

BHIMSEN TEMPLE PINNACLES

Report of the Institute of Conservation (IoC), University of Applied Arts Vienna

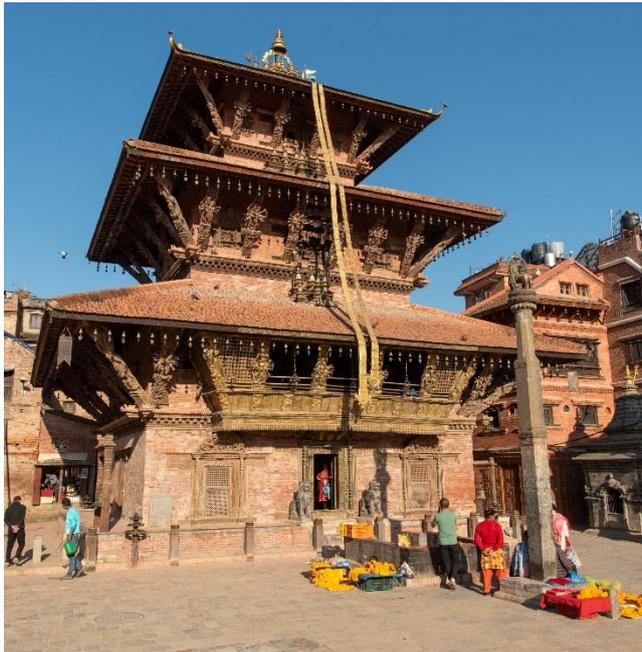


Fig. 1: Overview of the Bhimsen Temple

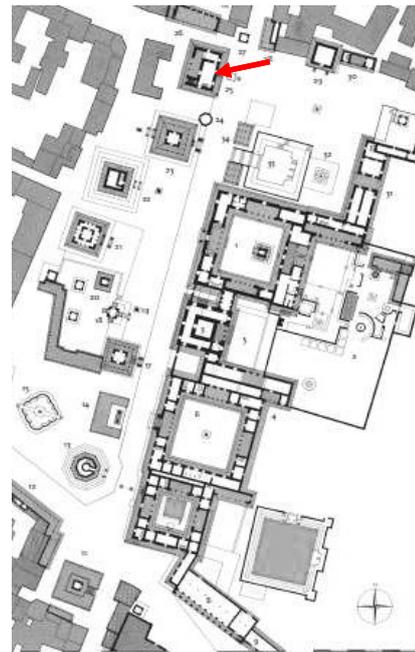


Fig. 2: Location within the Darbar Square

Data Sheet

Description

The Bhimsen Temple at the northwest entrance to Patan Darbar Square is dedicated to the god of trade and business. The three-story pagoda has an unusual rectangular plan that sets it apart from other temples in Patan. The temple as it exists now was completely rebuilt in 1681/1682 (?) after a fire by King Shri Nivas Malla, and was later restored after the 1934 earthquake, and again in 1967. Bhimsen temple has a very laborious and rich appearance which may be linked to the god Bhima being the protector of the wealthy. The roof is decorated with finials and various symbolic creatures. Four birds occupy the third-story terrace corners. The top roof is also decorated with two banners, one garland, mirrors, flags and eight pinnacles on the top story with a crowning finial. On the middle roof are seven pinnacles, and on the first roof are eight.

Names	Bhimsen Mandir	
Dated	17 th century, rebuilt in 1681/1682 (?)	
Measurements (H x W x D)		
Materials/Technology	Fire gilded copper repoussé and chasing work, iron	
Interventions (IoC)	Conservation	2019, 2020
Team (IoC)	Gabriela Krist, Marina Paric	
Academic Research (IoC)	-	

Survey: Materials and Technology

- Wooden base structure and wooden core
- Fire gilded copper repoussé and chasing
- Pinnacles constructed with several pieces (on average seven), pieces are stacked and kept together by iron chains in the hollow space inside
- Flags, banners, birds, mirrors, umbrellas and other metal elements consist of several pieces and are held together by iron rivets



Fig. 3: Dismantled pinnacles



Fig. 4: Dismantled parasol



Fig. 5: Dismantled canopy



Fig. 6: Dismantled banner

Previous (Conservation) Interventions

After 1934	repair after the earthquake
1967	repair
1968	special roof struts were painted with silver paint and marble panelling was added at the ground floor
1999	Restoration work (observed in the course of a WHC mission WHC-99CONF.209INF.17A)

