

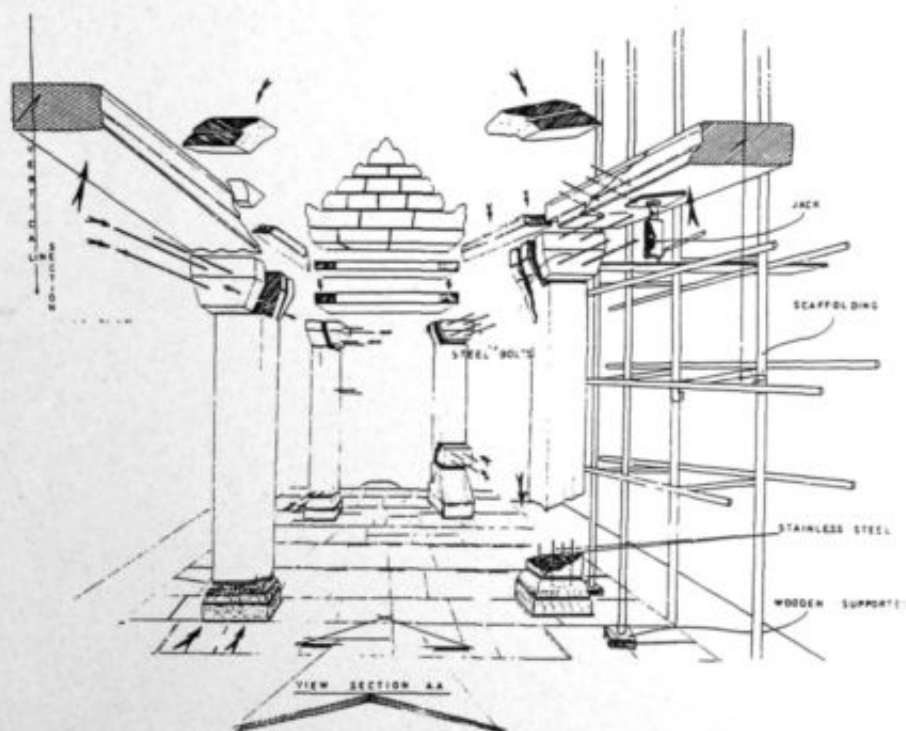
# PREAH KHAN CONSERVATION PROJECT

## HISTORIC CITY OF ANGKOR

Siem Reap, Cambodia

REPORT IX

FIELD CAMPAIGN VI



December 1999

World Monuments Fund, New York

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FIELD CAMPAIGN VI

October 1997 - September 1998

This work plan is prepared in accordance with the requirements of the International Coordinating Committee for Angkor, APSARA and the Royal Cambodian Government.

*cover graphic:* Conception for technical repair of West Portico Gopura III, drawing by Mr. Sam Himheng.

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## PREFACE

The continued political instability in Cambodia once again hindered the progress of work in Preah Khan for the first half of Field Campaign VI, which occurred between October 1997 to September 1998. During the lead-up to the elections in July 1997 there was a hiatus period at the site, causing the administration to close the project for a period of time. A further period of uncertainty continued until the government was established towards the end of the year.

However, great strides have been taken to promote the Preah Khan Project worldwide. There have been an increasing number of special tours at Preah Khan. The close association with the staff of Raffles International's newly renovated Hotel Grand has helped publicize WMF's activities at Angkor and Raffles has supported for some special events; the lecture programs in the USA, Asia and the UK as well as an art exhibition in London.

Even with the hiatus, work at Preah Khan has excelled as its structural interventions have become more sophisticated, demonstrated by the skilled interventions carried out at the West Gopura III Portico. The removal of the heavy reinforced concrete supporting beam and other damaging concrete repairs has resulted in a high quality structural repair, demonstrating the excellent level of workmanship now achievable by the Preah Khan workforce.

The professional staff has settled into a good rhythm of work, dividing their time between working at site and the preparing record drawings of the various sub-projects.

WMF's presence at Angkor is running into its tenth year; the original pledge was for ten years. We feel confident that ten years will not mark the end of WMF's involvement at the site, but the completion of the first phase of work. After year ten, the Preah Khan Conservation Project will go into a maintenance phase. This represents an important milestone as we approach the time when the project's management will be delegated to our professional staff and workforce who are more than capable of overseeing this project now and we are proud of their accomplishments and potential.

*John Sanday  
Field Director, Preah Khan Conservation Program  
December 1998*

## ACKNOWLEDGMENTS

The World Monuments Fund is grateful to an ever-increasing number of individuals who have served and continue to serve as members of the Preah Khan Field Missions and to those who have contributed to this report. The Preah Khan Conservation Consultant Team for Field Campaign VI consisted of John Sanday, Field Director, Preah Khan Conservation Project and Predrag Gavrilovic, Structural Engineer.

WMF and its consultant team continue to be pleased with the progress of our professional staff. Cambodian members consist of architects Mr. Lek Sareth, Mr. Var Morin, Ms. Cheam Phally, Ms. Chhun Soma, and Mr. Sam Kimheng, archaeologist Mr. Chan Chamroen, and Mr. Nay Sophea. WMF especially wishes to thank Prince Sisowath, Dean of the Department of Architecture for his help and insight. Contributions to this report have also been provided by WMF headquarters in New York, from Bonnie Burnham, President, John Stubbs, Vice President for Programs, and Felicia Mayro, Project Manager. WMF thanks Rachel Cohen-Stevens, Chris Randolph, and Sebastian Keneas who assisted in the production of this report.

Special thanks go to WMF's local administration team and work force ably led by Project Assistant Kusom Sarun, with special mention of the house staff at No.4 Wat Bo in Siem Reap. The Preah Khan work force, consisting of 70 masons, metalworkers, foremen and laborers, excelled throughout Field Campaign VI and worked hard as a harmonious group. WMF thanks the entire project development team based in Cambodia for their contribution to the success of the project.

Special thanks are expressed to our hosts: the Royal Cambodian Government, and in particular to His Majesty King Norodom Sihanouk; H.E. Vann Molyvann, Minister of State; H.E. Son Soubert; H.E. Nouth Narang, Minister of Culture and Fine Arts; and other members of the ministry including Under Secretary Mr. Michel Tranet, National Museum Director Mr. Pich Keo, and Cultural Adviser Mr. Ouk Chea.

WMF would like to express its gratitude to Governor Ton Chay of Siem Reap Province for his support of the Preah Khan Conservation Project and to Mr. Uong Von, Director of the Conservation d'Angkor in Siem Reap, for his constant support and advice. Gratitude is also extended to the staff of the Conservation d'Angkor.

Following its participation in the meeting of the International Coordinating Committee, WMF would like to express its gratitude to the Co-Chairmen of the Committee: The Honorable Yukio Imagawa, Ambassador of Japan to Cambodia, and The Honorable Gildas Le Lidec, Ambassador of France to Cambodia; to the UNESCO Secretariat and representative Mr. Khamliene Nhouyvanisvong as well as Sebastien Cavalier; and to all the teams working at Angkor for their cooperation, advice, and support.

WMF's efforts have also been aided by important contributions from individuals acting on their own initiative, both in Cambodia and throughout the world. The ongoing conservation project has attracted a large number of visitors to Preah Khan who have continually offered assistance in the form of advice, funds, food, and medical supplies for the local team. For these thoughtful and generous deeds the Preah Khan Conservation Project team conveys its thanks.

The Preah Khan Conservation Project Team is especially grateful for the continuing support and encouragement of the Board of Trustees of the World Monuments Fund.

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The World Monuments Fund is grateful to the many donors whose generous support sustains its efforts at Angkor, in particular the campaign to safeguard Preah Khan, one of the world's priceless resources. On the following pages we recognize some of the many individuals, visitors to the site, and organizations whose assistance with the ongoing site conservation work has been most gratefully received.

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## THE WORLD MONUMENTS FUND IN ANGKOR: 1990-2000

### 1.1 HISTORY OF THE WORLD MONUMENTS FUND PREAH KHAN CONSERVATION PROJECT

### 1.2 PREVIOUS ACCOMPLISHMENTS, CAMPAIGNS I-V

## 1.1 HISTORY OF THE WORLD MONUMENTS FUND PREAH KHAN PROJECT

### *Sketch History & Description Of Preah Khan*

In its present state, Preah Khan is best described as a partial ruin set deep in the jungle of north central Cambodia. It is one of the few temple complexes at Angkor which is still totally surrounded by jungle. The coexistence of these historically significant man-made remains and its relatively untouched natural setting make Preah Khan one of the outstanding sites at Angkor.

Preah Khan, covering approximately 56 hectares, is an extensive building complex within the Historic City of Angkor, located a short distance beyond the North Gate of the Angkor Thom precinct. It was built by the Khmer King Jayavarman VII as a monastery and teaching complex. Preah Khan is the most prominent of several temple complexes associated with the Northern Baray (often referred to as the Preah Khan Baray), which stretches approximately four kilometers eastward and links Preah Khan with the contemporaneous sites of Neak Pean and Ta Som. This group, one of Angkor's major urbanistic conceptions, once formed a major part of Angkor's vast hydrological system, which is now largely in disuse.

According to the Preah Khan stele, the site was dedicated in A.D. 1191. Over the next three centuries the temple complex was modified considerably. Four concentric enclosure walls subdivide the monastic complex. The outer wall is encircled by a wide moat, which today encloses a large tract of jungle. This area was formerly the living quarters of the monks and attendants of Preah Khan. The second enclosure wall delineates the principal religious compound, within which temples and shrines dedicated to the Hindu sects of Vishnu (West) and Shiva (North) are densely concentrated. The central shrine is Buddhist, the southern quadrants are dedicated to ancestor worship, and the eastern axis forms a grand approach to the principal Buddhist shrine in the center.

Like most of the monuments of Angkor, Preah Khan is in a state of ruin following a slow decline in royal patronage beginning in the middle of the 15th century. While evidence suggests that some of the temples and shrines remained in use (probably until the end of the 17th century), it was not until the end of the 19th century that Preah Khan, like many other temples at Angkor, was "rediscovered" by the Ecole Française d'Extrême Orient (EFEO). EFEO's work is well documented and archived both in Cambodia at the National Museum in Phnom Penh and in Paris; records are available in the form of transcriptions and microfiche.

### *World Monuments Fund at Angkor*

The World Monuments Fund (WMF) sent its initial field mission to Cambodia in December 1989 to survey Angkor and evaluate the damage the site had suffered after 20 years of civil strife and isolation. The mission soon discovered that the temples were relatively unaffected by the upheavals that shook Cambodia. Angkor's caretakers, however, were not as fortunate. Among the educated Cambodians to die in the "killing fields" were those with specialized training in architectural conservation. By the time the Khmer Rouge were ousted from power in late 1978, only a handful of the former workers at Angkor had survived. While the country remained isolated for more than a decade after the overthrow of the Khmer Rouge, the site was virtually unattended and the French conservation facility was in shambles.

When WMF visited Angkor in 1989, the Cambodian government urged its team to organize a pilot project to address some of the challenges facing preservationists at Angkor; the site selected by WMF for this undertaking was Preah Khan, a 12th-century Buddhist monastic complex. WMF has since conducted regular field missions to the site, under the supervision of Project Field

Director, John Sanday, a conservation architect with expertise in Asian structures who has been a consultant to WMF since the late 1970s.

By November 1992, WMF had mobilized a team of craftsmen and laborers to commence its program of on-site activities at Preah Khan. Mission I in 1989 represented the commencement of a projected 10-year commitment to assist the Royal Cambodian Government and UNESCO by contributing to the International Campaign to Safeguard Angkor. See previous reports Volume I *Conservation Considerations for the Historic City of Angkor* (1992) and Volume II *Preah Khan, Project Identification* (1993).

In preceding reports, WMF recommended a course of action at Preah Khan which was subsequently approved by Cambodian authorities and the ICC. The development of basic conservation principles and procedures guides the WMF team and its work force in a long-term program to repair, conserve and present Preah Khan as a partial ruin. Due to the magnitude of the task, major reconstruction is not to be undertaken at Preah Khan, which is presented to the public as an exposed archaeological and architectural ruin. In addition, judicious jungle clearance, debris removal and on-site interpretive aids have made Preah Khan more physically and visually accessible and its rich history more intelligible to visitors. WMF seeks to pass Preah Khan on to future generations in a state similar to that in which it was found, but with the added assurances that, by using modern conservation technology, the site will be rendered structurally sound and the natural environment will be sustained.

Since 1991, WMF has advocated and administered an on-site training program for Cambodian students of architecture and archaeology from the University of Fine Arts, Phnom Penh, in recognition of Preah Khan's value as a conservation training laboratory. During the 1995/96 Field Campaign IV, the graduate students trained under this program were integrated into WMF's professional team. Part of this training is being directed at the craftsmen who are also taught appropriate conservation skills as an extension of the local craft tradition.

### *Philosophy and Approach*

WMF's philosophy at Angkor is based on a dual challenge: to preserve a magnificent heritage site and to ensure that its Cambodian custodians possess the expertise required for its care and management. Initial surveys of the site led WMF to design a long-term program to repair and conserve the site as a partial ruin. Major reconstruction was not judged appropriate due to the lack of historical data, the magnitude of the task, and the questionable philosophical nature of such an approach.

WMF also intends for its work at Angkor to help support the restoration of peace and prosperity in Cambodia. It strives not only to preserve Angkor, the country's most cherished symbol of identity and its touchstone to the past, but also to strengthen the sense of stability and security in the local population by providing jobs, new expertise, and contact with the outside world.

WMF is dedicated to a comprehensive conservation strategy at Angkor which embraces the following objectives:

- Establish conservation methodologies which are appropriate for use at Khmer monuments and analyze building materials to determine how to resolve problems related to their use and conservation.
- Stabilize and partially consolidate structures at locations within the Preah Khan complex.
- Recommend ways to protect and properly present the historic monuments at Preah Khan and its environs.

- Emphasize formal on-site conservation training for Cambodian architecture and archaeology students and for local craftsmen.
- Seek to ensure the protection of Angkor's movable cultural property by deterring theft and vandalism, using video imaging and site-specific computerized inventories to document the architectural sculpture at Preah Khan.
- Conduct above-ground archaeological research at Angkor to learn more about the ancient Khmer empire and Angkor's prehistory.

## 1.2 PREVIOUS ACCOMPLISHMENTS

### Field Campaign I (1992-1993)

The first extended Field Campaign at Preah Khan, from October 1992 to April 1993, initiated the project's conservation plan. This campaign consisted of three principal field missions of WMF consultants as well as continuous on-site work by laborers.

In March 1993, WMF brought five consultants to the site to conduct a documentation and materials testing program. This led to the development of policies for structural repair, consolidation and planning to be further advanced the following year. For more detailed information, please see *Preah Khan Conservation Project Report IV: Field Campaign I — Project Mobilization*, including three separate appendices.

### Field Campaign II (1993-1994)

Field Campaign II, which ran from November 1993 to May 1994, consisted of three separate missions, which began with site clearance and preparation for the technical team's arrival in January.

During the first mission in January 1994, a nine-member team initiated the following projects: cleaning, repair and maintenance of stonework; structural testing, repairs and consolidation at the South Portico of East Gopura III, the Hall of Dancers, and the Lanterns (Bornes) along the West Processional Way; survey of the natural environment; and graphic and photographic documentation for architectural, archeological, engineering and interpretation purposes.

During the second mission, in March 1994, the team completed work begun earlier in the campaign and initiated new activities, including structural repairs and archeological soundings. Also, work began on the production of an annual report of WMF's accomplishments at Angkor.

The third mission was conducted in April 1994. Preah Khan Project Field Director John Sanday and WMF team members participated in the filming of the U.S.-based Discovery Channel's *The Struggle for Angkor*, which demonstrates present-day efforts to conserve the monuments of Angkor; the documentary aired in October 1994.

Based on its experience at Preah Khan and by arrangement with the Royal Cambodian Government, WMF began general maintenance work at nearby Prasat Neak Pean, located in the center of the Preah Khan baray, and proposed possible conservation and protection interventions at other sites within the Historic City of Angkor. This same year, a group of Preah Khan students prepared their final architectural diploma projects on the Neak Pean complex.

### Field Campaign III (1994-1995)

Preah Khan Field Campaign III commenced after the rainy season in October 1994. Efforts during this period concentrated more than in previous years on interventions for structural consolidation, in particular to prevent several imminent collapses and to make the site safer for visitors.

Project Field Director John Sanday visited Siem Reap with specialist Sharosh Pradhan to commence preliminary analyses of possible applications for computer-aided design (Autocad) at Preah Khan. Sanday returned to the site in December to introduce volunteer Andrew Dennis to

the project and prepare for the arrival of a group of 24 visiting sponsors from the World Monuments Fund in New York and the first mission in January 1995.

The first mission, January 2-22, overlapped with the WMF sponsors' visit. After preparing work plans with each of the consultants, Sanday joined WMF Vice President for Programs John Stubbs, WMF Chairman Marilyn Perry, and WMF Board of Trustees' Secretary and General Counsel Robert Geniesse at a conference entitled *The Future of Asia's Past* sponsored by The Asia Society in Chiang Mai, Thailand.

