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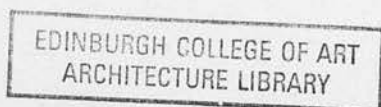
79058.

STUDIES IN THE EARLY MEDIAEVAL
ARCHITECTURE OF IRAN AND AFGHANISTAN

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Studies in the Early Mediaeval
Architecture of Iran and Afghanistan



Mehrdad Shokoohy M.Arch.; M.Sc.

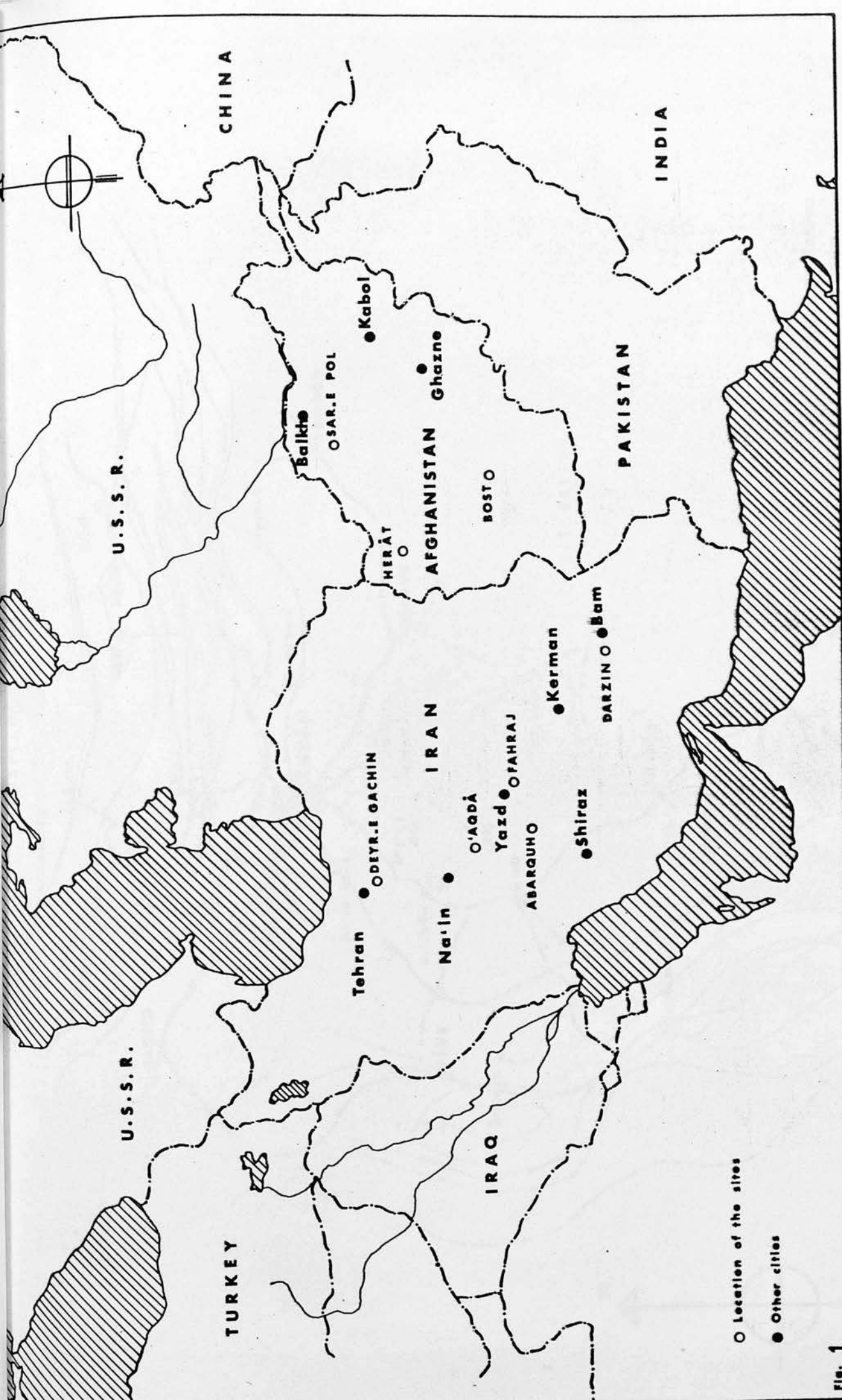
A thesis submitted in fulfilment for the degree of
Ph.D. at the Heriot-Watt University and the Edinburgh
College of Art, Edinburgh.

September, 1978.

Department of Architecture,
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Edinburgh.

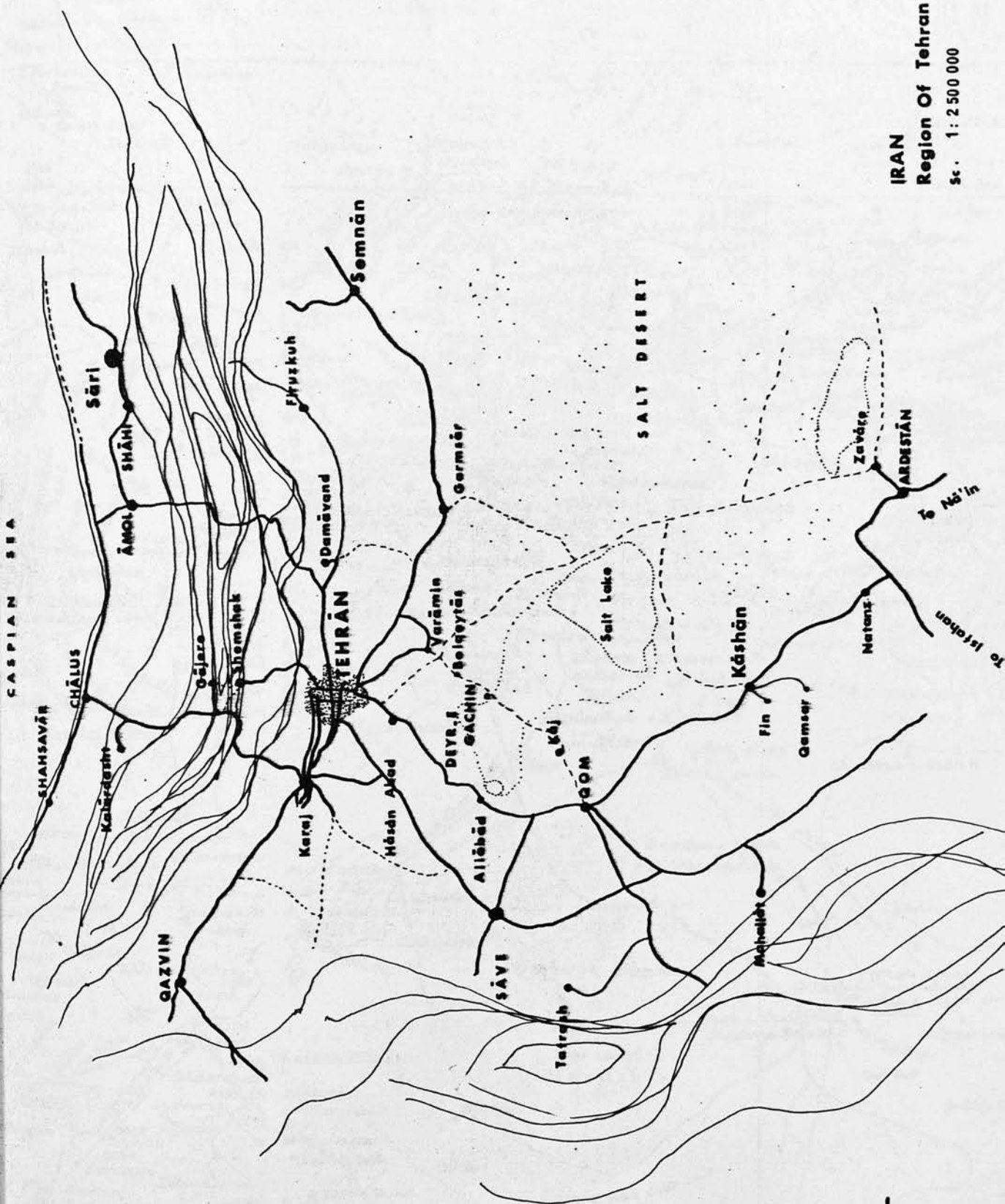
PART TWO

DROWINGS

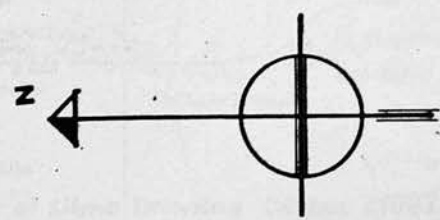


- Location of the sites
- Other cities

Fig. 1



IRAN
 Region Of Tehran
 Sc. 1:250 000

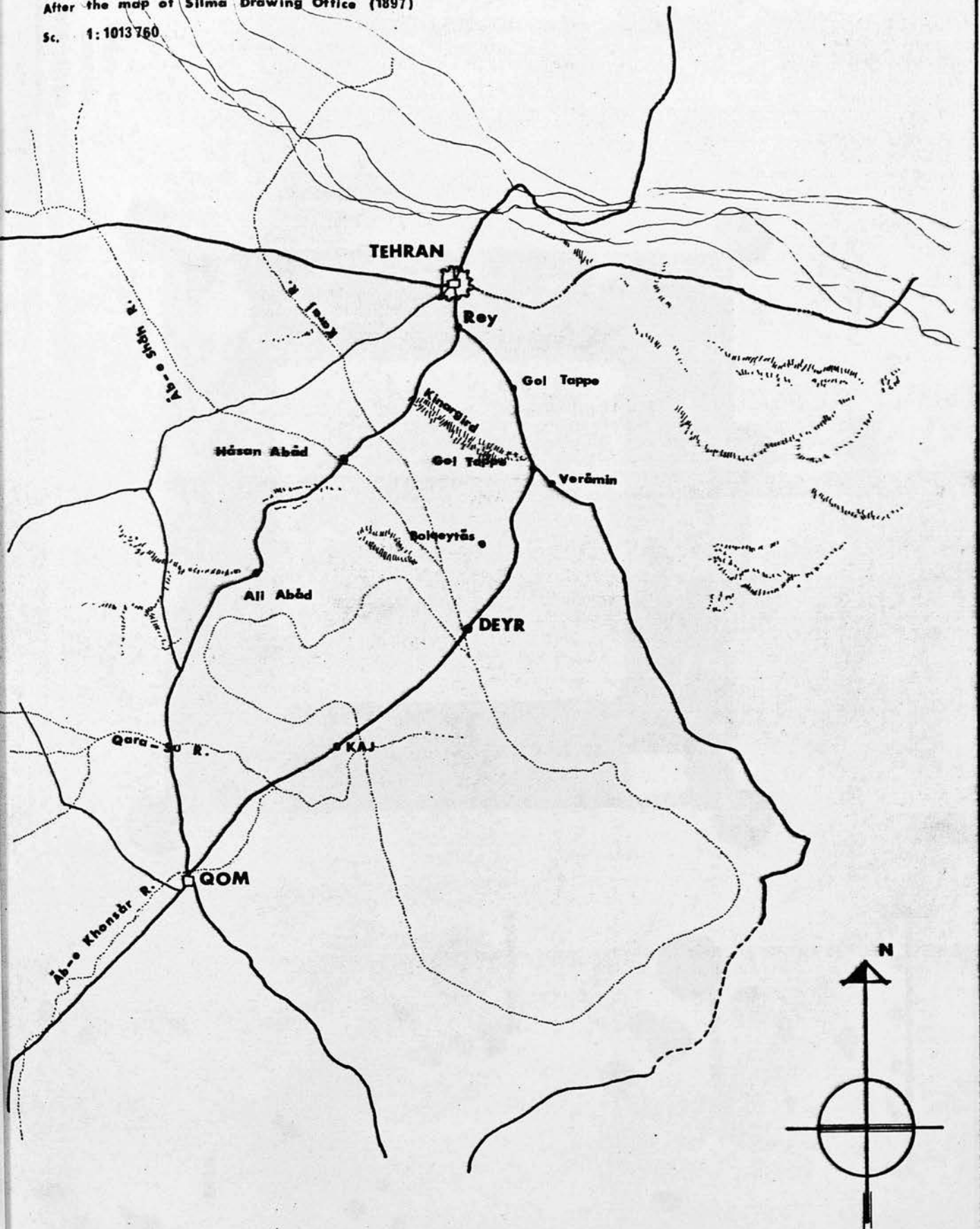


DEYR-E GACHIN, Iran

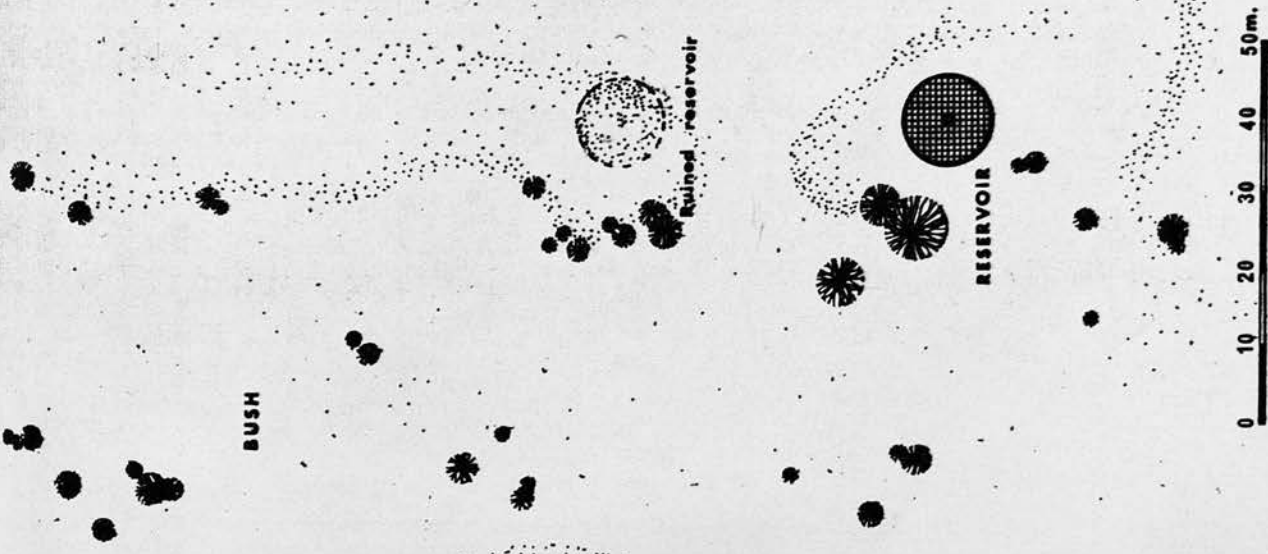
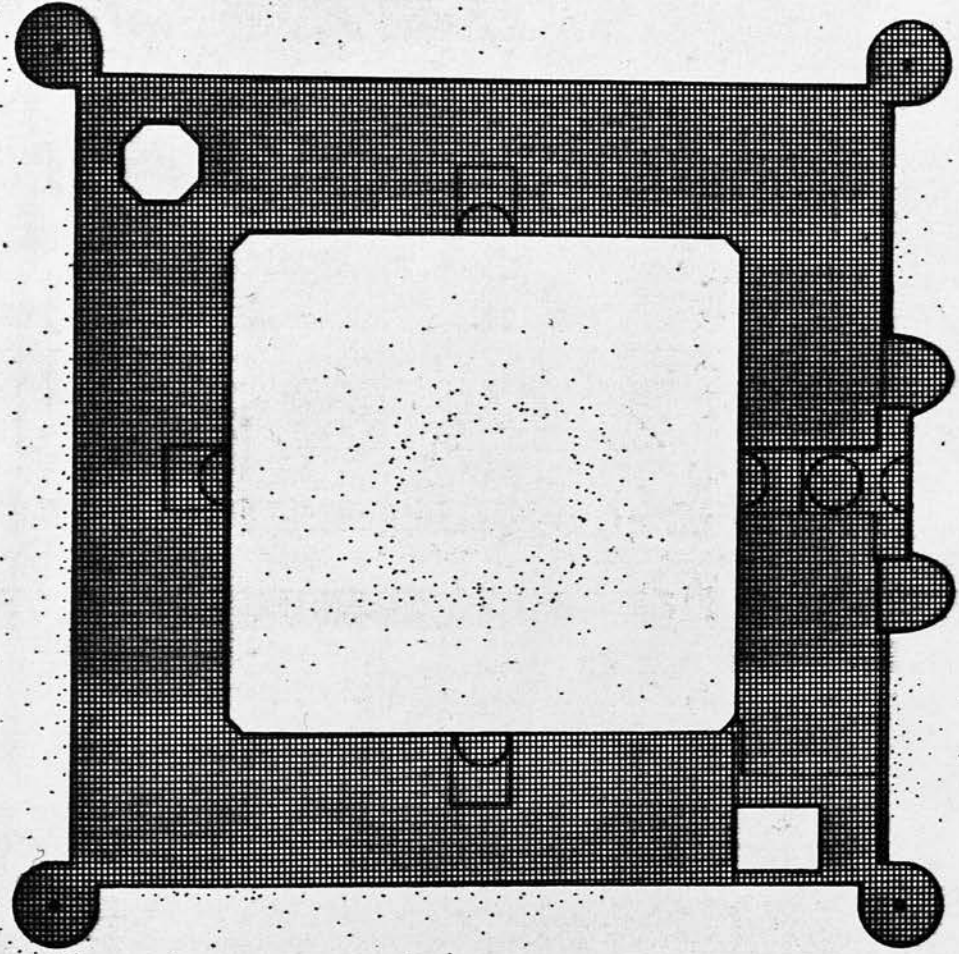
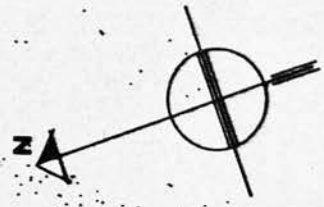
And The Old Route to Qom
LOCATION MAP

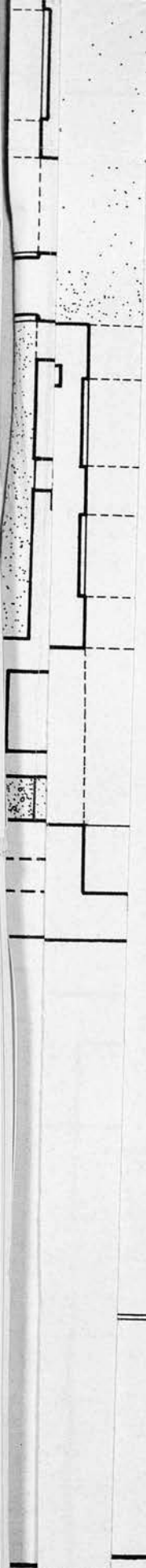
After the map of Silma Drawing Office (1897)

Sc. 1:1013760



Caravanserai of
DEYR-E GACHIN, Iran.
Site plan
Sc 1:1000





40 m.

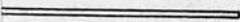
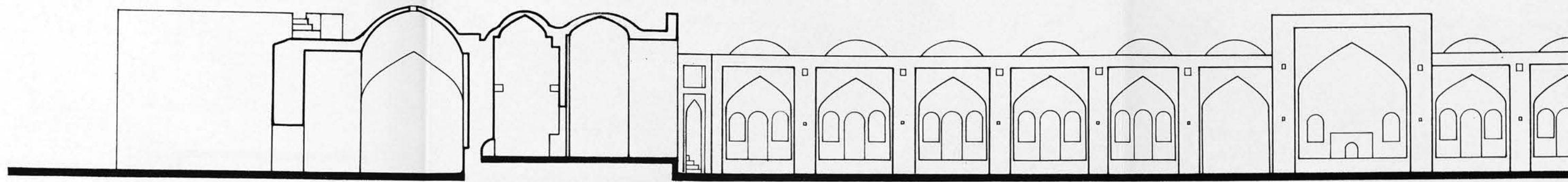
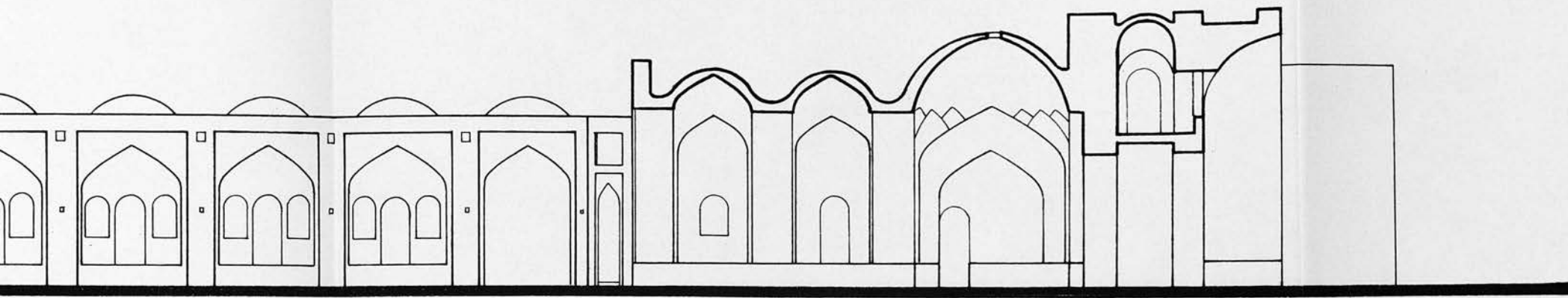


Fig. 6

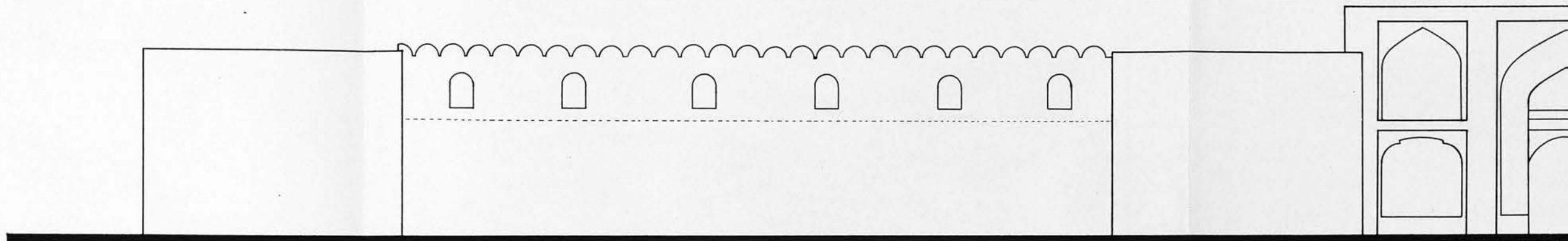


0 2 4 6 8 10 20 m.

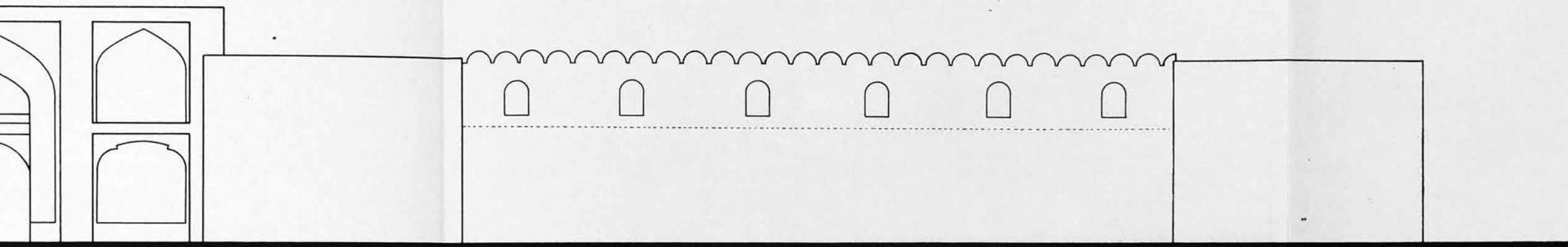


Caravanserai of DEYR-E GACHIN
IRAN

SECTION A - A Sc. 1:200



0 2 4 6 8 10 20 m.

