

NARASIMHA TEMPLE

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



Fig. 1: Overview of the Narasimha Temple, 2019

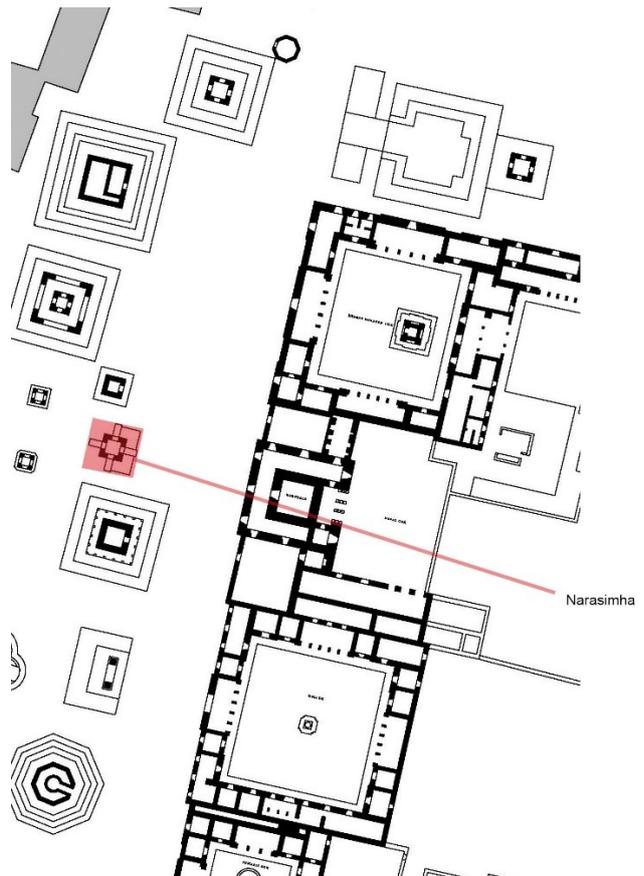


Fig. 2: Location within the Darbar Square

Data Sheet

Description

Built in 1589, the Narasimha Temple is located in the center of Patan's Durbar Square. It is built in the śikhara style and dedicated to a number of both Hindu and Buddhist gods but especially to the Narasimha avatar of Bogwan Vishnu. The structure of the śikhara temple is described as mountain-like because of its solid anchorage into the ground, from which it rises like a mountain almost vertical above the sanctum into the sky. As a miniature temple, it cannot be entered. In the Kathmandu Valley are around 25 brick-built śikhara temples, most of them are located in Bhaktapur. At the Patan Durbar Square, the Narasimha is the only brick built śikhara temple.

Two lion statues flank the stairs that lead to a stepped platform from which the temple's form extends into a slender tower. On all four sides there are towered porches, which are supported by two archaic stone pillars on the outer edges and two wooden ones on the inner edges. Wooden doors in each porch lead to the inner sanctum. On top of the porches four miniature towers (so called "fuchas") arise. All four are connected to the main tower. Each tower consists of three sides that exhibit two colonnettes on which a torana is placed. It includes elephants and lotus flowers, furthermore on the left and right side two nagas are placed. All of these elements are made of terracotta. Next to the already mentioned stone pillars, also the pinnacles on top of the porches are made out of stone. The temple itself is mainly constructed of bricks with clay used for pointing.

Following the earthquake 2015, the temple was partly dismantled and rebuilt in a secure manner. The twelve terracotta toranas were subject of conservation treatment to enable their reuse in the rebuilding. After evaluated it was decided that one torana on the south side, located in the West, needs to be reconstructed in total.

Names	Narasingha Temple	
Dated	1589	
Measurements (H x W x D)		
Materials/Technology	Bricks, clay, stone, wood	
Interventions (IoC)	Survey	2023
	Mapping	2023
	Sampling	-
	Analyses	-
	Conservation	2023
	Maintenance	-
Team (IoC)	Gabriela Krist, Katharina Fuchs	
Academic Research (IoC)	-	

Survey: Materials and Technology

- Temple is mainly constructed of bricks, joints pointed with clay, wooden pillars support the structure and provide stability
- Porches on all four sides of the temple are supported by two stone columns in the front and two wooden columns at the back and have a wooden door inside
- Miniature towers (fuchas) on top of each porch, resting on a wooden bar
- Pinnacles made of stone on top of every miniature tower
- Large pinnacle on top of the temple presumably made of bricks and a stone on top with a face of metal
- Stairway, which is flanked by two stone lions

