AND PARKING

#### i. Circulation in the area

One of the critical issues that prevents a pleasurable experience of the monuments district is the movement. There are two ways in which the tourists primarily approach Jantar Mantar. The first brings them to Jaleb Chowk in front of the city palace. They move into the city palace, and after that cut across Jaleb Chowk on foot through Nagarkhana ki mori to the entrance of Jantar Mantar. They may also go by vehicle, though only if they have a smaller vehicle. Buses are parked in Jaleb Chowk. The other route is through the Maharani Gayatri Devi Gate, next to the Tripolia, across Chandni Chowk.

The Hawa Mahal is mostly experienced from viewing across the east facade on the Hawa Mahal road. This causes congestion at that point. Those tourists interested in going to the top have to go to the lane on the western side of the property. This road is also the entrance for the Police Headquarter. This causes problems to both the properties since both are functions with high traffic.

These routes are also actively used by local people either as thoroughfare or as a way to go to the Govind Deo Ka Mandir. The monuments are part of a dense urban fabric where most of the retail commerce of the city occurs. This adds to the traffic problems. The mixed traffic contributes to further confusion.

Many of the internal routes of the sector have been made later on, post change in the political system. Historic uses have changed and to accommodate those changed circumstances, new routes may have been laid out. However, with the proposed change in landuse patterns, some of the historic connections need to be reviewed.

#### Recommendations:

Strategic gateways that existed historically to be opened up to segregate tourist and local traffic to an extent.

Tourism related parking to be consolidated as shown in the plan and movement within the area to be pedestrian as far as possible. This would reduce the load on the roads and stop the mixed traffic movement in the area. Serious action against encroachment of the sidewalks must be taken. Some of it has already occurred, especially along the Johari Bazar and Tripolia Bazar. More must be done, especially along Chauda Rasta. This will give place for pedestrian movement.



a. The slow moving traffic of cycles and cycle rickshaws combined with tourists on foot disturbs the fast moving cars and buses. Random parking off the road reduces the effective carriageway of the road. The encroachment on the sidewalks by the shopkeepers disrupts pedestrian movement which then spills over onto the main road. Thus a total picture of chaos reigns.



b. The approach to Jantar Mantar is mostly occupied by randomly parked vehicles that prevent smooth movement of the traffic causing traffic jams. (The gate of the monument is marked by the circle)



c. The narrow stair leading to an opening in the first floor is packed with tourists wanting a view of the Hawa Mahal. This causes congestion on the footpath and road.



d. The Badi Chaupar today; the significance of this space as an important intersection of the main processional ways of the city is lost in this chaos and confusion. There are no systematic stops for public transport.





**ii. Movement between the two monuments**

The Hawa Mahal and Jantar Mantar, two most important monuments of the area are separated by only one building. However, to reach one from the other, one has to go through the entire circuitous route through Badi Chaupar or through Jaleb Chowk. This leads to a lot of criss crossing of the tourists from the various monuments in the vicinity.

**Recommendations**

Jantar Mantar, Hawa Mahal and the city palace and other monuments of the sector may be looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss cross movements and having a single parking. It is highly desirable that the route between the two monuments be pedestrian through the Police Headquarter building. That function may be relocated and the space be utilised to create an enhanced tourist experience through museum or centre for performing arts. A route at the terrace level connecting the two monuments can also be made.



a,b. A pedestrian pathway through workshops and dirt abutting the Jantar Mantar on the south side. It connects to the chandi chowk through the Anand Krishna Bihari temple.



d. Presently the terraces of the buildings are in disuse and are easily accessible. They can, thus, be easily brought into use.



c. The route through Nakkar Khane ki mori is the most used route in the area and also connects the two monuments as well as the city palace. Its ambience leaves a lot to be desired with open public toilets, electrical boxes, open service lines. Though the two monuments are within a stone's throw of each other, the route between them is arduous and full of traffic.



e, f. A route, at the terrace level connecting the monuments through terraces of the police headquarters can give a most exhilarating experience of the city from a top level.



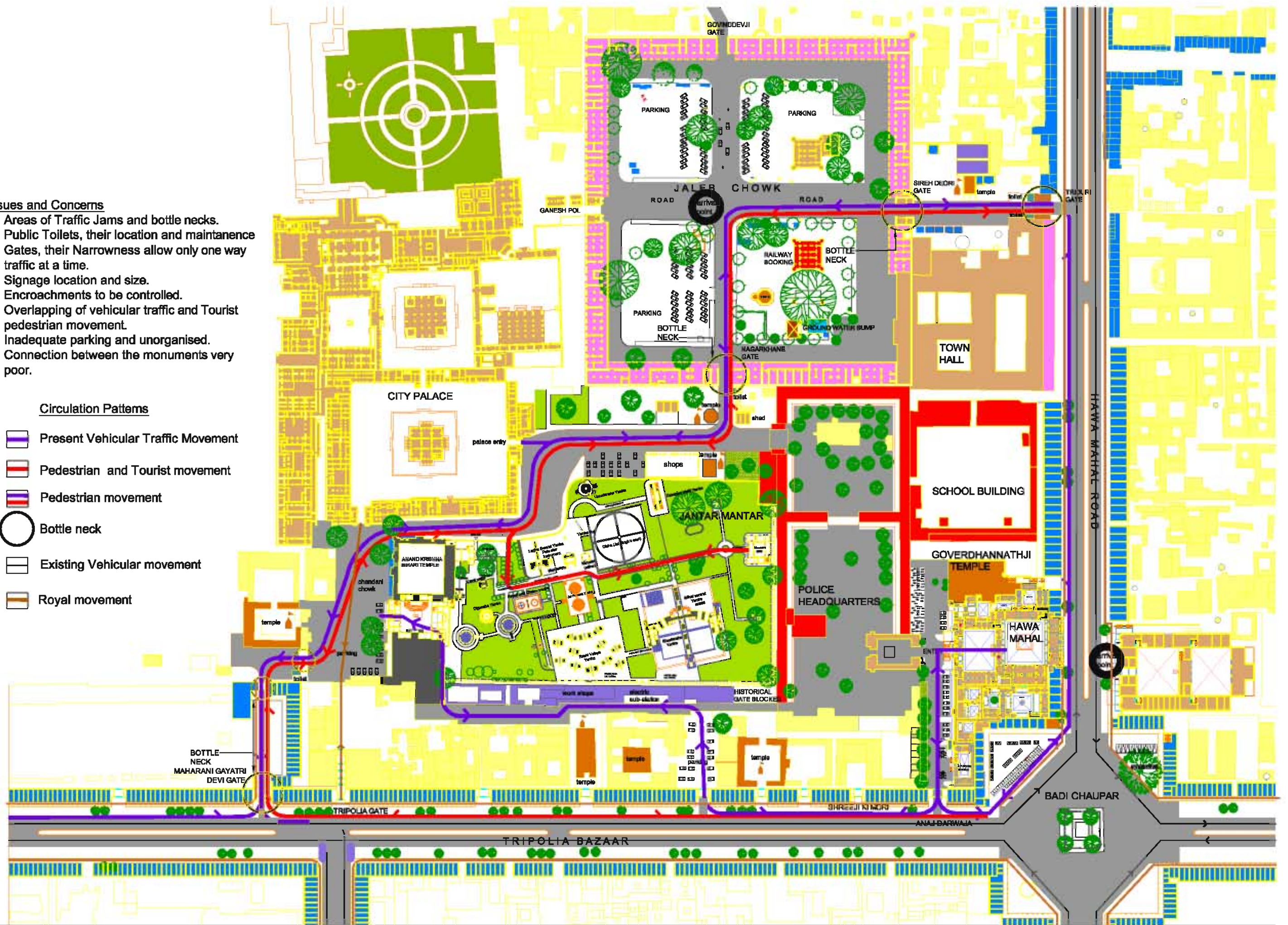


**Issues and Concerns**

1. Areas of Traffic Jams and bottle necks.
2. Public Toilets, their location and maintenance
3. Gates, their Narrowness allow only one way traffic at a time.
4. Signage location and size.
5. Encroachments to be controlled.
6. Overlapping of vehicular traffic and Tourist pedestrian movement.
7. Inadequate parking and unorganised.
8. Connection between the monuments very poor.

**Circulation Patterns**

-  Present Vehicular Traffic Movement
-  Pedestrian and Tourist movement
-  Pedestrian movement
-  Bottle neck
-  Existing Vehicular movement
-  Royal movement







a. Some systematic parking occurs along a section north of Jantar Mantar where the road broadens. The space may have, historically, been a palace court.



b. A tourist bus through the entrance gate of Jaleb Chowk. The scales of these spaces were not meant for this size of vehicles.



c. The clutter of vehicles in Jaleb Chowk destroy its significance as an important forecourt of the palace as well as an important public gathering space of the city. However, with the shifting of the government offices, this has reduced. Properly designed, underground parking in the chowk could be a solution.

d. The corner along Jantar Mantar is taken up by parking, both of visitors and local people who have come to the government offices. Some of the parking is also taken up by shopkeepers. On the other side of the road is parking of vendors. This reduces the effective width of the road.



e. Parking at the corner of Badi Chaupar has destroyed the scale and experience of the space from the buildings, especially at the ground level. Also seen are open urinals a menace throughout the area.



### iii. Parking

Change in urban activities through time cause the major problems in the historic core of a city. Though Jaipur is a comparatively young city, with much of the urban situation envisaged by its planners, a complete change of the political system has resulted in the dramatic change in the manner of moving through the city. What was earlier at the liberty of a select few, is now the focus of the masses.

Though the roads of the city are wide, the mixed use and heavy traffic cause congestion. The monuments, were historically, part of the royal complex and did not get so many visitors. Today, their popularity and lack of proper provision for parking has caused a tremendous problems. Much of the tourist parking happens in the Jaleb Chowk, where open space is available. However, this reduces the significance of the historic space to a mere parking lot. Haphazard parking and large tourist vehicles like buses, for which the inner lanes are not designed cause congestion. Add to this the many cyclerickshaws that wait to collect passengers from the monuments.

This area is also the most important commercial area of the city. Most of the retail shopping of the city happens here. There is a large movement of people and materials. This requires parking for large numbers, both for shopkeepers and shoppers. It also requires service area for loading and unloading, Public transport vehicles ply the route regularly and they require proper stops.

This is one of the most important public space in the history of Indian urban design. Its salient features have been the well thought out planning and organisation. The roads are fairly wide and adequate sidewalk space has been given for a smooth pedestrian movement. This space has been encroached upon by the shopkeepers making shopping more of a hassle than a pleasurable activity. Contemporary disregard for a sense of the civic has caused the loss of place. Adequate and timely measures not taken has lead to grossly inadequate facilities.

#### Recommendations:

Visitor parking should be restricted to one or two areas and most of the movement between monuments should be pedestrian. This will reduce short duration parking and therefore cut down the load on the roads.

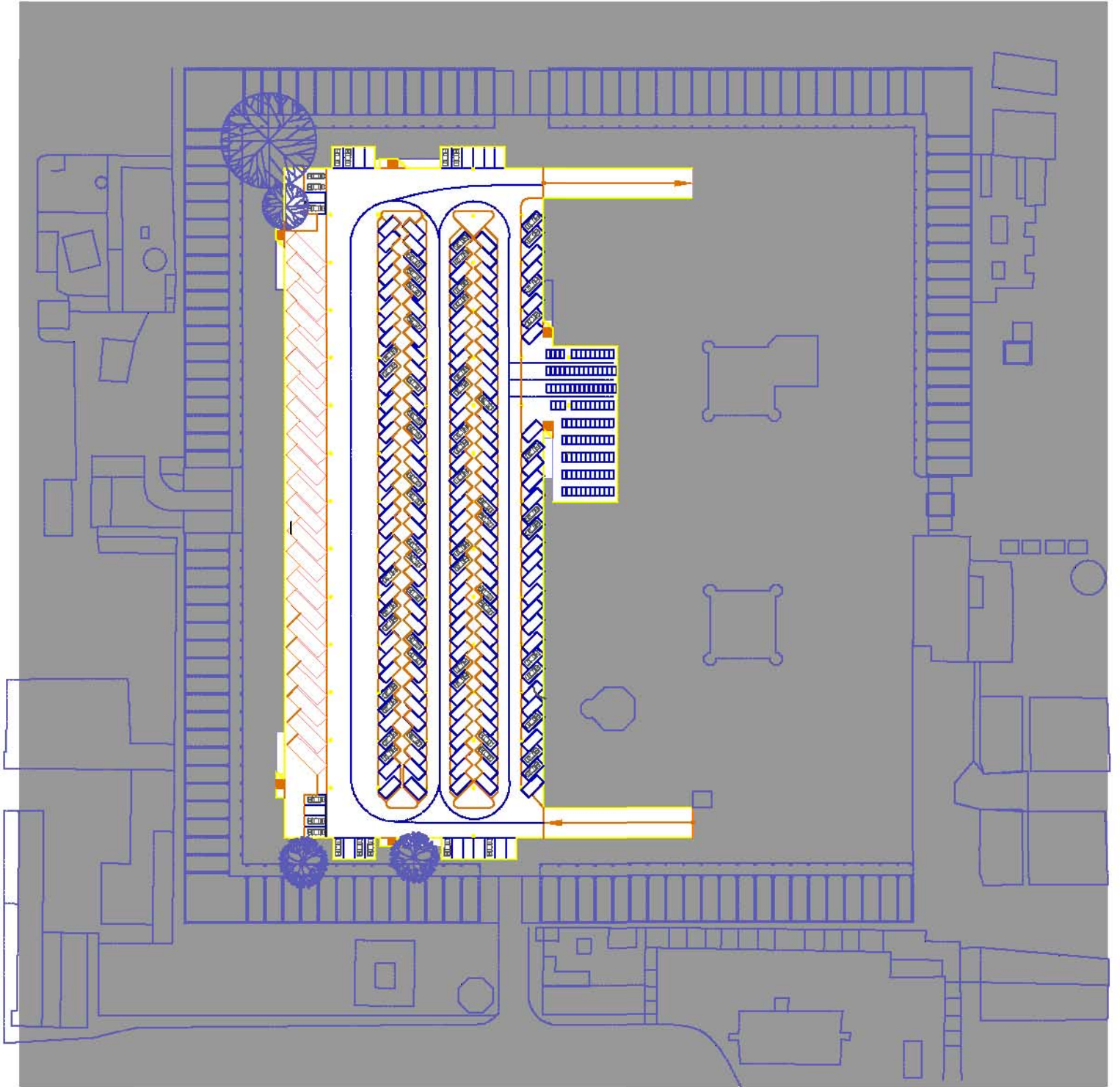
This parking needs to be sensitive to the area and therefore cannot be haphazard or too conspicuous. At the same time, it needs to accommodate all kinds of vehicles and large numbers. Jaleb Chowk seems to be the only large available piece of land in the area and therefore allows the possibility of parking. If made underground, it will not disturb the character of the chowk. In fact, the random parking that happens there could be taken care of, bringing back some historic ambience to the chowk.

The parking block proposed by JDA would be used by the local people.

Adequate and appropriate locations for public transport stops must be made. These stops cannot be encroached upon.







**PROPOSED PARKING PLAN FOR JALEB CHOWK**

**TOTAL NO.S OF VEHICLES IN BASEMENT PARKING**

**BUSES - 22 NO.S**

**CARS - 225 NO.S**

**TWO WHEELERS - 115 NO.S**

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scale - 1 : 1500

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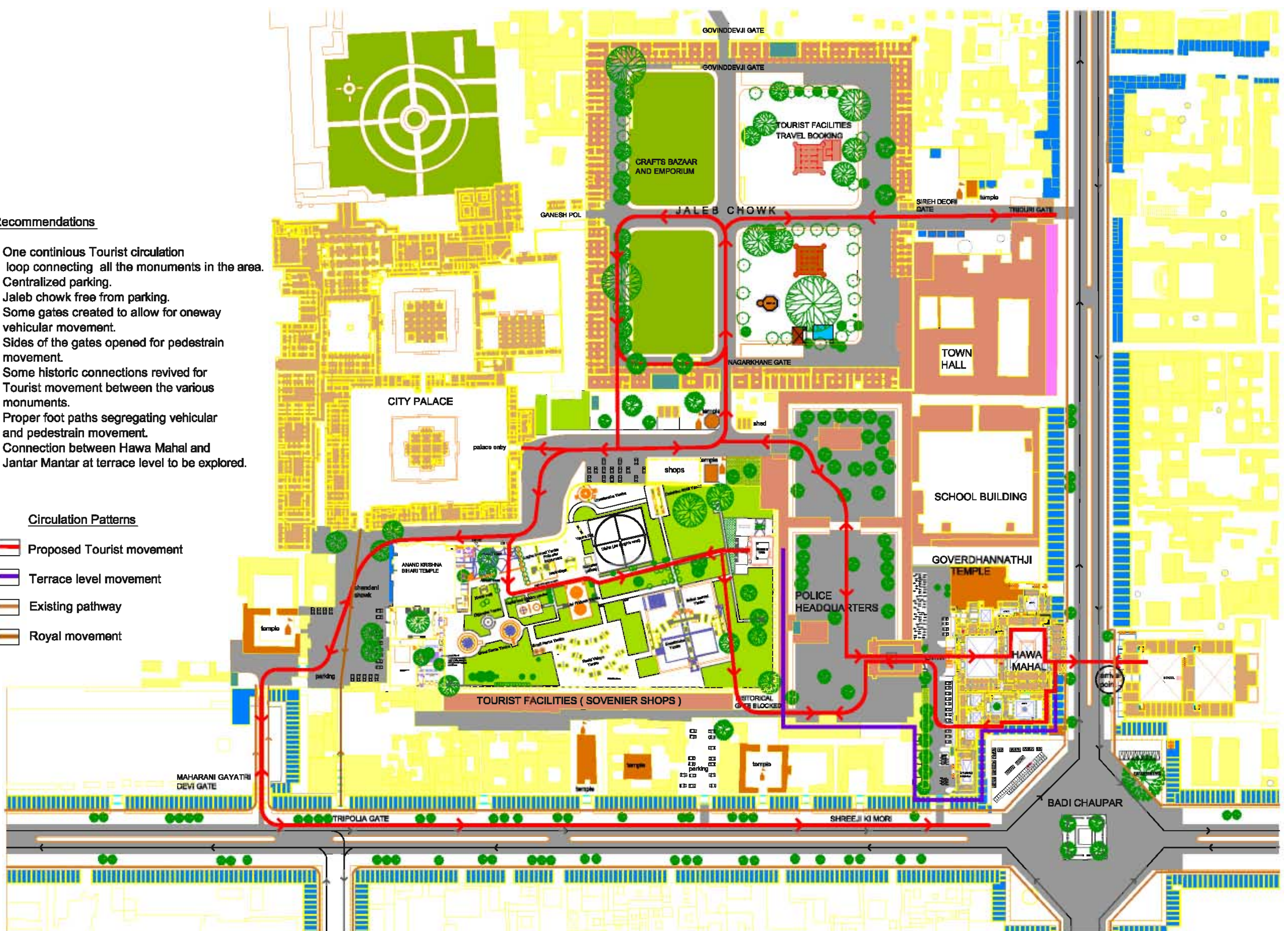


**Recommendations**

1. One continuous Tourist circulation loop connecting all the monuments in the area.
2. Centralized parking.
3. Jaleb chowk free from parking.
4. Some gates created to allow for oneway vehicular movement.
5. Sides of the gates opened for pedestrain movement.
6. Some historic connections revived for Tourist movement between the various monuments.
7. Proper foot paths segregating vehicular and pedestrain movement.
8. Connection between Hawa Mahal and Jantar Mantar at terrace level to be explored.

**Circulation Patterns**

-  Proposed Tourist movement
-  Terrace level movement
-  Existing pathway
-  Royal movement



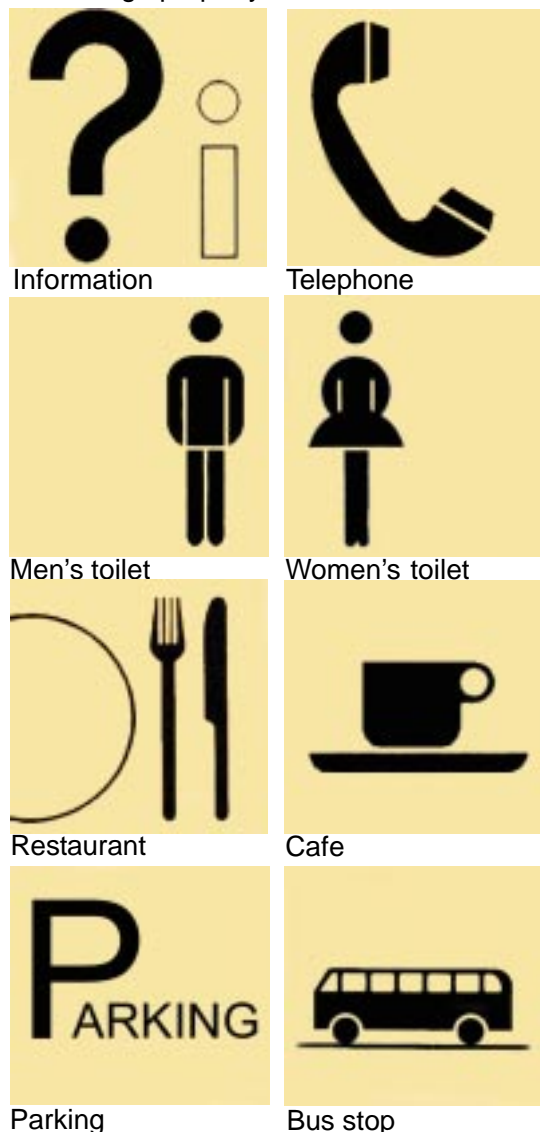




a. dense urban fabric with commercial street front.



b. The signage on a historic monument requires sensitivity. Here one can see all kinds of signs, various sizes, colours and graphics. This disturbs the view of the heritage property and reduces value of its facade.



Parking

Bus stop

#### IV ENVIRONMENTAL DEVELOPMENT

The core of all the issues regarding the monuments of the central district and their experience is the environment and context within which they lie. Here, they are surrounded by a dense urban fabric consisting of a typology of courtyard house, with commercial street front. The elements of this street front are the arcades, the terraces of the arcades and the facades of the buildings. The carriageway, the central median, the street lights, railings etc. all contribute towards the making of this environment.

Put into broad categories, the environment is determined by signage, public amenities, street furniture and floorscape.

##### i. Signage:

The signage of the city can at best be described as haphazard and random. There is a deterioration in the visual and experiential qualities of the urban environment. The clutter of large hoardings and signs reduces the vistas and open feeling of streets and roads. Though they provide the authorities with a revenue, alternative revenue methods must be looked into. And at the level of private enterprise like shops, it can easily be brought under control with some vigilance. In the historic urban design, the arcade has an inbuilt system of advertising for the shop. A horizontal band has been created at the beam level for all the shops. There is thus a consistency of shape and size. The colours, size of writing etc. is then left to individuals. Thus, within the control, there is a degree of freedom. However, over time, this band has been overridden with a multitude of signs, each one trying to outdo the next. The result is a chaotic scenario, disturbing the experience of the built form.

Another set of signs is the information signs. These are sadly lacking. There are hardly any signs that give information regarding the way to reach any particular monument. Even the basic road signs are missing. Thus the tourist can be very confused unless guided by people.

##### Recommendations:

- The fundamental significance of any good signage system is to eventually reduce the time and effort required to reach any particular point. So, whether it is shops declaring their goods, names or whether it is the signs for directions, they all contribute towards the making of a pleasant experience. Good signage also reduces the noise levels generated, since there is no need for person to person interaction. The flip side of this could be reduced social interaction. However, in a place frequented by so many people for the explicit purpose of tourism and shopping, a good signage system must be in place.
- All shops on the main road must respect the historic space assigned to them for signage. This space can become a basis for the overall signage system for the area.
- There should be not signs covering important features of the urbanscape like arcades, gates, railings, monuments. No signs should be allowed to be painted on historic surfaces. No large hoardings must be allowed, especially on important vistas and monuments. No signs must obstruct the movement paths or critical views.
- Information signs regarding the roads leading to the monuments and other important information related signs must be placed such that they are easily readable.
  - They must be bilingual.
  - They must stand out, apart from their surrounding. Yet, they cannot be loud or gaudy.
  - They must clearly indicate direction.
  - They must be made of durable material to withstand natural and manmade wear and tear.
  - They must have readable graphics, fonts, size, colour etc.
- Maps of the area must be mounted and placed at strategic points in the city like in Chandni Chowk, Jaleb Chowk and Badi Chaupar. There must be enough space around the map for a number of tourists to gather. It must have a reasonable height, clarity of fonts and indication of important monuments, roads, bazaars, etc..

b.A series of signs that are in accordance with international norms has to be decided upon and its consistent use throughout the monument district is recommended.







Tickets should be like souvenirs. They should include not only date, time, name of monument etc, but some pictures, some information. They can also be designed as bookmarks which can remain with the visitor.

## ii. Public Amenities

Toilets, drinking water places, communication booths, information kiosks all form a part of the basic public amenities which are over and above the tourist facilitation centres. These amenities are available to every person, irrespective of whether they are tourists or not. In an urban centre these are important. In particular, in a place like the city centre, they become critical due to the large numbers that move through the area. Provision of adequate facilities will help tourists and shoppers, both, thus resulting in increased revenues. Unlike contemporary towns, historic city centres have to deal with these very carefully. The amenities need to be placed discreetly and yet with adequate directions and ease of access so that they are utilised properly.

Toilets are the most important of all public amenities in urban public spaces like the monument district. Due to the high number of people moving through the area, they become a necessity that must be provided with. Adequate toilets keep the streets clean and contribute towards an overall ambience of the space, thus making the city centre more attractive and a pleasant experience. They also increase the dwell time of people since they would not be worried about being caught short. This would have major beneficial social and economic spin-offs. More often than not, one of the first experience that a tourist has in a foreign nation is toilets. Thus the image of a place gets made in that first instance. Clean toilets would contribute to a better representation of the place, people and culture.

### Recommendations

- While it is important that public toilets be easily visible and accessible, in a sensitive urban area like the monument district, which has specific needs of ambience and character, the location of public toilets must be done sensitively. They cannot be open toilets on major thoroughfares but must be discreetly placed. Adequate signage must be provided. However, care should be taken that they do not become like alleyways since that would give rise to crime and negligence.
- One important aspect to note, is that the number of women in public places has greatly increased, whether local or tourists. Therefore, while planning public toilets, there must be adequate provisions made for women.
- Adequate facilities for baby-changing, hooks for hanging purses must be provided.
- All toilets must be adequately lit and ventilated.
- The toilets must be supervised and checked regularly to maintain the highest levels of hygiene and cleanliness.
- It is now being recognised that the hygiene levels in an Indian style w.c. is higher than a western w.c. especially, in case of a women's toilet. Both must be provided.
- Using the right kind of brassware that would prevent leakage should be used.
- Finishes should be such that they can be easily cleaned to prevent accumulation of dirt.
- The toilet design should not be extraordinary so as to attract attention. It should merge with its background or be as neutral as possible.
- The piping and drainage system should be such that repairs are possible easily. The system should be designed to work smoothly, thus preventing accumulation of the waste. This will prevent the toilets from smelling, something generally associated with public toilets. Adequate direct sunlight into the toilets would also help.



In India, public water places have to be reasonably large in size. The climate, especially in Rajasthan demands regular water intake. They are generally of two kinds: the government ones like on railway stations and private charitable enterprises. Now, with bottled water becoming a preference, these places may not be placed very frequently.

**Recommendations:**

The foremost criteria for a drinking water place is the cleanliness of the water. Secondly, adequate drainage facilities must be provided so the area around is not muddy and wet. Drinking water should generally not be combined with toilets, since there is a psychological block against it. It may be placed nearby.

Communication kiosks, information kiosks are the other amenities that people today require on a regular basis. Most of the STD, PCO booths are totally covered by the yellow and black signs, removing any sense of the built form from their experience. More often than not, these signs are placed on the monuments. This cannot be allowed.

**Recommendations:**

The booths may be located at strategic points, where the movement of people is more. This would depend on availability of space. They cannot become like vendors, encroaching on monuments and historic fabric. Some signs, consistent with the rest of the city may be used for advertising. They can be all inclusive, thus giving facilities of photocopying, telephone and internet, all in one space. This would depend on the individual owners. Some of the booths may be owned by the authorities and leased out. They can become potential generators of revenue. In the central district this would be advisable since that would allow better control in terms of their visual qualities. The information and communication kiosks can be combined.

**iii Street furniture**

Railings, lampposts, benches, dustbins etc. would all constitute street furniture. Since the overall proposal is suggesting increased pedestrian movement in the area, the experience is going to be slower and registration time of these elements of the street become critical. As of now, there is no consistency in the design of the street furniture. There are hardly any benches or seats in the public areas. Very few dustbins are located. Most of the corners become garbage dumps. Railings are different in different parts of the area. In Jaleb Chowk they have horizontal bars while in the Jantar Mantar there are more vertical elements. Their height and colour differs. Within Jaleb Chowk there are variations since they would have been placed at different times.

**Recommendations:**

A consistent design for the entire area must be finalised and implemented. There may be variations like designs within the monument may be different from that outside on the roads and streets. However, there should not be more than one or two variations. The designs should be simple and not compete with the monuments for attention. These are utilities and should be dealt with as such. Issues like regular maintenance should be addressed. Since they will undergo heavy public usage, they should be strong, not require much maintenance, not have complicated details, should be able to withstand vandalism.



c. The railings within a space are of two different designs. They are broken and falling apart. They are used as clothes line. Beddings of the street people get stored over them. No dustbins make most of the place look like a large bin. Pushcarts are parked randomly. They are of poor quality.





#### **iv. Floorscape**

Floorscape would include all kinds of paving, roads, sidewalks, landscaping. The roads would remain bitumen roads. They would have to be repaired wherever necessary. There is no change in the current road network, except in some parts of Jaleb Chowk. It is the sidewalks, and other open areas that need attention. The sidewalks are broken and are not sufficient in parts. Since the overall proposal aims at increasing pedestrian movement in the area, this aspect needs careful detailing. Landscaping also becomes important, especially in the areas like Jaleb Chowk which at the moment are just left as earth.

#### **Recommendations:**

The sidewalks would be of two kinds. One would be the narrower kind meant primarily for movement. The other would be wide enough to accommodate other activities like resting and seating, plantation etc. However, these wide sidewalks generally get taken over by encroachments and vendors. A strict vigilance policy must be in place before they are implemented. Their location must also be marked. Nearer entrances to monuments, wider walkways will facilitate gathering of groups, drop off and pickup of tourists.

Plantation, the kinds of species, their location must be carefully evaluated. They should not obstruct any of the important views or traffic. At the same time, they should have the potential to provide shade.

#### **LANDMARK MONUMENTS**

The Jantar Mantar and Hawa Mahal lie in the heart of the royal palace complex in the central sector of Jaipur. While the palaces get significant visitors, the Jantar Mantar is a landmark monument that inspires by its very mystery and austerity. It is one of the five observatories of Jai Singh and is greatly significant in its position in astronomy. It is one of the best known observatories amongst those in India. The Hawa Mahal on the other hand, is the signature of Jaipur. It is one of the most eccentric constructions and yet, its imposing facade has become synonymous to the entire typology of Jaipur architecture.

#### **Recommendations:**

Any efforts towards the development of Jantar Mantar and Hawa Mahal into a world class monuments will have to take a serious look into the infrastructure on the site. Services like lighting, signage, maintenance, water supply all play an important role in the ambience that the monument offers. The nature of the monuments is such that they can be enjoyed from a distance. Simultaneously, the places must increase the dwell time of the tourists. Providing public amenities as well as visitor facilitation centres is important. The development of an astronomy society in Jantar Mantar and a coin museum in the Hawa Mahal can help to that end. Along with tourism, educational purposes can also be served the entire aspects of this is detailed in part B.



## II. GUIDELINES

### INTEGRATED CONSERVATION

Any historic area or core has to be handled sensitively and carefully since there are many complexities involved in it that would be different from dealing with an individual monument. There are issues of ownerships, authorities, implementing agencies as well as public sympathy and/or apathy. There are shared memories and significance in the socio-political and cultural milieu. Important to this is also the economics of the area and the market development. These are issues that cannot be ignored in today's time and context. Any development proposal that looks into the monuments and their conservation irrespective of the above will not have longevity.

The monument district of Jaipur is no different. The ownerships are as varied as public land, government properties, temple precincts, individual ownerships of small holdings, to the royal enclave owned by the royal family that still resides there.

#### Recommendations:

Any large task can be handled if distributed over a series of smaller tasks. Conserving historic town centres can be dealt with using the same concept. The conservation work can be divided into various scales starting with the development of the walled city to the monument district down to the smallest yantra.

The categories can be

- i. Urban elements like gateways, walls
- ii. The squares are an important element of this district and should be dealt with comprehensively
- iii. The royal enclave - the city palace which is held by the royal family
- iv. Monuments like the Jantar Mantar and the Hawa Mahal
- v. Institutions like the temples, large havelis, schools and colleges
- vi. Smaller buildings that comprise the fabric and have historic value

The district should be treated as a zone, coming under a harmonious planning strategy that considers the landuses, traffic and infrastructure requirements.



a. The squares form an important part of the monument district and need comprehensive attention starting from the Badi Chaupar



b. A distinct hierarchy is also observed in the gateways of the city, like this gate is the entrance to a temple opening onto Chandni Chowk, an important square.

c. An overview of the city of Jaipur showing it nestled amidst the Aravallis. The central core in the foreground is less dense with large open spaces while the rest of the city is densely packed. The central core thus becomes a breather for the entire city.

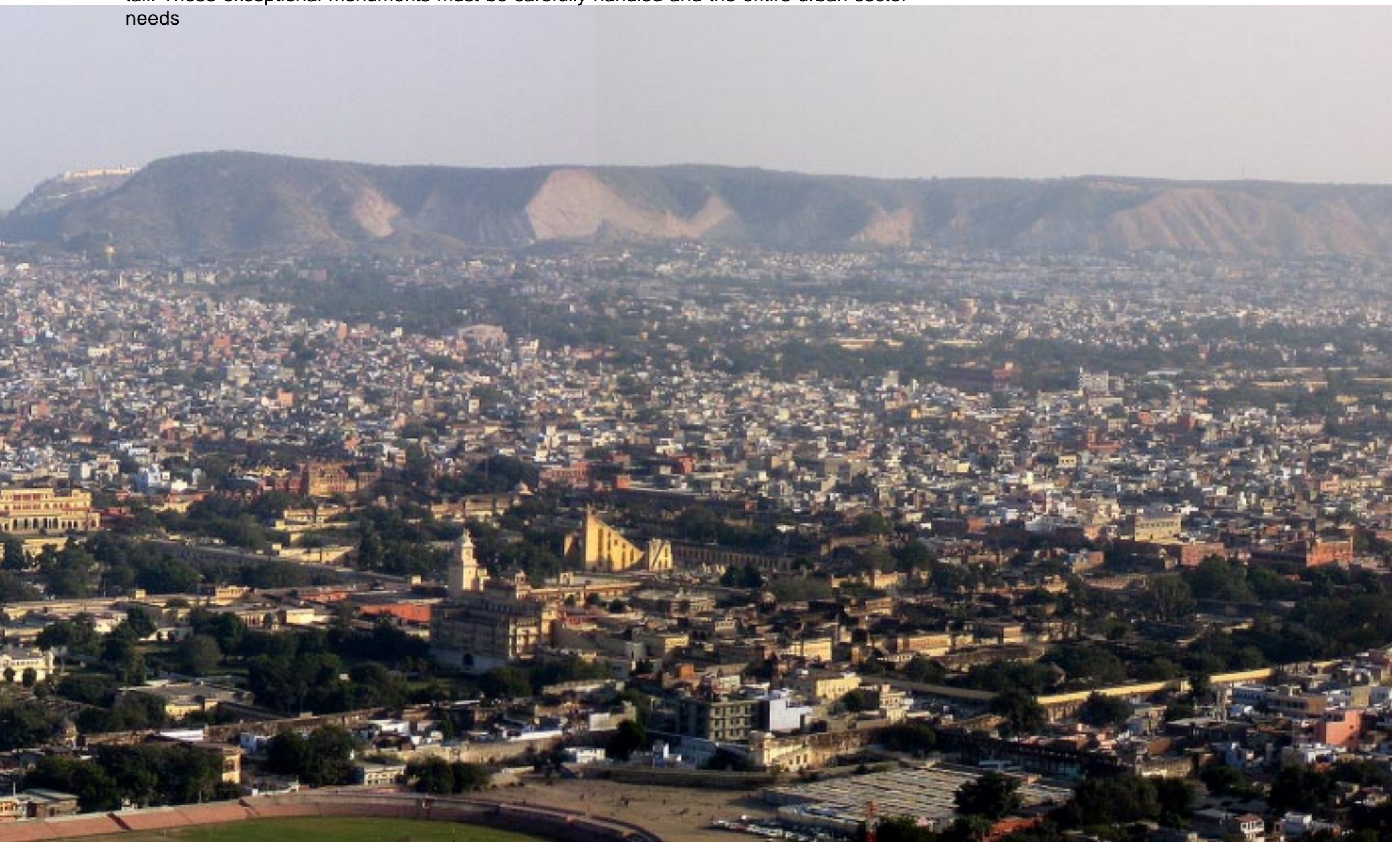




a. Simple actions like proper concealed infrastructure, proper signage can change the ambience of the city.



b. The entire monument district is seen in the foreground with the Samrat Yantra standing tall. These exceptional monuments must be carefully handled and the entire urban sector needs





The integrated urban and heritage development of towns like Jaipur which have a particularly high historical and cultural value requires a major effort to sustain them for the future. At present the historic core is getting disintegrated. The physical, social and economic infrastructure is unable to cope with the rapid change. As one looks at the monuments in the central area, there seems to be an inadequacy in the manner in which they are interrelated at the moment. Historic research and some existing gateways suggest that these have been connected and there is a strong need felt that they should be so once again. They are to be part of a wholistic experience. The guidelines for future developments consider conserving the historic edges and connections. They balance the developmental aspects and conservation requirements.

- For this monument district development, integral urban development and heritage conservation plans should be devised and agreed by all planning teams, such as Nagar Nigam, Town Planning Department, Traffic Administration, Police Department, Legal Department, Economic Planners etc. Coming to a common ground of understanding is most crucial.
- Development plan must be separately made for this historic area and land records updated for the legal and illegal land, open space, road, islands, chaupars, foot paths' occupancy etc. and integrated with the over all plan
- Infrastructure such as electric, tele communications (T.V., Phones, Computers), sewerage and water supply to be planned and / or replaced if required. As far as possible wires to be under ground.
- Fortunately, the road widths have been well envisaged and will not need modification for a while. Road management is what is required. Presently, half the road width is used for parking, moveable shops and garbage. Only half is available for vehicular movement.
- Garbage picking to be streamlined, recycling system to be installed. Plastics to be avoided.
- In this district, as shown on the plan, the historic city form must be preserved with historic open spaces, road widths, FSI and building form.
- To stop increasing the densities in the core areas. Extra density burdens infrastructure. Transferable FSI may be permissible in case of acquiring land for public facilities.
- Skyline is very important aspect of this area; all effort must be made to preserve it.
- Colour for buildings and monuments must be standardized.

This series of pictures and photomontages illustrates how the area can be cleared of the disturbing elements to regain its historic ambience as well as basic cleanliness





- This special urban area's house form is unique. It should be made sustainable by developing it as designer shops, night markets, pedestrian markets and evening food courts.
- Historic house form to be structurally strengthened. It should be reverted back to historic character for doors, windows, openings, courts, open spaces, entries, exits etc.
- Permissions will be required before any changes are allowed in the house form. An old photo will be required to be submitted for permission to repair. Detailed byelaws for the walled city maybe prepared.
- Special lighting to be designed and installed.
- Special planning to be done for visiting tourists.
- Three bay historic gates such as Tripolia, can be adapted to certain changes that will allow separate pedestrian way. At some other places one-way traffic is suggested for smooth movement.
- All the public toilets to be run by Sulabh or equivalent institutions, trusts etc. and their location to be away from gates. Under ground parking is suggested in Jaleb chowk. A garden can be developed here.
- Avoid taking large-scale loans with high interest rates for such public works. It can be dovetailed into standard daily routine work. Except major infrastructure works.
- Land for institutions to be identified and acquired.
- Lakes, water bodies and their catchments to be left open.
- Permissions should be required for any land cut or fill.
- City administration should be streamlined, transparent and people friendly.
- Simplifying procedures to avoid waste of energy and time. Avoid waste of time and energy between planning and implementation for infrastructure. Accountability should be a precondition to any project.
- Encroachments must be removed and cleared. This will reduce the density of the fabric to a manageable level.

**THE PROCESS SHOULD INVOLVE THE FOLLOWING:**

- Community participation in urban design development.
- Recommend procedures for control and administration of urban projects.
- Guideline for housing, low cost housing and squatters to be site specific.
- Conservation of natural and built amenities, landmarks, historical structures, or recreational places, and reduction of pollution potentials.
- Use of strong edges, landmarks and nodes, architectural elements, building massing, *chowks* to advance urban identification.



Side of the Maharani gayatri Devi gate after opening and making it accessible for pedestrain movement



Gate after removing toilets, hoardings and electric boxes





**RAJASTHAN STATE MUSEUMS MANAGEMENT AND DEVELOPMENT SOCIETY, JAIPUR**

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A photograph of a spiral staircase in a yellow stone building with arched windows. The staircase is made of light-colored stone and curves around a central shaft. The building's walls are made of yellowish-brown stone with several arched openings. The scene is brightly lit, suggesting a sunny day.

**CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX  
FINAL REPORT - PART B**

**RAJASTHAN STATE MUSEUMS MANAGEMENT AND DEVELOPMENT SOCIETY, JAIPUR**

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**Minister of state for Tourism & Archaeology and Museums  
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**3 CONSERVATION INITIATIVE**





## PREFACE

The Jantar Mantar is one of the most iconic images of the architectural heritage of India. It represents the zenith of developments in planning, architecture as well as science of the time. Over the years, however, this monument has been relegated to the realm of merely a visual treat, its relevance in astronomy lost. This report is an endeavour to enhance its architectural qualities, but simultaneously, make it available on a larger platform to people who are interested in its working.

Intensive mapping of the area in terms of movement patterns, historic landuses, present conditions and uses helps in understanding the position of the landmark in today's context. Though elementary drawings of the area existed, a detailed and exhaustive documentation was carried out as part of this report. This study shows that the planning principles adopted more than 275 years ago took into account most of the urban processes and continue to cater to them even today. It is only the over population that is putting pressure on an otherwise beautifully designed city centre. Lack of respect and negligence from all concerned has resulted in a congested and confused situation.

Tourism in India is just beginning to acknowledge the significance of a proper management of heritage monuments for their longevity and maintenance. This report, along with issues of conservation, takes cognizance of the fact that this is a very well visited site in the country. Therefore, all efforts towards conservation have to be inclusive and holistic. They have to take a broad perspective to include development of infrastructure and facilities. Simultaneously, to maintain the character and quality of the monument, all proposals follow a policy of minimum intervention. It must be kept in mind that any of the proposals envisaged in this report would have to be understood in conjunction with the provisions of law.

A master plan for the overall urban area, now being called monument district, has also been prepared with recommendations for some of the pressing issues like parking, appropriate use of spaces, tourist facilities, vehicular and pedestrian traffic. This is covered in part A of the report. A holistic approach where all owners work under a single umbrella is proposed for the overall ambience of the area.

Part B (Documentation - drawings, photographs) of the report deals with the Jantar Mantar Complex where the architectural study of the present status of the building is carried out. This is done with historic studies as background. Significance of the monuments, their strengths and weaknesses, tourism augmentation of the complex with development proposals, maintenance guidelines etc. have been considered while making the proposals.

Part C of the report deals with architectural conservation of the monument. A detailed condition and damage assessment is carried out. Recommendations to arrest the deterioration are proposed. Detailed Bills of quantities (B.O.Q) for the same is also provided.

The intentions of all the proposals and recommendations of these reports are to make the visit to this place meaningful and also pleasant. Preparing this report has been an insightful as well as difficult process. This enigmatic monument maintains its mystery while allowing certain understanding.





## EXECUTIVE SUMMARY

Jantar Mantar sits in the heart of the city and is part of a large group of monuments that include the City Palace and Hawa Mahal. Its conservation, development and the overall master plan of the area is based on field studies of movement patterns, circulation, facilities and land uses, architectural documentation and analysis. The key issues are presented in the three reports, with a broad summary given below.

### PART A

1. Both, the Jantar Mantar and Hawa Mahal can be seen as a single total experience along with all the other historic monuments in the area. They are looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss crossing movements and having a single parking. The existing Police Headquarters and the Jaleb Chowk are proposed as a link, their occupants are recommended to be relocated. Alternative functions, suitable to converting the area into a monument district with tourist facilities have been allocated.

2. The report provides an overall master plan of the area with suggestions, recommendations and guidelines considering the historic landuses, present conditions and future requirements.

3. The report examines issues of visitor arrival, parking and connections to other monuments in the area and also makes recommendations for improvement and development.

4. Overall development guidelines taking into account increased requirements for infrastructure, controls, conservation of the fabric have been given. The emphasis is on the area to be alive and develop in accordance to its special features and qualities.

5. An overall management committee is proposed that should guide the development of this monument district.

### PART B

1. It is a very well visited monument in terms of tourist traffic and can generate fair amount of revenue: a new ticket fee structure is proposed.

2. On the whole, the monument is, structurally, in a stable condition.

3. A regular system of maintenance and upkeep will ensure longevity and stability - for which larger staff is proposed.

4. There are some buildings on site which are office room, toilets, which do not have a historic background. They will be removed. The museum building on the east end will be retained and converted into multi-media centre.

5. A major part of the site is covered with grass and this landscape was researched for its historicity as well as relevance - A comprehensive landscape plan is proposed.

6. Within the monument, there is very little activity. Nor is there a potential place in the area which provides for pause, from where the entire area can be viewed and enjoyed peacefully. There is a proposal to provide for tourist facilities in terms of information kiosk, cafeteria, souvenir shops. Additional facilities like a multimedia centre, cultural centre and astronomical society are also part of the development.

7. Enlivening the monument in the evenings for which various evening activities are recommended. Several options of development were discussed and are proposed - light and sound show.

8. The Anand Bihari temple abuts the Jantar Mantar and is in dilapidated condition. It has a magnificent view of the Jantar Mantar, Hawa Mahal and City Palace. It is to be brought within the purview of the project and facilities like cultural centre and astronomical society are incorporated within it.

9. The monument may be operated on BOT basis for sustenance.

- Audio guide recommended

- Entrance plaza is proposed with a temporary tensile roofing membrane structure.

10. Visitors cause damage due to mishandling, vandalism and graffiti. This needs to be controlled in a threefold manner - control, fining and vigilance : necessary notices are also proposed as part of the overall signage system.

11. Block estimates for the development are also provided.

### PART C

1. Each yantra is looked at individually and all its damages are noted in form of drawings and markings.

2. Typical damages are understood in the Part C. This section notes all the specific problems.

3. Conservation and restoration recommendations are provided along with necessary guidelines and instructions for carrying out work.

4. Detailed bills of quantities are also provided.









## **1 INTRODUCTION**

### **I. HISTORY AND BACKGROUND**

### **II. SURROUNDING AND APPROACH**

### **III. ARCHITECTURE**

- a. Planning and growth
- b. Entrances, connections
- c. Construction and structure
- d. Geometry
- e. Landscape

### **IV. SIGNIFICANCE**







a. Map of India highlighting the state of Rajasthan and other major cities of India.

## I. HISTORY AND BACKGROUND

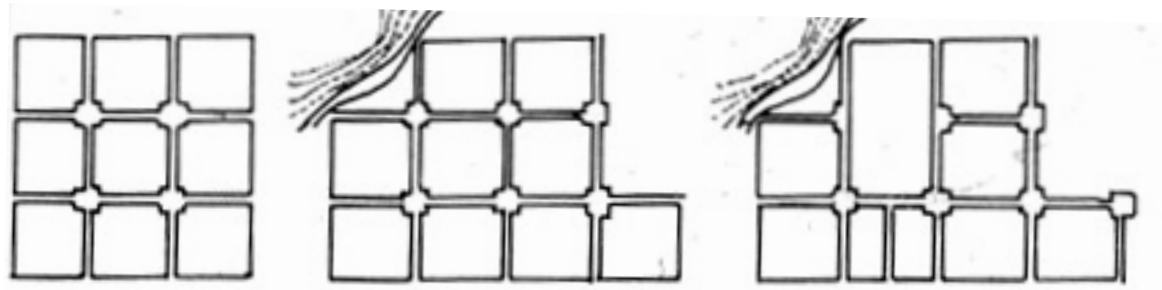
Jaipur is one of the most famous cities of India, romanticised by its pink colour. Located about 300 kms south west of New Delhi, and 260 kms southwest of Agra, it is an important tourist destination and forms a part of the National Capital Region. It is a part of the 'Golden Triangle', an important tourist circuit between Jaipur, Delhi and Agra.

Jaipur was commissioned by Sawai Jai Singh II in 1728 as an alternative capital to Amber. His fascination with astronomy, astrology and architecture are well manifest in the city at several levels. Much of it gets associated with ancient Hindu diagrams of planning like the mandala. At an abstract level, the making of Jaipur resolved itself as a transformation of the nine square 'mandala' corresponding to the nava graha or nine planets correlating to the ancient texts. Deviations from the perfect order have been made to accommodate topography, existing palace Jai Niwas and the sacred site of Galtaji. Of the nine squares, each of which was bound by primary roads, the central square belonged to the royal complex.

Jaipur also gained prominence due to the high level of urban design and planning displayed in its organisation with few precedents in India in terms of a clearly delineated orthogonal system. The sophistication of urban planning is appreciable in the harmonious coexistence of methodical and regulated systems with the more organic and spontaneous growth. The primary streets are all commercial.



b. Map of Rajasthan : Golden triangle (Delhi, Jaipur and Agra) and other historical cities of tourist interest.



- i.
  - ii.
  - iii.
- i. Conceptual plan  
ii. Effect of topography  
iii. Final plan

c. An analysis of the city of Jaipur done by Prof. Kulbhusan Jain in the seventies explaining the planning of Jaipur and the effects of topography.



d. The city of Jaipur with the palace complex and other important institutions in the centre. Jantar Mantar is marked in red.





There is a mixed use with commercial on the ground and residential on the top floors. This is intermingled with important institutions like temples, schools and colleges. The degree of importance determines the location indicating the sense of hierarchy. Each of the nine sectors was internally subdivided once again by orthogonal streets. Within this assembly, at the tertiary level, the development was allowed to take its own course. Rules regarding road widths, heights, terraces, pedestrian arcades were all clearly spelt out.

This exceptional level of involvement in the planning is manifest in the making of Jantar Mantar. Jai Singh had not only studied the Indian texts on the matters of planetary movements, but actively sought out information regarding developments in other countries. He was aware of the Arabic instruments and their limitations. He was also in consultation with experts in India. India's intimate connections with Persia, the Arab world and further West is of course, a well-chronicled fact. It is very clearly established that Jantar Mantar is not a whimsical agglomeration of form and geometry but a meticulous construction of scholarly intent.

**Fact File**

Location	
Country:	India
State:	Rajasthan
District:	Jaipur
Altitude	
Mean Sea Level:	431 meters
Latitude:	26°57'N
Longitude:	75° 40' E.
Climate	
Summer:	Max: 38° C Min: 22° C
Winter:	Max: 30° C Min: 11° C
Rainfall:	64 cms



Source: City Palace Library, Jaipur

a. The Chauda Rasta as it used to be historically.



c. Residences above the commercial making distinct zones in section rather than in plan allowing a mixed use pattern with controls and regulations.



b. The other street leading to Badi Chaupar today. Both the pictures show how the area and the streets are busy today and have been in the past.







a. The Hawa Mahal is an important monument in the vicinity and a lot of tourist movement occurs between Jantar Mantar and Hawa Mahal.

