

THE ARCHITECTURAL WORK OF  
LE CORBUSIER, AN OUTSTANDING  
CONTRIBUTION TO THE MODERN  
MOVEMENT

# CAPITOL COMPLEX CHANDIGARH

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STATUS REPORT ON PLANS, IMPLEMENTED AND  
PENDING WORKS

**ABHA NARAIN LAMBAH ASSOCIATES**

**CONSERVATION ARCHITECTS AND HISTORIC BUILDING CONSULTANTS**

**NOVEMBER 2018**

NO.	DESCRIPTION	STATUS
1.	<b>BUILDINGS</b>	
a.	Site evaluation report	Complete
b.	Impact assessment report	Complete
c.	Structural assessment report	CBRI, Roorkee prepared a concise report, observations of the same have been submitted by the conservation architects
d.	LIDAR surveys and structural assessment report	Completed for the buildings. Interior office areas of Secretariat and buffer zone remaining
e.	Site Management Plan for the Capitol Complex WHS	The Draft Site Management Plan submitted in December 2017 and again in September 2018; inputs are awaited
f.	Restoration and management plans of buildings and monuments (current issues, scope of works and block estimates)	Complete. Works related to landscape and security are pending approval
g.	Preparation of material specifications and finishes for civil works	Complete
h.	Civil work estimates - high court, assembly, civil secretariat	Complete
i.	Electrical and services plan and specifications Services (electrical, plumbing, hvac, fire fighting) tender drawings - high court, assembly, civil secretariat	Complete
j.	Services (electrical, plumbing, hvac, fire fighting) estimates - high court, assembly, civil secretariat	Complete
k.	Provision of detailed Fire detection plans and mitigation system; analysis of fire audit reports	Complete
l.	External concrete cleaning and repairs	Complete. The restoration of external concrete surface of Secretariat building is in progress
m.	Removal of accretions and additions as specified in the SMP	Majority of the aluminum partitions blocking balconies have been removed from the Secretariat. The accretions like Air conditioning unit, Cable dish antennas, security iron grill in balconies, temporary shed on rear side of Secretariat building etc. are yet to be removed
n.	Floating of tender for interior restoration works	A material palette for interior renovation works was provided

		Detailed matrix specifying all civil works was submitted and the tendering process has begun
o.	Restoration of specialized artefacts such as tapestries	In progress The assessment and recommendation report are being prepared by consultant. The works will begin parallel to the building conservation and furniture restoration works
p.	Furniture restoration	Inventory and assessment in progress. The recommendation report is being prepared by consultant.
q.	Additional works such as Terrace Club, restoration of skylights and key features	Work to be executed at site
r.	Restoration of Assembly Door	Work to be executed at site
s.	Revival of water bodies	UT is in the process of evaluating this component
<b>2.</b>	<b>MONUMENTS</b>	
a.	Martyrs Monument comments on completion	Observations on the implementation are attached {See Section 2.a) The actual execution of the project has been discussed in great detail and CA has been assigned the task of its completion. Barring delays on procurement of material and repair of the original uninstalled sculpture, the execution will take 6 months to complete
b.	Analysis of Open Hand Monument	Summary of recommendations attached (See Section 2.b)
c.	Note on Museum of Knowledge implementation	Observations on the implementation of the Museum of Knowledge were invited from Abha Narain Lambah Associates. These have been attached as part of this report (See Section 2.c)
d.	Geometric Hill	Complete As informed by Engineering Department, UT, Chandigarh that pending works of Geometrical Hill i.e. Sun Dial

		have been completed in July 2015
<b>3.</b>	<b>MANAGEMENT OF BUFFER AND LANDSCAPE</b>	
a.	Consolidation of security agencies and provision of visitor management plan and drawings, which included the following:	Works are pending approval
	Parking and area management	
	Security scheme	
	Signage scheme	
b.	Landscape restoration plan and design intervention	Works are pending approval. Inputs and recommendations are awaited for a revised scheme

## **SECTION 2.A MARTYRS MONUMENT COMMENTS ON COMPLETION**

The monuments are one of the most poignant expressions of Le Corbusier's sculptural prowess and the plaza has become a receptacle and a gallery for some of his most important investigations. However, unfinished sections of certain areas has led to either misinterpretation or abrasion or loss of value of the plaza and then in turn of the setting. This has necessitated an undertaking into the revival of this key space to offer the perception of the edifices as intended. One of the critical components that needs attention is the Martyrs Monument, which currently is in a state of incomplete execution in its entirety, due to the sculptural elements such as the symbolic ruins, serpent, tiger and prostrate man not being installed.

It is felt that installation of these key elements in the esplanade would provide the necessary scale and context to tie in all the buildings and monuments together, to complete the schematic as envisaged and bring in architecture, public art, contextual history and in a sense the entire composition of the Capitol together.