Miniature towers:

- Square shape with one side connected to the main tower and the other three sides decorated with a torana each, in total twelve toranas
- Torana made of terracotta, presumably modelled by hand as every torana slightly differs



Fig. 3: Miniature tower



Fig. 4: Pinnacle on top of the temple



Fig. 5: Old reconstruction of terracotta element



Fig. 6: Stratigraphy of lime layers



Fig. 7: Uncovering trench at the top pinnacle

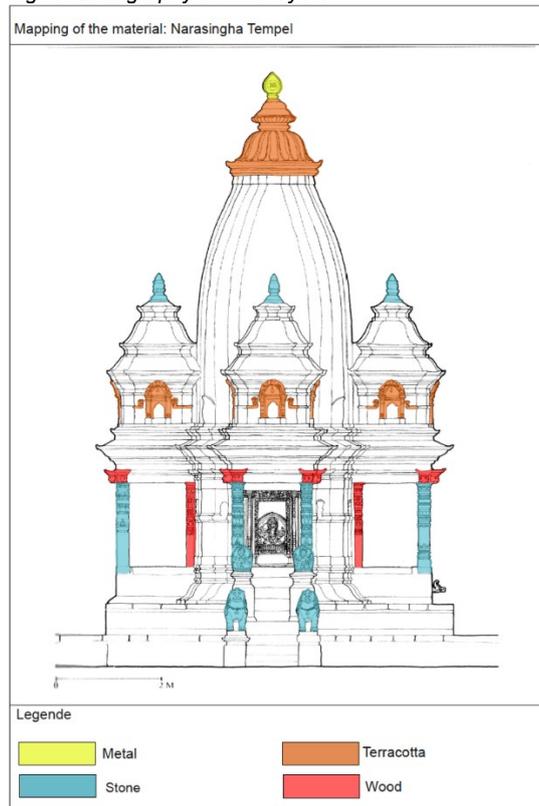


Fig. 8: Mapping of materials

Previous (Conservation) Interventions

Unknown	Replacement/Reconstruction of single elements of toranas on the north side of the north fucha and the north and south side of the east fucha
Unknown	Painting of temple with lime in different shades (blueish, yellowish), at least eight times since the 19 th century, on the toranas at least seven layers of lime in different shades (light blue, pink, etc.) could be identified
Unknown	Application of a blackish layer on toranas (bitumen?), prior to the lime washes

Survey: Condition and Causes of Decay

- Partial damage due to the earthquake 2015, wooden pillar inside the temple broken and bricks partly loose or missing
- Strong biological colonisation at the south side (moss, algae, lichen)
- Wooden bars on which miniature temple rests, are partly weathered
- Open joints and plant growth inside these joints
- Soiling of all surfaces, on the terracotta elements intensity of soiling differs and is probably linked to irregular sinter layers due to irregular firing (areas with higher moisture penetration are more soiled)
- Terracotta elements show heavily weathered areas, partly elements are missing completely, mainly due to continuous water penetration
- Cracks in terracotta elements



Fig. 9: Terracotta elements showing fractures, deformations and weathered surfaces