## II. SURROUNDING AND APPROACH

The central square included the City Palace, the Tripolia gate, the Hawa Mahal, the Govindsingh temple, the Talkatora, the Chandni Chowk and other temples and gathering public spaces. All of this lay between the Badi Chaupar and the Chhoti Chaupar which were connected by Chauda Rasta. This was the most important public place of the city, historically, politically and commercially. In fact, even today it is the main market of the city. The Badi Chaupar continues to be used for staging political rallies and protests.

The Jantar Mantar is part of the central institutional core of Jaipur. This sector is marked by large institutions, open chowks and courts and large landholdings in comparison to the rest of the dense city fabric. The city palace is the focus of this sector and lies on the northern side of Jantar Mantar. Studies on site and archival material suggests that it was probably part of a court of the city palace and not separated from it as it is now. The other important institutions were the Hawa Mahal, several large temples like Anand Krishna Bihari Temple, Govind Singh Temple. More recently, the Vidhan Sabha was also part of this sector.



b. The badi Chaupar is the most important cross road of the city. The Johari Bazaar and the Tripolia Bazaar intersect here. The centre was historically marked by a stepwell which no longer exists.

c. The City palace and Nahargarh Fort on the northern side of Jantar Mantar, as seen from Samrat Yantra at Jantar Mantar.



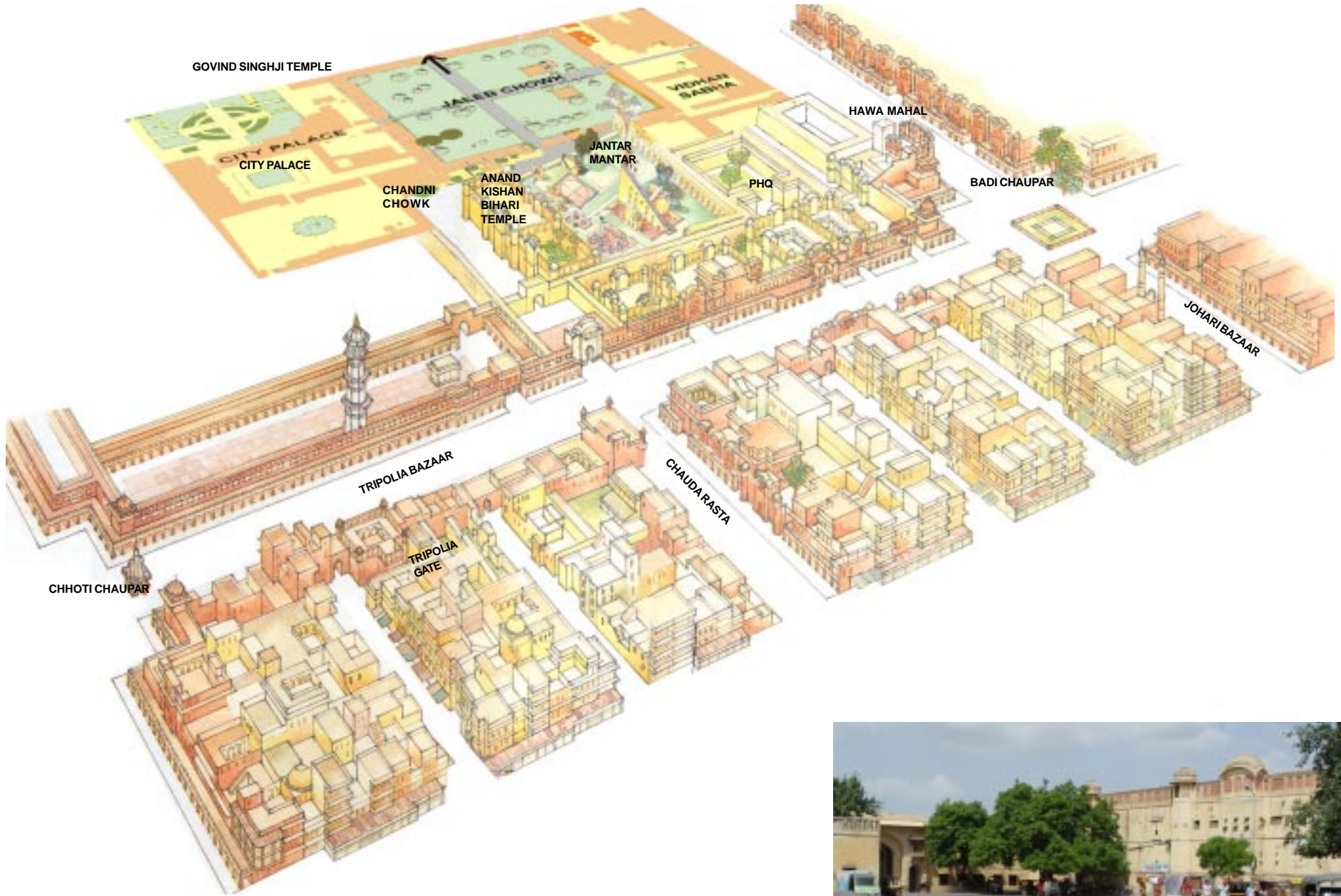


This central sector of the city is bound by two main roads, Chauda Rasta and the Hawa Mahal Rasta. The Badi Chaupar marks the intersection of these and the Tripolia Gate was the ceremonial access into the quarter. Another important approach was through the Jaleb Chowk which was a large forecourt with the potential of public gathering.

Today the approach to the Jantar Mantar is through a road carved out on its north east corner. This road primarily connects the Tripolia Bazaar from near the Tripolia to the Jaleb Chowk and the Govind Singhji Temple. It moves through the Chandni Chowk and gives access to the Anand Krishna Bihari Temple, the Jantar Mantar and the city palace. This route is also used as thoroughfare.



a. The Tripolia on the Chauda Rasta is the most important gateway into the royal quarter.



b. A view of the area showing the relationships of the different institutions and their densities compared to the rest of the city.



c. Chandni Chowk

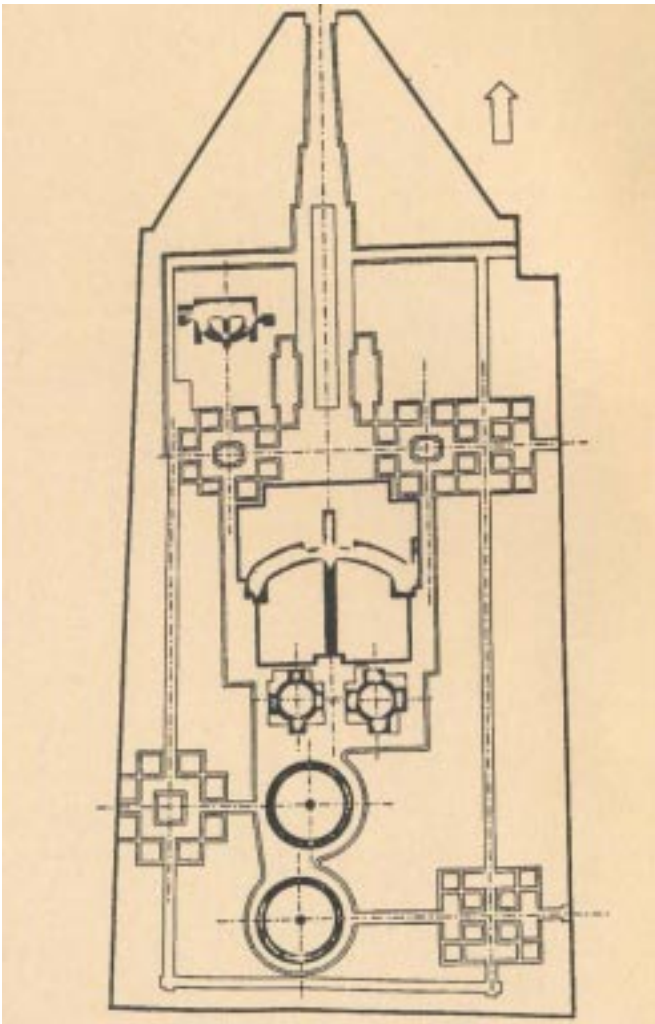


d. The approach road which cuts across the sector connecting the Chauda Rasta with the Hawa Mahal Road.





Source: Volvahasen, Andreas



a. A plan of the Delhi Jantar Mantar. Primarily, here one can see the instruments connected through the floor plane and not through paths. This allows for a freer visitor movement in the complex.

Source: Volvahasen, Andreas



b. A present day scenario where it sits surrounded by a metropolis. It was located outside the city walls and was incorporated into the city as it grew. This is distinct from Jaipur where it is part of the central royal square.



c. Archival picture of Jantar Mantar, Delhi. Large built forms with strong geometrical features stand starkly against open grounds.

Source: City Palace Library, Jaipur

### III. ARCHITECTURE

#### a. PLANNING AND GROWTH

In India, there were five observatories, all commissioned by Jai Singh. These were at Jaipur, Delhi, Ujjain, Mathura and Varanasi. The ones at Mathura and Ujjain are completely lost while Benaras is in a poor condition. The Delhi Jantar Mantar is better maintained but it is the Jaipur one that is in the best condition. It is also the largest and probably the most well known. *Though there is no accurate historical record of the sequence of the making of the observatories, some writings suggest that the Delhi one was built first and the others later to calibrate its accuracy.*<sup>1</sup>

There seems to be some discrepancy in the exact date of the building of Jantar Mantar. Most accounts note it to be 1729, but there are suggestions that it was actually started before the planning of the city. Like the Delhi Observatory, which was made outskirts of the city, this observatory may have been planned near Jai Niwas, the hunting palace of the king which was a reasonable distance from the seat of residence at Amber. Only at the time of making of Jaipur, would it then have been accommodated in the central square. However, this needs further research to be really corroborated.

The Jantar Mantar deteriorated very fast and by the end of the 19th century, only ruins and foundations were found. What we see today is largely a restoration. Records show that the entire complex was reconstructed by Maharaja Ram Singh in 1901. Some changes were supposedly made at the time. This includes cutting away of the north west corner for a road. This seems plausible since there are two entries to the complex in the south, which are presently closed. The boundary wall on the north west seems to be a later addition.

The calibrations on the instruments in the time of Jai Singh were made in plaster. These obviously did not last very long. The present day markings on marble are also a contribution of Raja Ram Singh.

1. As referred to by most authors including Volvahasen, Andreas

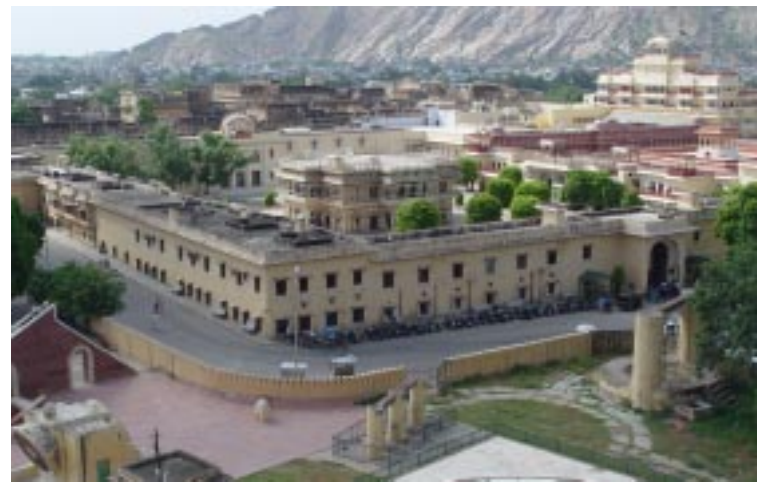




Source: Volvahasen, Andreas

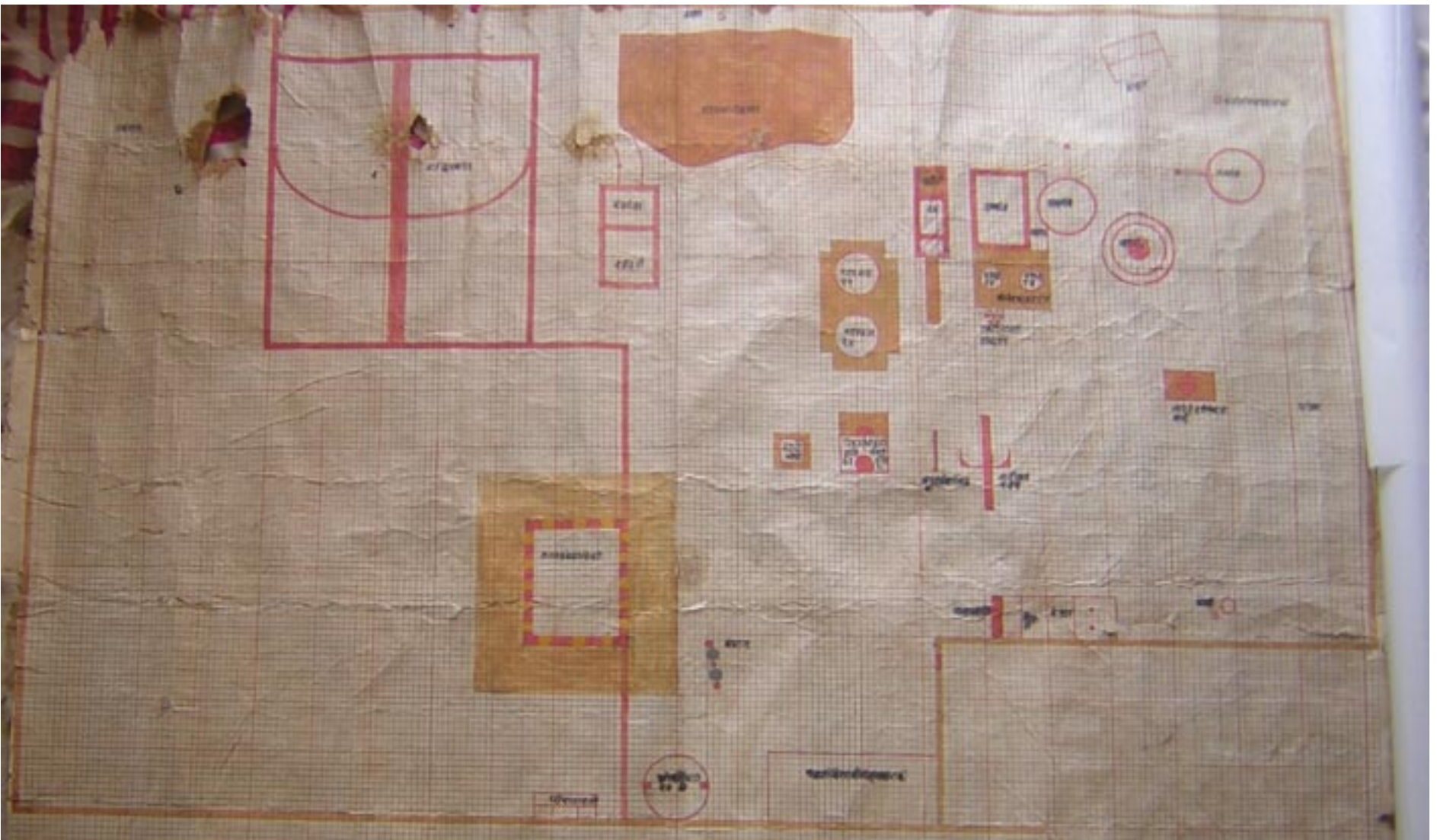


a. The Observatory at Benaras



b. Road passing along the northwest corner of the site. The proximity of some of the yantras to the road and suggestions of openings on the south wall show the road to be a later addition.

Source: City Palace Library, Jaipur



c. Historical plan of Hawa Mahal. This plan belongs to the 1901 reconstruction where the northwest corner is cut away to make way for a road. Some historical records also suggest that some instruments like the Dakshino Bhatti Yantra were relocated piece by piece.







a. Maharani Gayatri Devi Gate, leading to the Chandni Chowk



b. A gate in the south wall of the Jantar Mantar complex. It suggests an entrance to the complex through the south.

b. ENTRANCES AND CONNECTIONS

Jantar Mantar is, presently, entered from the northeastern corner. However, from within the monument, there are evidences of two gateways in the southern wall which open onto the road behind the Jantar Mantar. Abutting the southern wall, a number of small industrial units have developed which obviously do not have a historic background. On the other hand, a series of reasonably large and well made havelis lie across the small road. Though they are in a total state of disrepair, some of the elements visible suggest that these could have belonged to a higher level of officers. Evidently this is suggesting that the main entry point into the Jantar Mantar then is through its southern edge. There are other gateways on the eastern wall making connections to the Hawa Mahal via the present day Police Headquarters. That building was historically used as stables.

The historic connections are all but lost and the sense of the central core to that extent has completely changed. Presently, the entrance to the road leading to the Jantar Mantar is through the Gayatri Devi gate on the Tripolia Bazaar road, in line with the Tripolia. The other connection is with the Jaleb Chowk through the Nakkar Khane ki mori.



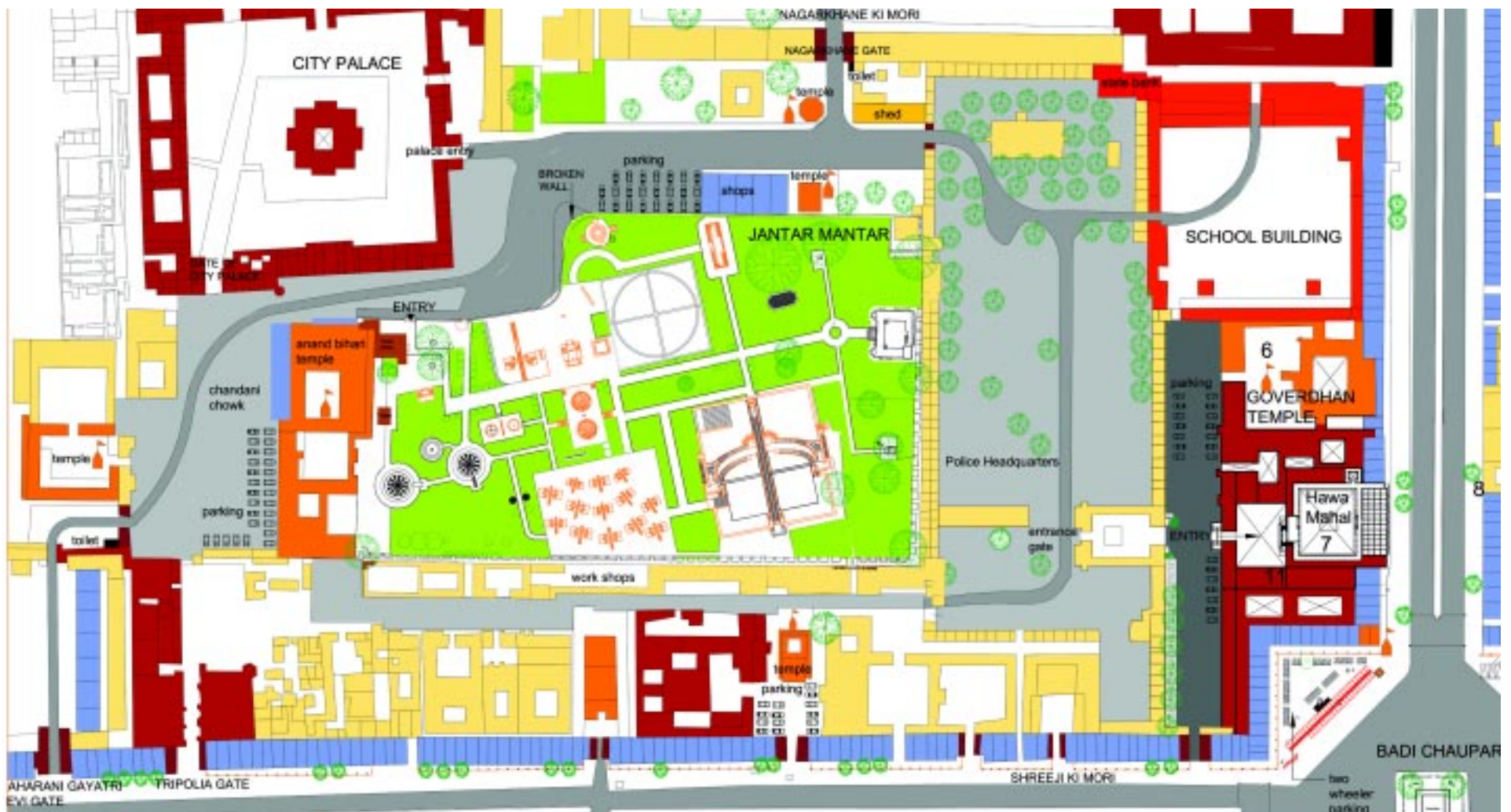
c. One of the entrances opening onto Chandni Chowk



d. The pathway through the Anand Krishna Bihari temple, though badly deteriorated has the potential to become an interesting pedestrian route through the historic fabric.



e. Entrance to Jaleb Chowk off the main road





### c. CONSTRUCTION AND STRUCTURE

The instruments are stone masonry construction. Since they are plastered all over, it is difficult to make out the kind of masonry. From some places where it has come away, large stone pieces are seen and they so one can infer that the yantras are made from fairly large pieces of the local sandstone. One has to bear in mind that these instruments are only from the early 20th century. The earliest instruments were ruined and have been reconstructed. In some cases, even more recent repairs have been done like replastering, retreading of stairs. Much of the stone joints are of the nature of wooden joinery like rebated joints, simply supported stones. This suggests that carpenters were also involved in the project.

The markings are made on a very hard and good quality marble that has been able to bear the brunt of weathering and human touch so far. The original plaster stucco obviously would not have lasted so long. The markings in marble were inlaid with lead. This helped in preventing their deterioration through time. The marble pieces have all been finely polished (this is further enhanced with time) and are about 3 inches thick. The marble pieces were evenly sized depending on the instrument and then dressed and curved precisely, often in two dimensions.

The Samrat Yantra is the largest and the surface of the markings is curved in two dimensions. It has a diameter of about 30 mtrs and its centre was not on the ground. The Disha diagram was made for its construction to transfer the markings from the horizontal on the vertical surface.

There is no provision for the draining away of water. The water flows on the supporting surfaces causing damages to the structure and the staircases.

The homogeneity in the forms, construction and materials gives a harmonious sense to the complex though each of the yantras is actually very different from each other.



a. The single piece stone wedges are supported in the centre with rebated joints and are simply supported in the middle with single piece stones.



b. The marble pieces on which the markings were done. They were often a double layer to increase strength and stability.



c. The disha diagram in the foreground and the samrat yantra in the background. The radius of both the curvatures is 15 mts.







a. The Samrat Yantra, the largest of all the yantras at Jantar Mantar



b. The staircases were incorporated with the shadow making element to give the distinct triangular form in both the large and small Samrat Yantra as also in the Rashi Valaya Yantras.

#### d. GEOMETRY

The fantastic agglomeration of sundials, the scales and the starkness of the total composition draws scholars and visitors, from far and near. Even without an expert knowledge of its working, it is awe-inspiring merely in its experience. It has been described as *“the most realistic and logical landscape in stone. Its 16 instruments resemble a giant sculptural composition.”*<sup>2</sup>

The plan of Jantar Mantar had to have a perfect orientation towards the cardinal directions. However, due to the deflection in the overall city plan by a few degrees, the plan of Jantar mantar does not correlate to the city grid.

The yantras are organized according to the celestial configurations depending upon their function. They do not have any apparent relation to each other on the site.

The yantras had to be geometrically very accurate in three dimensions for them to function precisely. Therefore all efforts were made to have simple geometrical forms devoid of any embellishments which were inherent to other construction in the region. The forms also elude to platonic solids.



c. Geometry in the Jantar Mantar is not an external form making tool, but an integral requirement of the function. The circles relate to the orbits of the planets and stars, while the angular surfaces cast the shadows. The function determines the angle.

2 - Illustrated Guide to India, Readers Digest & Penguin Books INDIA, 2002.





## e. LANDSCAPE

The floor scape at Jantar Mantar comprises of the stone paved paths and lawns in-between the instruments. Some areas around the instruments have also been paved to facilitate their observation. Though it is obvious that this pattern is not historic, not much archival material has been available to know the historic landscape. Some variations in soft and hard landscape seem to have existed. The trees have grown and matured over time though some shrubs and smaller plants are recent. Railings have been added to control the tourist movements. The railings are basically at the entrance area otherwise most of the complex allows free visitor movement without restriction, except the disha diagram which also has railing around it.

The pathways in polished red sandstone are interspersed with lawns. The areas around some of the instruments have IPS flooring. The variation is further highlighted by some kind of random rubble work done for steps only at the Great Samrat Yantra.







a. An artist's rendering of the kind of ambience of Jantar Mantar with scholars and priests conferring on the readings.

#### IV. SIGNIFICANCE

Jantar Mantar's significance lies not only in its architectural marvels, but also as a representation of the knowledge of the times in the field of astronomy. It is a link in a world wide network of observatories of ancient times. It is by far, one of the most accurate of observatories of historic times and is a visible record of the experimentation that was going on at the time in efforts to improve the readings of planetary and other cosmic movements. Any study of the development of modern observatories would have to analyse and understand Jantar Mantar, for it is here that the story of formal, documented observatories in India would start.

Traditionally, in India there is a deep belief in the connection between events in a person's life and planetary movements. Many important events of a person's life get linked to the positioning of planets. The need to have an accurate reading was a part of life. The Jantar Mantar's existence to a great degree is a reflection of this belief. This also suggests that the fields of astronomy and astrology as perceived in contemporary society were not distinct, but were intimately connected. Considering this, it was not unusual for a king to be concerned about planetary movements. However, Jai Singh was unique in his application of that interest to a wider area of astronomy and insistence on improving the accuracy of astronomical observations. It is this insistence that led to the gigantic size and variety of the instruments.

It also gives clues about the transfer of intellectual knowledge in the 18th century. Jantar Mantar, not only indicates the developments in astronomy but also in mathematics and geometry. These were crucial to its making. It is an evidence of the human mind grappling with forces that were greatly beyond comprehension through known sciences. In the process, both progressed forward.



b. The observations that have been taken for granted in contemporary times took extraordinary human efforts to arrive at. The Jantar Mantar is one such significant event in the history of mankind.

By its very scale and magnitude, Jantar Mantar was also an assertion of royal power and access to knowledge. Simultaneously, the scale demanded the creation of a public realm, though controlled.



a. The curves of the semicircular marble scales with their callibrations seem to extend into infinity.





### **3 BUILT ENVIRONMENT - PRESENT STATUS**

#### **I. SWOT Analysis**

#### **II. Jantar Mantar Complex**

- a. Yantras
- b. Other buildings
- c. Anand Bihari Temple

#### **III. Typical damages**

- a. Structural damage
- b. Finishes
- c. Calibrations and other elements of the instruments
- d. Grafitti and garbage
- e. Staircases
- f. Later additions
- g. Landscape

#### **IV. Infrastructure**

- a. Water supply and drainage
- b. Electrical and lighting
- c. Signage







a. The Great Rama Yantra - circular in plan

## i. SWOT analysis

### Strengths

- Historical importance for its scientific base and astronomical excellence.
- Large sizes of the structures helped in larger calibrations of the scales therefore providing greater accuracy.
- Situated in the heart of the old city of Jaipur.
- Surrounded by other important monuments, making it an important part of the tourist district.
- Lack of too many articulations make it easy to maintain and upkeep.
- A photographer's delight.
- Evoke a feeling of awe and mystery.

### Weakness

- Poor visitor amenities.
- No overall area development.
- Inadequate signage.
- Poorly connected to other monuments in the area.
- Inadequate parking.
- Lack of proper illumination.
- Too much of small scale commercial activity on the periphery disturbs the experience.
- Other buildings on the site disturb certain views. They spoil the overall character of the monument.



b,c. Damages to the monument reduces the life of these beautiful structures







### Opportunities

- Heritage tourism combined with other monuments of the area to make a proper, rich and holistic experience.
- Astronomical research.
- Development of facilities like museum and contemporary observatory.
- Development into a place of astronomical studies including observing the night sky.
- Can provide a point of pause and relaxation.
- Photographer's delight

### Threats

- Deterioration of certain structures.
- Wear and tear of the scales by excessive tourist traffic.
- Unsafe for visitors due to inadequate railings and other safety devices.
- The lawns are endangering foundations of existing structures due to excessive watering; they need to be protected from water seepage.
- Menace by monkeys.
- Over commercialisation can mar the beauty and peace; destroy the sanctity of the place.







## II. JANTAR MANTAR COMPLEX

The Yantras obviously constitute the primary focus of the Jantar Mantar. They seem to be placed at random distance from each other occupying a total area of 1,89,035 sq. mts. which is a fairly large open space in the heart of the city. Apart from the Yantras, there are other features on the site. These include some buildings made for visitor amenities, the landscape - pathways and gardens, railings, services, trees, and temples. Some of these are congruous to the monument, some others are not. Conservation recommendations will address the manner in which they can be dealt with.

a. The markings on one of the yantras; indentations in marble filled with lead which has come off in places.



b. An overview of the complex with its surrounding historic fabric.





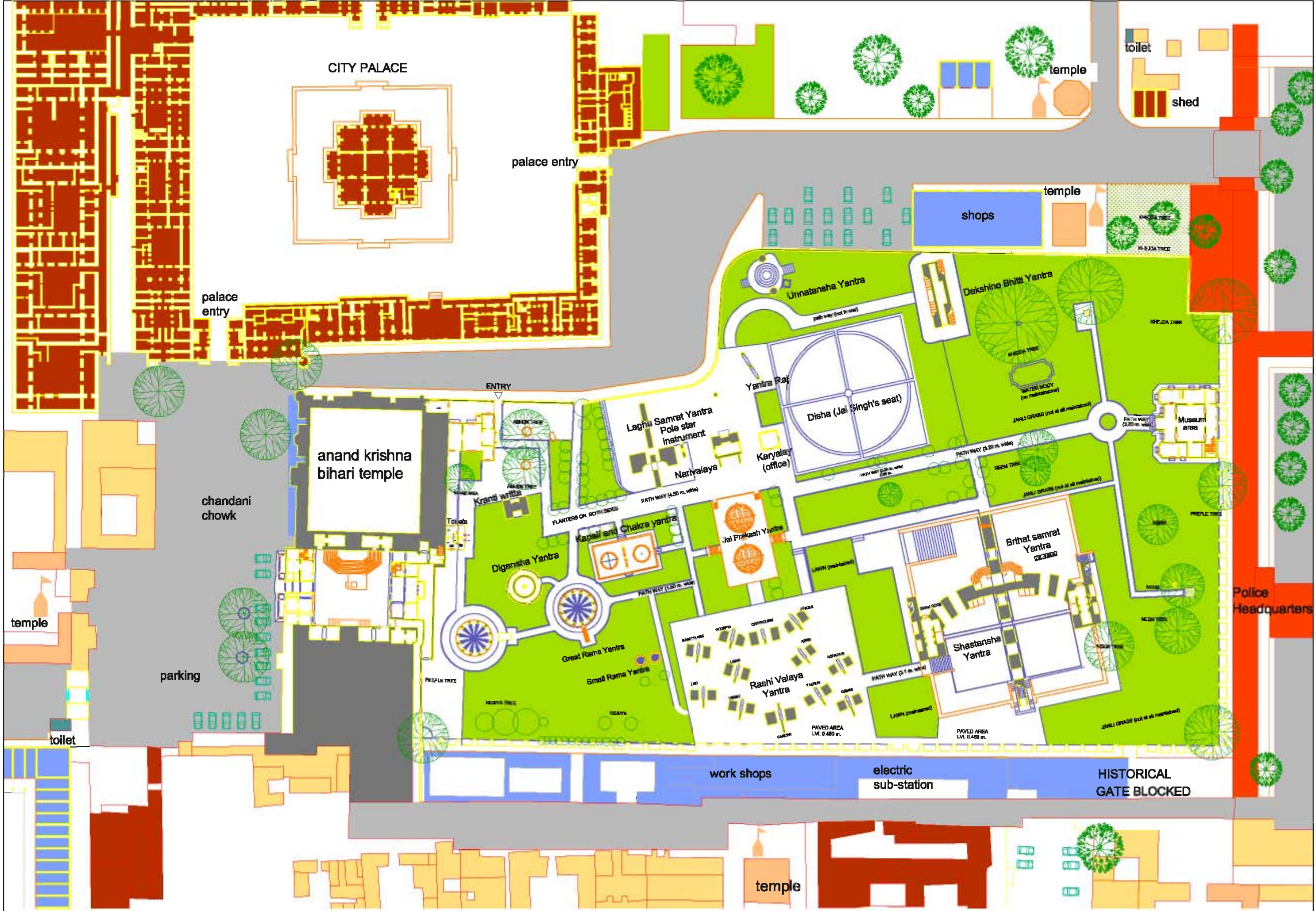


a,b. The different yantras are juxtaposed in the landscape giving fantastic views. Their stark forms against each other make beautiful compositions.



c. A view of the complex showing the randomly placed yantras





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**CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX**  
**THE BUILT ENVIRONMENT - PRESENT STATUS**

**GROUND FLOOR PLAN**



**SCALE - 1:750**

**m/s minakshi jain architects, ahmedabad**

10 - A, TOLAKNAGAR, PALDI, AHMEDABAD 380007, GUJARAT, INDIA.  
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**final report-B**

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### a. Yantras

The yantras can be understood as a system of supports like the arcaded walls with steps, the measuring elements like the Gnomon or polos that cast shadows and the surfaces on which the calibrations are made. The instruments are of varying sizes depending upon their functions. Each of these instruments are at different levels of accuracy showing a great deal of experimentation going on at the time. The instruments are

- The Rama Yantra
- The small Rama Yantra
- The Great Samrat Yantra
- Shastansha Yantra
- Jai Prakash Yantra
- Kapali Yantra
- Chakra Yantra
- The Kranti Vritta
- The Laghu Samrat Yantra
- Narivalaya Uttar and Dakshin Gol
- Digansa Yantra
- Yantra Raja
- Rashi Valaya Yantra
- Unnatansha Yantra
- Dakshino Bhitti Yantra

There is also the commonly referred to Jai Singh's seat which is a base drawing for the Great Samrat Yantra and is actually called the Disha diagram.



b. The Disha diagram, the base for making the Samrat yantra



c. The Laghu Samrat Yantra, a smaller variation of the Great Samrat Yantra.

a. The Great Samrat Yantra with a height of 27 metres (almost a 10 storey building) is an awe inspiring construction, further enhanced by the large open space in front of it.







a. The Laghu Samrat Yantra, along with the Jai Prakash Yantra and the Narivalaya Uttar and Dakshin Gol

The yantras are so juxtaposed against each other that a distinct sense of layering can be experienced, from one to another. Since these do not really have a human scale, illusions of depth are perceived. Within the complex, it is difficult to ascertain the size and distance of the yantras. The entire complex comes together as a poetic piece of architecture.



b. The diagonal staircase of the Samrat Yantra is a device to cast shadows on the scale to determine the time of the day. It does so with an accuracy of upto 2 seconds.

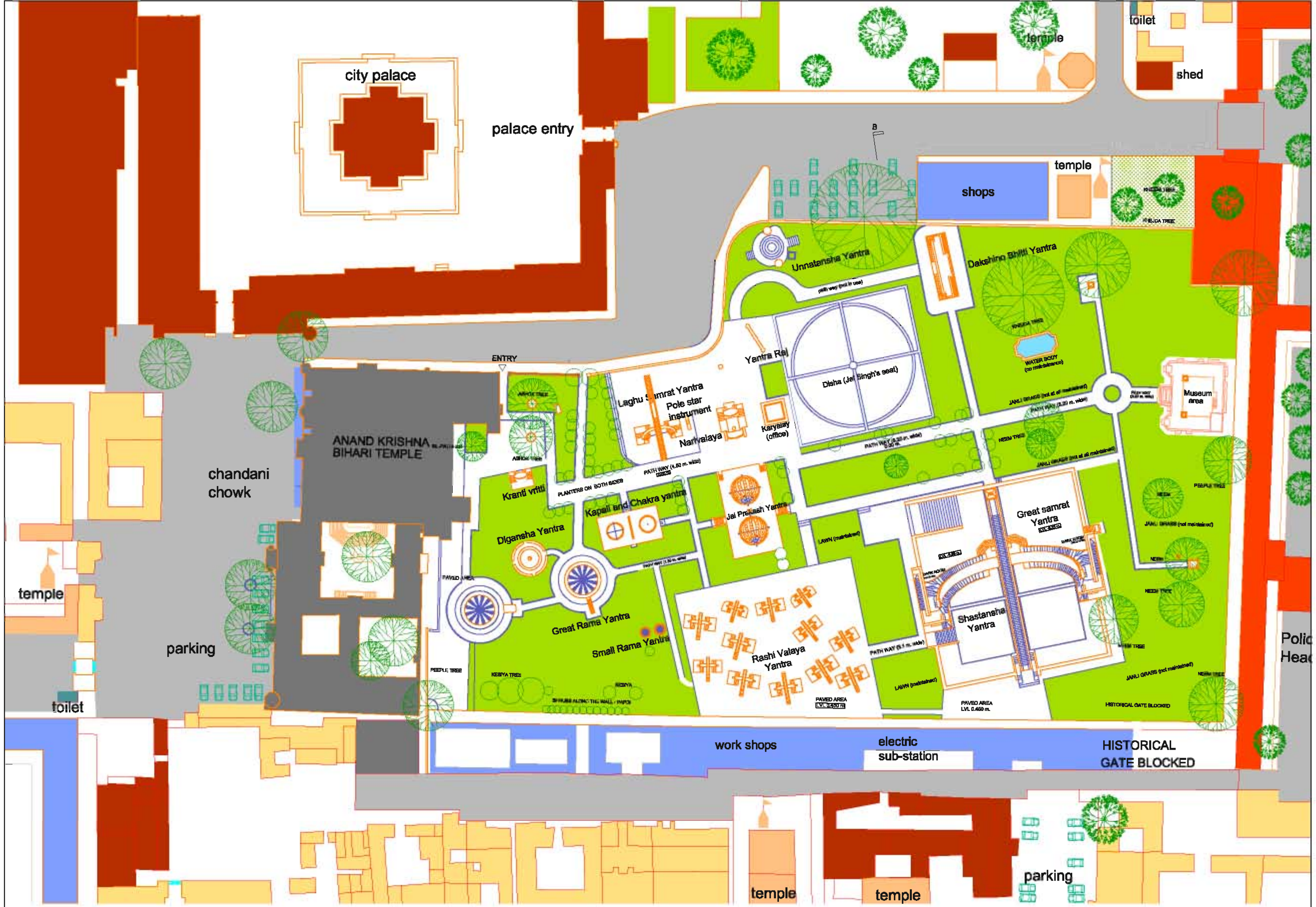


c. The Yantra Raj and the Unnatansha Yantra



d. The group of Rashi Valaya Yantras provide a contrast in size and numbers to the other larger instruments on the site.





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**CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX**  
**THE BUILT ENVIRONMENT - PRESENT STATUS**

TERRACE PLAN



SCALE - 1:750

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final report-B

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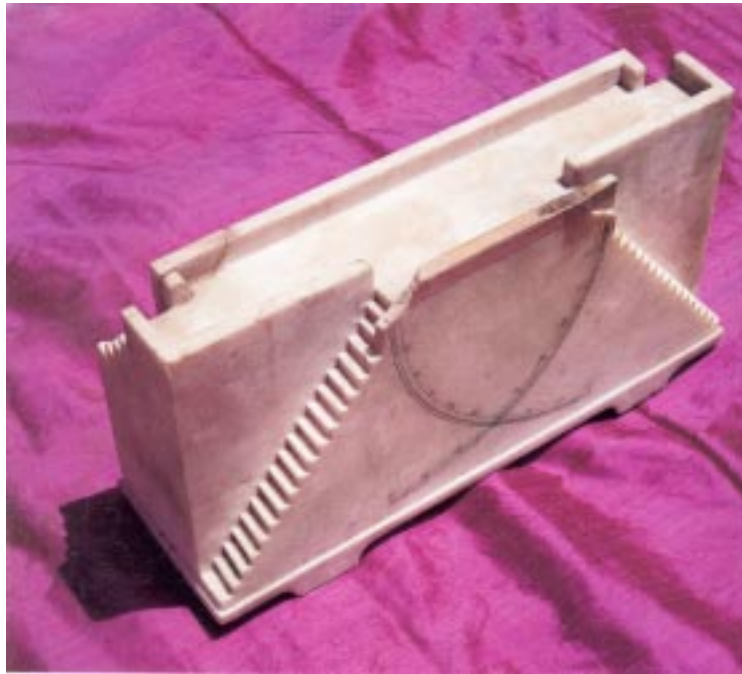




Wooden model of the Small Samrat yantra

The Jantar Mantar is a building in process. It was a part of an ongoing experimentation and research on the most accurate manner of getting information on the planetary movements. This process can be seen in the fact that within the complex there are several stages of yantras. Once a yantra was found to be more accurate than its predecessor, it was redundant. However, to build on this large scale must have been preceded by laboratory studies and experiments. Though concrete evidence of the same is a matter of independent research, it is obvious that the distinct manner of making the yantras, different from the rest of the architecture of the time, would have made it imperative for the craftsmen to have some studies before embarking on the construction.

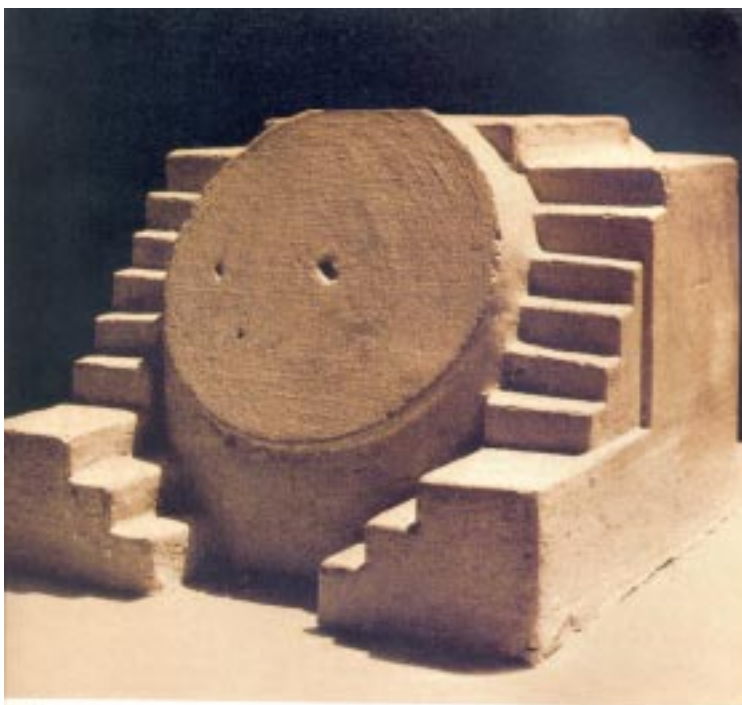
There are some models in the care of the superintendent of the complex. These models would be an important link in the understanding of this complex. They are presently under lock and key since there is no appropriate place to display them. These should be displayed for which a gallery space is suggested in the proposals.



Marble model of the Dakshino Bhitti Yantra



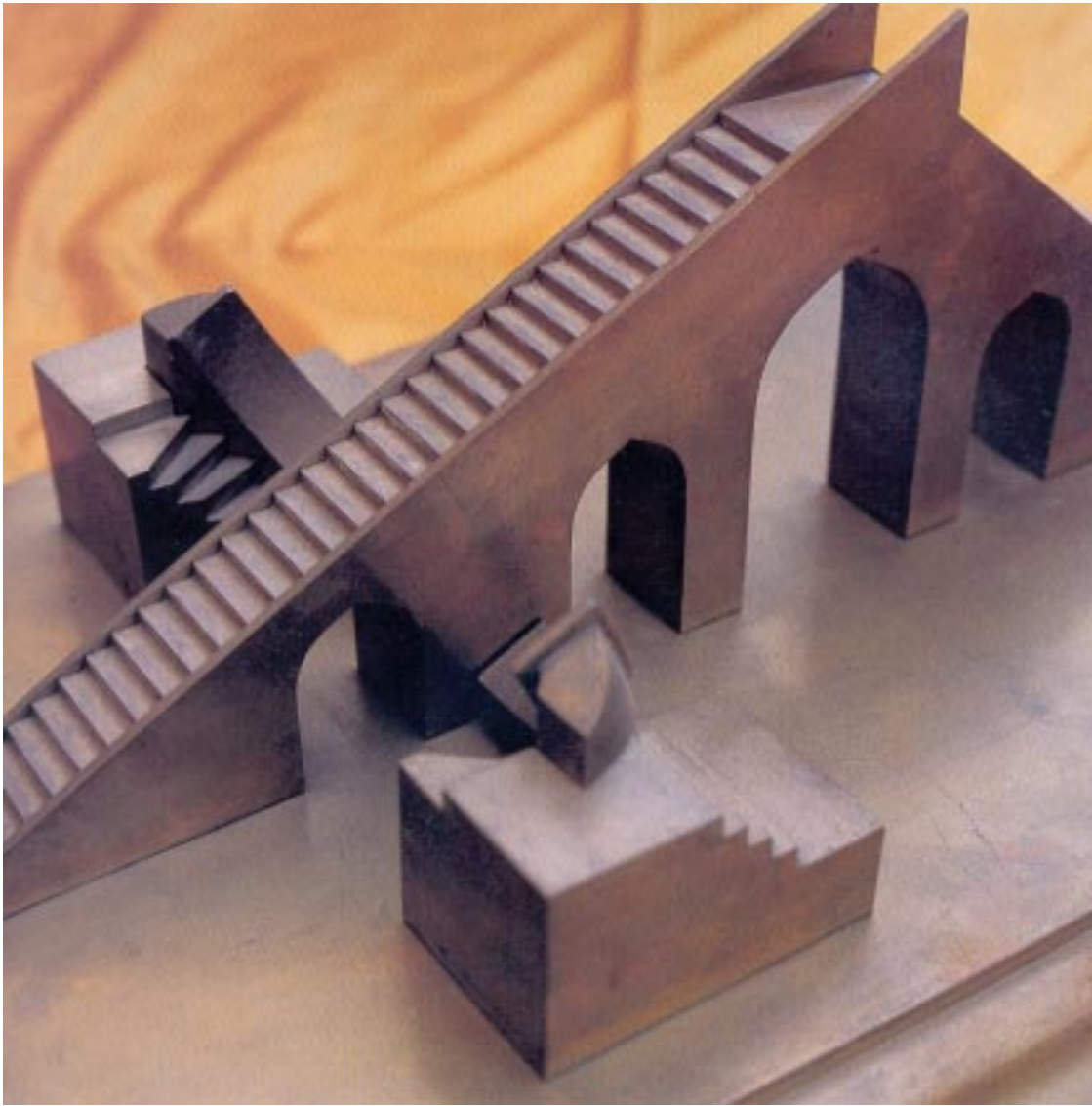
Wooden models of the twelve Rashivalya Yantras.



Wooden model of the Nirvalaya Uttar Gola







Wooden model of the Small Samrat Yantra.



Brass model of the Small Samrat Yantra.

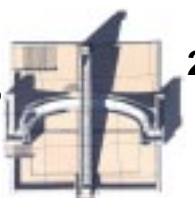


PHOTOGRAPH SOURCE : VOLWAHSEN ANDREAS, COSMIC ARCHITECTURE IN INDIA

Wooden model of the Rama Yantra.



Drum shaped sandstone and plaster model of the Great Jai Prakash Yantra.



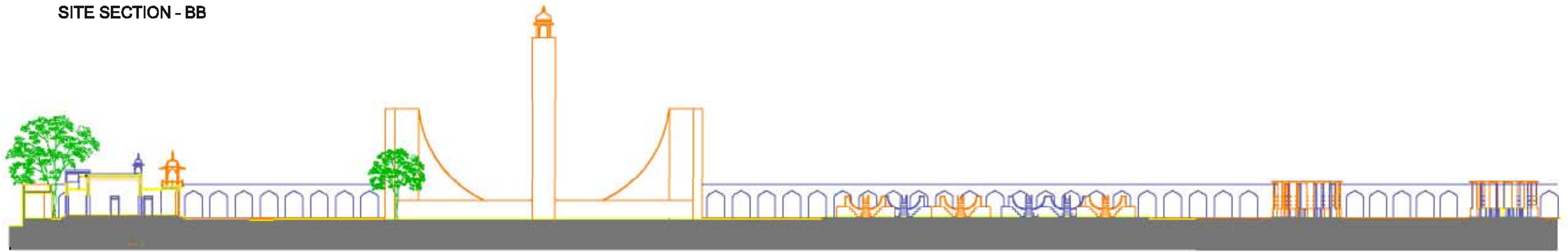




View of Jantar Mantar



SITE SECTION - BB  
 ROAD                      DAKSHINO BHITTI YANTRA                      MUSEUM AREA                      BRIHAT SAMRAT YANTRA



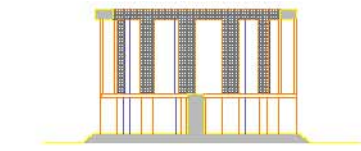
SITE SECTION - AA  
 BRIHAT SAMRAT YANTRA                      RASHIVALAYA YANTRA                      GREAT RAMA YANTRA



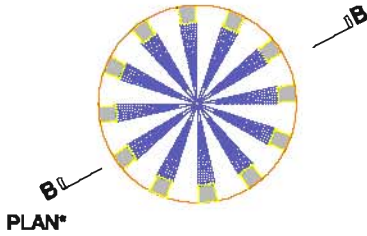




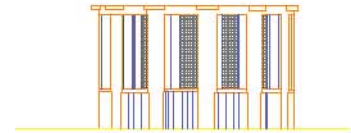
# SMALL RAMA YANTRA



SECTION - BB\*



PLAN\*



ELEVATION\*



PLAN\*



VIEW OF SMALL RAMA YANTRA



VIEW OF SMALL RAMA YANTRA



VIEW OF SMALL RAMA YANTRA



VIEW OF SMALL RAMA YANTRA

1 0.5 0 1 2 5 meters



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CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX  
THE BUILT ENVIRONMENT - PRESENT STATUS

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MINAKSHI JAIN ARCHITECTS, COASTAL ARCHITECTURE IN INDIA



## GREAT SAMRAT YANTRA AND SHASTANSHA YANTRA



VIEW OF GREAT SAMRAT YANTRA

Maharaja Singh believed that gigantic instruments would give more accurate results .

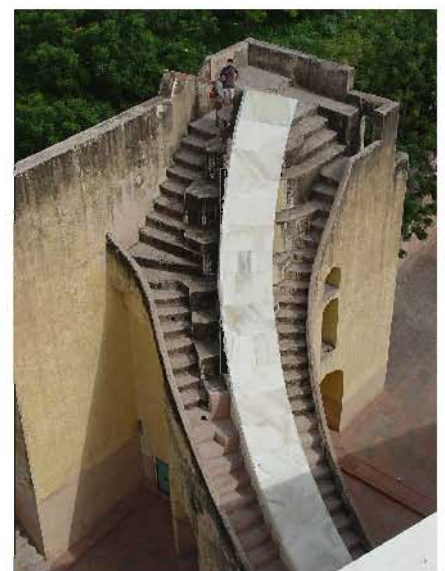
This 23-m(75 - ft) high sundial forecasts the crop.

The Great Samrat yantra is similar to the laghu samrat yantra. The huge sun dial is constructed on Jaipur's altitude. The centre of the instrument is at the centre of the stair. The instrument has two quarter dials made of marble slabs which is situated on either side of the stair. The left dial indicates time from 6 am in the morning to 12 pm and the right dial shows time from 12 pm to 6 pm. The quarter dial is divided into hours further divided into one mins which are divided into 3 parts making each division of 2 seconds.

Hence the instrument is capable of giving accuracy up to 2 sec in finding the local time. But sometimes due to not sharp shadow it can't be done that accurately.

### SHASTANSHA YANTRA

This instrument is located in a room below the samrat yantra. At mid day (local time) when the sunlight falls on the circular instrument it passes through two holes and falls on the curves in the room below. The curves have marking on them and this helps in finding out the declination of the sun.