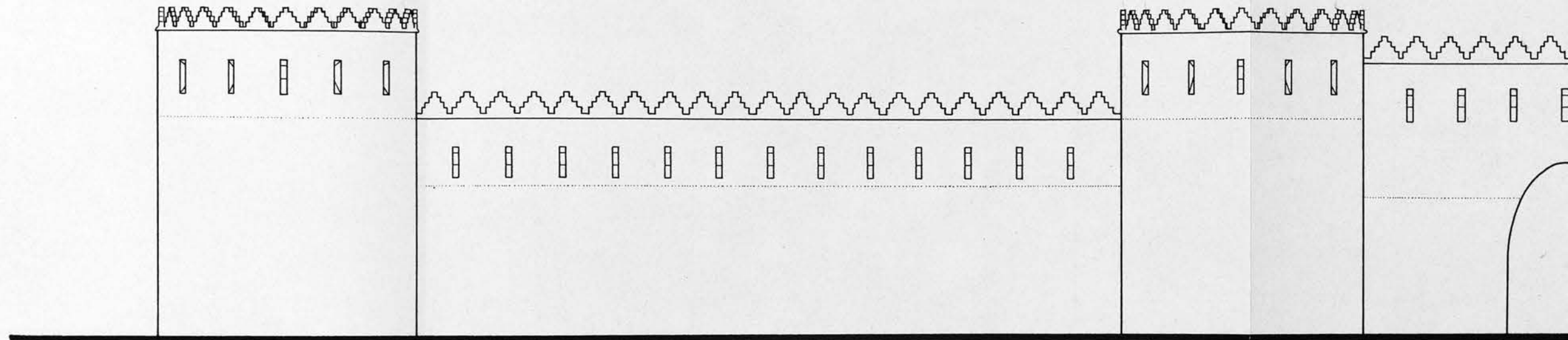


DEYR-E GACHIN- IRAN

SOUTH ELEVATION

Present condition

Sc. 1: 200



DEYR-E GACHIN IRAN

SOUTH ELEVATION

Reconstruction

Sc. 1: 200

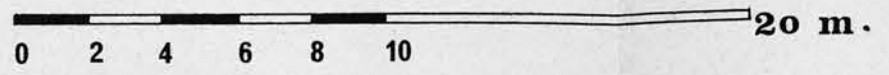
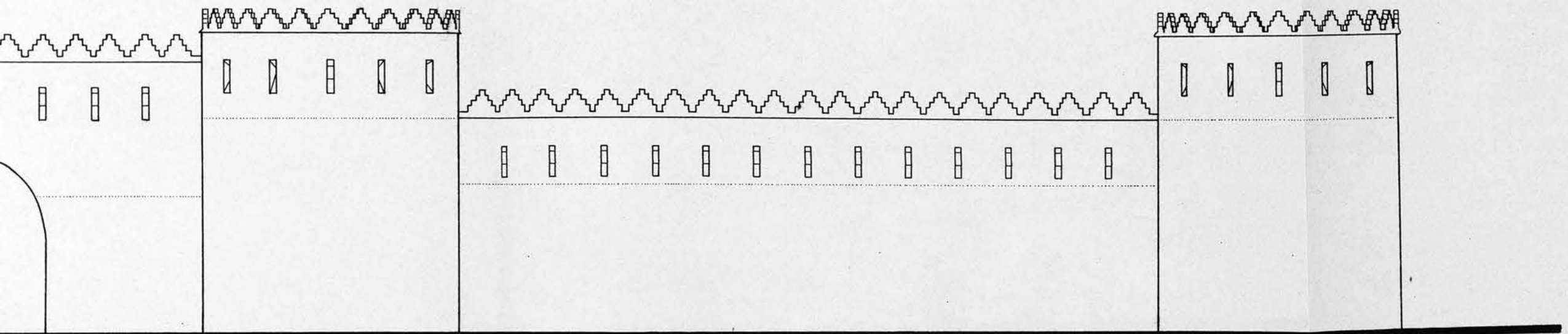
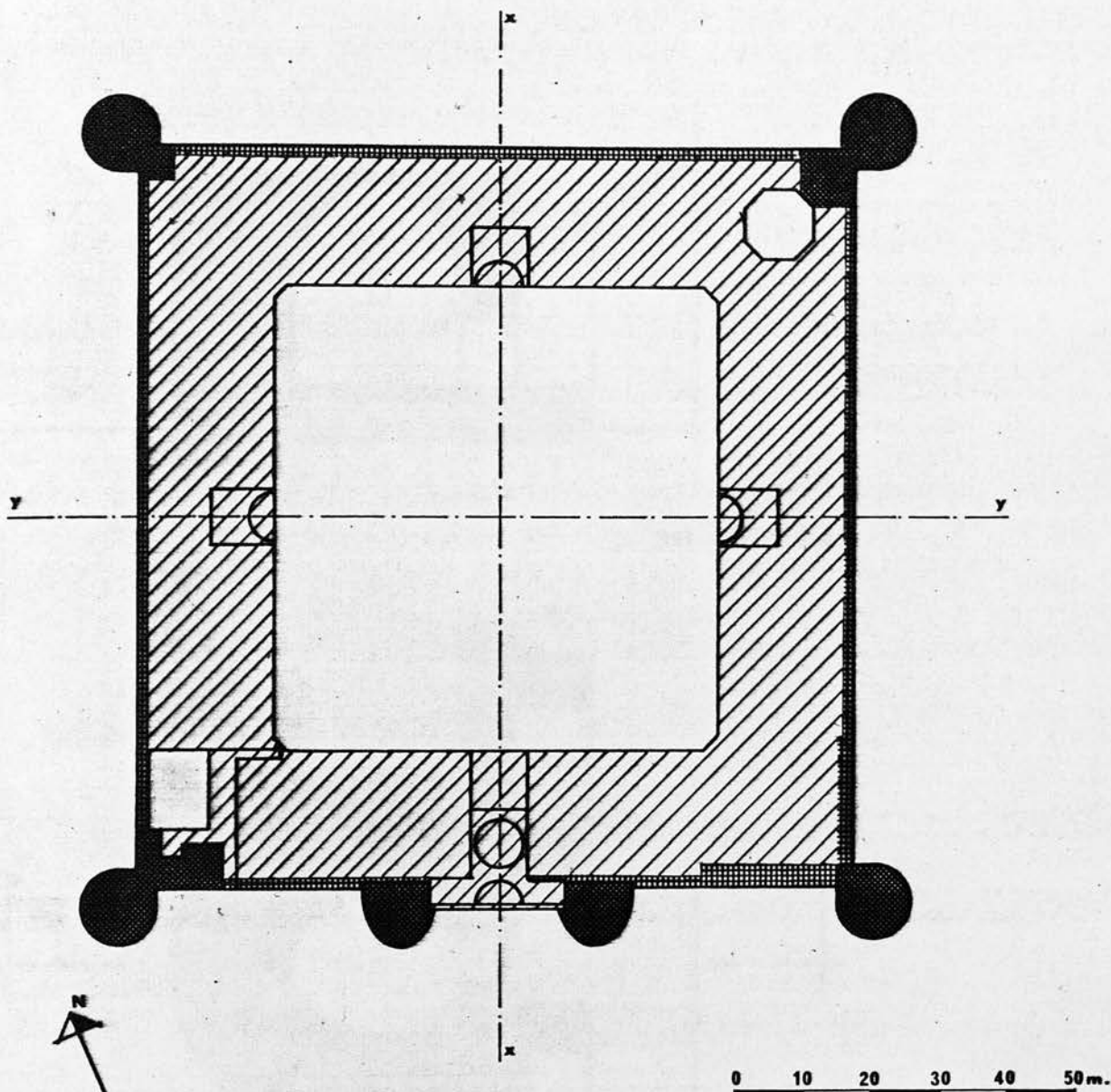





Fig. 9

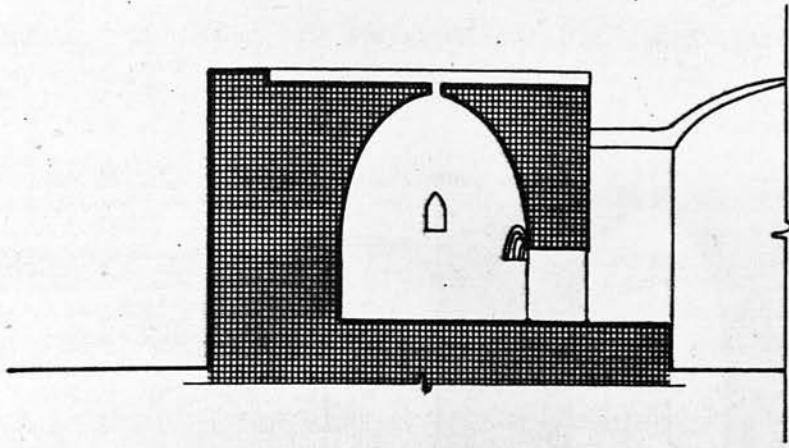


-  Sassanid roofs
-  Sassanid walls standing up to roof level
-  Islamic roofs

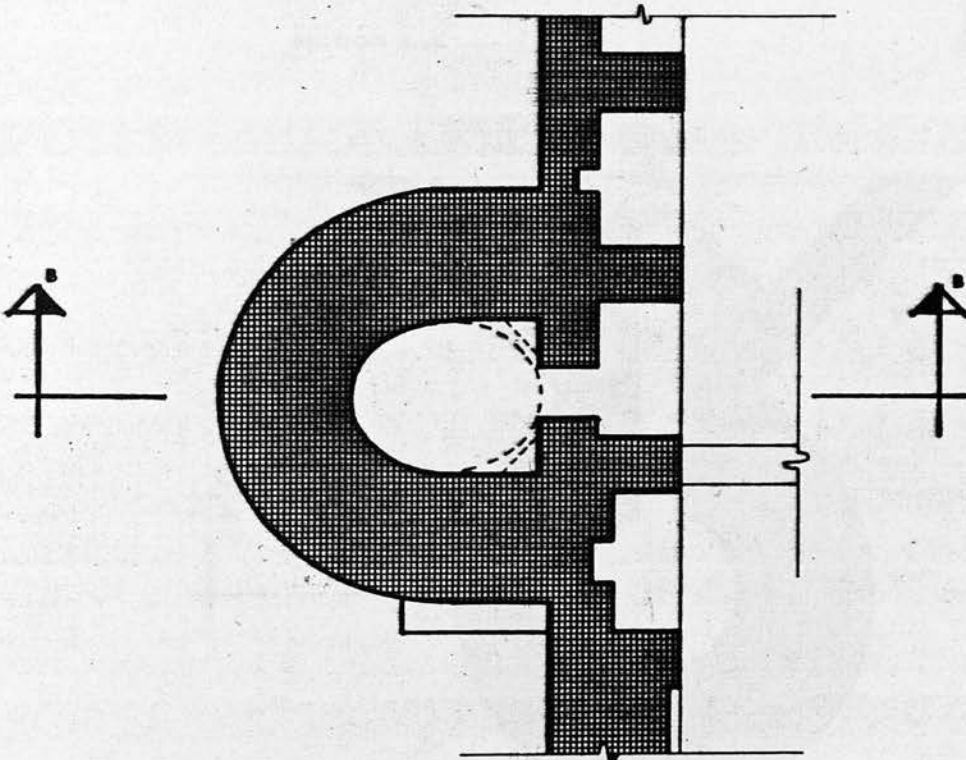
DEYR-E GACHIN, Iran

ROOF DIAGRAM

Sc. 1:1000



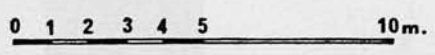
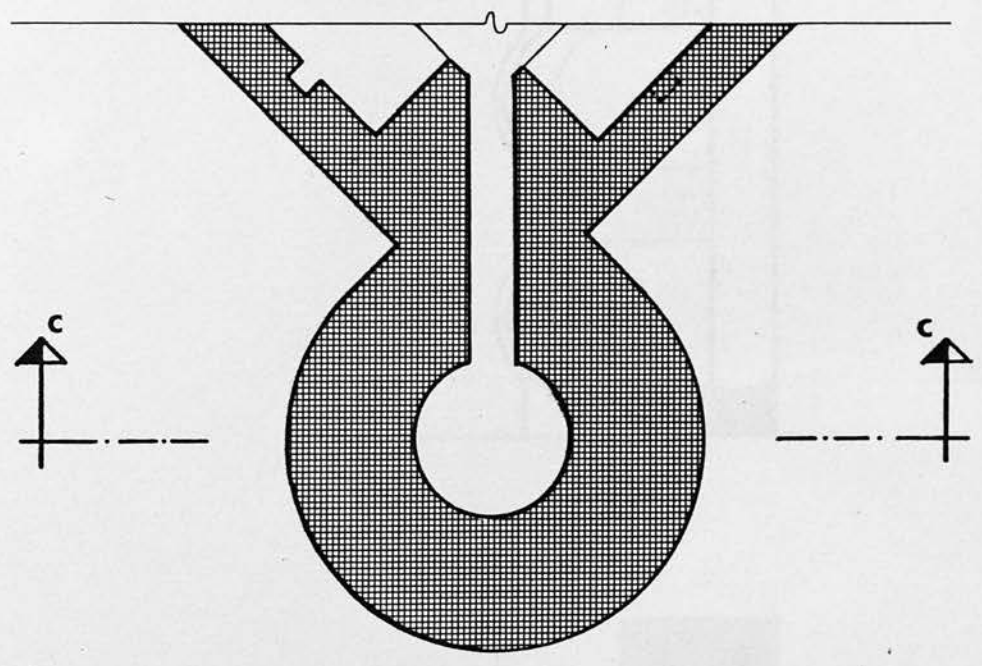
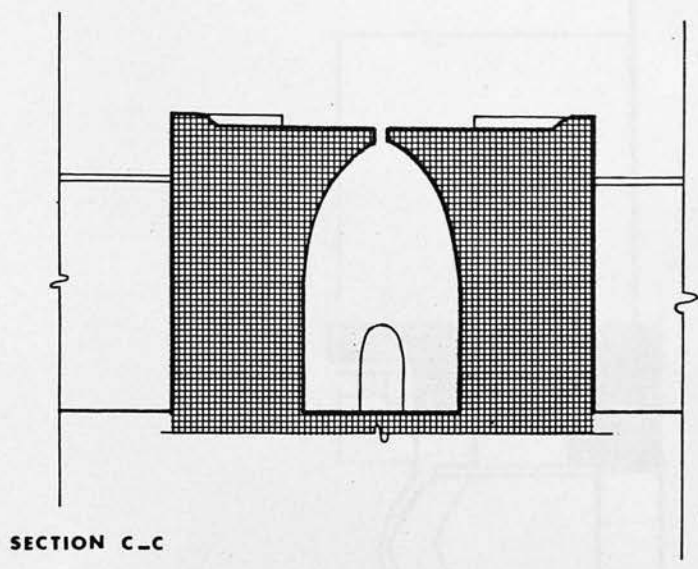
SECTION B-B



PLAN

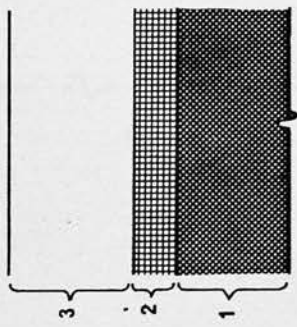
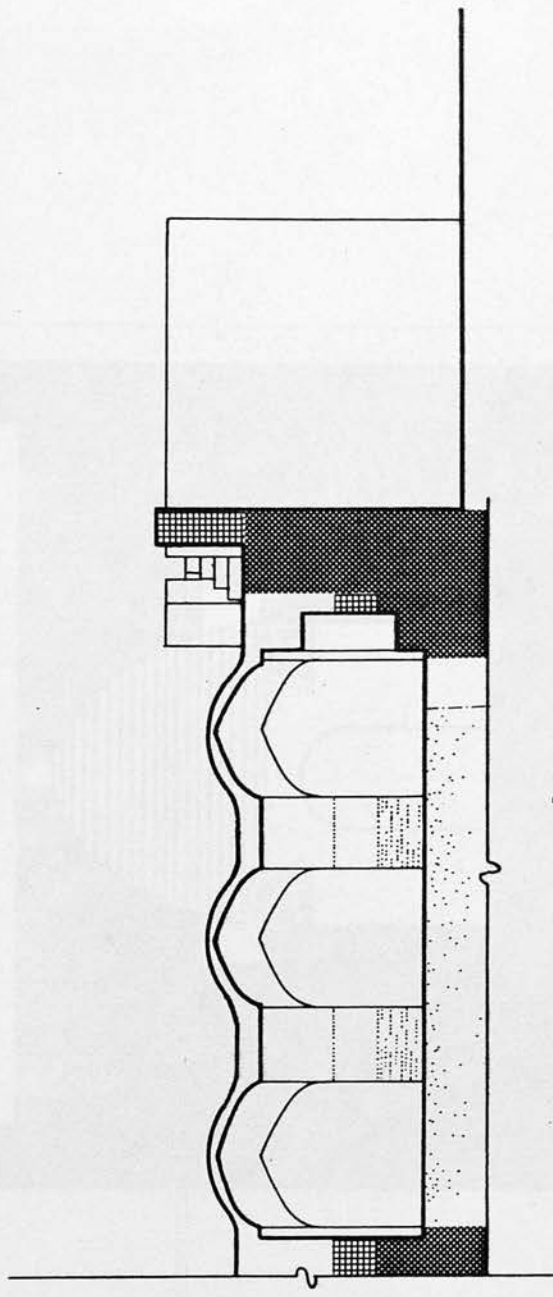
0 1 2 3 4 5 10m.

DEYR.E GACHIN, Iran
 EASTERN ENTRANCE TOWER
 Plan and section
 Sc. 1:200



DEYR_E GACHIN, Iran
 NORTH_WESTERN TOWER
 Plan and sketch section
 Sc. 1:200

- 1- Sassanid construction
- 2- Islamic construction with the Sassanid materials
- 3- Islamic materials