As part of its ongoing participation in the campaign to safeguard Angkor, WMF, in conjunction with the Royal Angkor Foundation (RAF), introduced radar images of the entire Historic City of Angkor as provided by the National Aeronautics and Space Administration's Jet Propulsion Laboratory. Taken by the space shuttle Endeavour during its April and October 1994 flights, these images are valuable new resources for the documentation and analysis of Angkor. With the support of the J.M. Kaplan Fund, Inc., WMF and RAF organized a scientific roundtable in February 1995 in Princeton, New Jersey to discuss space-borne radar imaging and its applications at Angkor. A report on the conference entitled *Radar Imaging Survey of the Angkor Eco-Site* was printed in March 1995. Subsequent workshops which address radar imaging at Angkor occurred at the University of Florida at Gainesville in 1996, and at Boston University in 1998.

During the second field mission, the team of consultants and the Preah Khan work force concentrated on the systematic consolidation of structures along the principle axial route originating at the East Gopura IV and the central gateway in particular. Since the de-mining and clearance of the original east access road along the boundary between Preah Khan and the North (Preah Khan) Baray, it is now possible to enter the site from the East or principal entrance. Priority was given to the consolidation and partial reconstruction of the North West Portico at East Gopura IV, which was at the point of collapse. In the Hall of Dancers, located on the main east/west axial route within the temple complex proper, the consultant team identified the southeast sector of the hall as being in need of urgent consolidation – a choice which was justified as the extant quarter vaults were also threatening collapse.

#### **Field Campaign IV (1995-1996)**

Previous campaigns surveyed and prioritized many physical conservation projects at Preah Khan; during campaign IV many of those projects matured or reached completion. Continuing interventions occurred at East Gopura IV (central gate entrance and tower, south tower, northeast tower and portico), the Hall of Dancers (southeast sector wall, southern causeway, northeast sector), Enclosure Wall IV (northeast sector, southeast sector), with the Garuda engaged statuary (NE31, NE35 "Brewer", NE36), the Central Buddhist Complex (southwest courtyard, central tower, northeast shrine), West Gopura III ("Dvarapala" statue South), and the Northeast "Dharmasala" Pavilion.

Research and training activities also expanded in the last year in anticipation of the eventual inheritance of the project by an entirely Cambodian professional staff. Training was facilitated by the presence of two foreign experts: Paolo Pagnin, an Italian stone conservator, instructed Cambodian staff in appropriate techniques for stone consolidation, put to use immediately on the broken southern Dvarapala statue at the west Gopura III; and Dr. Predrag Gavrilovic of the Institute of Earthquake and Engineering Seismology in Macedonia offered his expertise on emergency structural repairs and reinforcement for load bearing stone masonry. Following training sessions with these visiting experts, the full-time staff was able to replicate the new techniques successfully and improved results were clearly evident.

Three on-site interns – the second group of architectural students from Phnom Penh University to be trained in conservation at Preah Khan – graduated successfully on January 27, 1996; their thesis work involved numerous projects relating to the short- and long-term conservation of Neak

Pea Temple and that site's important hydrological features. Phally, Soma, and Heng joined the Preah Khan Conservation Project as paid full-time assistant architects in March. Architect Var Morin, who graduated in December 1995, also joined the regular staff in January.

The efforts of visiting experts Pagnin and Gavrilovic brought to light numerous techniques for gluing, pinning, and doweling broken stone elements which had never been used by the Preah Khan team before; these advances were made through the selection of experimental projects designed to test the ease and efficacy of their application under field conditions. The resulting documentation and capacity enhancement have formed a lasting contribution to the site.

Assistant architect Caroline Schweyer from France spent five months at Preah Khan, and during that time completed the modification of commercial Access II software for storage of the Preah Khan archive of architectural drawings and photographs which has been underway since 1992; her efforts have generated a systematic storage and retrieval system which will greatly facilitate research and enhance efficiency of the overall documentation program. This digital database will allow drawings to be tracked according to number, date, location, size, and type. All drawings have been reproduced at A3 size for consistency and ease of handling. Ms. Schweyer also developed a photographic database for the Preah Khan prints archive.

### **Field Campaign V (1996-1997)**

In Field Campaign V a great variety of work was accomplished, several more innovative conservation techniques were perfected and the Preah Khan team became more adept in many different types of conservation and repair interventions.

The project benefitted greatly from the presence of four of its consultants who were able to check the progress of work on site. Their reports were favorable and encouraging. With their guidance and direction the project team was able to undertake a series of interesting new interventions with particular reference to stone repairs, environmental developments and the enhancement of its Visitor Center, a facility that is greatly lacking in Angkor.

During Field Campaign V work continued in the Central Buddhist area following the damage wrought by a fallen tree. The North West Sector of the Hall of Dancers including the North door, which was threatening collapse, was skillfully repaired. Work was also completed on the North Gopura IV entrance where several stones had fractured. Also a section of the corbelled roof vaults, which were previously supported off a crude concrete structure, were satisfactorily consolidated and the concrete supports were removed.

Work started on perhaps the most ambitious project at the West Gopura II West portico. This work will span two seasons. It entails the removal of some reinforced concrete structural repairs, which are visually and structurally unsatisfactory. Work at the North East Sector of the laterite Enclosure Wall IV was essentially completed. The Garuda repair program has continued following the successful adoption of three new Garudas.

Finally interesting archaeological investigations on the East Jetty along the shoreline of the Northern Baray were completed and a report of the findings was prepared.



## SECTION 2

### FIELD CAMPAIGN VI: 1997-1998

#### 2.1 SUMMARY OF FIELD CAMPAIGN VI ACCOMPLISHMENTS

#### 2.2 PHYSICAL CONSERVATION PROJECTS

##### PREAH KHAN LOCATOR MAPS

##### 2.2.1 WEST GOPURA III

##### 2.2.2 GARUDAS

#### 2.2.3 ARCHAEOLOGICAL INVESTIGATIONS AT WAT PREAH KHAN

#### 2.3 RESEARCH, SURVEY, AND TRAINING

## 2.1 FIELD CAMPAIGN VI: SUMMARY OF ACCOMPLISHMENTS

### Overview

WMF's major intervention during Field Campaign VI has been to the West Gopura III West Portico. Two teams have been consistently working on this structure, firstly dismantling it following the preparation of detailed drawings and then carefully repairing the broken stones using stainless steel dowels and epoxy resin. Complicated designs to strengthen the three fractured lintels supporting the main fronton were prepared by Dr. Gavrilovic and discussed at length with the Preah Khan Team.

The Garudas that were repaired this season provided particular challenges as they were in various stages of disrepair. The work undertaken provided a great challenge to both the local professionals and the workers alike. The team worked diligently and the Garuda's adopters are very pleased with the results.

Chan Chamroen has continued with his archaeological investigations at Wat Preah Khan where he has been working with a team on excavation and recording of the Vihara Pagoda Site. This work has revealed new information on Preah Khan.

Smaller interventions as part of the general maintenance continue and general site maintenance remains a focus of the work undertaken at Preah Khan. All procedures have been described in previous WMF field reports.

### Physical Conservation

The following conservation interventions were undertaken as part of WMF's Field Campaign VI Program between October 1997 and September 1998:

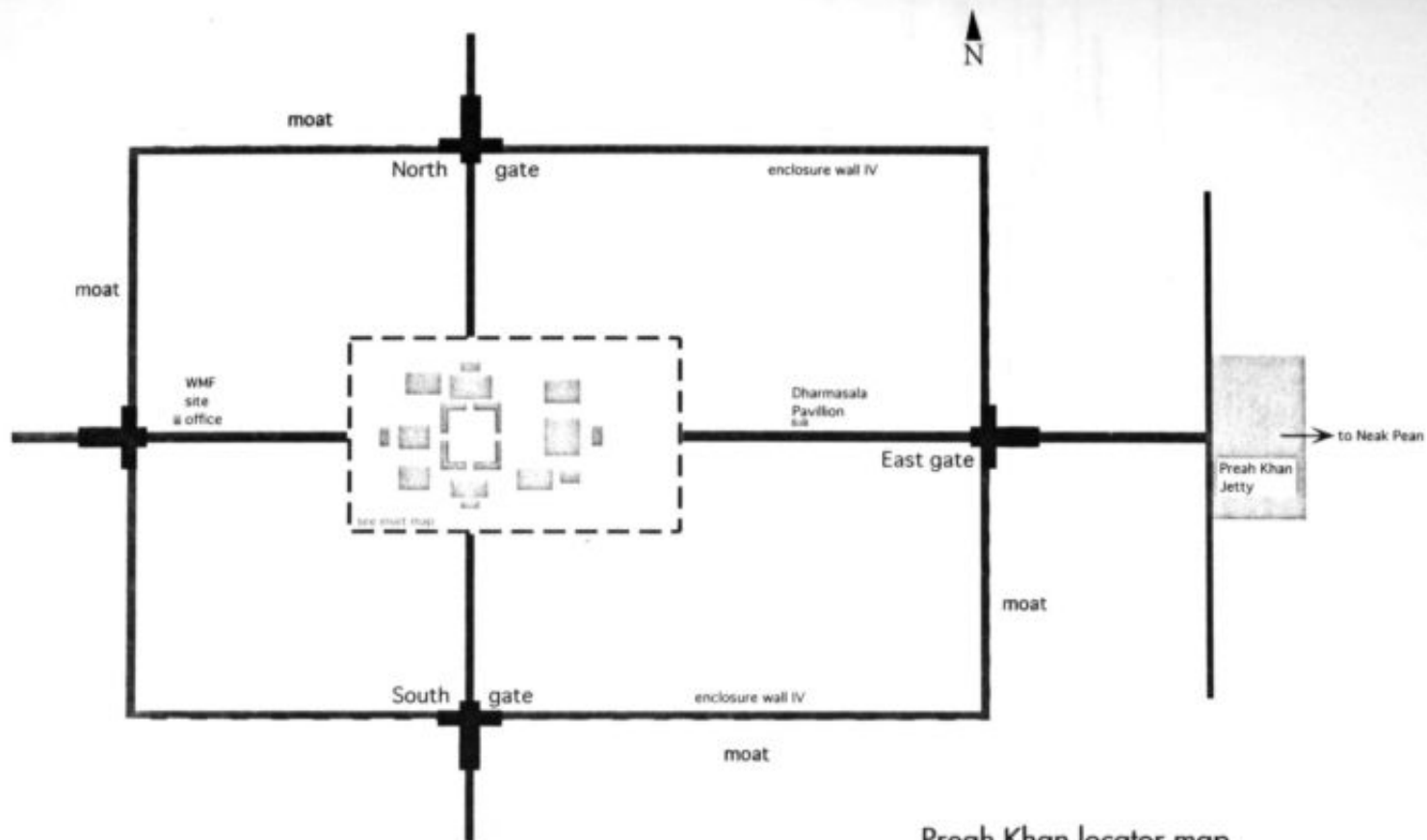
section / site	intervention zone	actions
A. West Gopura III	West Portico	<i>main lintel and two other lintel beams repaired; columns, capitals and vaults repaired and consolidated.</i>
B. Garuda statuary	NE33, NE29	<i>survey, drawing, dismantling, repair, consolidation</i>
C. Archaeological Investigations at Wat Preah Khan	Between Enclosure Wall IV and Enclosure Wall III	<i>clearance, excavation, and documentation</i>

Specific conservation actions will be detailed in subsequent sections of this report.

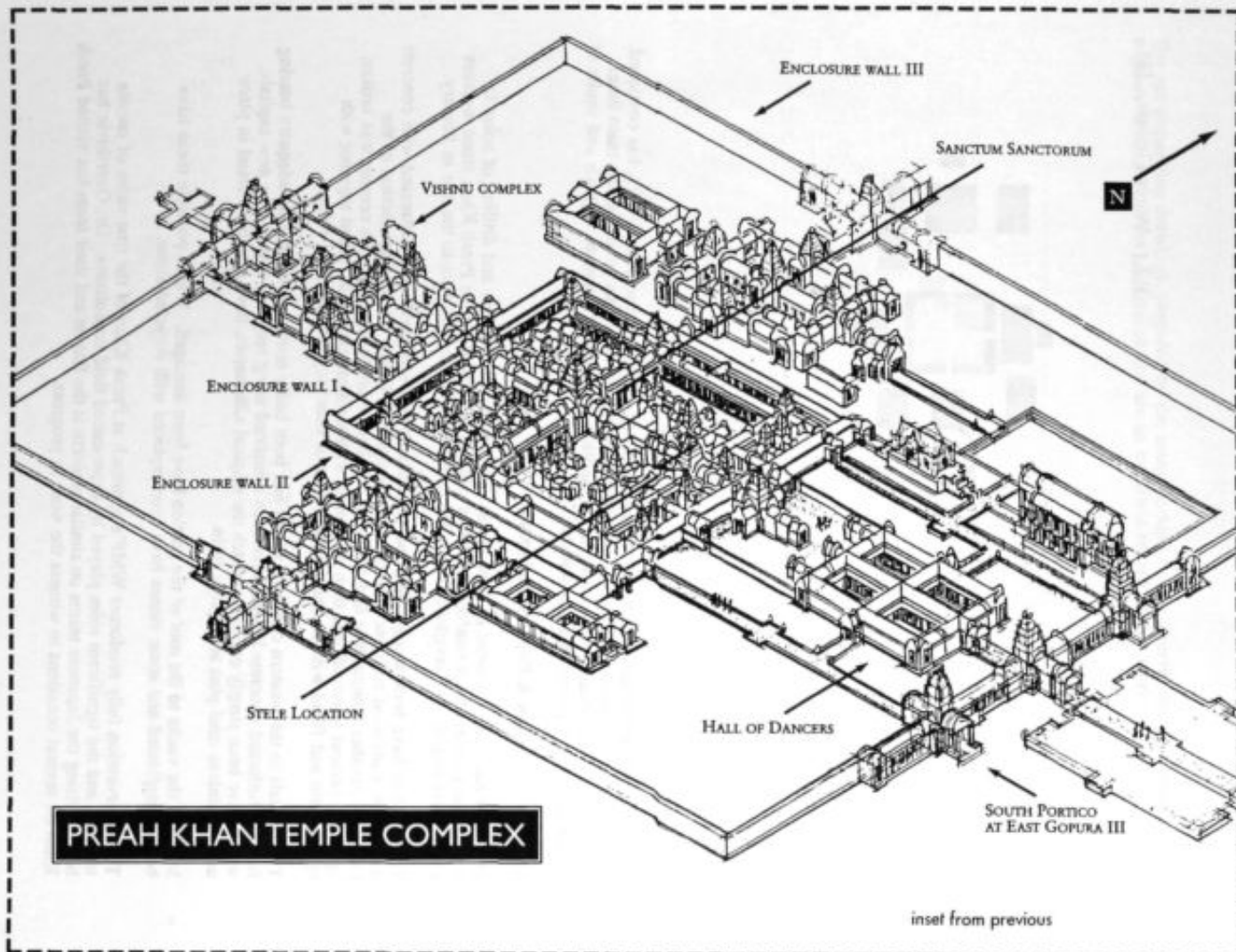
## 2.2 CAMPAIGN VI—PHYSICAL CONSERVATION

### LOCATOR MAPS

### CONSERVATION PROJECT SUMMARIES



Preah Khan locator map



## 2.2.1 WEST GOPURA III



### West Portico

#### **Summary**

Work on the West Portico, which was started at the end of the rainy season in 1997, has continued. Following careful calculations and an assessment of the local materials available, the main lintel and two other lintel beams were repaired. In addition a number of columns, capitals and vaults of the portico were repaired and consolidated.

#### **As Found Condition & Repairs Undertaken**

The lintel had been fractured in three places. The cutting of channels and drilling of holes to receive the stainless-steel reinforcement was skillfully executed by the Preah Khan stone workers group according to Dr. Gavrilovic's detailed instructions during his visit to the site in January.

The columns have been straightened and one column that was previously buttressed with concrete has had its buttressed concrete base carefully sculpted to follow the original section of the column. Another column that had fractured and been crudely repaired with cement was broken open, the cement removed, and then reinforced with stainless-steel pins, glued together with epoxy resin and filled with an excellent formula of matching reconstituted stone.

The capitals to the western columns, which had been badly mutilated to provide adequate bearing for the reinforced concrete lintels, have been reinstated using recycled stone. The new capitals, which have been simply carved to match the original silhouettes, have also been fixed in place using stainless-steel pins and epoxy resin.

Many of the vaults to the roof of the portico have been damaged. Where possible these have been consolidated and some stones have been replaced with recycled stone.

This intervention fully reinforces WMF's approach at Preah Khan of the true value of on-site training, and the significant roles played by experienced field consultants. Dr. Gavrilovic has been advising the Japanese teams on similar projects at the Bayon and their team has visited Preah Khan on several occasions to witness the work in progress.

The accompanying drawings, prepared by the team working on the interventions, graphically explain the interventions undertaken and are an excellent record of that work.



West Gopura III — Before repairs.