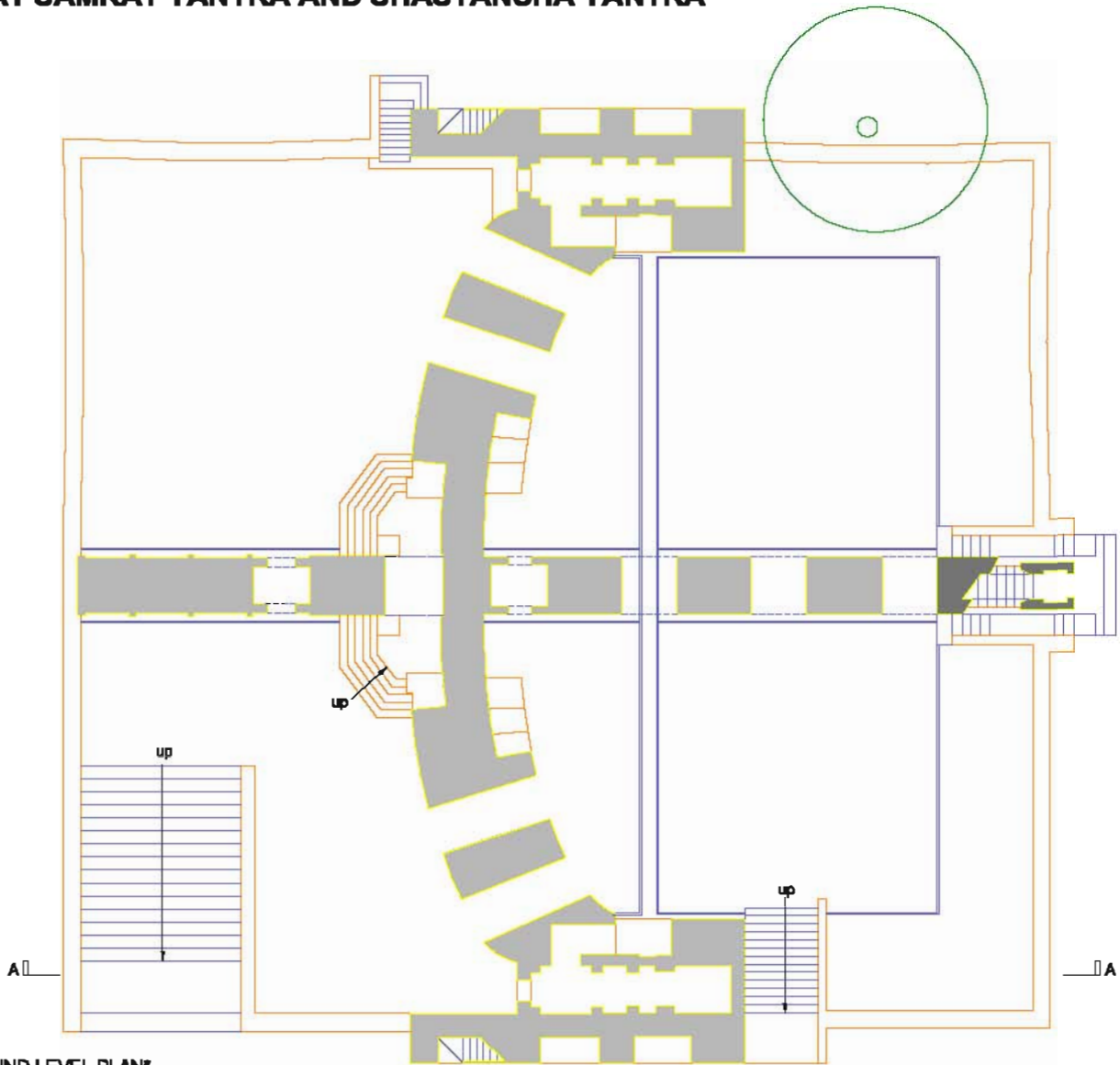


VIEW OF GREAT SAMRAT YANTRA

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# GREAT SAMRAT YANTRA AND SHASTANSHA YANTRA



GROUND LEVEL PLAN\*



VIEW OF GREAT SAMRAT YANTRA



VIEW OF SHASTANSHA YANTRA

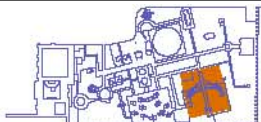


VIEW OF GREAT SAMRAT YANTRA

3 2 1 0 3 12 metres

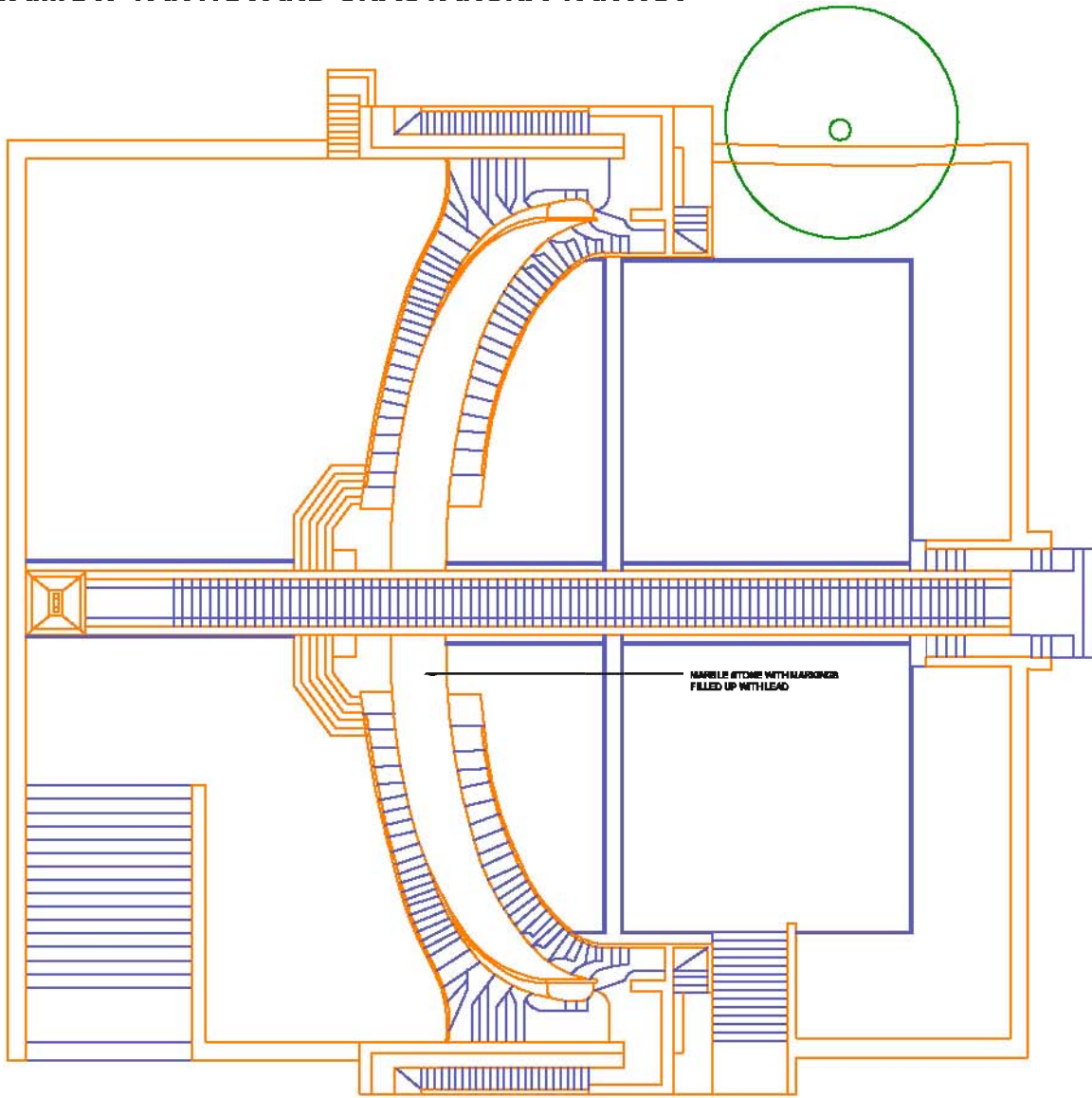


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# GREAT SAMRAT YANTRA AND SHASTANSHA YANTRA



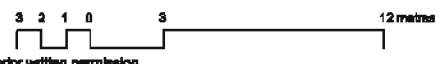
TOP VIEW PLAN\*



VIEW OF GREAT SAMRAT YANTRA



VIEW OF STEPS OF GREAT SAMRAT YANTRA

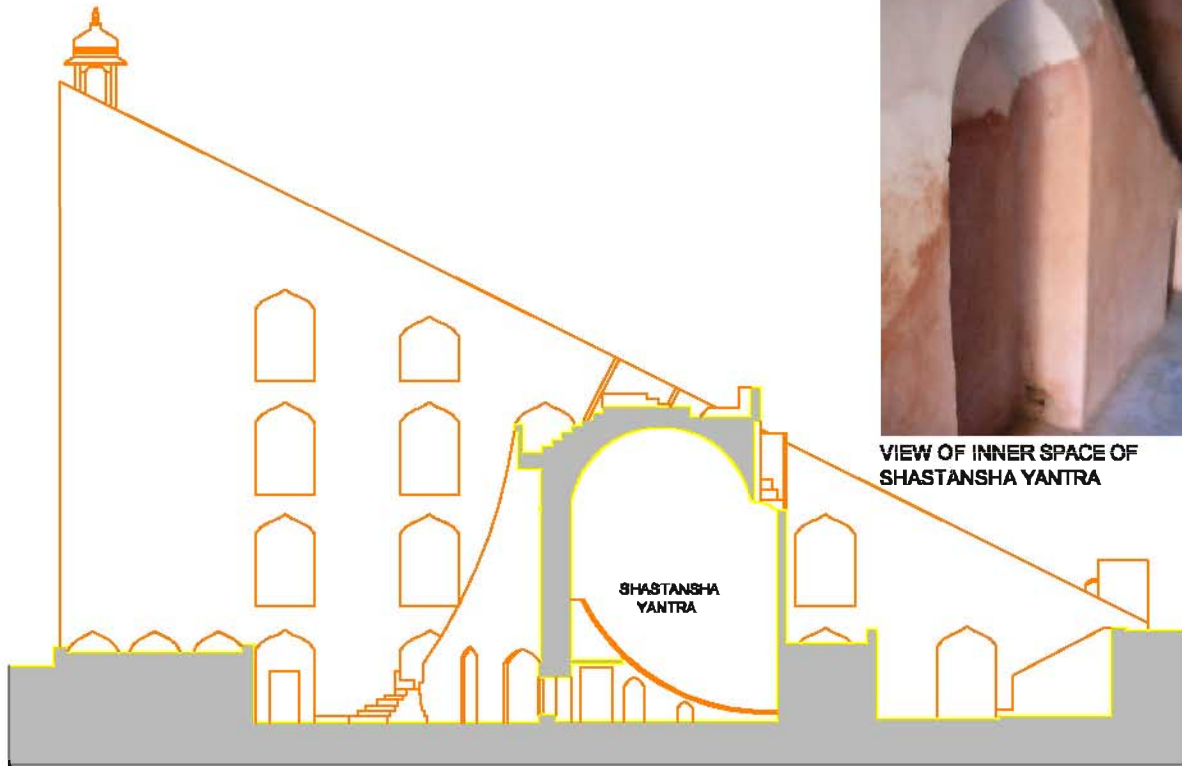


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# GREAT SAMRAT YANTRA AND SHASTANSHA YANTRA

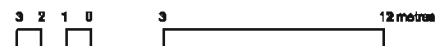


VIEW OF INNER SPACE OF SHASTANSHA YANTRA

SECTION - AA\*



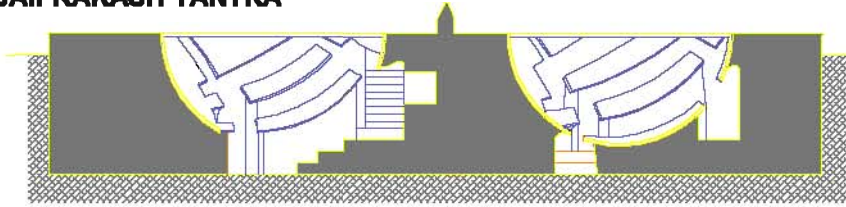
WEST ELEVATION\*



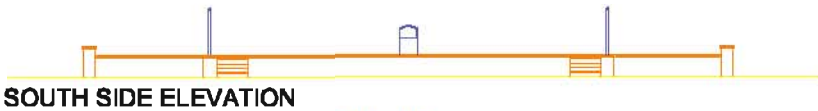
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# JAIPRAKASH YANTRA



SECTION - AA



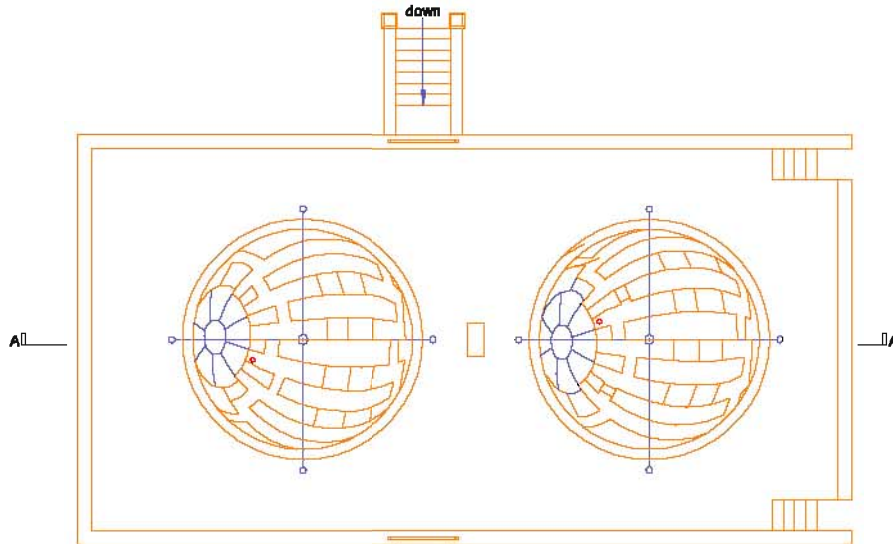
SOUTH SIDE ELEVATION



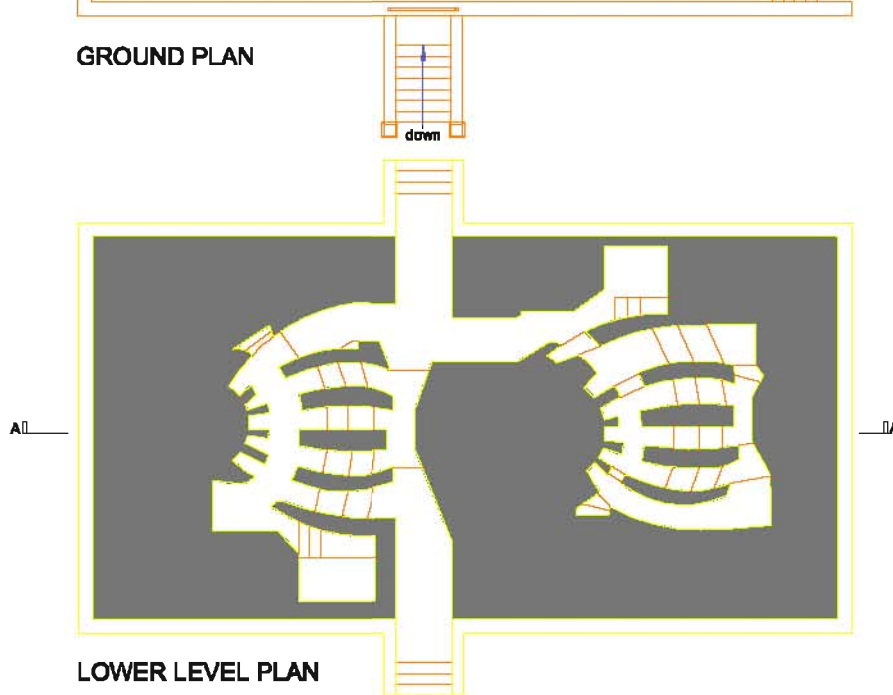
VIEW OF JAIPRAKASH YANTRA



VIEWS OF JAIPRAKASH YANTRA



GROUND PLAN



LOWER LEVEL PLAN

The Instrument is in two parts. The sky is depicted in the form of two semi circles. Each of which is complementary to each other. Each works alternately every hour. A scale is drawn from east to west which represents the equator, while the scale north to south represents the meridian. The centrally located metal disk represents the sun. The shadow of this when gets cast it tells the zodiac in which the sun is traveling. Through this instrument the position of ascendants, heavenly bodies can also be found out.

1 0.5 0 1 2 3 meters



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## JAIPRAKASH YANTRA



VIEW OF JAIPRAKASH YANTRA



VIEW OF JAIPRAKASH YANTRA



HOOKS TIED TO MARBLE PIECE



VIEW OF JAIPRAKASH YANTRA



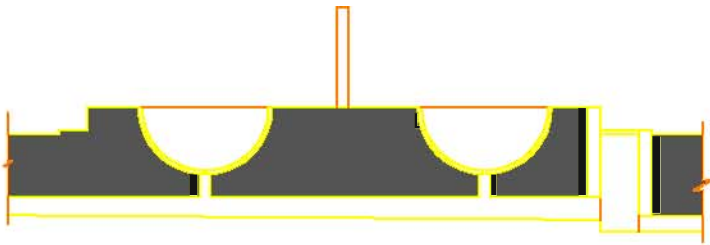
INNER VIEW OF JAIPRAKASH YANTRA

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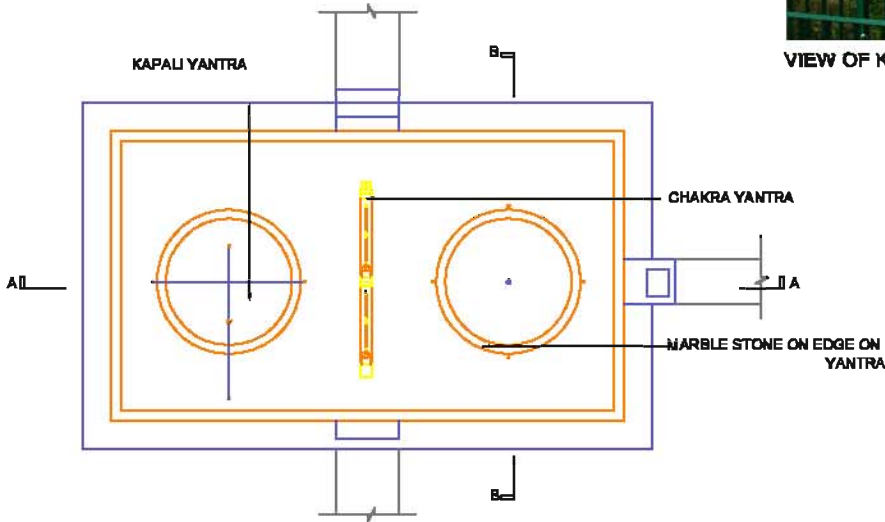
# KAPALI YANTRA AND CHAKRA YANTRA



SECTION - AA



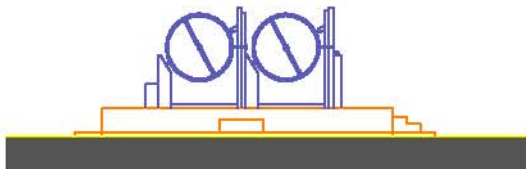
VIEW OF KAPALI YANTRA / CHAKRA YANTRA



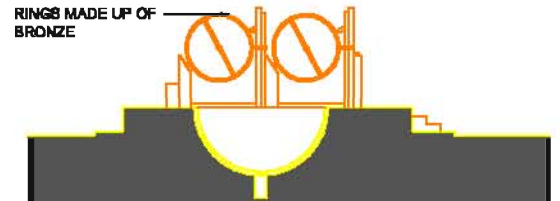
GROUND PLAN



VIEW OF CHAKRA YANTRA



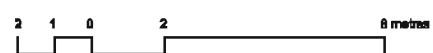
WEST ELEVATION



SECTION - BB

The Instrument consists of two parts. It works in the same manner as the Jalprakash yantra. It is the primary Instrument of Jal prakash yanta and all the errors of this are corrected in the Jal prakash yantra.

This Instrument consists of two rings made out of metal. Each ring is divided into 360 degrees which is further divided into smaller divisions. The metallic rings have markings over it. The rings rotate at their axis and can be made in plane with the angle of the heavenly bodies. The centre has a hole where when a rod is inserted the shadow of that rod tells us the declination of the heavenly bodies.



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## KAPALI YANTRA AND CHAKRA YANTRA



VIEW OF KAPALI YANTRA / CHAKRA YANTRA



VIEW OF KAPALI YANTRA



VIEW OF KAPALI YANTRA

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# KRANTIVRITTI YANTRA



FRONT VIEW OF KRANTIWRATTI YANTRA



VIEW OF KRANTIWRATTI YANTRA



VIEW OF KRANTIWRATTI YANTRA



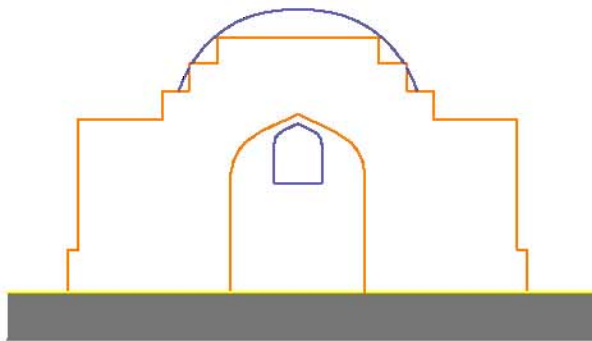
BACK VIEW OF KRANTIWRATTI YANTRA

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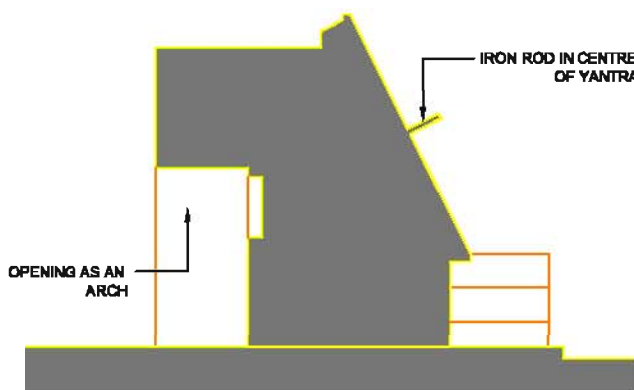
# KRANTIVRITTI YANTRA



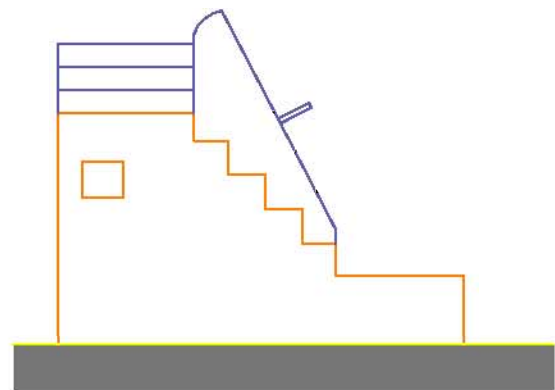
NORTH ELEVATION



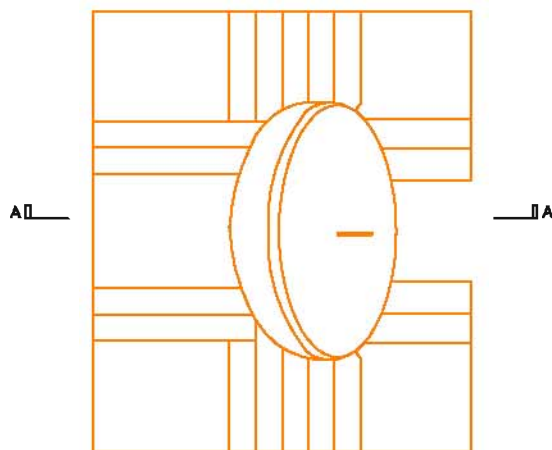
VIEW OF KRANTIGRANTH YANTRA



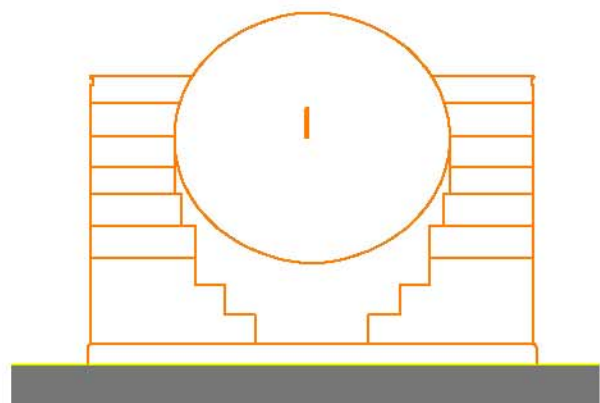
SECTION - AA



WEST ELEVATION



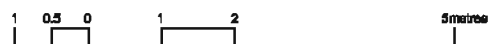
PLAN



SOUTH ELEVATION

The yantra is divided into one part: southern hemisphere. The instrument is constructed at the plane of the celestial equator. They are inclined the hemisphere are inclined at an angle of  $27^\circ$  and each functions for 6 months depending in which hemisphere the sun is located. This instrument was model of Narivalaya yantra. The centre of the instrument has an iron rod considering which as the centre. The inner most circle indicates the hour hence is divided into 12 parts which is subdivided into 12 parts making each division of 5 min each division of which is further more divided into 5 parts each making one division equivalent to 1 min. hence the instrument gives accuracy up to 1 min.

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## LAGHU SAMRAT YANTRA AND POLE STAR



VIEW OF LAGHU SAMRAT YANTRA



VIEW OF LAGHU SAMRAT YANTRA



VIEW OF LAGHU SAMRAT YANTRA

The small sun dial is constructed on Jaipur's altitude which is  $27^\circ$  north. The centre of the instrument is at the centre of the stair. The instrument has two quarter dials made of marble slabs which are situated on either side of the stair. The left dial indicates time from 6 am in the morning to 12 pm and the right dial shows time from 12 pm to 6 pm.

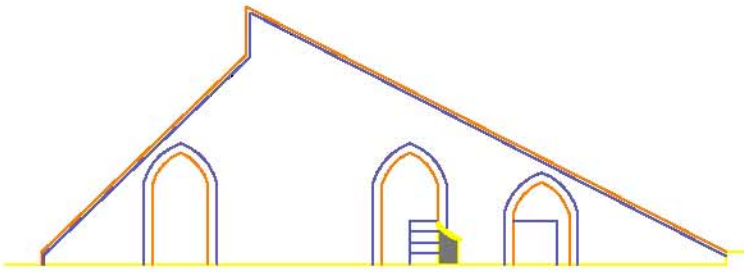
Each slab has markings of hours which are subdivided into 4 parts each of 15 mins which is subdivided into 3 parts of 5 mins each which is further subdivided into 3 parts hence telling the accuracy up to 20 secs.

The shadow of the stair falls on these slabs which help in telling the local time. When the latitude of Jaipur is added we get the Indian Standard time.

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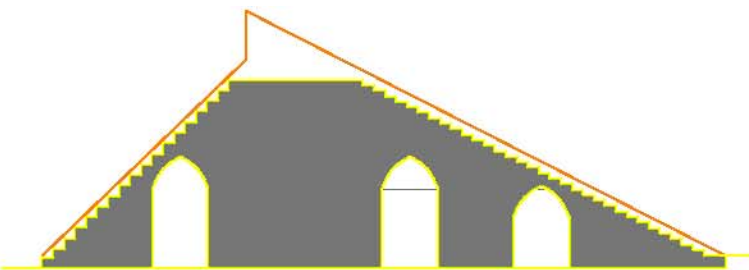
# LAGHU SAMRAT YANTRA AND POLE STAR



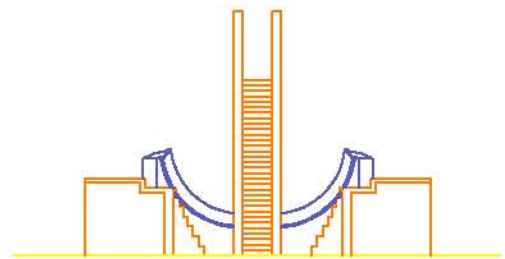
SECTION - BB



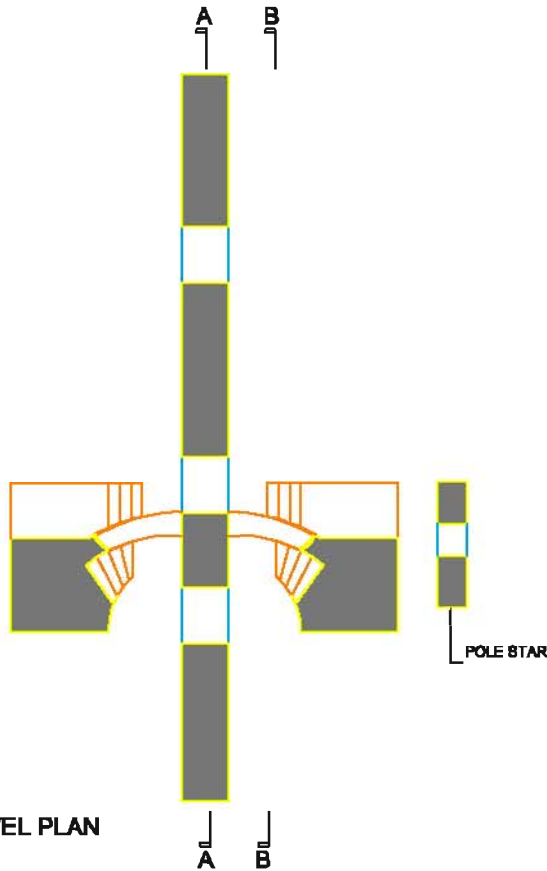
VIEW OF LAGHU SAMRAT YANTRA



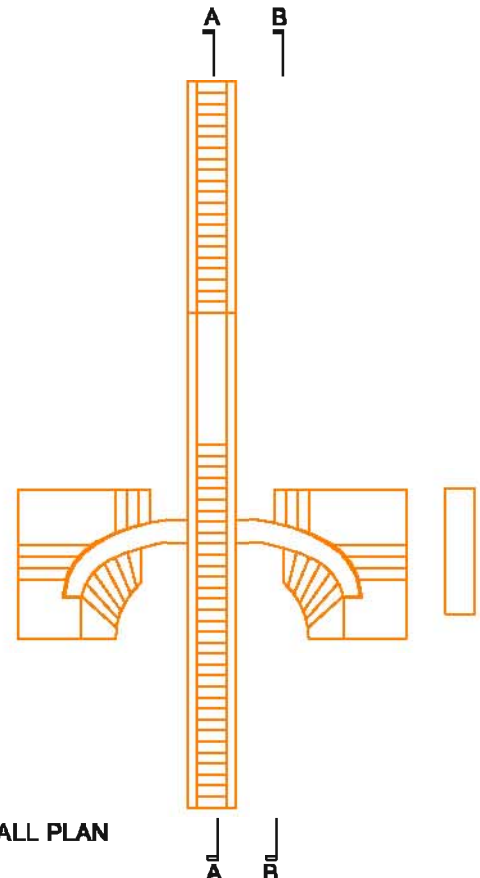
SECTION - AA



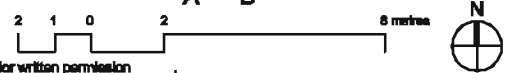
SOUTH ELEVATION



GROUND LEVEL PLAN



OVERALL PLAN



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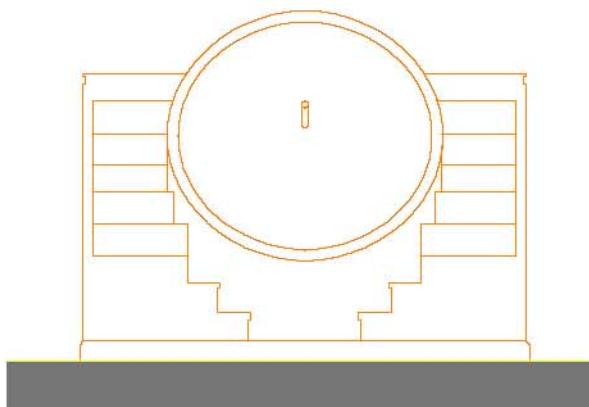
# NARIVALAYA YANTRA AND HORIZONTAL SUN DIAL



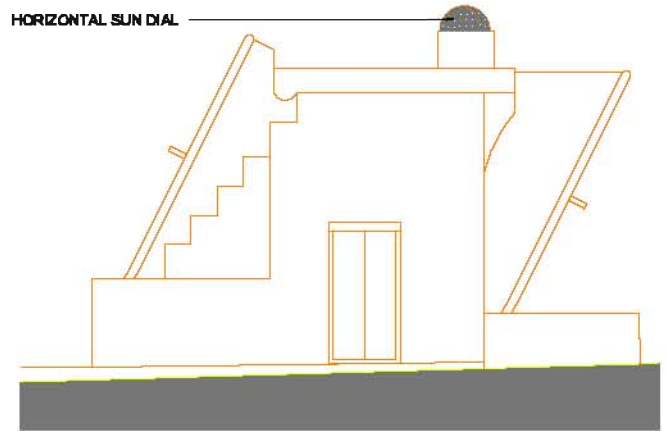
VIEW OF NARIVALAYA YANTRA



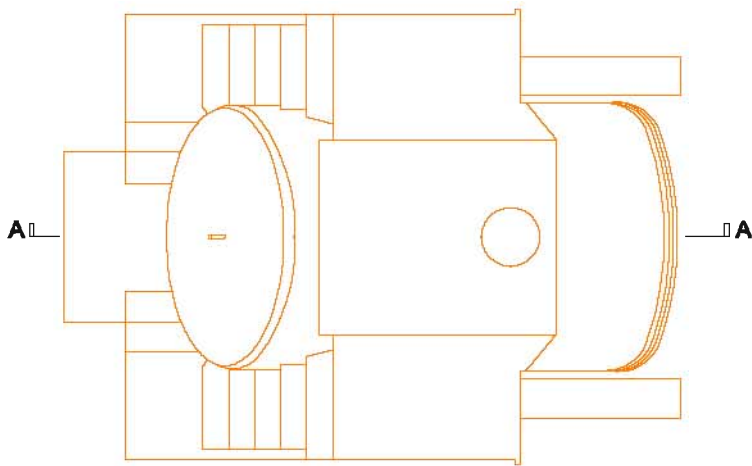
VIEW OF NARIVALAYA YANTRA



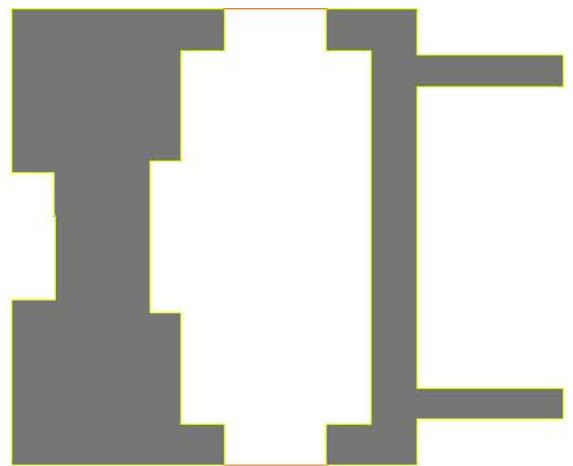
NORTH ELEVATION\*



WEST ELEVATION\*



PLAN\*



GROUND PLAN

1 0.5 0 1 2 5metres



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SOURCES- RESEARCH FROM VOLUNTEER ANDREAS, COSMIC ARCHITECTURE IN INDIA



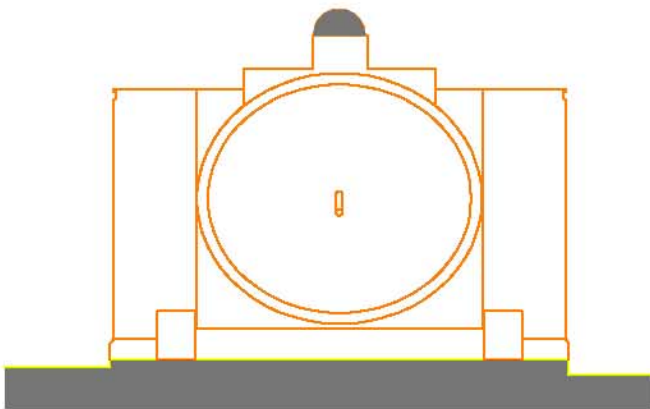
## NARIVALAYA YANTRA AND HORIZONTAL SUN DIAL



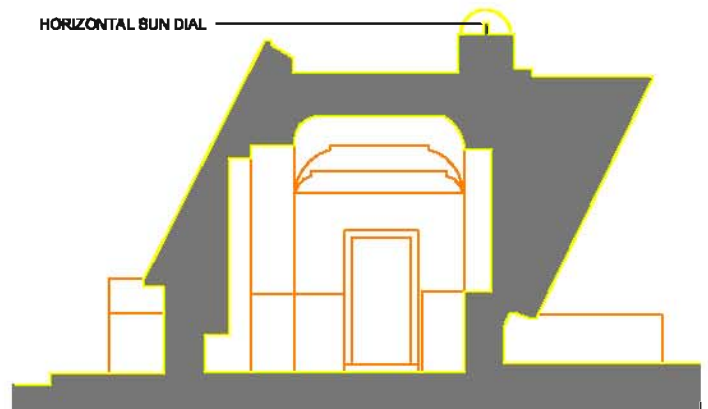
VIEW OF NARIVALAYA UTTAR GOLA



VIEW OF HORIZONTAL SUN DIAL



SOUTH ELEVATION\*



SECTION - AA\*

The yantra is divided into two parts; the northern hemisphere and the southern hemisphere. The instrument is constructed at the plane of the celestial equator. they are inclined at an angle of 27 degrees and each part functions for 6 months depending in which hemisphere the Sun is located.

The centre of the instrument has an iron rod considering which as the centre three circles are drawn at the outer edge. The inner most circle indicates the hour hence is divided into 12 parts which is sub-divided into 12 parts making each division of 5 min. Each division is further divided into 5 parts making equivalent to 1 min. Hence the instrument gives accuracy upto 1 min. As the iron rod at the centre casts its shadow on the west side before noon, and on the east side in afternoon while traveling in the northern hemisphere (i.e. 22nd March to 22nd September) and vice-versa while travelling in southern hemisphere (i.e. 24th September - 20th March). This shadow helps in finding the local time.

### THE HORIZONTAL SUN DIAL

It can be seen only from the top of Narivalay. At the north-south centre it has a 27 degrees triangular gnomon whose shadow indicates time in "ghatis". The time observed can be verified by hemispherical sun

1 0.5 0 1 2 5metres

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# DIGANSHA YANTRA



VIEW OF DIGANSHA YANTRA FROM ANAND BIHARI TEMPLE



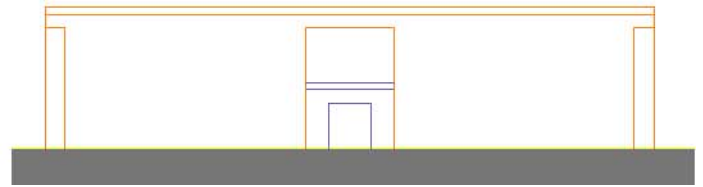
VIEW OF DIGANSHA YANTRA



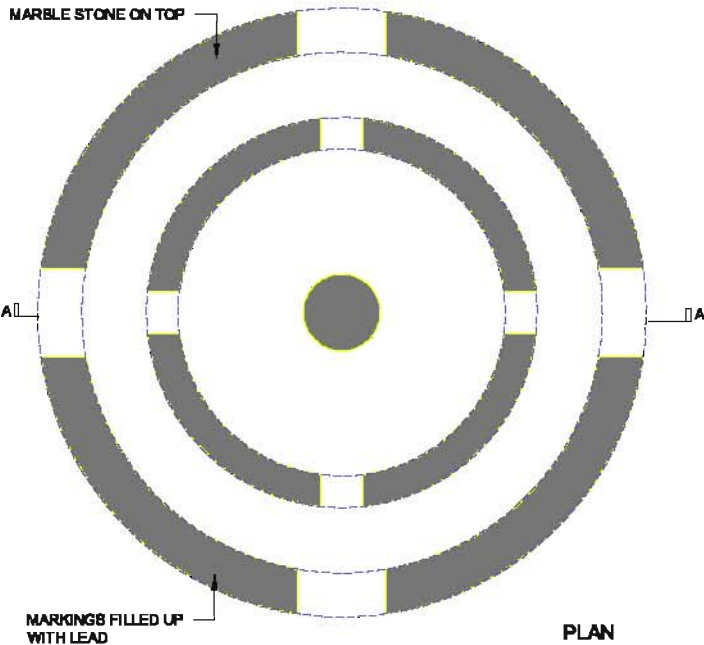
VIEW OF DIGANSHA YANTRA



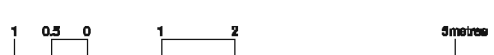
SECTION - AA



WEST SIDE ELEVATION



The instrument consists of three concentric circles each of 360 degrees one inside the other. The center of the circle is marked out by a metal. The instrument has openings in four directions i.e. north, south, east and west. This instrument also used to find out the azimuth of the sun and the planets.



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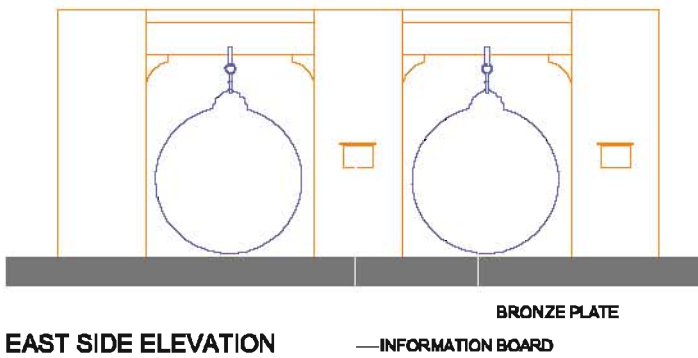
# YANTRA RAJ



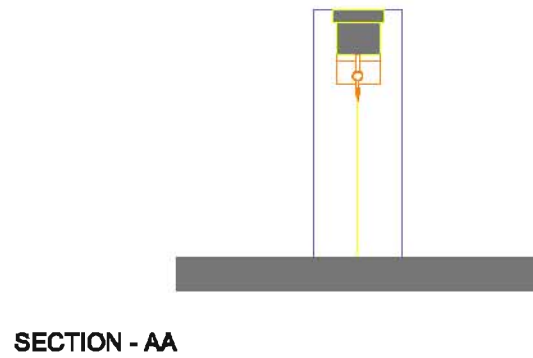
VIEW OF EAST SIDE



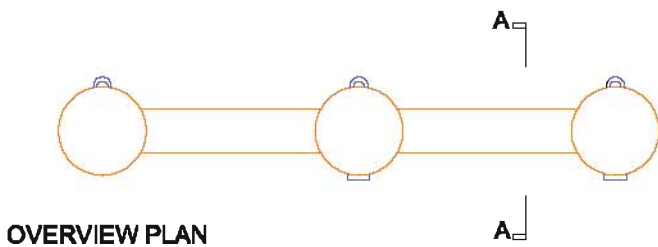
VIEW OF RAJ YANTRA



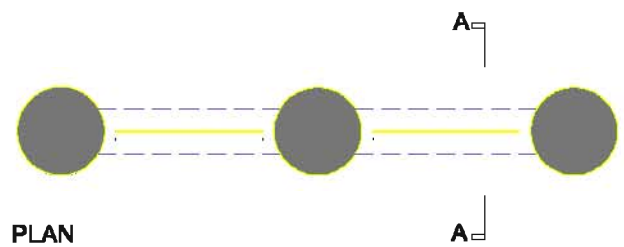
EAST SIDE ELEVATION



SECTION - AA



OVERVIEW PLAN



PLAN

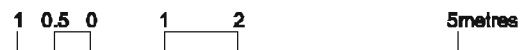
The instrument is a big metallic disk two meters in diameter which hangs from a wooden beam. A hole in the centre shows the position of the pole star 27 degrees below the centre's local meridian which runs north to south.

The 27 constellations are marked out. The outer edge has markings over it which tells the position of the constellations when a tube is placed at centre and constellation is seen through it by moving the instrument and making it plane with the constellation a line drawn adjacent to it on the instrument shows the exact position of that very constellation.

This is also known as the Jantar.

A similar disk is placed adjacent to the earlier one made out of Iron and is known as Mantar. This was used for calculations that were needed for Jantar.

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## RASHI VALAYA YANTRA



VIEW OF RASHI VALAYA YANTRA



VIEWS OF RASHI VALAYA YANTRA

This zodiac instrument is made out of a set of twelve instruments presenting the twelve signs of zodiac. Here the sky is marked out on the ground, hence it is mirror of the sky. Each of the instrument is placed at an angle facing its constellation.

This instrument works in day as well as night. It has got six divisions on one side and six divisions on the other side, one of which works through the light of sun and the rest six works through the light of moon. The markings on the stairs tell us the effect of other zodiac on the particular zodiac to which the instrument belongs.

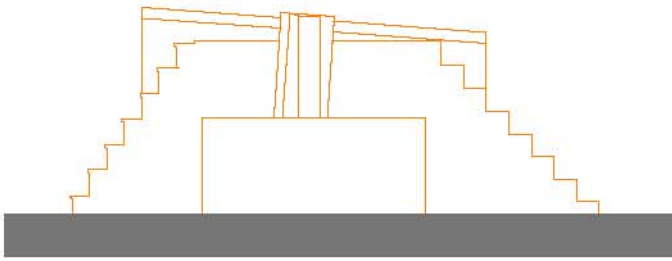
1 0.5 0 1 2 5metres

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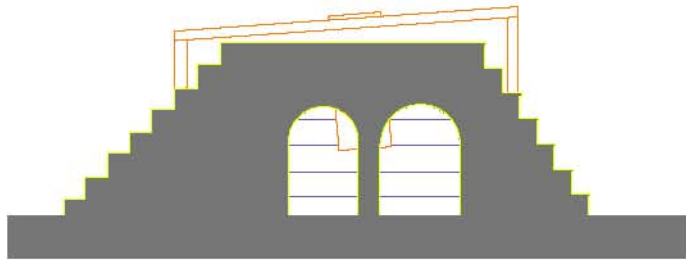




# RASHI VALAYA YANTRA



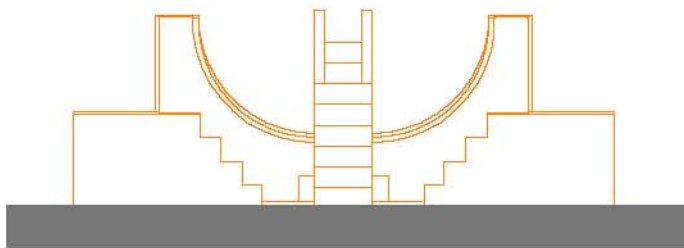
WEST SIDE ELEVATION\*



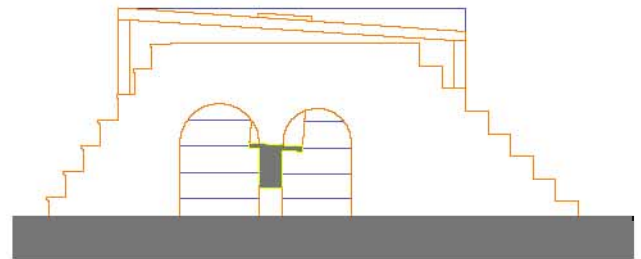
SECTION - BB\*



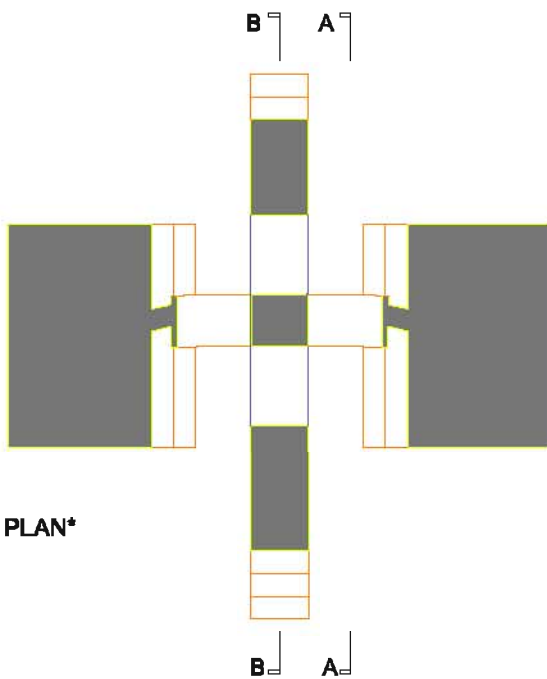
VIEW OF RASHI VALAYA YANTRA



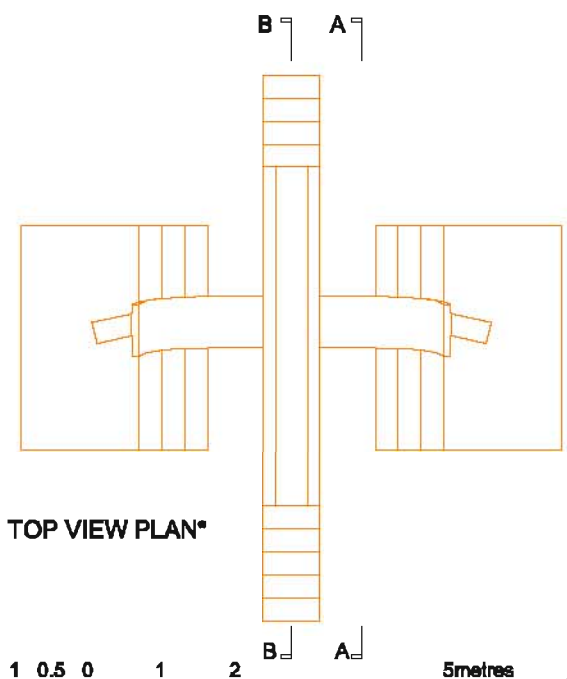
SOUTH ELEVATION\*



SECTION - AA\*



PLAN\*



TOP VIEW PLAN\*

1 0.5 0 1 2 5metres



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SOURCE: RECONSTRUCTED FROM VOLUNTEER ANDEKAR, COSMIC ARCHITECTURE IN INDIA







CAPRICORN, the she goat



PISCES, the fish



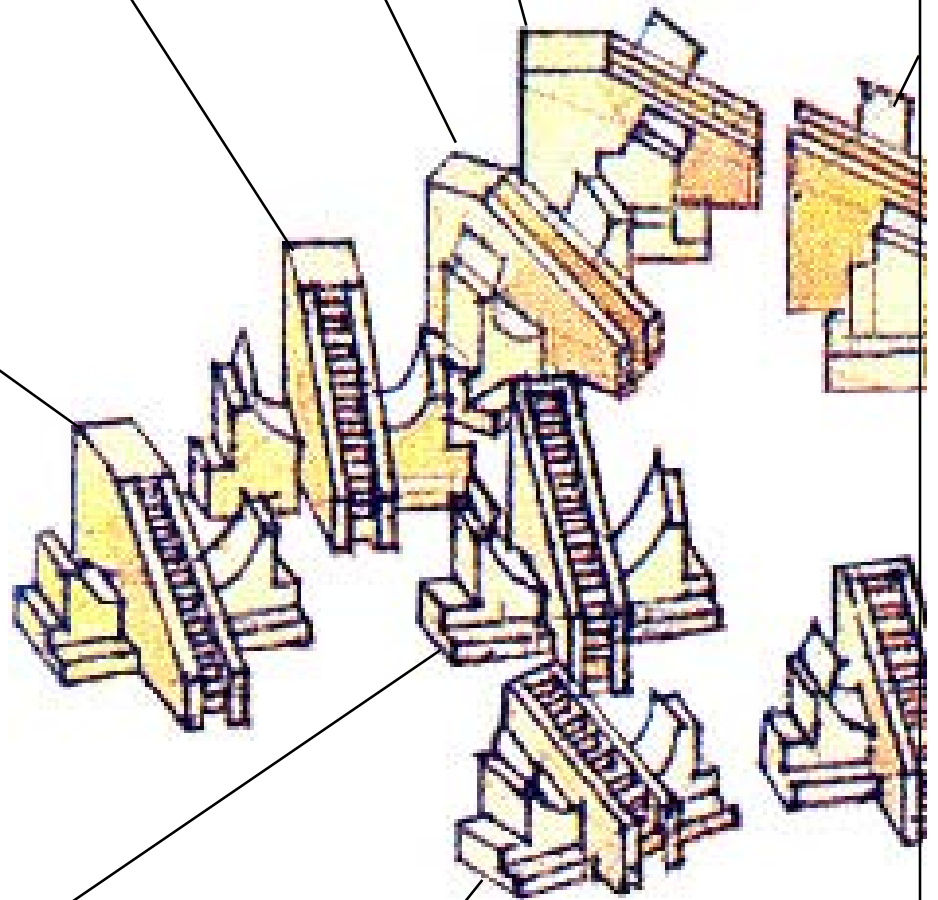
SCORPIO, the scorpion



ARIES, the ram



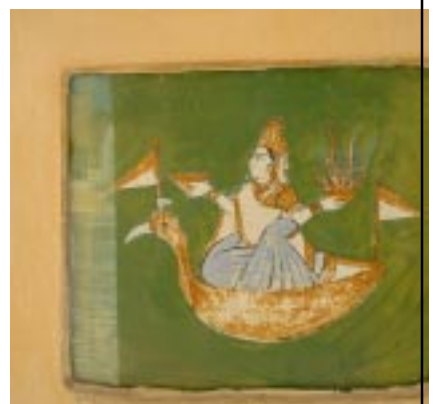
SAGITTARIUS, the archer



LIBRA, the scales



LEO, the lion



VIRGO, the virgin

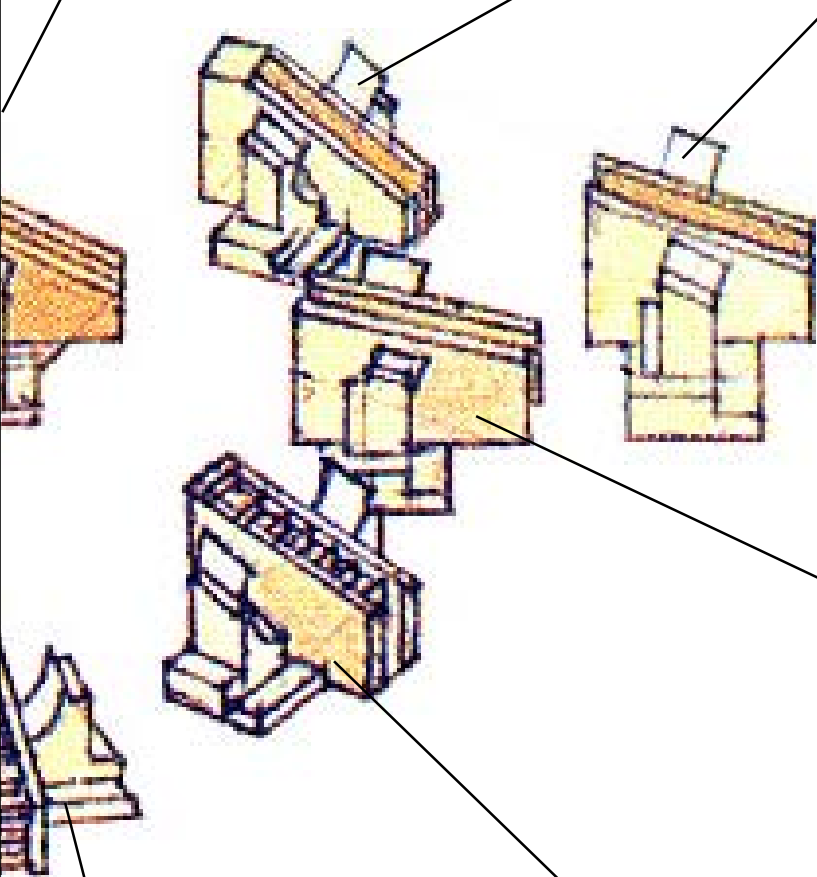


**RASHI YANTRAS OF RASHIVALAYA**

The group of twelve instruments which depict the twelve *Rashis* (Zodiac signs) located on a rectangular platform near the southern wall of the observatory.