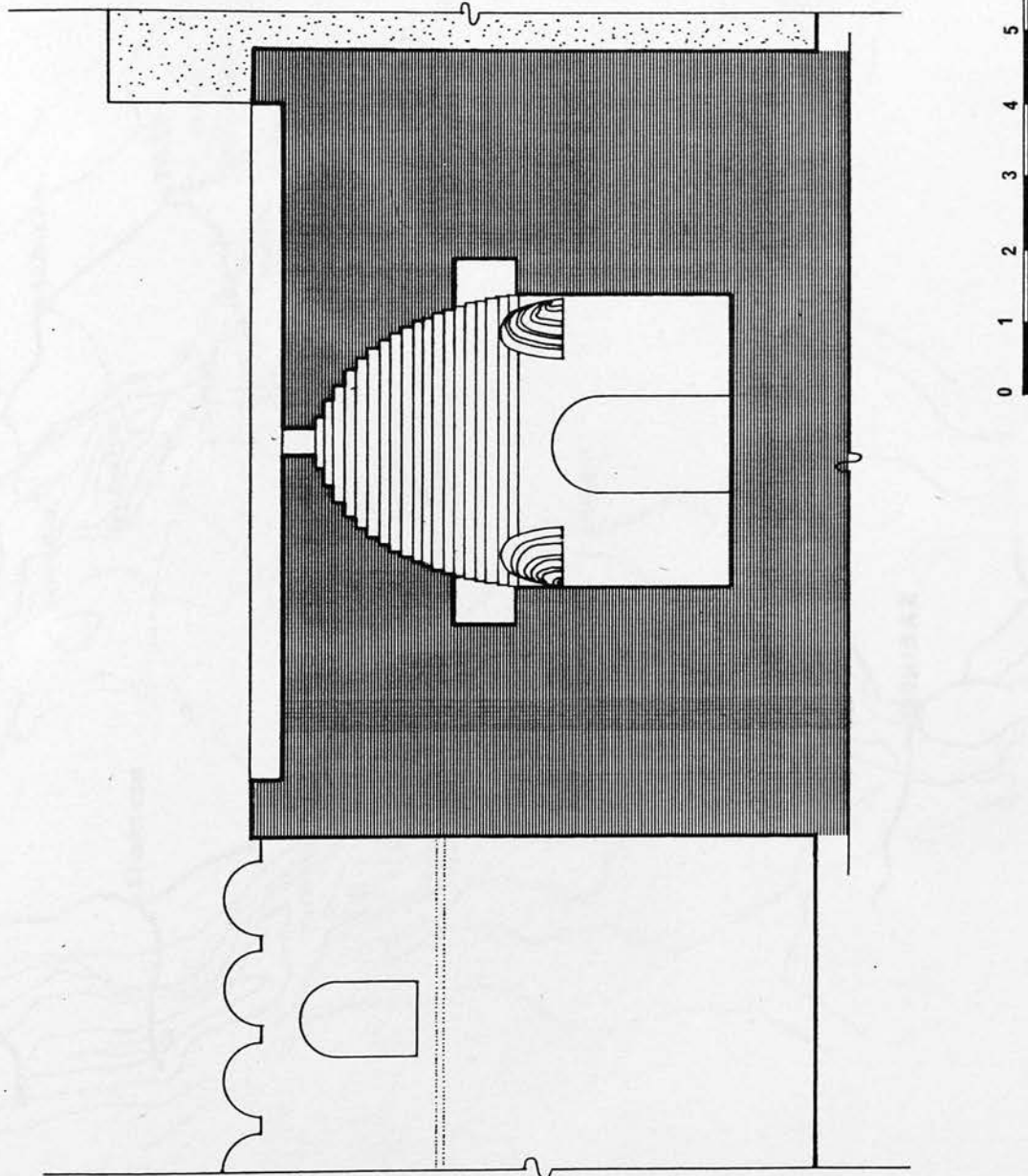


DEYR-E GACHIN, Iran
 PRESENT MOSQUE
 Section D-D
 Sc. 1:200

DEYR.E GACHIN, Iran
WESTERN ENTRANCE TOWER

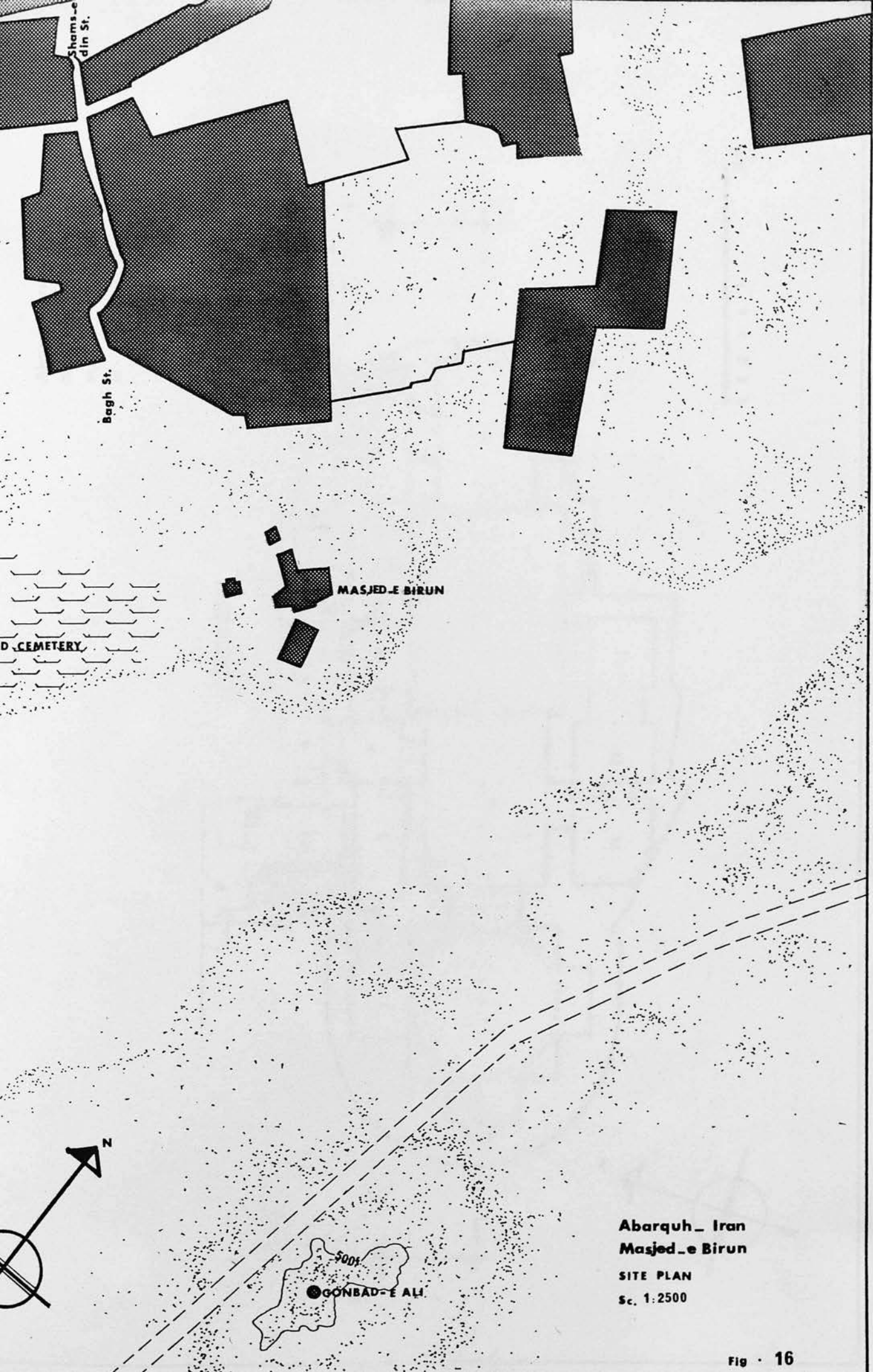
Section E-E

Sc. 1:100





CENTRAL IRAN
 Location map
 Sc. 1:2,500,000



Abarquh - Iran
Masjed - e Birun
SITE PLAN
Sc. 1:2500

Abarquh-Iran
Masjed - e Birun

PLAN

Sc. 1: 200

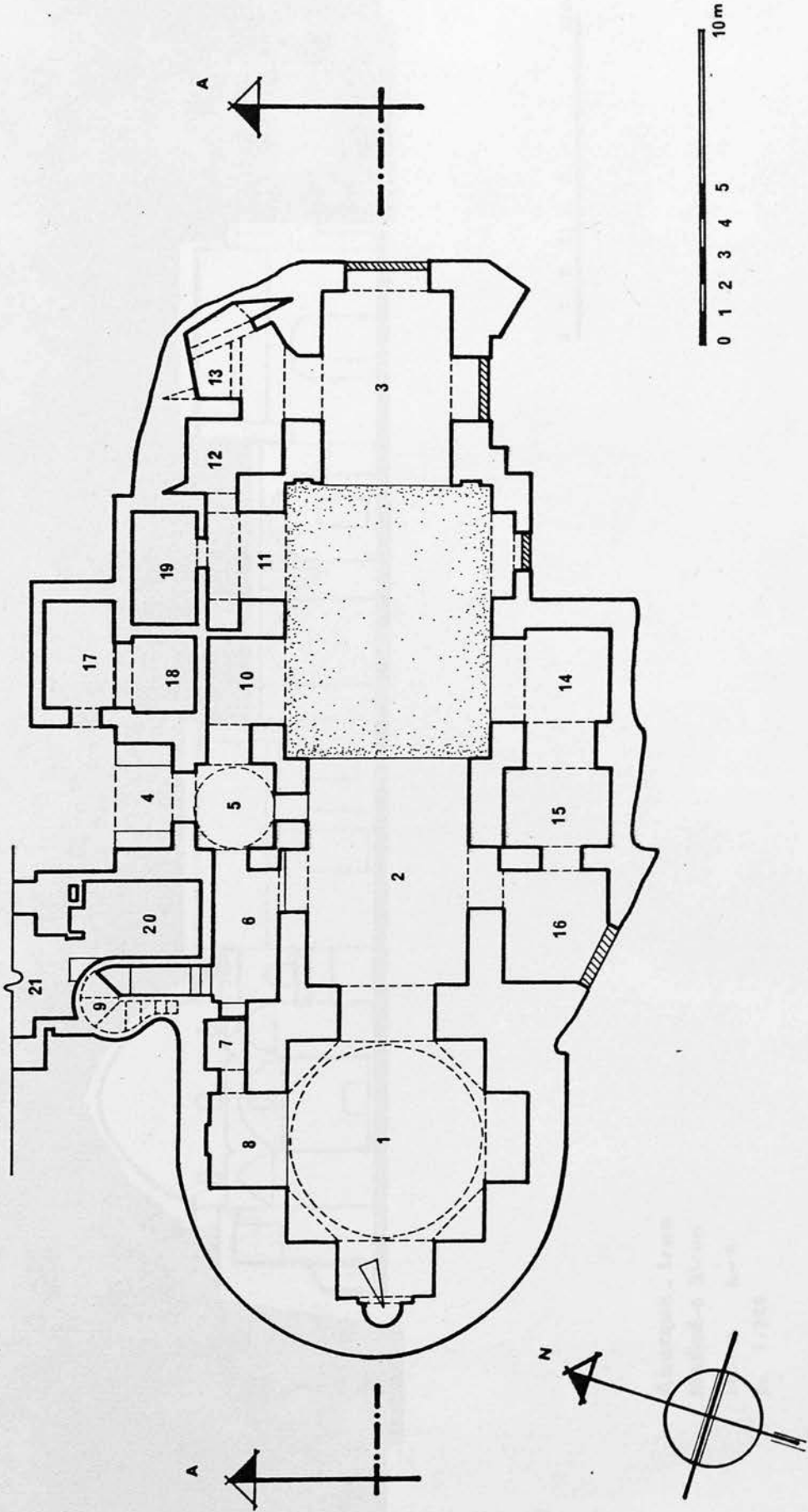
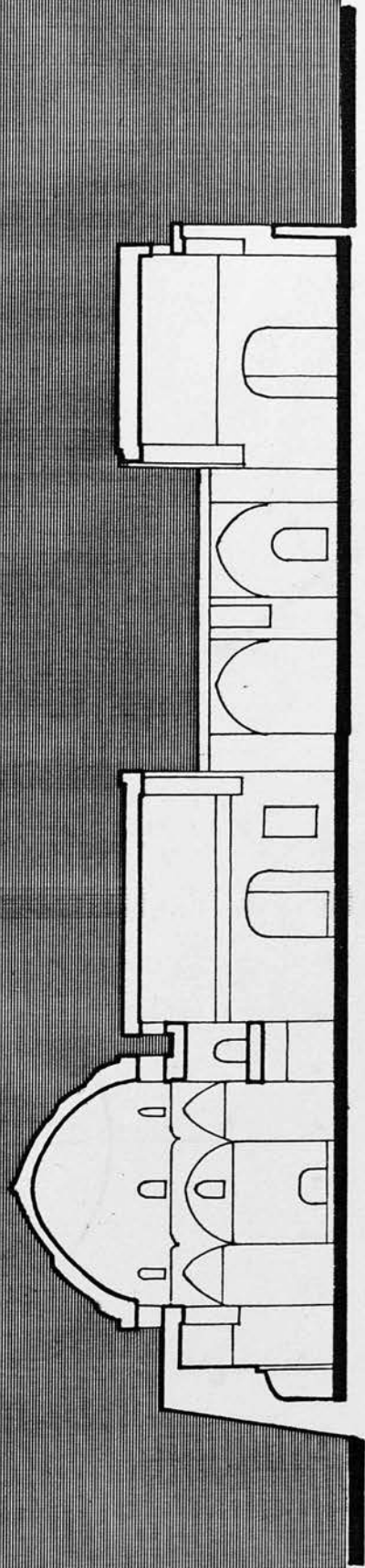


Fig. 17



0 1 2 3 4 5 10m.

Abarquh - Iran
Masjed.e Birun
Section A-A
Sc. 1:200

Abarquh: Long. = $\lambda_1 = 53^\circ 18'$
 Lat. = $\phi_1 = 31^\circ 09'$

MECCA: Long. = $\lambda_2 = 39^\circ 49'$
 Lat. = $\phi_2 = 21^\circ 26'$

Method of Al Battāni and Ebn Yunes:

$$o\Omega D = \phi_1 - \phi_2 = 9^\circ 43'$$

$$N\Omega B = \lambda_2 - \lambda_1 = 13^\circ 29'$$

$$\hat{A} = \alpha + 180^\circ = 5\Omega K + 180^\circ$$

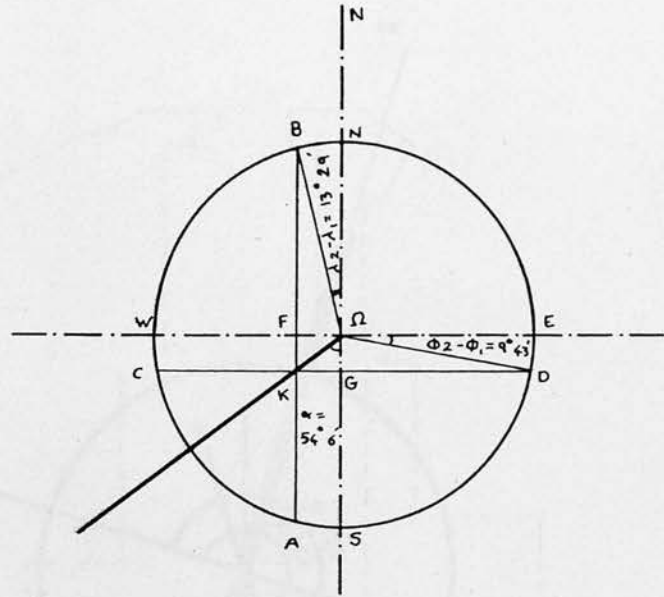
$$\sin \alpha = \frac{\sin(\lambda_2 - \lambda_1)}{\sqrt{\sin^2(\lambda_2 - \lambda_1) + \sin^2(\phi_1 - \phi_2)}}$$

$$\sin \alpha = \frac{0.233163}{\sqrt{0.0543649 + 0.0284853}}$$

$$\sin \alpha = 0.8100517$$

$$\alpha = 54^\circ 6' 4''$$

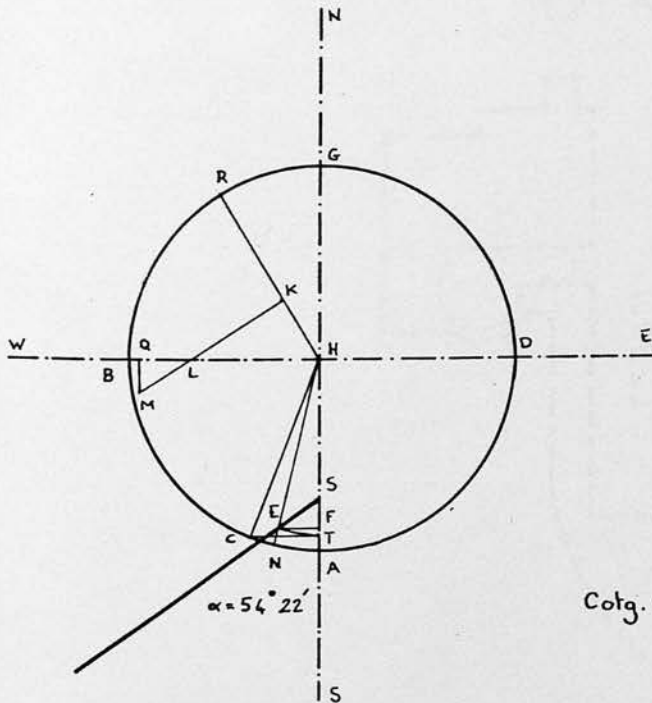
$$A = 234^\circ 6' 4''$$



Method of Al Haitham :

$$RHG = \phi_1 = 31^\circ 09'$$

$$CHA = \phi_2 = 21^\circ 26'$$



$$CT \perp AH$$

$$AHN = \lambda_2 - \lambda_1 = 13^\circ 29'$$

$$EH = TH$$

$$EF \perp AH$$

$$HK = CT$$

$$KM \perp RH$$

$$KM = FH$$

$$MQ = BH$$

$$MQ = FS$$

$$ESA = \alpha$$

$$\text{Cotg. } \alpha = \frac{\sin \phi_1 \cdot \cos(\lambda_2 - \lambda_1) - \cos \phi_1 \cdot \text{tg } \phi_2}{\sin(\lambda_2 - \lambda_1)}$$

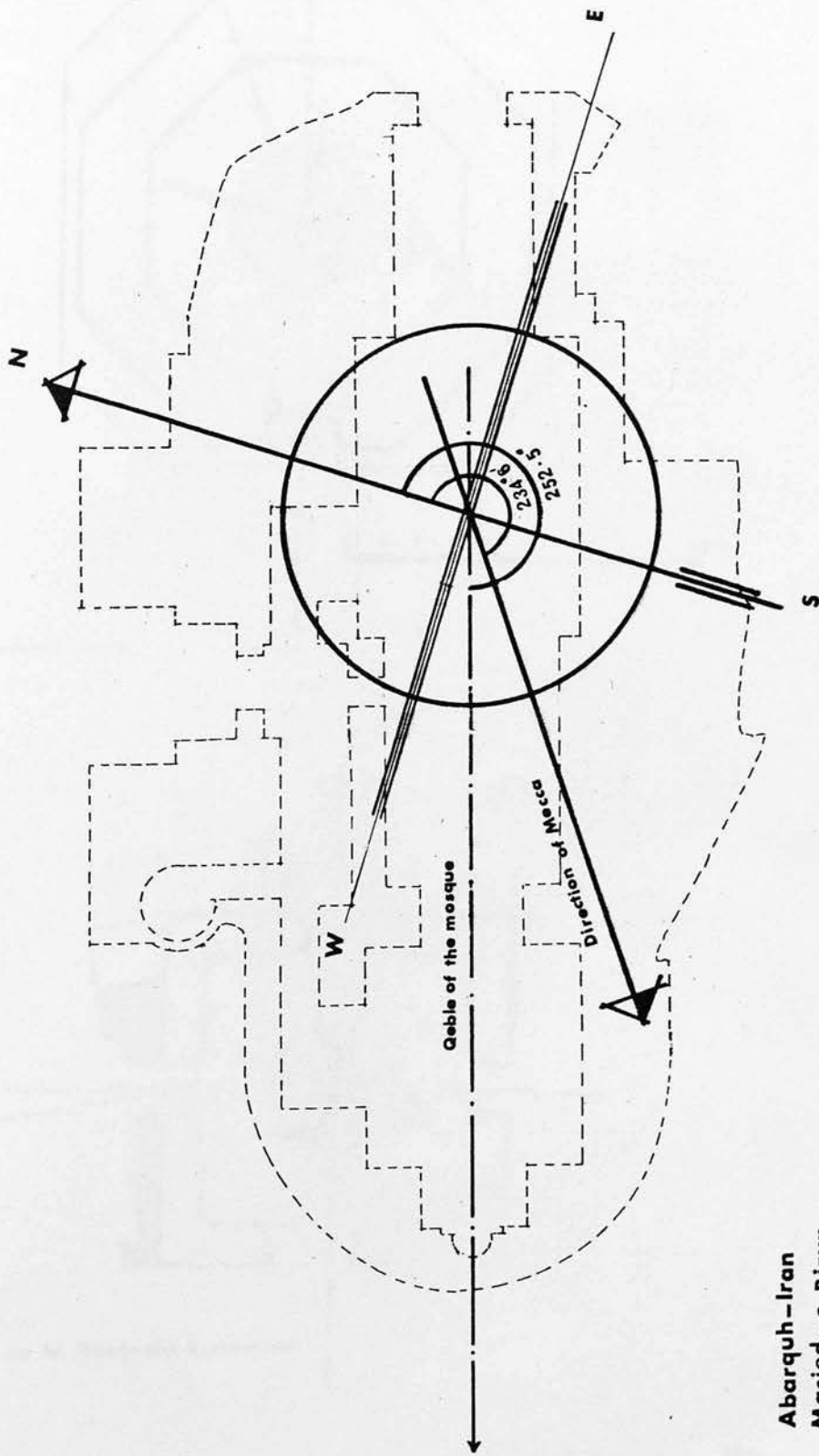
$$\text{Cotg. } \alpha = \frac{(0.51728 \times 0.972438) - (0.855816 \times 0.392567)}{0.233163}$$

$$\text{Cotg. } \alpha = 0.7164837$$

$$\alpha = 54^\circ 22' 44''$$

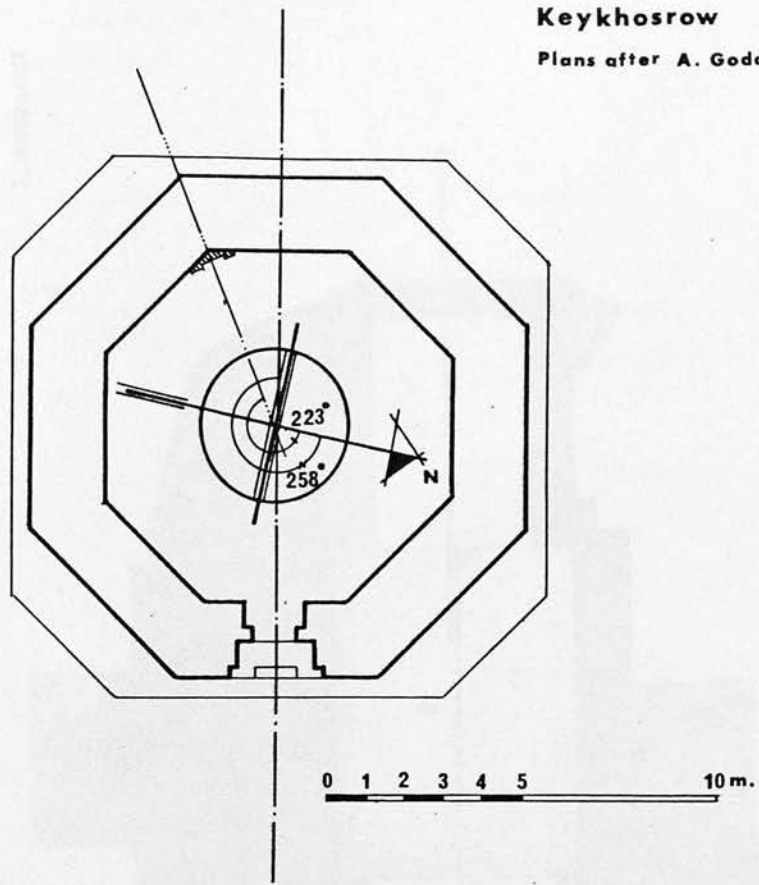
$$A = \alpha + 180^\circ = 234^\circ 22' 44''$$

Abarquh - Iran
 Masjed-e Birun
 Calculation of the qibla

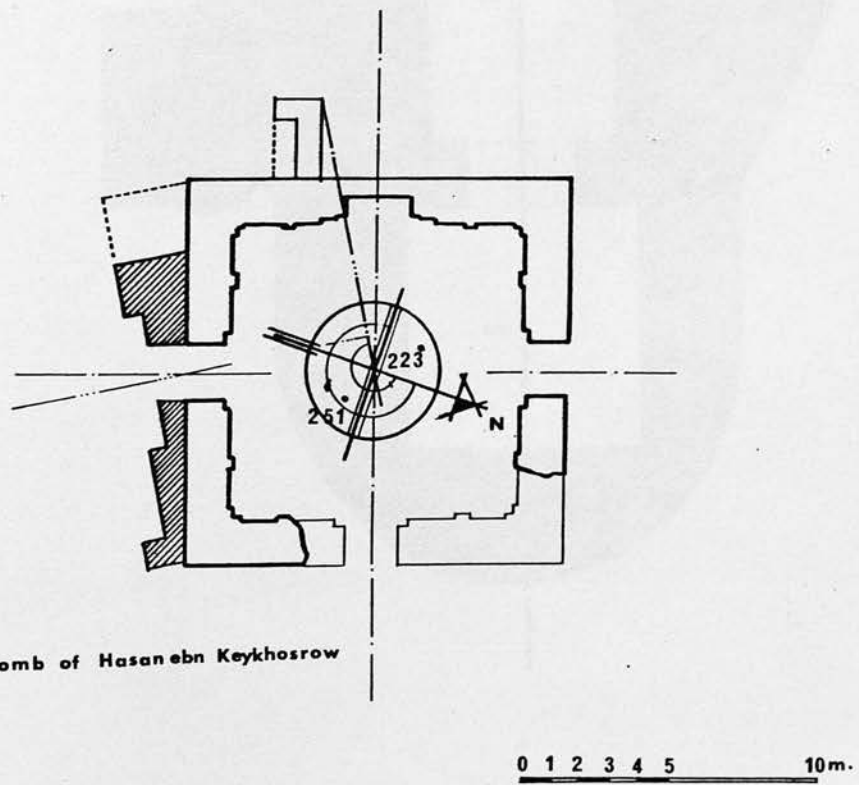


Abarquh - Iran
 Masjed - e Birun
 Orientation plan

Abarquh - Iran
 Orientation of the Gonbad-e Ali
 and the tomb of Hasan ebn - e
 Keykhosrow
 Plans after A. Godard

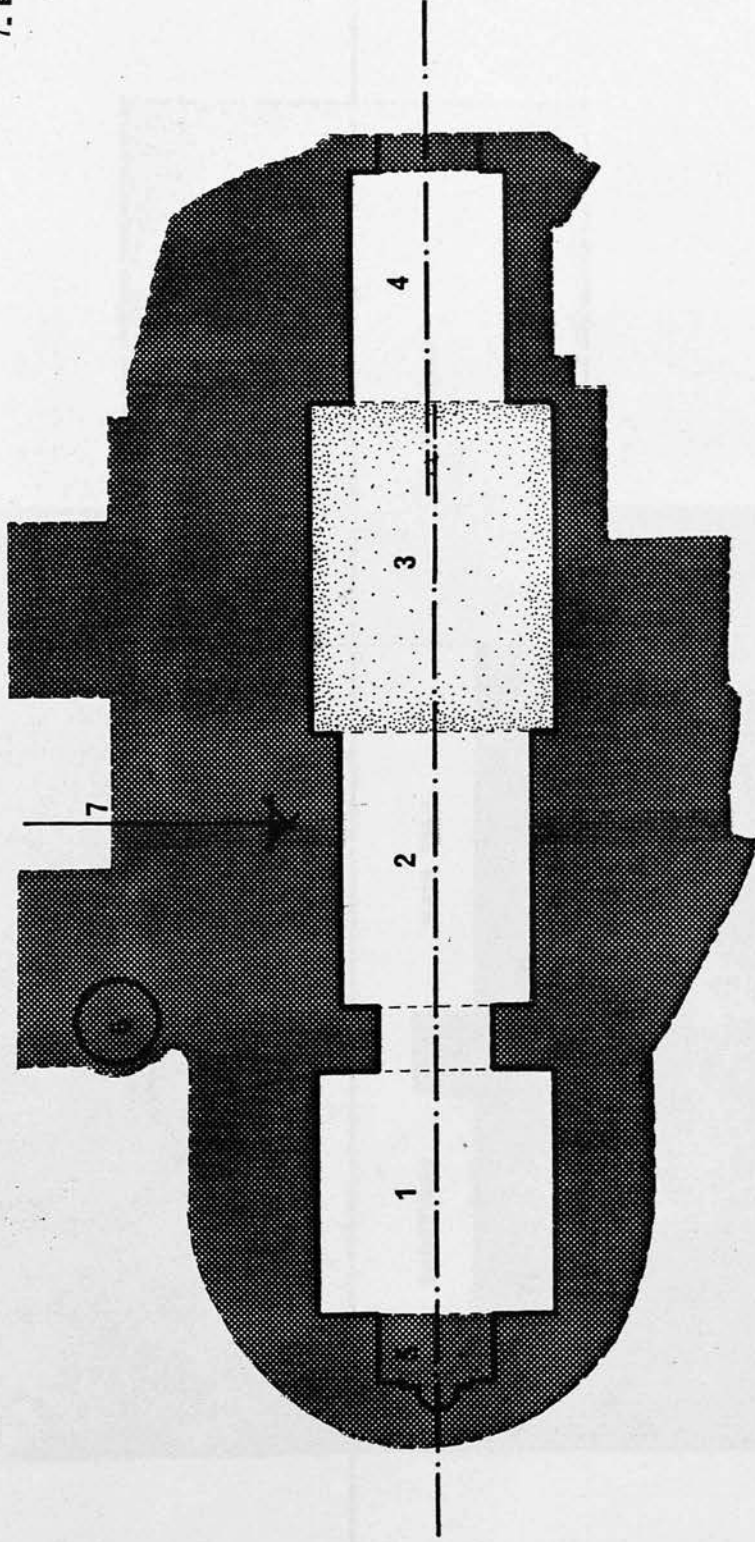


Gunband - e Ali



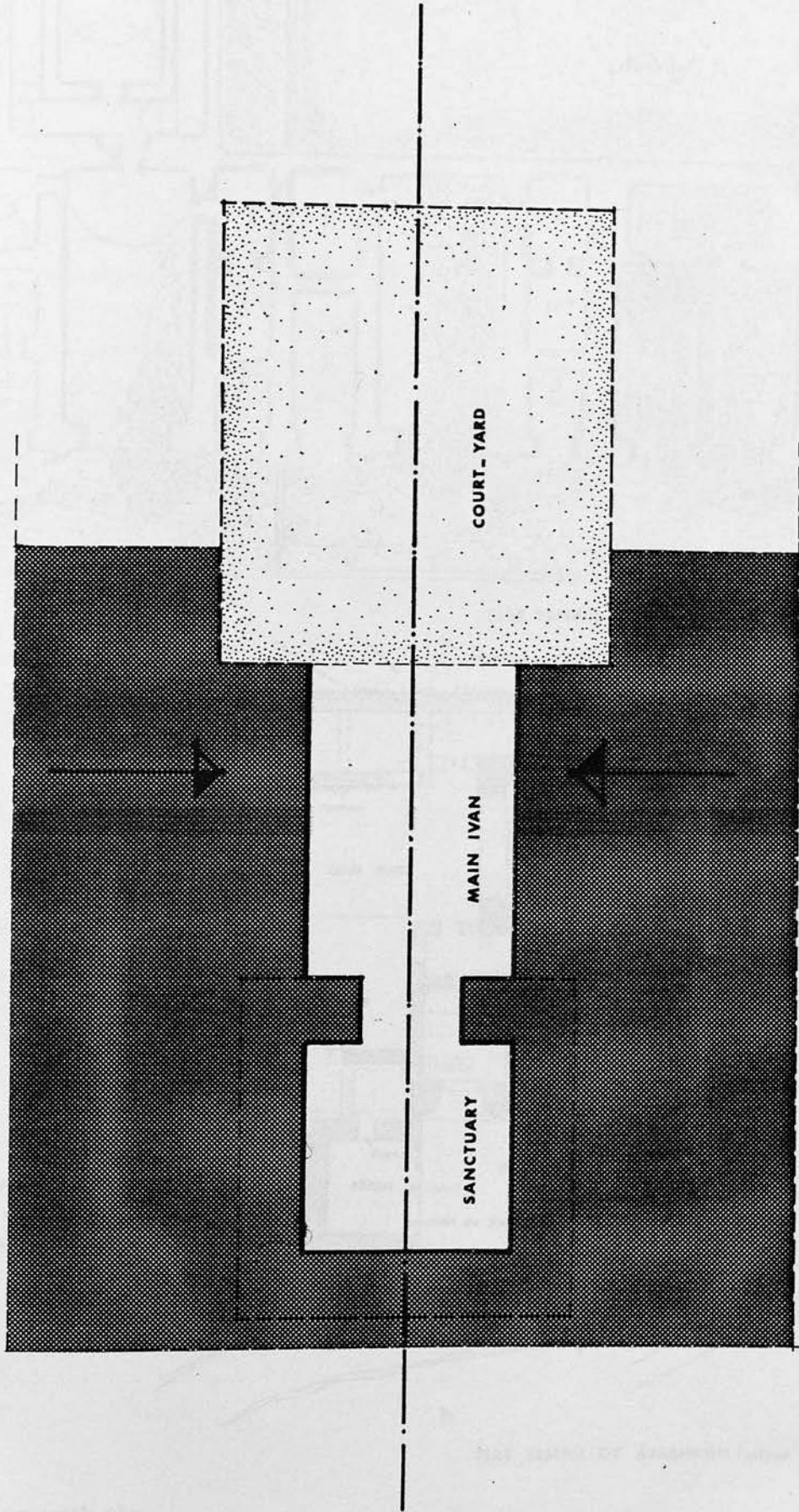
Tomb of Hasan ebn Keykhosrow

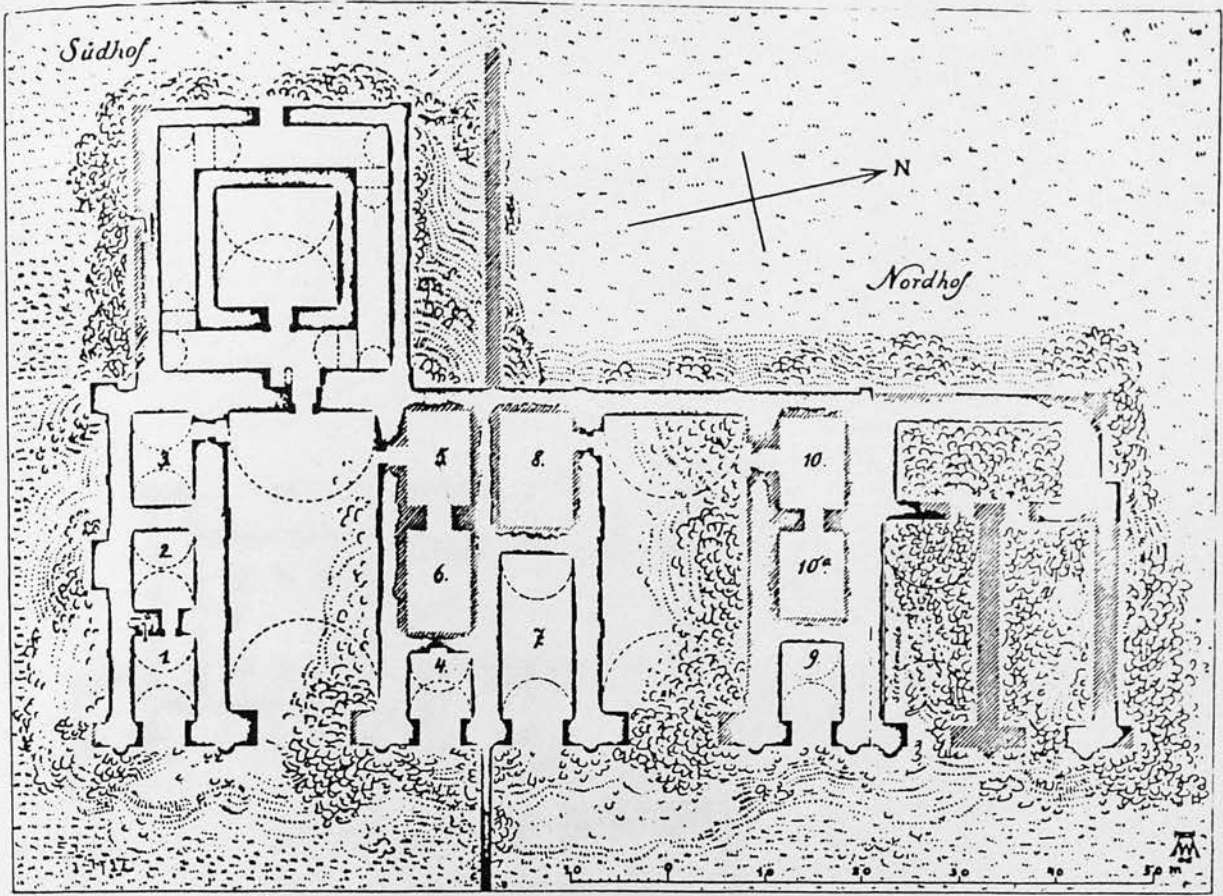
- 1 - SANCTUARY
- 2 - WESTERN IVAN
- 3 - CORT-YARD
- 4 - EASTERN IVAN
- 5 - MIHRAB
- 6 - MINARET
- 7 - ENTRANCE