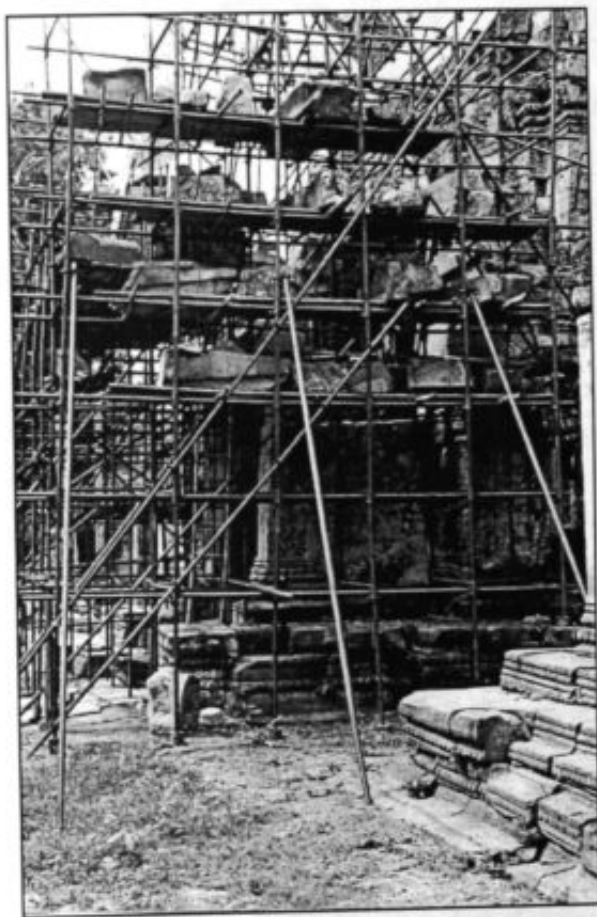




West Gopura III — Before repairs.



West Gopura III — Before repairs.



West Gopura III — During repairs.



West Gopura III — During repair.



West Gopura III — Restored capital.



West Gopura III — During column repair.



West Gopura III — Completed column repair.



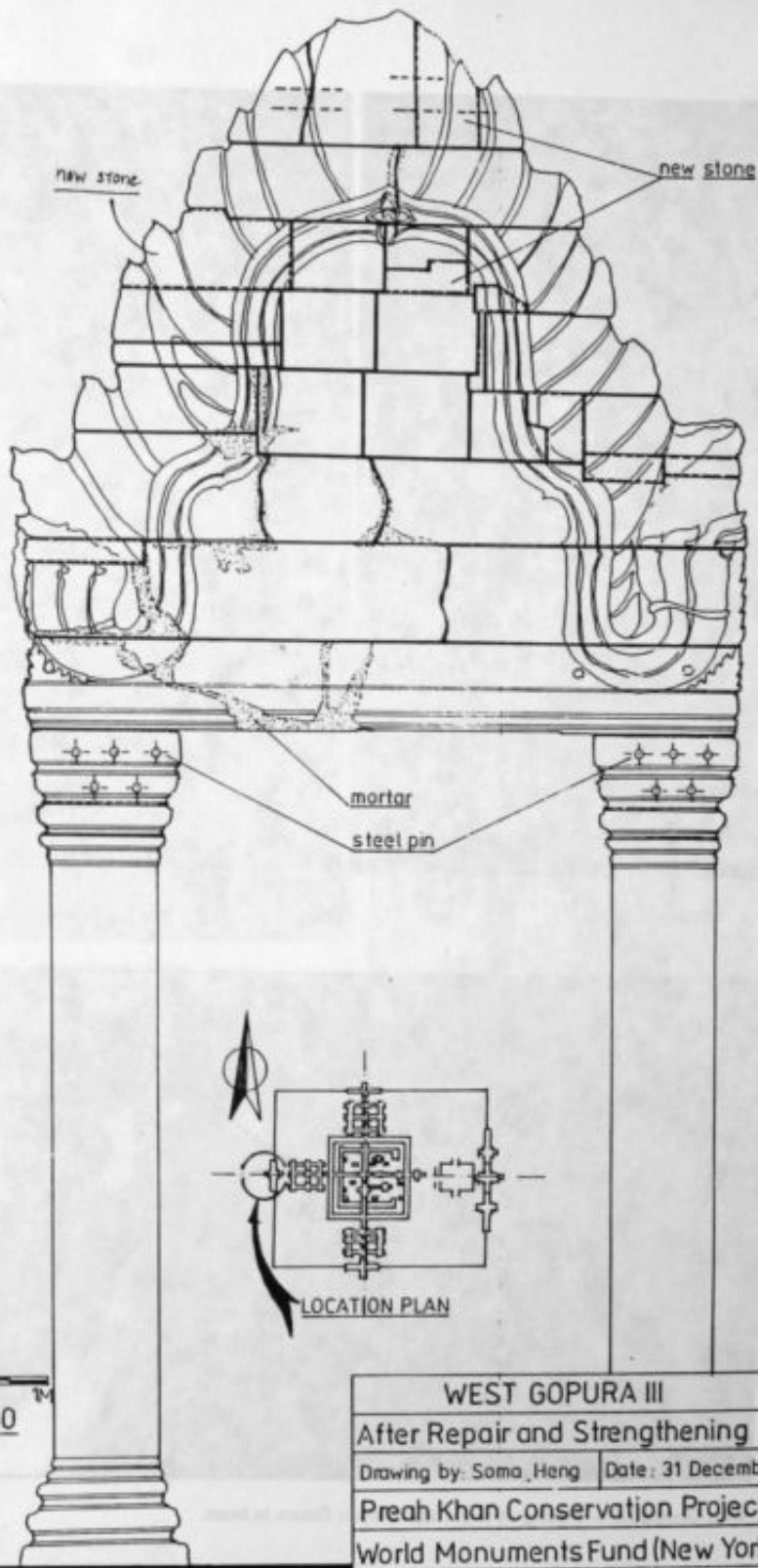
West Gopura III — Beam repair.



West Gopura III — Making grooves in beam for steel rods.

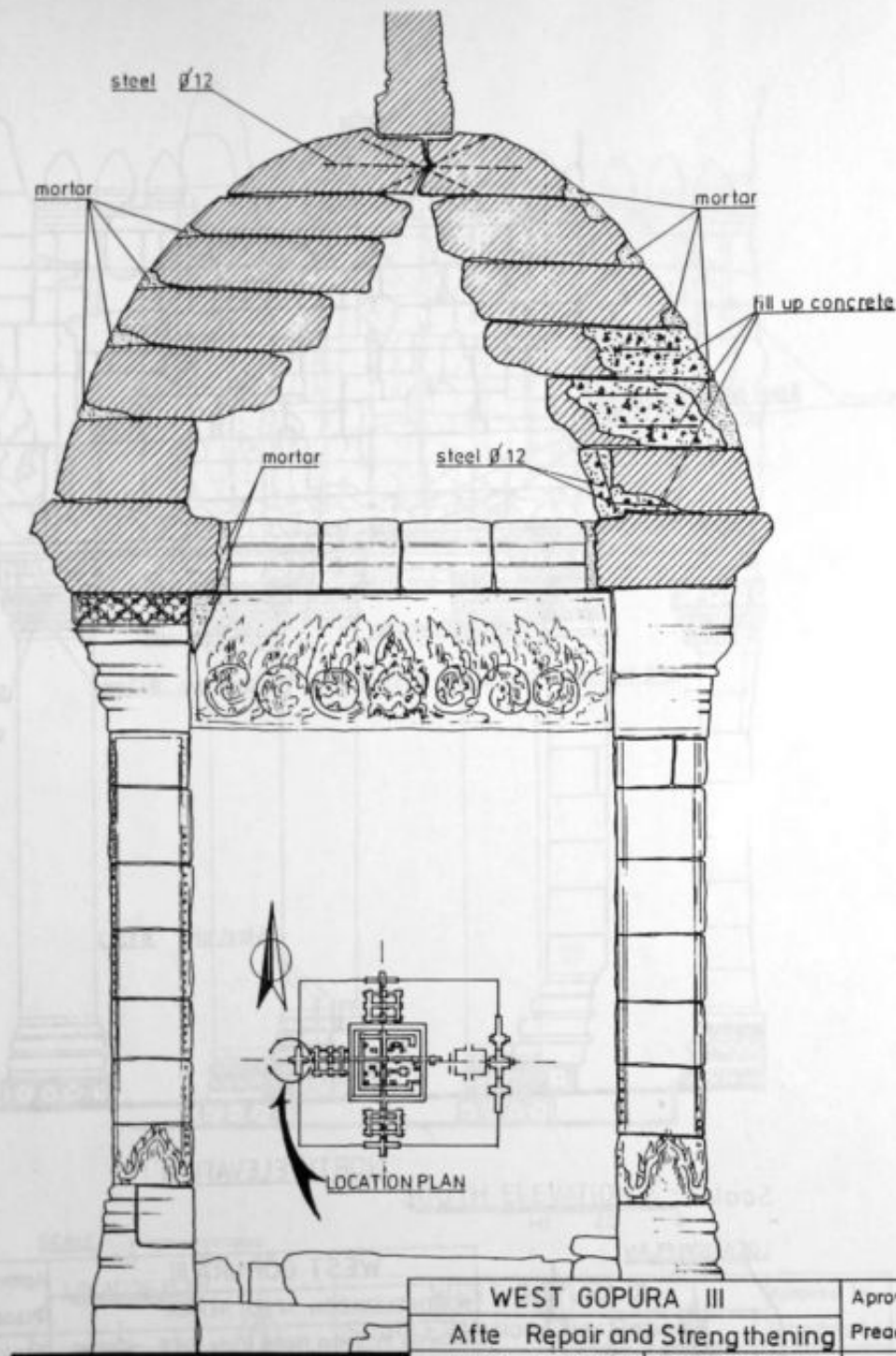


West Gopura III — Placing of steel rods to repair fissure in beam.



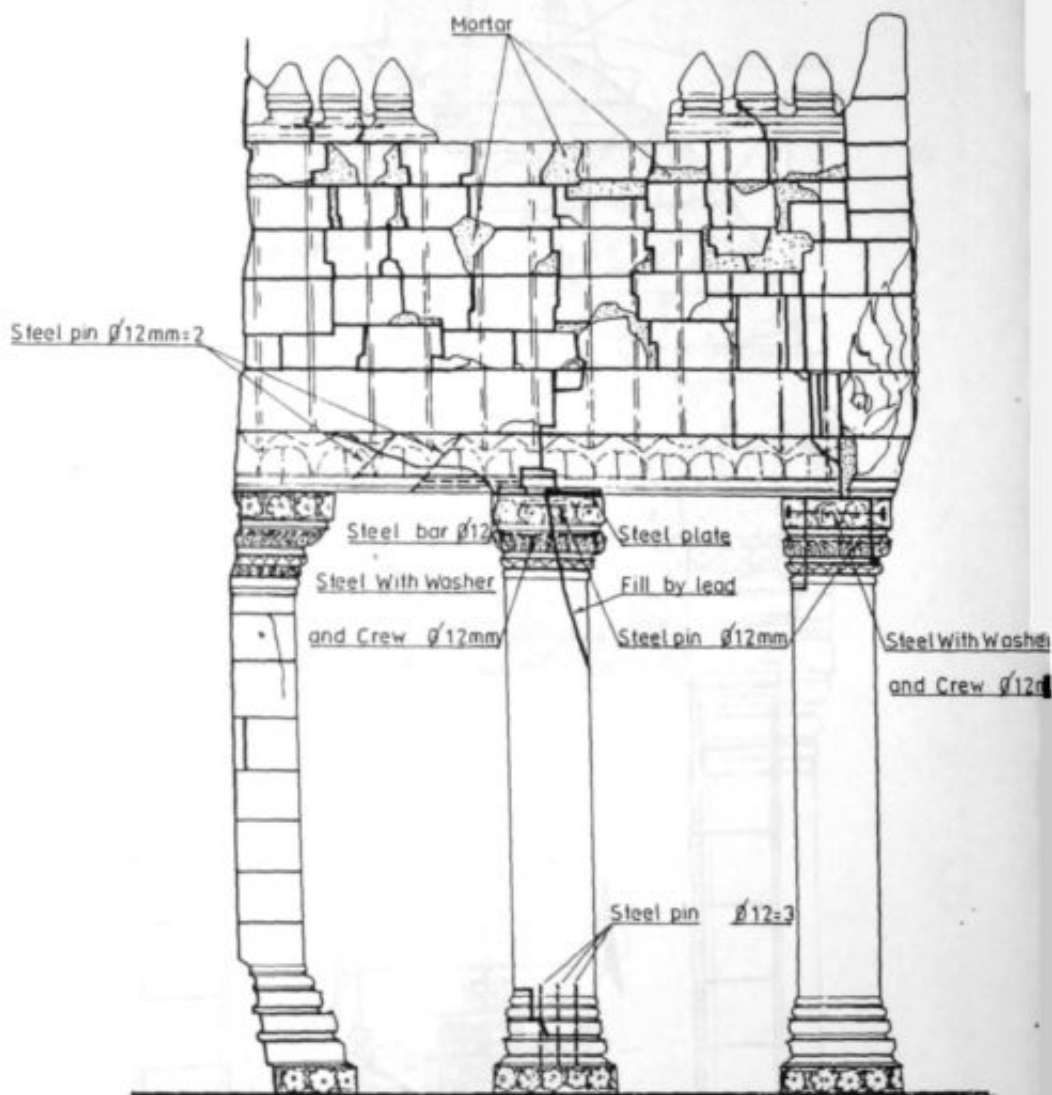
Scale: 1/50

WEST GOPURA III		Aproved by:
After Repair and Strengthening		Preahrag G.L.
Drawing by: Soma Heng	Date: 31 December/98	Scale: 1/20
Preah Khan Conservation Project		Drawing:
World Monuments Fund (New York)		N° 28



WEST GOPURA III		Approved by:
After Repair and Strengthening		Predrag&L
Drawing by: Soma, Heng	Date: 31 Dec. 1998	Scale: 1/20
Preah Khan Conservation Project		Drawing:
World Monuments Fund (New York)		N° 29

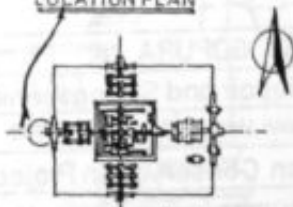




NORTH ELEVATION

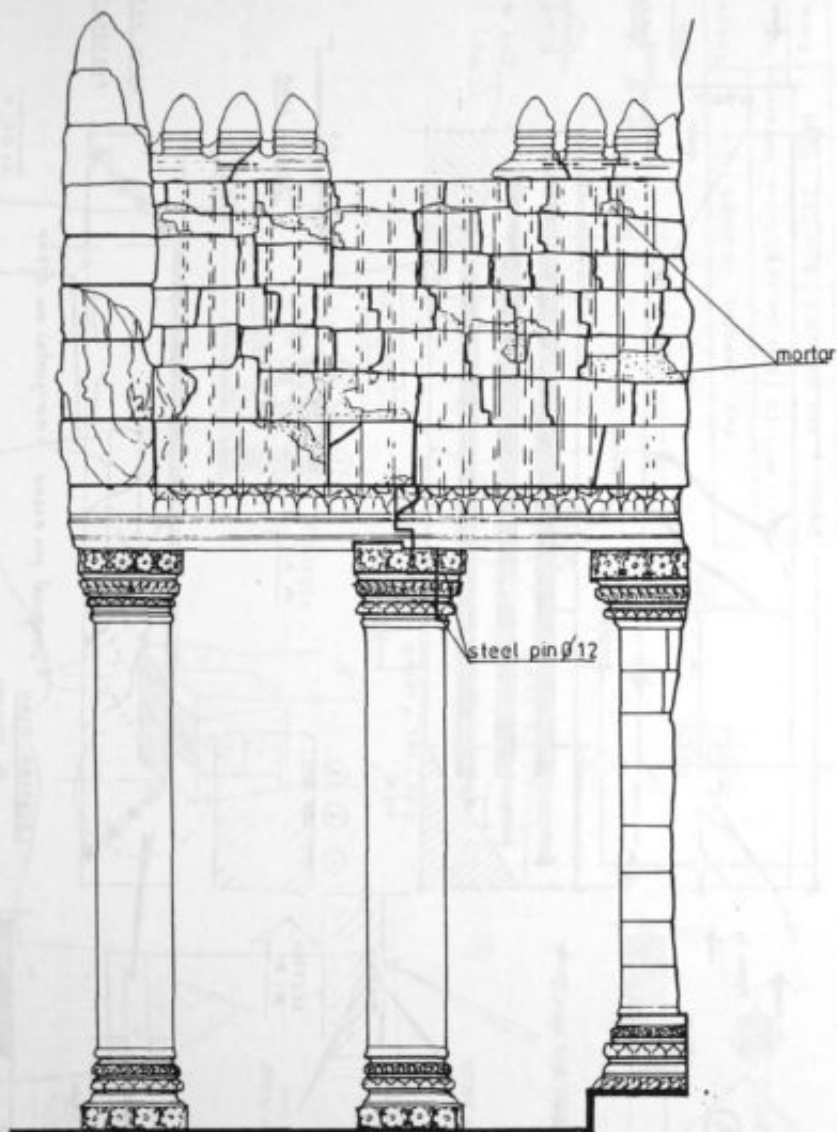
Scale: 0 0.5 1M

LOCATION PLAN



WEST GOPURA III		Approved by
NORTH ELEVATION AFTER REPAIR		Preadrag G.L.
Drawing by: Soma, Heng	Date: DEC 1998	Scale:
Preah Khan Conservation Project		Drawing n°:
World Monuments Fund (New York)		31