AQUARIUS, the water bearer



GEMINI, the twins



TAURUS, the bull



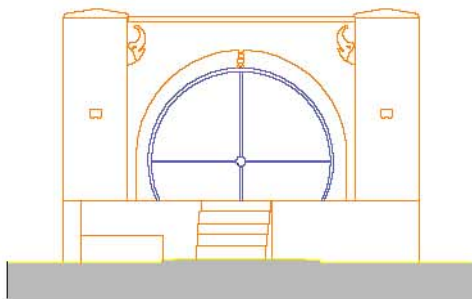
CANCER, the crab



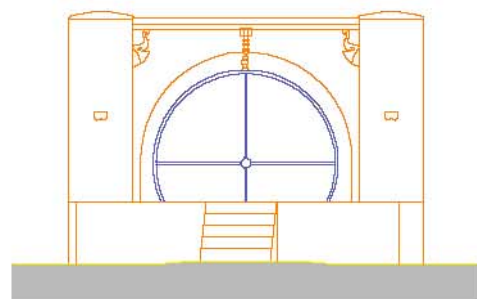
**UNNATANSHA YANTRA**



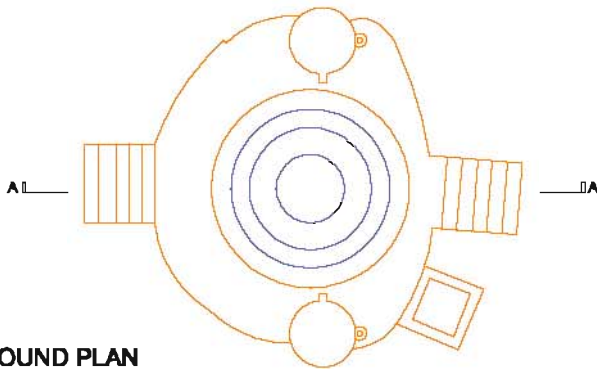
**VIEW OF UNNATANSHA YANTRA**



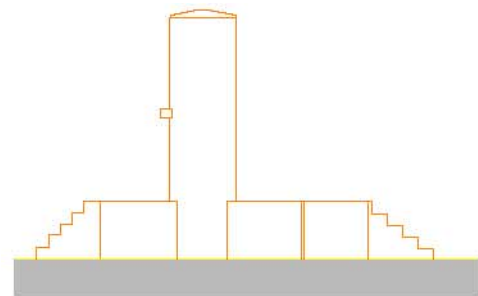
**EAST ELEVATION**



**WEST ELEVATION**



**GROUND PLAN**



**NORTH ELEVATION**



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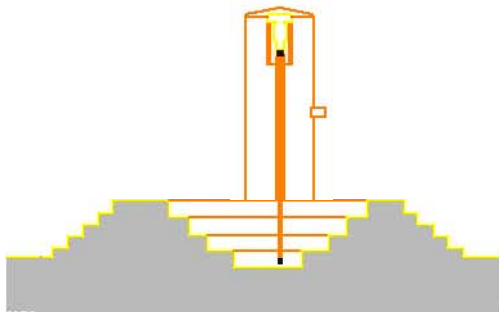
## UNNATANSHA YANTRA



VIEW OF UNNATANSHA YANTRA



VIEW OF UNNATANSHA YANTRA



SECTION -AA



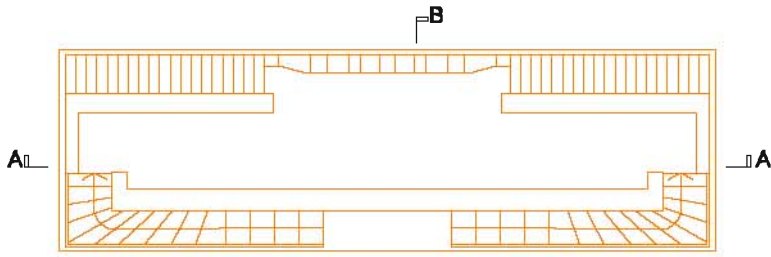
VIEW OF INNER PORTION OF UNNATANSHA YANTRA

This is a circular moving instrument made out of bronze metal of 5m diameter. This yantra was used to determine the positions of stars and planets at any time of day or night. By placing rod or pipe over it and moving it in such a manner that it becomes in plane to the celestial body. It has vertical as well as horizontal lines. The angle of sunset and sunrise as well as the movement of the sun from Cancer to Capricorn can be found out.

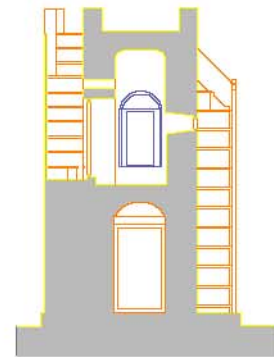
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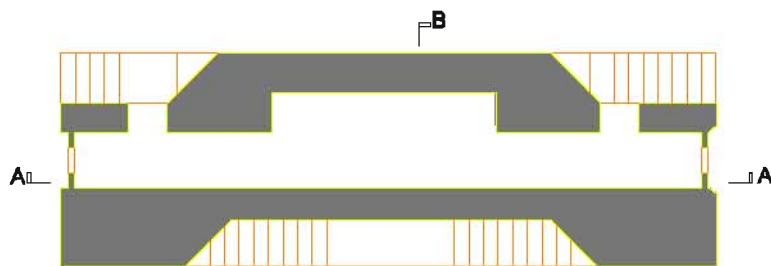
# DAKSHINO BHITTI YANTRA



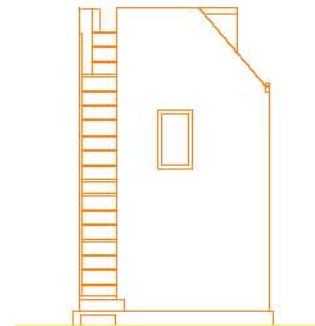
OVERVIEW PLAN \*



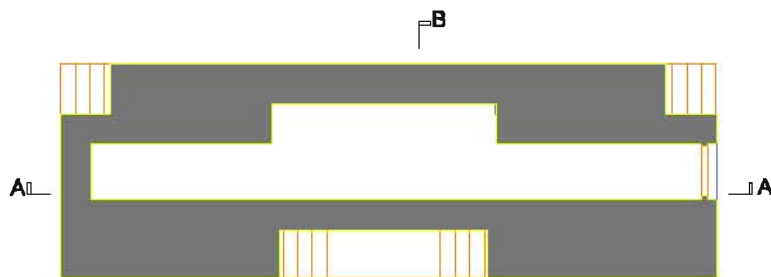
SECTION - BB\*



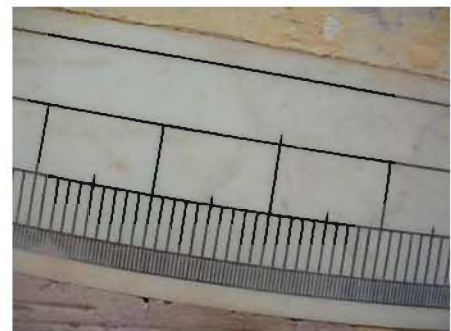
FIRST LEVEL PLAN\*



NORTH ELEVATION\*



GROUND LEVEL PLAN\*



LEAD FILLED UP IN THE MARKINGS

Situated in the north-eastern corner of the observatory. It is made upon a vertical wall built in the plane of the local meridian. The centre of the 180 degrees semicircular shape drawing has markings of 90 degrees on either side. The centre of the semi-circle has an iron rod which casts its shadow helps in finding out the altitude and zenith of sun when it crosses local meridian in afternoon.

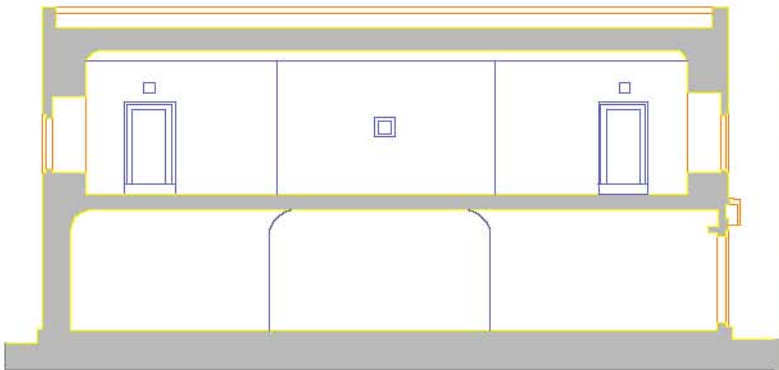
This is an example of building instrument which allows measurement to be taken at a certain time, but which eliminate errors in orientation through being fixed.



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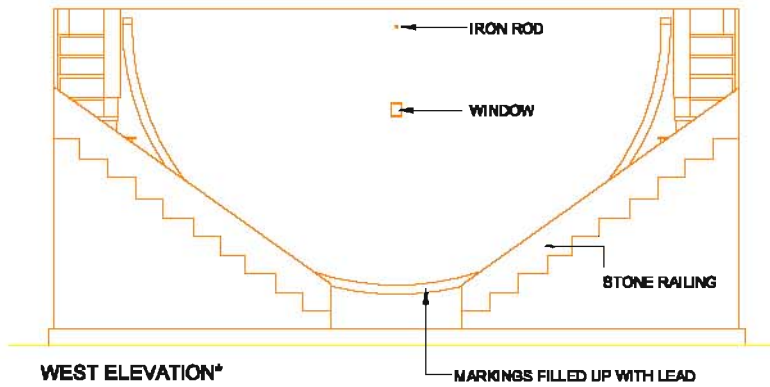
# DAKSHINO BHITTI YANTRA



SECTION - AA\*



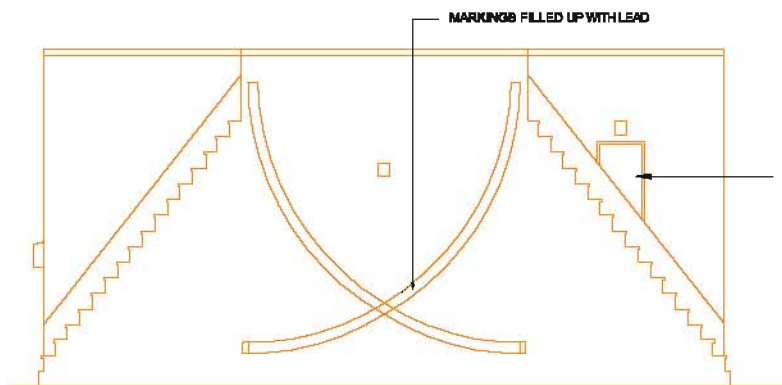
VIEW OF DAKSHINO BHITTI YANTRA



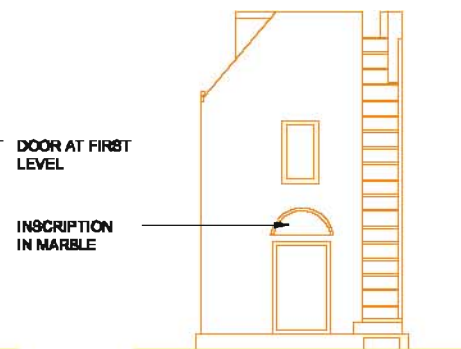
WEST ELEVATION\*



VIEW OF DAKSHINO BHITTI YANTRA



EAST ELEVATION\*



SOUTH ELEVATION\*

2 1 0 2 8 metres

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a. The observer's cabin

**b. Ancillary structures**

The built form of Jantar Mantar has been fascinating people around the world resulting in a large number of visitors. Apart from the yantras, there is an office in the middle of the complex. It is a small square box like structure with some openings. This structure was the office of the person who was to monitor these yantras. It is an observer's cabin. None of the other structures on the site (the yantras) have any semblance to buildings. No elements like openings, chajjas etc. exist. In some cases, there have been later additions in form of doors.

What was earlier an observatory is now a tourist monument. To accommodate the requirements of the new function, some buildings were constructed within the complex in the recent past. These include a ticketing office, toilets and museum.



b. Toilets: poorly made and badly maintained



e. The new structure on the eastern end of the site with stone chattris on the terrace - an attempt to connect to the architecture of Rajasthan. Though it fails to connect to the architecture of the complex, it can be seen as a positive aspect: it remains distinct and not imitative in that sense.



c, d. The entrance area with the ticket window. No ambience; cluttered with railings, poor signage.





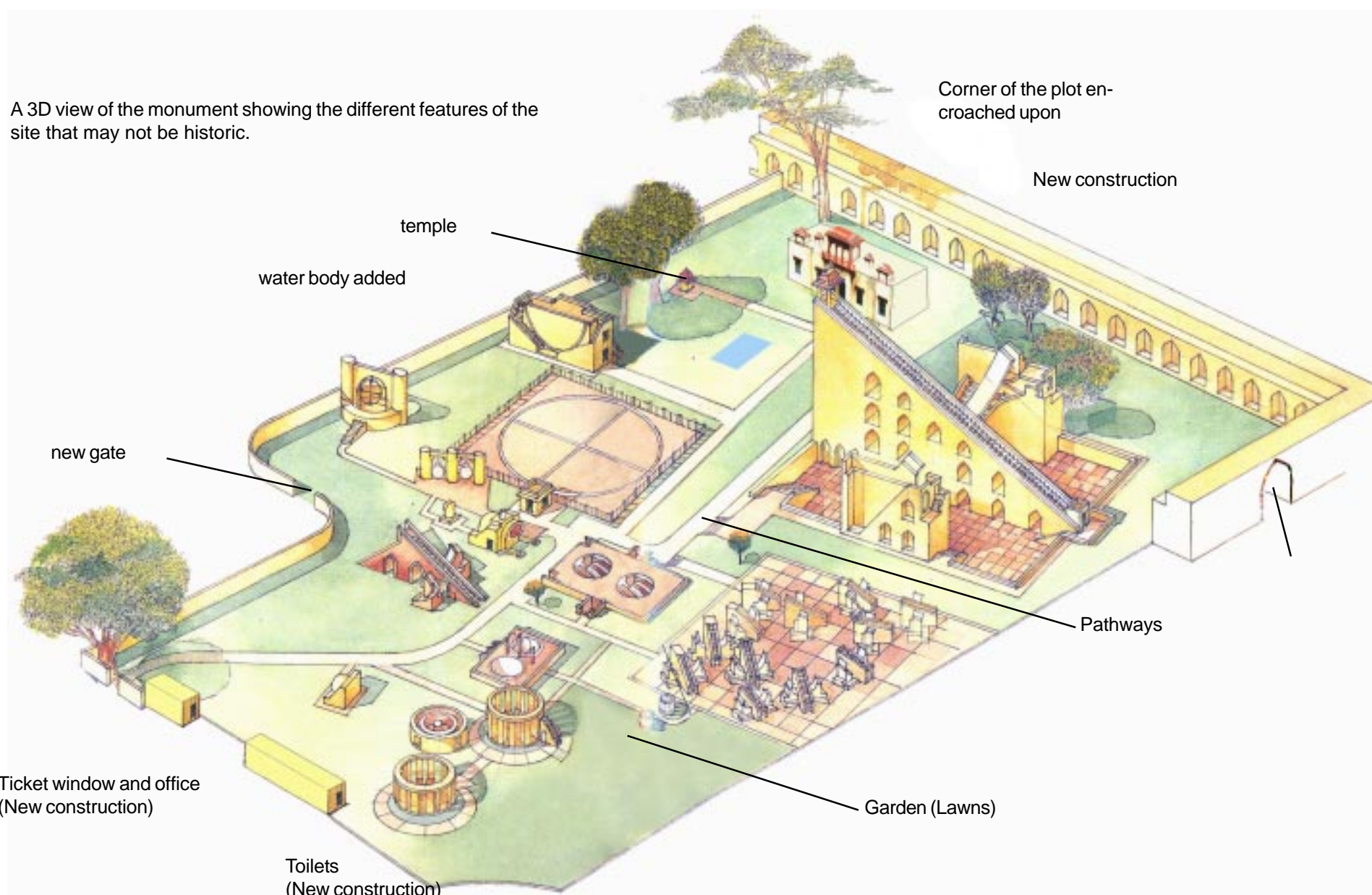
Public facilities like toilets have been randomly placed and are in a bad condition. They smell bad and cause irritation in the area. They are crudely made with some attempt to disguise them by using traditional motifs on the parapets. And yet they are located on the main axis of the complex.

The other building on the site is a structure that holds a large hall with supporting rooms. It was built to house a museum. It is lying vacant and has been used as a site office for this report. It is placed on the extreme eastern end and is articulated with pavilions and arched openings. It is plastered and coloured the same as the yantras. Some of the elements like the chatris are in red sandstone. It is same colour as the paving. This particular building sits on one end of the primary axis of the complex and is incongruous with the simple architecture of the complex.

There are two small temples on the site that have come up over a period of time. At the moment they are very small, and in general do not disturb the skyline of the complex. These are not operational on a day to day basis for public activity but are tended to by specific people occasionally. Mostly they remain locked up.



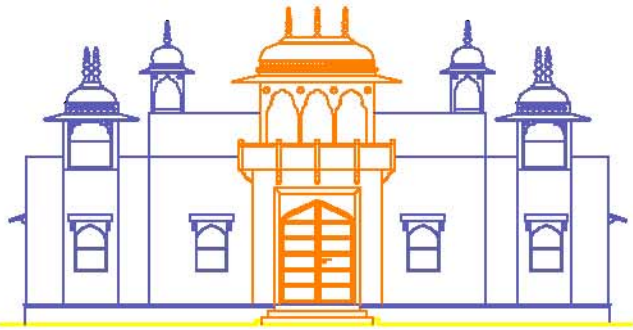
a. A temple in the north east corner of the site.



A 3D view of the monument showing the different features of the site that may not be historic.



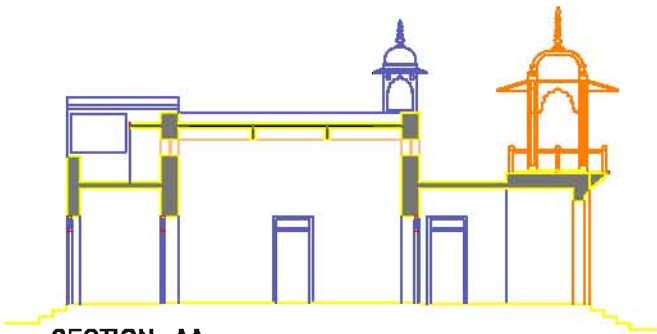
**MUSEUM AREA**



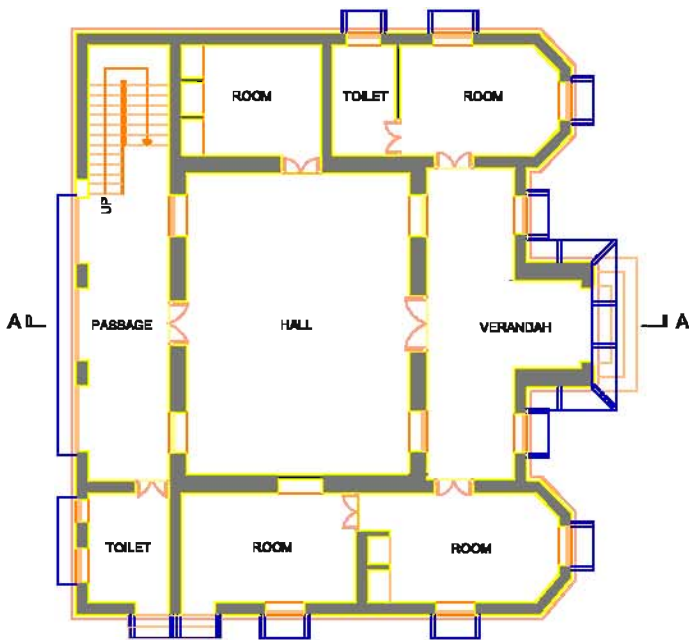
**ELEVATION**



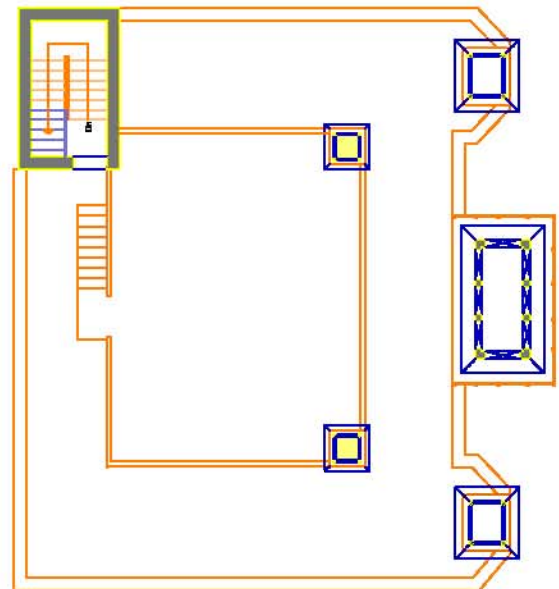
**VIEW OF MUSEUM BUILDING FROM TOP OF GREAT SAMRAT YANTRA**



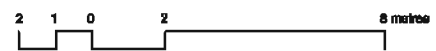
**SECTION - AA**



**GROUND FLOOR**



**FIRST FLOOR**



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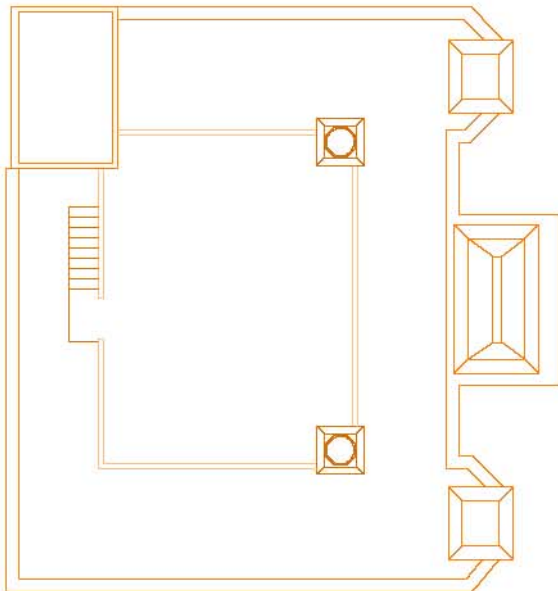




# OFFICE BLOCK



VIEW OF MUSEUM BUILDING FROM TOP OF GREAT SAMRAT YANTRA

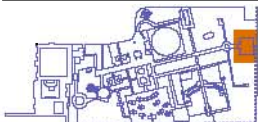


TERRACE LEVEL

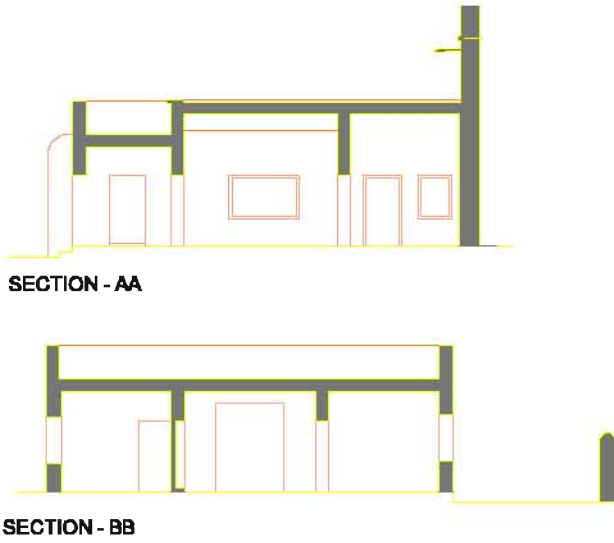
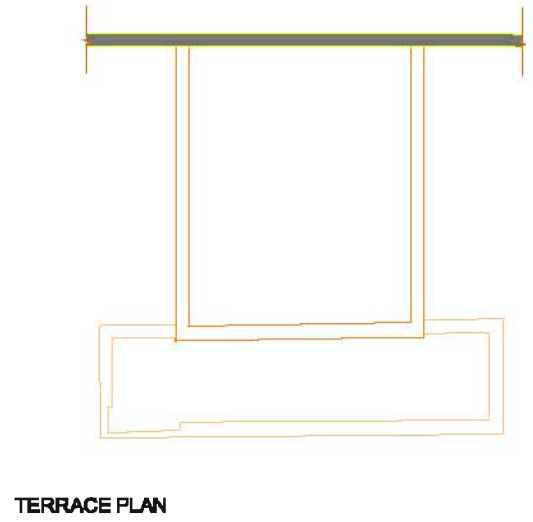
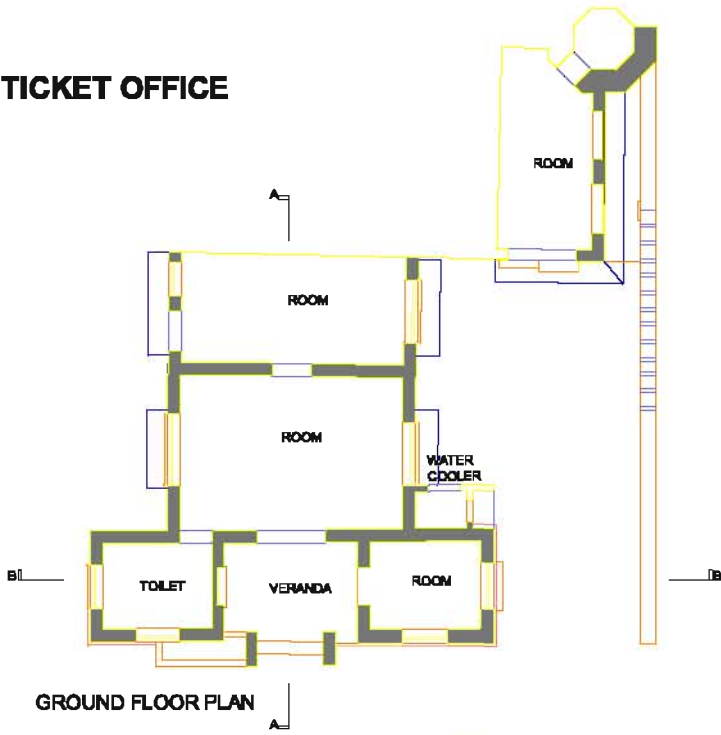
The museum building which is a later addition lies unused. The language of this building is incongruous to the buildings built in this complex. Lying on the main movement axis it forms the visual focus - which is subdued by the presence of two large trees in front.



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**TICKET OFFICE**



View of Ticket office



View of Water-cooler area



View of ticket office

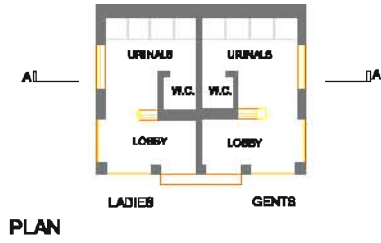


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# TOILET BLOCK



View of dump yard



View of toilet block and exposed electrical meter box



View of toilet block



View of toilet block



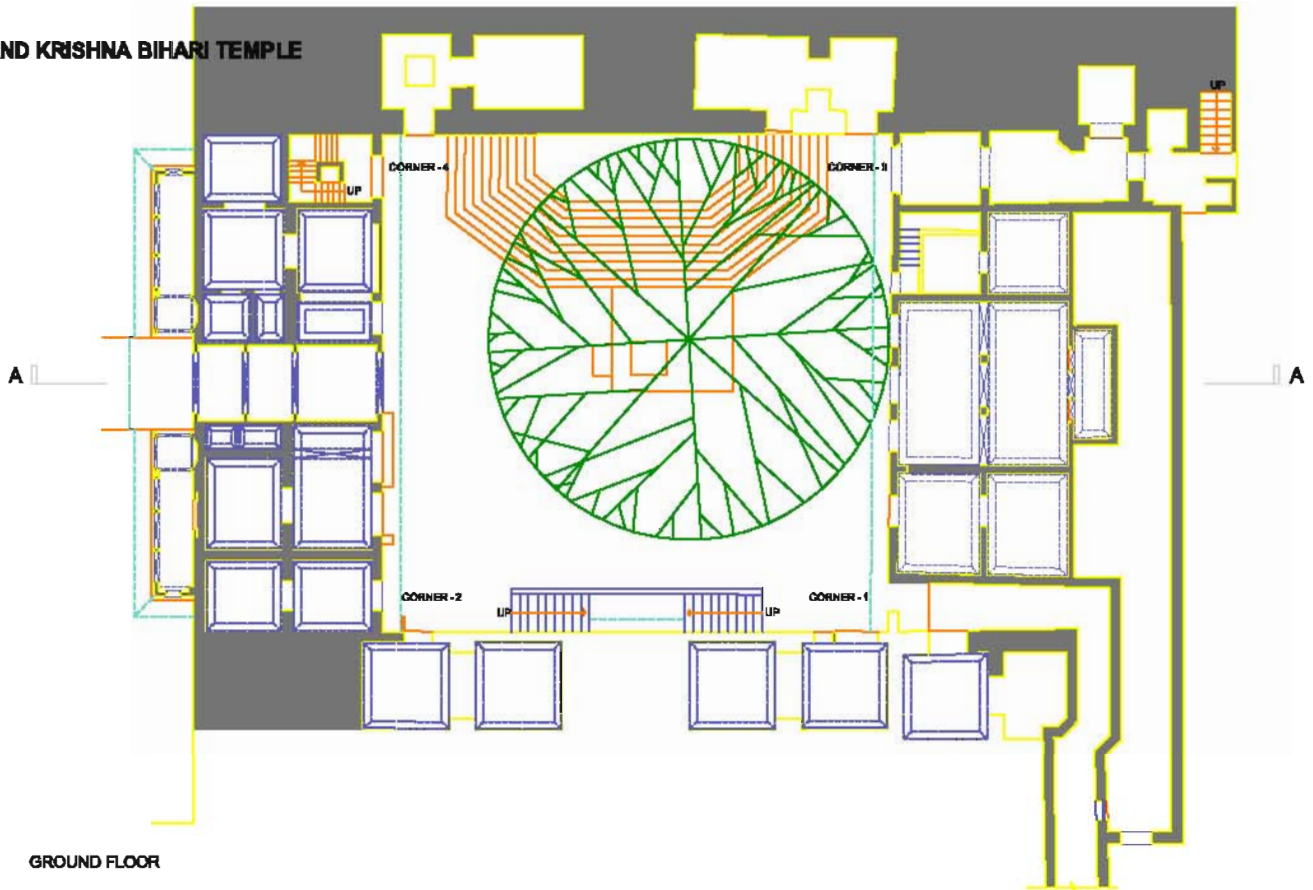
View of toilet block

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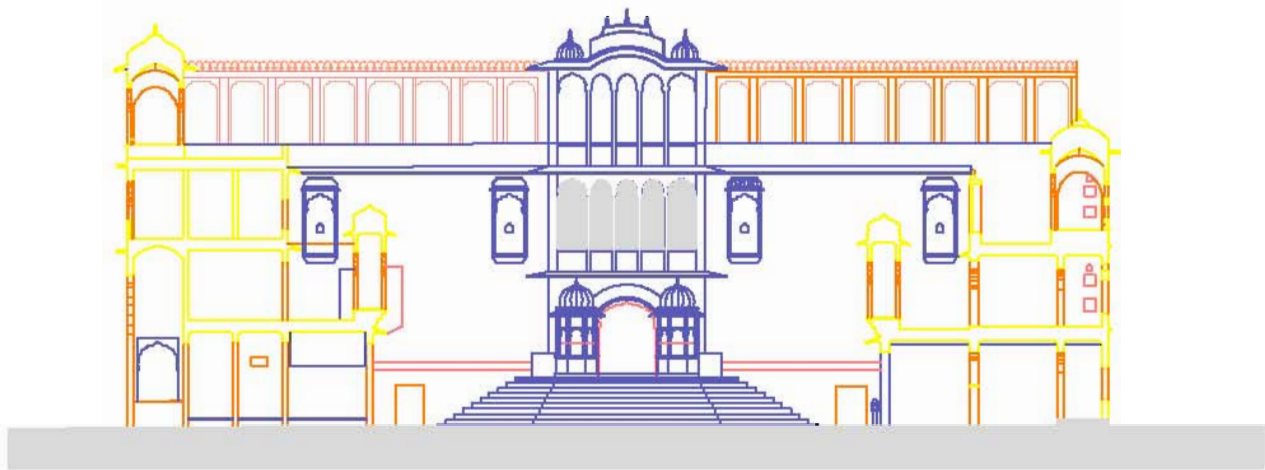




## ANAND KRISHNA BIHARI TEMPLE



GROUND FLOOR



SECTION -AA

### Anand Krishna Bihari Temple

This temple is a havell temple abutting the western boundary of the complex. It is still being used as a temple though much of is a dilapidated state. Some families also use the premises as residences. A pedestrian pathway moves along the complex through the temple courtyard. This pathway connects from a small lane in the south to the Chandni Chowk in the west. The main entrance is from the Chandni Chowk.

The temple has a series of courtyards like a house in the city. The scales of the courtyards vary from being residential to institutional. It has some wonderful views of the Jantar Mantar complex and the Hawa Mahal complex.

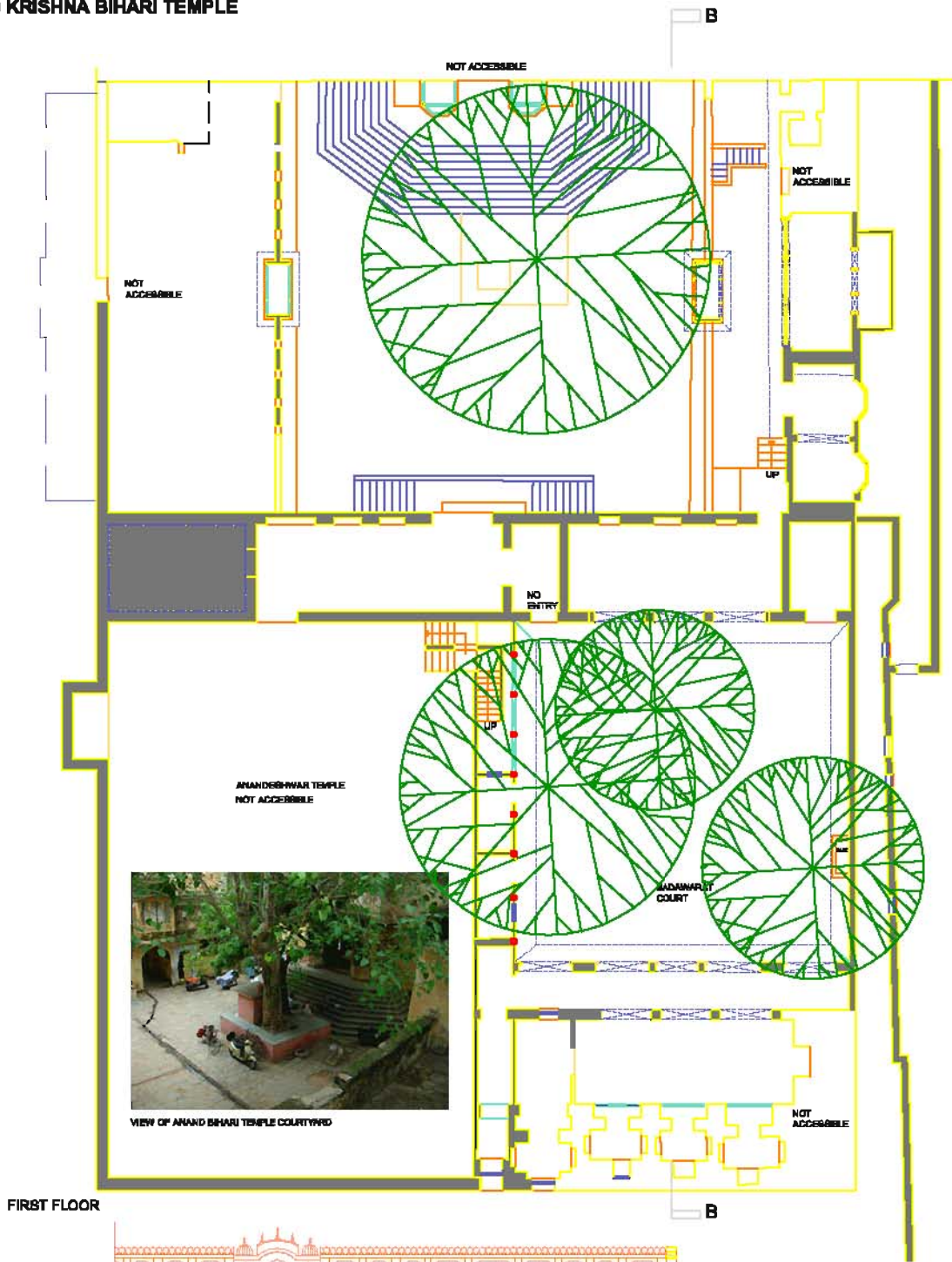
2 1 0 2 8 metres



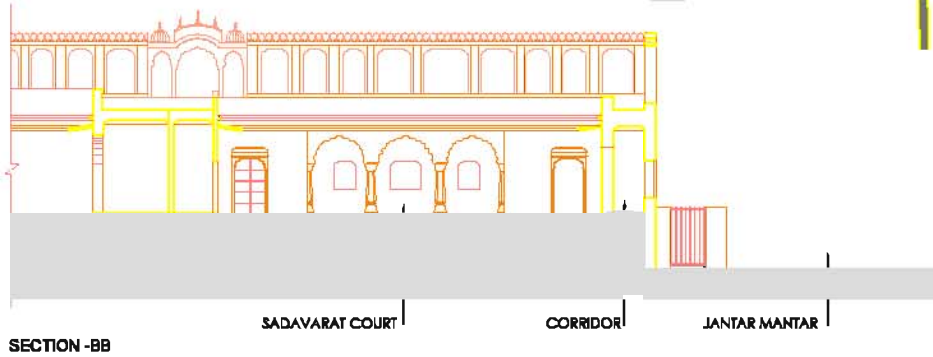
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**ANAND KRISHNA BIHARI TEMPLE**



**FIRST FLOOR**

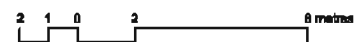


**SECTION-BB**

SADAVARAT COURT

CORRIDOR

JANTAR MANTAR

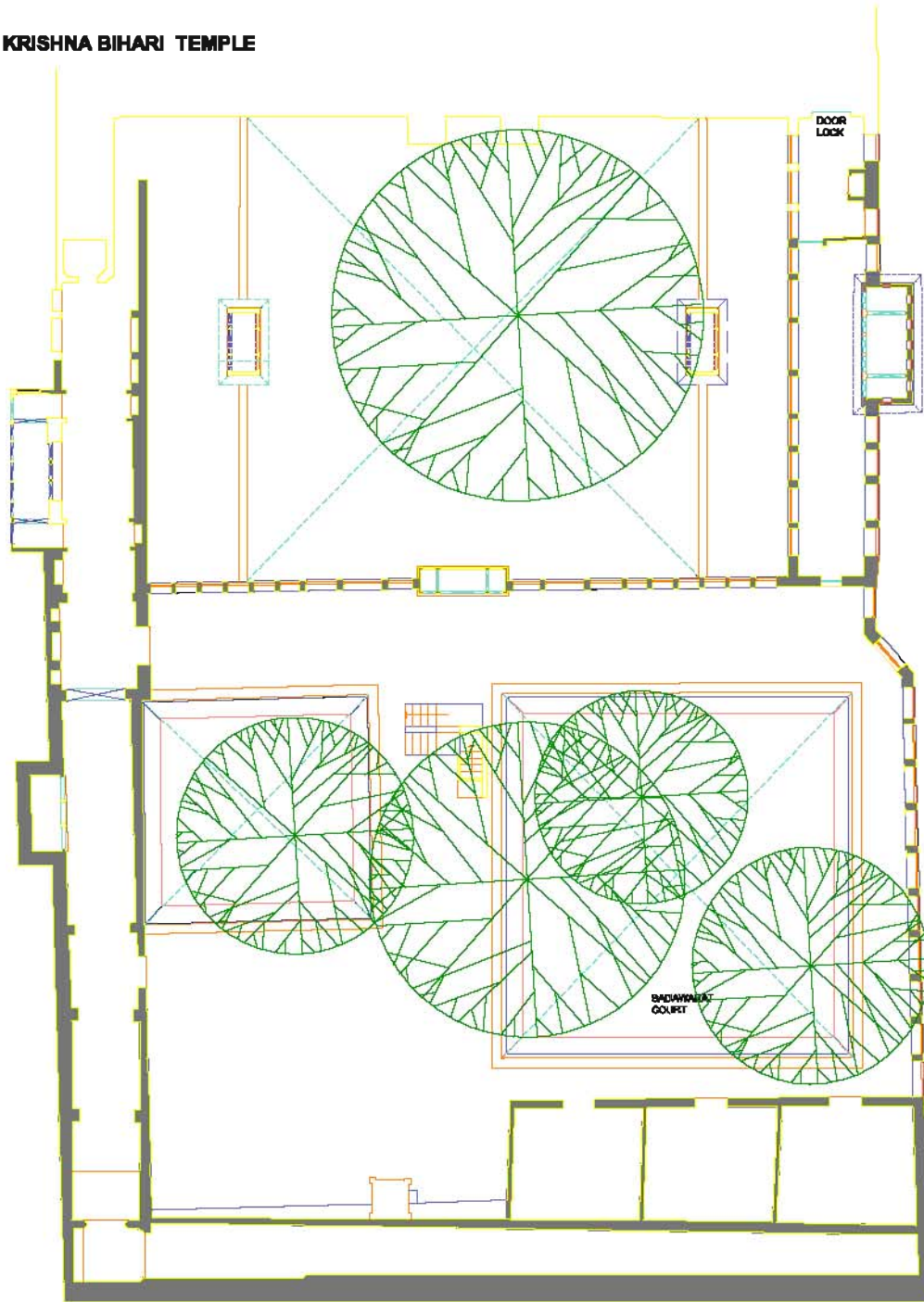


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**ANAND KRISHNA BIHARI TEMPLE**



**SECOND FLOOR**



**VIEW OF CHHATRI**



**VIEW OF SADAWARAT COURT**



2 1 0 2 8 metres

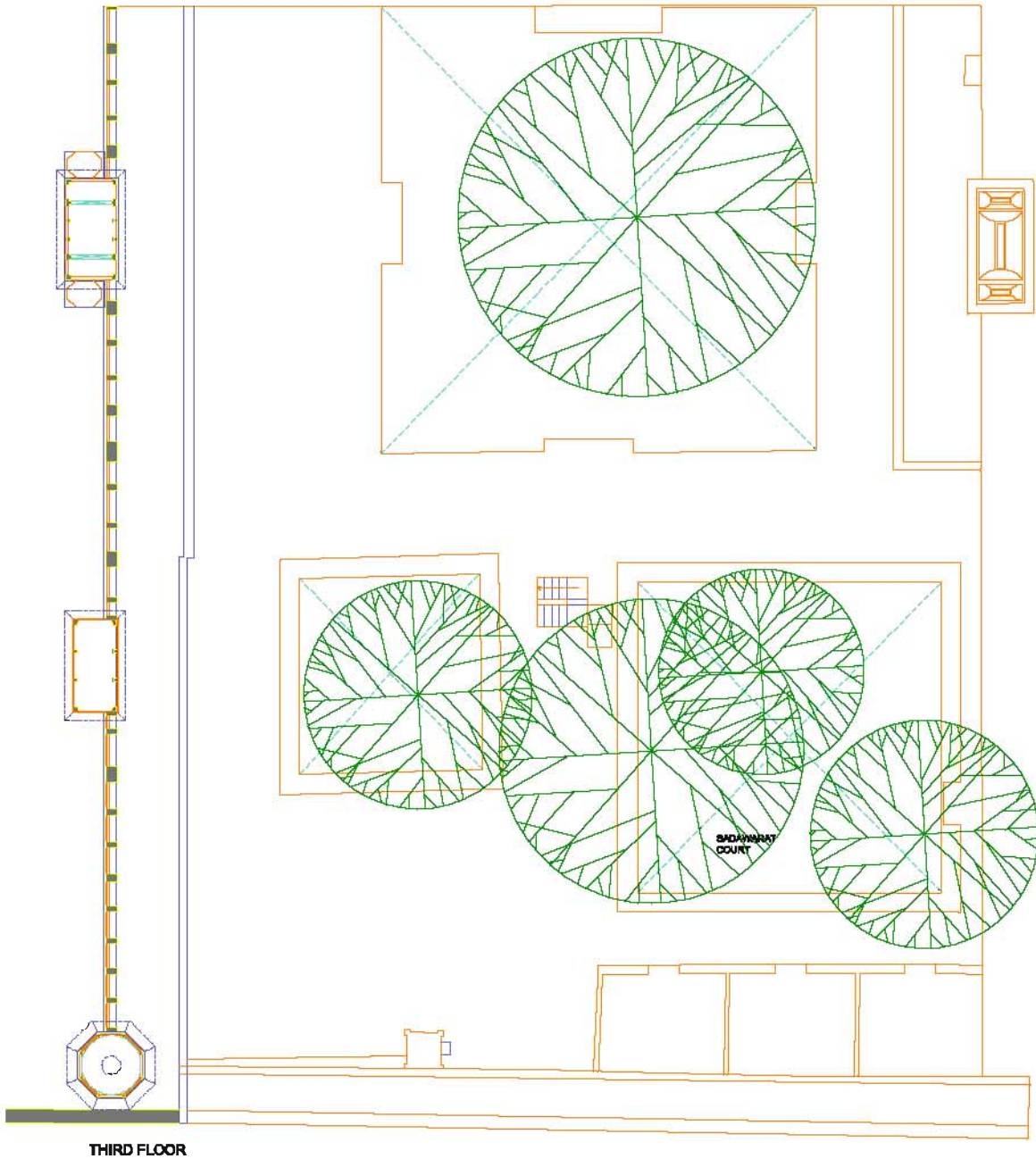


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**ANAND KRISHNA BIHARI TEMPLE**



**VIEW OF SADAWARAT COURT**



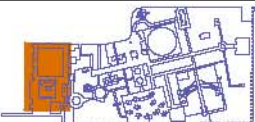
**VIEW OF ANANDESHWAR TEMPLE COURT**



**VIEW OF ANANDESHWAR TEMPLE COURT**



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**CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX**  
**THE BUILT ENVIRONMENT - PRESENT STATUS**

final report-B

m/s minakshi jain architects, ahmedabad







a. The lintels in the Digansha Yantra are cracking and need attention



b. Uneven plaster patches.



c. Structural damages like cracking of the loadbearing timber beams in Yantra Raja.



d. Ponding and improper water drainage systems causing water seepage



f. Algae formation due to water run off



g. Cracks

### III. TYPICAL DAMAGES

#### a. General Aspects

The reconstruction of 1901, under the supervision of Lt. R.E.Garret and Pandit Chandra Dhar Sharma Guleri, Pandit Gokul Chand Bhawan, and subsequent efforts towards maintenance during the British period as well as later has helped avoid major structural damages to the Yantras. However, deterioration has set in and if immediate preventive measures are not taken, it could lead to further damage.

Damages on the site can be broadly categorised as those to the yantras themselves and damages to the landscape, other buildings, services etc. Within these broad categories, there are damages due to weathering, due to human intervention like vandalism as well as incongruous structures and due to ageing of material. Combined, they present a picture of general apathy. The monument is standing mostly due to its own strength and ability to withstand the forces acting upon it.