Chandigarh Administration has engaged Sh. Adwaita Gadanayak, Director General, National Gallery of Modern Art New Delhi for completing the Martyr's Monument for which a meeting was held with him in New Delhi on 08.06.2018 for finalizing the modalities. The prints of requisite drawings, report of the two members Expert Committee, soft copy of presentation prepared by the office, comprising of Measurement drawings of stones required for sculptures, recommendations of CMP 2031, site photographs and photographs of sculpture and railing were handed over to him. He informed that it will take around 6 months to complete overall process and specialized craftsman, artisans will be brought to Chandigarh for this purpose. DG, NGMA visited the Martyr's Monument site on 11.11.2018 along with associates and discussed the modalities regarding completion of the Monument.



## **SECTION 2.B ANALYSIS OF OPEN HAND MONUMENT**

The following summary is based upon the report prepared by Dr. J. D. Sharma, PhD Metallurgy, Faculty, Materials and Metall. Engg. Dept, PEC University of Technology, Chandigarh.

### **Existing composition**

The entire structural and aesthetic fabric of the Open Hand monument comprises of three components – The sculptural face, internal fabrication supporting the face and the supporting pillar.

Material testing and composition was obtained using actual samples and on site observations. The metallurgical composition is primarily plain carbon sheet steel with low content.

The contoured and decorative front face of the structural component is finely forged through a process of pressing and cold forging.

The back face is assimilated out of flat mild steel plates 3.4mm approximately ms 10 rolled steel that are welded together with exposed joints.

The supporting columnar structure could not be tested but it is evident that is made of plain carbon steel and the surface painted.

### **Current status**

Corrosion in varying degrees is observed within all three components of the monument.

Corrosion is an electrochemical reaction. It involves the ionization of metal atoms and the loss of these ions into a soluble or corrosive product. Since the process involves a reactions giving up electrons, a flow of electrons away from the site of this reaction must occur to avoid a build up of negative charge. This drift initially causes the degradation of metal and finally the complete consumption of steel. The site where the loss of metal occurs is called the anode, or anodic region, and the electrons flow through the metal to a site, called a cathode, where they are consumed in a cathodic reaction. The result of this electrochemical process is the formation of rust, loss of material resulting in pit like formations throughout the surface.

The material is mild steel with average carbon composition varying C: 0.16 to 0.22%, Mn: 0.6 to 0.9%, Si: 0.4 to 0.9 % and S, P<0.05%. A typical plain carbon steel has good formability even in cold working conditions. Low carbon makes it soft (necessary for working) but the material has very low resistance to corrosion. Other details such as metallurgic observations and through optical microscopy have been provided in the report on the monument.

The primary nature that is the design of the contoured front face of the Open Hand is conducive to retaining moisture. Corrosive effect is observed on the lower side of the palm of the Open Hand and at a section near the thumb. Extensive rusting is observed on the back of the Open Hand, particularly near the little finger,

thumb and the center and edge of the palm. Filiform corrosion is observed on the entire surface of the supporting column. The bottom the pillar is tied with a steel wire, which may lead to galvanic corrosion. The interface between the sculptural section of the Open Hand the structural supporting pillar shows signs of corrosion, as well as towards the peripheral edges.

Moreover, nesting by birds and other species within the internal fabrication is observed. Bird droppings and other deleterious material is also visible within and outside the framework.

The primary design structure, material and climatic are conducive to corrosive action. Moreover, the scale and nature of the monument make some sections of the monument inaccessible for regular and routine planned inspections.

Since the Open Hand was designed to have an opening from the top, it has led to rainwater ingress and resulting corrosion.

## **Recommendations**

Pitting and loss of material due to corrosion needs to be addressed immediately, following the identification of vulnerable spots to arrest the progression of deterioration of the monument. The solution for the treatment of such a material is first to reduce the condition of formation of new pits and second to retard the progress of corrosion by encapsulation of the moisture absorbed by the material. The network of corrosion pits are of different size, shapes, volume and morphological nature. Hence comprehensive restoration plan is recommended rather than applications or remedial partial spot repairs.

The continued presence and action of water is only going to accelerate the process of deterioration, and needs to be addressed, before the restoration work can be initiated.

The front face of the Open Hand is fairly intact structurally and may not require significant intervention. The sections of the back face, particularly near the welded sections, may need complete replacement with as like original material composition and thickness as possible. The base of the Open Hand is the worst affected section due to added action of bird droppings and stagnant water, which needs to be periodically drained for its better future preservation. Perhaps it would be essential to provide an unobtrusive system of effective drainage within this section. The top section is in a fair state of preservation save some open joints. The supporting column needs revival and application of original coating. The entire internal framework of the Open Hand needs to be thoroughly cleaned and preventive action needs to be undertaken to arrest the issue of nesting.

The movement mechanism needs to be studied and separately addressed for restoration.

The stages of work and restoration system as devised within the report should be diligently followed for initial restoration work as well as a manual for repairs.