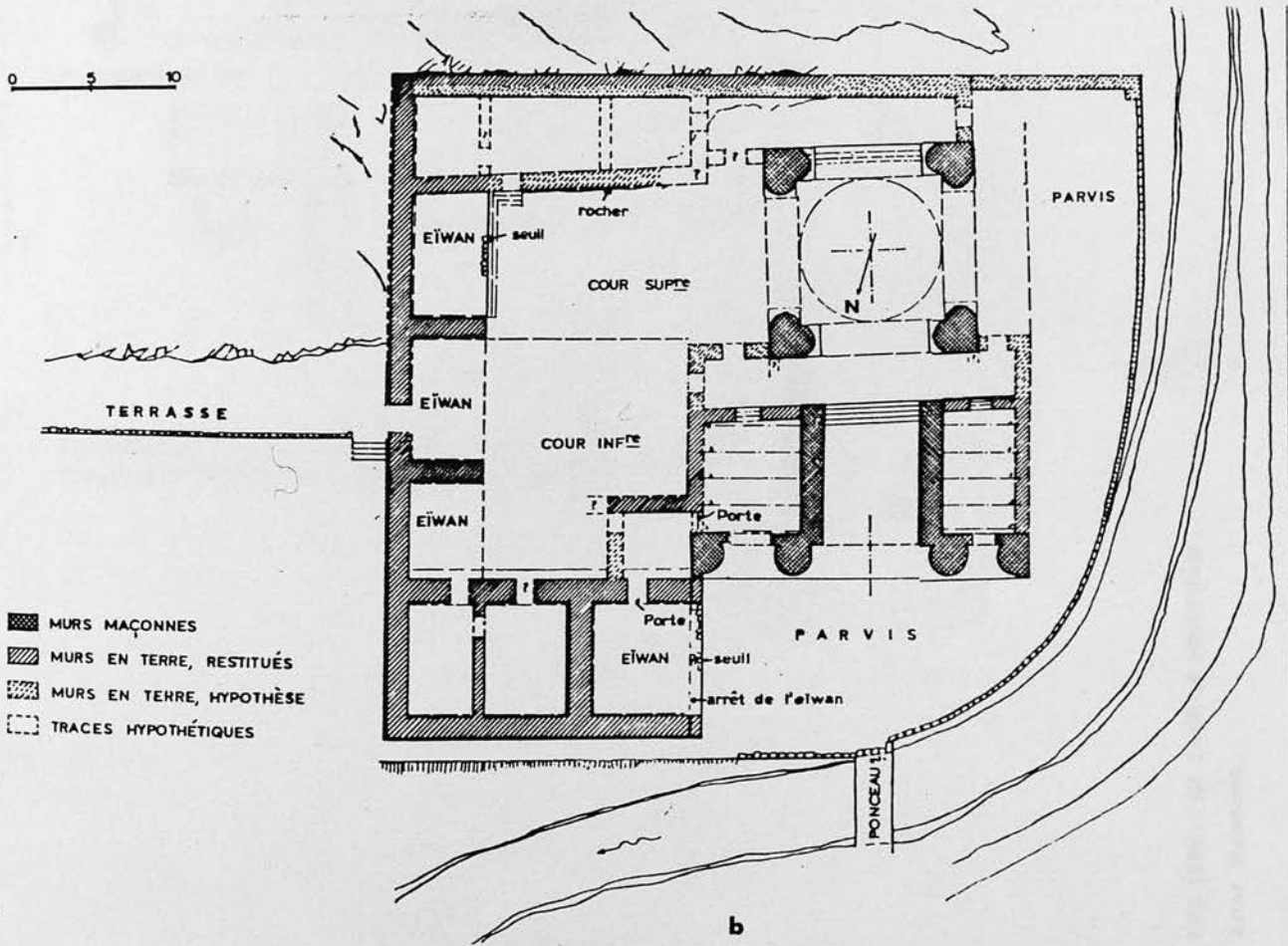
Abarquh - Iran
Masjed-e Birun
 DISTRIBUTION OF THE
 SPACES

Diagram of the plan of
a fire temple



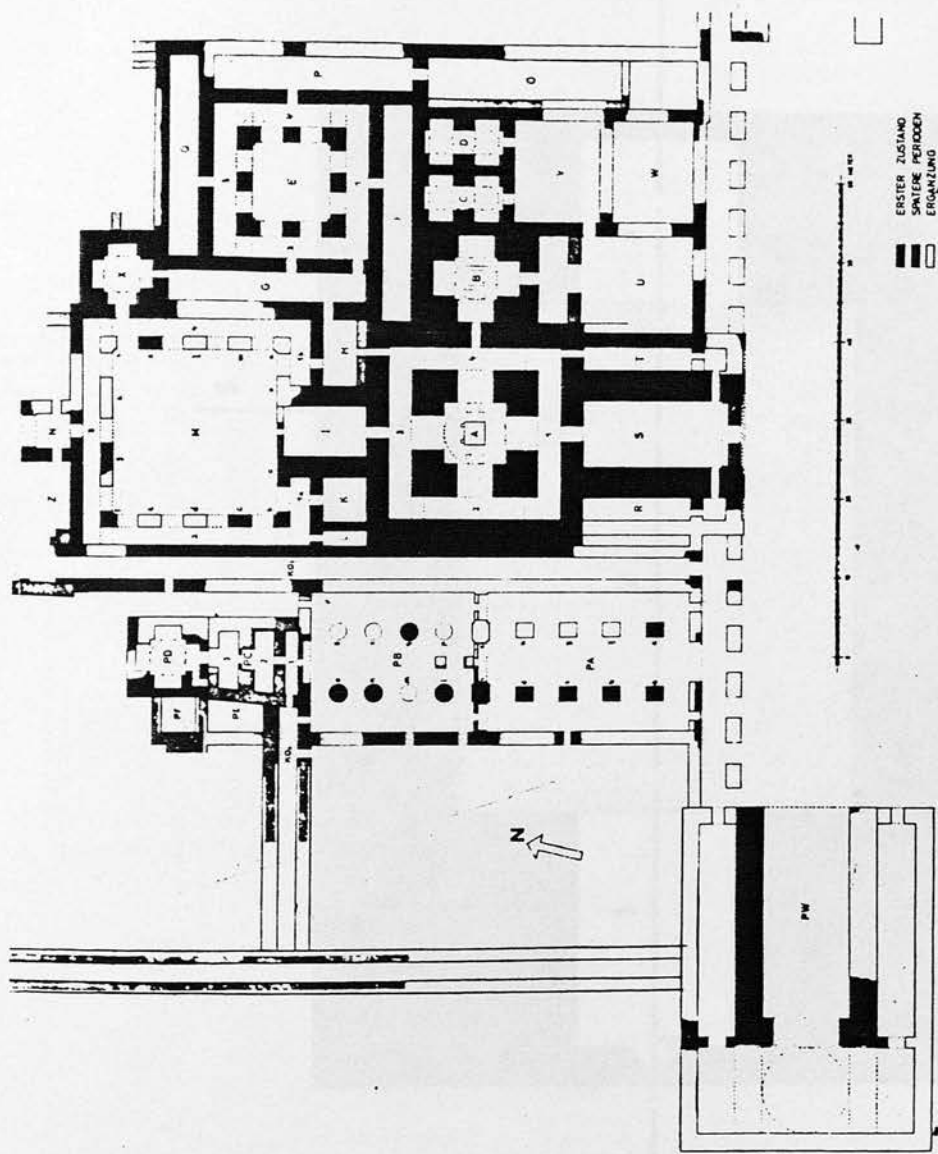


a FIRE TEMPLE OF HATRA (after Andrae)



b FIRE TEMPLE OF ĀTASHKŪH (after Siroux)

Fire temple plan with the sanctuary and the ivan



ERSTER ZUSTAND
 SPÄTERE PERIODE
 ERGÄNZUNG

FIRE TEMPLE OF TAKHT-E SOLEYMĀN

After Naumann

- 1- MAIN IVAN
- 2- CENTRAL COURT- YARD
- 3- SECOND IVAN
- 4- MIHRAB
- 5- USUAL PLACE OF THE ENTRANCES

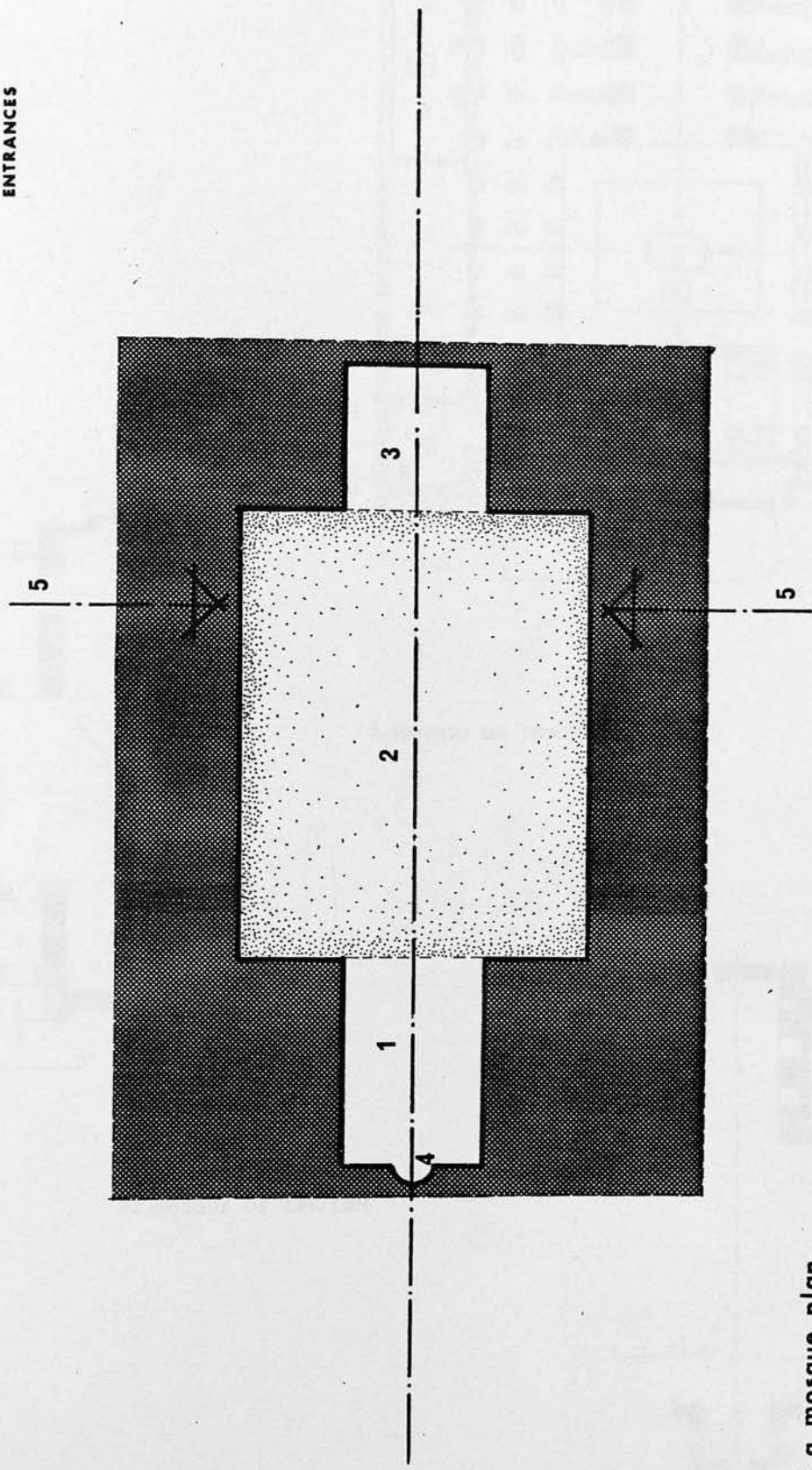
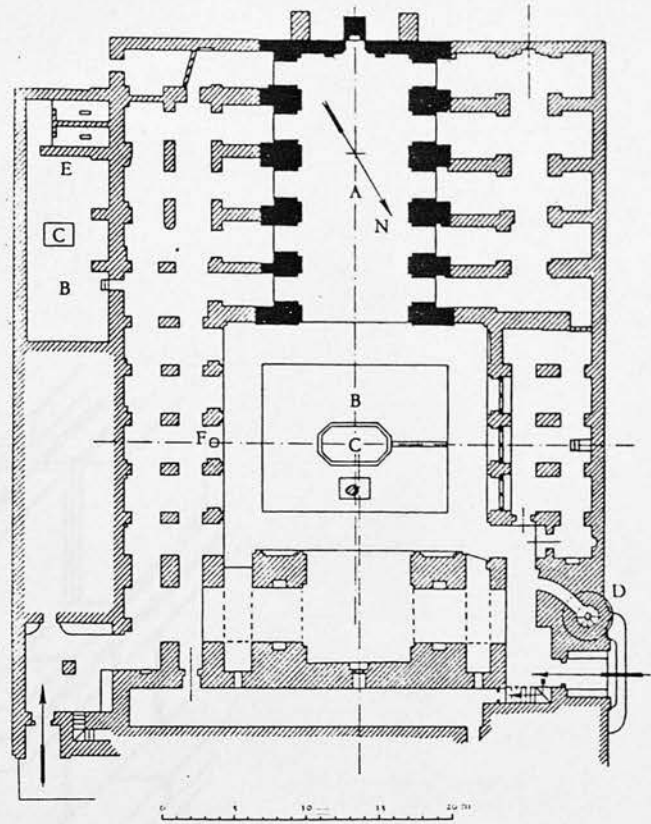


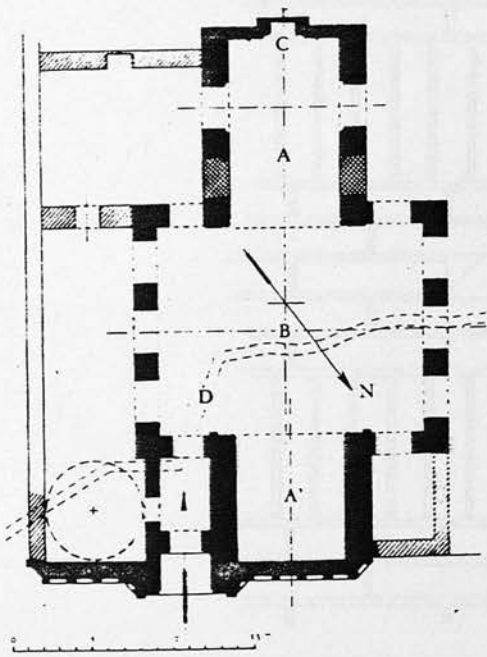
Diagram of a mosque plan
with two ivan

1. JAME' MOSQUE OF NAYRIZ



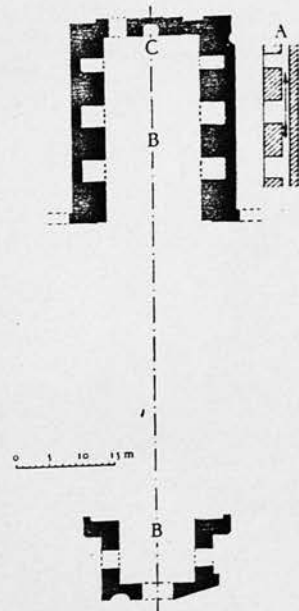
1

2. MOSQUE OF FORUMAD



2

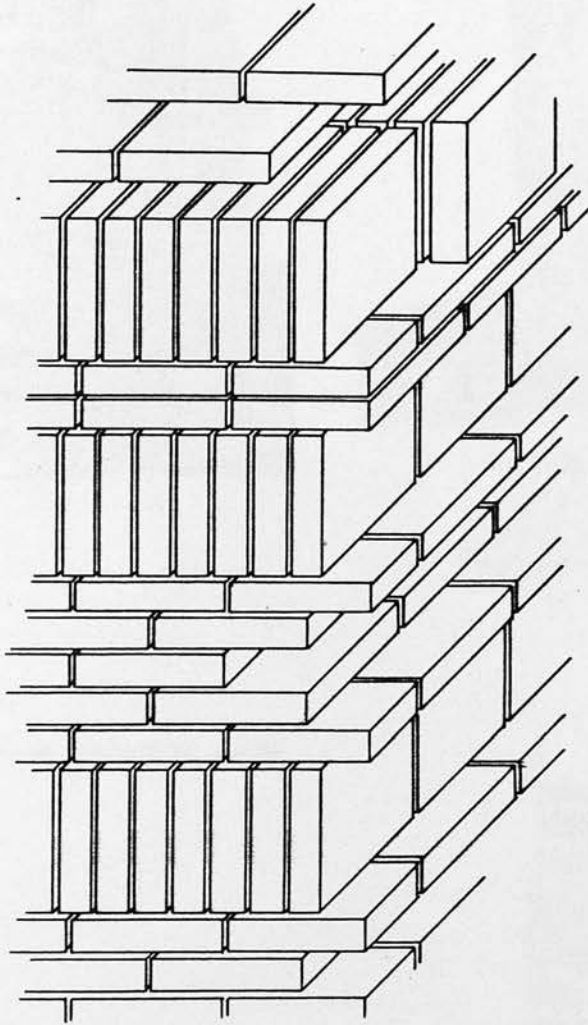
3. MOSQUE OF ZAWZAN



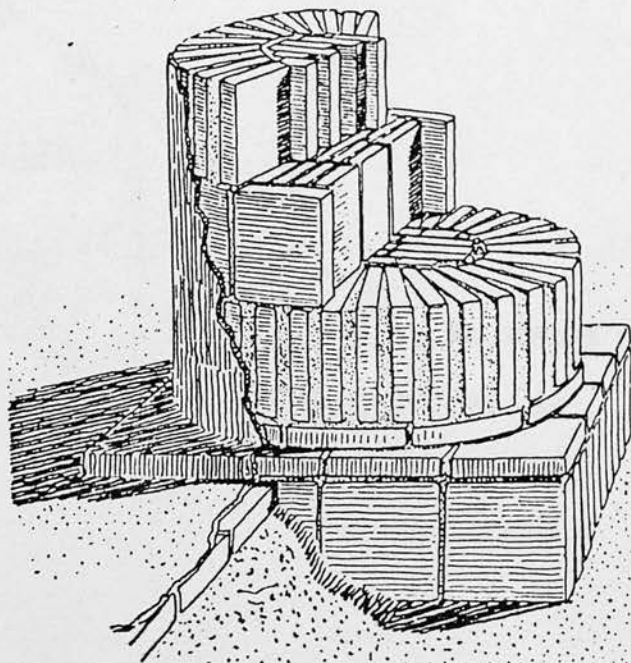
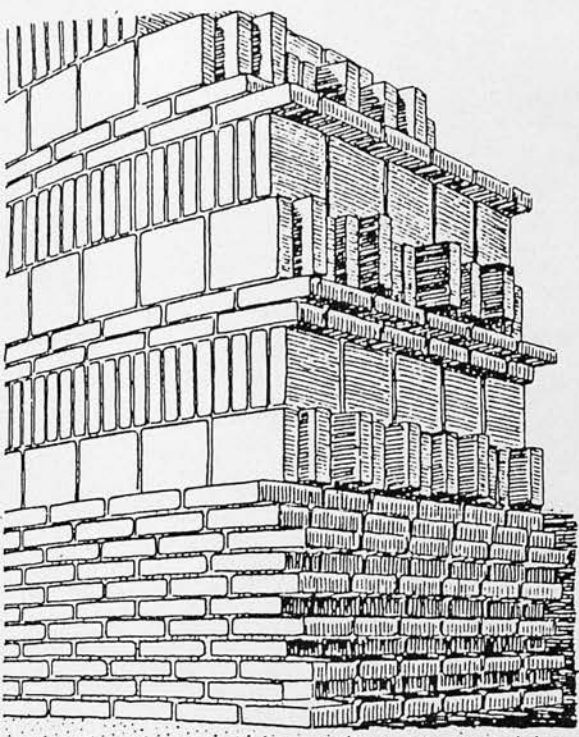
3