The damages on site are listed as following:

- a. Structural damages
- b. Damages to finishes
- c. Damages to calibrations
- d. Graffiti and garbage
- e. Staircases
- f. Later additions
- g. Landscape elements

#### a) Structural Damage

The yantras have by and large not sustained major structural damages. The reasons for the structural damages depend upon several conditions.

i) Ageing of materials: At places, wooden structural elements have been used to support some yantras like the wooden beams in the Unnatansha Yantra. These beams have deteriorated over time and the brass instruments are precariously positioned. One is structural which requires immediate attention and other is to the surface plaster in terms of cracking, peeling of the plaster, efflorescence, badly repaired plaster showing patches etc.

ii) Differential movement in foundation due to water seepage. The yantras are surrounded by gardens all around them. These are watered very frequently and therefore a lot of water percolates into the ground. Since these foundations would not have been designed for this kind of water seepage, they tend to settle unevenly depending upon the soil conditions. This causes cracks to develop in the structures. Water seepage is also through ponding in the paving which has not been done properly. This also exerts pressure on the walls of the yantras as can be seen in the Great Samrat Yantra. Most of this damage is still minor and can easily be stabilized before any major loss occurs.





## b) Finishes

Most of the yantras are plastered and painted over stone. In some cases, the stone masonry is left exposed. Damage to the surface would eventually lead to the damage of the load bearing stone masonry.

**Plaster:** The plaster is damaged in many places. Either it is flaking off or surface cracks have appeared in it. If not checked, it could lead to greater damage to the structure since the protective layer is damaged. There have been attempts to repair some of these but without cognisance of the original material such that it becomes ungainly.

**Efflorescence and dampness:** There is also a problem of efflorescence due to dampness and water seepage. This causes ugly patches to appear on the surfaces. If left unchecked, the efflorescence is likely to cause further damage to the plaster and eventually to the stone beneath. This is different from the age patina which is a natural part of the ageing process and is not to be considered



a, b. Dampness from water percolation will eventually weaken the structures leading to structural failure.

**Spotting due to algae.** There is no proper system of draining off the rainwater from the instruments. This is a problem of the original design. Or maybe since, these did not have many horizontal surfaces nor were these instruments to be occupied, this may not have been an issue. However, today, the rain water runoff is causing algae to collect in patches and damaging the surface.

**Flaking of the stone** is another problem that is found in many places in the complex. It is particularly prevalent in the areas that are immediately adjoining the gardens or are underground. In both the cases there is a direct contact with the surrounding ground. Though the flaking is on the surface at the moment, if not checked, it will eventually erode the stone.



c. The water runs off on the surfaces of the yantras damaging the supports



d. The chipping away and cracking of the plaster will eventually lead to damage of the yantra as the support becomes weak.



e. Replastering has not been matched with the earlier plaster



f. Efflorescence on the stone surfaces



g. Stone flaking

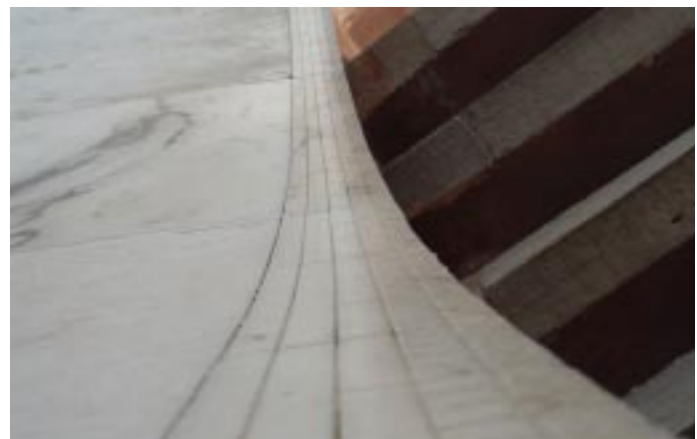




a. Lack of proper rainwater drainage causes damage to the markings.



b,c. Due to time and effects of weathering, the marble on which the calibrations are made is wearing away. This causes loss of the markings.



d, e. The lead filling in the calibrations has come off leading to their deterioration

### c) Calibrations and other elements of the instruments.

The reconstruction in 1901 made a huge contribution by remaking the calibrations of the instruments on a very good quality hard marble. However more than a century has passed and these remain exposed to all the forces of nature. And over time some damages have occurred.

Though there is very little horizontal surface, most of it is covered by the markings. And there is no proper rainwater drain system which allows the accumulation of water in the indentations of the markings. On the other hand, the runoff is also not controlled resulting in algae formation and deterioration of the supporting system of the yantras. The most critical is that the fine markings are getting weathered and the lead infills in them have been lost. These need to be redone so as to protect the accuracy of the readings.



f. The elaborate marking system on the marble is the most crucial element of the yantras. The accuracy of the yantras is greatly dependent on these markings. They have to be treated delicately since they remain exposed to the forces of nature at all times.





Some recent repairs have been done to hold the marble pieces together. These have not been done carefully. Neither the materials have been matched nor is the method appropriate. It is a difficult situation to try and repair these yantras, especially their marking. The efforts in repairs have resulted in the markings getting covered by cement or other construction materials. Some breakage has also occurred.

Sometimes, in an effort to protect the elements of the yantras, like the poles whose shadows give the readings, they have been covered with barbed wire, cages etc. Though these do protect to some extent, they mar the beauty of the yantra. At times to anchor these protection, dents and holes have been made on the yantras.



a,b. White cement has been used to repair the separation of the marble pieces which have markings on them. In the process, they become ugly spots on the yantras. Also, the markings have been covered.



c,d. The repair of the markings has not been done properly



e. The cables which mark the azimuth in the Great Jai Prakash Yantra have been fixed with poor details.



f. The central pole in the Great Rama Yantra covered with barbed wire to prevent vandalism. While intentions are appreciated, the methods are questionable. Similarly the cage over the pin on the Narivalaya Yantra.





a,b. People use their feet to shake the cable of the yantra to show the movement of the shadow. They also step onto the markings of the yantra. This is a gross misuse and should not be allowed at all.

#### d) Graffiti, garbage and vandalism

Another major cause for worry is the disrespect shown by people. Many visitors scribble their names on the yantras, particularly in areas under the arches. The scribbling is done either with a sharp object or with pens. In the process, they also damage not only the surface but also the plaster. Though there are guards present on the premises they are not enough nor are they adequately trained.

A most common factor causing damage to the calibration is in form of vandalism and misuse. The visitors step on the markings of yantras. They climb all over the yantras almost like they were elements of a children's playground. This is a gross disrespect of the yantras and must be controlled.

Observations also revealed a lack of proper cleaning of the premises. Empty plastic bottles, garbage etc. is dumped in corners and in the dry water body.



c. Scribbling on the plaster surfaces with sharp objects.



d. Dumping in closed rooms and corridors



e,f,g,h. Garbage lying around the premises.







a. The parapet of the stair has cracked considerable. The parapet will most likely collapse if not repaired urgently

### e) Staircases

The staircases are an important architectural element of the yantras. Considering the scale and size of the yantras, staircases were made to access them. They were converted into a tectonic element contributing to the form of the yantras. However, these staircases were not meant to be used by a large number of people but mostly by the astrologers and related people. With the opening up of the monument to a larger number of people, the staircases undergo a lot of wear and tear. This has resulted in them being damaged. At many places they have got cracks. The plaster has peeled off. The edges of the treads suffer the most.

At some places the parapet has also been damaged. Once again the immense human traffic has caused the maximum wear and tear.



b. The surface plaster of the parapet has worn away exposing the stone



d. Deterioration of the parapet



c. The nosing of the stairs is most vulnerable to the movement of the people. They have worn away at most places.



e. Wear and tear of steps





a. An arched opening in the yantra closed and a doorway made to access the portion behind.



b. Some openings closed.



**f) Later additions**

Since these yantras do not have any particular use as habitable spaces, and have a very strong form by themselves, they have been saved from much additional constructions. There are some instances where the openings and spaces within the structure have been closed and sealed.

Historically there were some rooms below the Jaiprakash yantra with 10 stairs leading to the chambers below. However, due to management problems these were closed down many years ago and not much trace of that remains.



c,d. The openings on one side of the Samrat Yantra are still open while those on the other side have been sealed.



e. An overall view of the entrance area showing the many disparate elements of the landscape disturbing the experience of the complex. The hedges, railings, and plantations are all placed randomly.





**g) Landscape elements**

Elements like pathways, railings, furniture, dustbins, gardens and plantations all constitute the landscape aspect of the complex. The attitude towards their making in this complex has been more like a public garden than a historic monument.

There are nice mature trees on the site. They may not have been there historically, but they provide some relief to the stark landscape and also shade some areas.

The pathways in the landscape have been recently surfaced. However, the surfacing is not evenly done leading to a lot of ponding. This becomes critical, especially in monsoon, since a lot of seepage is already taking place from the gardens.

The gardens, while providing relief in the stark landscape, cause a lot of seepage into the foundations of the yantras which may not be designed for that. It is already causing a lot of efflorescence as seen earlier.

Railings have been provided more to control visitor movement than protect the yantras since at many places in any case the people step over the yantras. The need for railings and their design needs to be reassessed.

Street furniture constitutes elements like lampposts, dustbins, seats (if any).



e. Ponding in the pathways will eventually damage them.



a. This umbrella like structure does not have any function. Such elements may be small but are part of the experience.



b. Flowerpots used as dustbins. And yet another plastic dustbins also placed with it.



f. Gardens too near the yantras will lead to weakening of their foundations.



c,d. The curbing, railing and pathways all constitute the total ambience of the complex and are at the moment badly made and not maintained.



g. Railings to control the crowd at the entrance area. Disturbs the experience.





a. The tourist office outside Jantar Mantar is hardly ever used and is more a disturbing element than contributing to the ambience.



b. Souvenir and facility shops outside the monument are random and clutter the area. They do not follow any system of signage, display and disturb the historicity of the area.



c. The kind of drinking water facility available in the complex does say much for quality of amenities. It clutters the area around the ticket window and makes it dirty.

#### IV INFRASTRUCTURE

Most of the infrastructure of the complex was done at a later stage, primarily to assist in its function as an important tourist destination. Water supply and drainage lines were laid as also the electrical works. Most of the piping has not been concealed. This mars the beauty of this monument. It must be concealed.

##### a) Facilities:

To bring the monument to international standards, it is important to improve the infrastructure and quality of the supporting facilities provided to tourists. With changing times, the tourists are becoming more aware of the monument and its history. A discerning visitor wants more from the monument than just a walk around the yantras. Presently, no such facilities exist except some toilets and an open drinking water area. These too are badly located (on main axis or right at the entrance) and badly made.



e. The entrance gate is very small and the area in front of the ticket window is not large enough for large numbers. Ticket checking is further with a number of twists and turns causing bottlenecks. All these aspects need to be smoothened.



d. The entrance area has very beautiful trees but the area is not properly planned for facilities.







a. The small entrance gate: a constant bottleneck



c. Toilet block on site, with an electric pole. Priests hang clothes in devasthan property which overlooks the complex. These elements disturb the historicity of the complex and need to be removed.

**Recommendations:**

A tourist facilitation centre is to be provided. It shall include an information centre, some souvenir shops, cafe, waiting areas, and amenities. It shall also house the administration. It will be located at the site of the present ticketing office and will also be an entrance plaza.

**b) Water supply and drainage**

The water supply and drainage in the site is at two levels. One is for the gardens where water connections have been given at several points to facilitate watering. The other part of the service goes to two buildings on the site, namely the ticketing and toilets and the museum. The piping and resultant junctions has caused a lot of problems.



d. Washing area right in front of the entrance. It is also not properly made leaving lot of dampness and wet area.

e. The piping is exposed at many places disturbing the experience.

Improper fixing of pipes has caused seepage and leakage at many places. This could become a health hazard.



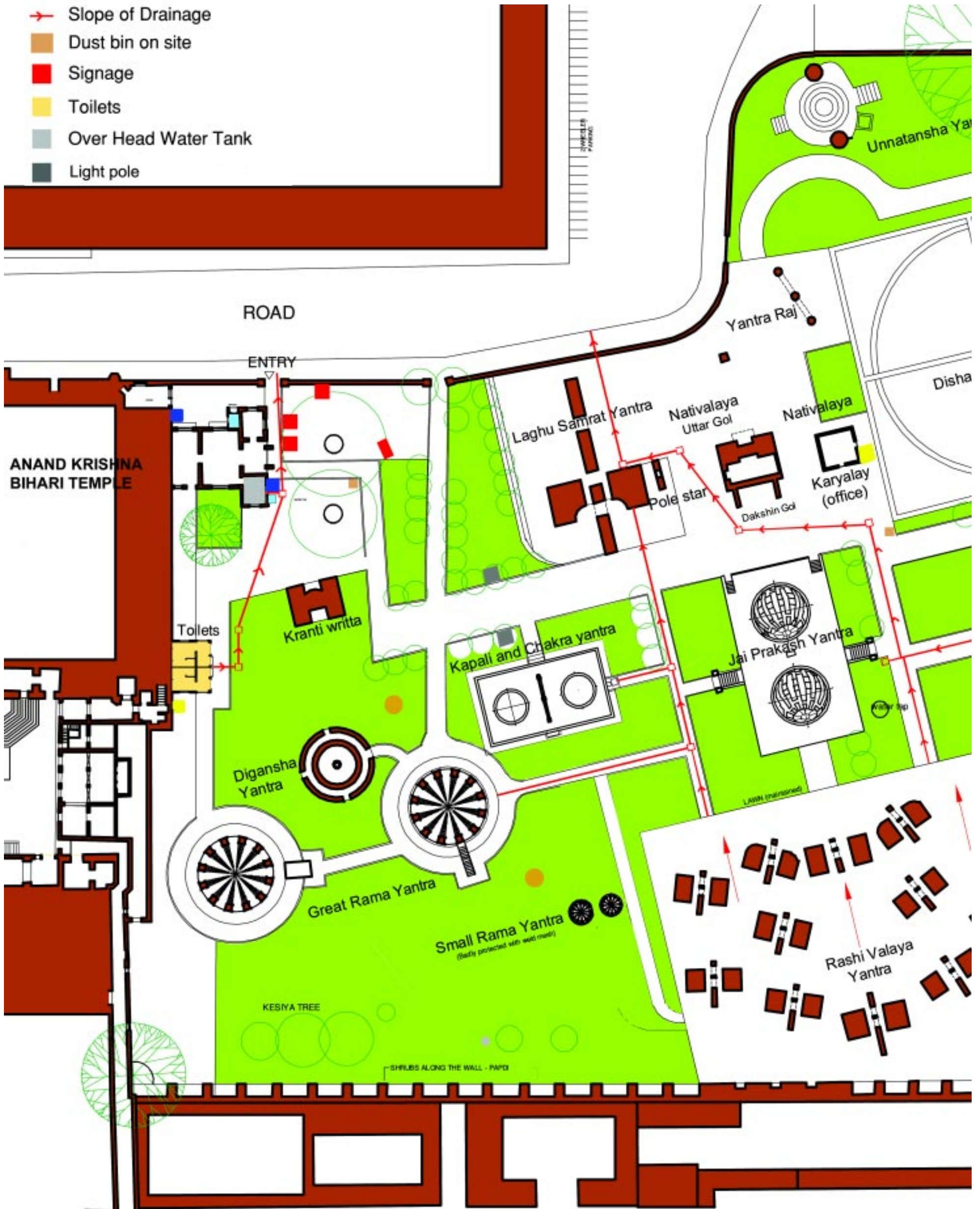
b. The neighbouring properties drain their waste into the complex precincts. This must be stopped immediately.



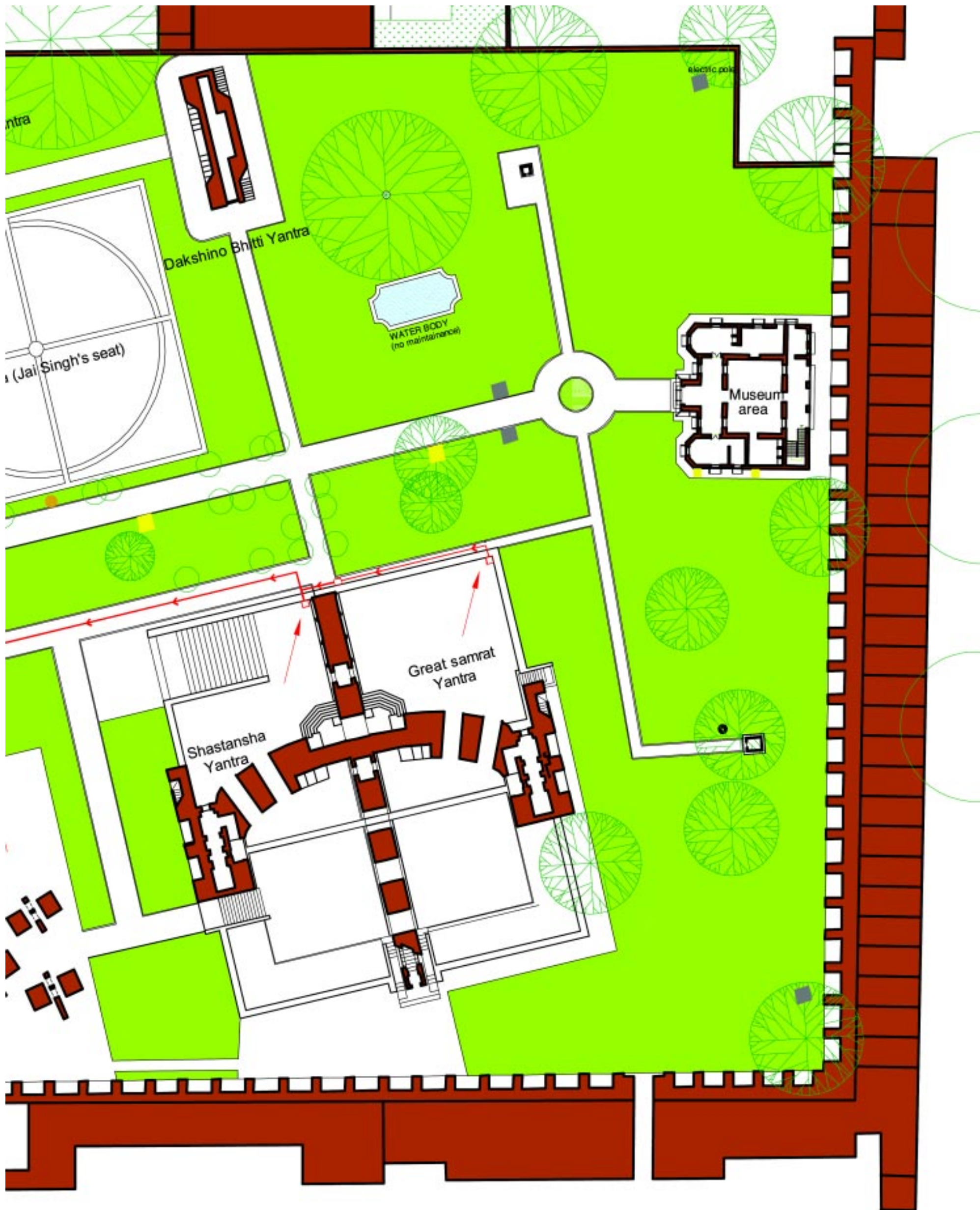


Legend

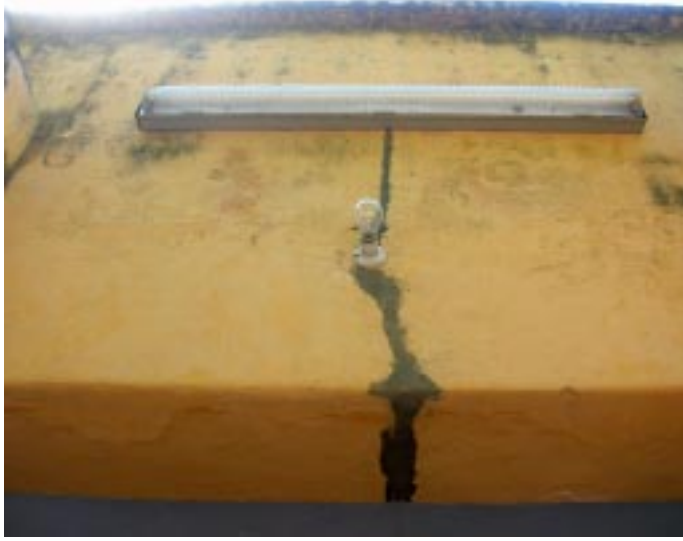
- Drainage Pipes
- Drainage (Manhole)
- Water used for site
- Electric pole and Meter box
- Water tap on site
- Slope of Drainage
- Dust bin on site
- Signage
- Toilets
- Over Head Water Tank
- Light pole











a. Fixing of electrical fixtures leaves a lot to be desired. Here there are two different fixtures at the same point.

b) Electrical services

The installation of the electrical services in the complex may have been functional, but was not done in a manner respectful of the monument.

Electric boxes are left open and may become hazardous.

Electrical fixtures are randomly placed and damage has been done to the yantras while fixing.

The electric poles are visible from everywhere and disturb the experience.

Some are also redundant and have not been removed.

Wires dangling in front of the yantras are a problem.



d. Open junction box in the complex.



e. Open meters with wires dangling are a potential hazard.



f. Redundant poles continue to stand in the complex.





c) Signage

Signage of a heritage monument is a very delicate matter. It is necessary and also should not mar the views and beauty of the monument. This paradox must be resolved sensitively and this aspect is sadly lacking at Jantar Mantar.

Though in Jantar Mantar there is basic signage, it is improper.

The signage is not congruent to its surroundings.

It is of different types, different supports and different character. In fact, no two signs seem to be similar. There are some similarities in the signs that are placed on the yantras but apart from that all other signs are random

The signage is breaking and is badly damaged, especially for the yantras.

The signage for public amenities is just randomly painted.



d. This sign giving information about the complex is placed in an area that gets crowded. Its height is not sufficient for that.



a. This is the first sign that one encounters on entering the premises. It is placed on a movement path causing people to gather around it and disturb the movement. Two signs next to each other but different heights, manner of writing, background.



b. Two different kinds of signs giving information about the same thing. The manner of fixing to a tree is not proper.

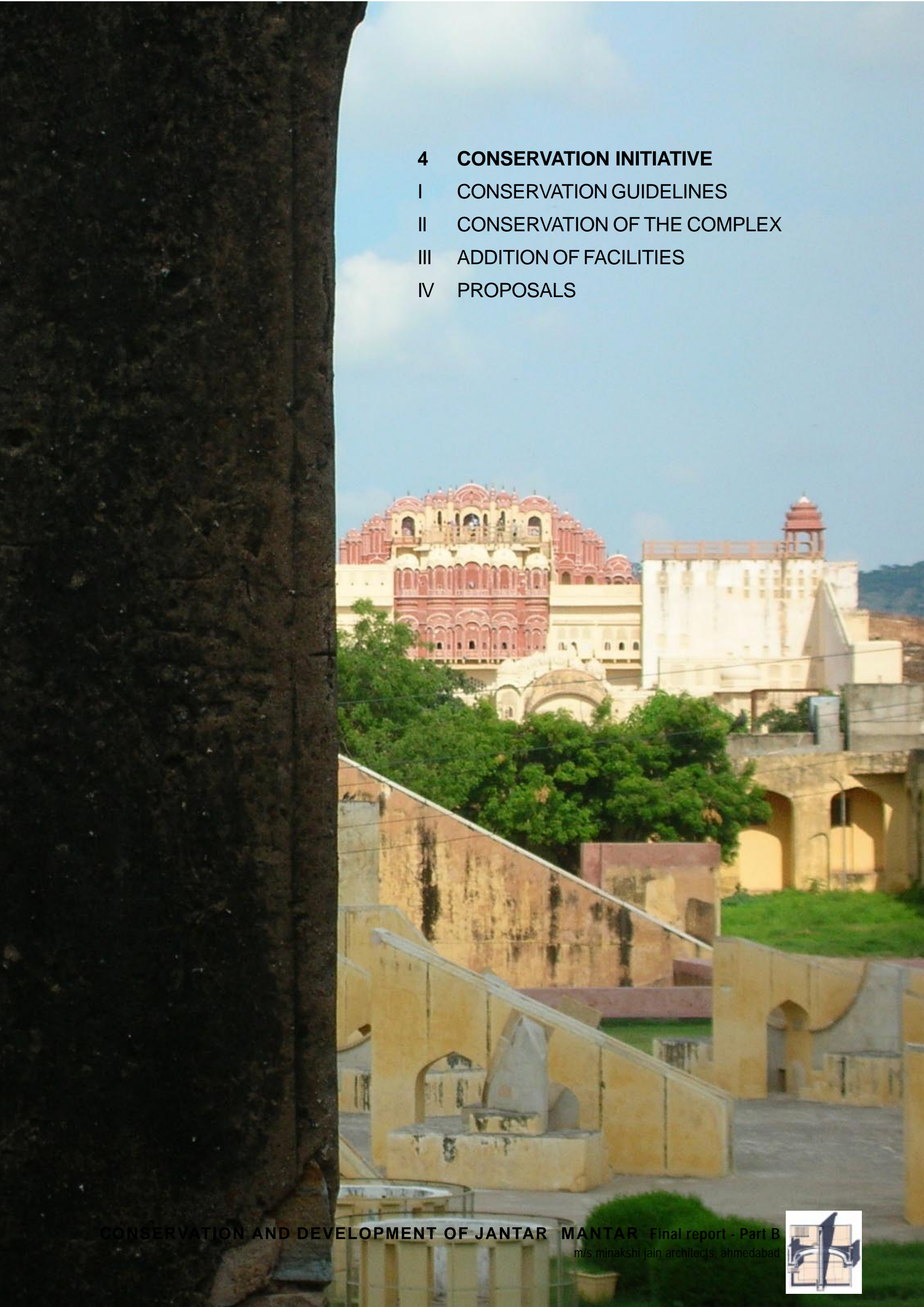


c,d,e. Though most of the signage for the yantras are made on stone and embedded within the yantra, some places they are different. Most of these signs are very old and show deterioration and damages. In most cases they are not legible.







- 
- 4 CONSERVATION INITIATIVE**
  - I CONSERVATION GUIDELINES
  - II CONSERVATION OF THE COMPLEX
  - III ADDITION OF FACILITIES
  - IV PROPOSALS





## **I. CONSERVATION GUIDELINES**

### **GUIDING PRINCIPLES IN THE CONSERVATION OF HISTORIC PROPERTIES**

The following are the guidelines for the conservation of the Jantar Mantar complex. They take cognisance of the actual situation on the site and are based on experience and sound planning principles. Over the past century, international standards have been established for conservation and these have been studied and understood.

i. **RESPECT FOR DOCUMENTARY EVIDENCE:**

As far as possible, conservation should not be based on mere conjecture but a proper analysis and inference.

ii. **RESPECT FOR THE ORIGINAL LOCATION**

Buildings should not be moved unless absolutely necessary.

iii. **RESPECT FOR HISTORIC MATERIAL**

Repair/conservate rather than replace building materials and finishes, except where absolutely necessary.

iv. **RESPECT FOR ORIGINAL FABRIC**

Repairs should be done with similar materials.

v. **RESPECT FOR THE BUILDINGS' HISTORY**

Do not restore to one period of history at the expense of another. As far as possible, efforts should be made to be true to available data on the monument.

vi. **REVERSIBILITY**

Alterations should be such as to revert to original conditions. Here, some base on the time upto which history is considered has to be established. This conserves earlier building design and techniques.

vii. **LEGIBILITY**

New work should be distinguishable from the old.

viii. **MAINTENANCE**

Continuous care and periodic maintenance will ensure longevity of the monument. Need for future restoration will be minimized.

ix. **sensitive USE OF BUILDINGS**

Unused buildings deteriorate fast. Access to visitors would also qualify as 'use' of a building. Appropriateness of new functions must be ascertained.





## II. CONSERVATION OF THE COMPLEX

Restoration of the monument to be undertaken with due care and consideration.

Research of the surrounding has revealed that the movement patterns of today do not match the historic patterns. It would contribute to the total experience, if some of the strategic connections were reworked as suggested in the masterplan (part A of the report)

Implementation of strict anti-vandalism measures to protect the monument. They could be a combination of control, fining and vigilance.

Lighting of the monument is a sensitive issue that needs to be addressed carefully. Overlit monuments lose their quality and lack of light doesn't allow visibility. In Jantar Mantar, an additional quality required would be that the lighting should not interfere with the night viewing activity, working of the instruments

Lighting can be categorised into three

- a. Night light enhancing the monument
- b. Basic safety lighting
- c. Lighting for light and sound show.

For the Light and Sound show, a story line will have to be worked out. There will be no fixed seating for the same. Instead visitors would be escorted in groups from instrument to instrument. It will also allow them to participate with the night working of the instruments to observe the night sky.

Signage of such a monument of significance must reflect on site. It should be of international standard, harmonious to the surrounding and of similar character.

There would be three scales of signage.

a. On the periphery of the monument, directional and informative (in the entire monument district covered in part A of the report these would include key area maps).

b. Internal signage; information.

c. Ticketing and brochures. Notices and instructions would also provide supplementary information. Tickets should be in the form of souvenirs.

Use of same materials and similar building techniques as used in historic construction. Cement mortar is often used to repair the building in a careless manner. This is incongruous with historic construction. Wherever used, it has to be done with care.



### III. ADDITION OF FACILITIES

While the monument itself is fascinating and exciting, there is a need felt to improve the facilities available to the tourists on the site to increase dwell time. Also, basic public amenities must be of good quality.

There should also be a possibility to view the monument in various conditions like even at night. Considering its significance in the astronomical sense, there is a proposal to have an observatory on the terrace of the existing Anand Bihari temple and to allow visitors access into the monument at night. This would be a unique feature of the monument.

However, the addition of facilities would not imply excessive building activity on the premises. In fact, some of the existing incongruous buildings would have to be removed.

Most of the new facilities are envisaged within the existing buildings like the devasthan property - Anand Krishna Bihari temple as well as the building on the extreme east of the site. The existing ticketing office to be removed and replaced with another building housing more comprehensive facilities.

#### **Facilities**

**Anand Bihari temple:** A part of the temple to be accessed from the monument itself. It has a wonderful view of the Hawa Mahal as well as the Jantar Mantar. This space could be used more as lounging areas and cultural activities. It is also proposed to develop an astroshop and souvenir shop. The terrace of the premises to be developed as a small observatory. Telescopes and other equipment could be mounted to facilitate observation.

**Museum building on east end:** To be converted into a multi-media centre. An extension in the form of a basement is proposed to accommodate a museum.

Existing spaces within the yantras to be used to exhibit some historic instruments.

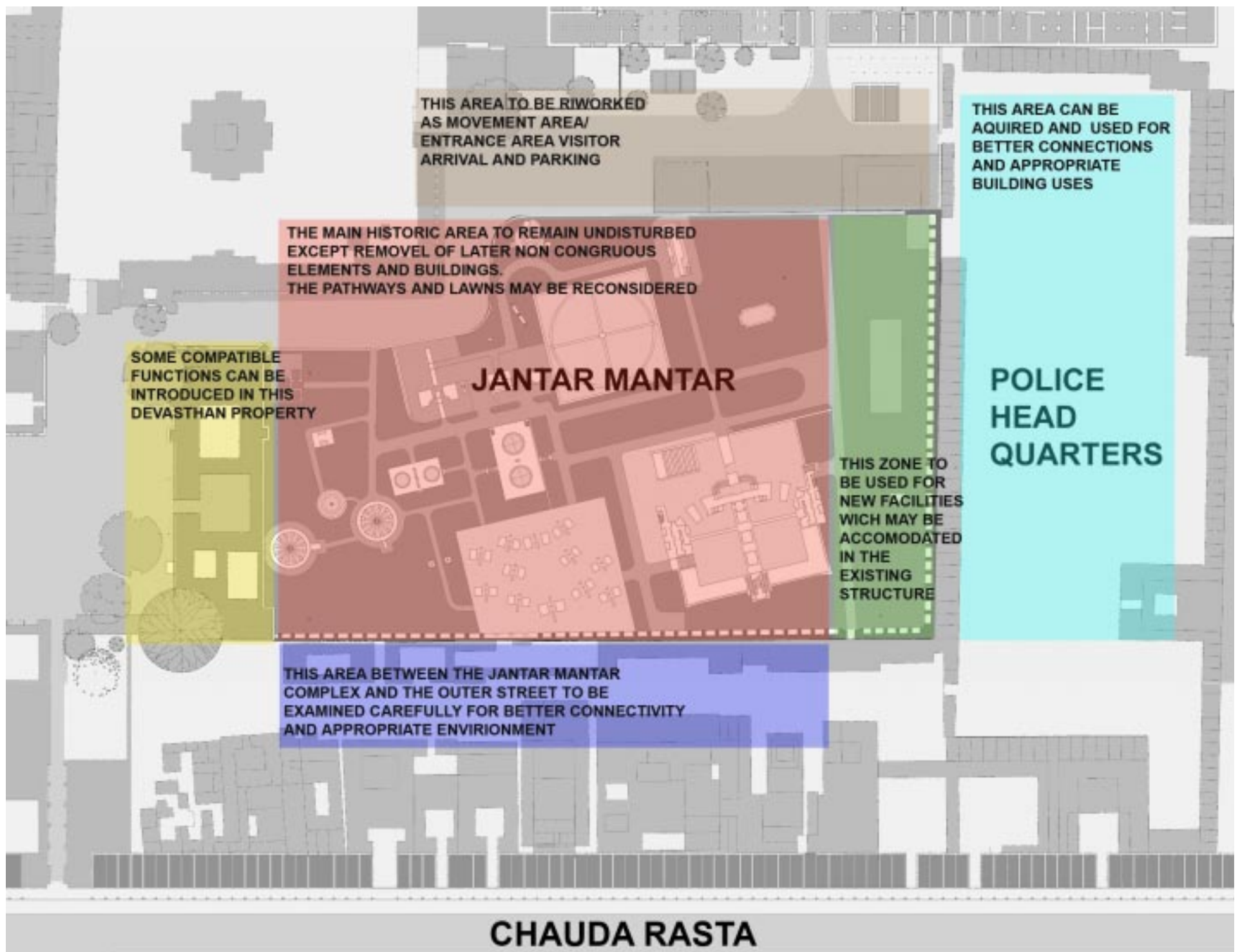
Entrance area to be reworked with entrance plaza and visitor facilitation. Ticketing, public amenities and information kiosk will all be included.

Audio guided tours of the monument. This should be in ten main languages namely English, Hindi, German, French, Japanese, Spanish, Italian, Chinese, Bengali and Gujarati. For this necessary script will have to be finalised.



#### IV PROPOSALS

Three different proposals have been made for the addition of the facilities in the complex. Each of them have their pros and cons. At this stage, considering the present availability of property, proposal three has been detailed in this report. However, those proposals should be kept in mind and if at a later stage, it is possible to acquire the mentioned properties, their potential could be realised. It would have a tremendous additional attribute towards the area becoming a monument district.





**ALTERNATIVE ONE - MOST RECOMMENDED**

Without making any new building, the addition becomes part of the neutral background.

Immense possibility of expansion towards police headquarters. This alternative can become more effective once the Police Headquarters has been relocated.

Can also then become a link with the Hawa Mahal making it a single experience of the entire complex

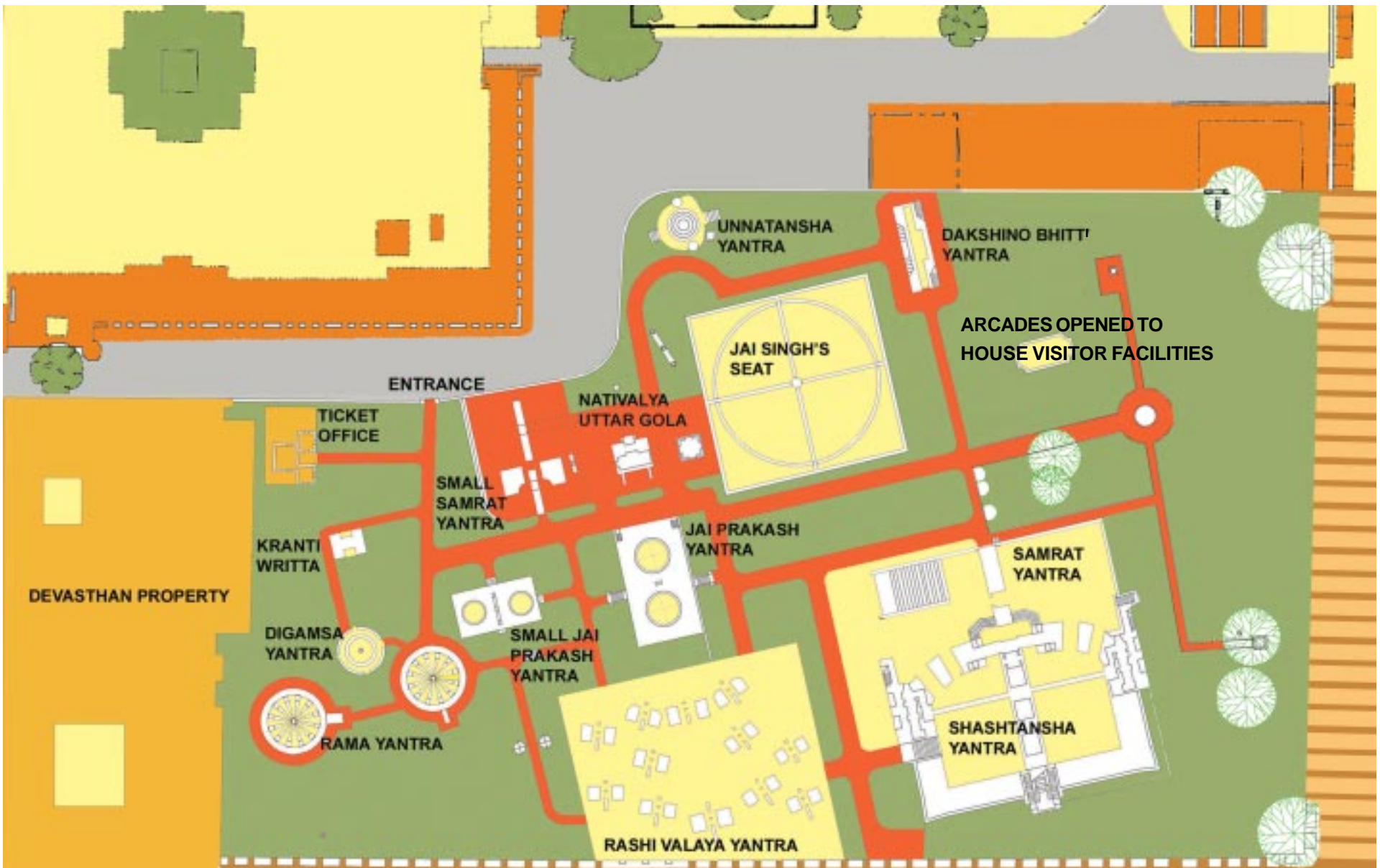
It is easily serviced from the side lanes.



a. View of City Palace and Nahargarh Fort from the terrace of Police Headquarters.



c. View of Hawa Mahal from the terrace of Police Headquarters.



b. Site plan with location of proposal







The corner of the site is encroached upon by the police offices. The new building built in the complex is incongruous with the architectural language of the complex.



The proposal gets rid of the encroachment and the incongruous later additions. New visitor facilities are housed in the opened up arcades of police head quarters forming a neutral backdrop.

Simulated images of existing and proposed situation.





## ALTERNATIVE TWO - NORTH OF THE COMPLEX

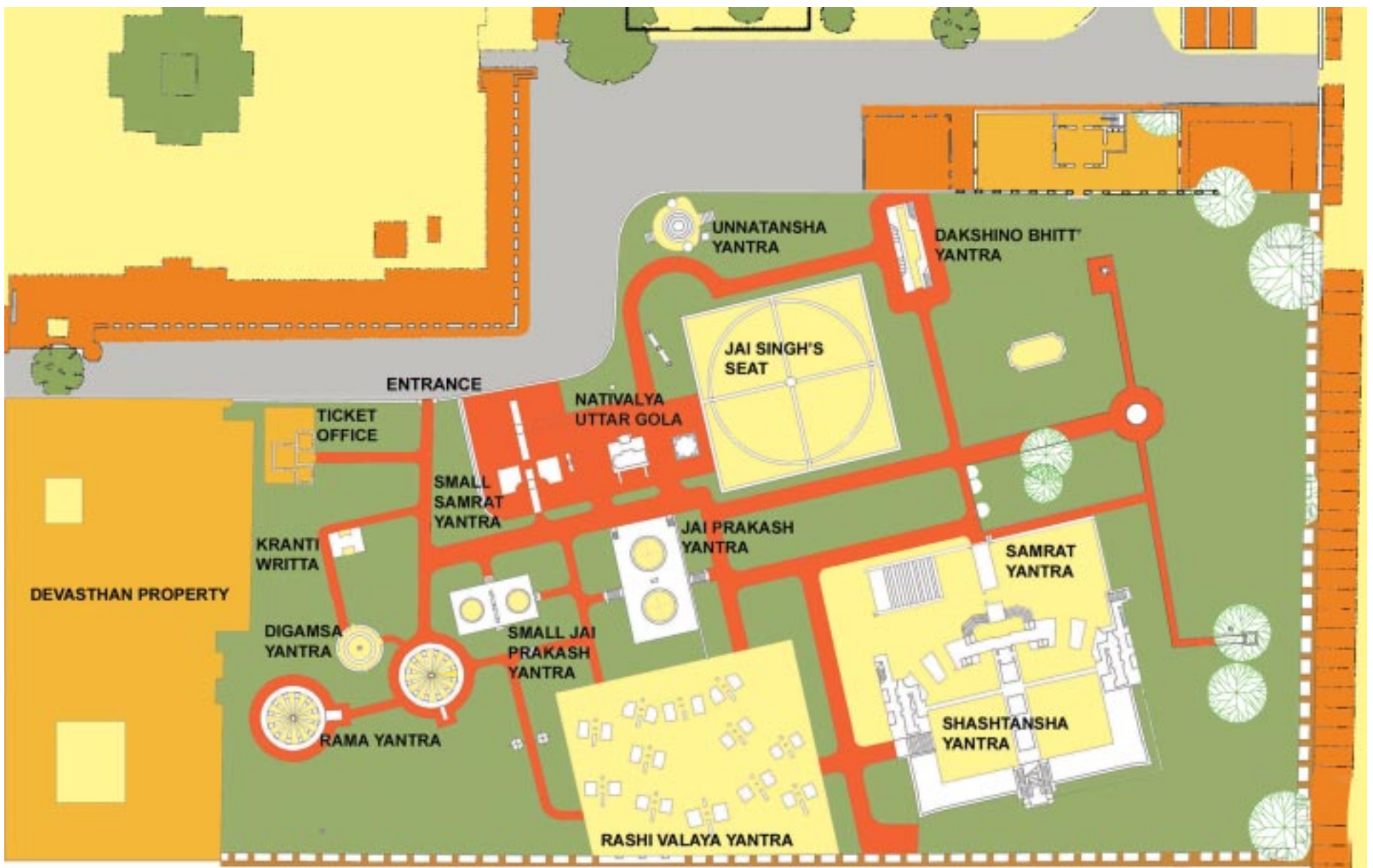
Requires acquisition of property on the northern boundary.

Makes a good connection to city palace and Jaleb Chowk.

- CAN BE DESIGNED SPECIFICALLY FOR THE DESIRED PURPOSE
- EASY SERVICING
- THE COMPLEX NEED NOT BE KEPT OPEN DURING NIGHT
- GOOD VIEW OF ALL THE MONUMENTS AROUND
- NON INVASIVE



a. A fantastic view of The Samrat Yantra from the site.



b. Site plan of the proposal







**EXISTING**

Unused and neglected part of the site.



**PROPOSED**

Unused and neglected part of the site made active by introducing visitor facilities without encroaching into the protected site. In the process giving historic character to the northern edge of the site.

Simulated images of existing and proposed situation.



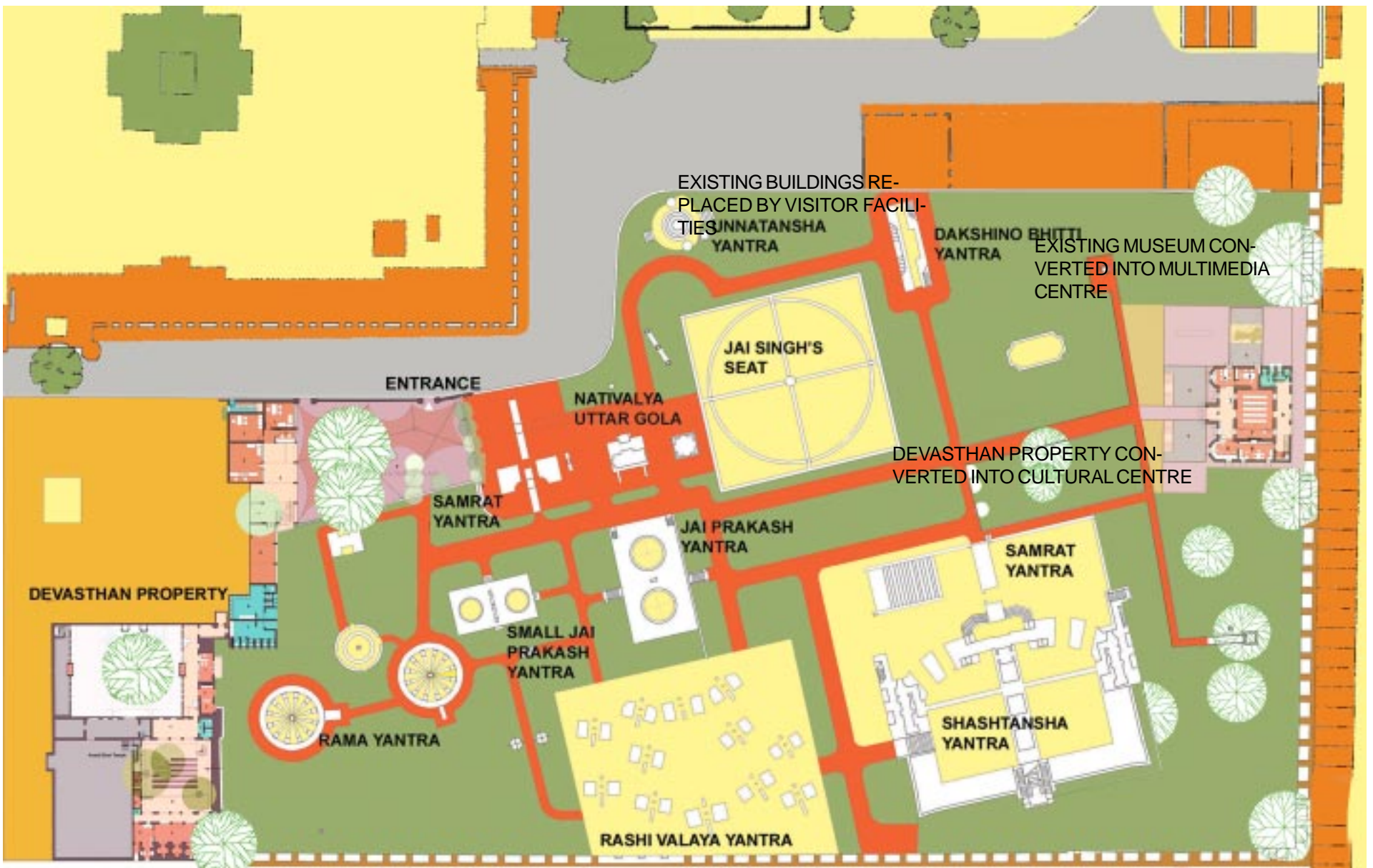




a. View from the proposed air conditioned restaurant on the first floor.

### ALTERNATIVE THREE

1. A very good view of the entire Jantar Mantar complex with Hawa Mahal in the back drop.
2. Use of existing Devasthan Property, giving it renewed meaning.
3. The Existing Museum Building is converted into a Multimedia Centre and Museum of Astrology.
4. Entrance area is developed by replacing incongruous buildings with a harmonious visitor facilitation centre and entrance plaza.
5. Entire complex is developed for its potentials - giving meaning to existing unused spaces.



b. Site plan of the proposal







View of the complex from the proposed terrace restaurant.



**PRESENT CONDITION**

Eastern edge of the site with Anand Krishna Bihari temple, toilet block, yard and entrance ticket window all form an incongruous collage.

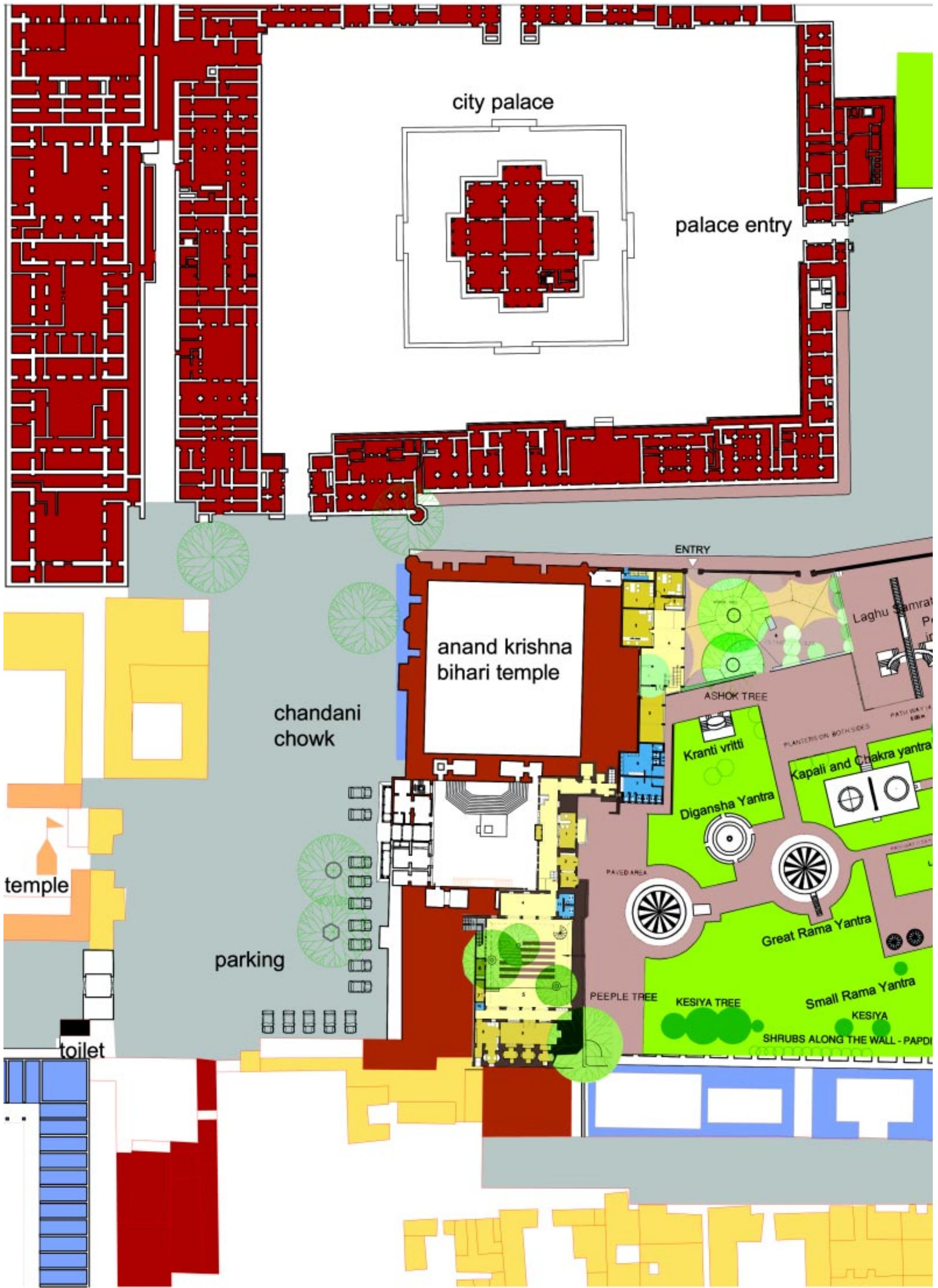


**PROPOSAL**

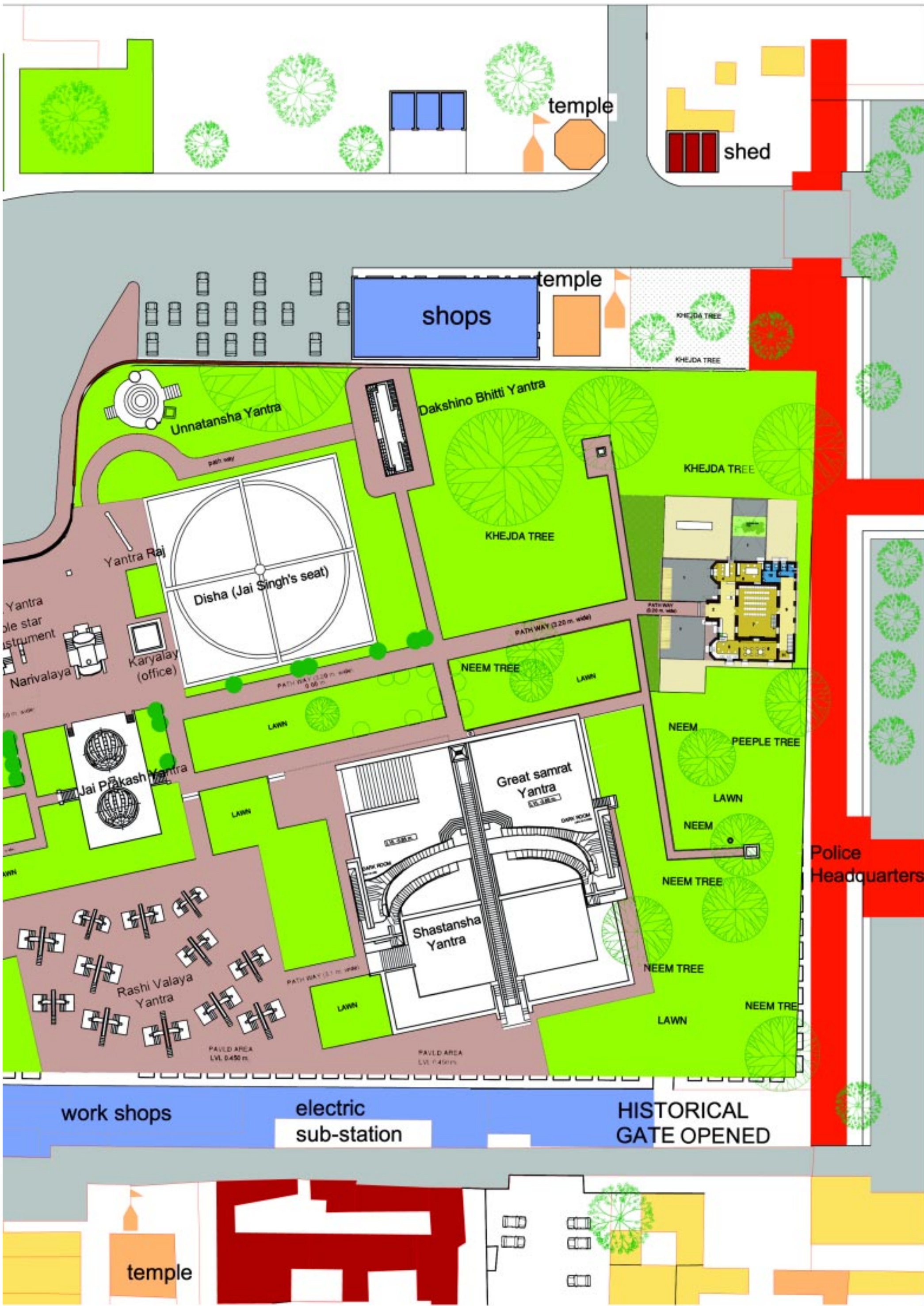
The development brings a sense of harmony and order.