Survey: Condition and Causes of Decay

- Thick soiling layers
- Mechanical damage (scratches, bumps)
- Worn-out gilding
- Corroded surfaces due to direct exposure to weather and pollution, heavy corrosion on iron chains



Fig. 7: Detail before dismantling



Fig. 8: Corroded iron



Fig. 9: Soiled surface



Fig. 10: Dismantled pinnacle

Conservation (IoC)

- Dismantling of all metal components and disjoining / disassembling
- Dry cleaning with brushes
- Wet cleaning of metal parts with water and surfactant, rinsing off with drinking water and exposure to sun for drying; elements with compact soiling layers were placed in a water bath with surfactant over night
- Removing of copper corrosion with citric acid (complexing agent), elements were either placed in citric acid bath (1:10 citric acid and water) or treated with cotton-wool patches soaked in citric acid, immediate subsequent cleaning with drinking water and brushes
- Cleaning of iron parts with metal brushes to remove corrosion, afterwards a protective layer of pure transparent lead soap was applied



Fig. 11: Wet cleaning



Fig. 12: Cleaning with poultices



Fig. 13: Mechanical cleaning



Fig. 14: Cleaning with citric acid



Fig. 15: Piece of pinnacle part before conservation

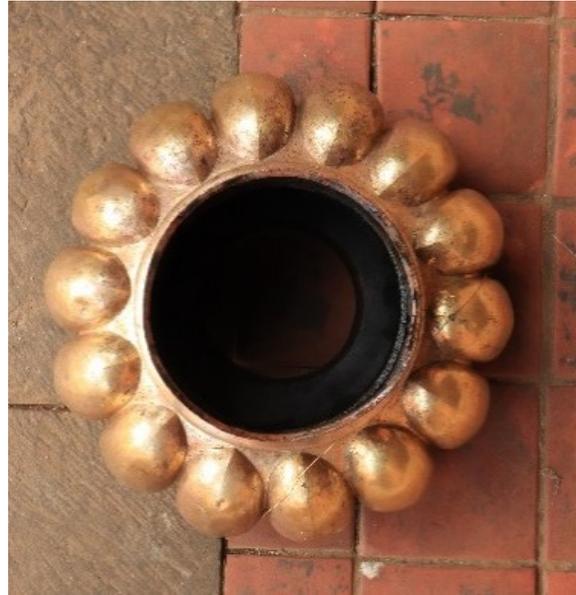


Fig. 16: Piece of pinnacle after conservation



Fig. 17: Before conservation



Fig. 18: After conservation



Fig. 19: Reassembling of pinnacles, 2021 © Bikash Khadgi

Before and after Conservation



Fig. 20: Bhimsen Temple, pinnacles on top, before conservation, 2019



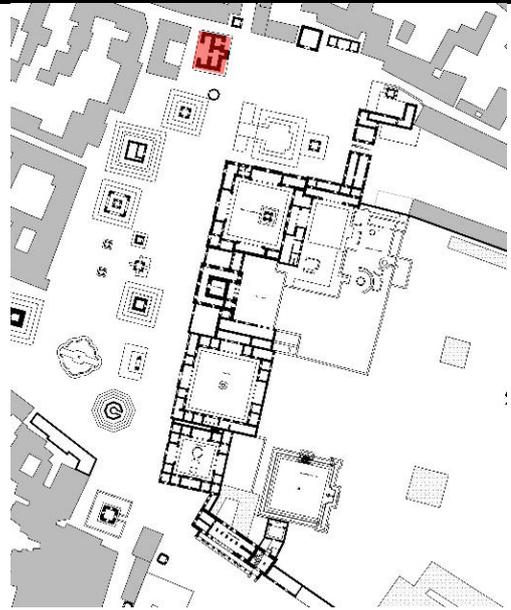
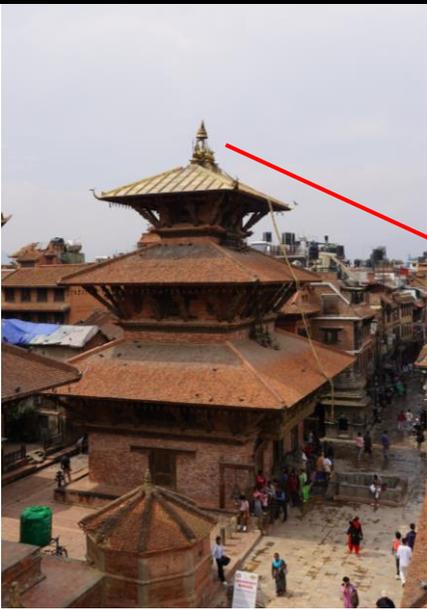
Fig. 21: Bhimsen Temple top roof, before conservation, 2019