Fig. 10: Missing and loose bricks

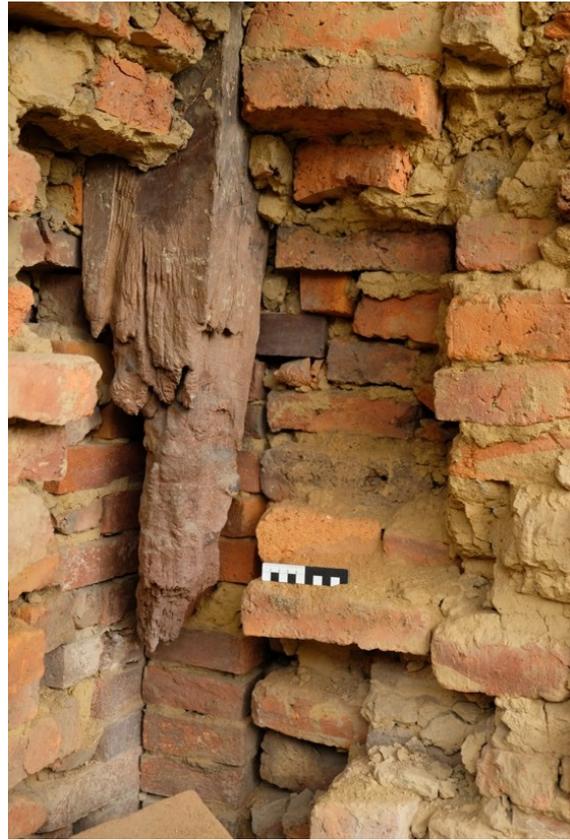


Fig. 11: Broken wooden pillar



Fig. 12: Material loss and weathered surfaces



Fig. 13: Plant growth



Fig. 14: Lime layers



Fig. 15: Black crust / layer beneath the lime layers

Conservation (IoC)

- Dismantling of the miniature towers and reassembling on the ground (done by KVPT)
- Uncovering of terracotta elements: all lime layers were removed, first, mechanically with hammer and chisel and, second, with scalpels and brushes, without damaging the sinter layers
- Removing old restorations with hammer and chisel
- Reconstructing parts of the toranas with newly fabricated terracotta elements or mortar
- Mortar reconstructions are made with brick sand/dust and slaked lime: first, a binder was applied to secure adhesion between terracotta and mortar filling, second, the shape was formed with coarse mortar; after drying, the sinter layer was scratched off and the fillings were repeatedly moistened, third, after complete solidifying again the binder was applied and the fine shapes formed with a fine mortar, after drying the sinter layer was scratched off and the fillings were repeatedly moistened
- Coating made of lime, pigments and water is applied on all mortar reconstructions for protection and to unify appearance

Conservation Materials* and Recipes used:

Binder: 1 vol. part brick sand : 1 vol. part brick dust : 1 vol. part slaked lime (mixed with water)

Coarse mortar: 2 vol. parts brick sand : 1 vol. part brick dust : 1 vol. part slaked lime (mixed with water)

Fine mortar: 1 vol. part brick dust : 1 vol. part slaked lime (mixed with water)

- brick dust and sand (crushed bricks, partly sieved)

- slaked lime (local)

* Product / technical data sheets can be found in the supplement [A]



Fig. 16: Dismantled miniature tower



Fig. 17: Partly uncovered terracotta element

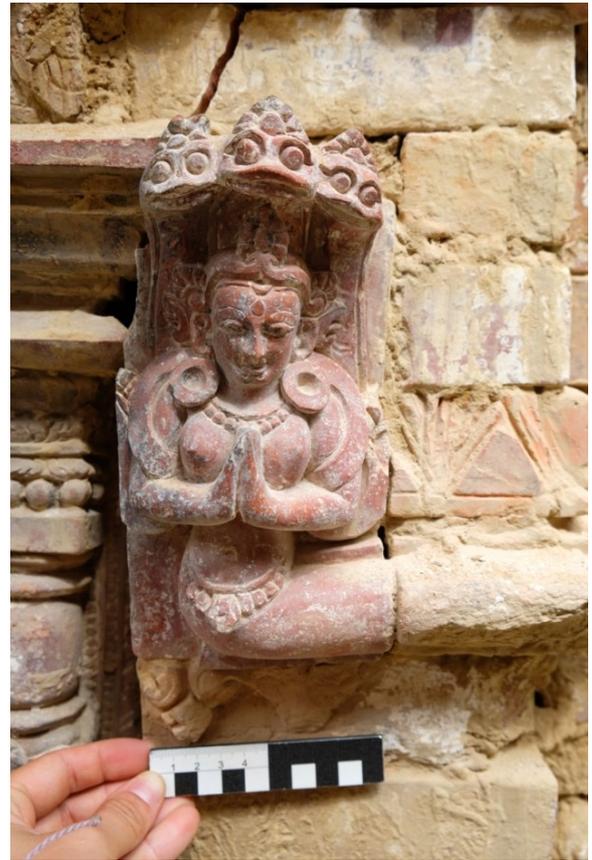


Fig. 18: Terracotta element after uncovering



Fig. 19: Torana before uncovering



Fig. 20: Torana after uncovering



Fig. 21 - 22: Reconstruction with coarse mortar (left) and fine mortar (right)