PLAN OF THE EARLY MOSQUES WITH TWO IVANS

After A. Godard



ABARQUH IRAN
Masjed-e Birun
BRICK-WORKS OF THE COLUMN
BETWEEN CHAMBERS 5 AND 10



A

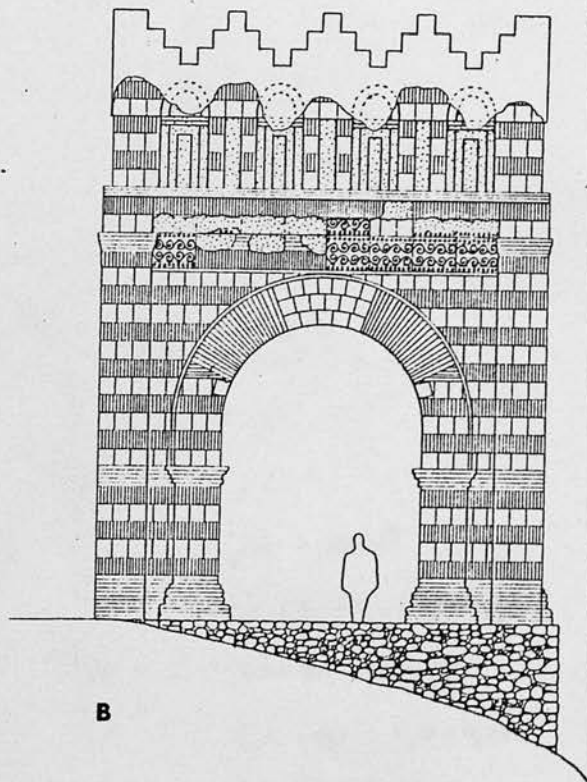
BRICK WORKS OF THE PARTHIAN PALACE IN ASHŪR

After O. Reuter

FIRE TEMPLE OF THE GAL'E ZOHAK

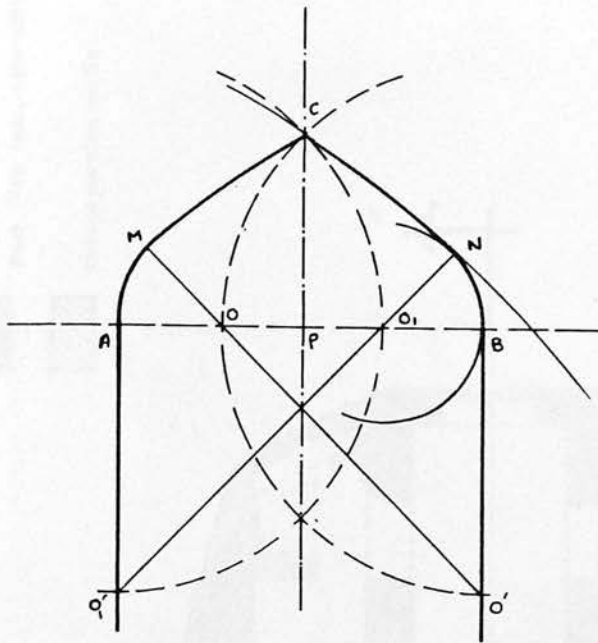
NORTH - EAST ELEVATION

After W. Kleis



B

Parthian and Sasanian brick-works



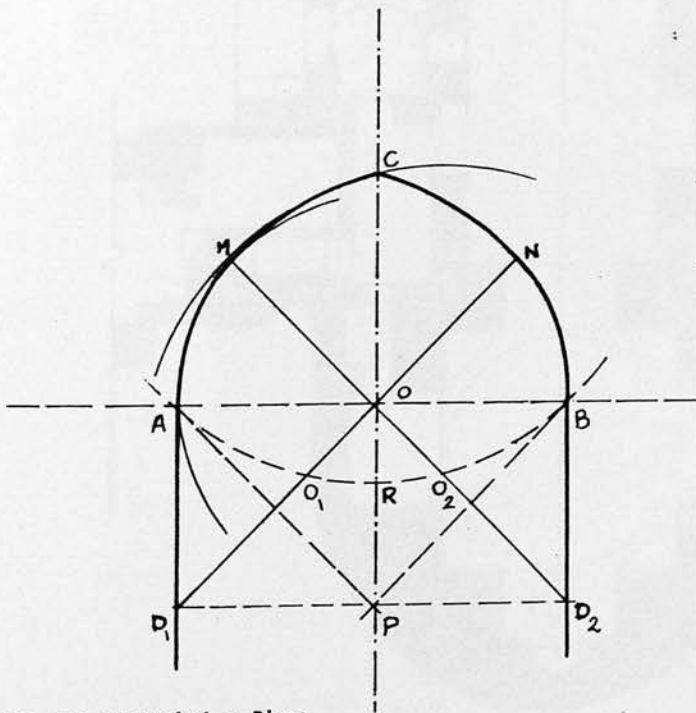
$$PC = \frac{1}{2} AB = AP = PB$$

$$AO_1 = BO_1 = AC = BC$$

$$AO_2 = AO_3 = BO_2 = BO_3$$

$$OA = O_1B \quad O_2M = O_3N$$

Well developed four centre arch in Iran



$$OC = AB\sqrt{3}$$

$$CA = CB = CR = CO_1 = CO_2$$

$$OP = OA = OB = \frac{AB}{2}$$

$$O_1C = O_2C = O_3N = O_4M$$

$$OM = ON = OA = OB$$





Analysis of an arch of Masjed-e Birun

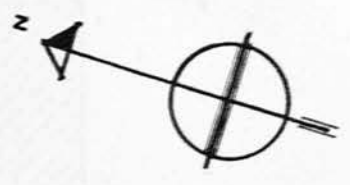
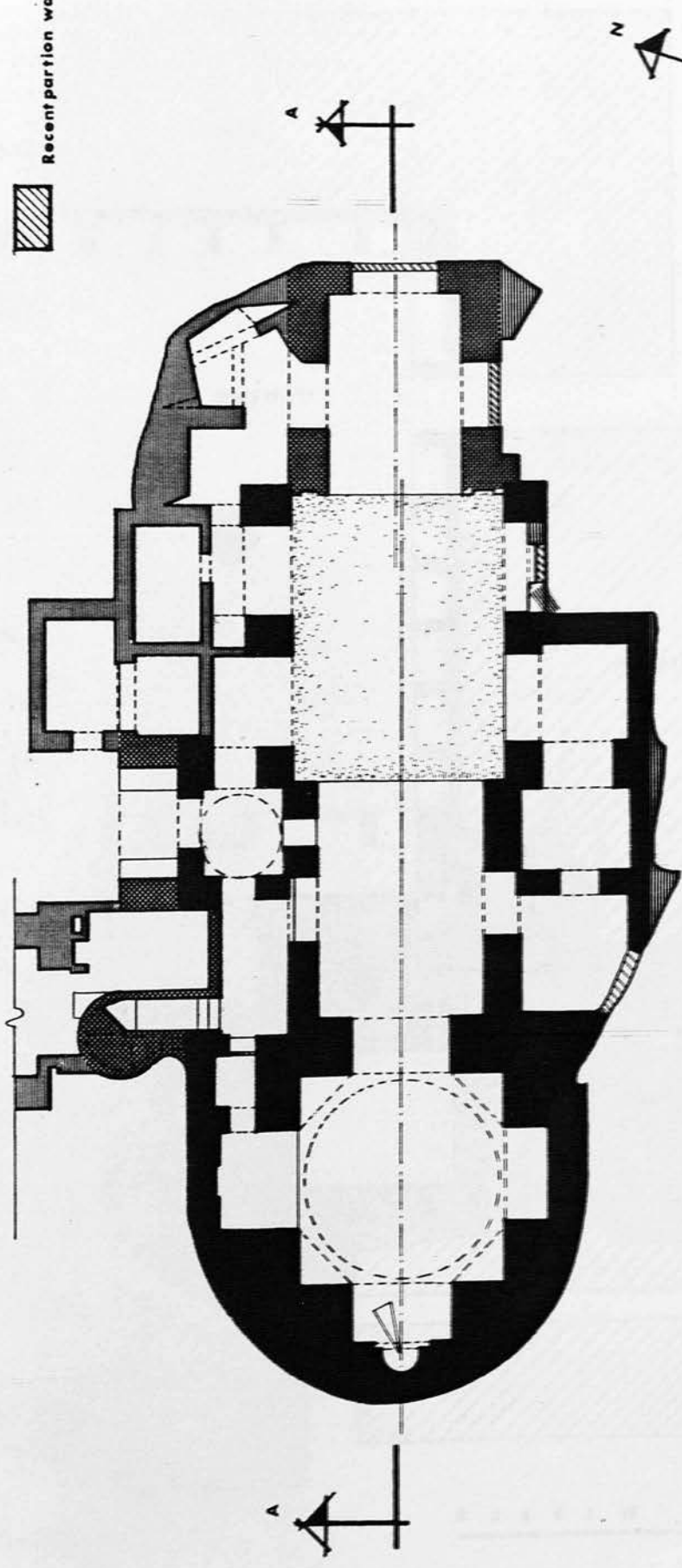
ABARQUH IRAN

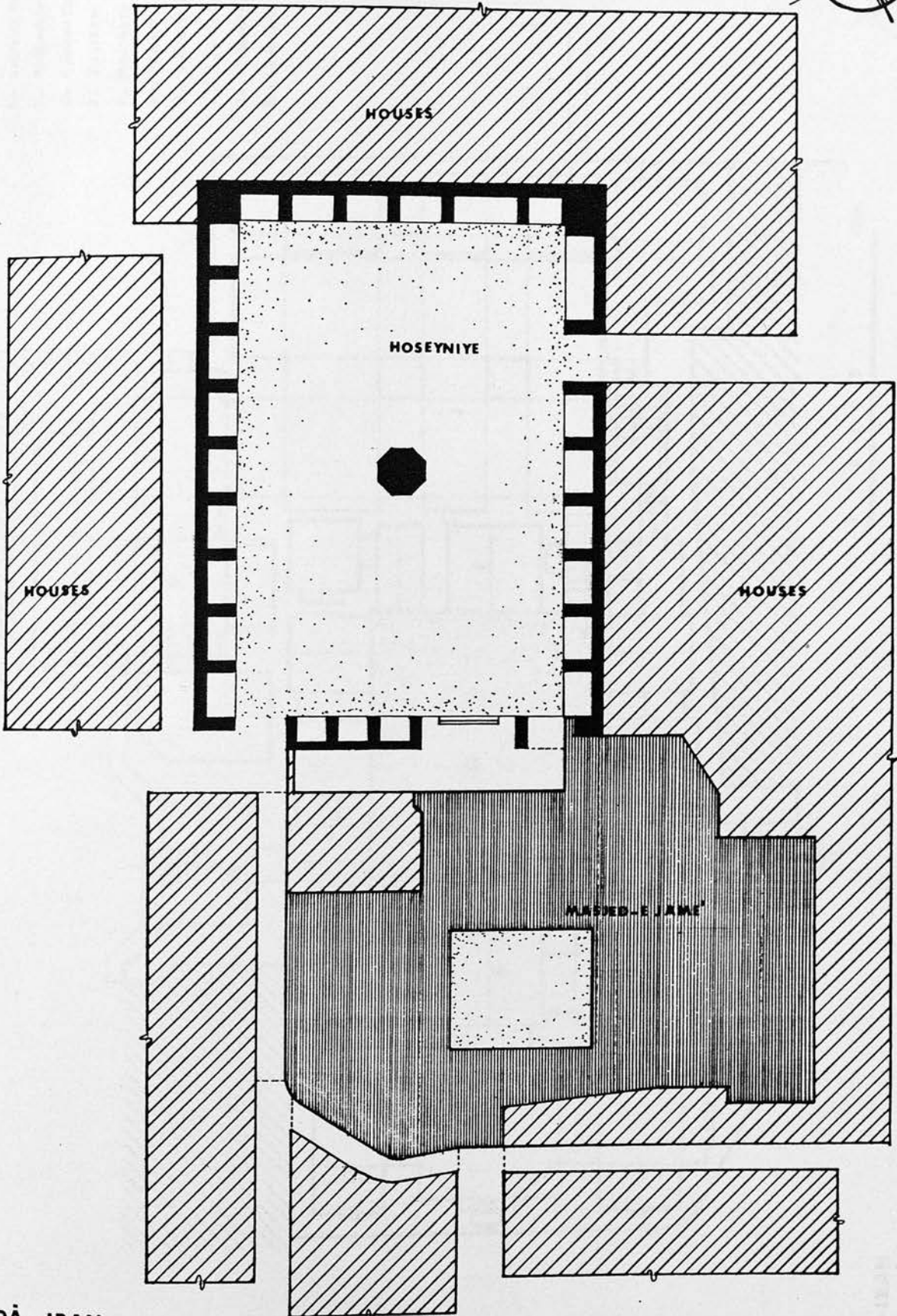
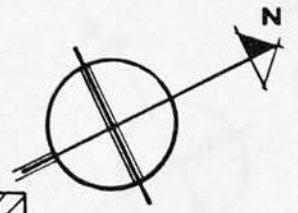
Masjed-e Birun

Comparison of the arches of the mosque with the well developed four centre arches of Iran

ABARQUH IRAN
 Masjed - e Birun
 CHRONOLOGICAL PLAN
 Sc. 1: 200

-  Sasanian Structure
-  Pre 14th cent. alteration
-  Post 14th cent. alteration
-  Recent partition walls





'AQDÄ - IRAN

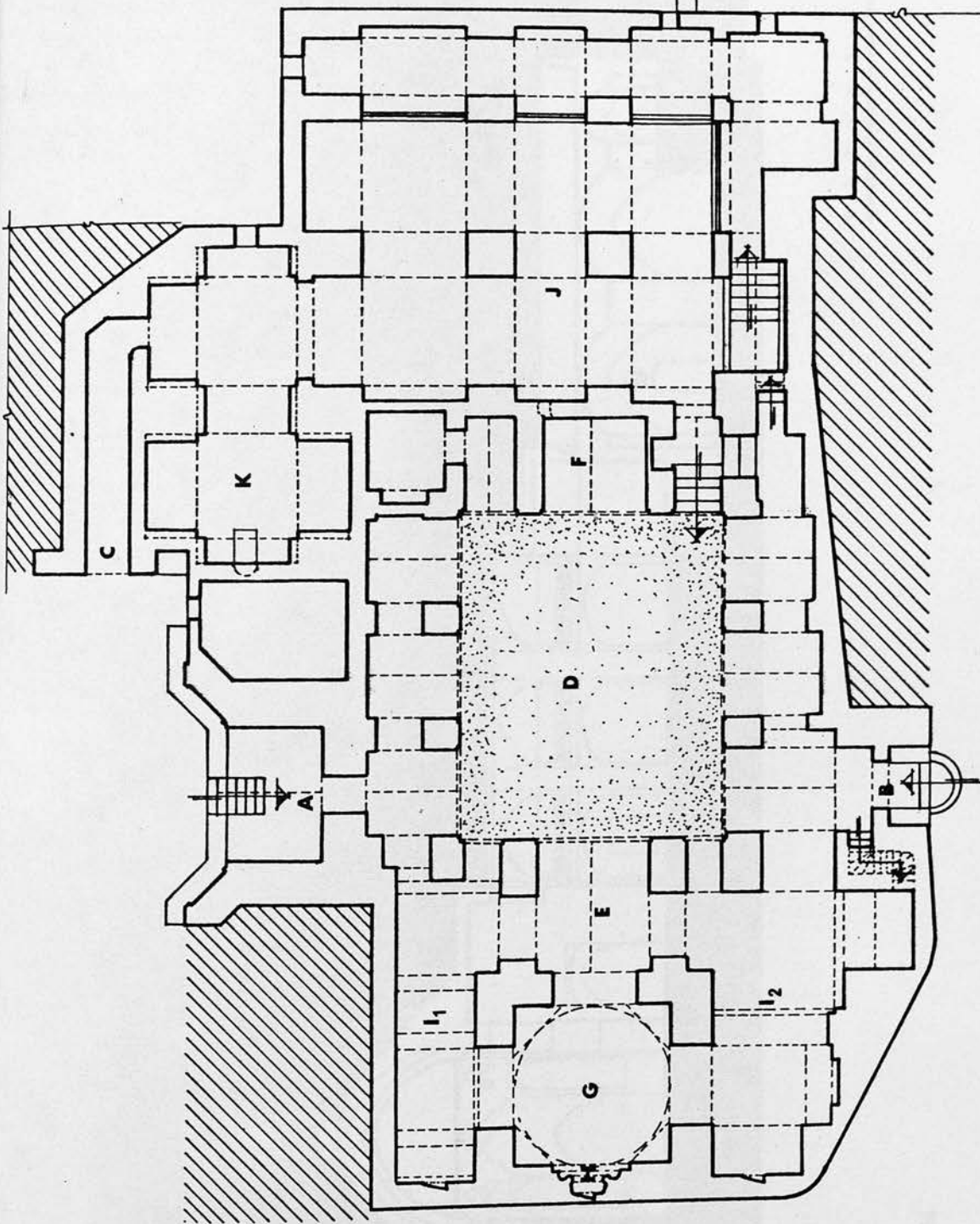
Meydän-e Husainia & Masjed-e Jâme'

Site Plan

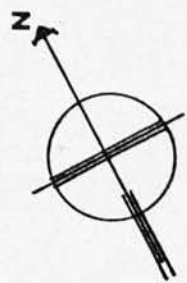
Sc. 1:400

0 2 4 6 8 10 20

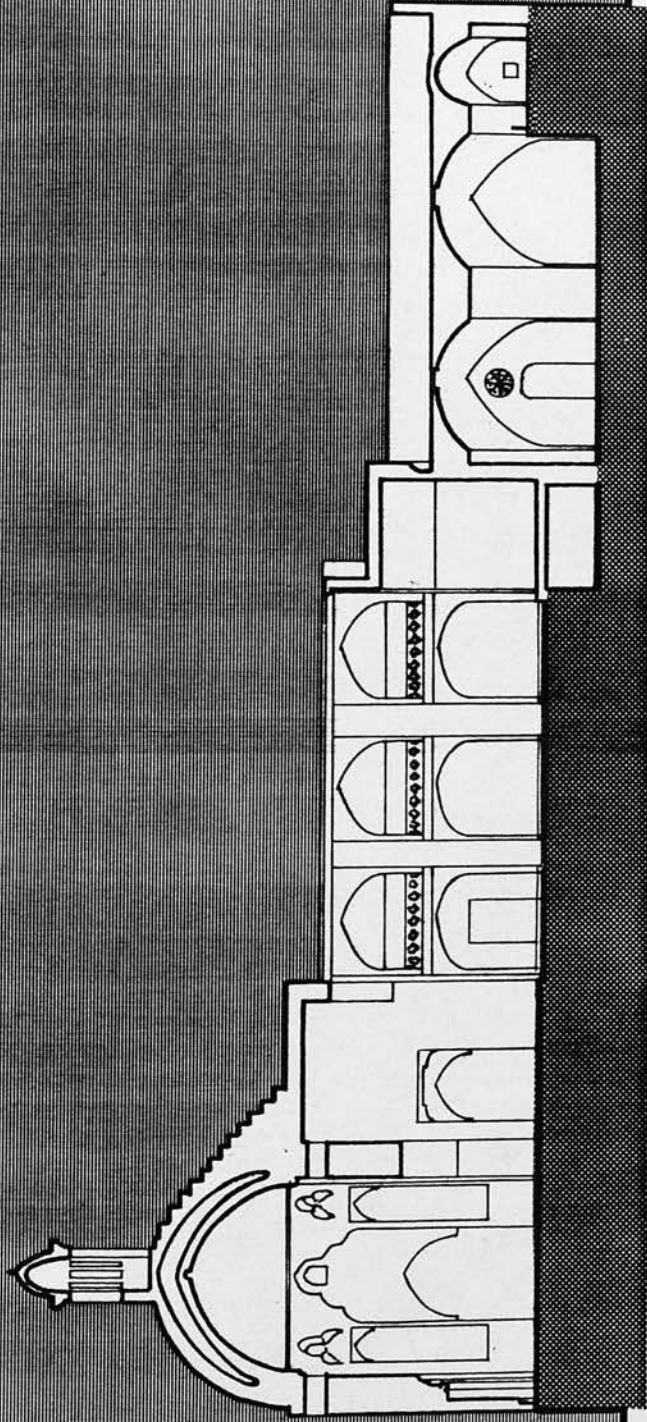
- A - Western Entrance
- B - Eastern Entrance
- C - Shabestan Entrance & Corridor
- D - Central Court-Yard
- E - Southern Ivan
- F - Northern Ivan
- G - Domed Sanctuary
- H - Main Mihrab
- I₁ & I₂ - Side Galleries
- J - Shabestan
- K - Shabestan Private Chamber



0 1 2 3 4 5
10 m.

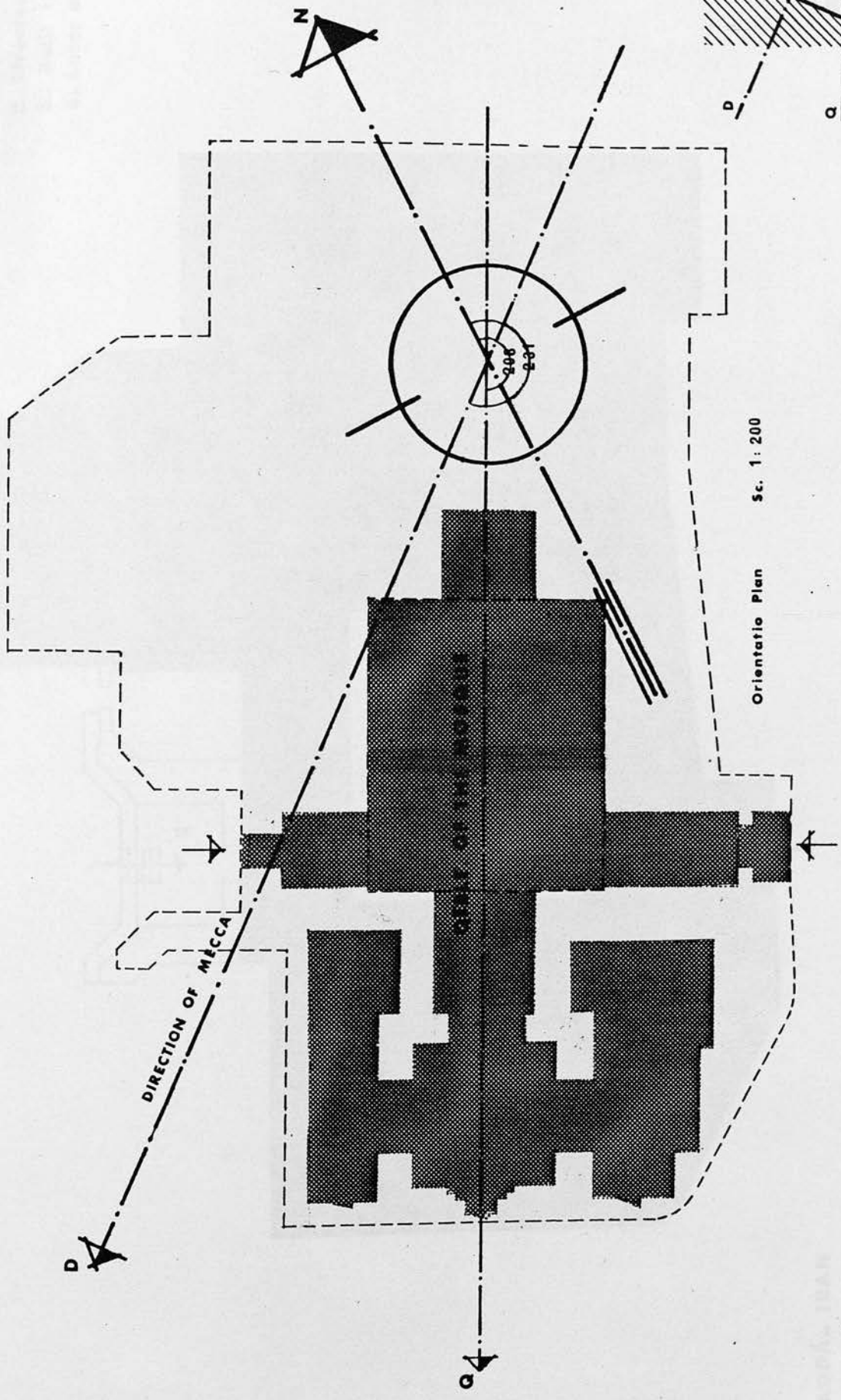


'AQDĀ - IRAN
Masjed-e Jāme'
Plan
Sc. 1:200



'AQDĀ - IRAN
Masjed-e Jāme'
Section A - A
Sc. 1:200

0 1 2 3 4 5 10 m.