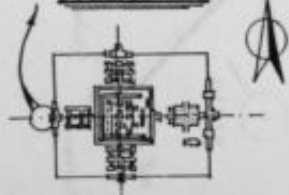




**SOUTH ELEVATION**

SCALE 0 0.5 1m

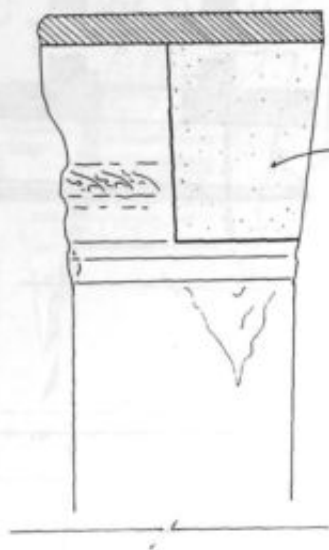
LOCATION PLAN



WEST GOPURA III		Approved by
South Elevation After Repair		Preadrag G.L.
Drawing by: Soma & Heng	Date: DEC 1998	Scale :
Preah Khan Conservation Project		Drawing n°
World Monuments Fund (New York)		32



SIDE E



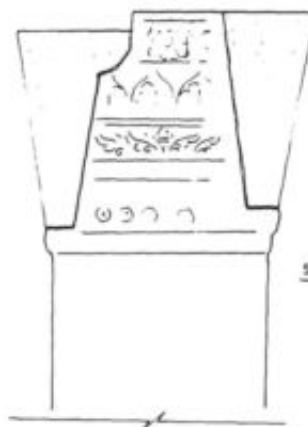
Concrete

SIDE W

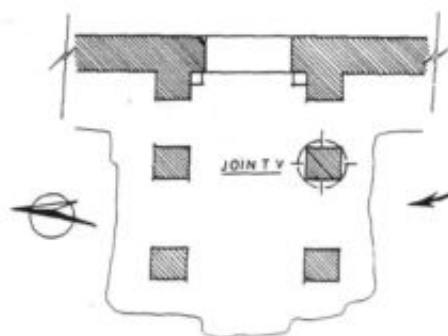


DETAIL (JOINT V)

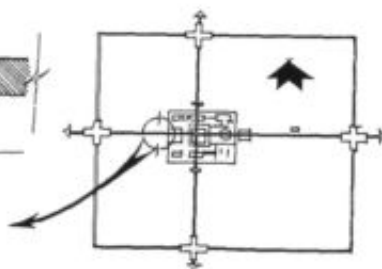
SIDE N



WEST PORTICO PLAN



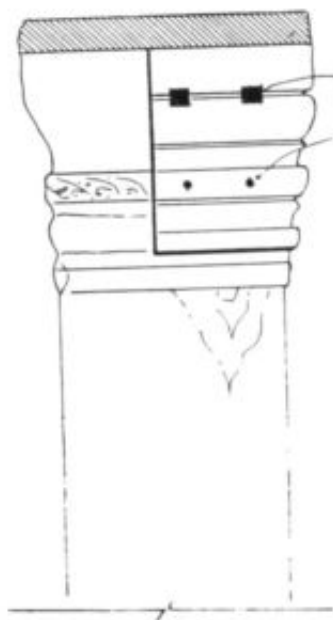
LOCATION PLAN



0 01 02 03 05 m

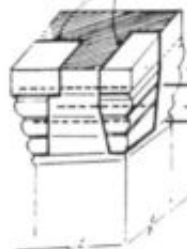
THE CAPITAL (JOINT V)		Checked by
WEST PORTICO (West gopura) before restoration		Janh Sanday
Drawing SAM KIMHENG	Date DEC 1998	Scale, 1:10
PREAH KHAN CONSERVATION PROJECT		Drawing
WORLD MONUMENTS FUND (New York)		N° 34

SIDE E



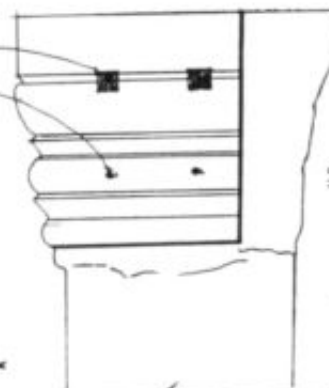
Epoxy Mortar

Epoxy Injection



DETAIL (Joint v)

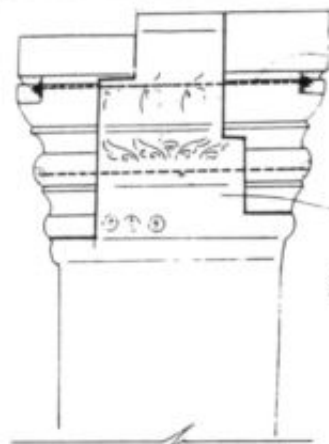
SIDE W



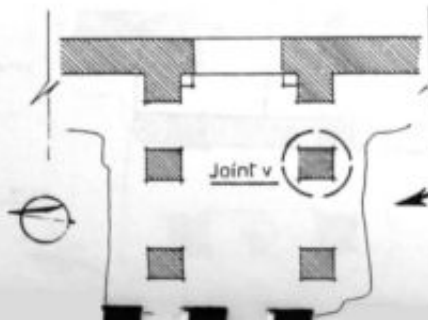
Steel Bolts

steel needles

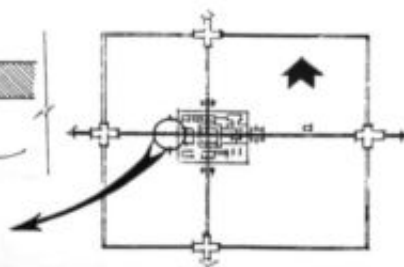
SIDE N



WEST PORTICO PLAN



LOCATION PLAN



TECHNICAL REINFORCEMENT

CAPITAL (JOINT V)

Drawing Sam Kimheng

Date DEC 1998

Preah Khan Conservation Project

World Monuments Fund (New York)

Checked by

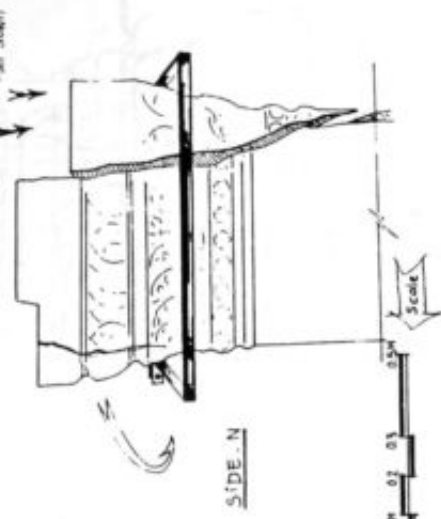
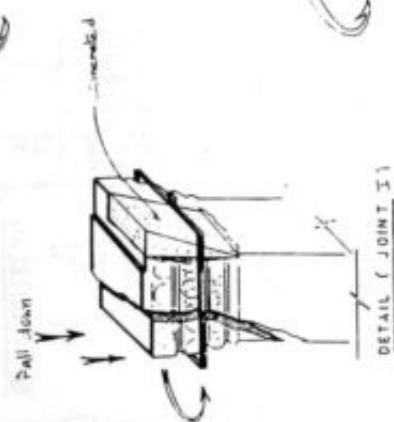
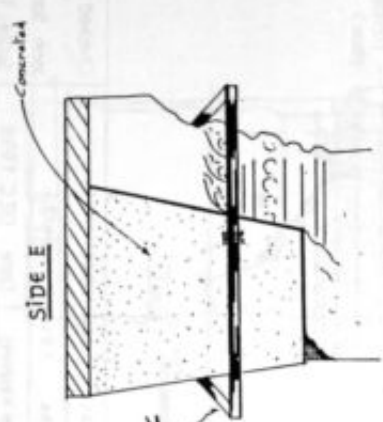
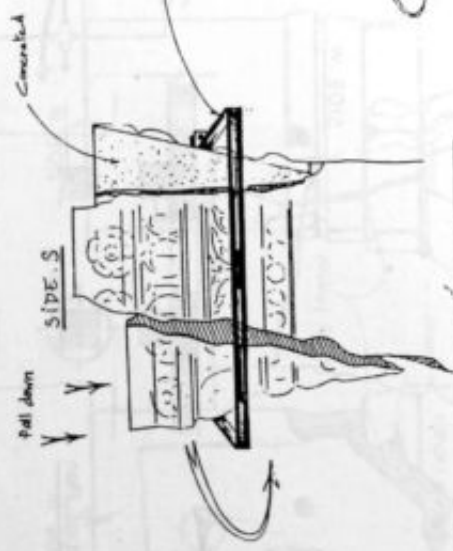
Jonh Sanday

Scale 1:10

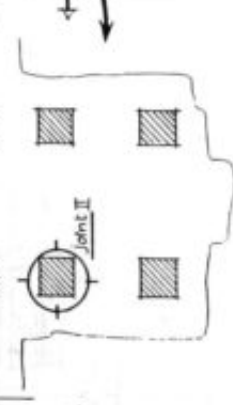
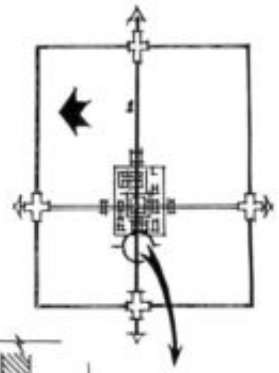
Drawing

N° 35

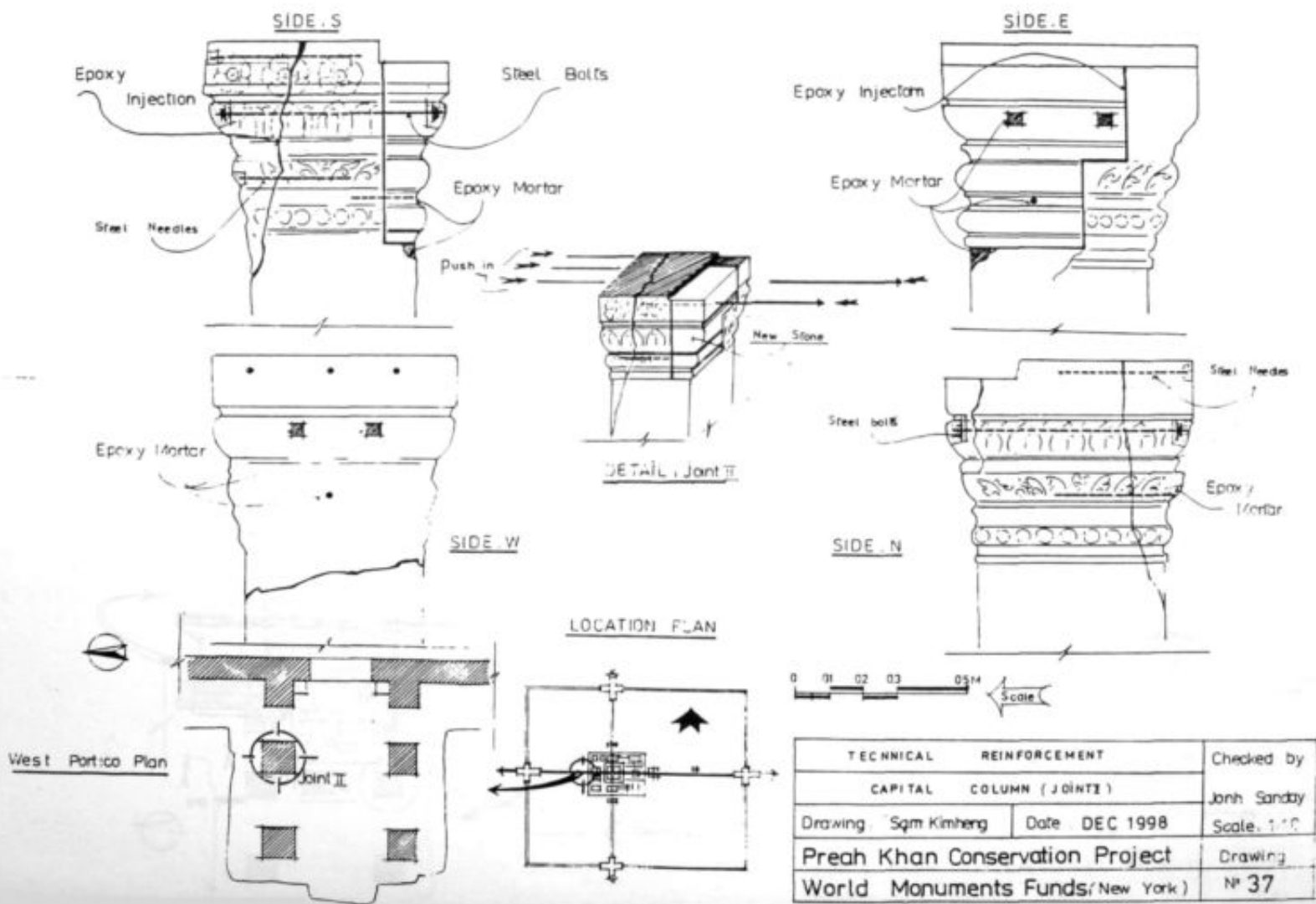
( TEMPORARY SOLUTION )

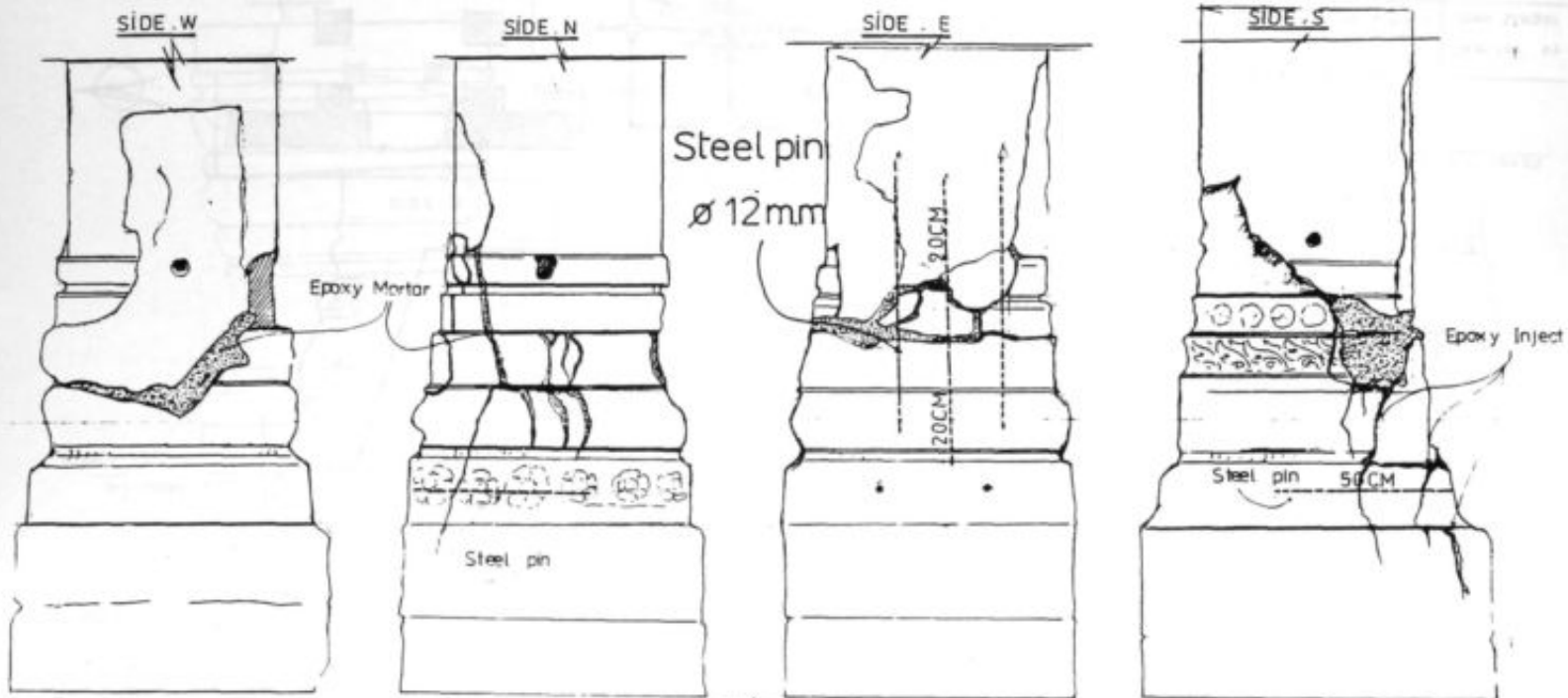


LOCATION PLAN



DRAWING BY SAM KIM HENG	DATE DEC 1998	CHECKED JOHN SANDAY
CONSOLIDATION TEMPARY OF DAMAGED		
CAPITAL COLUMN ( JOINT I ) BEFORE RESTOR.		Scale. 1:10
PREAH KHAN CONSERVATION PROJECT		Drawing
WORLD MONUMENTS FUND ( New York )		N° 36