## SECTION 2.C NOTE ON IMPLEMENTATION OF MUSEUM OF KNOWLEDGE

### Part 1: Status of Works

It was decided during 1411 meeting of CHCC held on 23.04.2018 under the Chairmanship of Worthy Adviser to the Administrator, UT, Chandigarh, wherein it was decided that possibility of construction of Museum of Knowledge should be explored. It was also decided to form a Sub Committee under overall guidance and supervision of the Principal, CCA for further examining the proposal and give its recommendations. The Department of Urban Planning, UT shall extend all logistic support in the form of drawings and maps. Beside Sh. S.D. Sharma, Pvt. Architect, Prof. Rajnish Wattas, Ex Principal, CCA, Dr. B.N. Goswamy, Art Historian and Dr. Rohit Jigyasu, President ICOMOS India, Sh. Raj Rewal, Eminent Private Architect and Sh. B.V. Doshi, Eminent Architect and winner of Pritzker Award, who had the opportunity of working with Le Corbusier and well apprised of his theories and doctrine, may also be associated with the above Sub- Committee

A soft copy of the drawings of Museum of Knowledge were given to Principal, CCA. Principal, CCA also procured the drawings from Foundation Le Corbusier, Paris and observed that there are changes/modifications in both the set of drawings.

Thereafter, a meeting was held by Principal, CCA with Prof. B.N. Goswamy in the college on 10.08.2018 regarding Museum of Knowledge and its probable functions in the present day scenario and his comments are given below (F/E):-

*"in his views, the city does need something like /IC in Delhi, but if Delhi Centre is a Model-and it is a good and successful model- the Capitol Complex is not the place for it. This because a Centre like the must have facilities like a guest house, a library, a dining hall, a lounge, even a bar, where there can be free exchange of idea, and where people with ideas can come and stay/ work for a time. That cannot conceive as forming a part of the Capitol Complex which had been visualized entirely differently.*

*As for the Museum of Knowledge, Prof. Goswamy was very emphatic that it must be built, even if the original ideas of Le Corbusier about how it should function would need to be departed from a bit, since new technologies have come in and democratic forces of a different kind are at work. He wondered if it would not be a good idea to orient the Museum of Knowledge towards turning into a centre where 'India's Contribution to Human Knowledge' can be showcased, alike in the areas of science and the humanities and arts. It will give the young generation something not only to learn but also feel a sense of pride in what our land was once like."*

Further, Principal, CCA has proposed members of the said Sub-Committee which are given as under and the case has been sent to the Secretary Technical Education for the approval of HE, the Administrator, UT, Chandigarh: -

- a) Ar. S D Sharma, Chairman of the Sub Committee of CHCC.
- b) Prof. Rajnish Wattas, Member of the Sub Committee of CHCC.

- c) Dr. B N Goswamy, Member of the Sub Committee of CHCC.
- d) Dr. Rohit Jigyasu, Member of the Sub Committee of CHCC.
- e) Ar. Raj Rewal, Eminent Architect, New Delhi.
- f) Ar. B V Dosh, Eminent Architect, Ahmedabad.
- g) Prof. AGK Menon, Eminent Architect, New Delhi
- h) Prof. KT Ravindran, Eminent Architect, School of Planning and Architecture, New Delhi (Retd.)
- i) Ar. Abha Narain Lambah, Eminent Architect, Mumbai (Conservation Consultant, Capitol Complex, Project)
- j) Prof. Rabindra Vasavada, Eminent Architect, Head, UNESCO World Heritage City Nomination Dossier Project, Ahmedabad Municipal Corporation
- k) Prof. Nalini Thakur, Conservation Architect, New Delhi.
- l) Ar. Janvijn Sharma, Director, Archaeological Survey of India, New Delhi.
- m) Dr. Shikha Jain, Conservation Architect and Adviser to Capitol Complex World Heritage Dossier from Ministry of Culture, New Delhi.
- n) Ms. Brigitte Bouvier, Director, Fondation Le Corbusier, Paris, France.
- o) Ms Benedicte Gandini, Conservation Architect, Fondation Le Corbusier, Paris, France.

The above said matter was also discussed in the meeting of Sub Committee of CHCC held on 03.08.2018 wherein it was advised by the Sub Committee that the requisite Sub Committee be constituted as advised by the W/AA in the 14th meeting of CHCC and a meeting of the Sub Committee be convened at an early date to discuss and finalize the matter.

## **Part 2 : Comments by ANL Associates**

There have been decades of debate on the pros and cons of completion of Corbusier's ultimate urban composition through implementation of the Governors Palace or also proposed as the Museum of Knowledge. In his lifetime, during the building of other structures as well as much later after the project was completed, Corbusier actively advocated to complete this final key component of the Capitol Complex. Even after his demise, several workshops, international competitions and publications have been undertaken relating to this very poignant subject. Much as it would emotionally and architecturally complete the very essence of Corbusier's grand scheme, it has to be viewed in its current light of nomination as a WHS and how the implementation may affect the fragile balance that has been achieved by the current components of the composition over the years. The newly developed responses of the buildings, the monuments and the plaza, sans the non-implementation of this building cannot be denied nor ignored. Hence, this summary has been prepared objectively based purely upon its repercussion on the existing buildings and the WHS status.