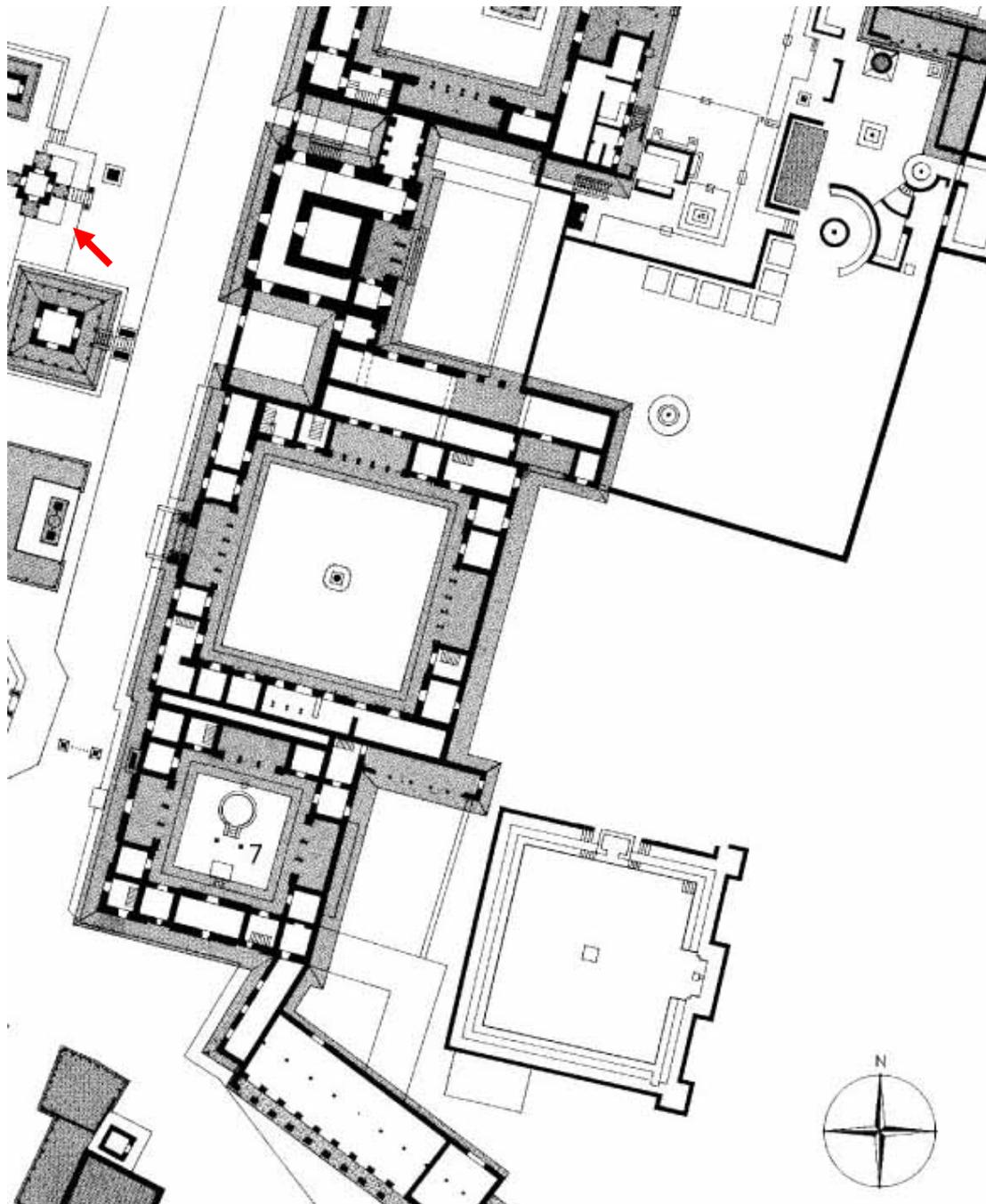
Supplements

[A] List of all product / technical data sheets

Photo Credits

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GENERAL INFORMATION		
Monument Narasimha Temple	Orientation	Size (H x L x W)
Date of Production 1674 (?)	Location Darbar Square	
Date of the last Treatment Conservation 20: see short report	Institutions of the last Treatment IoC	



Condition Assessment

Date of Evaluation

May 2024

Evaluation done by

Martina Haselberger

Fabian Sever

Sarah Moyschewitz

Recent Damages:

Stability Problems

Not detected

Major

Medium

Minor

-

Comment:

Broken / - into several Pieces

Not detected

Many

Some

Few

Comment: No new cracks or broken parts detected.