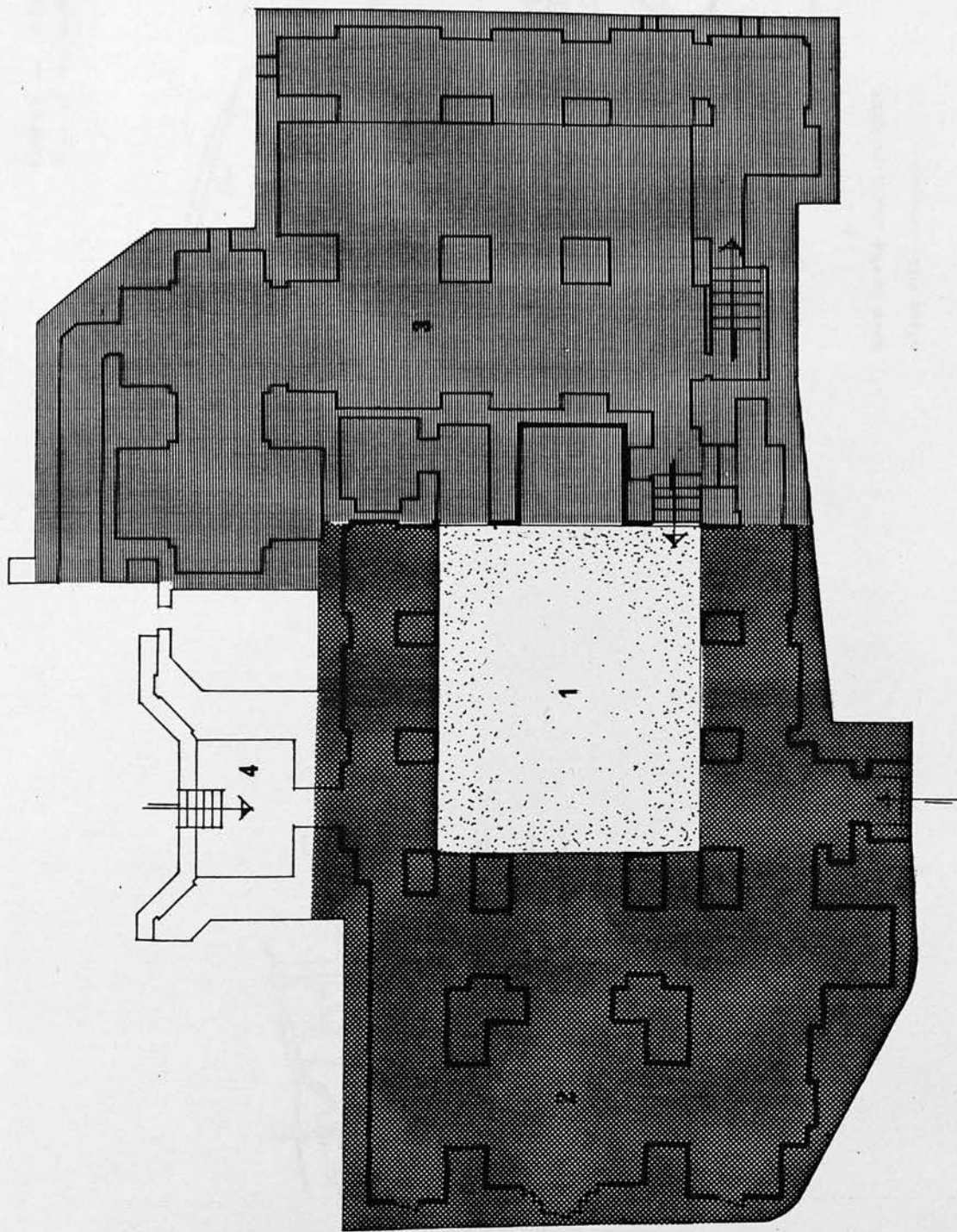


'AQDĀ - IRAN
Masjed-e Jame'
Orientation Plan

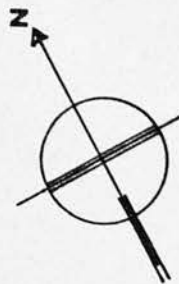
Sc. 1:200
Orientatio Plan

Correction of the qibla in
the mihrabs (detail)
Q - Old direction
D - New corrected direction

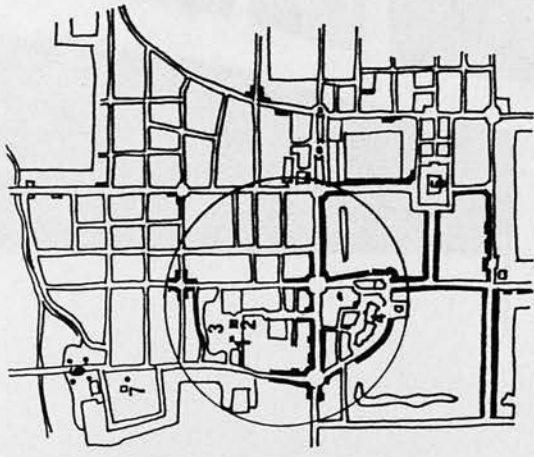
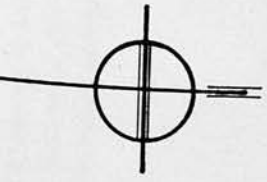
- 1- Court- Yard
- 2- Structure pre 847 H.
- 3- Built in 847
- 4- Later addition



'AQDĀ- IRAN
 Masjed-e Jāme'
 Chronological Plan
 Sc 1:200

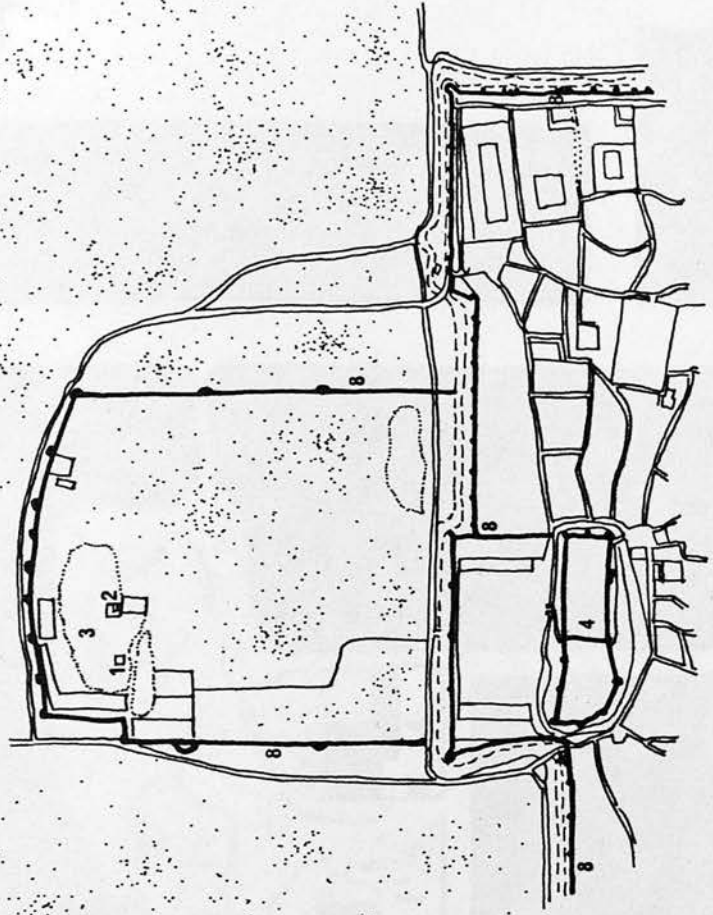


Herat — Afghanistan
 Plan of the north west of the city



A

- 1 - Shrine of Shāhzāde Abdollāh
- 2 - Shrine of Shāhzāde Abolqāsem
- 3 - Mound of Kohandez
- 4 - Citadel

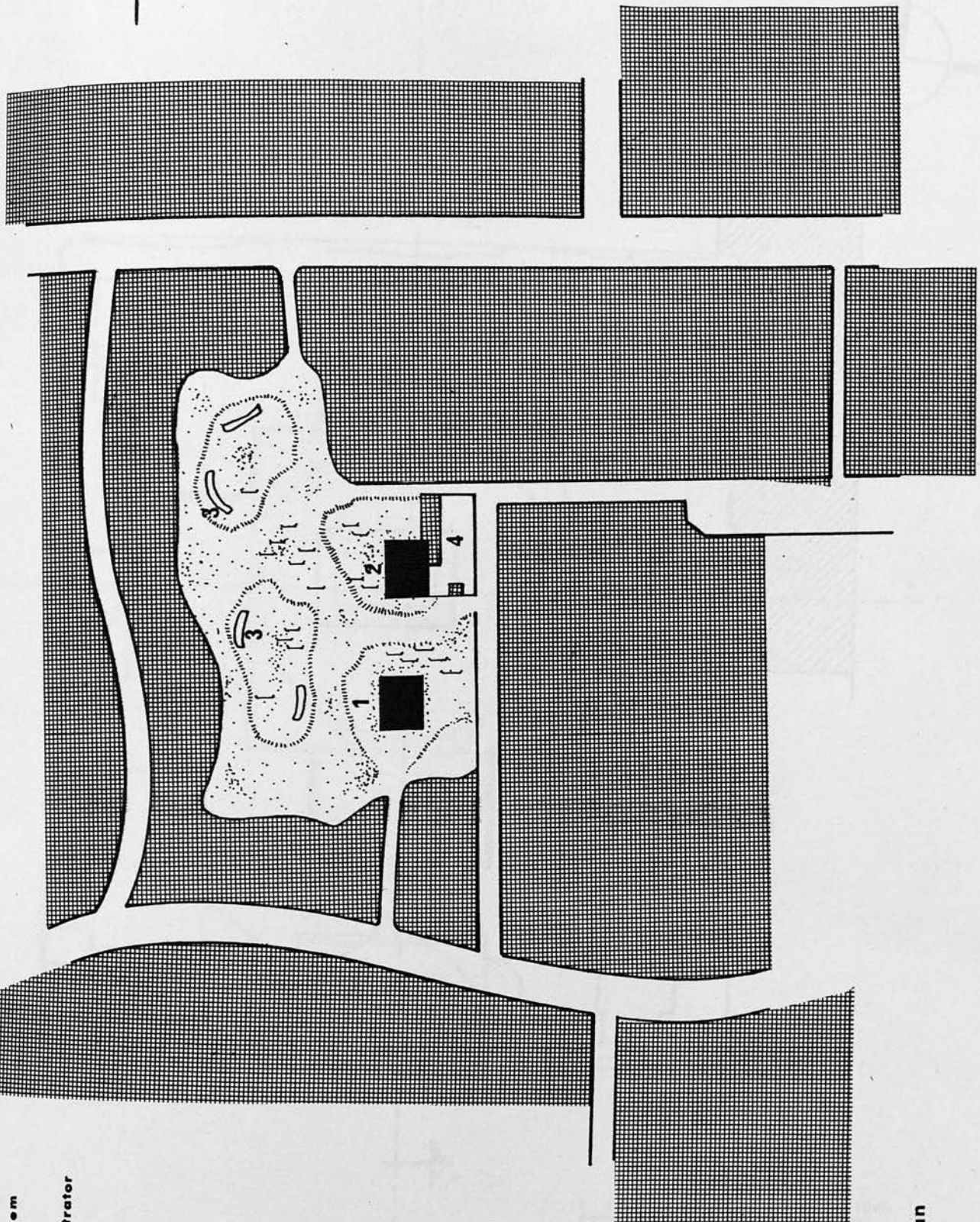
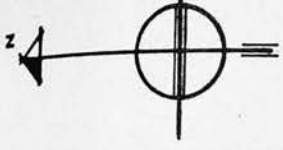


B

Area in the circle in 1924,
 after Niedermayer.

- 5 - Jāme' mosque
- 6 - Madrese of Hoseyn.e Bayoqrā
- 7 - Shrine of Gowharshād
- 8 - Old city wall

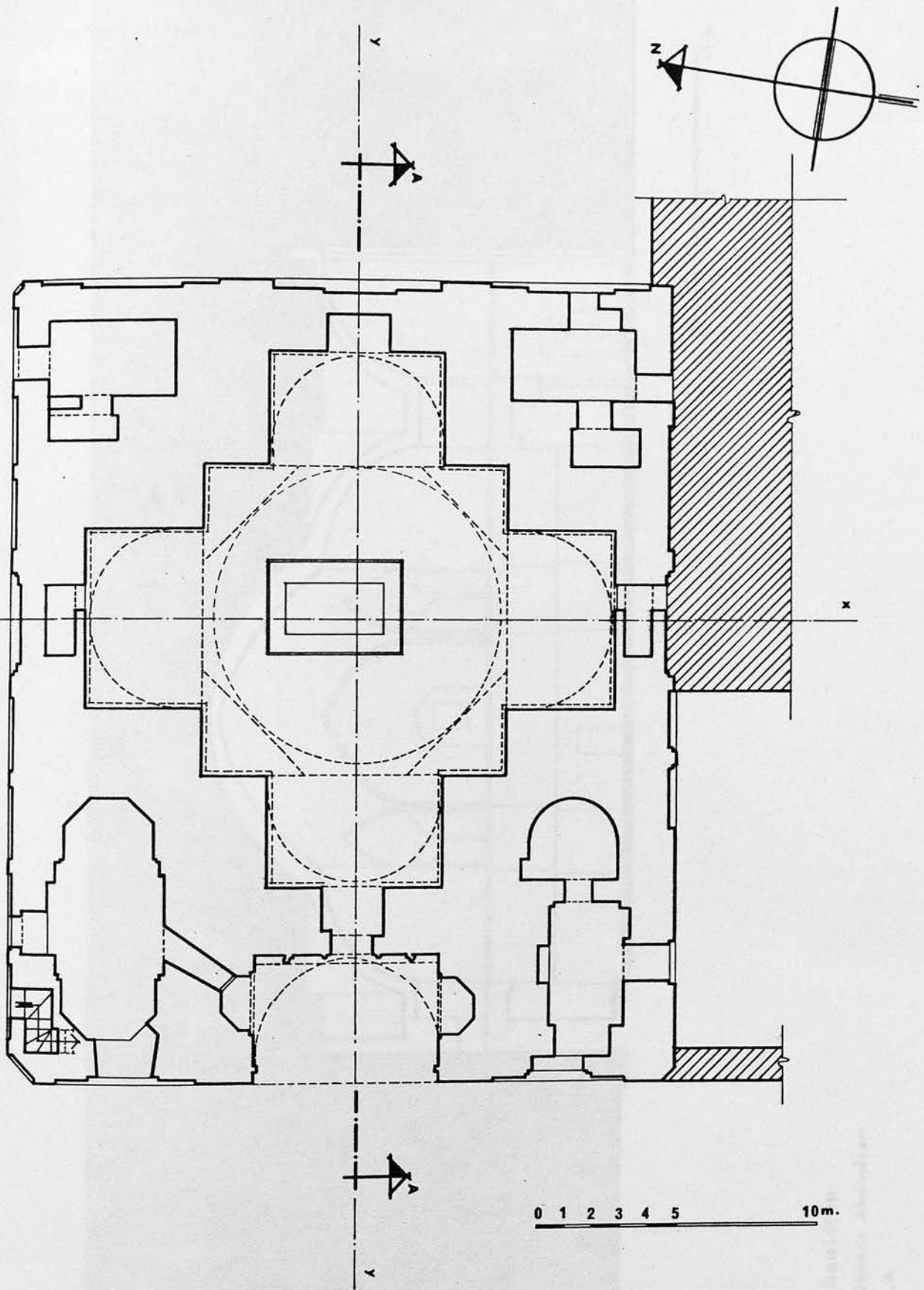
- 1- Shrine of Shāhẓāde Abdolīāh
- 2- Shrine of Shāhẓāde Abolqāsem
- 3- Ruins of the anclet walls
- 4- House of the shrines administrator



Herat, Afghanistan
 KOHAN DEZ
 Sketch plan

fig. 39

0 50 100 150 200 m.

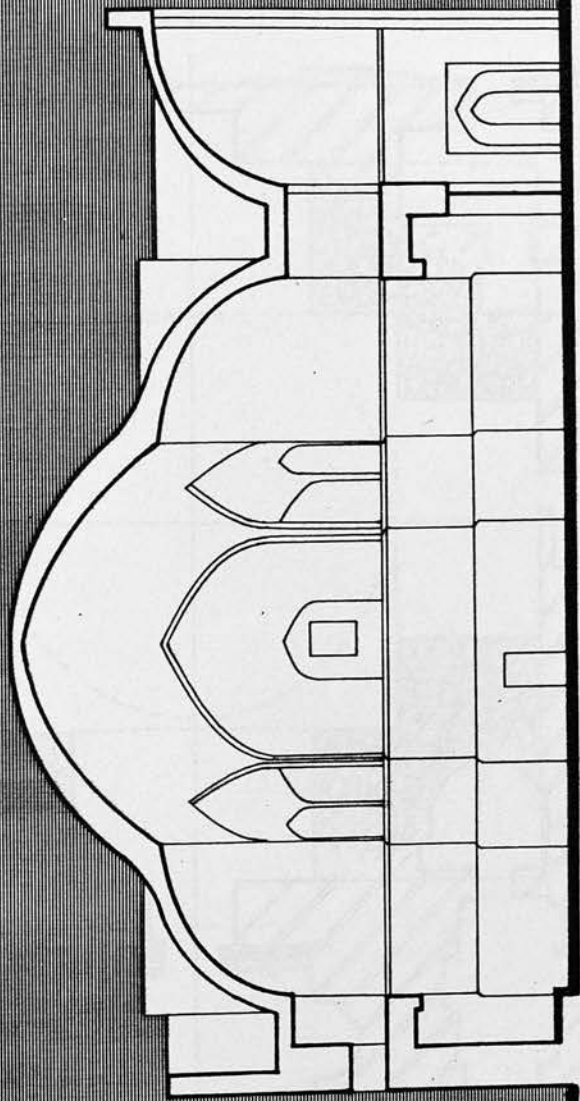


Herat - Afghanistan

Shrine of Shāhzāde Abolqāsem




Plan

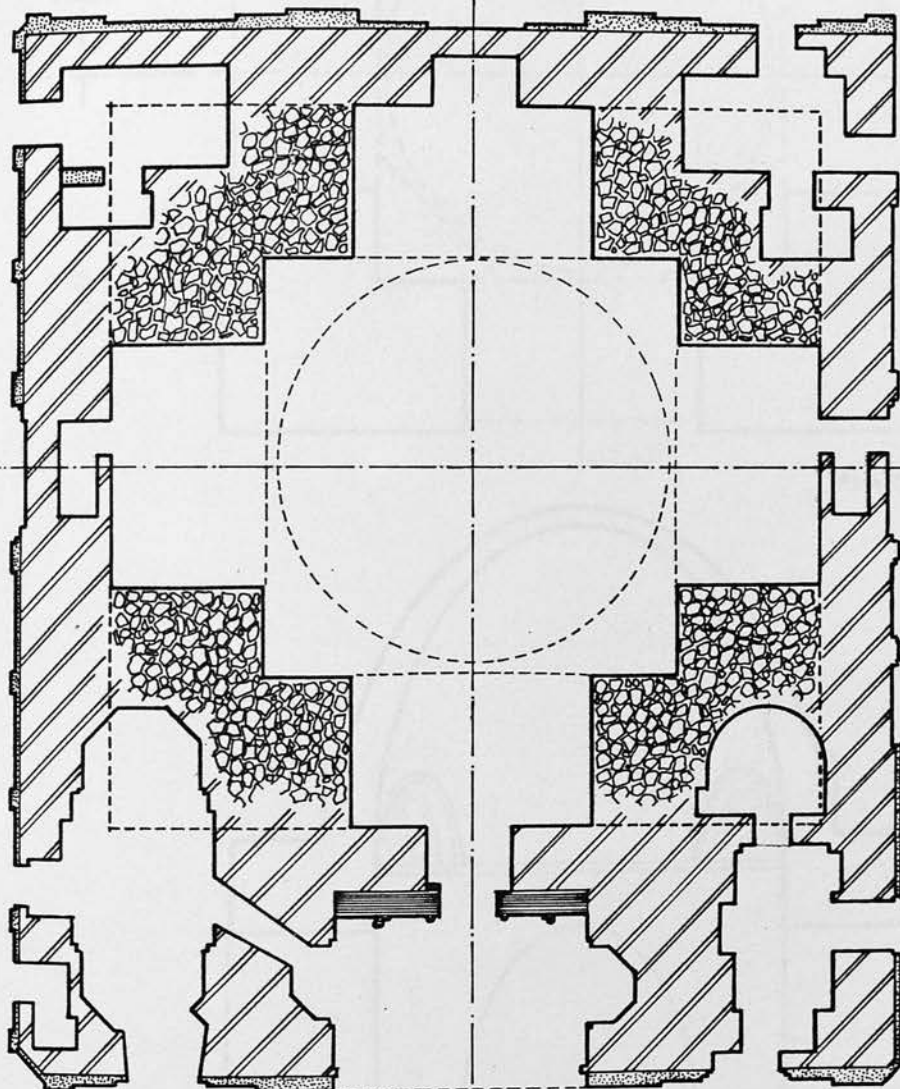
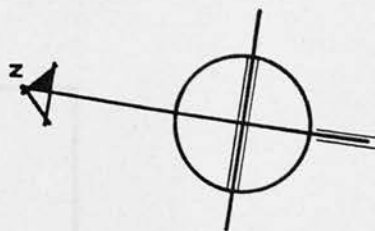
Sc. 1:200



0 1 2 3 4 5 10 m.

Herat - Afghanistan
Shrine of Shāhẓāde Abolqāsem
SECTION A - A
Sc. 1:200

-  Ancient stone work
-  Safavid brick work
-  19th-century addition
-  Recent restoration

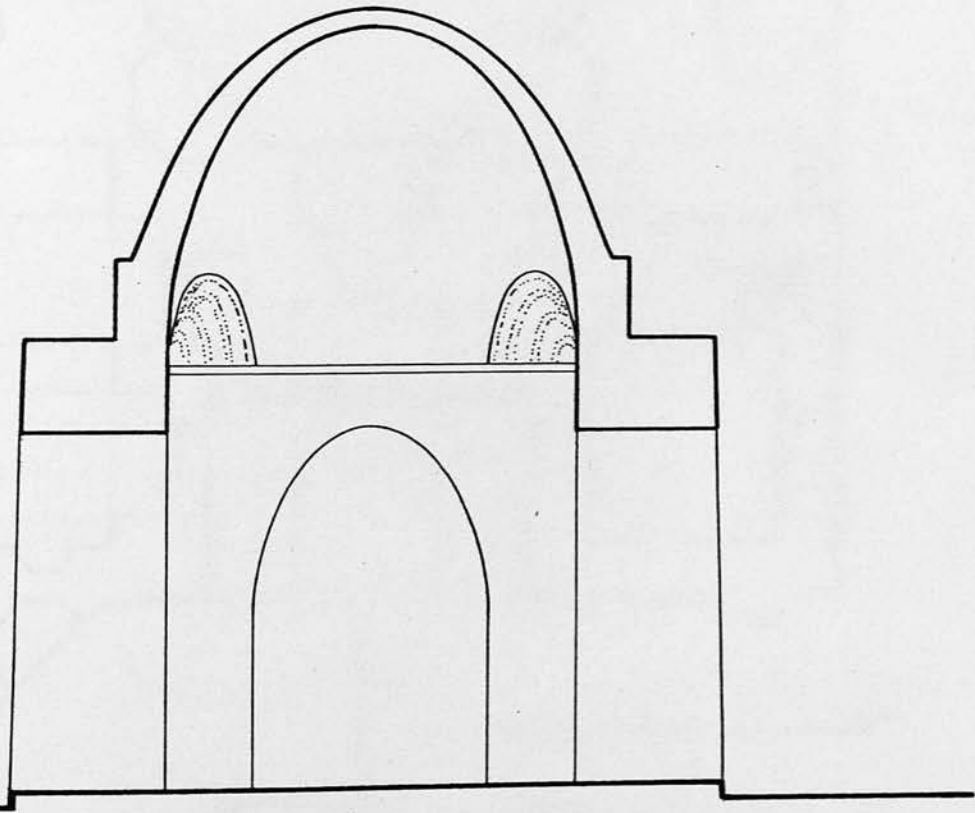
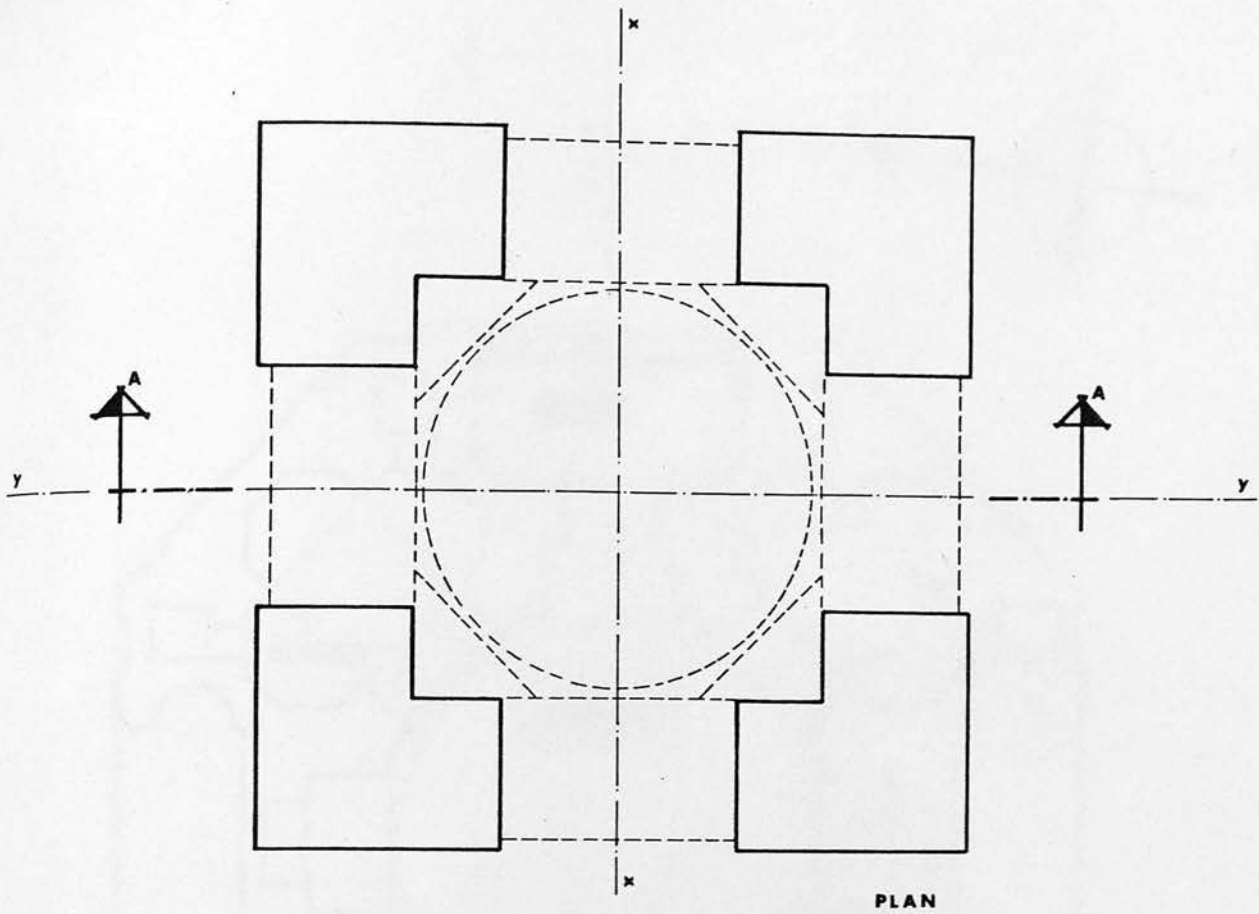


0 1 2 3 4 5 10m.