The proposed tourist facilitation centre includes ticketing, entrance plaza, waiting areas, tourist information centre, restaurant and shop. All the facilities are clubbed together so that different buildings do not dot the site. At the same time, sufficient spaces are available for tourists to gather and wait. They can be part of the entrance plaza, wait in the verandahs or in the information centre. Two gates are provided - one for entrance and one for exit.

### VISITOR FACILITATION CENTRE ENTRANCE AREA

#### Area development

Place of arrival into the premise in terms of

- Entrance plaza
- Seating arrangements
- Information boards

#### Requirements

Ticket office / window	-15sq mts
Archeologists offices 2 nos (25 sq mt each)	- 50sq mts
Waiting verandah	- 50sq mts
Souvenir shops – 3nos	- 40 sq mts
Public toilets (men and women)	- 70 sq mts
Drinking water area	- 05 sq mts
Tourist info desk (audio guide)	- 35 sq mts
Cloakroom	- 25 sq mts

Total 290sq mts

#### First floor

Air Conditioned Restaurant (70 persons)	- 125sq mts
pantry	- 20 sq mts
Office	- 10 sq mts
Terrace restaurant	- 125
Service counter (Services areas included)	- 10 sq mts

Total 290sq mts

parking for staff (10 / 12 pers) - 100 sq mts





**ENTRANCE AREA**



General view of the entrance area along with tourist facilities.

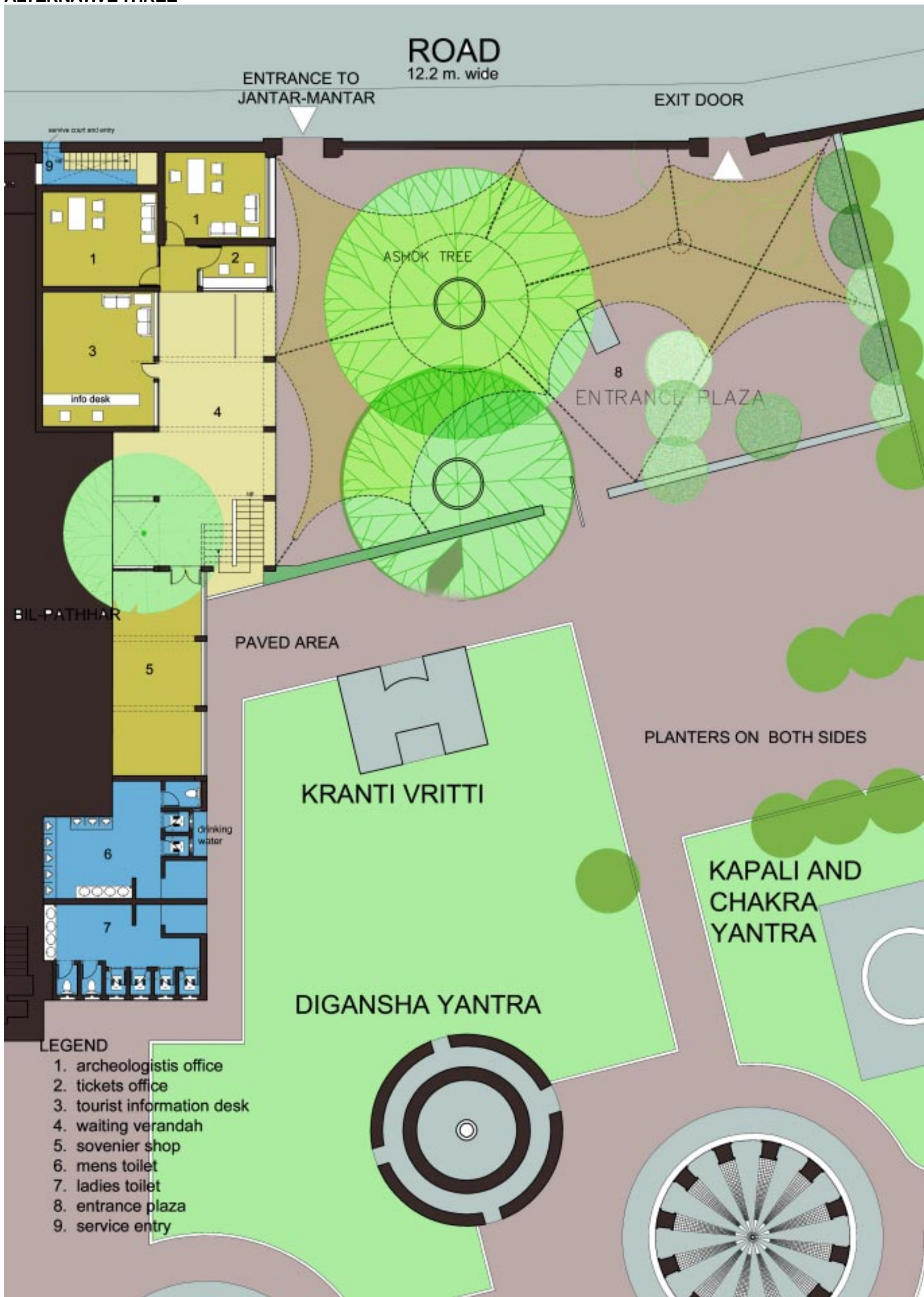


View from under the tensile structure that marks the entrance plaza.





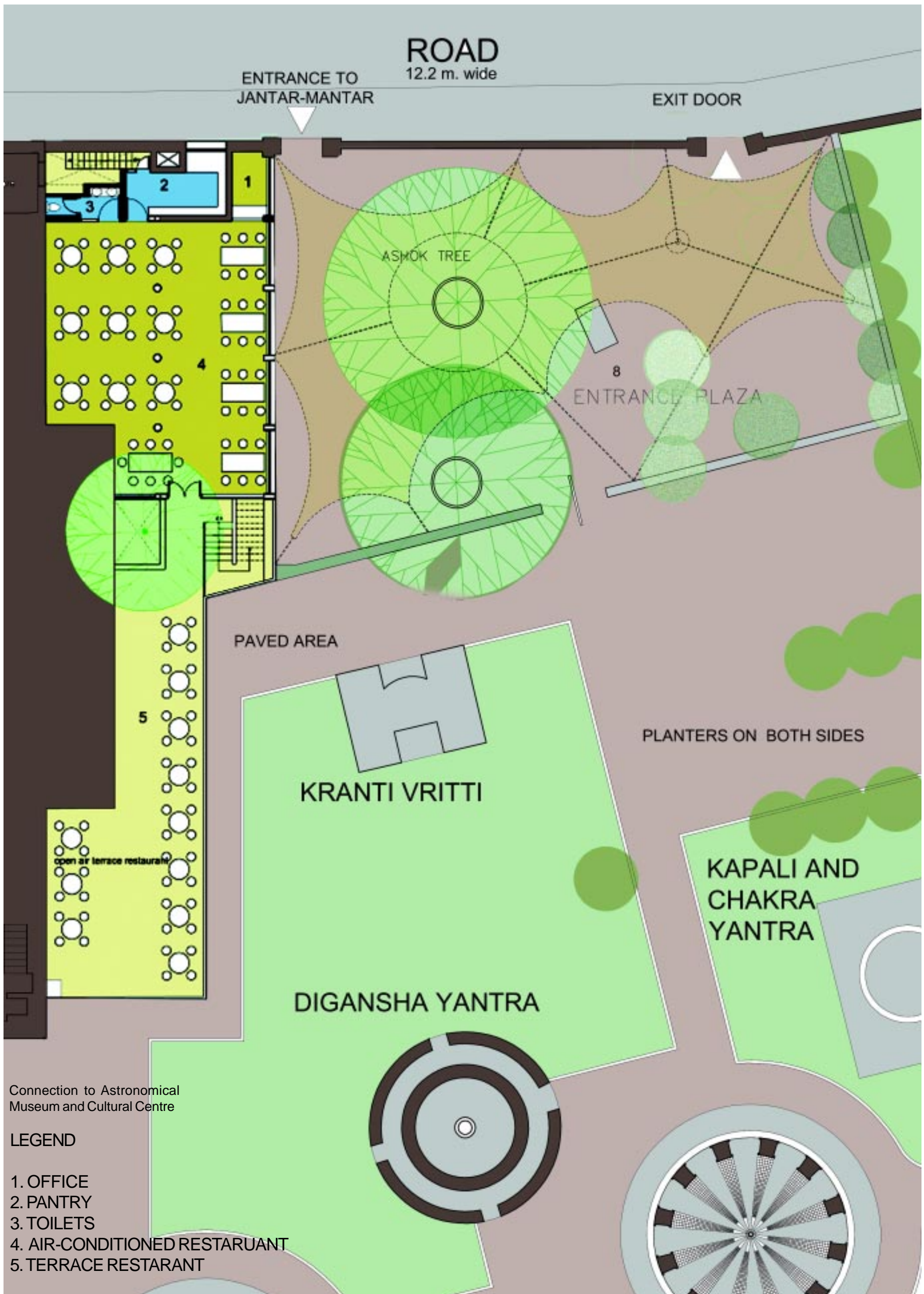
**PROPOSALS  
ALTERNATIVE THREE**



GROUND FLOOR PLAN







FIRST FLOOR PLAN

Connection to Astronomical Museum and Cultural Centre

LEGEND

- 1. OFFICE
- 2. PANTRY
- 3. TOILETS
- 4. AIR-CONDITIONED RESTARUANT
- 5. TERRACE RESTARANT





**ANAND KRISHNA BIHARI TEMPLE  
ASTRONOMICAL SOCIETY AND CULTURAL  
CENTRE**

**Objective:**

To bring about much needed awareness and dispense information regarding the solar system and the general working of the cosmos. This society also reaches out to the people in Rajasthan conducting camps and drives. Local people would be part of the organization trained to carry out such programmes. A cultural centre in such a premise helps the local people get involved various programmes arranged and also gives the people a stage to portray themselves.

**Target audience:**

Off site - local and regional level involvement in terms of camps and awareness drives. Children, schools and villages (mobile planetariums).  
On site - Visitors, tourists, foreigners, research / study, Staff, sponsors, commercial enterprise staff, faculty.

**On site program**

Information desk	- 15 sq mts
Office	- 27 sq mts
Viewing Gallery	- 20 sq mts
Exhibition Gallery	- 40 sq mts
Viewing gallery / terrace	- 155 sq mts
Astro shop	- 6 sq mts
Souvenir shop	- 50 sq mts
Toilets (m/f)	- 25 sq mts
Drinking water	- 2 sq mts
Library	- 30 sq mts
Training / meeting room	- 44 sq mts
Storerooms	- 6 sq mts
Performance Theatre	- 180 sq mts
Total	600 sq mts

Waiting / gathering areas not included.

**Offsite-program**

Vans, trucks parking	- 2/3 nos
Storeroom for equipment	- 15 sq mts

(Equipment for mobile planetarium – projector, screens, inflatable dome, pumps, battery, chairs, servicing parts, stands, charts, and models)



a. The view of Jantar Mantar and Hawa Mahal from the Anand Krishna Bihari Temple



b. View of the Anand Krishna Bihari Temple after it has been restored and brought into use.







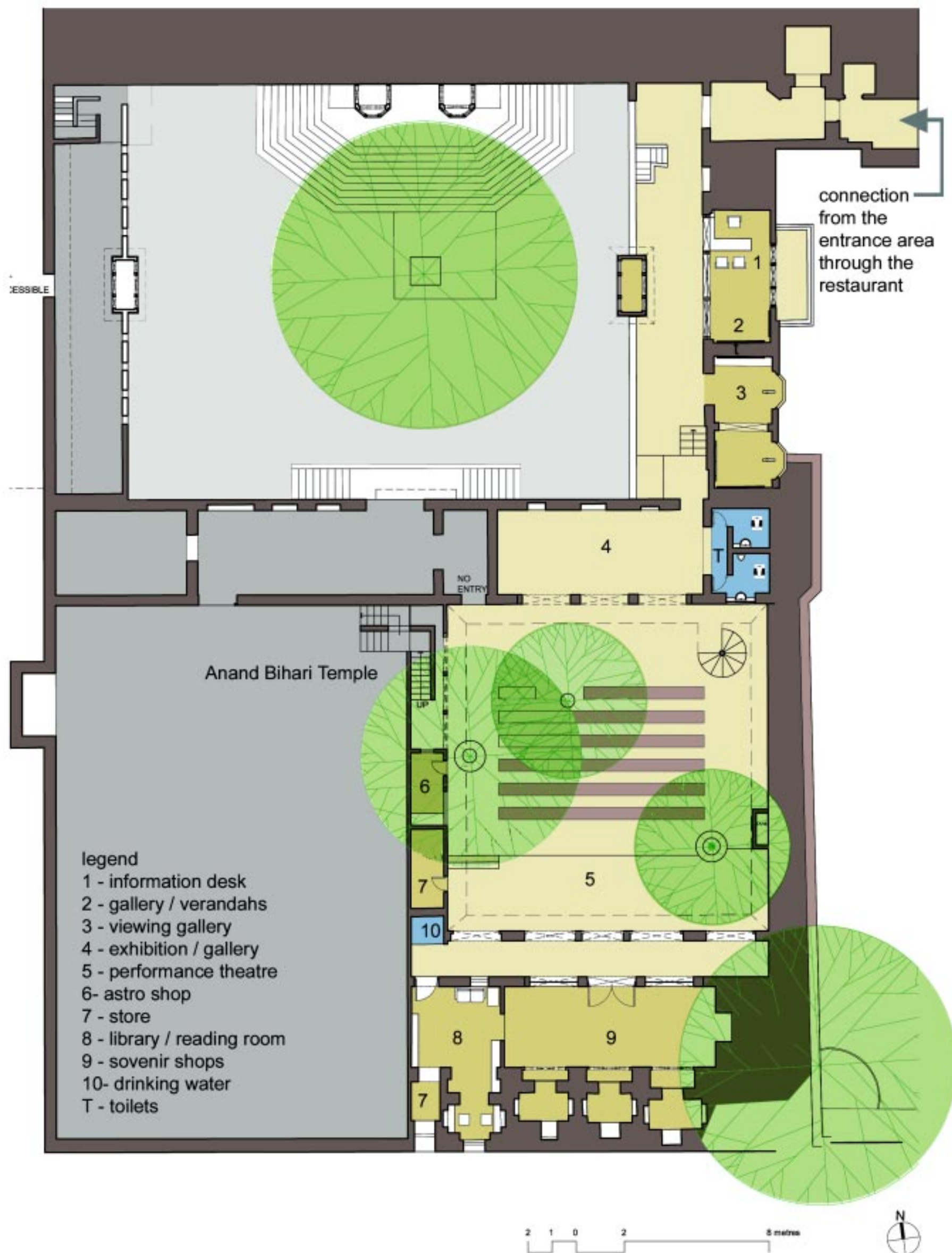
View of the Anand Krishna Bihari Temple courtyard in ruin condition.

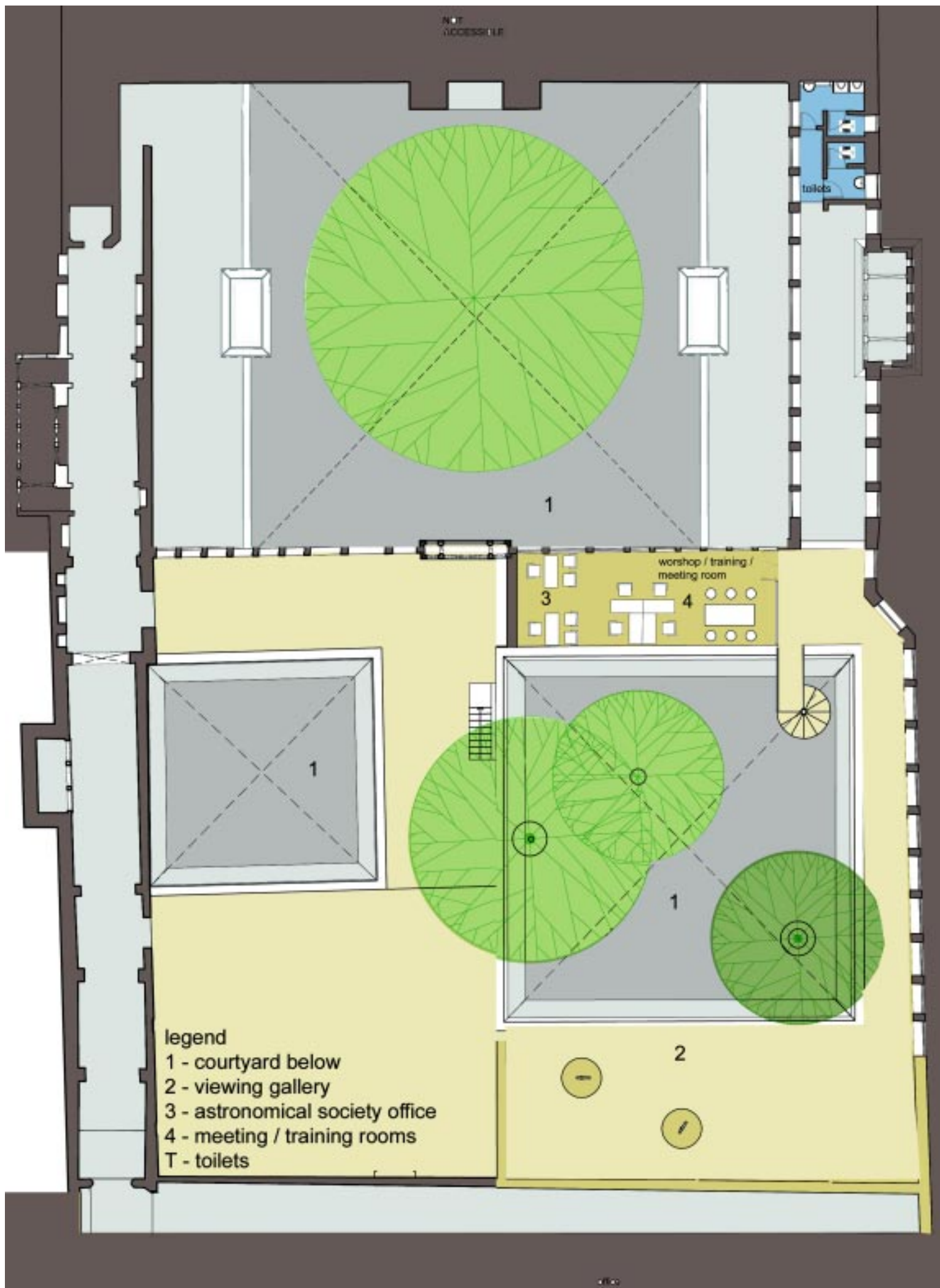


View of the Anand Krishna Bihari Temple courtyard











## MUSEUM BUILDING: MULTIMEDIA CENTRE

Multimedia center / astronomical museum

**Objective:** To familiarize the people into new technologies, provide informal education and training. This center provides basic infrastructure in terms of a library, Internet access, projection screens for screening important events and displaying computer-generated models. Its placing being inside the Jantar Mantar, gives it the function of providing and maintaining information bank and models readily accessible to the public. Its expertise deals in audio-visual media. The museum displays drawings and models that were used to create such a place.

Information desk	- 6 sq mts
Offices (3 people)	- 10 sq mts
Audio-visual room including mezanine floor (108 persons)	- 75 sq mts
Video conference room	- 12 sq mts
Café	- 20 sq mts
Store (part of office)	- 6 sq mts
Internet access – 5 computers	- 12 sq mts
Waiting areas / gathering areas	- 40 sq mts
Souvenir shop (basement)	- 40 sq mts
Astronomical Museum(basement)	-210 sq mts
Waiting Courtyards(basement)	-145 sq mts
Total	576 sq mts



SALIENT FEATURES of adding a sunken courtyard exhibition area.

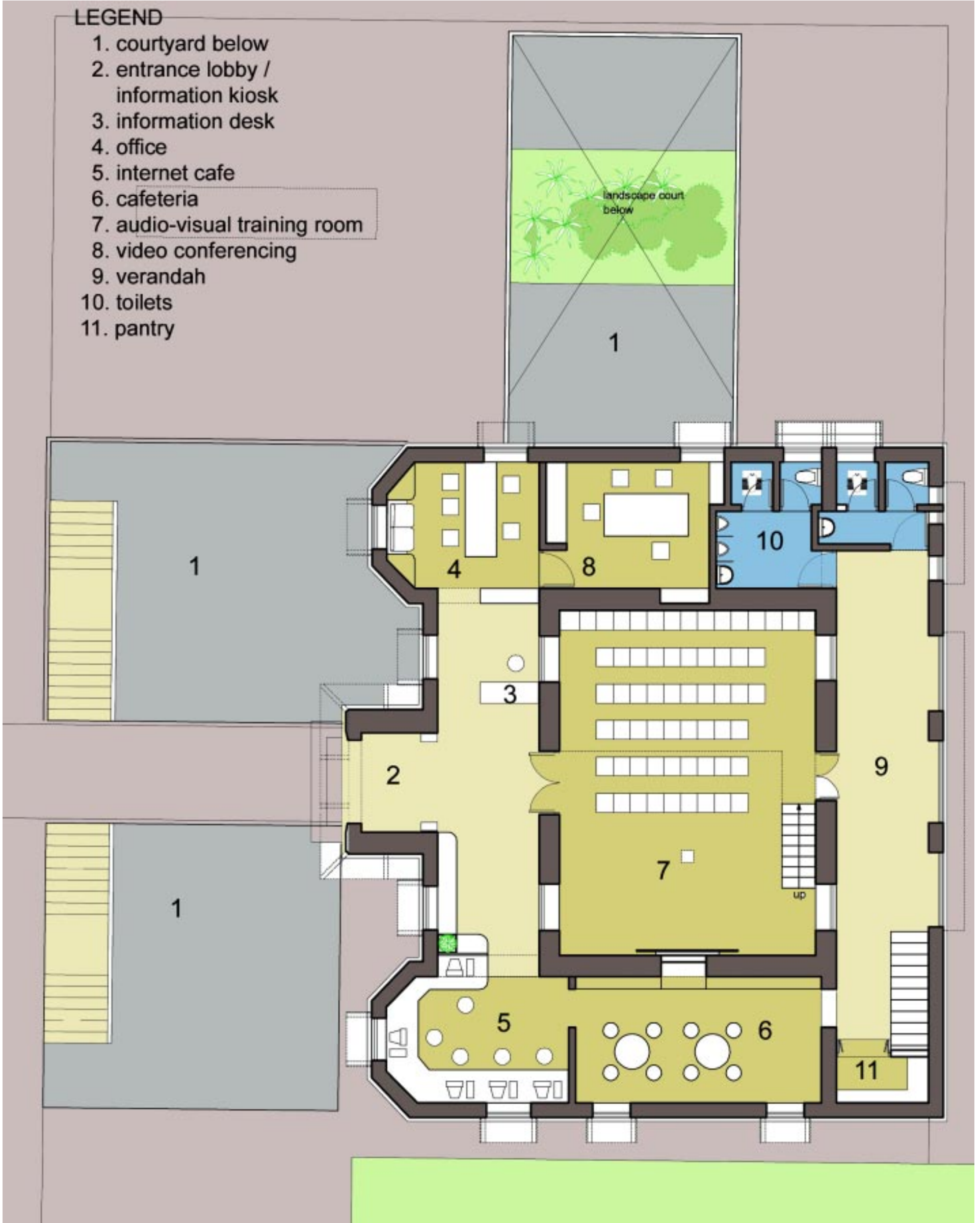
- Not visible from the entrance hence doesn't interfere with the historic image of the complex.
- It is in line with the sunken courtyard typology which exists on site



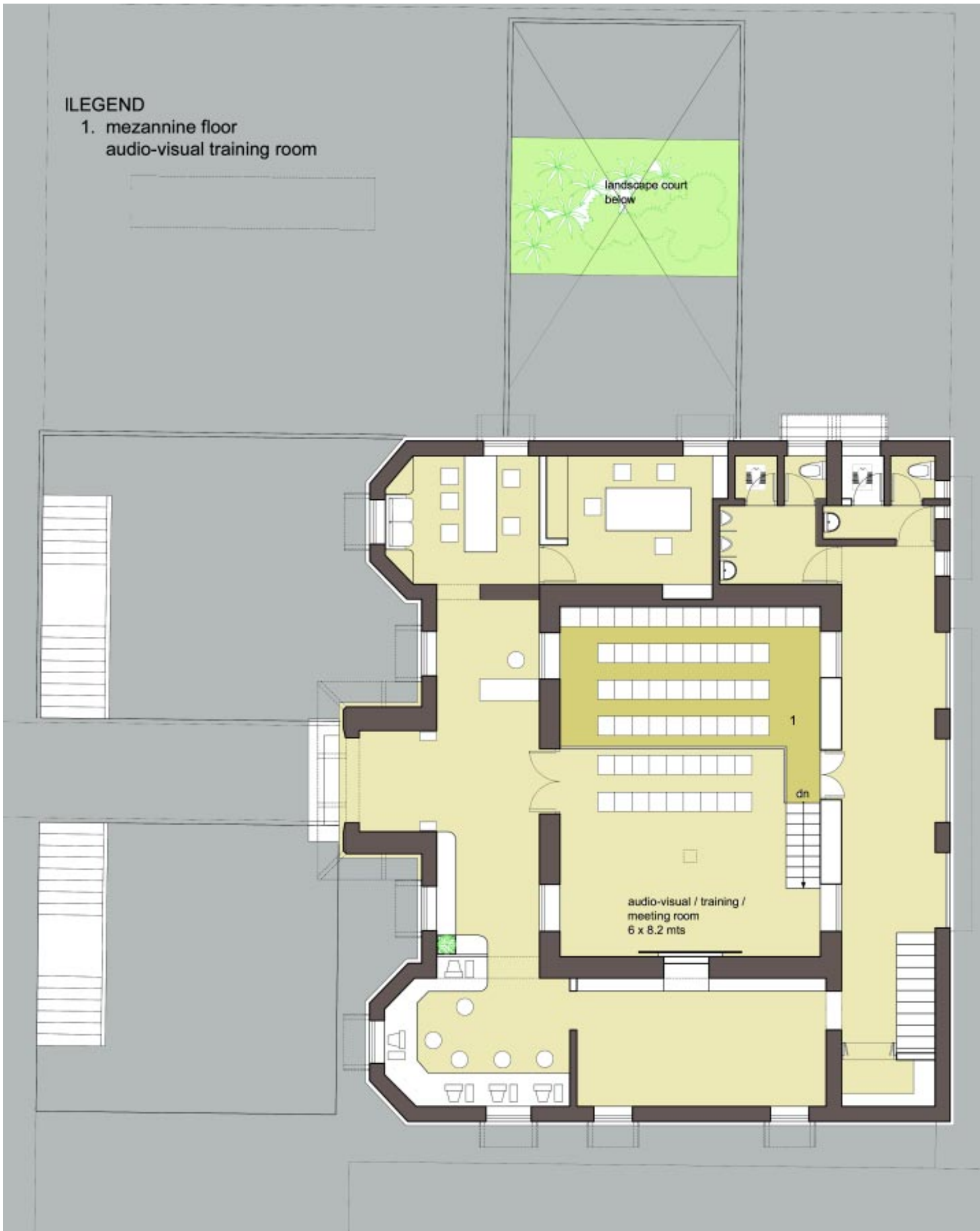


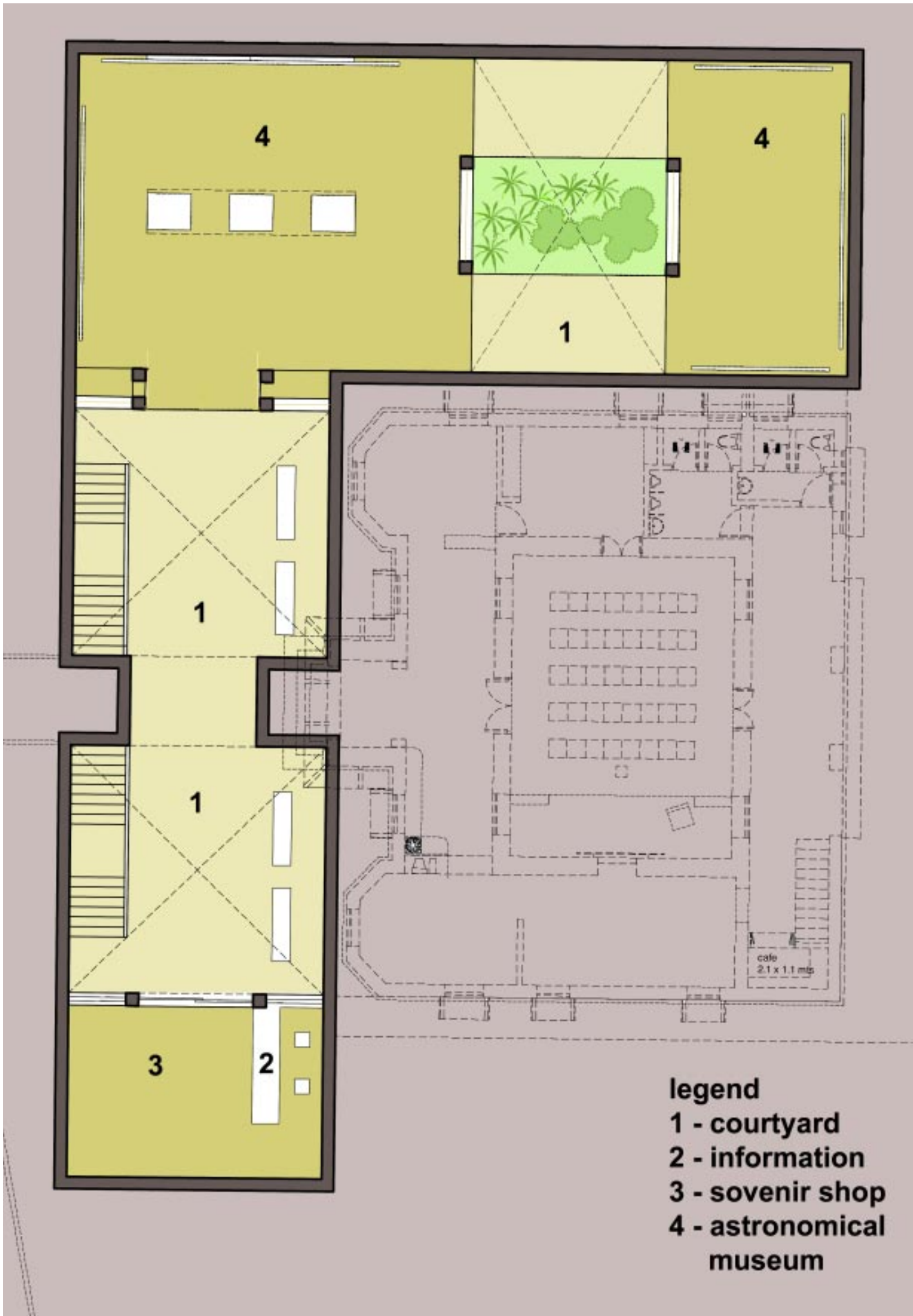
**LEGEND**

- 1. courtyard below
- 2. entrance lobby / information kiosk
- 3. information desk
- 4. office
- 5. internet cafe
- 6. cafeteria
- 7. audio-visual training room
- 8. video conferencing
- 9. verandah
- 10. toilets
- 11. pantry











### iii. Movement within the monument

An attempt to control visitor movement within the monument has been made through regularised pathways. These pathways are made by paving with red sandstone. These are then curbed with concrete curb blocks or with railings. Unfortunately these pathways have become a strong distinct pattern in the ground disturbing the floorscape and view of the Yantras. Some of the larger paved areas allow tourists to experience these Yantras from many desired locations / sides / angles. The floor of the whole complex is supposed to be a plane on which these instruments are juxtaposed. The historicity of the pathways has not been established though there is some indication of movement patterns.

Recommendations: The yantras cannot be seen as individual buildings that need to be connected by pathways. They need to be seen as existing on a single ground plane, like on a table. The paving should then be an element that brings them together rather than mere connection. And it should be as unobstrusive in character as possible.



b, c. The paved pathways themselves are becoming a strong floorscape, distracting from the yantras.



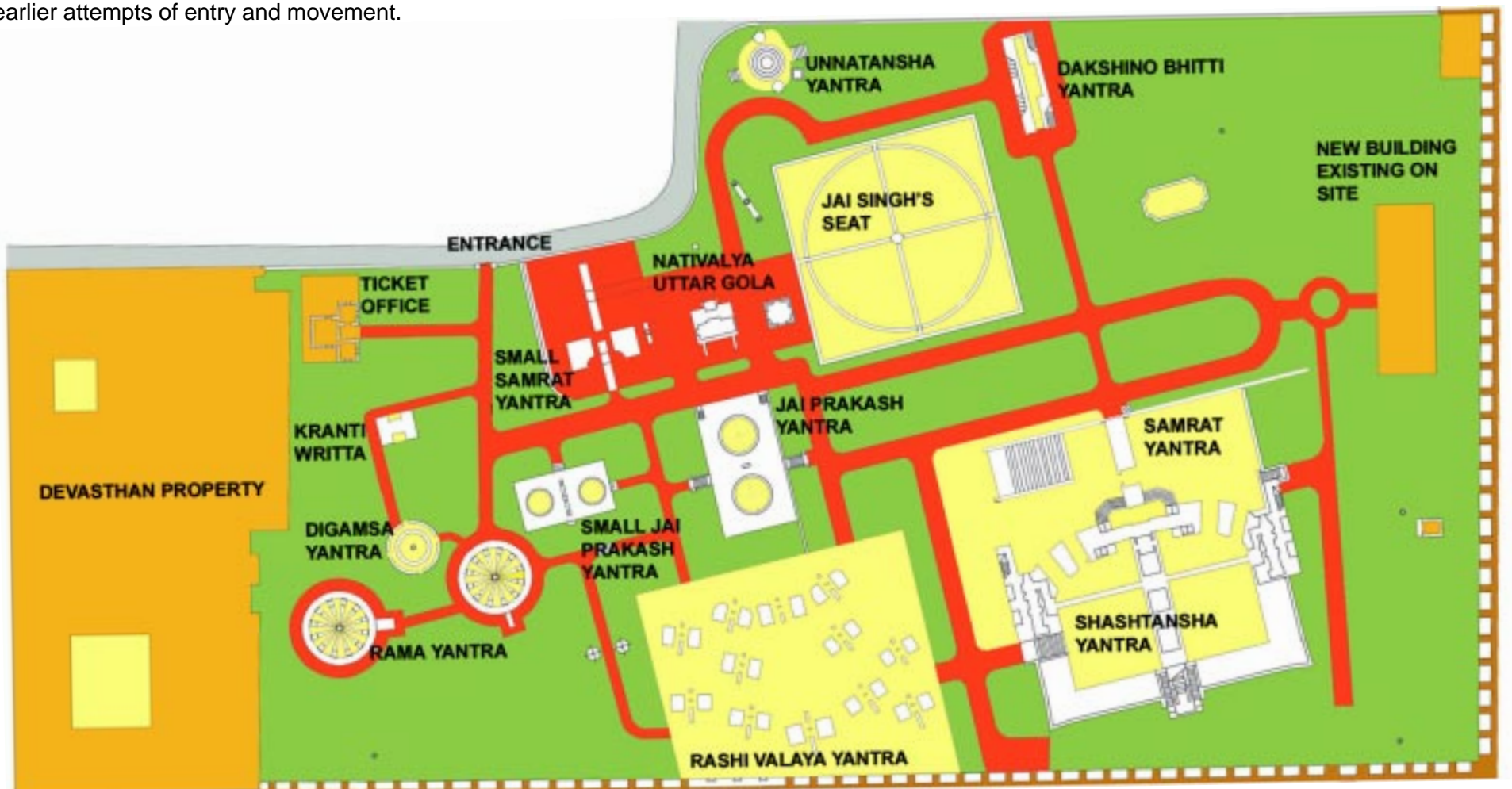
a. Visitors gather around monuments requiring larger areas around them.







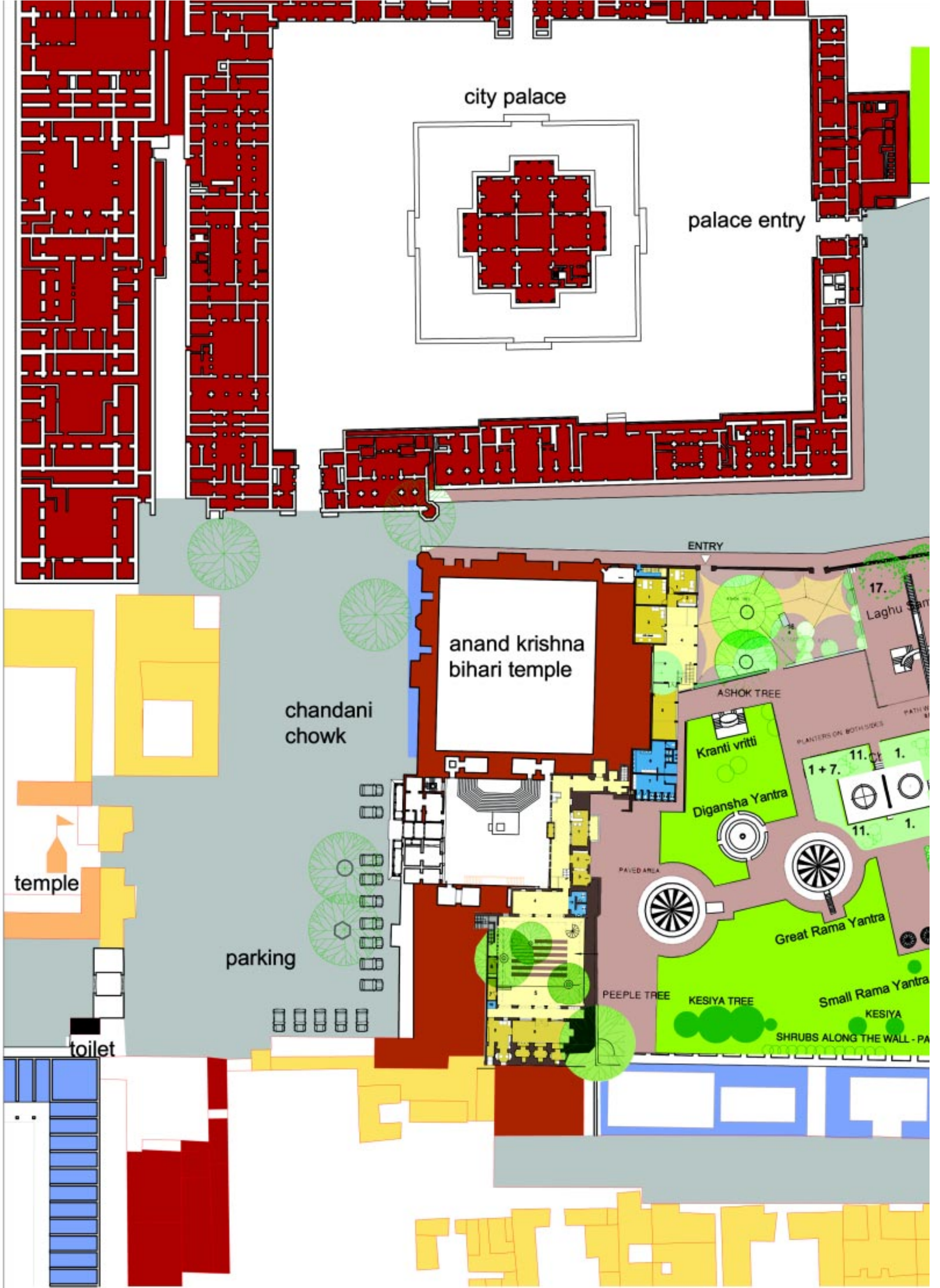
a,b. Movement within the monument has been in a state of flux. Some remnants from earlier attempts of entry and movement.



c. A plan of the movement patterns within the monument, the pathways are marked in red






























## Legend

Ground cover				
Sno.	Botanical name	Common name	Visuals	Characteristics
1.	Stenotaphrum secundatum	Elephant grass		Good lawn for shade, grows quickly and can be cut finely
2.	Wadelia trilobata	Wadelia		A hardy ground cover forms a dense mat of leaves, bears plenty of small yellow flowers; grows in full sun and shade too.
3.	Chlorophytum comosum variegatum	Spider plant		A hardy ground cover, grows in sun and shade as well.
4.	Zebrina pendula	Wandering jew		A deep purple ground cover does well in sun and shade as well
5.	Asystasia coromandalina alba	Asystasia		A low creeping variety. the leaves are deep green and the flowers stand up in foliage. grows well in sun and shade as well
6.	Verbina species white	Verbina white		A hardy plant growing to a ht. of max. 40 cms. The foliage is covered with numerous flowers throughout the season
7.	Zaphranthes candida	Thunder lily white		Planted in mixed beds blooms when there is a cloud cover and looks spectacular
8.	Hymenocallis littoralis	spider lily		Grows upto the ht. of 80cms, evergreen and flowers almost throughout the year. grows well in sun and shade as well
Medium height shrubs				
Sno.	Botanical name	Common name	Visuals	Characteristics
9.	Canna dwarf red	Canna red		Plants are around 80 cms tall, the foliage is dark green contrasting with the red flowers
10.	Ixora chinensis	Ixora orange		Dwarf small leaf variety, plant grows upto 80cms tall, blooms profusely
11.	Tabernaemontana coronaria	chandani		Plant grows upto 2m tall , rounded canopy. Can be trimmed and kept short, flowers in monsoon
12.	Polyscias balfouriana	Aralia		Height upto 1.5 mts, rounded leaves, nice bushy plant. hardy and easy to grow
13.	Galphimia gracillis	Galphimia		Grows quickly, a hardy shrub. flowers yellow throughout the year in abundance
Aquatic plants				
Sno.	Botanical name	Common name	Visuals	Characteristics
14.	Nymphaea alba	Water lily white		Plants can be planted in muck filled pots and can be inserted into ponds for growing
15.	Nymphaea purpurea	Water lily purple		
Medium sized trees				
Sno.	Botanical name	Common name	Visuals	Characteristics
16.	Polyalthia pendula	Ashoka tree		Quick growing and hardy tree distinguishable by pods, flowers in spring and have a delicate fragrance
17.	Albizia lebek	Shirish		



## LIGHTING

### Sound and light show

Illumination of the buildings depends on the shadow cast by the sun, or on the visual axis of other planetary bodies. Overlighting of the same may lead to non-use of these instruments. As stars and planets can be best viewed when it is dark. Therefore it is proposed that only the calibrated surfaces – from which the reading is obtained, is illuminated and not the entire structure. This would serve a dual purpose of emphasizing on the most important parts and the most important geometrical forms of these structures.

This is based on the understanding that these structures consist of two components, the calibrated scales and the supports. If it were possible to have the scales in position without support it would have been enough but it is not possible to build the structures without supports. However, in lighting this is possible and this would create a magnificent experience of floating scales - the essence of these instruments.

The illumination of these structures along with basic safety lighting would have to be done very discreetly.

As a lot of these instruments are to be used in the night it has the potential of night tourism – but this has to be very carefully monitored. This makes the complex susceptible to vandalism. A very high ticket will have to be charged as entry fee for the interested visitors. All the visitors will have to be escorted in groups through the complex.

The safety lighting will have to be in the form of foot lights which ensure lighting of the most movement areas but have very little illuminating effect on the instruments. Other practical lighting shall be on the signages and notices.





### III. VISITOR MANAGEMENT

The most important is the first experience upon arrival. In this case, the entrance is only a small gate, with a narrow pathway leading to the ticket window. The view of the yantras is cluttered by signboards.

This entrance area falls on a main thoroughfare and gets cluttered by vehicles coming to drop off or pick up visitors.

Many visitors come to Jantar Mantar on cycle rickshaws. These rickshaws keep waiting for passengers. They also ferry visitors between monuments, especially to Hawa Mahal. There needs to be a system of their parking and movement.

The congestion is compounded by shops around the entrance area. The hawkers and vendors pester the tourists to sell their wares. While handicraft and souvenir shops are required, the shouting, pestering etc. must be avoided.

There are fixed government rates for guides. But the guides pester the tourist once they are inside and this disturbs the experience.

Finally, it is very important that the visitors have a feeling of freedom and can enjoy their visit. Any facility provided must be discreet though not hidden as to cause discomfort of finding.



b. From whichever side the visitors may arrive, these are the kind of views they first get before reaching the monument. Public toilets need to be restructured.



c. Rickshaws waiting for passengers clutter the approach road.



a, d. The approach road to Jantar Mantar and the entrance area. The visitors are pestered by hawkers, vehicles drop off or pick up tourists and the other vehicular movement continues.







a) Ticketing

Ticketing is an important aspect of any heritage monument. Funds collected contribute towards the maintenance and general upkeep of the monument. However, all activities related to ticketing and checking must be streamlined. It must allow for a smooth flow of traffic and should not cause bottlenecks. At present ticketing in Jantar Mantar is through one small window in the office. During peak season, it is not sufficient. It causes long waits and there is no adequate waiting area. Most visitors have to wait on the footpath outside the monument. There is a small shaded area in the entrance, but a lot of it is lined by railings which, though help in the making of queues, do not allow for gathering. This is also the place where the guides show the yantras to the visitors and a first good view of the complex is available.

Recommendation:

Ticketing should become part of the public facilities with adequate covered waiting area. There should be more than one window, especially during peak periods.

Entry and exit to be through two gates so that the tourists do not cross paths and thus create congestion.



c,d. The entrance gate and pathway are too small to handle the large numbers of tourists that the monument gets. There leads to situations of confusion and crowding.



e. The ticket window - one small opening constitutes the ticket window. There is no covered area in front of it.





**Signage**

**Logo**

It is important to develop a logo for the Jantar Mantar as a symbol that can appear on tickets, other literature, pamphlets, stationary, etc. The logo would have to be simple so that it is easily recognisable and also give hint of the place in it.

Some suggestions for possible logos for the Jantar Mantar are given below.



**Types of Signage**

Design standardization of general signage in the complex.

Design standardization of signage in museum.

Direction signage, Contextual signage.

Instrument -Information signage.

Gallery signage.

Visitor facility signage.

Notices and instruction signage.

**Tickets**

Along with logos, it is also necessary to have good quality tickets that can be later on preserved by the tourists as souvenir.





The ticket would have a tear joint along the width such that part of it can be saved. The size is made such that the remaining part can be used as bookmark.

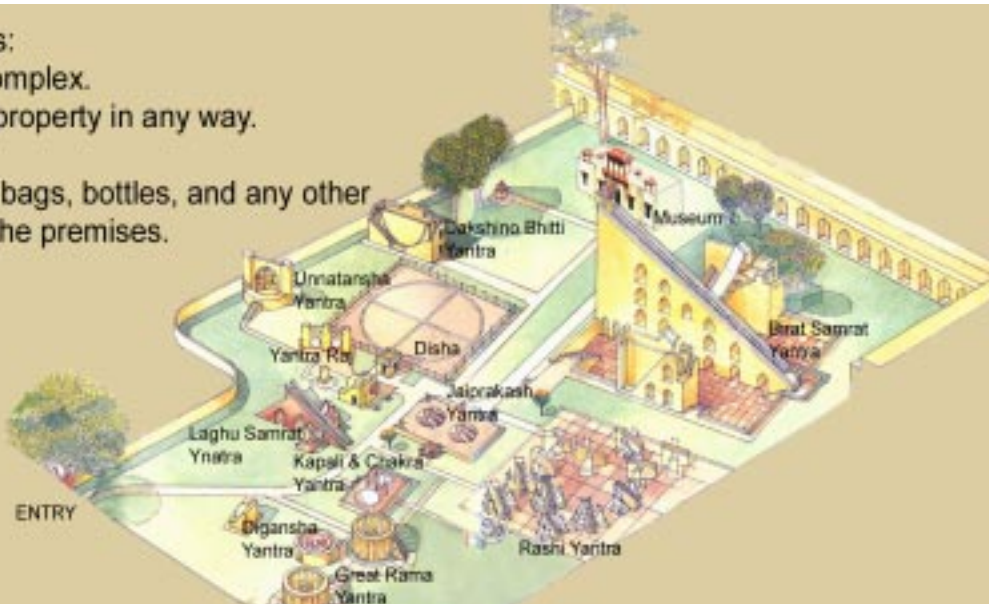
The ticket would also have strict warning against littering, scribbling or any other kind of damage made to the monument and fine clause.

It could be in two languages-Hindi and English.

The logo would appear on the ticket along with some image of Jantar mantar and also plan that could be like a guide map. The route could also be marked on it.