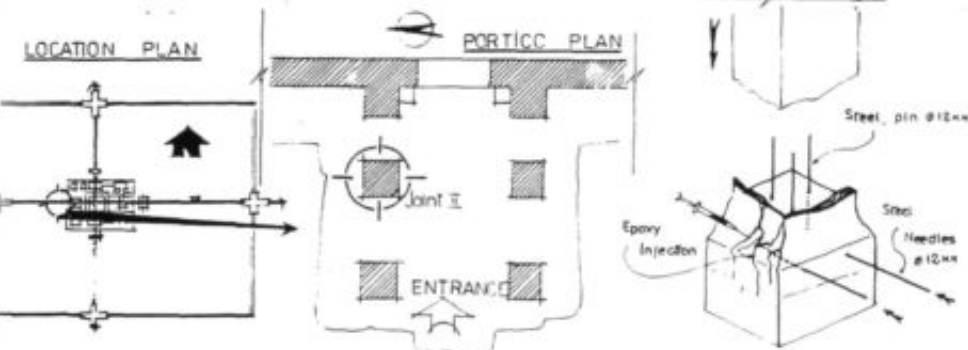


DETAIL (Joint II)

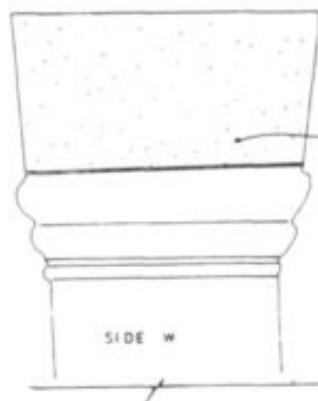
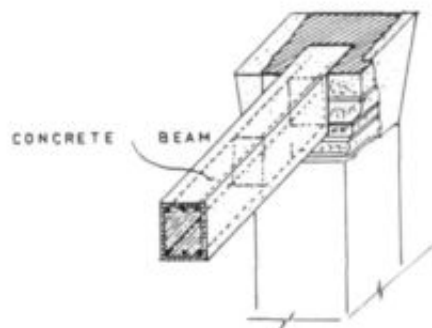


LOCATION PLAN

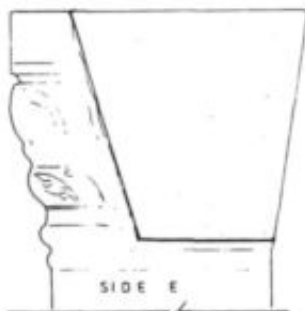
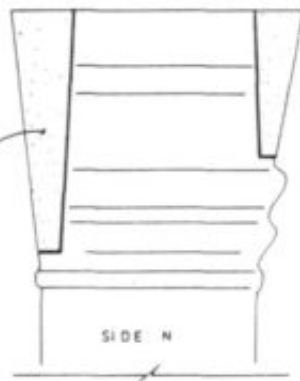
PORTICO PLAN



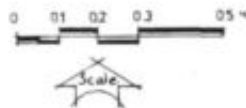
TECHNICAL REINFORCEMENT (Gopura II)			Checked by
COLUMN LEG JOINTS WEST PORTICO			Jonh Sanday
Drawing	SAM KIMHENG	Date DEC 1998	Scale 1:10
PREAH KHAN CONSERVATION (Project)			Drawing
World Monuments Fund (New York)			N° 38



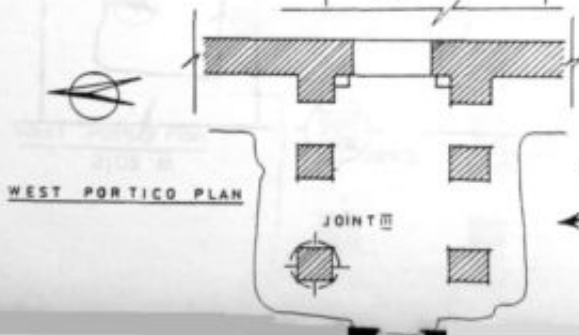
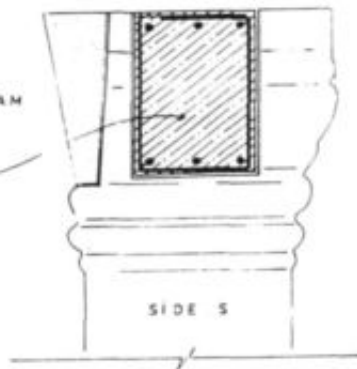
CONCRETE



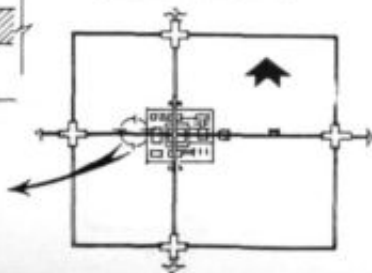
DETAIL JOINT III



CONCRETE BEAM  
SECTION



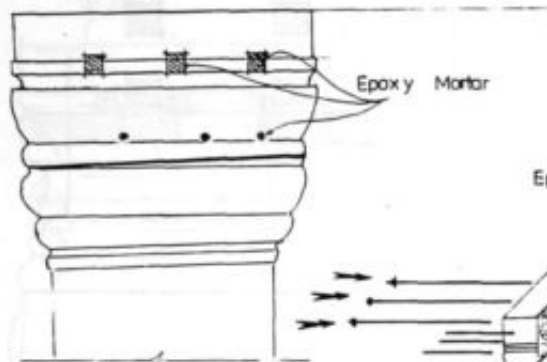
LOCATION PLAN



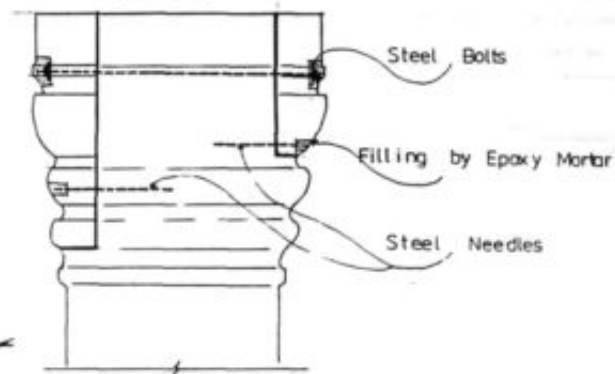
THE CAPITAL (JOINT III)		Checked by
WEST PORTICO (West gopura) BEFORE REPAIRING		JONH SANDAY
Drawing: SAM KIMHENG	Date: DEC 1998	Scale: 1:10
PREAH KHAN CONSERVATION PROJECT		Drawing
WORLD MONUMENTS FUND (New York)		Nº 39



SIDE . W



SIDE . N



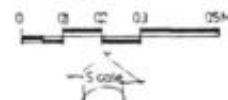
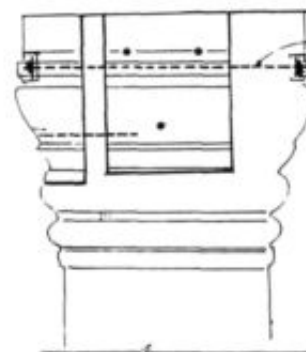
Epoxy Injection

Push in

DETAIL Joint III

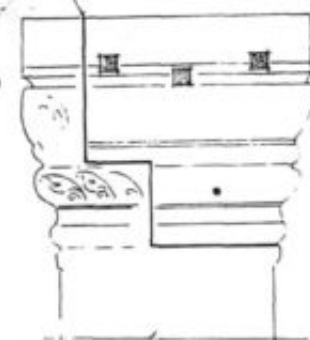
Steel Bolts

SIDE . S

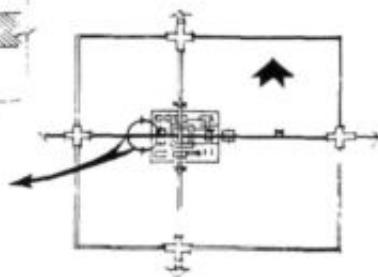


Epoxy Injection

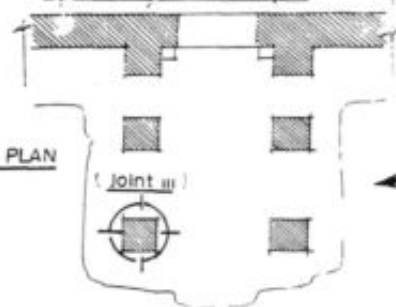
SIDE . E



LOCATION PLAN



WEST PORTICO PLAN



TECHNICAL REINFORCEMENT

Checked by

CAPITAL ( JOINT III )

Jonh Sanday

Drawing : Sam Kimheng

Date : DEC 1998

Scale : 1:10

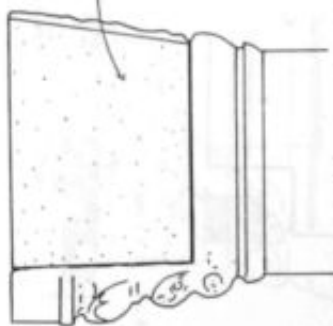
PREAH KHAN CONSERVATION PROJECT

Drawing

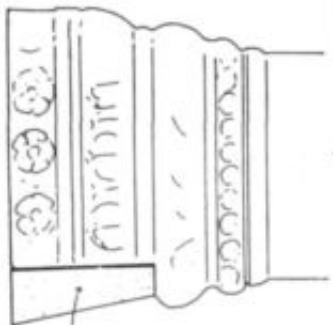
World Monuments Fund ( New York )

N° 40

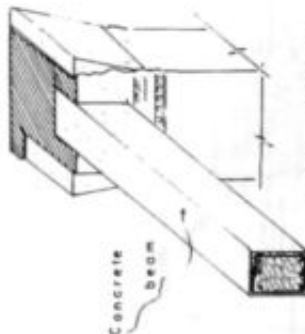
SIDE E



SIDE S



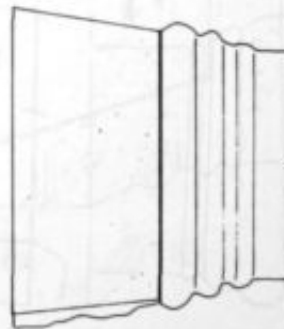
Concrete



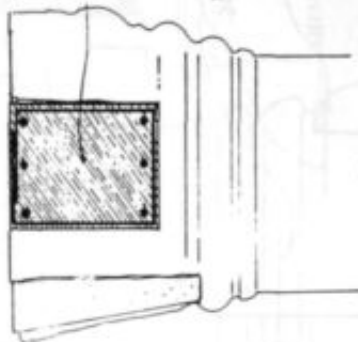
Concrete beam

DETAIL JOINT IV

SIDE W



Concrete beam  
Section

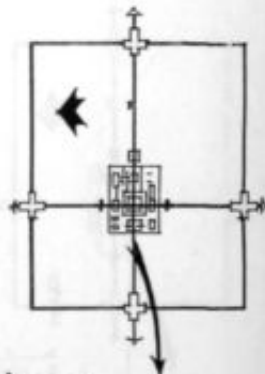


SIDE N



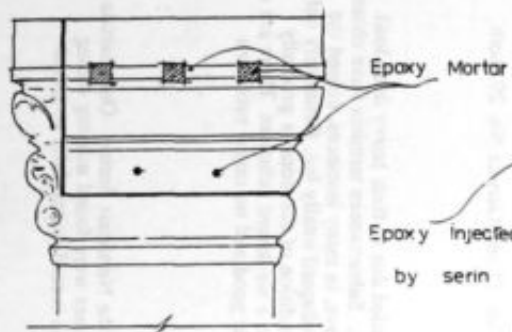
0 0.1 0.2 0.3 0.5m

LOCATION PLAN

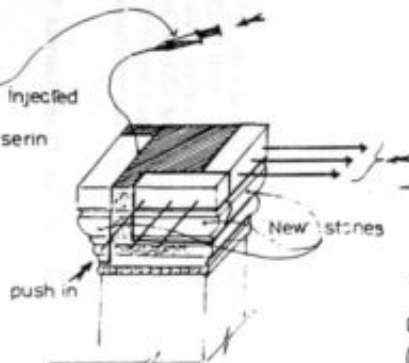


THE CAPITAL (JOINT N)		Checked by
WEST PORTICO (West gopuram) BEFORE RESTORATION		Jenm Sanday
Drawing : SAM KINHEG	Date : DEC 1998	Scale : 1:10
PREAH KHAN CONSERVATION PROJECT		Drawing
WORLD MONUMENTS FUND (New York)		N° 41

SIDE . E



Epoxy Injected  
by serin

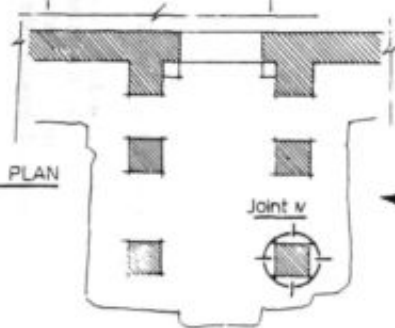
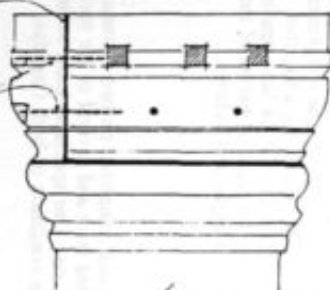


DETAIL / JOINT IV

Epoxy Injection

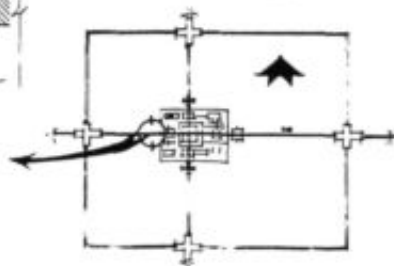
Steel pin

SIDE . W

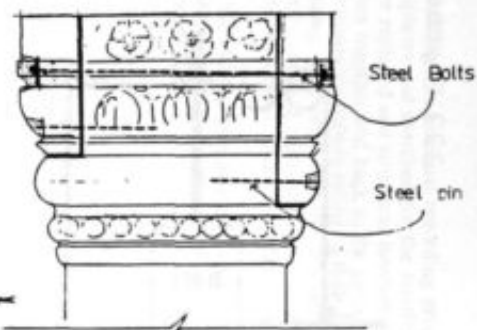


WEST PORTICO PLAN

LOCATION PLAN

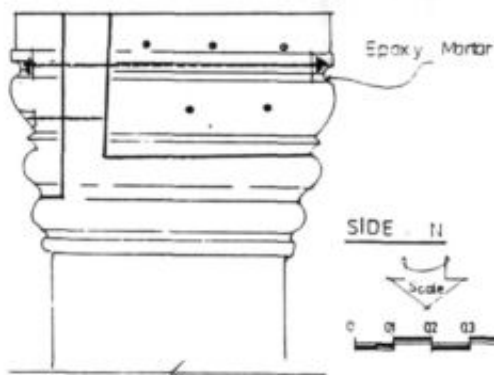


SIDE . S



Steel Bolts

Steel pin

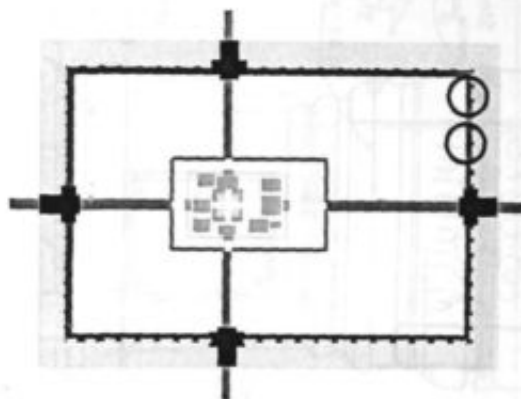


SIDE . N



TECHNICAL REINFORCEMENT		Checked by
CAPITAL JOINT IV ( West portico gapura in )		Jonh Sanday
Drawing Sam Kimheng	Date DEC 1998	Scale 1:10
Preah Khan Conservation Project		Drawing
World Monuments Fund ( New York )		Nº 42

## 2.2.2 GARUDAS



### North East Sector

#### **Summary**

Seventy-two monumental sandstone engaged *garuda* statues are spaced every 35 meters along the outward face of enclosure wall IV, and they stand the full height of the wall (3.25 meters) with minimal connection to it. A fund-raising and conservation strategy called "Adopt a Garuda" has been developed, in which donors are solicited for contributions of \$20,000 to support the Preah Khan Conversation Project and provide for the consolidation and repair of a single statue. Proper repair involves survey, dismantling, removal of termite mounds, realignment, resetting and pinning to laterite backing wall.

This year WMF received two specific adoptions for Garuda No. 33 and Garuda No. 29, both located in the Northeast sector.