Herat, Afghanistan
SHRINE OF SHĀHZĀDE ABOLQĀSEM

Chronological plan

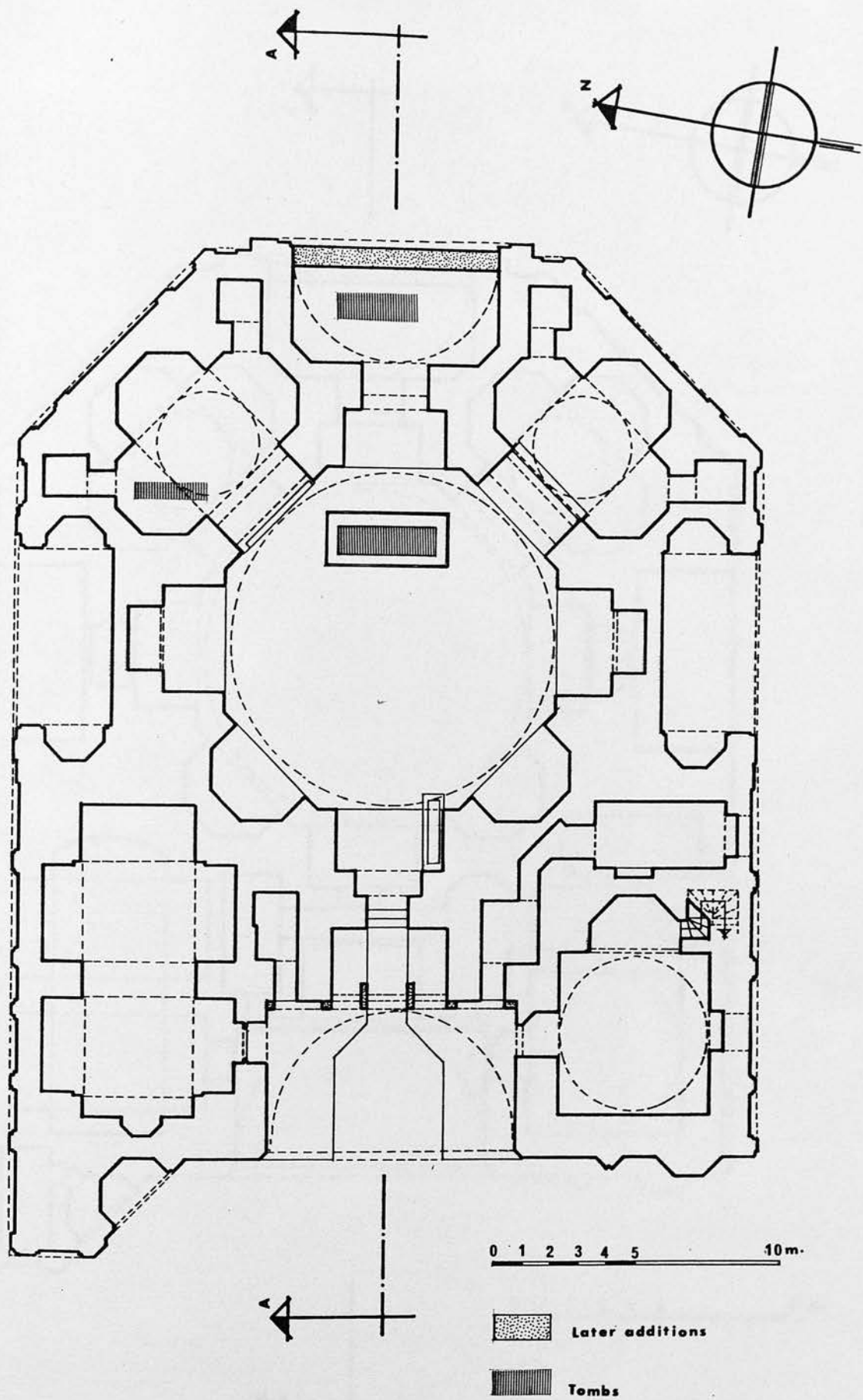
Sc. 1:200



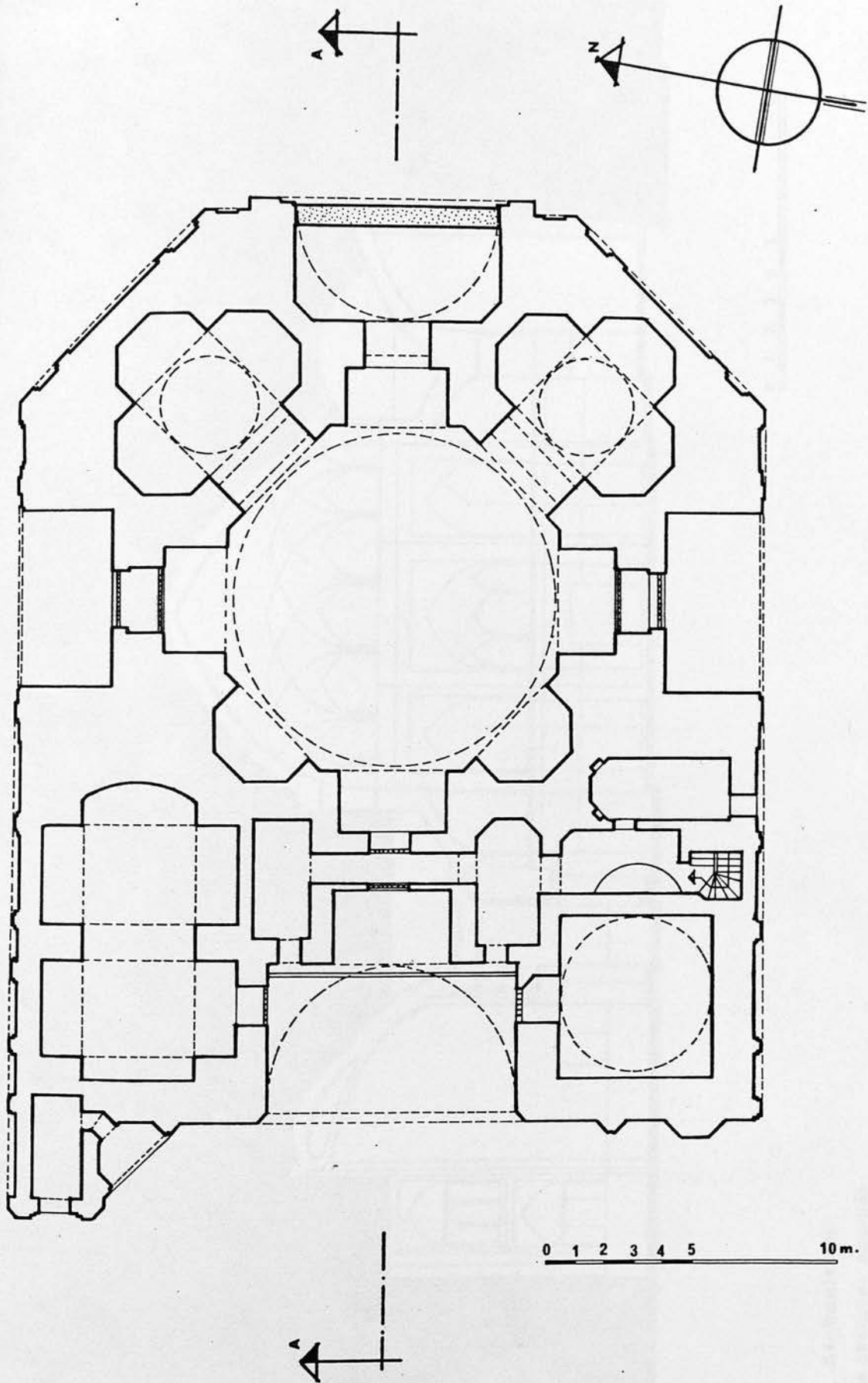
SECTION A-A

0 1 2 3 4 5 10m.

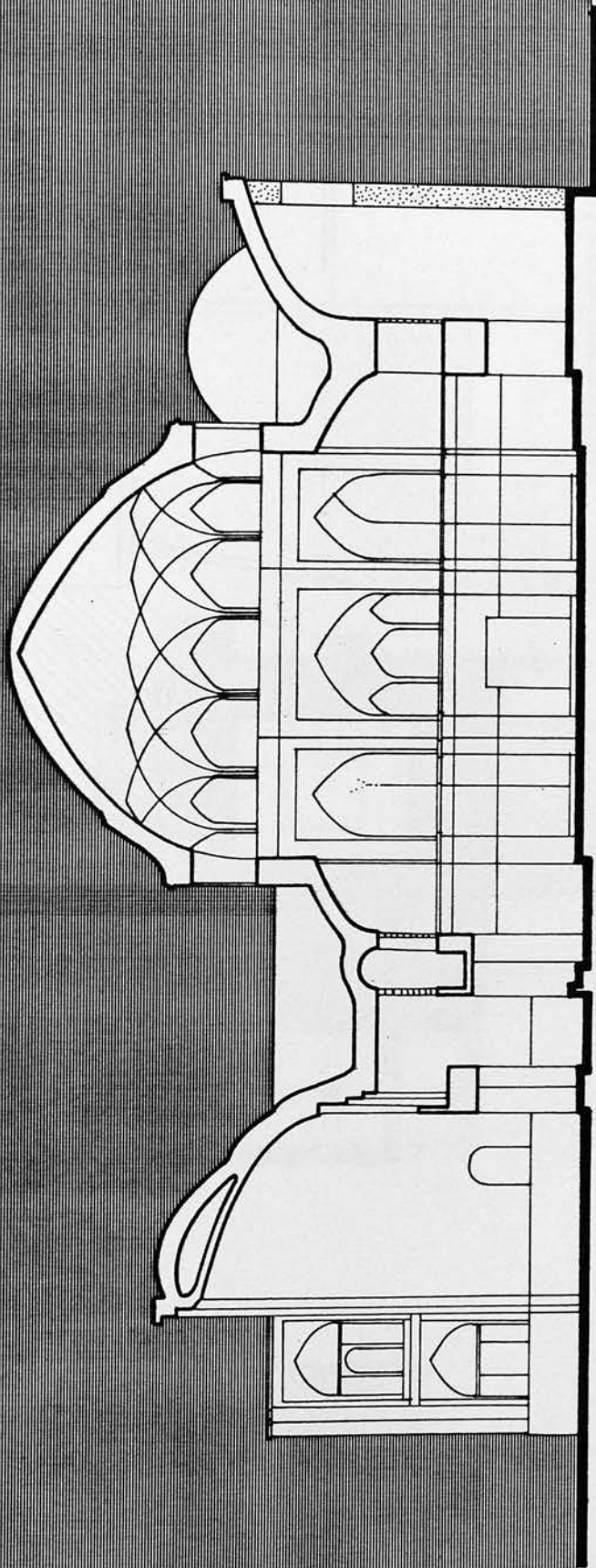
Herat - Afghanistan
 Shrine of Shāhzāde Abolqāsem
 Reconstruction of the ancient
 structure. Sc. 1:200



Herat - Afghanistan
 Shrine of Shāhzāde Abdollāh
 GROUND FLOOR PLAN
 Sc. 1:200

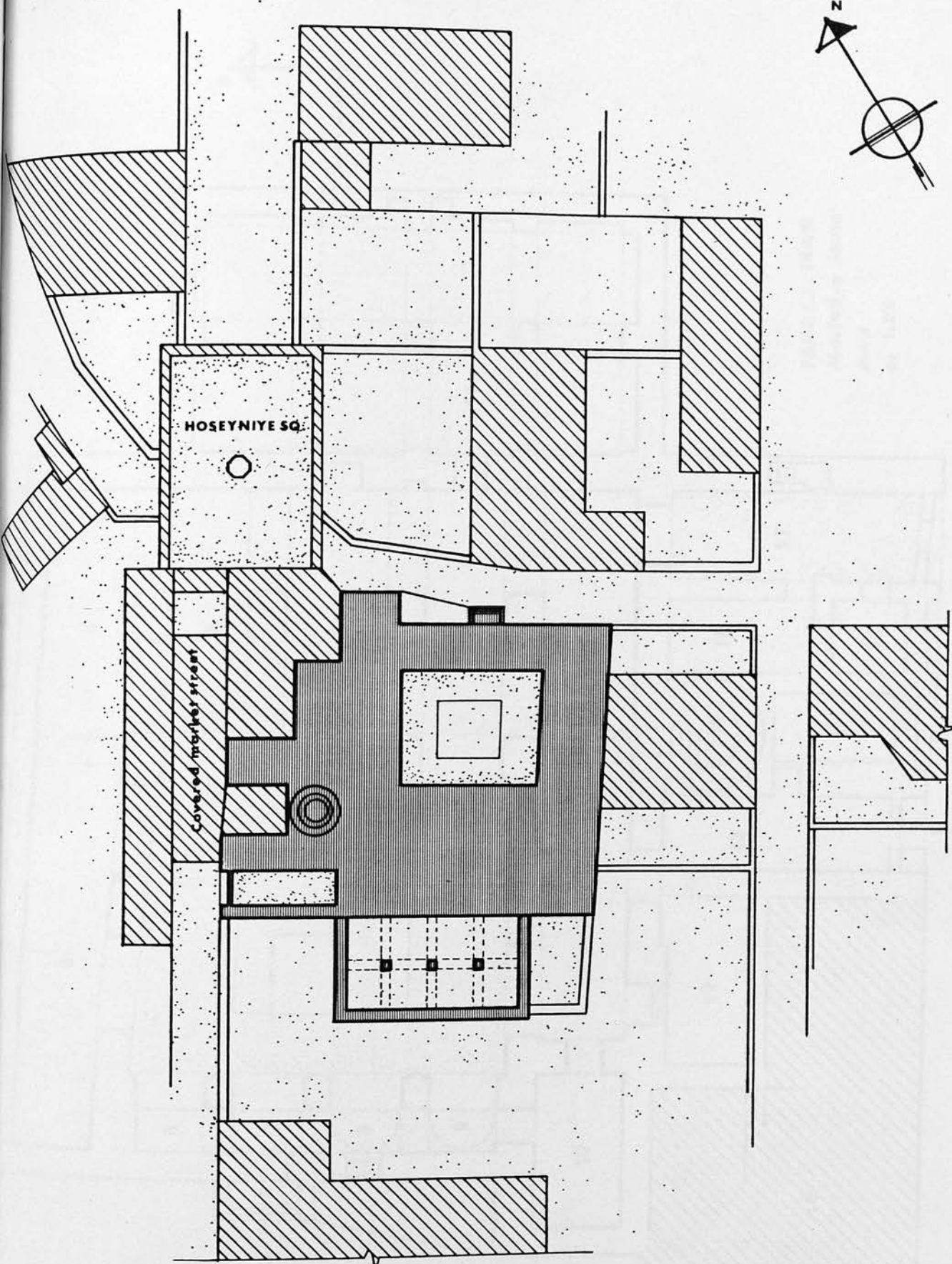


Herat - Afghanistan
 Shrine of Shāhzāde Abdollāh
 UPPER FLOOR PLAN
 Sc. 1:200



Herat - Afghanistan
Shrine of Shāhzāde Abdollāh
Section A-A
Sc. 1:200

0 5 10 15 20 25m.



FAHRAJ - IRAN

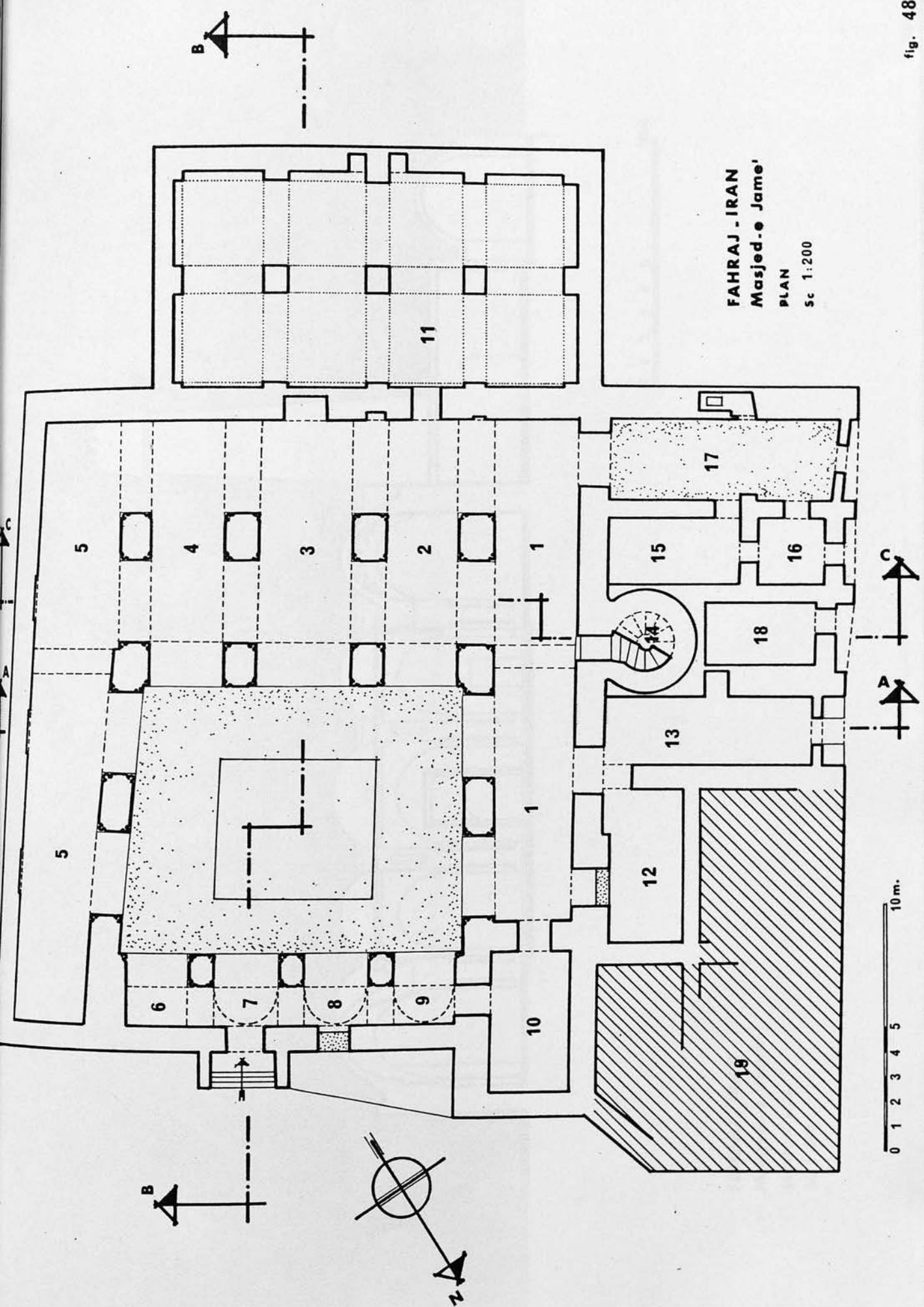
Masjed.e Jame'

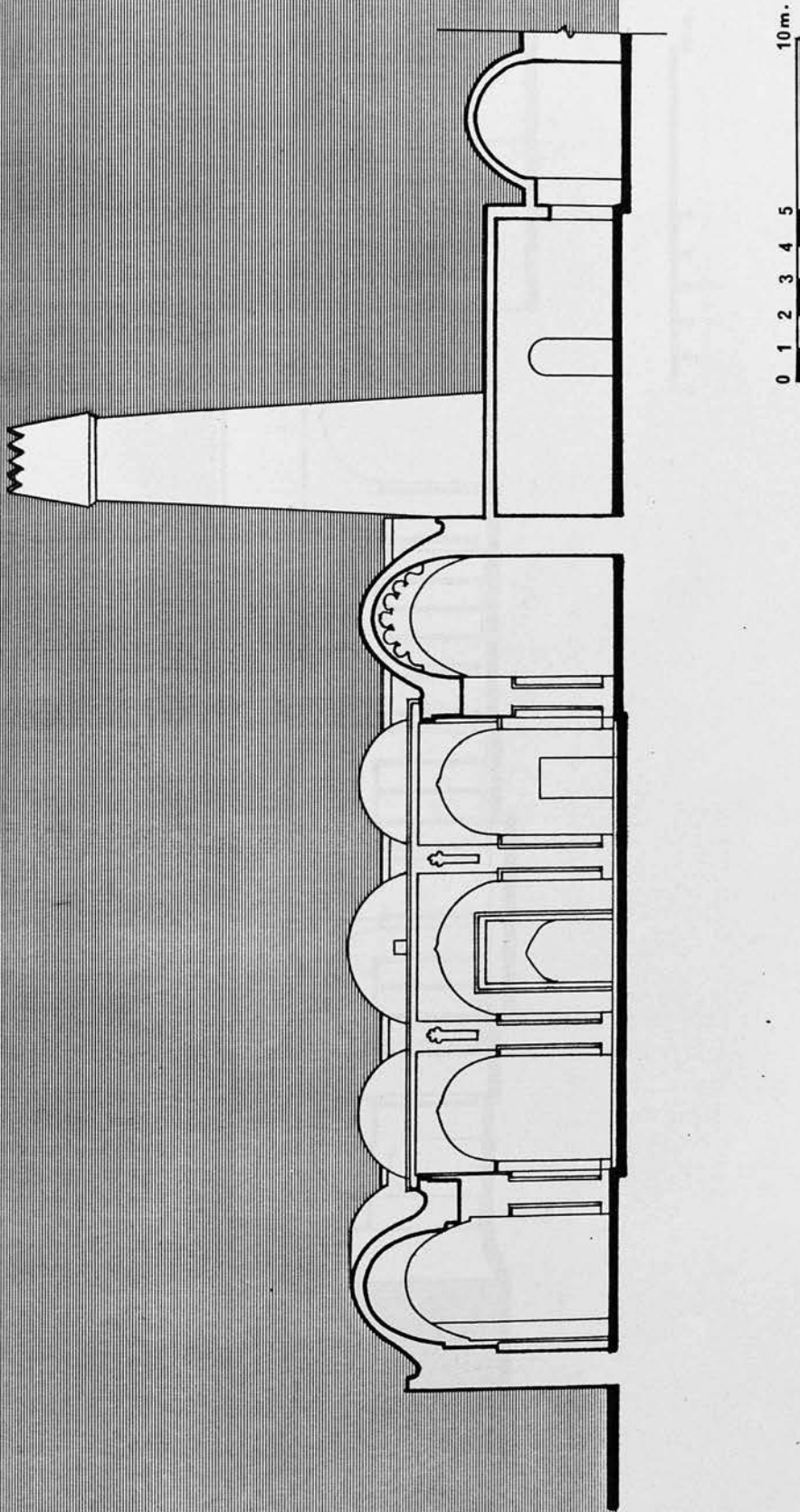
Sketch plan of the site

Sc. 1:500

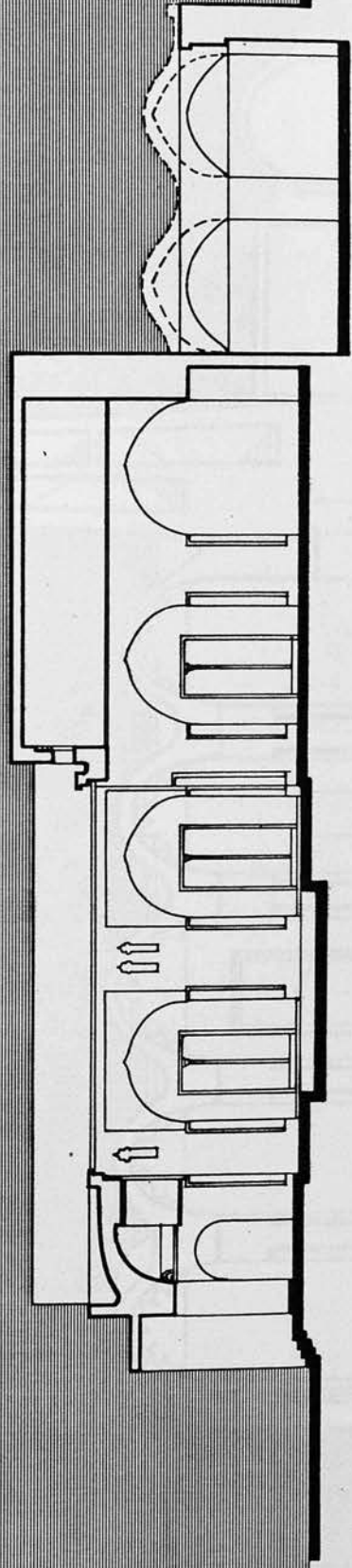
-  The mosque
-  Build up spaces
-  Open spaces

FAHRAJ - IRAN
Masjed-e Jame'
PLAN
Sc 1:200

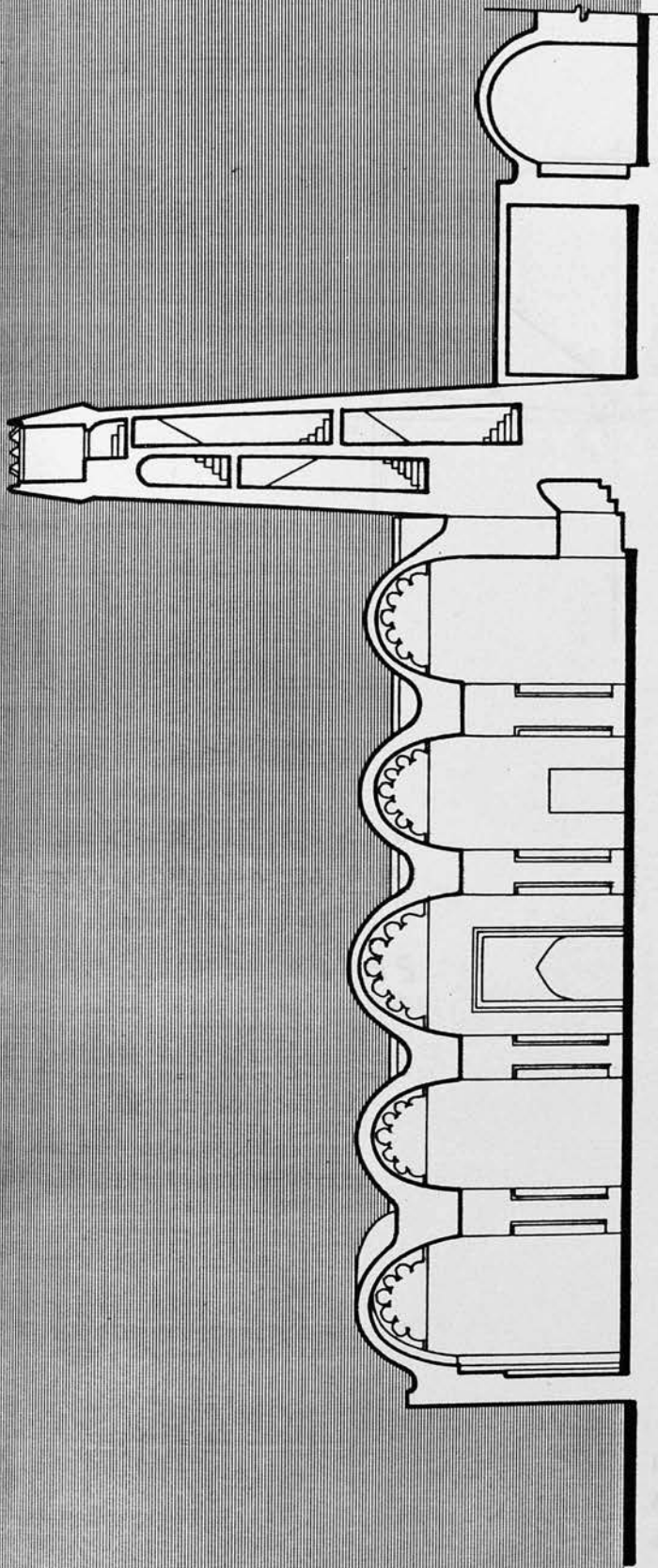




FAHRAJ - IRAN
Masjed-e Jame'
SECTION A-A
Sc. 1:200

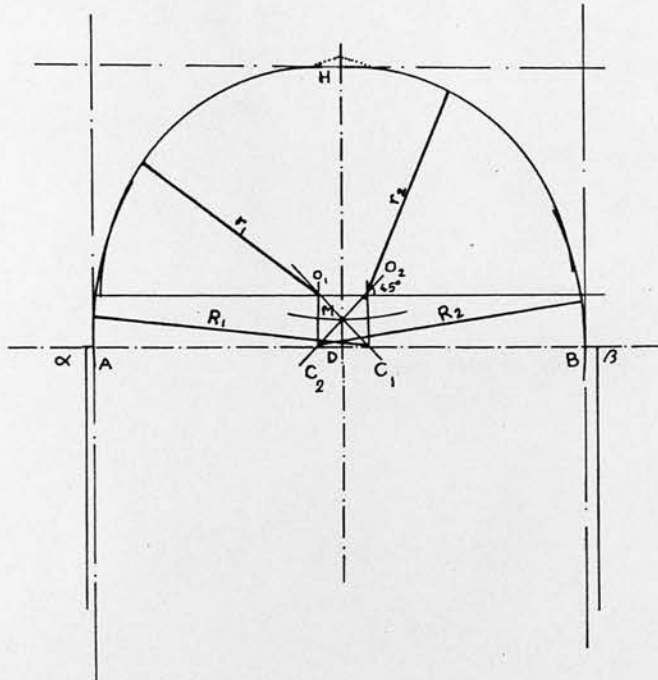


FAHRAJ - IRAN
Masjed.e Jame'
SECTION B-B
Sc. 1:200



0 1 2 3 4 5 10 m.