The Capitol Complex expresses a continuity of usage, retention of original concepts, true form and preservation of exterior finishes and an entirety of composition. The intactness of the property is well demarcated by the distinct boundaries of the site, and does not in any way suffer from the adverse effects of development or neglect. The Capitol Complex along with its elements well expresses the complete representation of Le Corbusier's composition derived from the Modular and the Golden Section in all three dimensions. The implementation of the Museum of Knowledge, although based upon the original designs of Corbusier himself, could have a widespread and irreversible affect upon the integrity of the site. Based on the sheer magnitude and placement within the Complex, the fallout of such a large scheme cannot be defined. Hence, it would be prudent to express reserve towards any implementation projects, particularly within the sacrosanct core of the UNESCO property.

The authenticity of the Capitol Complex is well maintained in the realized components i.e. the three edifices and the four monuments as well as the general layout of the Capitol Complex. The property meets the conditions of authenticity as recognized in the defined criteria and are credibly expressed through a variety of attributes including: Form and Design, Materials and Substance, Use and Function, Spirit and Feeling. It has been mooted that it was Corbusier's wish that the Museum of Knowledge be implemented, that it would complete the original composition amongst several other theories. However, the wishes of the other key player in this conceptual planning of the city cannot be denied. Prime Minister Jawaharlal Nehru was the foremost proponent of this modern city built on the ruins of older cities and ideologies. No matter how forward thinking and vociferous supporter he was of the entire scheme, it cannot be denied that he was against the implementation of the Governors Palace and the later evolved and modified Museum of Knowledge. Moreover, both Corbusier and Nehru were firm believers of being contemporary and in the times. Implementation of a building that is both stylistically redundant and not in keeping with contemporary aspirations, even if mooted in an evolved "avatar", would conflict with the very core of the two key players in the Chandigarh project. Therefore, to construct a new building in the 21st century based on the drawings prepared over half a century back, would also be perhaps questionable given that the construction of this building, built with widely differing methodologies of today's times, would not accurately represent the time and construction period of the rest of the Capitol Complex. Given that Corbusier constantly evolved his design skills in keeping with contemporary objectives, it can be safely surmised that even he would have modified the design accordingly. Hence, since a newly developed scheme would be conjecture and implementation of the original in a sense a convolution of Corbusier's design ideals, it has been recommended that any such implementation is not advocated. These objectives are also in keeping with the guiding principles laid down in the Site Management Plan.