#### **As Found Condition**

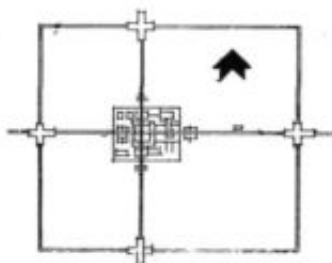
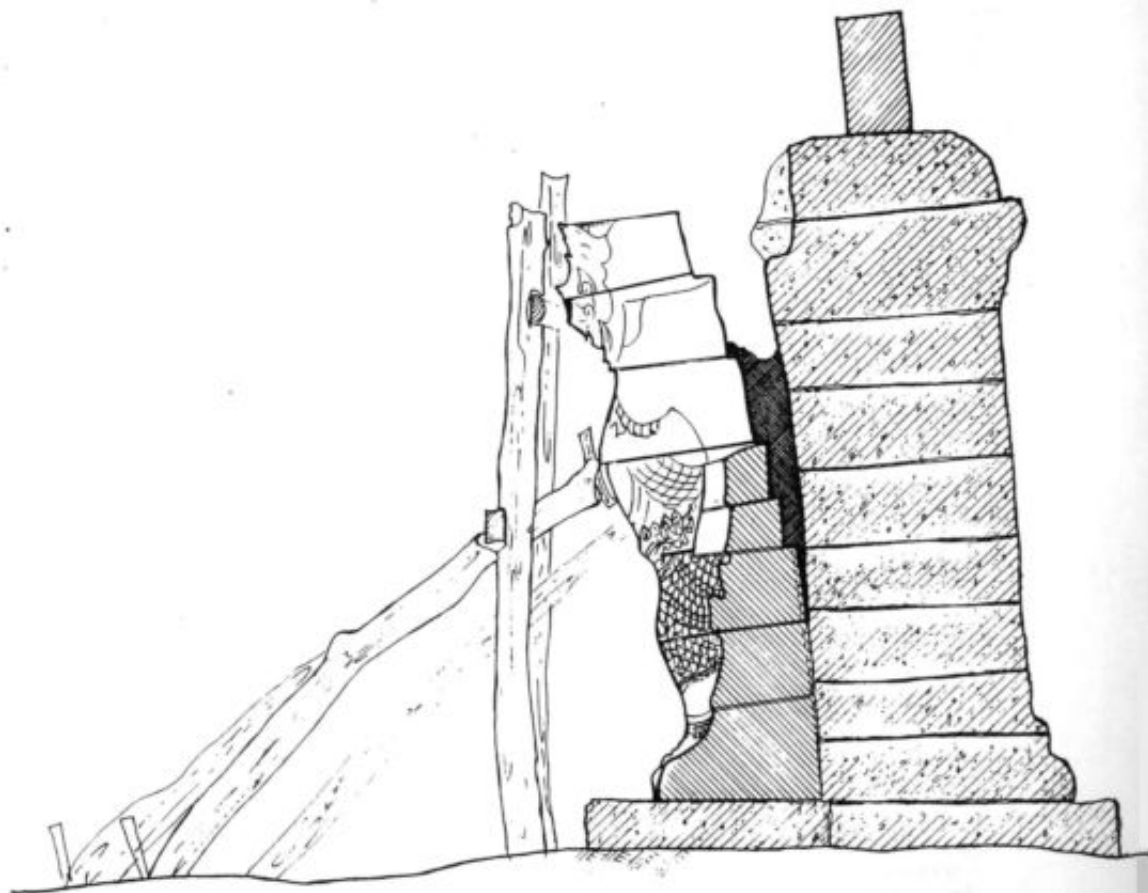
The laterite plinths on which the Garudas are placed have settled due to their heavy dead load. The leaning of the wall itself has caused the sculptures to tilt. Subterranean termites have chosen to build their nests between the wall and the sculpture, and have, in many instances, caused the blocks to be displaced. In a few cases, the sculptures have collapsed totally but, fortunately only very few stone blocks have gone missing altogether. The condition of the stone is generally good, although some of the stones' edges have spalled due to a weakened substrate. There are a few cases of delamination. The general patina of the stone is good and no major problems resulted from the growth of algae and lichens.

#### **Repairs Undertaken**

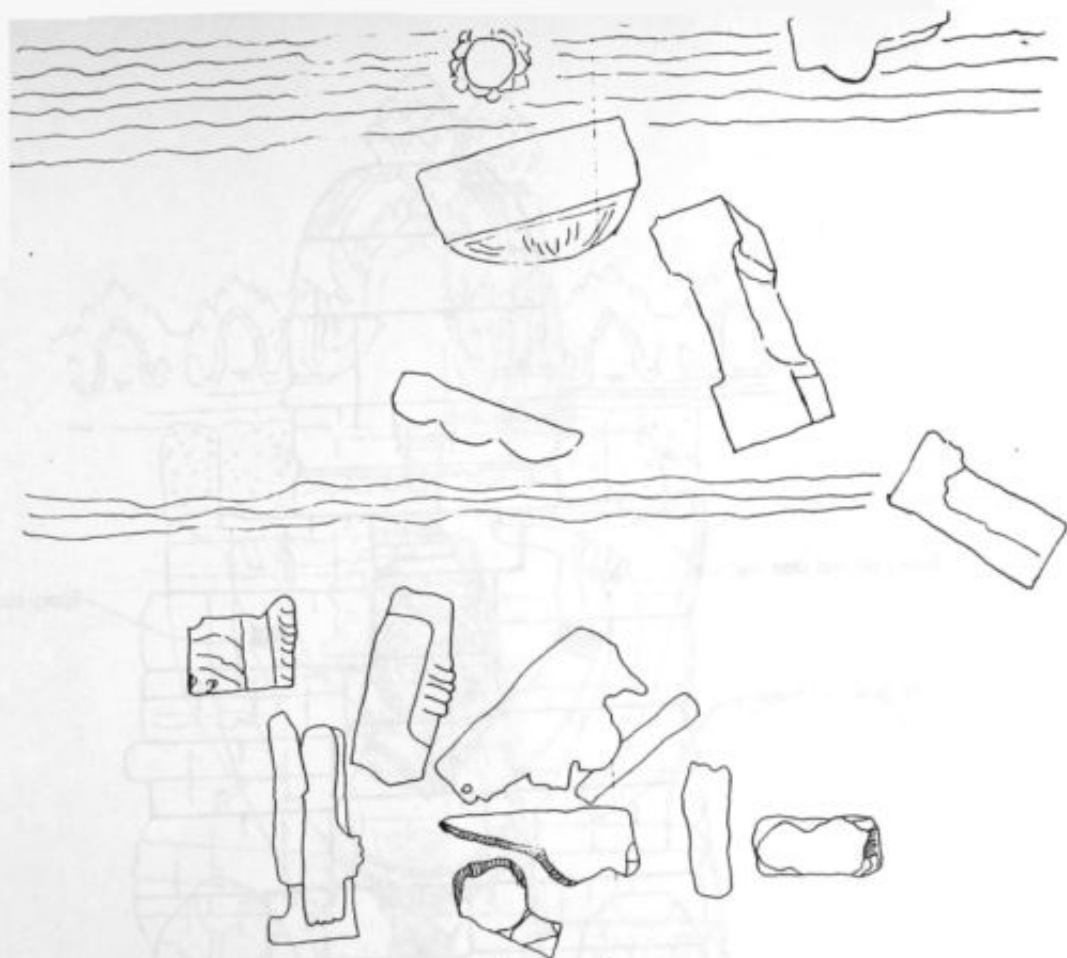
Work was undertaken and completed on two Garudas along the Northeast Sector. One Garuda was in a very dilapidated state and several of the sculpted stones were found missing during preliminary investigations. Our specialist team set to work to record in carefully prepared measured drawings the condition of both Garudas.

Following this essential recording procedure, the stone workers carefully dismantled the sculptures and searched for the missing pieces. Once a sound foundation was formed the stones were replaced and structural interventions, designed by the Dr. Gavrilovic, were made to tie the stones together and back to the enclosure wall against which they were originally constructed. Previously the stones relied on their dead weight to remain in situ which, in most cases was wishful thinking. The second of the two Garudas repaired was at the point of collapse. It was leaning heavily outward partly due to termites nesting between it and the wall and partly due to the lean of the wall itself. Both Garudas have been consolidated and visited by their very happy sponsors.

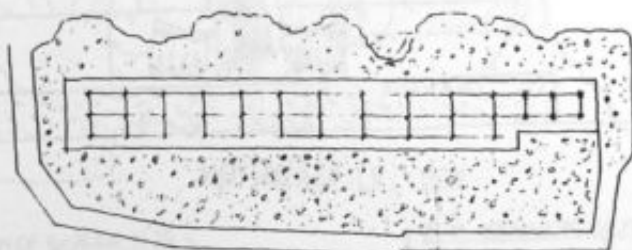
All the visiting groups are taken to see the Garuda repair works in progress and are very impressed. Such projects serve as good examples of WMF's approach to the conservation work at Preah Khan.



CONDITION AS FOUND OF GARUDA		CHECKED BY JOHN SANDAY
N° 29 NE WALL IV		
DRAWING BY NETH PHOUS	Date: January 1998	Scale: 1/20
PREAH KHAN CONSERVATION PROJECT		DRAWING
WORLD MONUMENTS FUND (New York)		N° 1

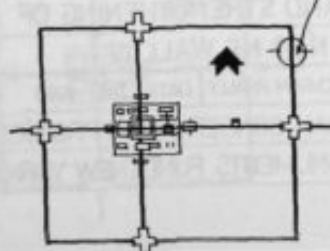


( Figure.1 )



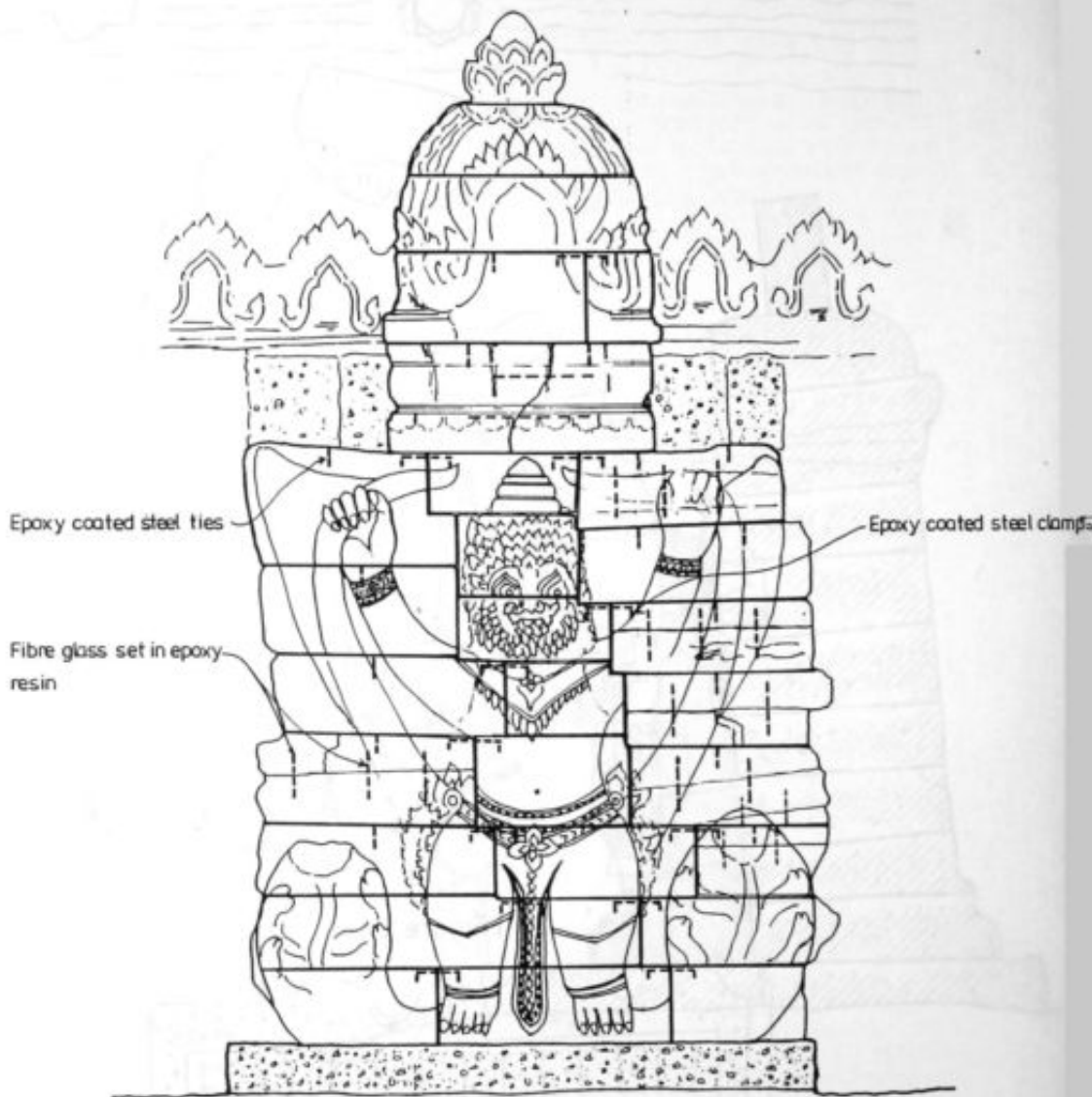
( Figure.2 )

LOCATION PLAN OF GARUDA N° 29



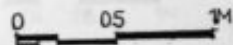
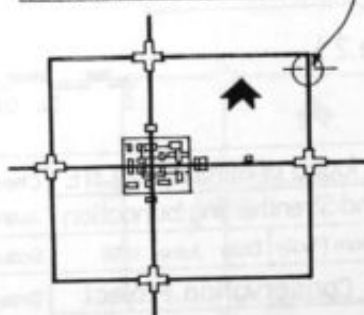
0 04 06 1M

Condition as found of Garuda N° 29 NE		Checked by
Wall IV (fg1) and Strengthening foundation		John Sanday
Drawing by Cheam Phaly	Date: June 1998	Scale: 1/20
Preah Khan Conservation Project		Drawing:
World Monuments Fund (New York)		N° 15