Lose / Missing Parts

Not detected

Many

Some

Few

Comment: No new loose or missing parts detected.

Fillings

Not detected

Adhesion loss

Cohesion loss

Many

Some

Few

Many

Some

Few

Comment:

Protective coating

Not detected

Powdering

other

Comment:

<input checked="" type="checkbox"/> Biological Colonization <input type="checkbox"/> Not detected	<input type="checkbox"/> Microbiological Growth	<input type="checkbox"/> Some	_____
		<input checked="" type="checkbox"/> Few	_____
	<input type="checkbox"/> Mosses	<input type="checkbox"/> Minor	_____
		<input type="checkbox"/> Major	_____
	<input type="checkbox"/> Higher Plants	<input type="checkbox"/> Medium	_____
		<input checked="" type="checkbox"/> Minor	_____
<input type="checkbox"/> Major		_____	
		<input type="checkbox"/> Medium	_____
		<input checked="" type="checkbox"/> Minor	_____

Comment:

<input type="checkbox"/> Mechanical Damage <input checked="" type="checkbox"/> Not detected	<input type="checkbox"/> Abrasion	<input type="checkbox"/> Major	_____	
		<input type="checkbox"/> Medium	_____	
	<input type="checkbox"/> Other	<input type="checkbox"/> Minor	_____	
		<input type="checkbox"/> Major	_____	
			<input type="checkbox"/> Medium	_____
			<input type="checkbox"/> Minor	_____

Comment:

<input checked="" type="checkbox"/> Soiling <input type="checkbox"/> Not detected	<input type="checkbox"/> Heavy	-	_____
		<input type="checkbox"/> Medium	_____
	<input checked="" type="checkbox"/> Light	_____	

Comment:

<input type="checkbox"/> Other	Comment:
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Individual Evaluation of the terracotta elements

WS Scaling in the middle of the Torana (recent?), Small cracks in the coarse mortar, no powdering or sanding of the protective coating.

W Cracks (detachment of coarse mortar due to manufacturing errors), no powdering of the protective coating.

WN Coarse mortar is partly crumbling, no powdering of the protective coating.

EN Cracks in the coarse mortar, rough/inappropriate application (regarding formal reconstruction), no powdering of the surface coating.

E Small splitting of mortar, a bit of powdering of protective coating,

ES Crack at the boarder of mortar and terracota, a bit of powdering of the surface coating, cracks in the terracotta (recent?)

SE Protective coating on sinter-surface (?), moss/funghi grows on coating in shape of dots (coating with acrylic resin (Primal?)), powdering of the protective coating.

S Mortar is soft and crumbling (not cured properly, can be easily scratched off), protective coating is powdering, colour a bit too pinkish, cracks at boarder of mortar and terracotta.

SW Only Naga is preserved, no Torana. Good condition.

The North-Fudja was still on the ground, following Terracotta elements:

NN Crack in the middle of the cornice; missing part at left pillar; joints partially open; major scaling, sanding and powdering on the left pillar and the right base – probably due to salt deterioration; medium soiling, mostly dust and bird droppings;

EN open joints; medium soiling with dust and dirt;

WN joints partially open; major scaling sanding and powdering on the left pillar – probably due to salt deterioration; medium soiling mostly dust;

General comment on the north Fudja: Toranas are fully covered with protective coating ('Schlämme'), pillars only partially; partial missing parts of the protective coating ('Schlämme') probably due to manufacturing errors; otherwise, no sanding of protective coating;

Evaluation of the Condition

- good (no need for treatment)
 satisfactory (some minor treatments necessary)
 unsatisfactory (major conservation measures necessary)

Conclusion

Mortar is generally in good condition, conservation treatments on some objects show manufacturing errors, resulting in cracks, crumbling and powdering. The cohesion loss of the protective coat on one Torana can probably be connected to a too high amount of pigments added. Execution was not specifically evaluated and rated, but it definitely could be also improved regarding its aesthetics.

All over, the treatment can be rated as satisfying.