## **ANNEXURE**

**Drawings and photographs related to the Incomplete Monuments**



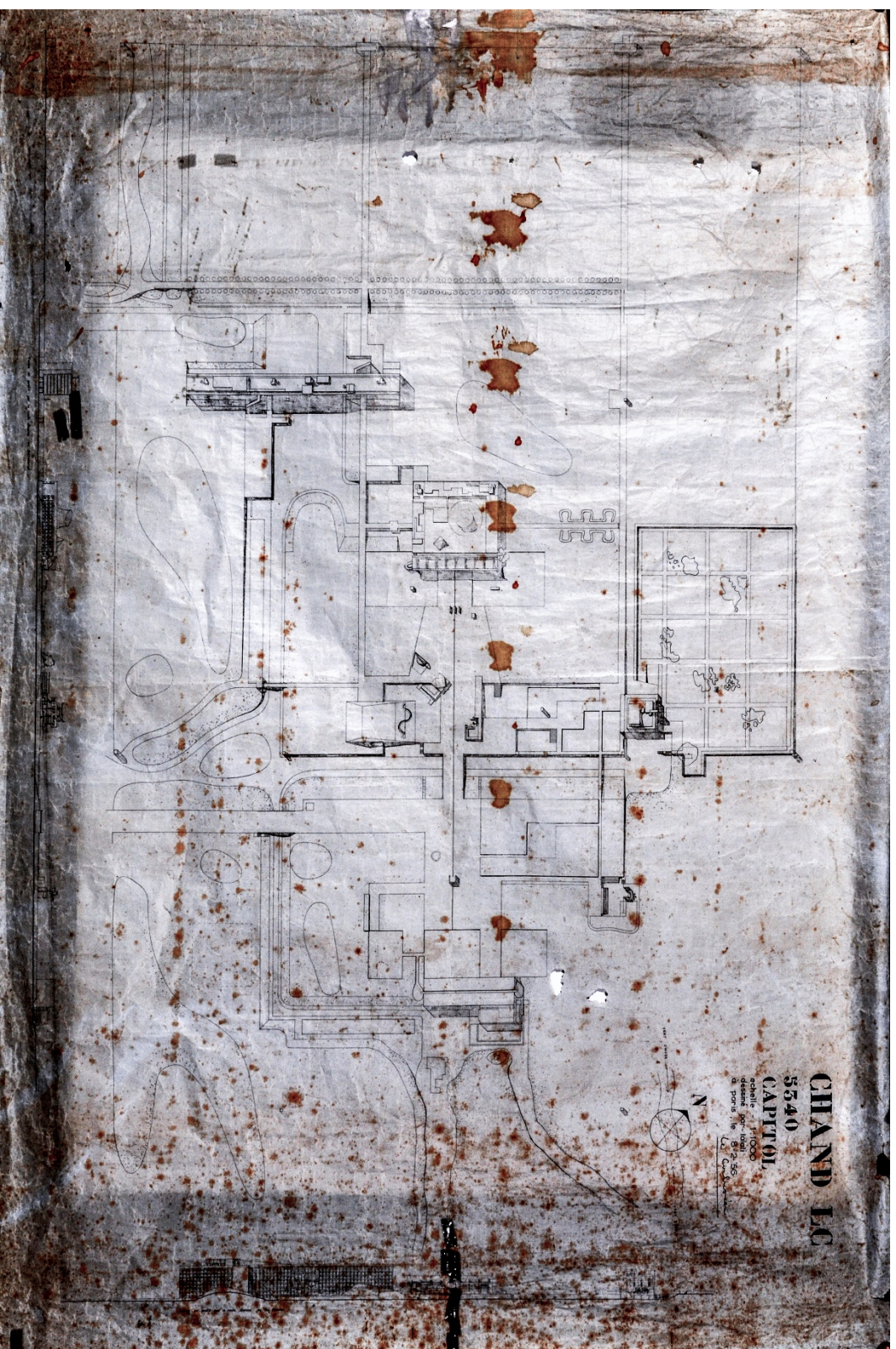
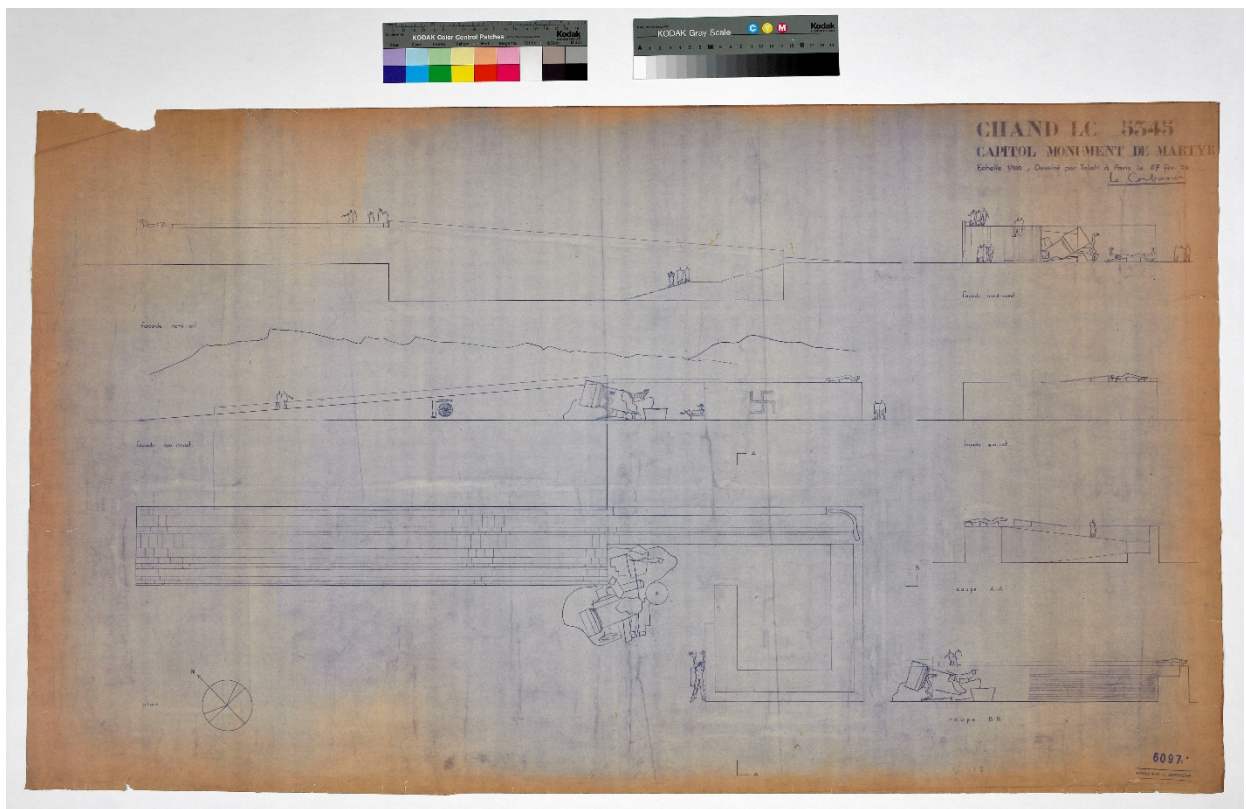
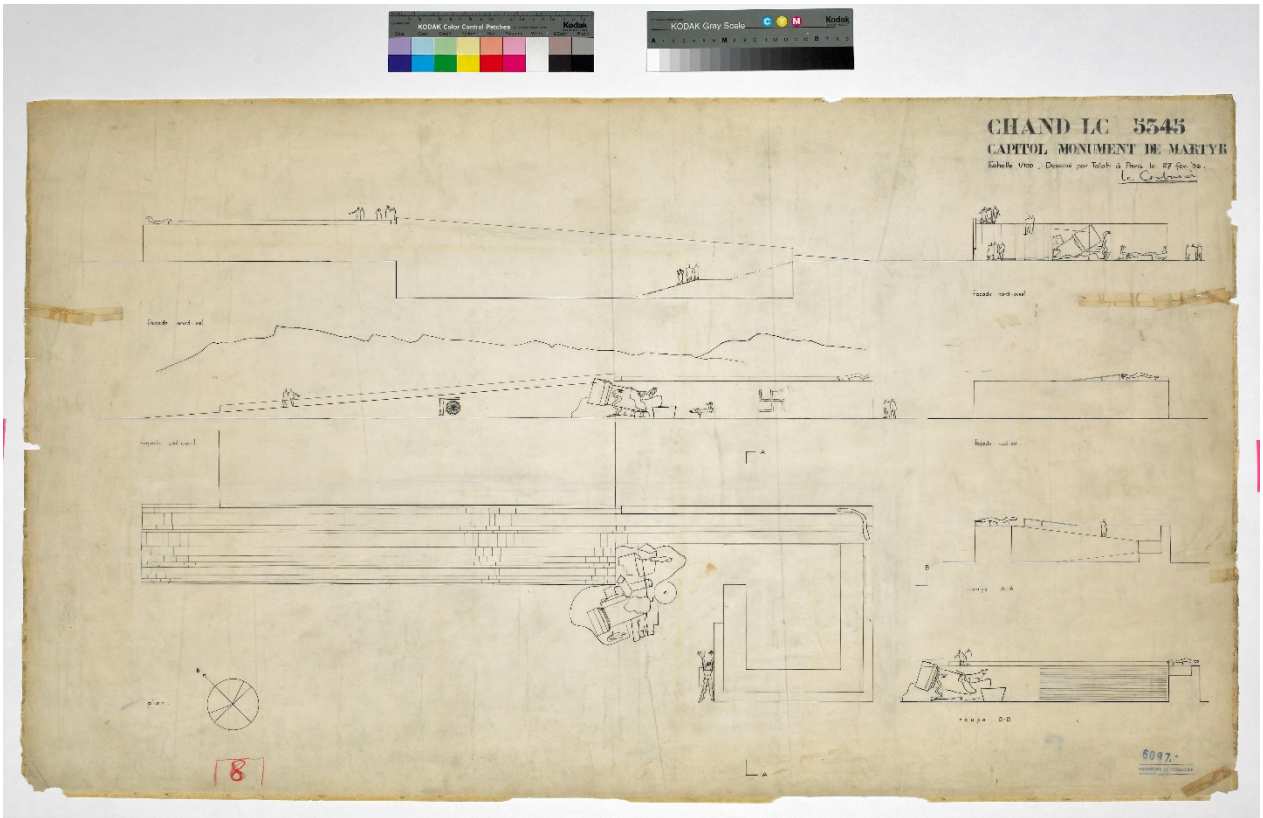