**ELEVATION**

**LOCATION PLAN OF GARUDA N° 29**



**REPAIR AND STRENGTHENING OF  
GARUDA N°29 NE WALL IV**

DRAWING BY: CHEAM PHALLY DATE: JULY 1998

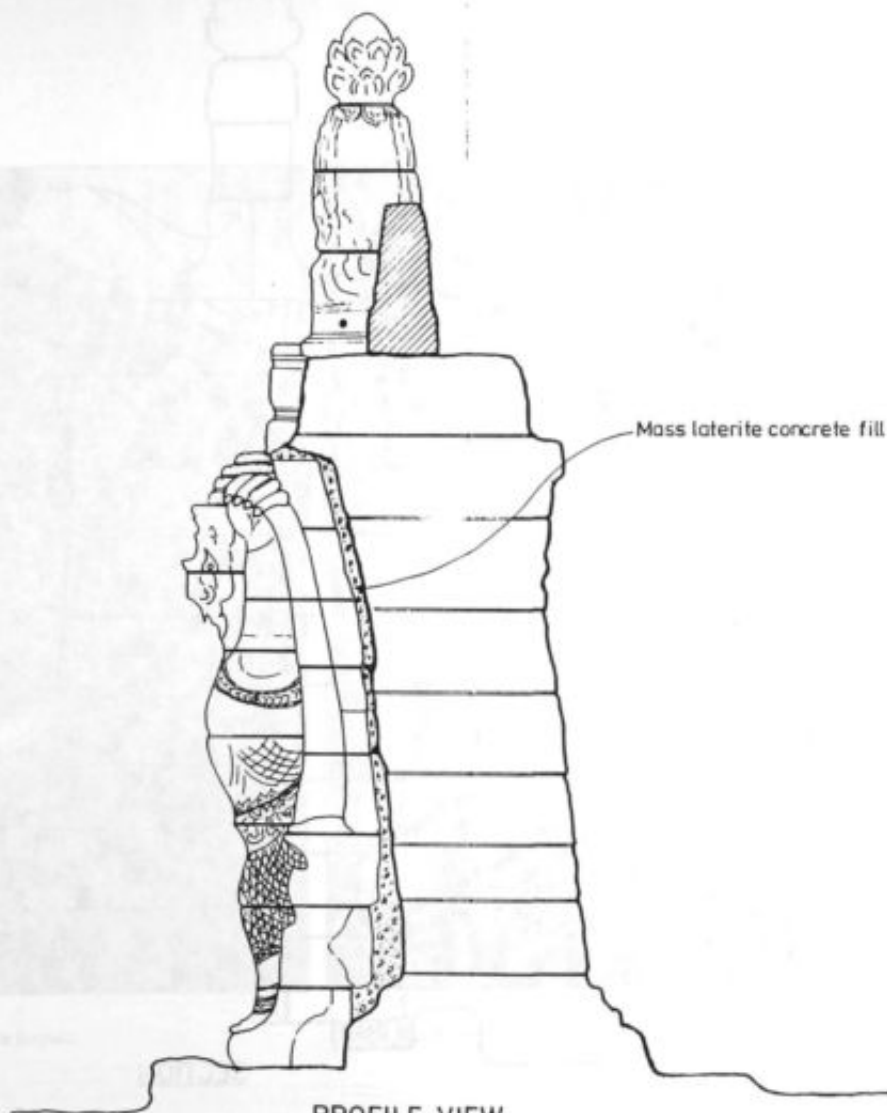
**PREAH KHAN CONSERVATION PROJECT  
WORLD MONUMENTS FUND (NEW YORK)**

CHECKED BY  
JOHN SANDAY

SCALE: 1/20

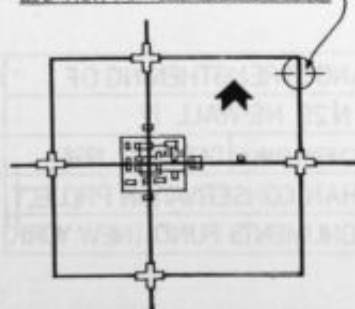
DRAWING  
N° 17





PROFILE VIEW

LOCATION PLAN OF GARUDA N°29



0 05 1M

REPAIR AND STRENGTHENING OF  
GARUDA N°29 NE WALL IV

DRAWING BY: CHEAM PHALLY

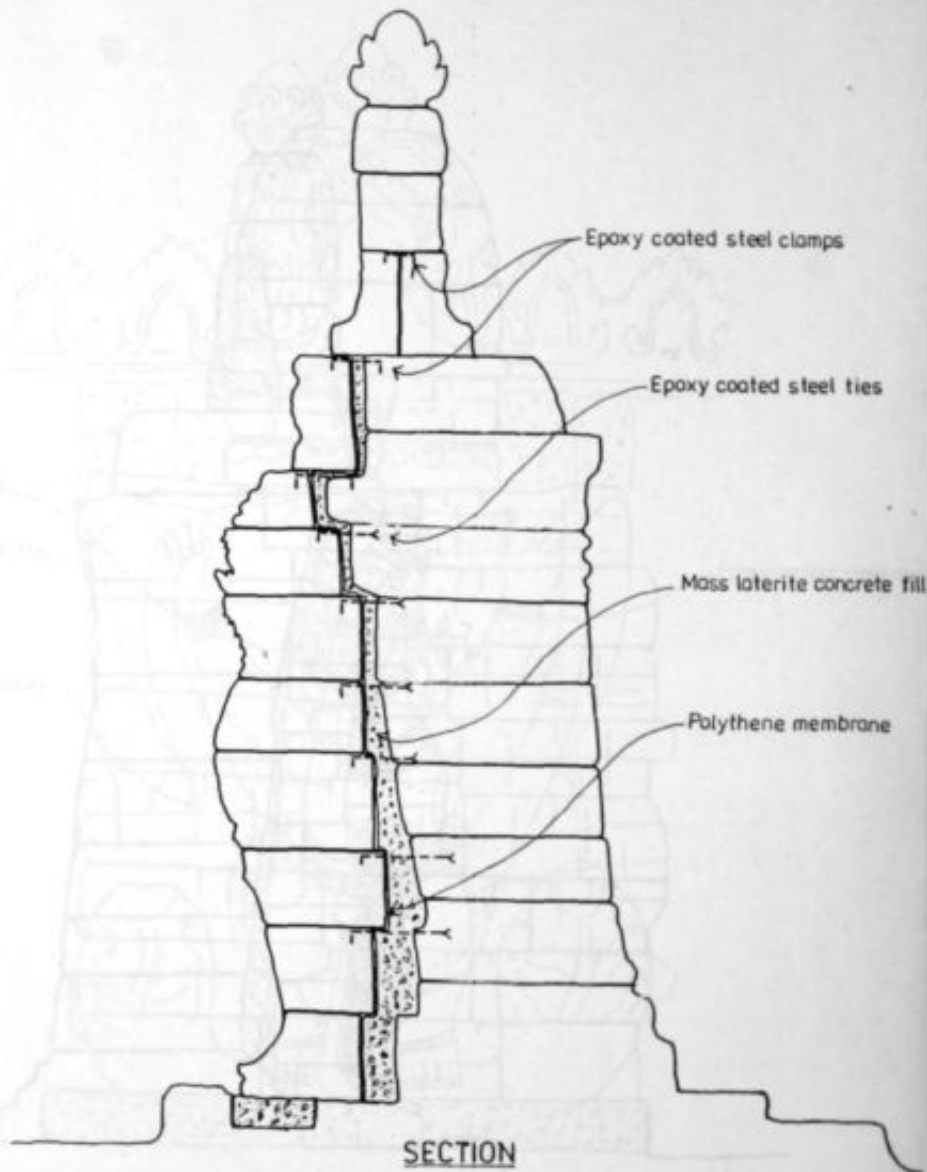
DATE: JULY 1998

CHECKED BY  
JOHN SANDAY

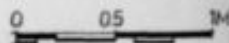
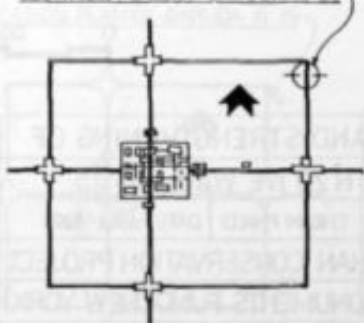
SCALE: 1/20

PREAH KHAN CONSERVATION PROJECT  
WORLD MONUMENTS FUND (NEW YORK)

DRAWING  
N° 18



LOCATION PLAN OF GARUDA N 29



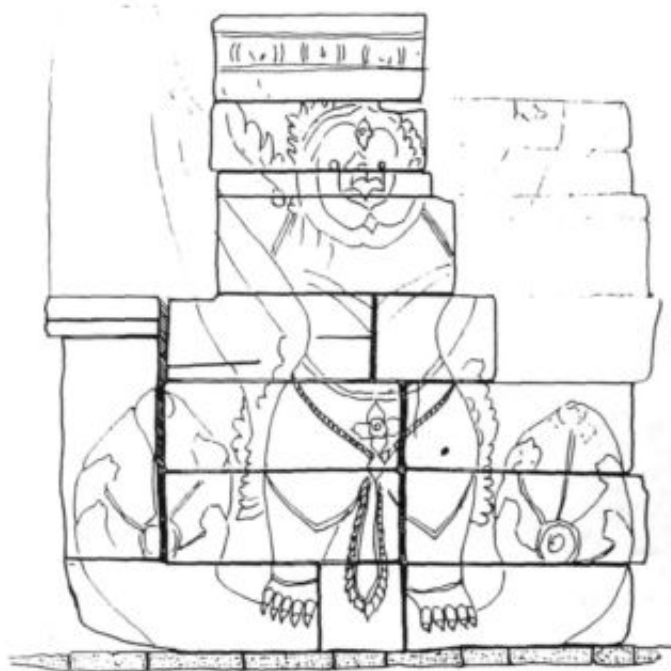
REPAIR AND STRENGTHENING OF		CHECKED BY
GARUDA N 29 NE WALL IV		JOHN SANDRY
DRAWING BY CHEAM PHALLY	DATE : JULY 1998	SCALE : 1/20
PREAH KHAN CONSERVATION PROJECT		DRAWING
WORLD MONUMENTS FUND (NEW YORK)		N° 19



Garuda No. 33 — Before Repair.



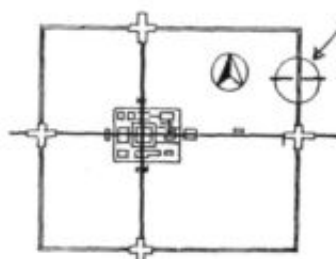
Garuda No. 33 — During repair.



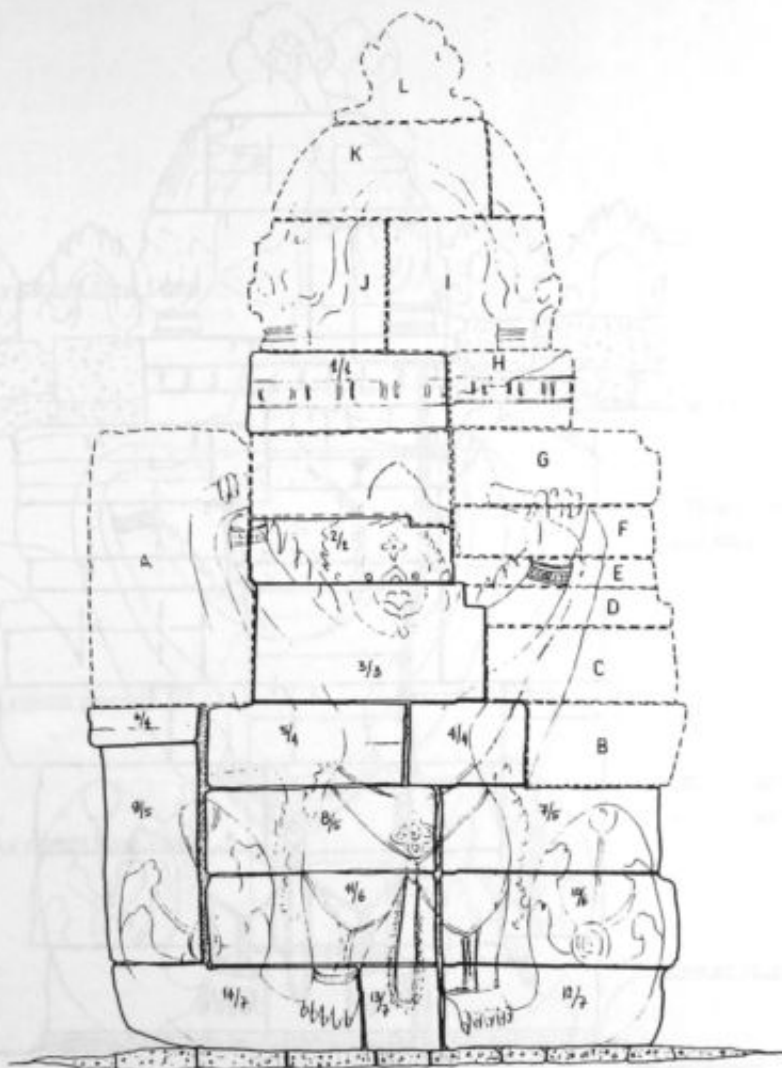
ELEVATION



LOCATION PLAN OF GARUDA N° 33NE



Condition as Found	Checked by
Of Garuda N° 33NE	Jonh Sanday
Drawing by Nop pongvimean	Scale: 1/20
Date January 1998	Drawing
Preah khan Conservation Project	N° 3
World Monuments Fund (New York)	

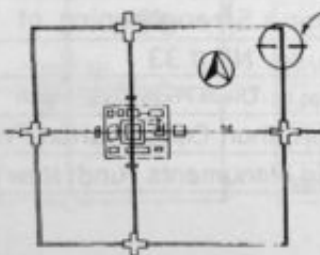


[A] Replacing stones

[ ] Existence stones

LOCATION PLAN OF GARUDAN° 33 NE

0 04 06 1M



# Survey and numbering Of GARUDA N° 33 NE

Checked by  
John Sanday

Drawing by: Cheam Phally

Date: March 1998

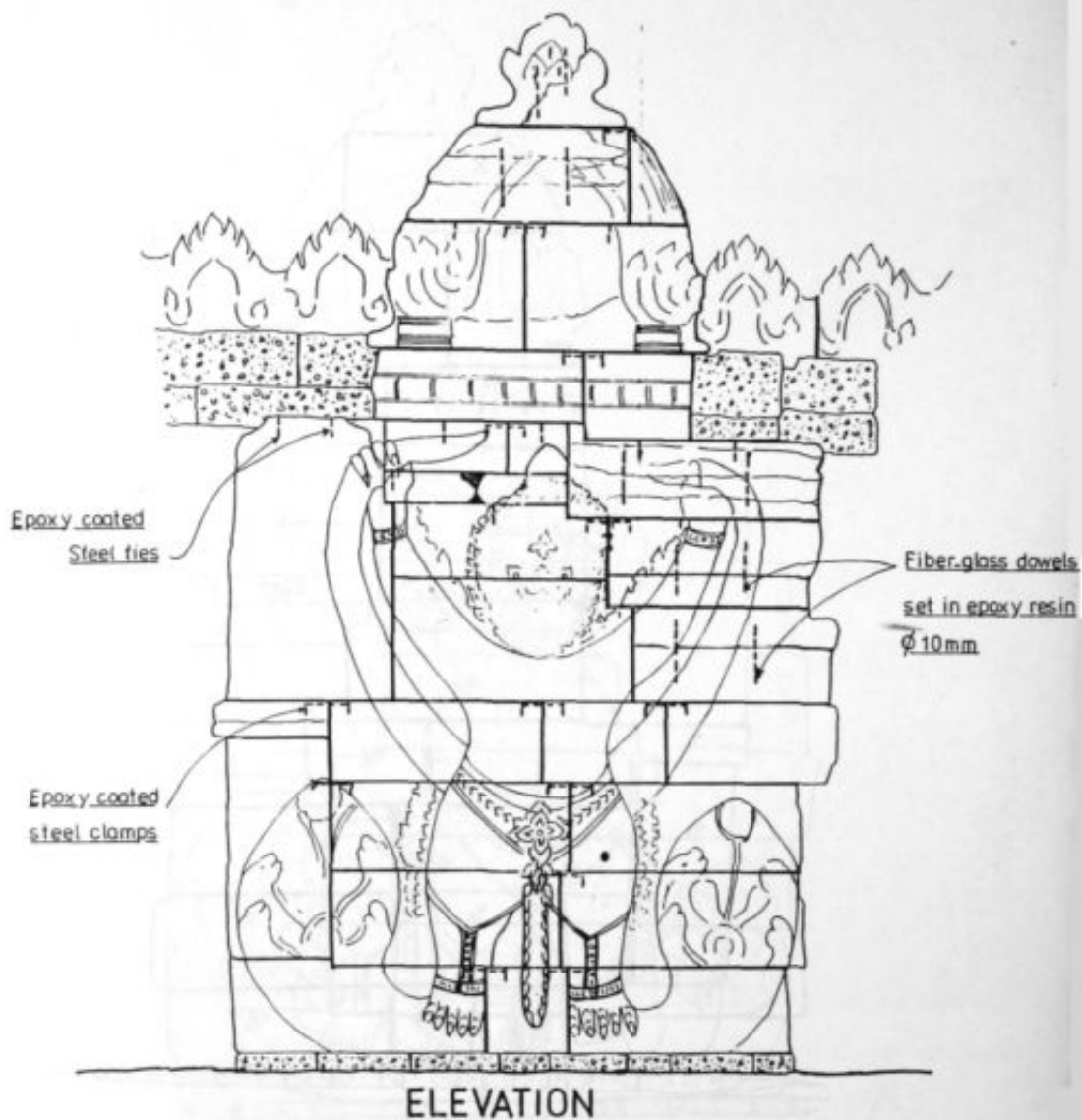
Scale: 1/20

Preah Khan Conservation Project

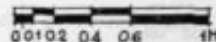
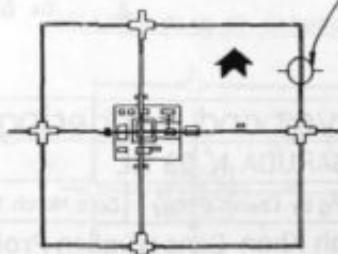
Drawing

World Monuments Fund (New York)

N° 5



LOCATION PLAN OF GARUDA N 33



Repair & Strengthening of	Checked by
Garuda NE # 33	John Sanday
Drawing by : Cheam Phally	Date: March 1998
Preah Khan Conservation Project	Scale: 1/20
World Monuments Fund (New York)	Drawing: N° 6

Epoxy coated steel clamp

Polythene membrane

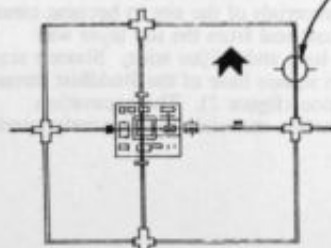
Mass laterite concrete fill

Epoxy coated steel ties

Rammed earth

## SECTION

LOCATION PLAN OF GARUDA N° 33



Repair & Strengthening of  
Garuda NE # 33

Checked by  
John Sanday

Drawing by: Cheam Phally Date: March 1998

Scale: 1 / 20

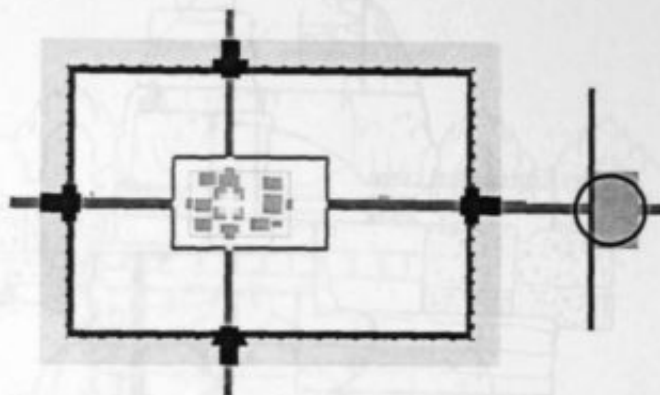
Preah Khan Conservation Project

Drawing:

World Monuments Fund (New York)

N° 7

### 2.2.3 ARCHAEOLOGICAL INVESTIGATIONS AT WAT PREAH KHAN



There has been a growing interest in archaeology at Preah Khan. The archaeological program at Preah Khan has included a number of projects and research. The first project was the site clearing and small excavation of the East Jetty on the edge of the Jayatataka (Northern Baray), during the 1996-1997 Campaigns. A new site was identified for Field Campaign VI. It is a "Pagoda Site," the Vihara north of the western access path between Enclosure Wall IV and Enclosure Wall III. The discovery and excavation of the Wat Preah Khan has sparked off a host of new research projects. The WMF has started surveying the jungle, between enclosure walls III and IV of the northwest corner, searching for new discoveries in Preah Khan.

Sadly Preah Khan was prey to looters and an important torso was stolen from the South Portico of the central shrine. It was fortunately found undamaged.