PHOTO DOCUMENTATION

Condition at Evaluation Date

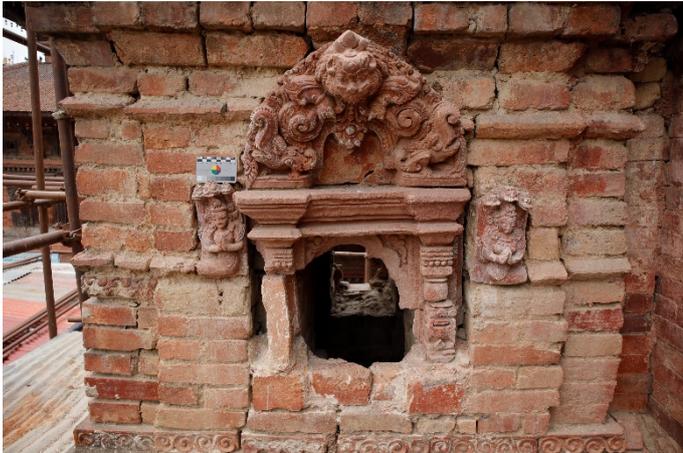


Figure 2: West Fudja, WS Window.



Figure 1: WS Window, Detail left Nagar.



Figure 4: WS Window, Detail Torana.

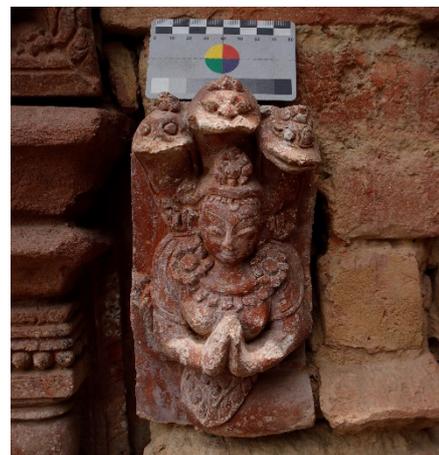


Figure 3: WS Window, Detail right Nagar.



Figure 6: Detail, scaling in the middle of the WS Window, Torana.

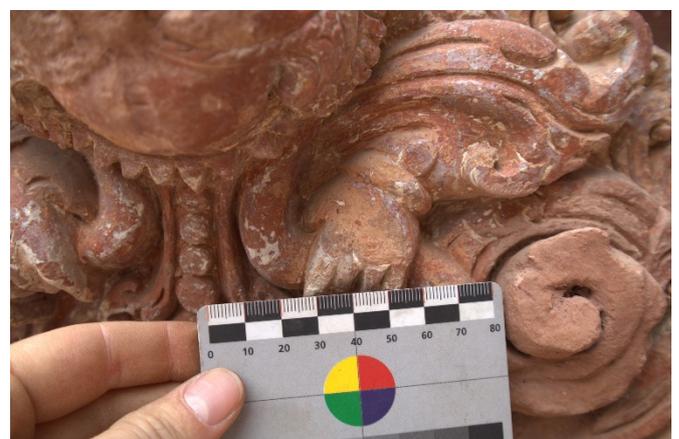


Figure 5: Detail, scaling at the left backhand of the Kirtimuga, WS Window, Torana.



Figure 8: West-Fudja, W-Window.



Figure 7: W-Window, Detail Torana.



Figure 10: W-Window, Detail left Nagar.



Figure 9: W-Window, Detail right Nagar.



Figure 12: W-Window, Detail Torana, Crack at the Nose of the Kirtimuga.



Figure 11: W-Window, Detail Torana, Crack at the border between mortar and terracotta.

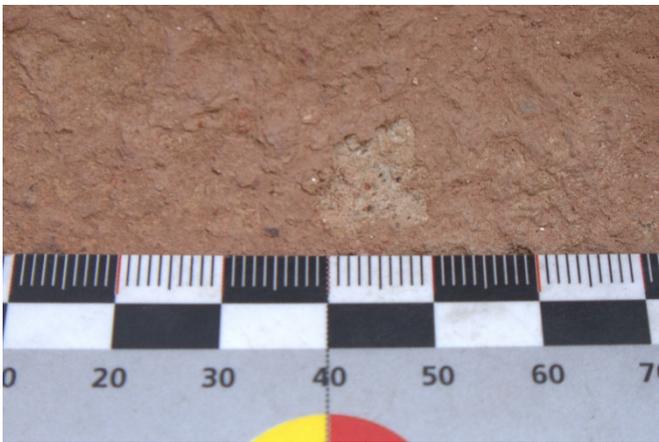


Figure 14: W-Window, Middle of the Torana, Scaling of the protective layer.