Fig. 1: Archival drawing of Capitol Complex dated 08/02/1956 (source: Le Corbusier Centre, Chandigarh)

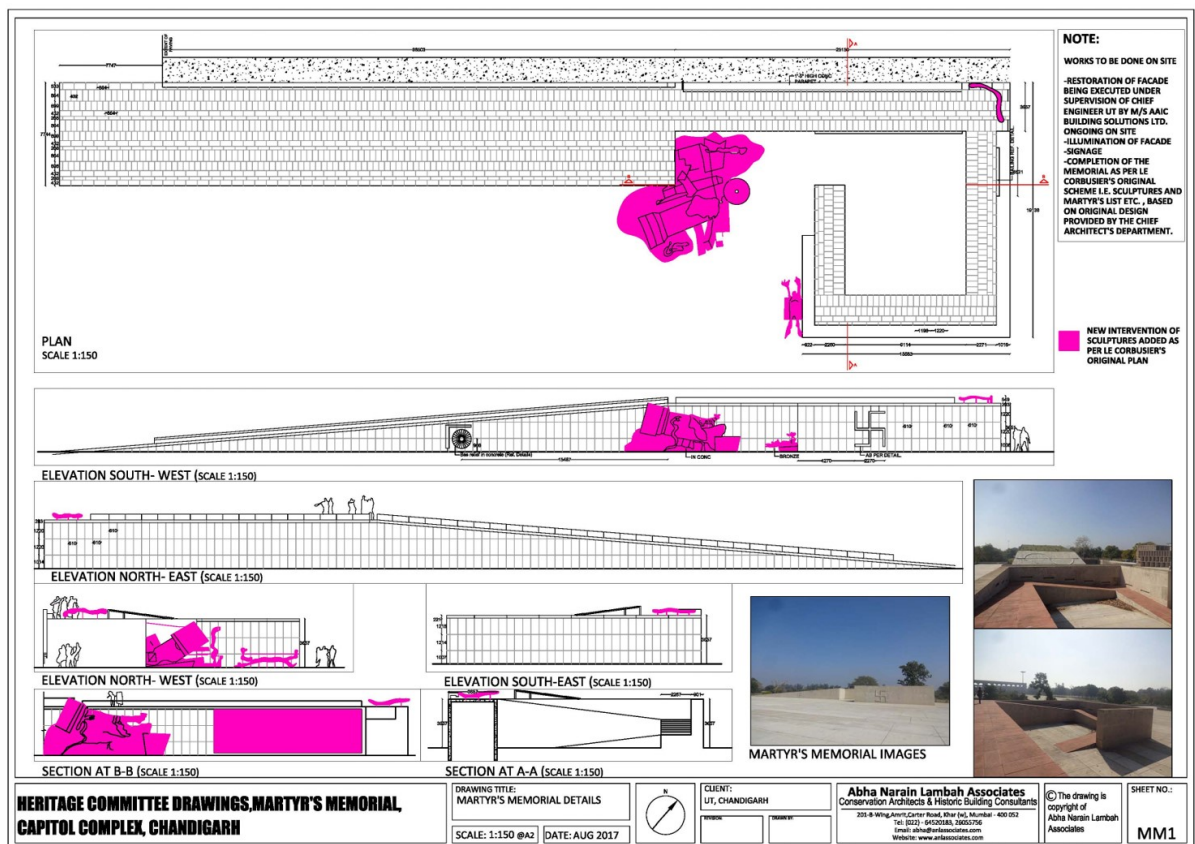
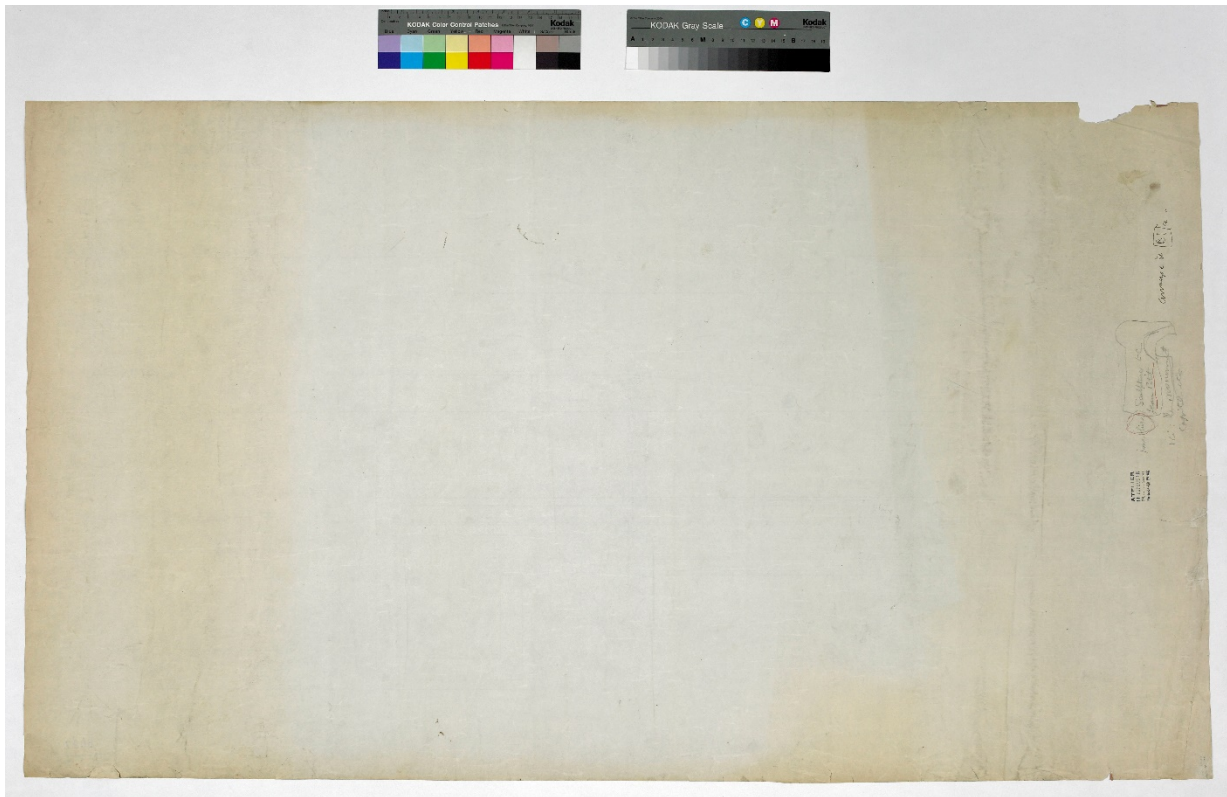