Fig. 22: Bhimsen Temple, top roof, after conservation, 2024 © Bikash Khadghi

Photo Credits

Unless otherwise stated, all photographs © Institute of Conservation, University of Applied Arts Vienna

GENERAL INFORMATION		
Object / Monument 8 pinnacles and finial elements on the top roof of Bhimsen Temple	Orientation North-western corner of the palace complex	Size (H x L x W) -
Date of Production 17 th century, rebuilt in 1681/1682 (?)		Location Patan Durbar Square
Material and Technology - copper repoussé, fire-gilded - internal wrought iron structure		
Date of the last Treatment Conservation 2019-2020: see short report		Institutions of the last Treatment IoC
		

EVALUATION	
Date of Evaluation May 2024	Evaluation done by Meral Hietz, Katharina Mendl
Recent Damages:	
<input type="checkbox"/> Stability Problems	<input type="checkbox"/> Major <input type="checkbox"/> Medium <input type="checkbox"/> Minor
Comment:	
<input type="checkbox"/> Broken / - into several Pieces	<input type="checkbox"/> Many

	<input type="checkbox"/> Some <input type="checkbox"/> Few	
Comment:		
<input type="checkbox"/> Lose / Missing Parts	<input type="checkbox"/> Many <input type="checkbox"/> Some <input type="checkbox"/> Few	
Comment:		
<input type="checkbox"/> Cracks / Holes	<input type="checkbox"/> Many <input type="checkbox"/> Some <input type="checkbox"/> Few	
Comment:		
<input type="checkbox"/> Deformation / Dents	<input type="checkbox"/> Major <input type="checkbox"/> Medium <input type="checkbox"/> Minor	
Comment:		
<input checked="" type="checkbox"/> Abrasion / Worn out Gilding	<input type="checkbox"/> Major <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Minor	- Top side of the base with downward and upward curved ends (<i>kulām</i>) - Partially on roof slabs - Bell-shaped centrepiece of the outer right pinnacle - Lotus element of the outer left pinnacle - Tip of top pinnacle on umbrella - 4 birds on roof corners
Comment:		
<input checked="" type="checkbox"/> Corrosion	<input type="checkbox"/> Major <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Minor	- Darkening of abraded areas with thin or no gold layer (see Abrasion / Worn out Gilding) and lower flags - Partial green corrosion, especially on middle pinnacle and <i>kulām</i> -base (due to bird droppings)
Comment:		
<input checked="" type="checkbox"/> Soiling	<input checked="" type="checkbox"/> Dust <input type="checkbox"/> Heavy <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Light	- Slightly matt appearance because of dust layer
	<input checked="" type="checkbox"/> Dirt <input type="checkbox"/> Heavy	- Bird droppings (especially around pinnacles, top side of <i>kulām</i> -base)

Medium

Light

Blood

Heavy

Medium

Light

Comment:

Evaluation of the Condition

good

satisfactory

unsatisfactory

Conclusion

In general, the condition of the objects was judged to be good. Due to inaccessibility, details of conservation work could only be assessed using binoculars.

The IoC did not implement any technical measures (e.g. closing cracks) in 2019-2020. The surface treatments that were carried out have proved to be stable over time. The pinnacles show partial darkening, however the overall appearance blends in well with the surroundings. The pinnacles on the two lower levels were not cleaned, so that they have a dark appearance in comparison due to dust and dirt deposits.

Deposits (soiling and especially bird droppings) can be found on the surface and are a major cause of corrosive reactions. In this respect, maintenance is the key to the long-term preservation of the sculpture. Regular cleaning and removal of bird droppings must be considered by the local community as the most important factor in long-term conservation. Where citric acid is used to chemically reduce corrosion, it is essential that the surface is thoroughly rinsed after cleaning, as acidic residues accelerate corrosive reactions.