#### 1. Archaeological Research – Wat Preah Khan

Archaeologist Chan Chamroen has been working with his team on the excavation and recording of the Vihara Pagoda Site to the north of the western access route in Preah Khan. The exact location is between the Outer Enclosure Wall IV and Enclosure Wall III. The main work has been to expose the foundations and to discover the extent of the structures associated with this hitherto unknown pagoda. The results of this excavation are very interesting and provide a new dimension to the Preah Khan history. The report on these discoveries is included in the appendices of this report.

The foundation of the Wat Preah Khan Vihara shows where people used to pray to the god Buddha. It is located in the jungle, 41 meters northwest of West Gopura III and 25.50 meters north of the western axial path (figure 1). Vegetation clearance on the Vihara and surrounding areas has allowed the shape, orientation, and construction materials of the site to become clear. Clearing was carried out on the surface of the foundation, and soil from the top layer was removed. The base of the now-exposed Vihara is 18.68m long and 7.70m wide. Sixteen stone *Sima*, in pairs, face each cardinal point. There is also a 3m square base of the Buddhist throne (*ballang preah*) on the Western part of the Vihara foundation (figure 2). The excavation revealed the Vihara Pagoda's structure and specific construction materials used, namely laterite



and sandstone. The presence of several post holes on the wat base indicates that a wooden structure may have existed over it.

Vihara reflects the Buddhist tradition at Preah Khan. The temple was dedicated as a Mahayana Buddhist monastic training center in 1191, only to fall victim to the Hindu iconoclasm of the 13th Century. Buddhism returned to Angkor in the 16th century. The Wat Preah Khan was probably constructed sometime between the 13th and 16th Centuries. During this time, many other Buddhist temple structures in Angkor were built using similar shapes, styles, and materials.

The intent of excavation in the Wat Preah Khan is to more fully understand its role in the more recent history of Preah Khan.



Excavation at Preah Khan Pagoda.

## 2.3 TRAINING, RESEARCH, AND SURVEY ACTIVITIES

### 2.3.1 TRAINING

#### **Support to the Faculties of Architecture and Archaeology**

Throughout the year, WMF's principal staff members continued their teaching activities at the Royal University of Fine Arts, Phnom Penh. Architect Lek Sareth taught computer aided design (Autocad) at the Faculty of Architecture and helped students comprehend the basics of architectural conservation. Architect Var Morin dedicated a week each month, as part of his work with WMF, to assist the Faculty of Architecture by teaching workshops on architectural conservation. Both these staff members were given UNESCO honoraria to continue their teaching activities. Archaeologist Chan Chamroen contributed one week per month at WMF's expense teaching archaeological site management at the Faculty of Archaeology.

#### **The Center for Khmer Studies**

For the past eight years, WMF has administered physical conservation, stabilization, and emergency repair projects at Angkor's Preah Khan complex that have provided field training for dozens of Cambodian students from Phnom Penh University's Department of Architecture and Archaeology. During this period, it has become apparent to WMF that teaching and research programs in Khmer studies needed further development beyond the scope of WMF's mission. Therefore, it was decided that WMF would provide the impetus for the creation of a separate organization — The Center for Khmer Studies — to facilitate the growing interest of Cambodians and international scholars in Khmer culture.

WMF has completed an initial proposal that will be considered at a workshop for planning and development. In addition the founding consortium members have been identified that provide a basis from which to launch this new organization. Funds have been secured to support a workshop for curriculum planning and development.

The Center for Khmer Studies will be a place that will work in coordination with all other existing institutions in Cambodia, and at Angkor specifically.

### 2.3.2 RESEARCH AND SURVEY ACTIVITIES

#### **Emergency Intervention at The Galleries of Angkor Wat**

During a visit to Angkor by Mr. H. Peter Stern, a member of WMF's Board of Directors, he became especially concerned about the urgent need to preserve, protect and safeguard the future of the bas-reliefs in the encircling gallery of Angkor Wat. Comparing their condition to his previous visit in 1969, Mr. Stern was convinced there had been deterioration of these priceless works of art, which he views as the single most important expression of art in the whole of the Angkor complex. Mr. Stern considered it essential to undertake a careful study and analysis of the bas-reliefs. He, therefore, recommended that WMF, in conjunction with the German Apsara Conservation Project, develop a structural and a proto-typical stone conservation plan to provide the necessary protection of the gallery structure and the sculpted surfaces within.

The WMF team undertook a visual inspection and discussed the development of such a proposal with the GACP team. This proposal was presented to the ICC for its consideration and the concept is to be passed to the Ad Hoc Technical Committee for their approval.

## **A Hydrological Study of the North Baray and the Water Tanks of Neak Pean**

As an outgrowth of studies of Neak Pean temple done by WMF trained students, hydrological engineer James Goodman looked at the possibilities of restoring the tanks in Neak Pean. To be able to develop recommendations to achieve this, it became essential to make a cursory study of the broader aspects of the hydrology of the Northern Baray as well as that of Angkor.

Mr. Goodman arranged his visit to make his preliminary investigations in April at the driest period, prior to the onset of the monsoon. He spent a week studying the field conditions when the water table was at its lowest and plans to use this information as the basis for future comparative studies.

During preliminary investigations on-site it was found that as an engineering exercise the Northern Baray could, indeed, be filled by a canal from a diversion weir on the Siem Reap River. From map studies and some informal verification on-site — a proper survey was not possible during the visit — it was found that the canal would need to be constructed some 5 or 6 kilometers north of the Baray. It seems that the canal bed would have to be elevated for some distance as the ground levels are the same both north and south of the north dike of the northern Baray, particularly in the north east corner. Canal lining would be required. The real question that needs considerable research is whether, indeed, this intervention is a correct assessment and whether the present hypotheses concerning the irrigation methods for Angkor are correct. WMF is considering developing a proposal for a more detailed engineering study to be undertaken of the hydrology of Angkor.

At Neak Pean, with Conservation d'Angkor's approval, a series of excavation pits were dug in the central tank of the Neak Pean complex, in the southern ablution tank (the Lion) and in the Baray itself on the eastern side of Neak Pean. Although excavations were made to a depth between 1-2 meters, no permeable layer was found in either of the tanks nor in the Baray.

Immediately below the present ground level at the side of the main tank, a concrete ring beam was revealed supporting the steps of the tank; clearly much rehabilitation work had been undertaken in the recent past by the Ecole Francaise de l'Extreme Orient (EFEO). If there had ever been an impermeable layer for this particular tank, it either no longer existed or, if it had originally existed, it would now be severely compromised and certainly not functional at this point in time. Little change in soil profile was found in the excavation in the south ablution tank.

From these preliminary investigations, there appears to be no overall impediment to the proposal to pump water into the tanks in the Neak Pean complex.

## SECTION 3

### OTHER ACTIVITIES

#### 3.1 OTHER STRUCTURAL INTERVENTIONS

#### 3.2 PROJECT ADMINISTRATION

#### 3.3 VISITORS TO PREAH KHAN

#### 3.4 PUBLIC OUTREACH EFFORTS

#### 3.5 GLOSSARY

## 3. OTHER ACTIVITIES

### 3.1 OTHER STRUCTURAL INTERVENTIONS

The WMF team carried out several smaller structural interventions of both a permanent and temporary nature. Each time a consultant visited the site, a general site survey was conducted to check on the structural condition of the temple complex. Any temporary emergency stabilization required during the survey was undertaken by a specialty team who have been trained in structural stabilization. (If the intervention was a new technique the team was instructed by the consultant in how to execute it). This team was also responsible for checking all temporary structural interventions, which generally took the form of timber supports or dead shores, on a monthly basis. Other permanent interventions were also been designed by the consultants and instructions given to this group for their implementation. This procedure has become standard practice and the work force, in general, is always on the lookout for potentially urgent hazardous conditions.

#### 3.1.1 GENERAL MAINTENANCE

General maintenance at Preah Khan is of paramount importance and the Preah Khan team keeps a conscious focus on year-round site maintenance. With the completion of each conservation intervention, Preah Khan is once again more accessible to visitors. It is therefore essential to maintain the site in an orderly fashion, to keep it tidy and free of rubbish and to control vegetal growth. WMF's major architectural stabilization and conservation interventions at Preah Khan will soon come to an end. It is important to establish a sustainable and long-term maintenance program. Thought is now being given to developing a sufficient self-perpetuating revenue for the site's general maintenance program, as the workforce has been trained to maintain the required level of management.

### 3.2 PROJECT ADMINISTRATION

The project administration underwent several changes this season as a result of the development of a more mature experienced staff. All members of the team from the workforce to the professional staff have specific responsibilities. The workforce was carefully monitored and all those with initiative were given positions of responsibility, often being appointed team leaders or "chef de groupe".

#### 3.2.1 PROFESSIONAL STAFF

The professional staff were all student trainees at Preah Khan. All have completed their academic training and received their degrees from the Royal University of Fine Arts. They are:

Lek Sareth	<i>Assistant Architect</i>
Var Morin	<i>Assistant Architect</i>
Chan Chamroen	<i>Archaeologist</i>
Ms Cheam Phally	<i>Architect-Supervisor</i>
Ms Chhun Soma	<i>Architect-Supervisor</i>
Sam Kimheng	<i>Architect-Supervisor</i>

### 3.2.2 ADMINISTRATIVE STAFF

The general administration of the project was overseen by Kussom Sarun. The task of running such a project addressed the of numerous challenges of staff administration, materials acquisition, budget management, and maintenance of the WMF House.

The site was run by Chef de Chantier Ouk Samon who was responsible for the management of the entire work force and for translating the requirements of consultants and professional staff to the eleven different work groups.

Kussom Sarun	<i>Assistant Administration</i>
Ouk Samon	<i>Chef de Chantier</i>
Im Chenda	<i>Site Administrative Assistant &amp; Shopkeeper</i>
Ra	<i>Driver</i>
Ms Sun	<i>Housekeeping</i>
Ms Ari	<i>Housekeeping</i>

Andrew Dennis continued his good work in guiding visitors through Preah Khan and also produced a brochure on the natural environment of Preah Khan.

### 3.3 VISITORS TO PREAH KHAN

February 1998 marked the return of visitors to Angkor. Preah Khan also had a large number of visitors some of whom are listed below. The visitors to Preah Khan were received mainly by Andrew Dennis, whose hard work and commitment to the Preah Khan project showed. High points in the presentation of Preah Khan this campaign included:

- Cecily Cook of the Asian Cultural Council visited the WMF Team in Siem Reap to talk about the future Preah Khan Program.
- H. Peter Stern and his wife Margaret's visit was a great highlight and it was wonderful to be with such inspiring and enthusiastic people. The Sterns were joined by Mr. & Mrs. Montgomery for the last part of their time in Angkor.
- Round the World by Private Jet Group of approximately 100 people from TCS Expeditions.
- Joyce and John Clark were received by Andrew Dennis and given a special tour of Angkor including Preah Khan.
- Mr. & Mrs. Mark Mattison were shown around Preah Khan by Andrew Dennis.
- A group of French travel writers toured Preah Khan with Andrew Dennis.
- Steven McCurry, a National Geographic photographer was guided by Andrew Dennis through Preah Khan. Mr. McCurry is preparing an article on Angkor for the magazine and was on a preliminary scouting mission.
- Eleanor Briggs returned to Preah Khan to see the water birds on the Tonle Sap and visit her adopted Garudas. There was a very simple ceremony at which time she was presented with a replica Garuda in bronze.

- Ms. Happy Harun, executive director of the China Heritage Fund, came to Preah Khan to see the work undertaken at the site.
- John Little the Pritzker Curator of the Asia Department of The Art Institute Chicago was asked to accompany Mr. James Wood the Director of the Art Institute and John Bryan a board member of the Art Institute on a tour of South East Asia.

## 3.4 PUBLIC OUTREACH EFFORTS

### IN THE UNITED STATES

John Sanday visited the USA between 23-31 March, following an invitation from the Art Institute of Chicago. Below is a synopsis of his activities during this period.

**Art Institute of Chicago:** This visit was Sanday's second to the Art Institute and is a follow-up to a very successful visit a group from the Art Institute made to Angkor. During Sanday's last visit to Chicago, at the invitation of Edward Horner, Executive Vice President, Development and Public Affairs, I met with Dr. Stephen Little the Pritzker Curator Asian Art, who was intrigued with WMF's program in Angkor and invited Sanday to return to talk to the museum's Oriental Society. At the same time, those who visited Angkor with the Art Institute were also invited and Laurie Beckelman, WMF New York, joined us. The lecture was well received and indeed a good link has been created between WMF and the Art Institute.

**Cambodian New Year in New York:** In addition to meetings, John Sanday was in attendance for WMF's annual Cambodian New Year Celebration in New York.

### IN LONDON

**Exhibition — Shades of Angkor:** Felicity Priest held an exhibition at the East-West Gallery in Portobello London entitled 'Shades of Angkor'. The collection of over 33 works of art consisted of oil paintings, water colors, charcoal drawings and sculptures. The opening was extremely well attended and it provided a great opportunity to promote WMF's activities in Preah Khan and Angkor. The Rt. Hon. William Shawcross made a moving introductory at the exhibition's opening. Several members of the British group who visited Angkor two years ago came to the opening and others visited the exhibition. Ed Horner from the Art Institute of Chicago also came to the opening.

On the day after the opening, Sanday gave a talk at the gallery, which linked the concept of conservation with the artist's inspiration and showed slides that illustrated this aspect. There was also a reading of a short story written by Joy Stephens and read by Jan Bayley, which was specially commissioned for the exhibition. It told the story of Preah Khan's rise and fall through the eyes of a beautifully sculpted Apsara on the walls of Preah Khan. It was a truly moving experience for all those that attended.

**Lecture at London University:** Sanday gave an illustrated talk on the Preah Khan Project at the Institute of Archaeology, London University which was well attended. Mr Chris Brewer, one of the members from the British Group who adopted a Garuda was in the audience and he generously made a further donation to "feed his Garuda" as he explained when he presenting the check.



FILM AND PRINT JOURNALISM

**Cafe Productions** have plans to shoot a documentary in December at Angkor for the Learning Channel. They have asked the WMF team to help set up the groundwork. Preah Khan will be featured in the documentary.

**Discover Magazine:** Jeff Grunwald is preparing an article or profile on the work in Preah Khan and the simple technology used in our conservation activities. The editors are keen to use some of our drawings and illustrations.

### 3.5 GLOSSARY

<i>ablution tank</i>	a tank in which one bathes as part of a religious rite
<i>anastylosis:</i>	rebuilding fallen masonry elements in their assumed position in the original structure, including restacking fallen column drums.
<i>Angkor:</i>	('city or capital') an ancient capital in Cambodia that was the main center of the Khmer Empire from AD 802 to 1432
<i>apsara</i>	a female divinity; heavenly dancer; celestial nymph who entertains the gods and is the sensual reward of kings and heroes who die bravely
<i>ballang preah:</i>	"Buddhist throne"
<i>Banteay:</i>	('fortress') the name given to a temple with an enclosing wall
<i>Banteay Srei:</i>	(the citadel of women), Sivaite temple built in 967 to 968 by the Brahman Yajnavaraha about fourteen miles north of Siem Reap.
<i>baray:</i>	('lake') a large man-made body of water surrounded by banks of earth; reservoir
<i>causeway:</i>	a raised road across a body of water
<i>corbelling:</i>	a method of forming enclosed spaces and openings used by the Khmers; it consists of an overlapping arrangement of stones, each course projecting beyond the one below
<i>dvarapala:</i>	a guardian often standing and holding a club or mace; sculpted in the round and frequently at the entrance to a temple.
<i>fronton</i>	the triangular vertical face used decoratively above a lintel or over a portico or other entrance.
<i>garuda:</i>	a mythical creature depicted in Khmer art with the arms and torso of a human and the beak, wings, legs, and claws of an eagle; an enemy of the 'naga'; Vishnu's mount
<i>gopura:</i>	an elaborate gateway to a temple in the south of India; it serves as an entrance pavilion in walls enclosing a temple
<i>Khmer:</i>	the ancient indigenous people of Cambodia
<i>laterite:</i>	a residual product of rock decay abundant in the soil of Cambodia and Northeastern Thailand; characterized by a porous texture and a red color; hardens on exposure to air; widely used as a building material by the Khmers; particularly for foundations of temples
<i>lintel:</i>	a crossbeam resting on two upright posts; on a Khmer temple lintels form the door or window openings, directly below pediments
<i>Phnom:</i>	the Khmer word for 'hill' or 'mount'
<i>pilaster:</i>	a column used on the side of an open doorway that projects slightly from the wall

<i>portico:</i>	an entrance porch
<i>preah:</i>	sacred' 'holy'
<i>Sima:</i>	(or <i>Simha</i> ) the mythological form of lions
<i>stele:</i>	an upright shaped stone bearing an inscription
<i>stucco:</i>	a plaster used decoratively for covering walls in Khmer architecture
<i>Tonle Sap:</i>	('sweet water') a freshwater sea in western Cambodia that is linked with the Mekong River by the Tonle Sap River
<i>vault:</i>	an arch extended in depth
<i>Vihara:</i>	(Buddhist sanctuary) a wooden pavilion, rectangular in plan that supported a tiled roof and housed sacred images. <i>Vihear</i> is the Khmer name for vihara
<i>Vishnu:</i>	one of the three major Hindu gods; the preserver and protector
<i>wat:</i>	a Thai word meaning 'temple'
<i>weir:</i>	a dam in a stream or river to raise the water level or divert its flow