<p><b>JANTAR MANTAR</b> JAIPUR, INDIA</p> <p>Ticket No.:00ABC</p> <p>Ticket: Indian Tourist</p>  <p>Managed By: Rajasthan State Museum And Development Society, Jaipur</p>	<p>Ticket No.:00ABC</p> <p>Ticket: Indian Tourist Rs. 20/- (Twenty Only)</p> <p>Admit One</p>		 
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<p>Important Instructions:</p> <ul style="list-style-type: none"> <li>-Do not litter in the complex.</li> <li>-Do not damage the property in any way.</li> <li>-Do not spit.</li> <li>-Do not throw plastic bags, bottles, and any other desposable items in the premises.</li> </ul> 	<p><b>JANTAR MANTAR</b> JAIPUR, INDIA</p> <p>Ticket No.:00ABC</p> <p>Ticket: Indian Tourist</p> 
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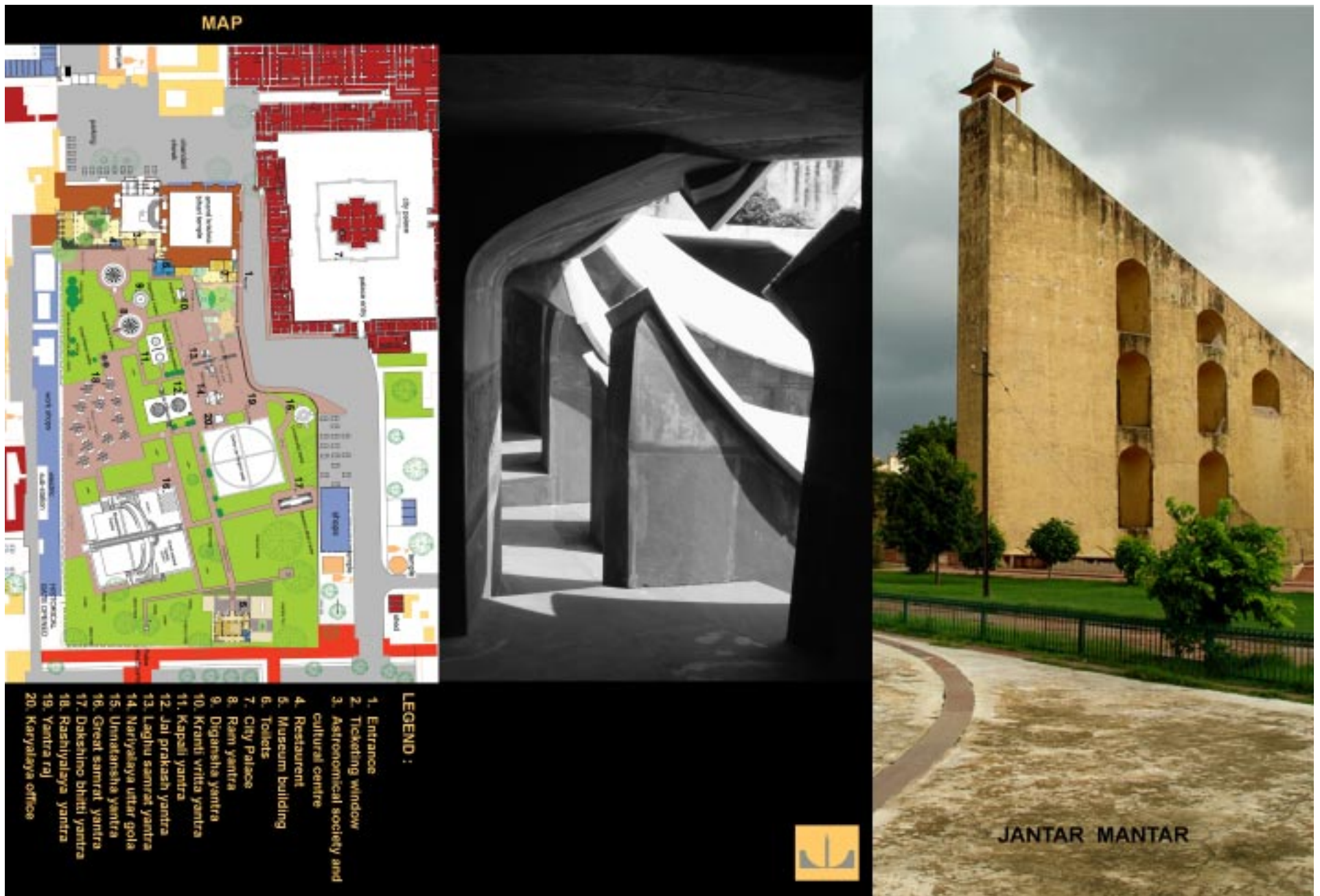




**Brochure**

A brochure on Jantar Mantar can be designed that would explain the history in brief. It could also have information regarding timings, facilities, ticketing, approach and other related tourist information.

It could be on a A4 size printed front and back and folded in three. An alternative is given below.





	Amber	Jodhpur	Udaipur	Jantar Mantar
Built up area G.F.+F.F.+S.F.+T.F. Basement / courts Revenue - total Staff - total	25000.00sm			2,118
Tickets rates	Rs. 50.00	Rs. 250	Rs. 21807250	12 Nos.
-Local				Rs. 30
-Students				Rs. 10.00
-Below 7 years				Rs. 5.00
				Free
Foreigners	Rs.50.00	Rs. 250	Rs. 200	Rs.10
Camera	Rs.25.00	Rs. 200	Rs. 50	
Still				
-Indian				Rs. 20
-Foreigner				Rs. 50
Video Cameras		Rs. 50		Rs. 75 & for camcorder
-Indian				Rs. 50
-Foreigner				Rs. 100
Shops / Nos.	10 shops 7illegally occupied	25 shops	20 nos given on lease	-
Administration staff/ officials/ total		9 Nos.		4 Nos.
Director	Dept. of Museum & Archaeology	Mehrangarh Museum Trust	Shri Arvind Singh	Dept. of Museum & Archaeology olidays
Holidays	-	Weekly off	Mewar festival	Holiday on Dhuleti
Accounts'staff Helpers		12 Nos.	1 Autocad, Draftsmen, 5 supporting staff	3 Nos. 4 Nos.
Others		16 Nos.	20 cleaning	1
Total staff	35-50 persons	126 persons	75 persons	12 persons
Holidays	Weekly off + National holiday	Weekly off + National holiday	Weekly off + National holiday	Holiday on Dhuleti
Houses/ Guards	7/8	80 to 90		-
Engineers		9 Nos.	22 Nos.	-
Sweepers		14 Nos.	20 Nos.	1
Cleaning schedule	whole day in museum hours.	Before and after museum hour.		in morning hours
Guides	22 registered	200 registered		6 Nos.
Rates of Guides				
- 1 - 4 person				Rs. 75
- 5 - 15 person				Rs.100
- 16 - 35 person				Rs.150
- More than 35				Rs. 20 each
Audio guides	-	Rs. 150	-	-
Mode of vertical transport	Stairs + Ramps	Stairs + Ramps+Lift	Stairs	-
Vehicles	-	4	-	-
Attitude/ concern	-	Personal	Personal	-
Vision/ Development areas/ Research	-	Dormitory for researchers		-
Publications		Many publications	Many publications	Many publications
Opening/ Closing time	9.00 AM / 4.30 PM	9.30 AM/5.00 PM		
Night program		Rampart restaurant		
Lighting/ Load services/ Water / Toilets			1.75 crore	2 toilet
Restaurant	2	1+1 -Water @ snack bar		
Parking buses/ cars	182 cars	outside main gate for all	150 car can be parked at a time	outside the main gate for all
Visitor Numbers		4,45,688 Indian 95,475 Foreigner	3,20,486 Indian 1,12,400 Foreigner	
Total 2003-2004		5,41,163	42,886	



## Recommendations

- Ticket rates to be made Rs. 20 for the Indian tourist. Students to pay Rs.10. No separate charges for still Camera.
- Ticket rate for foreigners Rs.100. No separate charge for still Camera
- Video Camera with stand - from Indians Rs 50  
- from foreigners Rs.250
- For evening Sound and light show - Indians Rs. 100  
- Foreigners Rs. 500

## Recommended Maintenance procedures

### Daily / Weekly Routine:

- Cleaning: each instrument should be cleaned once a week, with a dry long broom on the walls and ceilings. Cobwebs must be cleaned from all crevices. On the floor with dry cleaning, a wet mop cleaning is also suggested. It may vary with the season and for different locations.  
E.g. There should be no wet mopping during the monsoon.
- The cleaner must report any defects they note i.e. broken windows, dampness and leaks in roofs, falling pieces of masonry, wood dust from termite infestation, chipping of lime plaster, etc.
- Security checks in the evenings.
- Check toilets, its water system and drains.

### Monthly Routine:

- Check rainwater and other drainage outlets.
- Checking of supply lines and water tanks.
- Wild vegetation removal. Particularly growth of peepal trees must be notified.

### Quarterly Routine:

- Check all the roofs (outside and inside), rainwater disposal outlets, and copings.
- Check all the doors and locking devices.
- Cleaning of light fixtures.
- Technical supervision to inspect the site.
- This inspection should be prior to the monsoons – to check the rainwater disposal system and all roofs/copings.

### Annual Routine:

- Inspection and overhauling of all services.
- Oiling of locks, hinges and replacement of defective hardware.
- Touching up of poor spots on the exteriors.
- Inspection of all water taps kitchen/toilet accessories.

### Quinquennial Routine:

- Inspection by a conservationist and team of consultants.
- Employment of craftsperson and engineer on site for regular inspection and to carry out immediate first aid repairs to avoid needless delays hence, thereby cutting maintenance costs.

Cleaning staff should be given simple training in reporting defects to the custodian.





**TIME FRAME:** Two year from the date of commencement of project on site .Tenders can be invited three months after appointment of consultants.

## **ESTIMATES**

This conservation and development report takes care of detailed analysis of deterioration and a detailed BOQ for the same has been prepared and included in Part C of the report. The Development works however are conceptual giving clear directions to the development that is envisaged for this area. For making block estimates of the same sample areas were detailed out and then applied to the entire development.

There are some assumptions made for this calculation which are as under:

### **CONVERSION OF EXISTING BUILDINGS FOR ADAPTIVE REUSE**

50% of the total flooring will have to be redone.

30% of the wall/ceiling plaster have to be redone.

40% of the total doors and windows are either to be replaced or new ones have to be provided

Internal paint is included.

Internal water supply system, drainage work and plumbing fixture (jaguar make) are included.

Railing work for stairs is included in the sq.mt. rate.

### **CONVERSION OF EXISTING OPEN SPACES (Coutyards and Terraces) FOR ADAPTIVE REUSE:**

50% of the total flooring will have to be redone.

60% of the total parapet plaster will have to be redone.

Safety railings have been included.

### **NEW CONSTRUCTION**

All new construction will be done in stone masonry. As per historic construction techniques. Flooring will be of marble. Doors and windows will be in teakwood with brass hardware. Toilets will be in ceramic tiles with Jaguar fixtures.

### **ELECTRIC WORKS**

The Electric work would include mains, cabling, switches and fixtures calculated @ 1 fixture per 5.00 sq. mt. area. The fittings would be philips, switches would be modular and wiring would be of finolex. Area lighting would be with sturdy external fittings with water proof, fire proof cabling.

### **AIRCONDITIONING**

All areas considered for museum, audio-visual and restaurant are considered for airconditioning.

These development works will have to be designed in details and then actual estimates will be prepared. To account for the variation an additional cost of 10% is included towards contingency. Administrative and management costs @ 10% have been included as government agency charges. Consulting fees @ 10% has also been included for detailing out of the project during executing phase of the project. This scale of charges is based on charges recommended by Council of Architecture. This fees includes payments made to Structural, Electrical, Lighting Consultant, Landscape Architect, Conservation Architects, Urban Designer, Quality Surveyer.

The above specifications are tentative which may change while detailing of the woks is done. This would also mean variation in costs.



## Block Estimates

**Conservation works ( Detailed BOQ provided in part C of this report) 1,25,00,000(A)**

### Development works

#### Total built up area:

1. New construction	a) Visitor facilitation centre	455 sq mt	@5,000	22,75,000
	b) Museum building	270 sq mt		13,50,000
2. Conversion	a) Museum	167 sq mt	@3,700	6,17,900
	b) Astronomical society and cultural centre	265 sq mt		9,80,500
	c) Dakshino bhitti yantra (f.f + g.f.)	70 sq mt		2,59,000
	d) Karyalaya(office)	14 sq mt		51,800
3. Open areas	a) Visitor facilitation centre entrance area	377 sq mt	@1,300	4,90,100
	b) Basement Museum	145 sq mt		1,88,500
	c) Astronomical society and cultural centre	355 sq mt		4,61,500

**Total 66,74,300(X)**

### Services

1. Internal water supply & sanitary installations.	6% on (x)	4,00,458
2. Internal electrical installations	13% on (x)	8,67,659
3. External service connections	6% on (x)	4,00,458

**Total Cost 16,68,575(Y)**

**Total Cost (X+Y) = 83,42,875(B)**

### Site Development:

1. Illumination	a) Light and sound			30,00,000
	b) Audio guide	200 instruments		5,00,000
	c) Safety lights	1 fitting per 125 sq mt		15,00,000
2. Drainage and Water supply	including 5 water harvesting recharge percolation bore wells, Under-ground water storage tank, overhead water tank			15,00,000
3. Opening of historic gates, entrances			Lumpsum	7,50,000
4. Solid waste management			Lumpsum	2,50,000
5. Landscaping including lawn, shrubs, plants as per architects choice, paving, railing, including water bodies	13,000sq mt	@250		32,50,000
6. Acquiring of property on the north and part of Anand Bihari temple.			Lumpsum	40,00,000
7. Parking area	571 sq mt	@500		2,85,500
8. Entrance plaza including membrane structure	377 sq mt	@2500		9,42,500

**Total 1,59,78,000 (C)**

### Miscellaneous

1. Air conditioning visitors facilitation center and museum building	435 sq mt	@1500		6,52,500
2. Furniture including showcases for display	1070 sq mt	@2000		21,40,000
3. Equipment cost		Lumpsum		25,00,000
4. Signage		Lumpsum		9,00,000

**Total 61,94,500 (D)**

### Sub total

**(A + B + C + D) 4,30,15,375**

**Say 4,30,00,000**

Contingency	@ 10%	43,00,000
Administrative and management costs	@ 10%	43,00,000
Consulting fees	@ 10%	43,00,000

**Grand Total 5,59,00,000**

**Say 5,60,00,000**

**Rupees five crore sixty lacs only**





## Bibliography

some reports and books have been referred to for the making of this report. They are stated below.

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|--|--|
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| 8.M.M. Bhandari                          | Flora of the Indian Desert                             |





# CONSERVATION AND DEVELOPMENT OF JANTAR MANTAR COMPLEX

## CONDITION ASSESSMENT, PART - C

RAJASTHAN STATE MUSEUMS MANAGEMENT AND DEVELOPMENT SOCIETY, JAIPUR

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## THANKS TO

This project would have been unrealized without patronage of,

**The Honorable Chief Minister, Rajasthan,  
H.H. SMT. VASUNDHARARAJE SCINDIA**

**Minister of state for Tourism & Archaeology and Museums  
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We are also thankful for the help and support received from the various staff members and the guards at the Jantar Mantar and Hawa Mahal Complex as well as the innumerable people involved in the departments of the Government of Rajasthan.

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## **CONTENTS**

- 1. CONDITION ASSESSMENT**
- 2. RECOMMENDATIONS  
AND ESTIMATES (BOQ)**





## PREFACE

The visual and spatial qualities of the central royal district are unique. Unlike most city centres of medieval towns, this city centre is not a dense urban residential fabric but an amalgamation of some of the most important institutions of the time, secular, religious and royal. These combine to give a flavour, par excellence. The Jantar Mantar and Hawa Mahal are a part of this sector and are key buildings which give it the unique character.

Intensive mapping of the area in terms of movement patterns, historic landuses, present conditions and uses helps in understanding the position of the landmark in today's context. Though elementary drawings of the area existed, a detailed and exhaustive documentation was carried out as part of this report. This study shows that the planning principles adopted more than 275 years ago took into account most of the urban processes and continue to cater to them even today. It is only the over population that is putting pressure on an otherwise beautifully designed city centre. Lack of respect and negligence from all concerned has resulted in a congested and confused situation.

Tourism in India is just beginning to acknowledge the significance of a proper management of heritage monuments for their longevity and maintenance. This report, along with issues of conservation, takes cognizance of the fact that this is a very well visited site in the country. Therefore, all efforts towards conservation have to be inclusive and wholistic. They have to take a broad perspective to include development of infrastructure and facilities. Simultaneously, to maintain the character and quality of the monument, all proposals follow a policy of minimum intervention. It must be kept in mind that any of the proposals envisaged in this report would have to be understood in conjunction with the provisions of law.

A master plan for the overall urban area, now being called monument district, is prepared with recommendations for some of the pressing issues like parking, appropriate use of spaces, tourist facilities, vehicular and pedestrian traffic. This is covered in part A of the report. A wholistic approach where all owners work under a single umbrella is proposed for the overall ambience of the area. The primary objective is to prolong the life of these wonderful monuments towards which we have not only an emotional attachment, but also a connection with our history, culture and heritage.

Part B (Documentation - drawings, photographs) of the report deals with the Jantar Mantar Complex where the architectural study of the present status of the building is carried out. This is done with historic studies as background. Significance of the monuments, their strengths and weaknesses, tourism augmentation of the complex with development proposals, maintenance guidelines etc. have been considered while making the proposals.

Part C of the report deals with architectural conservation of the monument. A detailed condition and damage assessment is carried out. Recommendations to arrest the deterioration are proposed. Detailed Bills of quantities (B.O.Q) for the same are also provided.

The intentions of all the proposals and recommendations of these reports are to make the visit to this place meaningful and also pleasant. Preparing this report has been an insightful as well as difficult process. This enigmatic monument maintains its mystery while allowing certain understanding.



## EXECUTIVE SUMMARY

Jantar Mantar sits in the heart of the city and is part of a large group of monuments that include the City Palace and Hawa Mahal. Its conservation, development and the overall master plan of the area is based on field studies of movement patterns, circulation, facilities and land uses, architectural documentation and analysis. The key issues are presented in the three reports, with a broad summary given below.

### PART A

1. Both, the Jantar Mantar and Hawa Mahal can be seen as a single total experience along with all the other historic monuments in the area. They are looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss crossing movements and having a single parking. The existing Police Headquarters and the Jaleb Chowk are proposed as a link, their occupants are recommended to be relocated. Alternative functions, suitable to converting the area into a monument district with tourist facilities have been allocated.

2. The report provides an overall master plan of the area with suggestions, recommendations and guidelines considering the historic landuses, present conditions and future requirements.

3. The report examines issues of visitor arrival, parking and connections to other monuments in the area and also makes recommendations for improvement and development.

4. Overall development guidelines taking into account increased requirements for infrastructure, controls, conservation of the fabric have been given. The emphasis is on the area to be alive and develop in accordance to its special features and qualities.

5. An overall management committee is proposed that should guide the development of this monument district.

### PART B

1. It is a very well visited monument in terms of tourist traffic and can generate fair amount of revenue: a new ticket fee structure is proposed.

2. On the whole, the monument is, structurally, in a stable condition.

3. A regular system of maintenance and upkeep will ensure longevity and stability - for which larger staff is proposed.

4. There are some buildings on site which are office room, toilets, which do not have a historic background. They will be removed. The museum building on the east end will be retained and converted into multi-media centre.

5. A major part of the site is covered with grass and this landscape was researched for its historicity as well as relevance - A comprehensive landscape plan is proposed.

6. Within the monument, there is very little activity. Nor is there a potential place in the area which provides for pause, from where the entire area can be viewed and enjoyed peacefully. There is a proposal to provide for tourist facilities in terms of information kiosk, cafeteria, souvenir shops. Additional facilities like a multimedia centre, cultural centre and astronomical society are also part of the development.

7. Enlivening the monument in the evenings for which various evening activities are recommended. Several options of development were discussed and are proposed - light and sound show.

8. The Anand Bihari temple abuts the Jantar Mantar and is in dilapidated condition. It has a magnificent view of the Jantar Mantar, Hawa Mahal and City Palace. It is to be brought within the purview of the project and facilities like cultural centre and astronomical society are incorporated within it.

9. The monument may be operated on BOT basis for sustenance.

- Audio guide recommended

- Entrance plaza is proposed with a temporary tensile roofing membrane structure.

10. Visitors cause damage due to mishandling, vandalism and graffiti. This needs to be controlled in a threefold manner - control, fining and vigilance : necessary notices are also proposed as part of the overall signage system.

11. Block estimates for the development are also provided.

### PART C

1. Each yantra is looked at individually and all its damages are noted in form of drawings and markings.

2. Typical damages are understood in the Part C. This section notes all the specific problems.

3. Conservation and restoration recommendations are provided along with necessary guidelines and instructions for carrying out work.

4. Detailed bills of quantities are also provided.







a. The lintels in the Digansha Yantra are cracking and need attention



b. Structural damages like cracking of the load bearing timber beams in Yantra Raj



c. Structural damages like cracking of the load bearing timber beams in Yantra Raj.



d. Structural damages like cracking of the load bearing timber beams in Unnatansha Yantra are critical.

## TYPICAL DAMAGES

### General Aspects

The reconstruction of 1901, under the supervision of Lt. R.E.Garret and Pandit Chandra Dhar Sharma Guleri, Pandit Gokul Chand Bhawan, and subsequent efforts towards maintenance during the British period as well as later has helped avoid major structural damages to the Yantras. However, deterioration has set in and if immediate preventive measures are not taken, it could lead to further damage.

Damages on the site can be broadly categorised as those to the yantras themselves and damages to the landscape, other buildings, services etc. Within these broad categories, there are damages due to weathering, due to human intervention like vandalism as well as incongruous structures and due to ageing of material. Combined, they present a picture of general apathy. The monument is standing mostly due to its own strength and ability to withstand the forces acting upon it.

The damages on site are listed as following:

- Structural damages
- Damages to finishes
- Damages to calibrations
- Graffiti and garbage
- Staircases
- Later additions
- Landscape elements

### Structural Damage

The yantras have by and large not sustained major structural damages. The reasons for the structural damages to upon several conditions.

i) Ageing of materials: At places, wooden structural elements have been used to support some yantras like the wooden beams in the Unnatansha Yantra. These beams have deteriorated over time and the brass instruments are precariously positioned. One is structural which requires immediate attention and other is to the surface plaster in terms of cracking, peeling of the plaster, efflorescence, badly repaired plaster showing patches etc.



e. Structural damages in Chakra nad Kapali yantra are critical.





ii) Differential movement in foundation due to water seepage.

The yantras are surrounded by gardens all around them. These are watered very frequently and therefore a lot of water percolates into the ground. Since these foundations would not have been designed for this kind of water seepage, they tend to settle unevenly depending upon the soil conditions. This causes cracks to develop in the structures. Water seepage is also through ponding in the paving which has not been done properly. This also exerts pressure on the walls of the yantras as can be seen in the Great Samrat Yantra. Most of this damage is still minor and can easily be stabilized before any major loss occurs.

### Finishes

Most of the yantras are plastered and painted over stone. In some cases, the stone masonry is left exposed. Damage to the surface would eventually lead to the damage of the load bearing stone masonry.

Plaster: The plaster is damaged in many places. Either it is flaking off or surface cracks have appeared in it. If not checked, it could lead to greater damage to the structure since the protective layer is damaged. There have been attempts to repair some of these but without cognisance of the original material such that it becomes ungainly.

Efflorescence and dampness: There is also a problem of efflorescence due to dampness and water seepage. This causes ugly patches to appear on the surfaces. If left unchecked, the efflorescence is likely to cause further damage to the plaster and eventually to the stone beneath. This is different from the age patina which is a natural part of the ageing process and is not to be considered a damage.

Flaking of the stone is another problem that is found many places in the complex. It is particularly prevalent the areas that are immediately adjoining the gardens are underground. In both the cases there is a direct contact with the surrounding ground. Though the flaking is on the surface at the moment, if not checked, it will eventually erode the stone.



a. flaking of stone in the Great Samrat yantra



b. Ponding and improper water drainage systems causing water seepage.



c. The chipping away and cracking of the plaster will eventually lead to damage of the yantra as the support becomes weak.



d. Replastering has not been matched with the earlier plaster



e. flaking of stone in the Jai prakash yantra.



### Calibrations and other elements of the instruments.

The reconstruction in 1901 made a huge contribution by remaking the calibrations of the instruments on a very good quality hard marble. However more than a century has passed and these remain exposed to all the forces of nature and over time some damages have occurred.

Though there is very little horizontal surface, most of it is covered by the markings. And there is no proper rainwater drain system, thus allowing accumulation of water in the indentations of the markings. On the other hand, the runoff is also not controlled resulting in algae formation and deterioration of the supporting system of the yantras. The most critical is that the fine markings are getting weathered and the lead infills in them have been lost. These need to be redone so as to protect the accuracy of the readings.

Some recent repairs have been done to hold the marble pieces together. These have not been done carefully. Neither the materials have been matched nor is the method appropriate. It is a difficult situation to try and repair these yantras, especially their marking. The efforts in repairs have resulted in the markings getting covered by cement or other construction materials. Some breakage has also occurred.

Sometimes, in an effort to protect the elements of the yantras, like the poles whose shadows give the readings, they have been covered with barbed wire, cages etc. Though these do protect to some extent, they mar the beauty of the yantra. At times to anchor these protective devices, dents and holes have been made on the yantras.

A most common factor causing damage to the calibration is in form of vandalism and misuse. The visitors step on the markings of yantras. They climb all over the yantras almost like they were elements of a children's playground. This is a gross disrespect of the yantras and must be controlled.



c. Dampness from water percolation will eventually weaken the structures leading to structural failure.



d. Due to time and effects of weathering, the marble on which the calliberations are made is wearing away. This causes loss of the markings.



a. Due to time and effects of weathering, the marble on which the calliberations are made is wearing away. This causes loss of the markings.



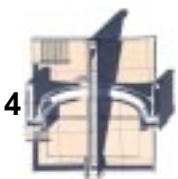
e. Small rama yantra is surrounded by cage



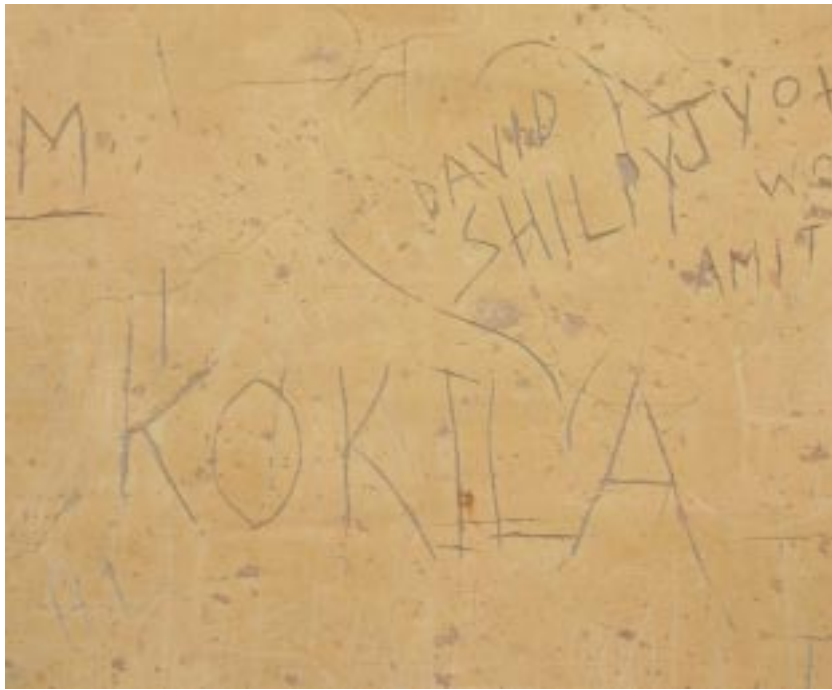
b. The markings are disappearing due to bad plaster done on the surface.



f. Dumping in closed rooms and corridors







a. Scribbling on the plaster surfaces with sharp objects.



b. The kind of dustbins for collecting garbage leaves a lot to be desired.



c. Garbage lying around the premises.



d. Garbage dumped in water sumps.

### Graffiti and garbage

Another major cause for worry is the disrespect shown by people. Many visitors scribble their names on the yantras, particularly in areas under the arches. The scribbling is done either with a sharp object or with pens. In the process, they also damage not only the surface but also the plaster. Though there are guards present on the premises they are not enough nor are they adequately trained.

Observations also revealed a lack of proper cleaning of the premises. Empty plastic bottles, garbage etc. is dumped in corners and in the dry water body. Also, the containers used to collect garbage are not properly designed. They themselves are inadequate and often, just old buckets.

### e) Staircases

The staircases are an important architectural element of the yantras. Considering the scale and size of the yantras, staircases were made to access them. They were converted into a tectonic element contributing to the form of the yantras. However, these staircases were not meant to be used by a large number of people but mostly by the astrologers and related people. With the opening up of the monument to a larger number of people, the staircases undergo a lot of wear and tear. This has resulted in them being damaged. At many places they have got cracks. The plaster has peeled off. The edges of the treads suffer the most.

At some places the parapet has also been damaged. Once again the immense human traffic has caused the maximum wear and tear.



e. Deterioration of the parapet



f. Wear and tear of steps



g. Deterioration of the parapet





a. An arched opening in the yantra closed and a doorway made to access the portion behind.

### Later additions

Since these yantras do not have any particular use as habitable spaces, and have a very strong form by themselves, they have been saved from much additional constructions. There are some instances where the openings and spaces within the structure have been closed and sealed.

Historically there were some rooms below the Jaiprakash yantra with 10 stairs leading to the chambers below. However, due to management problems these were closed down many years ago and not much trace of that remains.



b. The openings on one side of the Samrat Yantra are still open while those on the other side have been sealed.



d. The openings on one side of the Samrat Yantra are still open while those on the other side have been sealed.

### Landscape elements

Elements like pathways, railings, furniture, dustbins, gardens and plantations all constitute the landscape aspect of the complex. The attitude towards their making in this complex has been more like a public garden than a historical monument. This aspects needs consideration.



c. An overall view of the entrance area showing the many disparate elements of the landscape disturbing the experience of the complex. The hedges, railings and plantations are all placed randomly.



There are nice mature trees on the site. They may not have been there historically, but they provide some relief to the stark landscape and also shade some areas.

The pathways in the landscape have been recently surfaced. However, the surfacing is not evenly done leading to a lot of ponding. This becomes critical, especially in monsoon, since a lot of seepage is already taking place from the gardens.

The gardens, while providing relief in the stark landscape, cause a lot of seepage into the foundations of the yantras which may not be designed for that. It is already causing a lot of efflorescence as seen earlier.

Railings have been provided more to control visitor movement than protect the yantras since at many places in any case the people step over the yantras. The need for railings and their design needs to be reassessed.



d. Ponding in the pathways will eventually damage them



a. The railing and pathways all constitute the total ambience of the complex and are at the moment badly made and not maintained.



e. Gardens too near the yantras will lead to weakening of their foundations.



b. The curbing and pathways all constitute the total ambience of the complex and are at the moment badly made and not maintained.



f. Railings to control the crowd at the entrance area. Disturbs the experience.



c. Flowerpots used as dustbins. And yet another plastic dustbin is also placed with it.





## TYPICAL DAMAGES

- General Aspects
- Structural Damage
- Finishes
- Calliberations
- Graffiti
- Staircases
- Later Additions







a. The lintels in the Digansha Yantra are cracking and need attention



b. Structural damages like cracking of the load bearing timber beams in Yantra Raj



c. Structural damages like cracking of the load bearing timber beams in Yantra Raj.



d. Structural damages like Cracking of the load bearing timber beams in Unnatansha Yantra is critical.

## TYPICAL DAMAGES

### General Aspects

The reconstruction of 1901, under the supervision of Lt. R.E.Garret and Pandit Chandra Dhar Sharma Guleri, Pandit Gokul Chand Bhawan, and subsequent efforts towards maintenance during the British period as well as later has helped avoid major structural damages to the Yantras. However, deterioration has set in and if immediate preventive measures are not taken, it could lead to further damage.

Damages on the site can be broadly categorised as those to the yantras themselves and damages to the landscape, other buildings, services etc. Within these broad categories, there are damages due to weathering, due to human intervention like vandalism as well as incongruous structures and due to ageing of material. Combined, they present a picture of general apathy. The monument is standing mostly due to its own strength and ability to withstand the forces acting upon it.

The damages on site are listed as following:

- Structural damages
- Damages to finishes
- Damages to calibrations
- Graffiti and garbage
- Staircases
- Later additions
- Landscape elements

### Structural Damage

The yantras have by and large not sustained major structural damages. The reasons for the structural damages depend upon several conditions.

i) Ageing of materials: At places, wooden structural elements have been used to support some yantras like the wooden beams in the Unnatansha Yantra. These beams have deteriorated over time and the brass instruments are precariously positioned. One is structural which requires immediate attention and other is to the surface plaster in terms of cracking, peeling of the plaster, efflorescence, badly repaired plaster showing patches etc.



e. Structural damages in Chakra nad Kapali yantra are critical.

## EXECUTIVE SUMMARY

Jantar Mantar sits in the heart of the city and is part of a large group of monuments that include the City Palace and Hawa Mahal. Its conservation, development and the overall master plan of the area is based on field studies of movement patterns, circulation, facilities and land uses, architectural documentation and analysis. The key issues are presented in the subsequent chapters, with a broad summary given below.

1. It is a very well visited monument in terms of tourist traffic and can generate fair amount of revenue: a new ticket fee structure is proposed.
2. The report examines issues of visitor arrival, parking and connections to other monuments in the area.
3. The report provides an overall master plan of the area with suggestions, recommendations and guidelines considering the historic landuses, present conditions and future requirements.
4. Both, the Jantar Mantar and Hawa Mahal can be seen as a single total experience along with all the other historic monuments in the area. They are looked at as interrelated parts with easy movement of people covering all aspects, thus effectively reducing criss crossing movements and having a single parking. The existing Police Headquarters is proposed as a link, its functions recommended to be relocated.
5. On the whole, the monument is in a stable condition.
6. A regular system of maintenance and upkeep will ensure longevity and stability - for which larger staff is proposed.
7. Visitors cause damage due to mishandling, vandalism and graffiti. This needs to be controlled in a threefold manner - control, fining and vigilance : necessary notices are also proposed as part of the overall signage system.
8. Within the monument, there is very little activity. Nor is there a potential place in the area which provides for pause, from where the entire area can be viewed and enjoyed peacefully. There is a proposal to provide for tourist facilities in terms of information kiosk, cafeteria, souvenir shops. Additional facilities like a multimedia centre, cultural centre and astronomical society are also part of the development.
9. Enlivening the monument in the evenings for which various evening activities are recommended. Several options of development were discussed and are proposed - light and sound show is also proposed.
10. A major part of the site is covered with grass and this landscape was researched for its historicity as well as relevance - A comprehensive Landscape plan is proposed.
11. There are some buildings on site which are office room, toilets, which do not have a historic background. They will be removed. The museum building on the east end will be retained and converted into multi-media centre.







1. INAPPROPRIATE ENTRANCE GATE



4. SIGNAGE FOR THE MONUMENT



5. PLASTER PEEL OFF DUE TO WATER



6. GARBAGE DUMPING



2. EXPOSED DRAINAGE PIPES



3. WALL CRACK AND REPLASTERING EXPOSED



EXPOSED ELECTRICAL METER BOX AND CABLES



8. GARBAGE DUMPING



9. PLASTER PEEL OFF

There are nice mature trees on the site. They may not have been there historically, but they provide some relief to the stark landscape and also shade some areas.

The pathways in the landscape have been recently surfaced. However, the surfacing is not evenly done leading to a lot of ponding. This becomes critical, especially in monsoon, since a lot of seepage is already taking place from the gardens.

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e. Gardens too near the yantras will lead to weakening of their foundations.



f. Railings to control the crowd at the entrance area. Disturbs the experience.







**RECOMMENDATIONS AND ESTIMATES**





## EXECUTION PROCESS

Broadly the process of conservation work should be as follows

1. The repairs should be confirming to historic details.
2. It is advisable to divide work among several expert agencies.
3. Architect should visit the site regularly, inspect the work done in terms of quality and quantity.
4. Conservation work should be systematically taken up. This helps to identify the quality of work and the commitment of the contractor.
5. The site must be continuously investigated for further findings.
6. Most of the rate should be done by means of rate analysis, with a sample.
7. Structural stability to be achieved with the grouting of the walls, pointing of the stonewalls, joining of the roof slabs with the help of stainless steel rods. This is a method devised by the expert consultants to stabilize the heritage structures
8. For good results and efficient setting time, 10% cement can be used as specified by ISI to make a good lime mortar. In addition Gud, Guggal and Methi to be boiled for seven days, and this concoction to be used to get the required consistency of the mortar.
9. Stone-carvings, painting, should be given to master craftsman only.
10. Workshops and seminars should be held for guides and for local children.
11. Experiments must be carried out to determine the colour of the plaster, using various ingredients.
12. Steel scaffolding, the grouting machine, mortar mixing machine, stone cutting machine, and such other mechanical tools should be used for ease of construction.
13. Extremely weathered stones should be replaced with new pieces.
14. Inventory of items found on site should be made and they should be properly stored.
15. All missing elements should be replaced to get back the historic ambience.

## SITE PRACTICE AND SKILLS

Unfortunately, loss of built heritage continues to occur at many levels.

- Often resulting from miss understood practices- and can remain overlooked until damage has been done. But loss can be prevented through a better understanding of the correct materials and methods to be employed.
- Typical causes of damage might include an increase in visitors numbers- visitor traffic causes wear and tear of the treads in the staircases, decay including dry rot in supporting timbers; damage from water, including burst pipe and penetrating rain water; vandalism or accidental physical damage and inappropriate treatment, such as modern paint finishes.
- Many historic buildings have suffered from the careless installation of services. New routes are often driven through walls and floor without proper consideration.
- Where possible re-location of the water-borne services away from the vicinity of the plaster work is recommended.
- If used appropriately, lime based materials will be effective for the repair and maintenance of traditional building where these were originally constructed using these materials, but they do require to be used with a degree of understanding and care.
- Animal hair has been traditionally been used to improve tensile strength and reduce shrinkage in lime renders and plasters.
- As general principal, surviving original lime- based materials should be used if available. Skilled craftsman and good site practice are of a fundamental importance. In addition to techniques of application of the mortar, attention should be given to preparation of the materials, preparation of the masonry, provision of an appropriate working environment and appropriate curing conditions.

For preparation of site the following preliminary actions should be taken.

- a) All surfaces to be photographically recorded.
  - b) To provide a fully protected scaffold. Adequate access, equipment, health and safety requirements should also be available.
  - c) Agree on a program and sequence of work. If necessary the preliminary program, perhaps used for obtaining the contractor's tender, should be revised and adjusted as necessary to suit the actual conditions found on site.
  - d) All vegetation growth and roots must be removed from the masonry before repairing.
  - e) For preparation of repairing of joints and masonry damages, the decayed mortar is carefully raked out loose from the surface, up to sound original lime mortar. As a general rule the depth of a joint for re pointing should be around twice its width.
- Where possible, loose stones and pinning which are removed in the course of raking out should be clearly identified for replacement in their original.



23. ARCHES ARE FILLED UP BY BRICK



24. ARCHES ARE FILLED UP BY BRICK



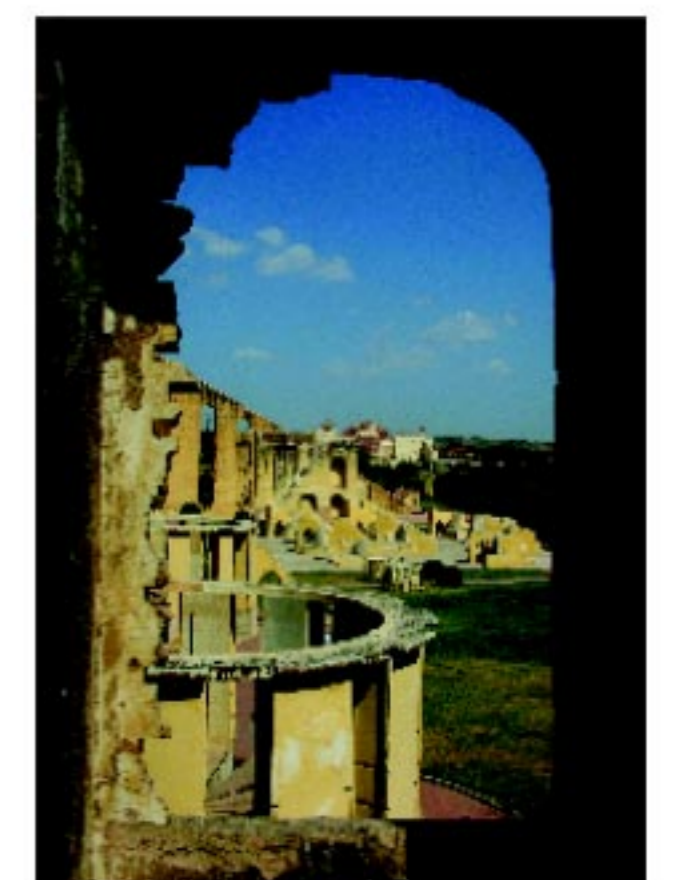
25. COLLECTION OF GARBAGE



26. PLASTER PEEL OFF, WALL DAMAGED



27. GARBAGE COLLECTION, PLASTER PEEL OFF



28. JALIS ARE BROKEN

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# ICOMOS

INTERNATIONAL COUNCIL ON MONUMENTS AND SITES  
CONSEIL INTERNATIONAL DES MONUMENTS ET DES SITES  
CONSEJO INTERNACIONAL DE MONUMENTOS Y SITIOS  
МЕЖДУНАРОДНЫЙ СОВЕТ ПО ВОПРОСАМ ПАМЯТНИКОВ И ДОСТОПРИМЕЧАТЕЛЬНЫХ МЕСТ

Our Ref. GB/MA 1338

Paris, 14 December 2009

H. E. Ms Bhaswati Mukherjee  
Ambassador  
Permanent Delegation of India to UNESCO  
Maison de l'UNESCO  
Bureaux M1.42/M1.38  
1, rue Miollis  
75732 PARIS Cedex 15

## **World Heritage List 2010: Request for information – The Jantar Mantar, Jaipur (India)**

Dear Madam,

ICOMOS is currently assessing the nomination of “The Jantar Mantar, Jaipur” as a World Heritage site, and we thank you for your assistance with the recent Mission to the property.

As part our evaluation process, the ICOMOS World Heritage Panel has now reviewed this nomination and identified a few areas where it considers that further information is needed.

Therefore, we would be pleased if the State Party could consider the following points and additional information:

- Confirm if the Disha Yantra and the Astronomers’ House are in fact inside the limits of the nominated property, or if not, consider an extension of the existing limits to include them. Supply an exhaustive map showing the location of each instrument, bearing the same name and the same number as in the nomination dossier (Part 2, Description).
- Consider extending the buffer zone to the south of the property (zones 8 and 12 on the layout plan), and if possible extending it more generally, in order to control urban and landscape development in the environment of the property to ensure compatibility with the expression of the property’s values. The management rules of a buffer zone enlarged to encompass private law owners must be set out in detail. Supply a map of the new buffer zone.
- Reinforce the comparative study to take into account the scientific and cultural conceptions which led to the construction of the Jantar Mantar. Extend this study by a comparison with the other observatories included in the Tentative List, particularly in terms of the instruments, use and history of observatories, in terms of integrity and authenticity, in terms of landscape environment, and finally in terms of state of conservation.
- Indicate when the Management Plan was promulgated, or when it will be promulgated. State the schedule for its implementation and operation. State which bodies are in charge of coordinating the management of the property by the various partners.
- A serial nomination has been announced. It will be necessary to justify the series, and to state its objectives and limits, and the process by which a nomination for the World Heritage List could be made.

We look forward to your responses to these points which will be of great help in our evaluation process.



ICOMOS has no obligation to contact States Parties during the evaluation process. However, with a view to being as transparent as possible, ICOMOS has agreed to approach States Parties in specific cases. This does not prejudice the ICOMOS recommendation on the nomination and should be considered as preliminary information. It also does not prejudice the World Heritage Committee's decision.

We would be grateful if you could provide ICOMOS and the World Heritage Centre with the above information by **28 February 2010**.

We thank you in advance for your kind cooperation.

Yours faithfully

A handwritten signature in black ink, appearing to read 'RD', with a long horizontal line extending to the right from the bottom of the letters.

Regina Durighello  
Director  
World Heritage Programme  
ICOMOS

Copy to

Department of Art and Culture, Government of Rajasthan  
DRONAH  
UNESCO World Heritage Centre, Paris

**Document:**

Additional Information in response to 'World Heritage List 2010:  
Request for information – The Jantar Mantar, Jaipur (India)

**Submitted to:**

Director, World Heritage Programme, ICOMOS

**Submitted by:**

World Heritage Section, Archaeological Survey of India, New Delhi

**Date:** February 23, 2010



**CONTENTS - Additional Information enclosed for following points raised by ICOMOS:**

<b>S.No.</b>	<b>Information Required</b>	<b>Page No.</b>
1.	Confirm if the Disha Yantra and the Astronomers' House are in fact inside the limits of the nominated property, or if not, consider an extension of the existing limits to include them. Supply an exhaustive map showing the location of each instrument, bearing the same name and the same number as in the nomination dossier (Part 2, Description).	Page 3 Page 15
2.	Consider extending the buffer zone to the south of the property (zones 8 and 12 on the layout plan), and if possible extending it more generally, in order to control urban and landscape development in the environment of the property to ensure compatibility with the expression of the property's values. The management rules of a buffer zone enlarged to encompass private law owners must be set out in detail. Supply a map of the new buffer zone.	Page 3-5, Page 16 -20
3.	Reinforce the comparative study to take in to account the scientific and cultural conception which led to the construction of the Jantar Mantar. Extend this study by a comparison with the other observatories included in the Tentative List, particularly in terms of the instruments, use and history of observatories, in term of integrity and authenticity, in terms of landscape environment and finally in terms of state of conservation.	Page 6-10 Page 21
4.	Indicate when the Management Plan was promulgated, or when it will be promulgated. State the schedule for its implementation and operation. State which bodies are in charge of coordinating the management of the property by the various partners.	Page 11- 12 Page 16- 20
5.	A serial nomination has been announced. It will be necessary to justify the series, and to state its objectives and limits, and the process by which a nomination for the World Heritage List could be made.	Page 12-14
6.	Additional List of Maps and Tables <ul style="list-style-type: none"> <li>• Plan of Jantar Mantar with names of all instruments</li> <li>• Plan of the Jantar Mantar with extended buffer zone <i>(revision to Nomination Dossier, Buffer Zone Map on Page 5)</i></li> <li>• Plan showing ownership of site and buffer zone</li> <li>• Plan showing legislative framework for site and buffer zone</li> <li>• Plan showing list of properties in buffer zone</li> <li>• Table showing list of properties with details of ownership and legislation</li> <li>• Table showing comparative analysis of observatories <i>(revision to Nomination Dossier, Table 3.1 on Page 44)</i></li> </ul>	Page 15- Page 21

- 1. Confirm if the Disha Yantra and the Astronomers' House are in fact inside the limits of the nominated property, or if not, consider an extension of the existing limits to include them. Supply an exhaustive map showing the location of each instrument, bearing the same name and the same number as in the nomination dossier (Part 2, Description).**

The Disha Yantra (Jai Singh's Seat) and the Astronomers' House (Karyalaya/Office) are inside the limits of the nominated property.

*Refer plan of Jantar Mantar with location of each instrument bearing same name as Part 2, Description on Page 15 of this document*

- 2. Consider extending the buffer zone to the south of the property (zones 8 and 12 on the layout plan), and if possible extending it more generally, in order to control urban and landscape development in the environment of the property to ensure compatibility with the expression of the property's values. The management rules of a buffer zone enlarged to encompass private law owners must be set out in detail. Supply a map of the new buffer zone.**

The Buffer Zone for Jantar Mantar is revised and extended to ensure sufficient areas on all sides of the nominated site for protection of its OUV. The extended Buffer Zone as shown on Page 16-19 of this document includes the southern zones 8 and 12 (that were shown on Page 5 of Nomination Dossier). These are now marked as zone 13 and 14 in the revised map on Page 19 of this document. The extended buffer zone also includes more areas to the north towards the City Palace and Jaleb Chowk area. Collectively, the buffer zone now occupies a quarter of the central sector of the historic walled city of Jaipur

*(Refer page 16 -20 of this document as Revision to: Nomination Dossier -Fig. 5, p.5; Management Plan- Fig.2, p.7))*

### **Rationale for Extended Buffer Zone**

The extended Buffer Zone for Jantar Mantar, Jaipur as marked in Plan ensures sufficient areas on all sides of the nominated site for protection of its OUV.

The selection of the Buffer area to the South and the East of the nominated site is logically extended till the main commercial streets of the old city of Jaipur. Thus, towards the south and the east; the nominated site is encased by few historic buildings followed by narrow inner



streets and another row of buildings facing the main commercial streets. Similarly, the buffer zone to the west includes the built form of Anand Bihariji temple followed by road area of Chandini Chowk and Brajnidhi temple block with the access road to Chandni Chowk marking the the buffer zone boundary on this edge.

While on the three sides of the site (i.e. east, west and south), the extended buffer zone is clearly marked till the edge of the approach road or main commercial roads, it is the north side of the site that allows maximum buffer area. The selection of the buffer zone to the north covers the entire site of the historic City Palace and the Jaleb Chowk. This buffer area covers the second approach to Jantar Mantar site which is via Jaleb Chowk.

In terms of historic planning of this sector, the extended buffer zone ideally covers the oldest core of the City Palace with its two main open spaces ie. Jaleb Chowk and Chandni Chowk. These open spaces till date continue to be the access to the nominated site and the City Palace from the main commercial streets of the city.

Since the visitors to the nominated site are same as the ones visiting adjoining monuments such as the City Palace and Hawa Mahal in the buffer zone, inclusion of these areas in the buffer zone not only ensures enough protection of the OUV of the site, but is also a feasible selection to collectively resolve access, transportation and parking issues for the nominated site and the entire zone.

#### **Statutory and Legislative framework for extended Buffer Zone**

Following Acts/ Rules ensure the protection of the nominated site and the buffer zone areas *(Refer Page 16 -20 of this document for maps and tables):*

- a. The Rajasthan Monuments, Archaeological Sites and Antiquities Act 1961. This act applies on all state protected monuments that come under the jurisdiction of the Department of Archaeology and Museums, Government of Rajasthan.
- b. The Municipal Council, Jaipur (Building) Bye laws, 1970

Besides the above mentioned legislation, the Jaipur Master Plan 2025 also marks the walled city of Jaipur (including the nominated site and buffer zone) as a Heritage Zone in the city and recommends preparation of a Zonal Level Plan ensuring heritage protection for the same. This

Master Plan 2025 has been completed in October 2009 and is currently open for public consultation. Thereafter, it becomes a statutory document.

In December 2009, the State of Rajasthan has formed a State Level Heritage Committee under the Urban Development Minister of Rajasthan (with representatives from various departments responsible for urban heritage such as the Department of Urban Development and the Department of Art, Literature and Culture. This body will oversee and monitor all urban heritage conservation projects across the state and in the city of Jaipur. While the legislative framework a. and b. mentioned above are in place to ensure protection and enhancement of the site and the buffer zone, documents such as the Jaipur Master Plan 2025 and formation of State Level Heritage Committee to guide urban conservation further strengthens the implementation of existing bye laws. The Heritage Committee has already commissioned work on special Architectural Control Guidelines to be developed by the Jaipur Municipal Corporation for each sector within the walled city including the Buffer Zone area.

### **Planning for Buffer Zone**

The following table collectively presents the entire range of planning documents/proposals which relate to the site directly or indirectly. These range from strategic planning documents at regional and local level to overarching strategies guiding tourism, transport, economy or heritage, integrated conservation plans and management plans.