PHOTO DOCUMENTATION



Fig. 1: Stored pinnacles after conservation, September 2019



Fig. 2: Top roof of Bhimsen Temple in May 2024



Fig. 3: Top roof of Bhimsen Temple in May 2024



Fig. 4: Pinnacles and finial elements on the top roof of Bhimsen Temple in May 2014



Fig. 5: Pinnacles and finial elements on the top roof of Bhimsen Temple in May 2014



Fig. 6: Pinnacles on the top roof of Bhimsen Temple in May 2014

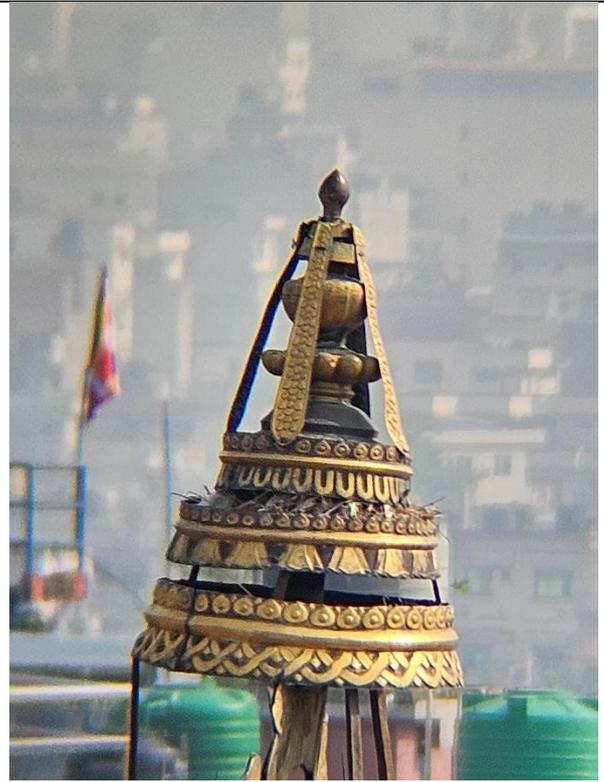


Fig. 7: Umbrella on the top roof of Bhimsen Temple in May 2014

[A] Product Data Sheets – Links¹ to Suppliers/Manufacturers

AEROSIL® 200

https://products.evonik.com/assets/or/ld/AEROSIL_200_TDS_DE_DE_TDS_PV_52043839_de_DE_WORLD.pdf

Aviva Silikat Grundierung

https://www.adler-lacke.com/Canto/tmb/aviva-silikat-grundierung_tmb_4079_de.pdf

Alkylbenzyltrimethylammonium chloride

<https://www.sigmaldrich.com/AT/en/sds/mm/8.14858?userType=anonymous>

KluceI™ EF

<https://www.kremer-pigmente.com/elements/resources/products/files/63701-63713.pdf>

Aviva Tirokat-Color, Adler

https://www.adler-lacke.com/Canto/tmb/aviva-tirokat-color_tmb_4087_de.pdf

Mixtion Le Franc, Kremer

<https://shop.kremerpigments.com/elements/resources/products/files/98000e.pdf>

Waxes, Deffner und Johann

https://deffner-johann.de/media/datasheets/4186000/EN/Zusatzinformation_Wachse_DE_DJ.PDF

Injection mortar HFX

https://productdata.hilti.com/APQ_HC_RAW/ASSET_DOC_7567931.pdf

Kölner Classic Ölmixtion 3h; 12h; 24h

<https://www.kolner-vergolderprodukte.de/produkte/koelner-oelmixtion/>

KSE 500 E

https://media.remmers.com/celum/export/documents/Remmers_0715_KSE-500-E-_Technisches-Merkblatt_de_DE_26355.pdf

Lascaux 498 20 X acrylic adhesive

[https://deffner-](https://deffner-johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf)

[johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf](https://deffner-johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf)

Marble dust

https://www.kremer-pigmente.com/elements/resources/products/files/58500-58580_59001-59690.pdf

Natural hydraulic lime

<https://www.preservationworks.us/wp-content/uploads/2019/10/NHL-Datasheet-Lafarge-23.5.pdf>

Plextol B-500 (acrylic dispersion)

[https://deffner-](https://deffner-johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf)

[johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf](https://deffner-johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf)

Primal® SF 016

[https://deffner-](https://deffner-johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf)

[johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf](https://deffner-johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf)

AKEPOX® 2010

https://data.akemi.de/fileadmin/user_upload/products/productdocuments/TMB/Akepox_2010_TMB_D.pdf

¹ All links were last accessed on 13 May 2025.

EPO-TEK® 301-1

<https://www.epotek.com/docs/en/Datasheet/301-1.pdf>

Titebond Wood Glue

<http://sds.franklini.com/msds/1411.042k0nmo0020.pdf>

Paraloid™ B-72, Kremer

<https://www.kremer-pigmente.com/elements/resources/products/files/67400-67409.pdf>

Keim Granital®

https://www.keim.com/documents/de-AT/723/TM_Granital_DE-AT.pdf