Figure 13: W-Window, Corner of Window, Mortar-replacement.



Figure 16: West-Fudja, WN-Window.



Figure 15: WN-Window, Detail Torana.



Figure 18: WN-Window, Detail left Nagar.



Figure 17: WN-Window, Detail right Nagar.



Figure 19: WN-Fudja, left cheek Kirtimuga, Scaling of Terracotta.



Abbildung 3: East Fudja, EN-Window.



Abbildung 2: EN-Window, Detail Torana.



Abbildung 4: EN-Window, Nagar
left side Detail



Abbildung 1: EN-Window, Nagar
right side Detail.



Abbildung 6: EN-Window, Detail Torana: Crack and scaling of Terracotta under the head of left Makara.



Abbildung 5: EN-Window, Detail Torana: Scaling of the Tail of the right Makara.



Abbildung 8: EN-Window, Detail Torana: Crack at the back of the left Makara.



Abbildung 7: EN-Window, Detail at the left Nagar face: Scaling, not sure if due to manufacturing mistakes or conservation treatment.



Abbildung 10: EN-Window, Detail Torana, Scaling at the Tail of the left Makara.



Abbildung 9: EN-Window, Detail right Nagar.



Figure 22: East-Fuja, E-Window.



Figure 23: E-Window, Detail Torana.



Figure 24: E-Window, Detail Torana, scaling at the bottom of the right Makara.



Figure 20: E-Window, Detail left Nagar.



Figure 21: E-Window, Detail right Nagar.



Figure 26: East-Fudja, ES-Window.



Figure 25: ES-Window, Detail Torana.



Figure 27: ES-Window, Detail left Nagar.



Figure 28: ES-Window, Detail right Nagar.



Figure 30: ES-Window, Detail cracks at the bottom of the right Pillar.



Figure 29: ES-Window, Scaling at the right side of the arch.#



Figure 31: ES-Window, Detail at the Torana of a crack at the mouth of the Kritimuga.



Figure 32: ES-Window, Detail of the cracks at the right bottom of the Window.



Figure 33: South-Fudja, SO-Window.



Figure 34: SO-Window, Detail Torana.



Figure 36: SO-Window, Detail left Nagar.



Figure 35: SO-Window, right Nagar.

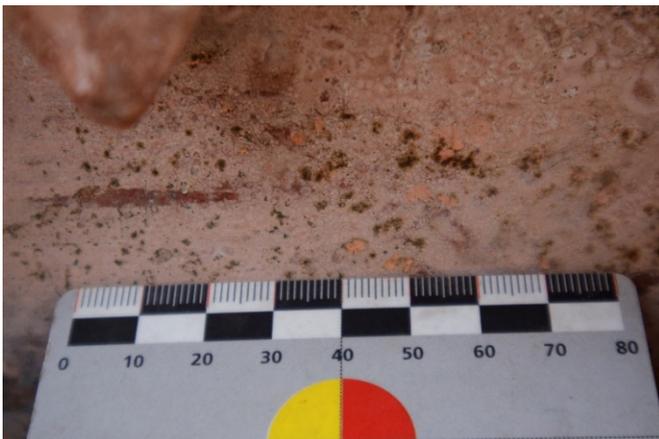


Figure 38: SO-Window, Detail Torana, Flaking off of the protective layer and microbiological infestation.



Figure 37: SO-Window, detail scaling at the cornice.



Figure 39: SO-Window, Detail of the biological infestation around the window. Mosses and microbiology.



Figure 41:South-Fudja, S-Window.



Figure 40:S-Window, Detail Torana.



Figure 43: S- Window, Detail left Nagar.

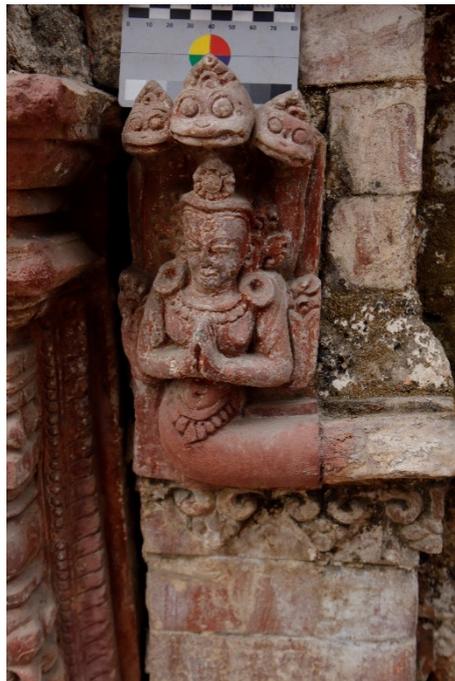


Figure 42: S-Window, Detail right Nagar.