<b>S. No.</b>	<b>Plan</b>	<b>Year of Preparation</b>	<b>Agency Responsible</b>	<b>Status</b>
1.	Jaipur Master Plan 2025	2009	Jaipur Development Authority	Master Plan is currently open for public consultation
2.	Urban renewal proposals for walled city of Jaipur	2008-09	Jaipur Municipal Corporation	Currently under implementation
3.	Comprehensive Mobility Plan for walled city of Jaipur	2009-10	Jaipur Development Authority	Currently under implementation
4.	Heritage Management Plan	2007	Jaipur Heritage Committee	Integrated the the Jaipur Master Plan 2025
5.	Integrated conservation plan for Jantar Mantar and Hawa Mahal	2005-06	Department of Archaeology and Museums	Implemented partly on site but not in the buffer zone area. Plan will be reviewed as per suggestions in the Management Plan.



- 3. Reinforce the comparative study to take into account the scientific and cultural conception which led to the construction of the Jantar Mantar. Extend this study by a comparison with the other observatories included in the Tentative List, particularly in terms of the instruments, use and history of observatories, in term of integrity and authenticity, in terms of landscape environment and finally in terms of state of conservation.**

#### **Scientific and Cultural Conception that led to the construction of Jantar Mantar**

- While the use of monumental scale goes back to prehistoric times, when megalithic structures imbued with astronomical associations were erected as landmarks, the precedents of the Jantar Mantar observatories built by Sawai Jai Singh II are the observatories at Maragheh and Samarkand dating from the 13th and 15th centuries respectively. The Jantar Mantar sites are monumental architectural ensembles of varying scale that reflect the culmination of principles of medieval observational astronomy that stressed on the use of large scale instruments for better accuracy. True to the belief in accuracy being achieved by increasing the scale of instruments, the Brihat Samrat Yantra at the Jantar Mantar, Jaipur is the largest equinoctial sun-dial in the world today.
- Though brass pre-telescopic instruments were known to be used in other parts of the world by early 18<sup>th</sup> century, Sawai Jai Singh II was convinced as a result of experiments conducted through metal instruments that large scale masonry instruments gave more accurate readings, as the axes of the brass instruments rapidly wore down, displacing the centre and shifting the planes of reference. Hence, he used his vast reading and knowledge about astronomical instruments from other lands, including Ulugh Beg's observatory at Samarkand, to modify, innovate and create his own instruments and observatories called Jantar Mantar.
- Sawai Jai Singh II's intention in creating the Jantar Mantars was the compilation of the *Zij-i Muhammad Shahi*, a set of astronomical tables based on his own observations at the Jantar Mantar in Jaipur and Delhi (which were intended as revisions to Ulugh Beg's *Zij* from the Samarkand observatory). The scholars of India who were trained according to the Islamic school of astronomy readily adopted the *Zij-i Muhammad Shahi*. They wrote commentaries on it. To the world at large, the *Zij* was not of much value, but to traditional Islamic scholars of India, to whom Western science was out of reach, the *Zij* served a valuable resource. These scholars prepared almanacs with its aid for more than

100 years. Hindu astronomers also embraced the parameters of the *Zij* and prepared their *panchangas* (Hindu calendar) with it.

- The creation of Jantar Mantar observatories as monumental ensembles is also related to the transforming cultural beliefs in the 18<sup>th</sup> century India that accepted a wider dissemination of codified astronomical knowledge to the general public. These mark the beginning of creating observational instruments as monumental architectural expressions in India where readings could be taken conveniently in groups.
- The Jantar Mantar observatories were built to inculcate contemporary findings of astronomy within the late medieval cultural context in India. It represents the culmination of *Zij* astronomy and an ambitious expression of large scale pre-telescopic masonry observatories as a result of the interchange of ideas across the Indian, Central and West Asian and European cultures.

A comparison of Jantar Mantar with other historic observatories across the world is presented in the nomination dossier covering the following:

- Nomination dossier, page 36-44 provides a comparison with precedent international observatories such as Observatory of Nasir-ud-din Al Tusi at Maragheh, Iran, Gaocheng Astronomical Observatory, China, Ulugh Beg's Observatory at Samarkand, Uzbekistan and Beijing Ancient Observatory, China. It also provides comparison with the Istanbul Observatory of Taqi al-Din, Turkey, Tycho Brahe's Observatories at Uraniborg and Stjerneborg, Sweden and the Royal Greenwich Observatory, UK.
- Nomination dossier, page 45-46 provides a comparison with national level pre telescopic observatories that include other 3 Jantar Mantar observatories at New Delhi, Varanasi and Ujjain in India.

The above comparative analysis is further strengthened here, by a comparison with observatories (both pre telescopic and telescopic kinds) recently included in the Tentative List. Following table shows this comparison in terms of the instruments, use and history of observatories, in terms of integrity and authenticity, in terms of landscape environment and finally in terms of state of conservation:

*(Refer table on comparative analysis on Page 21 of this document)*



Tentative List	Instruments	Use and History	Integrity and Authenticity	Landscape Environment	State of Conservation
<p><b>The Jantar Mantars: Astronomical Observatories of India</b> Ref no. 5419 Criteria (ii)(iv)(vi)</p>	<p>Jantar Mantar, Jaipur has 19 instruments Jantar Mantar, Delhi has 7 Instruments Jantar Mantar, Varanasi Observatory has 7 instruments Jantar Mantar, Ujjain has 7 instruments In essence, all are positional astronomy instruments for the measurement of time and celestial co-ordinates in the Horizon, Equatorial and Ecliptic co-ordinate systems.</p>	<p>Jantar Mantars were established between 1718 and 1738. These were used to prepare complete astronomical ephemeris with better accuracies in positional astronomy measurements than had been possible with earlier instruments in India. The instruments have tremendous potential for teaching basic astronomy, a usage envisaged by their creator</p>	<p>Instruments can still be used for observations. The multiple restorations have altered built fabric. However, all changes are recorded.</p>	<p>Jaipur observatory is an architectural-sculptural complex within the walled city heritage zone surrounded by 18<sup>th</sup>-19<sup>th</sup> century urban fabric. Observatories at Delhi and Varanasi are now surrounded by tall buildings. Ujjain observatory is in an isolated site with no man-made structures around.</p>	<p>Good state of conservation, especially Jaipur observatory which has been restored in 2007-08.</p>
<p><b>Archaeo-astronomical Site Kokino</b>, the Former Yugoslav Republic of Macedonia Ref no. 5413 Criteria (i)(ii)(iii)</p>	<p>Megalithic thrones, deduced to be oriented with respect to the directions of the Equinox and Solstice rising Sun and the rising Moon during Lunar Standstills, for an epoch about 3800 BC.</p>	<p>5800 years old, used for observing the movement of the Sun and the Moon and marking of the extreme positions</p>	<p>Authentic marker cuttings and their purpose, overall design, marking the precise measurements and the application of the astronomic methods in the argumentation and documentation of the positions of the marker cuttings for the rising of the Sun and the Moon in astronomically precisely determined time.</p>	<p>The dominant location and the monumental appearance of the stone seats (thrones), the distinctly made stone markers, trenches, access paths and formed rite spaces - are a testimony of one original monumental art expressed through the skill of designing a space in a rocky area.</p>	<p>The archaeo-astronomical site is preserved in its original condition.</p>
<p><b>Astronomical Observatories of Ukraine</b> Ref no. 5267 Criteria (ii)(iv)(vi)</p>	<p>Meridian circle, axial meridian circle, refractor, astrograph, passage instrument, solar telescopes and other types of telescopes from 19<sup>th</sup> century and later</p>	<p>Connected with two outstanding achievements of 19th-20th centuries, namely, creation of the fundamental celestial coordinate system and successful research of the Sun. The sites date from 1821, 1845, 1871 and 1908(1945)</p>	<p>The main buildings of observatories in Kyiv, Nikolaev, Odesa, Simeiz have been preserved and used in accordance with their primary destination. Lots of Archival data on observatories exists.</p>	<p>All four are architectural complexes with pavilions, towers and housing units</p>	<p>All protected at national level, in good state of preservation</p>

Tentative List	Instruments	Use and History	Integrity and Authenticity	Landscape Environment	State of Conservation
<p><b>Observatory (Dengfeng) in Mount Song, China</b></p> <p>(Mentioned as Gaocheng Observatory in comparative study in the nomination dossier)</p> <p>Criteria (i)(ii)(iii)(iv)(vi) (the observatory contributes to criteria i)</p>	<p>The gnomon for solar meridian observations in the observatory, being the only surviving material evidence of the reform of astronomical instruments in the early Yuan Dynasty, is of extremely great scientific value. It marks the summit of the use of the gnomons for meridian observations in China as well as in the world.</p>	<p>Built between 1267 and 1269 AD, it is the oldest observatory that remains in China, and one of the oldest structures for astronomical observation in the world. Unlike the observatory in Beijing that was built under the supervision of European astronomers in Qing Dynasty, thus showing a blend of Chinese and western architectural styles, the observatory in Dengfeng is typical of the traditional Chinese astronomical structure. It adopted the sundial and improved it so much that for 300 years it was more precise than the best of any western instruments.</p>	<p>Unlike most other similar observatories or instruments in the world, which have lost their instruments, this observatory has retained its original gnomon,-which, having been first used by the Duke of Zhou and has been used from Tang dynasty to now, is still functioning normally. Therefore it has made a world record of the duration of astronomical observation at one site. The horizontal slab to the south of the gnomon, for marking the annual solar position, was rebuilt at a later stage.</p>	<p>The complex consists of 13 ancient structures and sites, of which the observatory is one.</p>	<p>Good state of conservation</p>
<p><b>Observatories in Alexandria, Egypt</b></p> <p>Ref no. 1822</p> <p>Criteria (i)(ii)(vi)</p>	<p>Astrolabes that have completely disappeared now</p>	<p>The observatories were part of the Great Library of Alexandria. The city was founded in 332 BC by Alexander.</p>	<p>The Great Library probably disappeared between 250 and 270 AD</p>	<p>The modern city is built on the rubble of Alexandria</p>	<p>Ruins or remains as excavations or submerged under the sea. A new Library has been established in 2002 on the tentative location of the ancient library.</p>



Tentative List	Instruments	Use and History	Integrity and Authenticity	Landscape Environment	State of Conservation
<b>Hermitage Blaca, Croatia</b> Ref no. 5103 Criteria (ii)(v)	The telescope from Blaca has remained to this day the third most powerful one in Croatia	Monastic complex from 16 <sup>th</sup> century developed from cave as nucleus and expanded	Cultural and natural characteristics have been preserved to a large degree in their integral and authentic form.	The Blaca valley is protected as a significant landscape on the basis of the Law on the Protection of Nature	Adequate protection and management system to ensure its preservation.
<b>The Cape Arc of Meridian</b> Ref no. 5461 Criteria (ii)(iv)(vi)  (similar to already inscribed Struve Arc in the northern hemisphere)	Lacaille used a 28 inch telescope and ½ inch refractor to catalogue the southern stars. 20 foot reflecting telescope used by Sir John F.W. Herschel from 1834 to 1838 for astronomical observations. 13 ½ foot Bradley's Zenith Sector used by Maclear to re-measure the Arc of Meridian. Maclear's triangulation measurements were made with the most accurate theodolites available.	The Arc of Meridian, surveyed by the Abbé Nicholas-Louis de Lacaille in 1751-1753 and Thomas Maclear from 1838-1848. This was the first accurate measuring of a long segment of a meridian in the southern hemisphere, helping in the establishment of the exact size and shape of the earth. It is a technological ensemble presenting the triangulation points of the measuring of the arc of the meridian. Thomas Maclear erected a stone cairn, known as Maclear's Beacon, in 1865 on the highest point near the north-eastern face of Table Mountain.	The measurements of the Arc of Meridian and the related other scientific observations of the scientists are still credible and are the scientific bases of not only geodetic/trigonometric measurements of the earth, but also of the southern constellations and stars.  The terminals, beacons, sites and structures related to the Cape Arc of Meridian represent a complete picture that conveys the significance of the site.	The sites, beacons, terminals and structures related to the Geodetic Arch, also known as the Cape's Arch of Meridian, are situated in the extreme south-western corner of the African continent in the immediate vicinity of and adjacent to Cape Town, the capital of the Western Cape Province, one of nine provinces of the Republic of South Africa.	The beacons, sites and structures are in good condition and are still in use, maintained by the various owners and authorities.
<b>Samarkand Observatory</b> (Inscribed in 2001) Ref no. 603rev Criteria (i)(ii)(iv)	A 40m Sextant in the Meridian Arc (with only the foundations now extant). Possibly several other instruments like astrolabes, armillary spheres and smaller quadrants and sextants which have completely disappeared.	Observatory Built around 1424 AD. Meridian arc and sextant used extensively for solar and lunar meridian transit observations. Measurement of the length of the tropical year, obliquity of the ecliptic and ephemeris Ilkhanide tables constructed, extant copies of which survive.	20 <sup>th</sup> century archeological excavations have revealed the extant foundations of the 40 m sextant.	The site remains are part of a larger monumental complex in the urban landscape that is designated as a World Heritage Site.	Site now well maintained as a World Heritage Site.

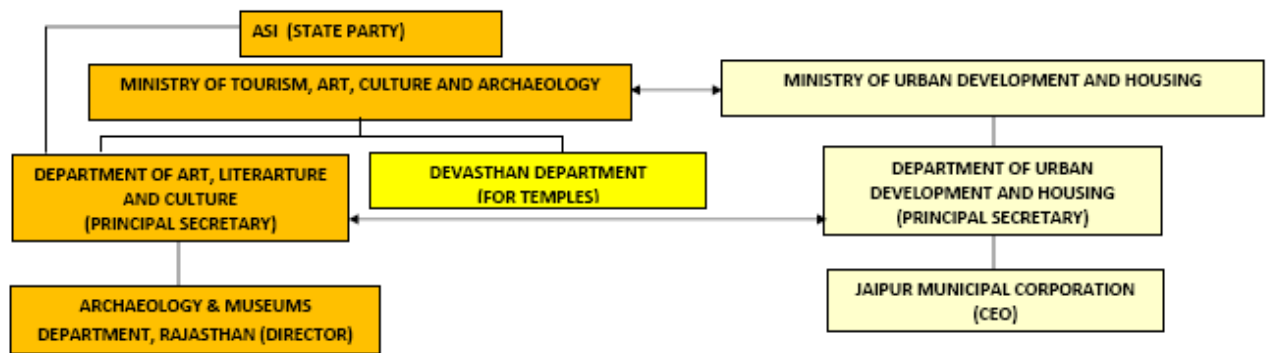
**4. Indicate when the Management Plan was promulgated, or when it will be promulgated. State the schedule for its implementation and operation. State which bodies are in charge of coordinating the management of the property by the various partners.**

The Management Plan for Jantar Mantar, Jaipur will be promulgated in May 2010. The Department of Archaeology and Museums responsible for the site of Jantar Mantar has initiated a dialogue for the promulgation of the Management Plan with other departments such as the Devasthan Department and Jaipur Municipal Corporation as well as other private property owners in the buffer zone area (as listed on Page 14 of this document). The Jaipur Municipal Corporation under the Department of Urban Housing and Local Self Governance, Rajasthan will be processing the Management Plan and notifying the same in May 2010. The schedule for its implementation and operation will be subsequently reviewed and phased out as per the outlined Action Plan (Management Plan, Page 59) from July 2010 onwards.

**Organizational Structure of Department of Archaeology and Museums and associate departments (*Addition to: Management Plan - 3.6, p. 24; 6.1, p.61*)**

While the Department of Archaeology and Museums in Rajasthan functions independently for protection of all monuments listed under the Department, it is in dialogue with other associate departments to ensure protection of the buffer zone. Following flowchart briefly explains the relation and connectivity of the relevant Departments responsible for core and buffer zone area of the nominated site. It should be noted that currently, decisions regarding all planning activities for the walled city of Jaipur (that includes the site and buffer zone) are taken collectively in joint meetings between the Department of Art, Literature and Culture, Rajasthan and the Department of Urban Development and Housing, Rajasthan in the presence of the Principal Secretaries of both Departments with representations from the respective Ministry. Following is a flowchart showing the associations between the concerned departments.





*Flowchart showing associations between the concerned departments for Management of the Site and Buffer Zone*

The Management Plan for Jantar Mantar, Jaipur also specifies an association between the Department of Archaeology and Museums, Rajasthan and the Archaeological Survey of India for successful implementation of the Management Plan (Section 6.1, p. 61). It also suggests revisions in the Plan (p.63) to integrate and synchronize with the management plans of other Jantar Mantar sites that would subsequently be part of the serial nomination as outlined in the tentative listing. However, it may be further ensured that the Archaeological Survey of India, being the State Party for all UNESCO World Heritage Sites in India would be formally engaged with the Department of Archeology and Museums for periodic monitoring of the nominated site during the post inscription phase.

- 5. A serial nomination has been announced. It will be necessary to justify the series, and to state its objectives and limits, and the process by which a nomination for the World Heritage List could be made.**

#### **Justification of series**

India represents four 18th century observatories: the Jantar Mantar at Jaipur, New Delhi, Ujjain and Varanasi belonging to the same historico-cultural group, within the UNESCO framework of the thematic initiative "Astronomy and World Heritage". These four sites of Jantar Mantar Observatories in India are historico-cultural monuments that continue to serve as a knowledge base for astronomical studies and, the preservation of these astronomical instruments and devices increases the importance of these monuments to the level of the world heritage. The

Jantar Mantars of Sawai Jai Singh II were instrumental in the preparation of the Zij-i-Muhammad Shahi, by the ruler, the basis of which was the Zij of Ulugh Beg completed in 1436 that held sway for close to three centuries, when it was supplanted by telescopic data. The programme of Sawai Jai Singh II's observatories was unique in the Hindu experience because it set aside the iconographic subtext in architecture of scale. At the observatories, monumental architecture remained a method of apprehending cosmological order, but the programme substituted divinely revealed mathematics and geometry as a privileged form of understanding.

These four Jantar Mantar Observatories built by Sawai Jai Singh II represent the pre-telescopic masonry type observatories of the medieval period, marking the last and the most ambitious attempt of creating such architectural ensembles for observational astronomy at a large scale in the world. They are significant representation of the best preserved conglomerate of pre-telescopic masonry astronomical instruments in functional condition. The Jantar Mantar sites are monumental architectural ensembles of varying scale and, amalgamate science and religion of 18th century India to facilitate measurement of celestial position and movement.

### **Objectives and limits of the Serial Nomination**

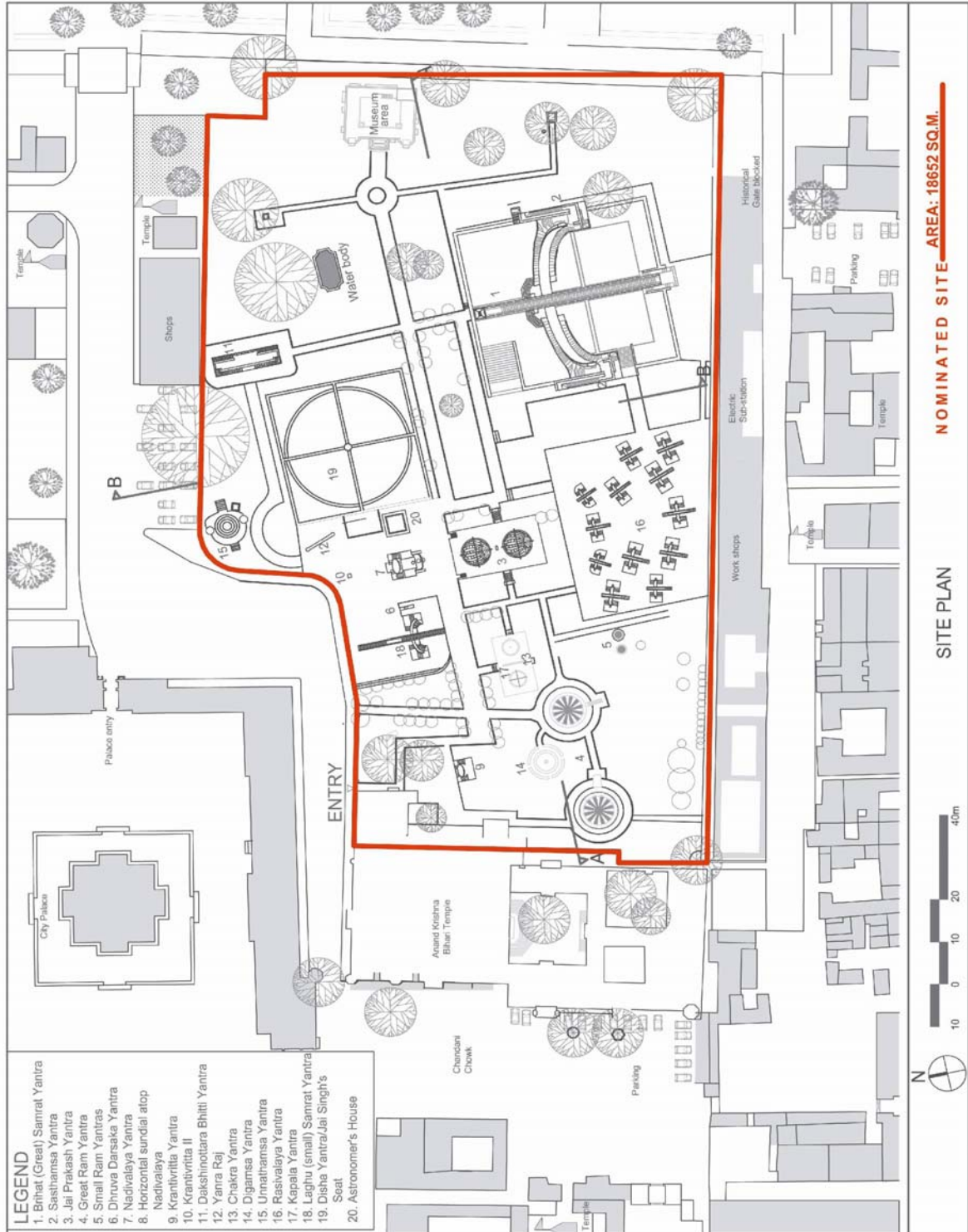
The astronomical instruments at Jantar Mantars in India are the finest examples of the pretelescopic masonry era in astronomy that had come to a close with the advent of the telescope. This potential serial nomination of national properties of the four Jantar Mantar sites at Jaipur, Delhi, Varanasi and Ujjain is an extant example of 18<sup>th</sup> century amalgamation of science and architecture in India. In long term, this national serial nomination may be included into a transnational property together with observatories from a range of countries, such as: China, Uzbekistan, Germany, England, France, Russia, Ukraine, South Africa, the USA, etc. which also took part in creation of the fundamental reference coordinate system.



**Process for nomination on the World Heritage List**

The Archaeological Survey of India has submitted the Nomination Dossier and Management Plan for Jantar Mantar, Jaipur (in February 2009) as part of the serial nomination as per Para 139, page 35 of the World Heritage Operational Guidelines since the site is of Outstanding Universal Value in its own right. The State Party will subsequently be submitting a combined single dossier for the remaining three Jantar Mantar Observatories located at Delhi, Varanasi and Ujjain in India to complete this serial nomination.

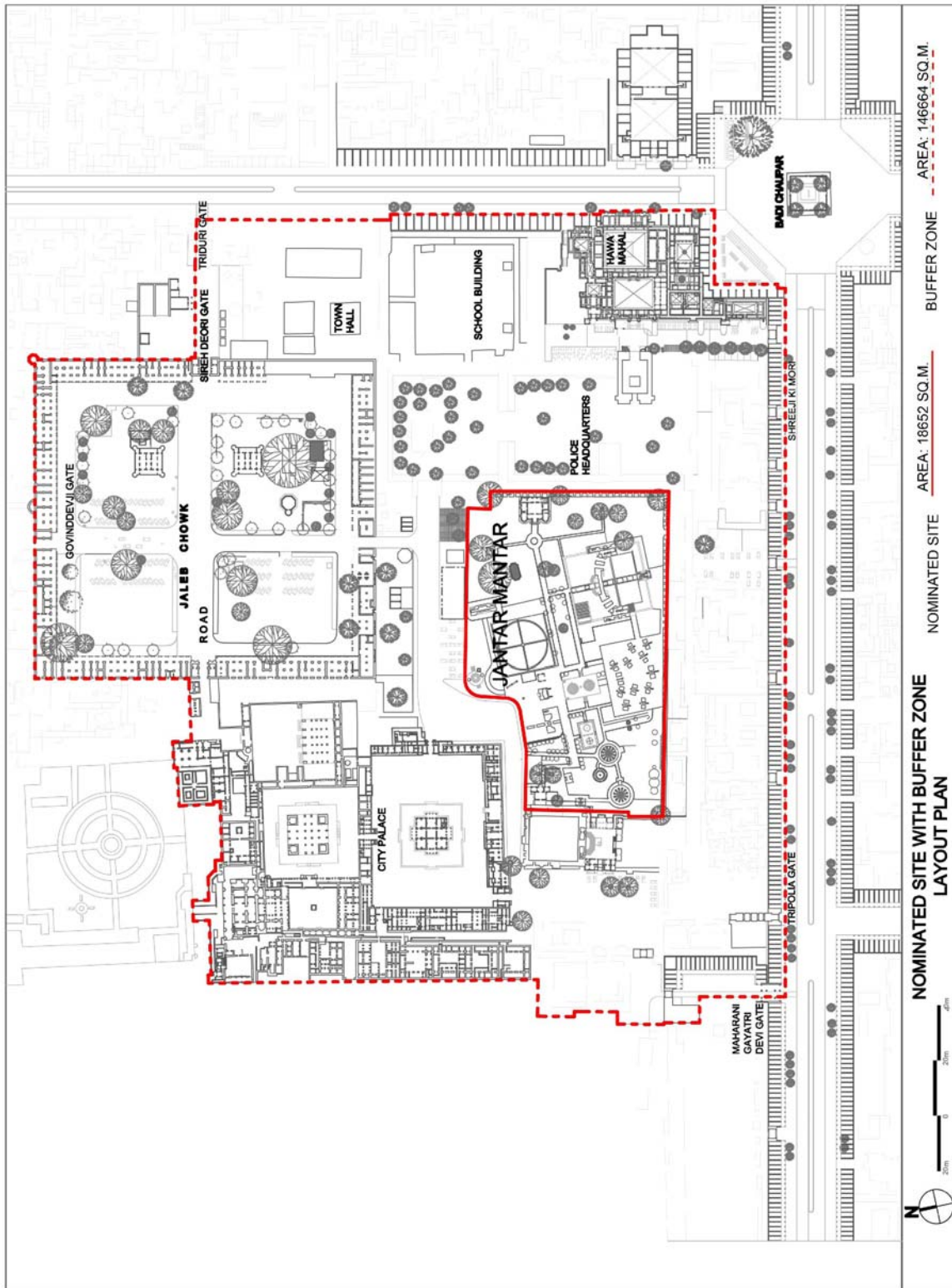
**Plan of Jantar Mantar with location of each instrument bearing same name as Part 2, Description of Nomination Dossier**



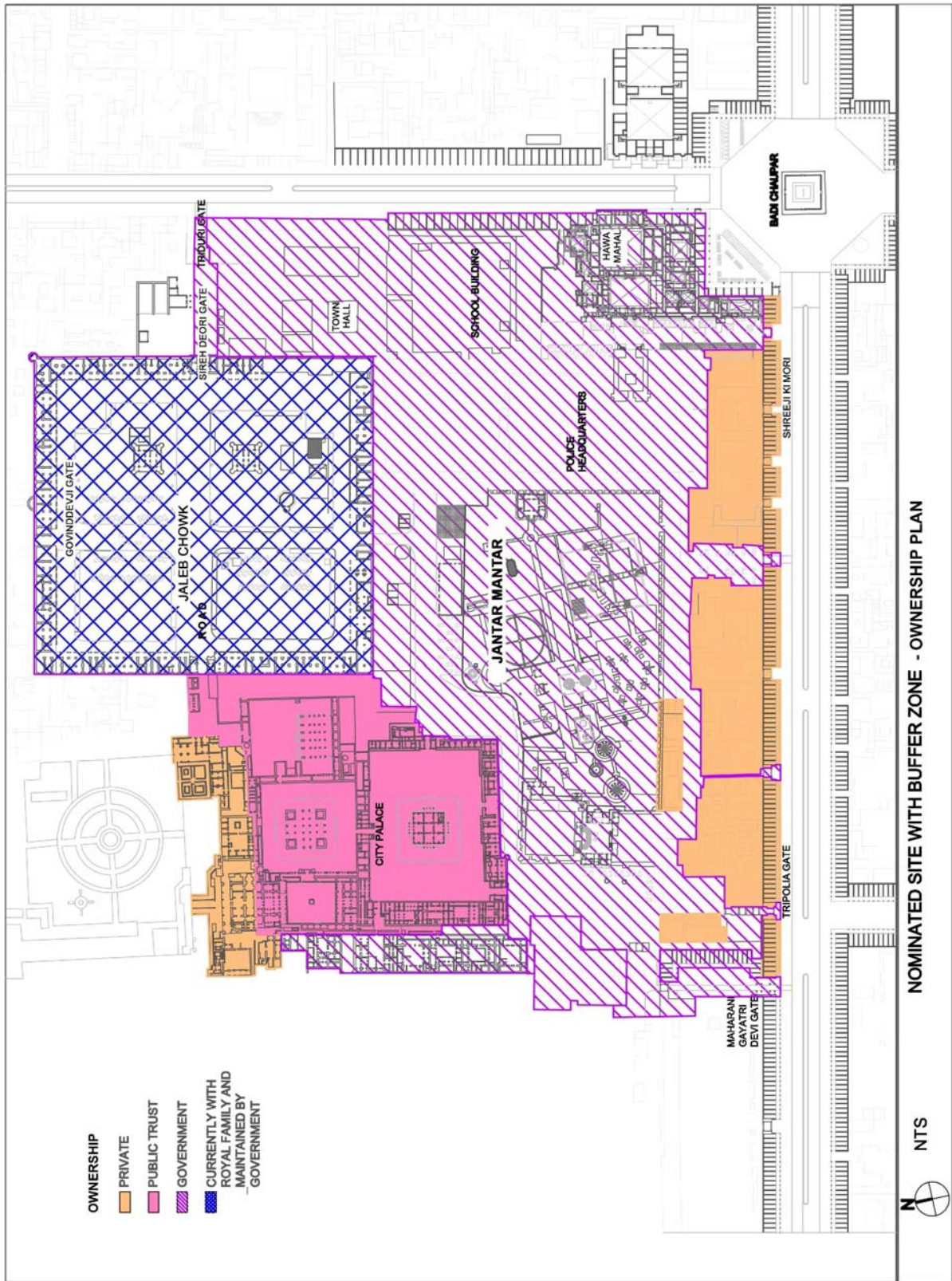


**Plan of the Jantar Mantar, Jaipur and its surroundings with the nominated site boundary and extended buffer zone boundaries**

*(Revision: Nomination Dossier -Fig. 5, p.5; Management Plan- Fig.2, p.7)*

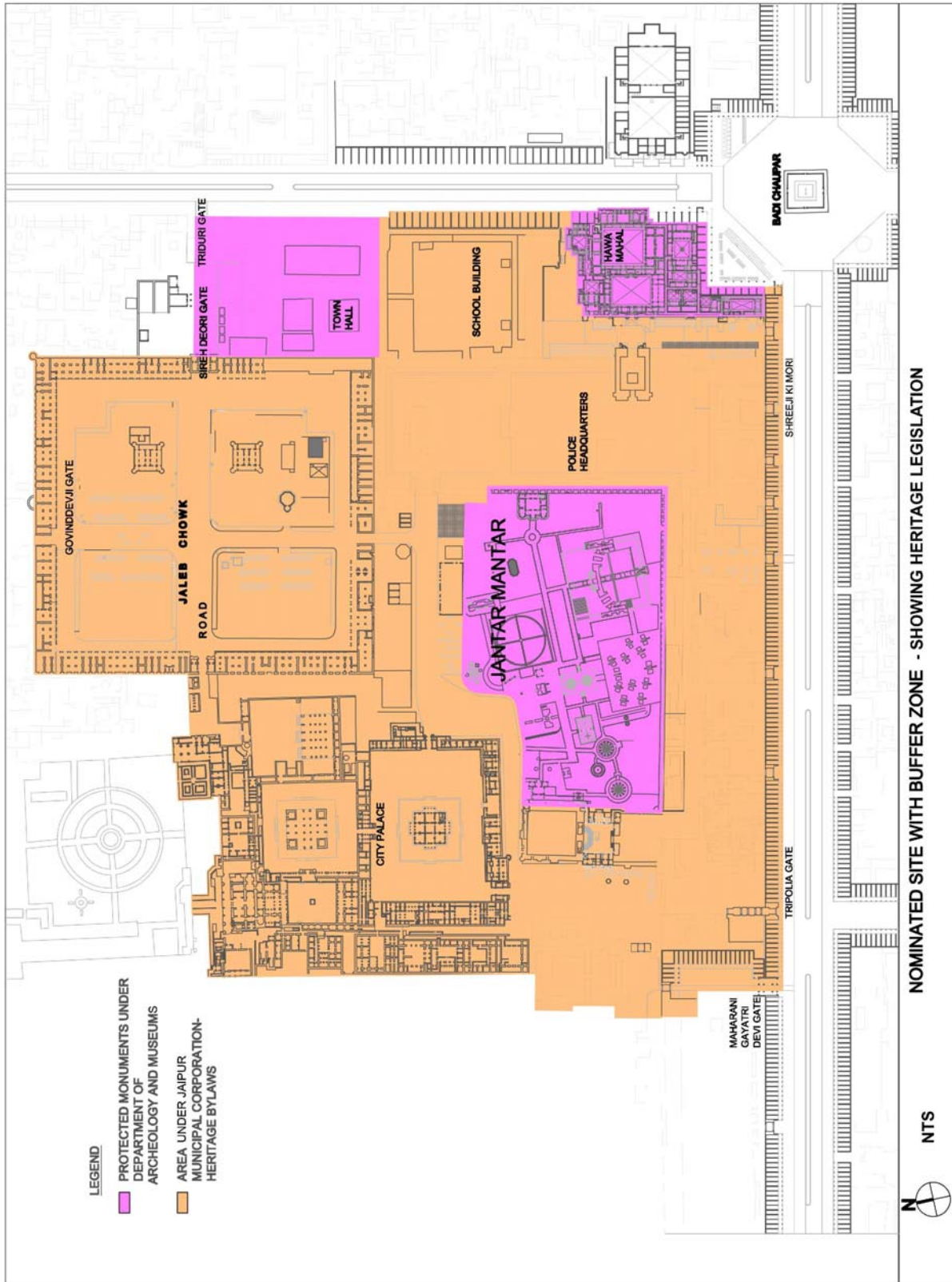


Plan showing ownership of site and buffer zone

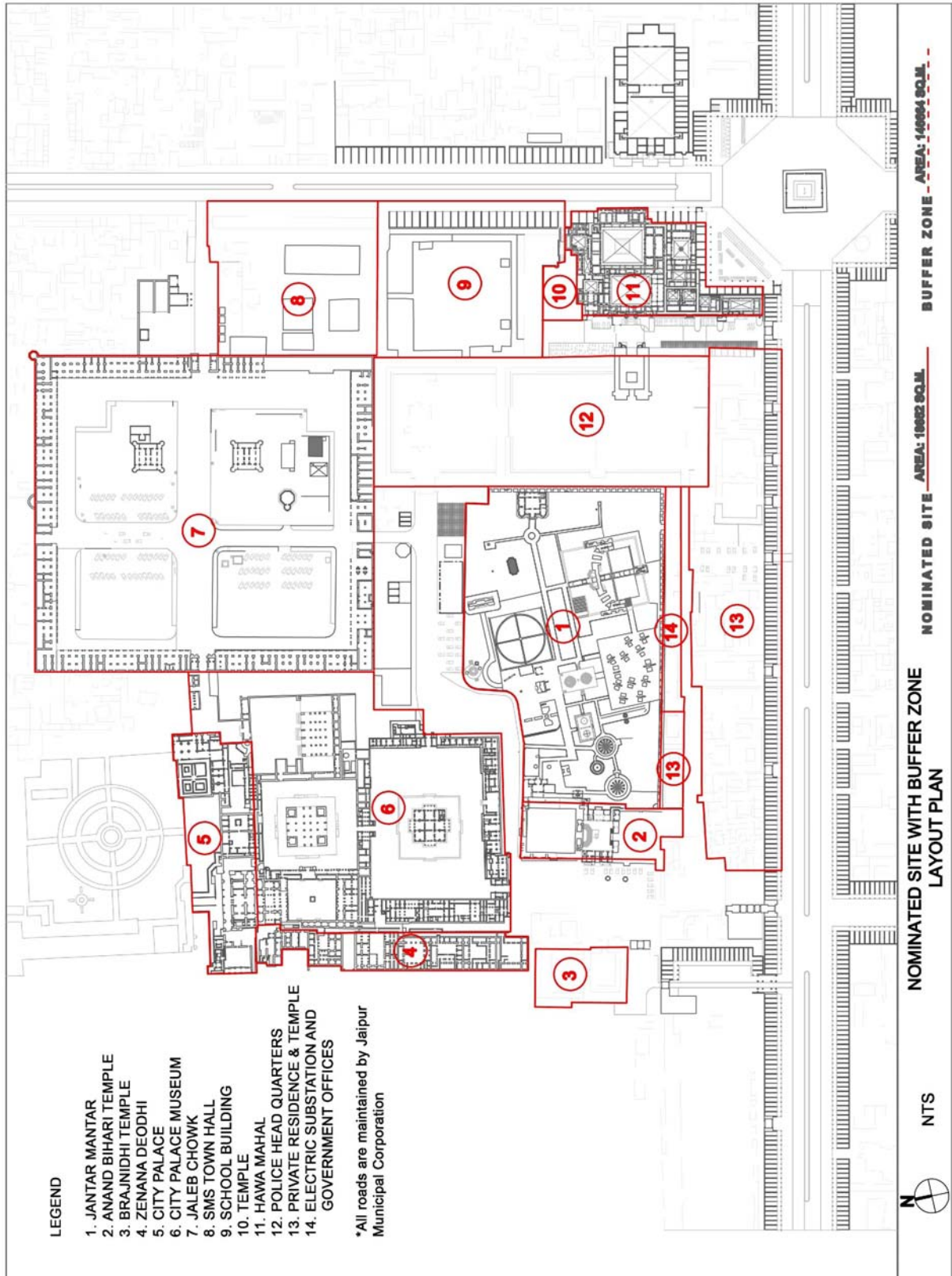




Plan showing legislative framework for site and buffer zone



Plan showing list of properties in buffer zone





**Table showing list of properties with details of ownership and legislation**

<b>S. No.</b>	<b>Name of Property</b>	<b>Ownership</b>	<b>Legislation/Protection</b>	<b>Government Department enforcing legislation</b>
1.	Jantar Mantar	Department of Archaeology and Museums	The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961	Department of Archaeology and Museums
2.	Anand Bihari Temple	State Government Devsthan Department	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
3.	Brajnidhi Temple	State Government Devsthan Department	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
4.	Zenana Deodhi	State Government	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
5.	City Palace	Private	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
6.	City Palace Museum	Public Trust	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
7.	Jaleb Chowk	Royal Family (Private) to be handed over to government	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
8.	Sawai Man Singh Town Hall	State Government	The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961	Department of Archaeology and Museums
9.	School Building	State Government	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
10.	Temple (near Hawa Mahal)	Private Trust registered with Devsthan Department	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
11.	Hawa Mahal	Department of Archaeology and Museums	The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961	Department of Archaeology and Museums
12.	Police Head quarters	State Government	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
13.	Private Residences and Temples	Private	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation
14.	Electrical substation and offices	State Government	The Municipal Council, Jaipur (Building) Bye-laws,1970 . Point 26. Prohibition regarding alterations in structural design, colour, heights etc.	Jaipur Municipal Corporation

**Table showing comparative analysis of observatories with the ones on Tentative List/  
inscribed as WHS marked in green**

Name of Observatory	Present Status	Emphasis on large scale instruments	Construction Material			Type of Observatory		Date of Origin								
			Megaliths	Masonry	Metal	Pre-Telescopic	Post-Telescopic	Pre 13th Cent.	13th Cent.	14th Cent.	15th Cent.	16th Cent.	17th Cent.	18th Cent.	19th Cent.	
Archaeo-astronomical site Kokino, the Former Yugoslav Republic of Macedonia	Site preserved in original condition							3800 BC								
Stonehenge, Avebury and associated Sites United Kingdom	Megaliths on site. Well preserved							3100 BC								
Observatories in Alexandria, Egypt	Ruins submerged. New Library constructed above															
Observatory of Nasir-ud-din Al Tusi at Maragheh, Iran	Archeological remains								1259							
Observatory (Dengfeng), as monuments of Mount Song, China	Well preserved								1267 -69							
Ulugh Beg's observatory at Samarkand	Archaeological remains present. On WHL as part of Samarkand										1425					
Hermitage Blaca, Croatia	Adequate preservation											16 <sup>th</sup> cent.				
Istanbul observatory of Taqi al-Din, Turkey	Destroyed in 1580											1577				
Tycho Brahe's Observatories, Sweden	Destroyed in early 1600's. Archeological remains											1580 - 1584				
Royal Greenwich Observatory, United Kingdom	Well preserved												1675			
Observatories of Sawai Jai Singh II, India	Well preserved instruments														1718-1734	
The Cape Arc of Meridian	In good condition and still in use															1751 -1865
Observatories of Ukraine	Well preserved															1821 - 1908

 WHS/ Tentative List







United Nations  
Educational, Scientific and  
Cultural Organization

Organisation  
des Nations Unies  
pour l'éducation,  
la science et la culture

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de las Naciones Unidas  
para la Educación,  
la Ciencia y la Cultura

Организация  
Объединенных Наций по  
вопросам образования,  
науки и культуры

منظمة الأمم المتحدة  
للتربية والعلم والثقافة

联合国教育、  
科学及文化组织

## The Culture Sector

H. E. Mr Vinay Sheel Oberoi  
Ambassador  
Permanent Delegation of India to  
UNESCO  
UNESCO House

06 OCT 2010

WHC/74/MR/APA/10/363/RLYS

**Subject: Inscription of the *Jantar Mantar, Jaipur* (C 1338) (India) on the World Heritage List**

Dear Sir,

I have the pleasure to inform you that the World Heritage Committee, at its 34th session (Brasilia, Brazil, 25 July – 03 August 2010), examined the nomination of the *Jantar Mantar, Jaipur* and decided to **inscribe** the property on the World Heritage List. Please find **below** the Decision **34 COM 8B.17** adopted by the Committee.

I am confident that your government will **take** the necessary measures for the proper conservation of this new World Heritage property. The World Heritage Committee and its Secretariat, the World Heritage Centre, will do everything possible to collaborate with you in these efforts.

The *Operational Guidelines for the Implementation of the World Heritage Convention* (paragraph 168), request the Secretariat to send to each State Party with a newly inscribed property a map of the area(s) inscribed. Please examine the attached map and inform us of any discrepancies in the information by and not later than **15 December 2010**.

The inscription of the property on the World Heritage List is an excellent opportunity to draw the attention of visitors to, and remind local residents of, the *World Heritage Convention* and the outstanding universal value of the property. To **this** effect, you may wish to place a plaque displaying the World Heritage and the UNESCO emblems at the property. You will find suggestions on this subject in the *Operational Guidelines for the Implementation of the World Heritage Convention*.

In many cases States Parties decide to hold a ceremony to commemorate the inscription of a property on the World Heritage List. Upon request to the World Heritage Centre by the State Party, a World Heritage Certificate can be prepared for such an occasion.

I would be grateful if you could provide me with the name, address, telephone and fax numbers and e-mail address of the person or institution responsible for the management of the property so that we may send them World Heritage publications.



Please find attached the brief descriptions of your site, prepared by ICOMOS and the World Heritage Centre, in both English and French. As these brief descriptions will be used in later publications, as well as on the World Heritage website, we would like to have your full concurrence with their wording. Please examine these descriptions and inform us, by and not later than 15 December 2010, whether there are any changes that should be made. If we do not hear from you by this date, we will assume that you are in agreement with the text as prepared.

Furthermore, as you may know, the World Heritage Centre maintains a website at <http://whc.unesco.org/>, where standard information about each property on the World Heritage List can be found. Since we can only provide a limited amount of information about each property, we try to link our pages to those maintained by your World Heritage property or office, so as to provide the public with the most reliable and up-to-date information. If there is a website for the newly inscribed property, please send us its web address.

As you know, according to paragraph 172 of the *Operational Guidelines for the Implementation of the World Heritage Convention*, the World Heritage Committee invites the States Parties to the *Convention* to inform the Committee, through the World Heritage Centre, of their intention to undertake or to authorize in the area protected under the *Convention* major restorations or new constructions which may affect the outstanding universal value of the property.

The full list of the Decisions adopted by the World Heritage Committee at its 34th session is available online at <http://whc.unesco.org/en/sessions/34COM/>.

May I take this opportunity to thank you for your co-operation and for your support in the implementation of the *World Heritage Convention*.

Please accept, Sir, the assurances of my highest consideration.



Francesco Bandarin  
Director a.i.  
World Heritage Centre

cc: National Commission of India for UNESCO  
ICOMOS  
UNESCO Office New Delhi Office

### **BRIEF DESCRIPTION**

The Jantar Mantar, in Jaipur, is an astronomical observation site built in the early 18th century. It includes a set of some 20 main fixed instruments. They are monumental examples in masonry of known instruments but which in many cases have specific characteristics of their own. Designed for the observation of astronomical positions with the naked eye, they embody several architectural and instrumental innovations. This is the most significant, most comprehensive, and the best preserved of India's historic observatories. It is an expression of the astronomical skills and cosmological concepts of the court of a scholarly prince at the end of the Mughal period.

### **BREVE DESCRIPTION**

Le Jantar Mantar de Jaipur est un site d'observation astronomique construit au début du XVIII<sup>e</sup> siècle. Il comprend un ensemble d'une vingtaine d'instruments fixes. Edifiés en maçonnerie, ce sont des exemplaires monumentaux d'instruments connus mais souvent aux caractéristiques particulières. Destinés à des observations d'astronomie à l'œil nu, ils comportent plusieurs innovations architecturales et instrumentales. C'est l'ensemble le plus significatif, le plus complet et le mieux conservé des observatoires anciens de l'Inde. Il exprime les compétences astronomiques et les conceptions cosmologiques acquises dans l'entourage d'un prince savant à la fin de l'époque moghole.

### **Extract of the Decisions adopted by the 34th session of the World Heritage Committee (Brasilia, 2010)**

#### **Decision: 34 COM 8B.17**

The World Heritage Committee,

1. Having examined Documents WHC-10/34.COM/8B and WHC-10/34.COM/INF.8B1,
2. Inscribes the **Jantar Mantar, Jaipur, India**, on the World Heritage List under criteria (iii) and (iv).
3. Adopts the following statement of Outstanding Universal Value:

#### **Brief synthesis:**

The Jantar Mantar, Jaipur, is an astronomical observation site built in the early 18<sup>th</sup> century. It includes a set of some twenty main fixed instruments. They are monumental examples in masonry of known instruments but which in many cases have specific characteristics of their own. The Jantar Mantar is an expression of the astronomical skills and cosmological concepts of the court of a scholarly prince at the end of the Mughal period.

The Jantar Mantar observatory in Jaipur constitutes the most significant and best preserved set of fixed monumental instruments built in India in the first half of the 18<sup>th</sup> century; some of them are the largest ever built in their categories. Designed for the observation of astronomical positions with the naked eye, they embody several architectural and instrumental innovations. The observatory forms part of a tradition of Ptolemaic positional astronomy which was shared by many civilizations. It contributed by this type of observation to the completion of the astronomical tables of Zij. It is a late and ultimate monumental culmination of this tradition.

Through the impetus of its creator, the prince Jai Singh II, the observatory was a meeting point for different scientific cultures, and gave rise to widespread social practices linked to cosmology. It was also a symbol of royal authority, through its urban dimensions, its control of time, and its rational and astrological forecasting capacities. The observatory is the monumental embodiment of the coming together of needs which were at the same time political, scientific, and religious.



**Criterion (iii):** The Jantar Mantar in Jaipur is an outstanding example of the coming together of observation of the universe, society and beliefs. It provides an outstanding testimony of the ultimate culmination of the scientific and technical conceptions of the great observatory devised in the Medieval world. It bears witness to very ancient cosmological, astronomical and scientific traditions shared by a major set of Western, Middle Eastern, Asian and African religions, over a period of more than fifteen centuries.

**Criterion (iv):** The Jantar Mantar in Jaipur is an outstanding example of a very comprehensive set of astronomical instruments, in the heart of a royal capital at the end of the Mughal period in India. Several instruments are impressive in their dimensions, and some are the largest ever built in their category.

#### **Integrity and authenticity**

The observatory of Jantar Mantar in Jaipur has been affected by its outdoor situation in a tropical area, and then by its temporary abandonment in the 19<sup>th</sup> century, which has resulted in frequent maintenance interventions and then various restorations over a period of more than a century. Nevertheless, the general integrity of the site has been essentially maintained and partially restored.

On the other hand, establishing the authenticity of each individual instrument is more complex, as a result of the many interventions which have taken place. While authenticity is generally unquestionable with regard to the astronomical function, it is more difficult to establish with regard to plasters, instrument graduations, some architectural interpretations and the immediate landscape environment of elements of the property.

#### **Protection and management measures**

The Jantar Mantar is protected under the Rajasthan Monuments Archaeological Site and Antiquities Act, 1961, under Sections 3 and 4. It was designated a monument of national importance in 1968.

The main challenges for the property, which could potentially represent a threat, are controlling the development of tourism, and allowing for urban development in the immediate vicinity of the Jantar Mantar. Major projects to upgrade the district and modify traffic have been announced, and these may affect the buffer zone, and more generally the landscape and cultural environment of the property. It is in particular necessary to specify the measures taken to protect the buffer zone, and to include these measures in the upcoming Master Plan of the municipality of Jaipur. The system for the management of the property is appropriate, **provided** that it includes a genuinely overarching management body and provided that the Management Plan is promulgated. Furthermore, it is necessary to strengthen the scientific expertise of the bodies in charge of managing the property.

#### 4. Requests the State Party to:

- a) Promulgate the management plan without delay and apply it, and implement a program of conservation works in this context;
- b) Set up, as part of the management plan, an overarching authority for the property in order to facilitate coordinated management of the property and its buffer zone;
- c) Provide information about the decisions to be taken in the upcoming Master Plan of the city of Jaipur, with regard to the property and its buffer zone, and about the plans for the upgrading of the eastern district of the buffer zone;
- d) Draw up an environmental and landscape report on the nominated property, based on existing early documentation (maps, photographs of site showing its environment) and on systematic contemporary photographs of the environs seen from the Jantar Mantar;

- e) Carefully evaluate any scientific alterations made during past restorations to the graduated scales of the instruments;
- f) Take care to ensure that future maintenance policy pays close attention to maintaining the conditions of authenticity of the instruments not only in scientific terms, but also in architectural terms;
- g) Give greater consideration to present and potential constraints arising from urban development and traffic in the environment of the property, outside the current buffer zone;
- h) Ensure that an integrated policy of visitor reception is applied in the property and its environs, while ensuring that its values are respected and taking care to present them in a pedagogical way;
- i) Give greater attention to the landscape impact of the restructuring being considered in the immediate vicinity of the property;
- j) Reinforce the management capacities and competencies of the Department of Archaeology and Museums of Rajasthan.

**Surface and coordinates of the property inscribed on the World Heritage List by the 34th session of the World Heritage Committee (Brasilia, 2010) in accordance with the *Operational Guidelines*.**

State Party	Name	ID N	Area	Buffer Zone	Centre points Coordinates
India	The Jantar Mantar, Jaipur	1338	1.8652 ha	14.6664 ha	N26 55 29 E75 49 30



**Plan of the Jantar Mantar, Jaipur and its surroundings with the nominated site boundary and extended buffer zone boundaries**

*(Revision: Nomination Dossier -Fig. 5, p.5; Management Plan- Fig.2, p.7)*