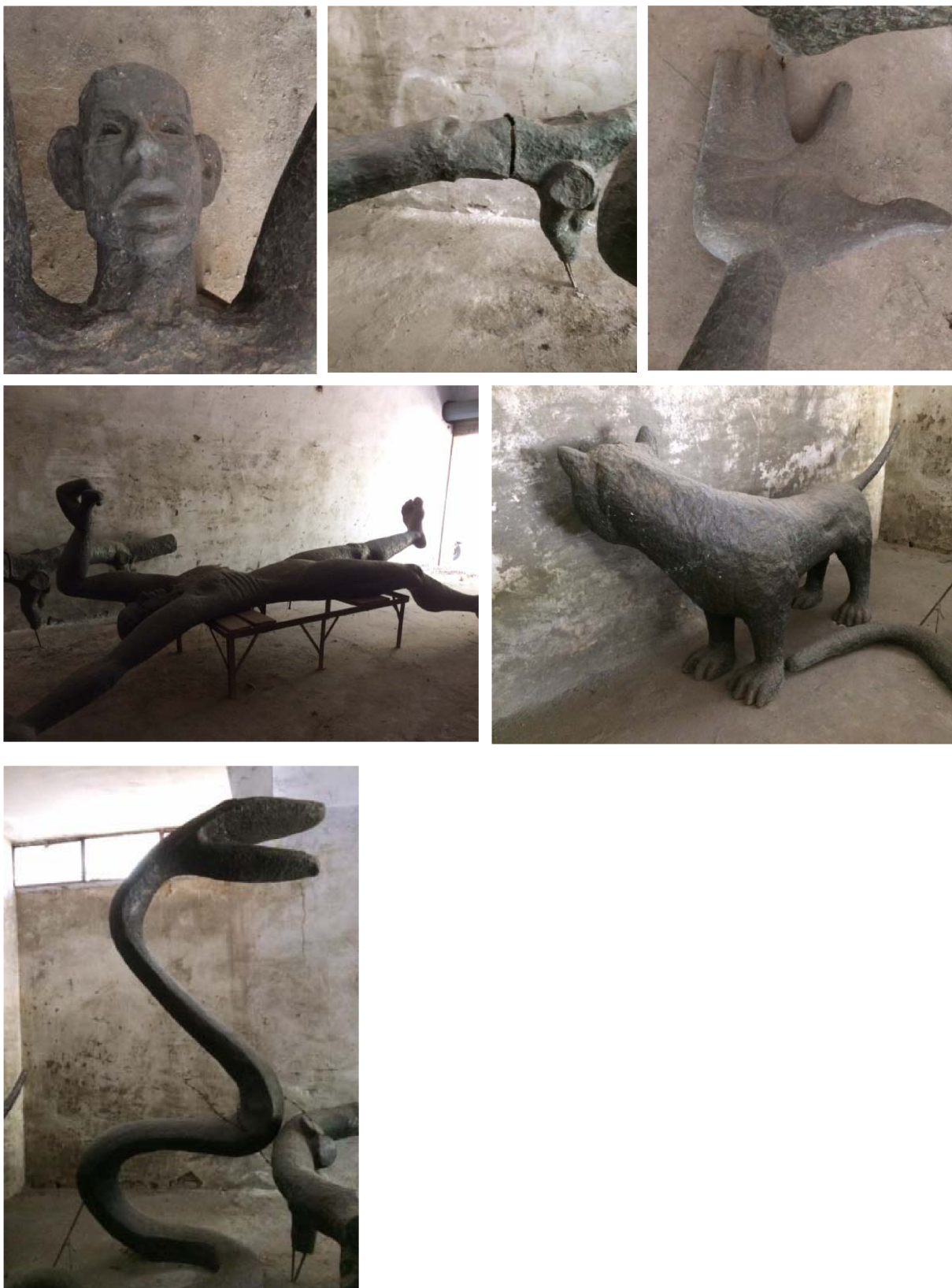


**Fig. 3: Archival Drawings for Martyr's Monument (source: Fondation Le Corbusier, Paris)**



**Fig. 4: Drawings for completion of Martyr's Monument (source: ANL Associates)**





**Fig. 5: Sculptures by Corbusier commisioned to BM Chugh, stored in Sector 12, Chandigarh**









**Fig. 6: Images of Geometric Hill, works of the sundail, completed as of July 2015 (source: ANL Associates)**