Figure 45: S-Window, Detail Torana, scaling.



Figure 44: S- Window, Detail Torana, flaking off from the protective layer.

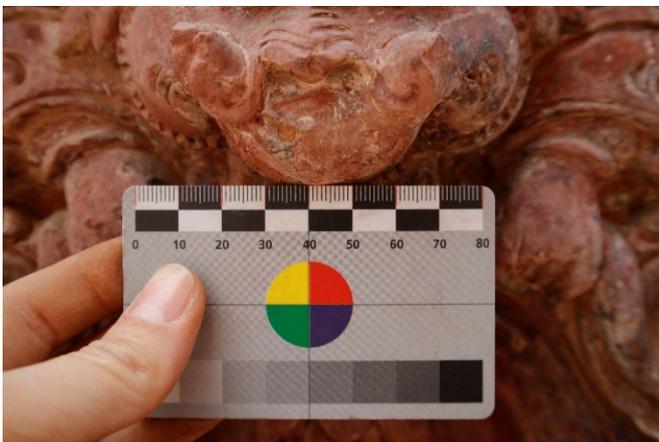


Figure 47: S-Window, Detail Torana, Scaling at the mouth of the Kirtimuga.



Figure 46: S-Window, Detail left Nagar, Scaling of the Terracotta at the Hands.



Figure 48: S-Window, Detail Torana, replacement with coarse mortar.



Figure 49: South-Fudja, SW-Window, only the right Nagar is left.



Figure 50: North-Fudja, North-North Window.

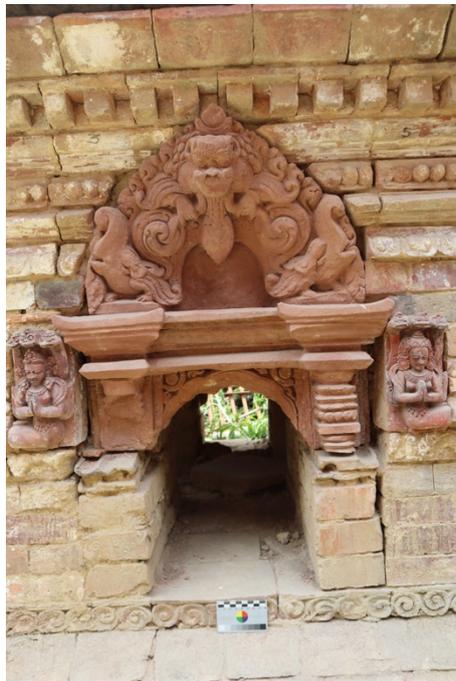


Figure 51: North-Fudja, North-East Window.

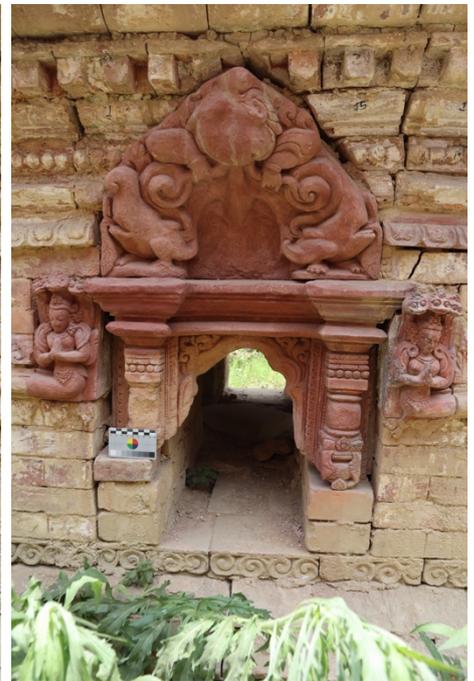


Figure 52: North-Fudja, North-West Window.

[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.sigmaaldrich.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