FAHRAJ . IRAN
Masjed-e Jame'
SECTION C-C
Sc. 1:200



$$AD = DB = \frac{1}{2} AB$$

$$DH = \frac{1}{2} \alpha\beta \quad DH \perp AB$$

$$HM = \frac{AB}{2} = AD = DB$$

$$MC_2B = MC_1A = 45^\circ$$

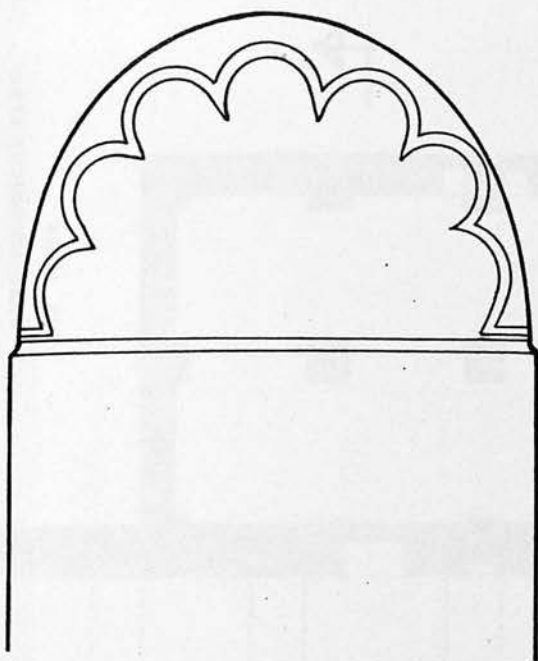
$$C_1O_2 \perp AB \quad C_1O_2 = C_1C_2$$

$$C_2O_1 \perp AB \quad C_2O_1 = C_1C_2$$

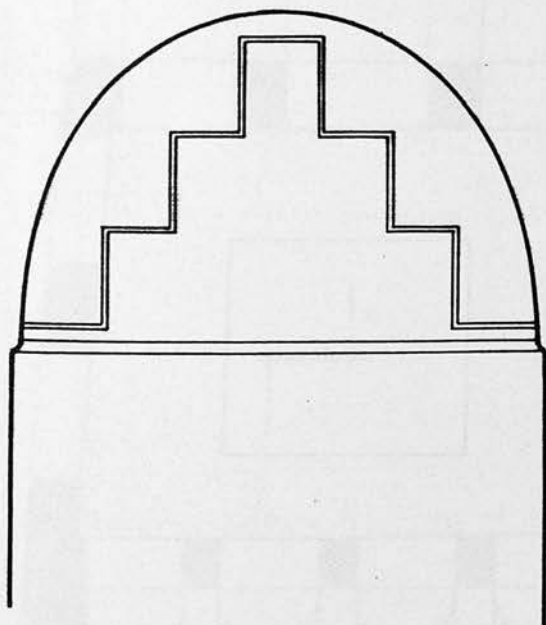
$$R_1 = R_2$$

$$r_1 = r_2$$

FAHRAJ - IRAN
Masjed.e Jame'
ANALYSIS OF THE ARCHES



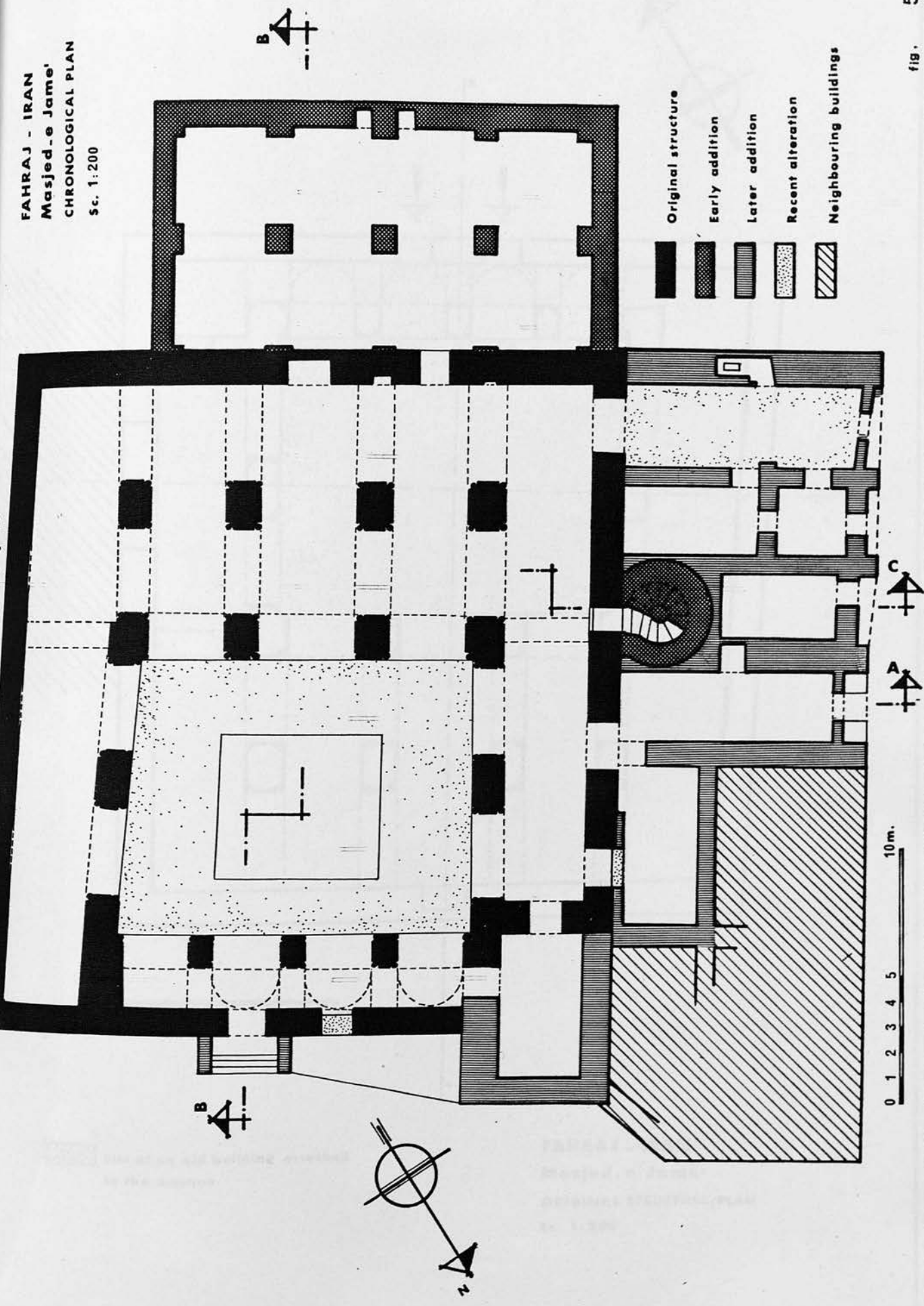
Detail a.
CASPED ARCHES AT THE
QEBLE WALL

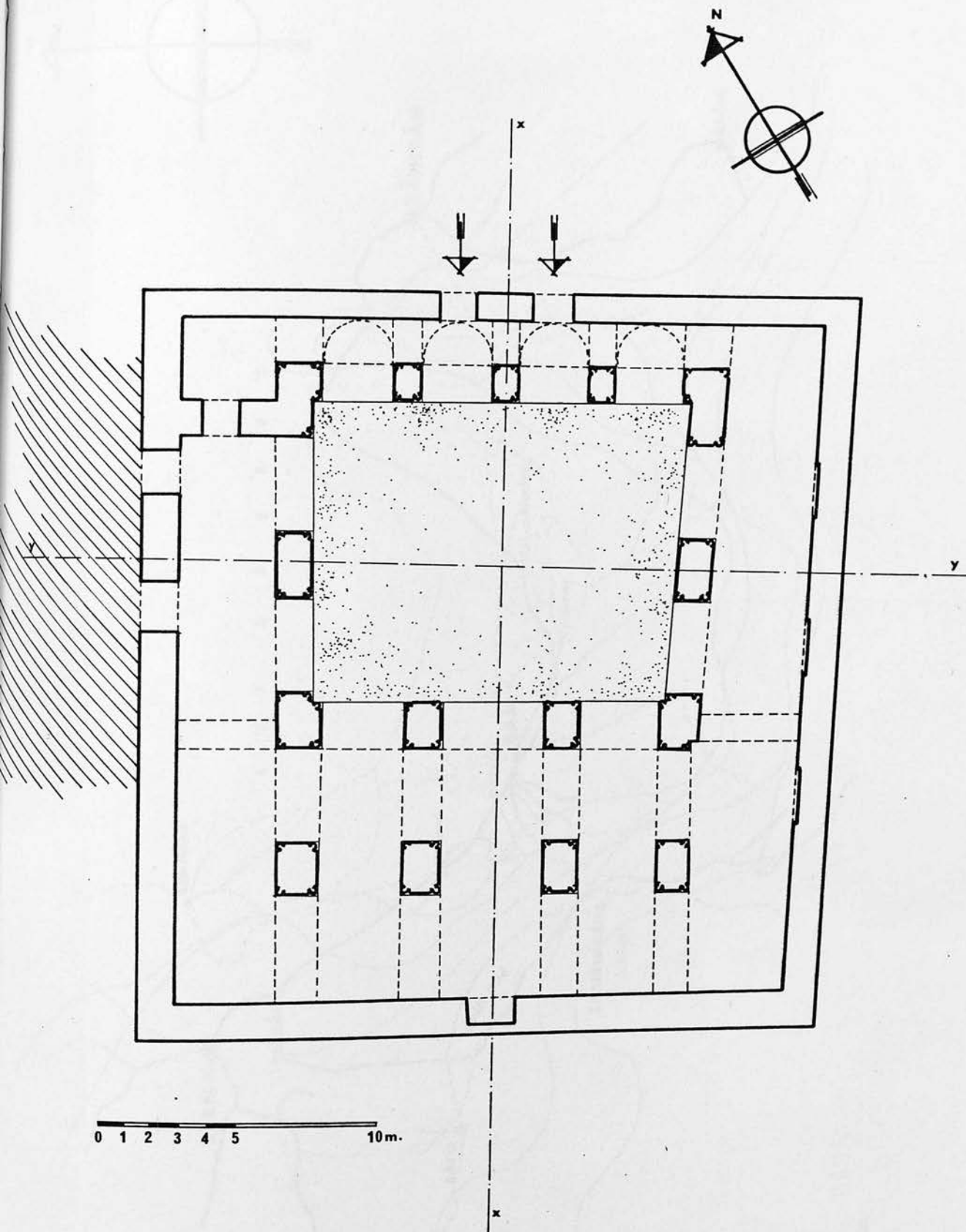


Detail b
Outline of a Sasanian type merlon,
moulded in the stucco, at the north
end of the west aisle


FAHRAJ - IRAN
Masjed.e Jame'
Details a and b

FAHRAJ - IRAN
 Masjed-e Jame'
 CHRONOLOGICAL PLAN
 Sc. 1:200

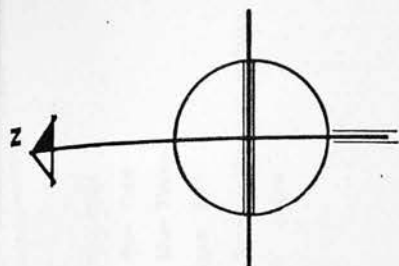




0 1 2 3 4 5 10m.

 Site of an old building attached to the mosque

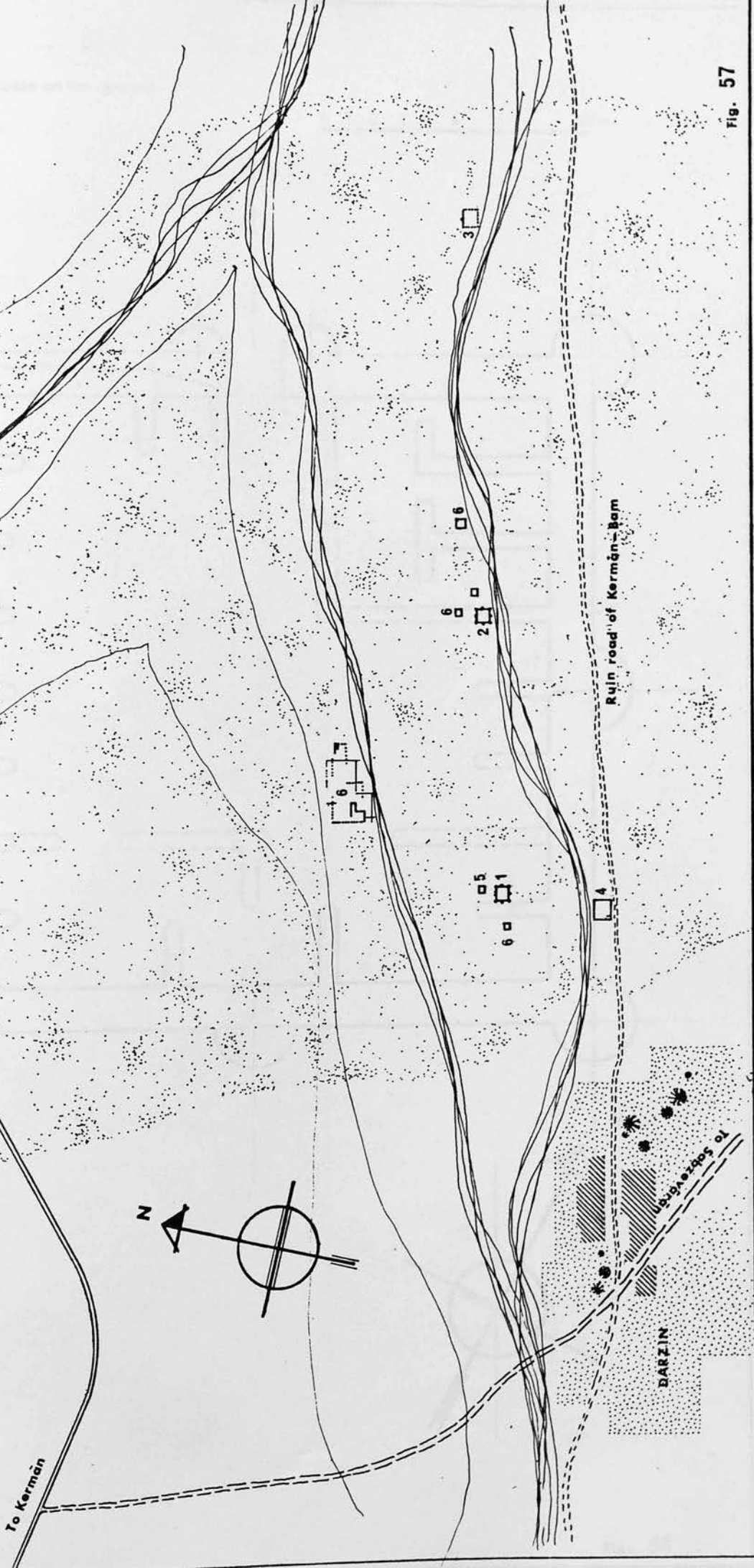
FAHRAJ - IRAN
Masjed.e Jame'
 ORIGINAL STRUCTURE; PLAN
 Sc. 1:200



South East of Iran
MAP OF THE AREA
Sc. 1:2 500 000

DARZIN - IRAN
 SKETCH PLAN OF THE SITE
 SC. about 1:20 000

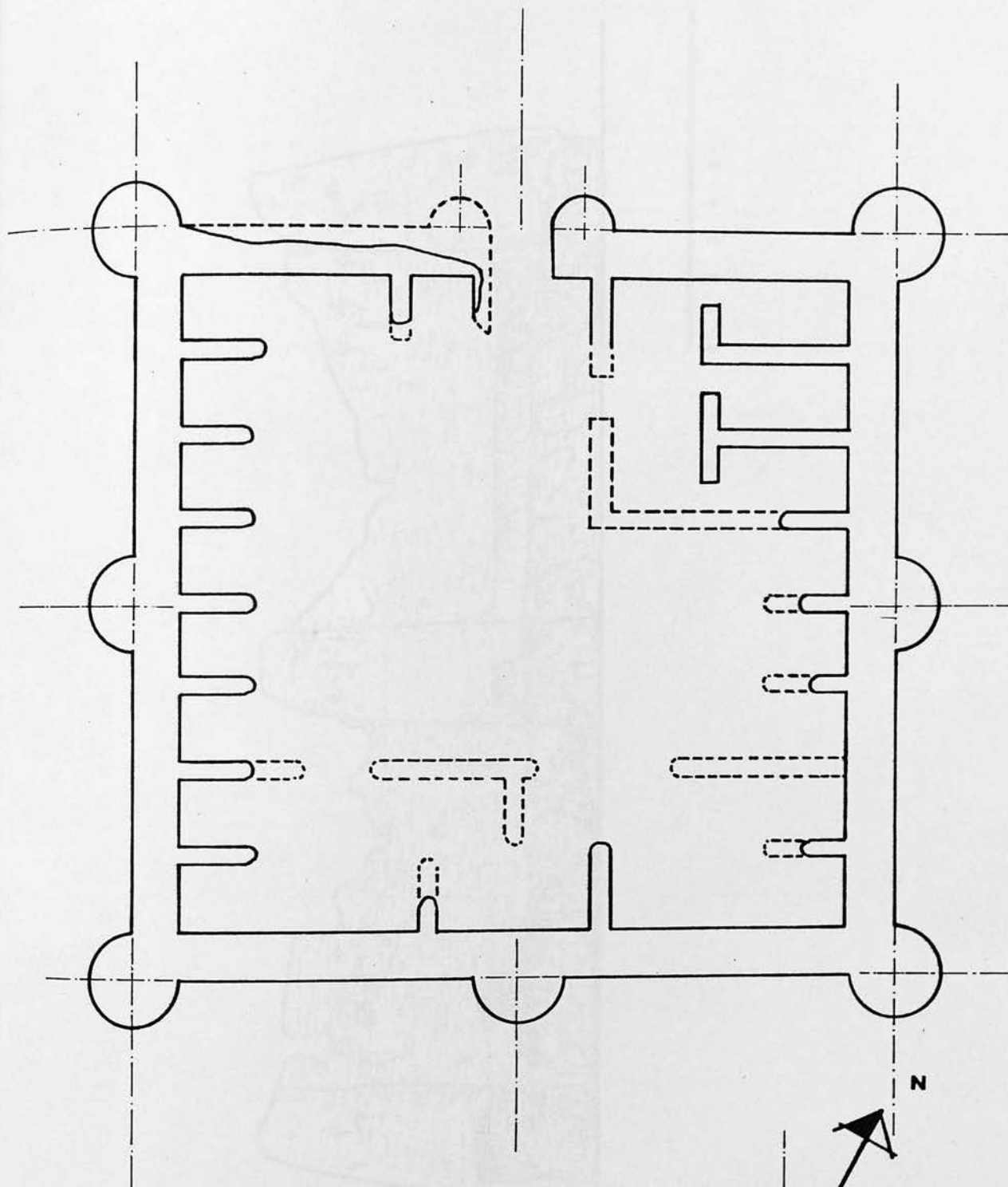
- 1- Fort No. One
- 2- Fort No. Two
- 3- Fort No. Three
- 4- Mosque (?)
- 5- Ruin built with larg bricks
- 6- Other ruins



Foundation Visible on the ground

Standing walls

0 1 2 3 4 5 10 m.



DARZIN- IRAN

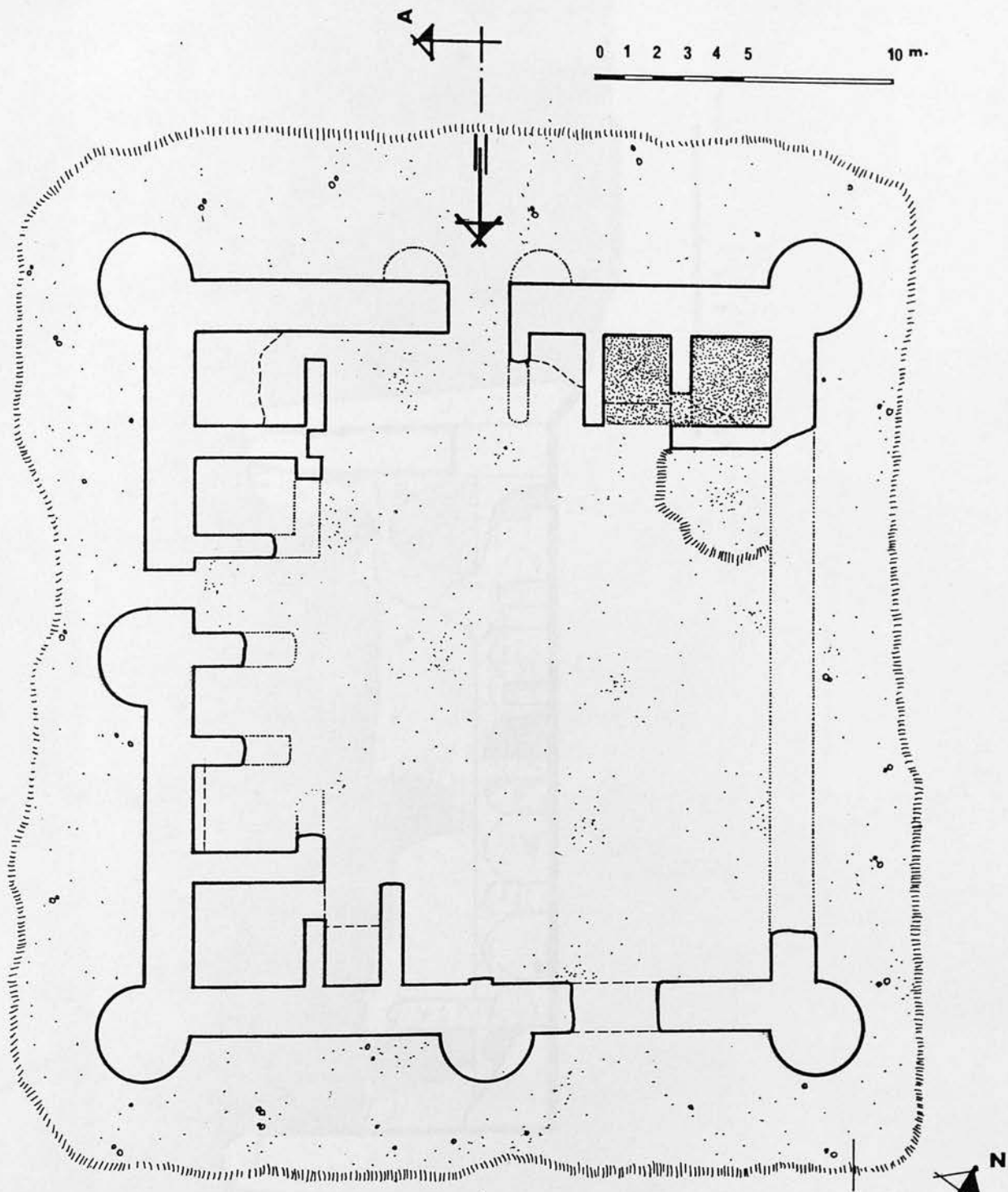
Fort No. One

PLAN- Present Condition

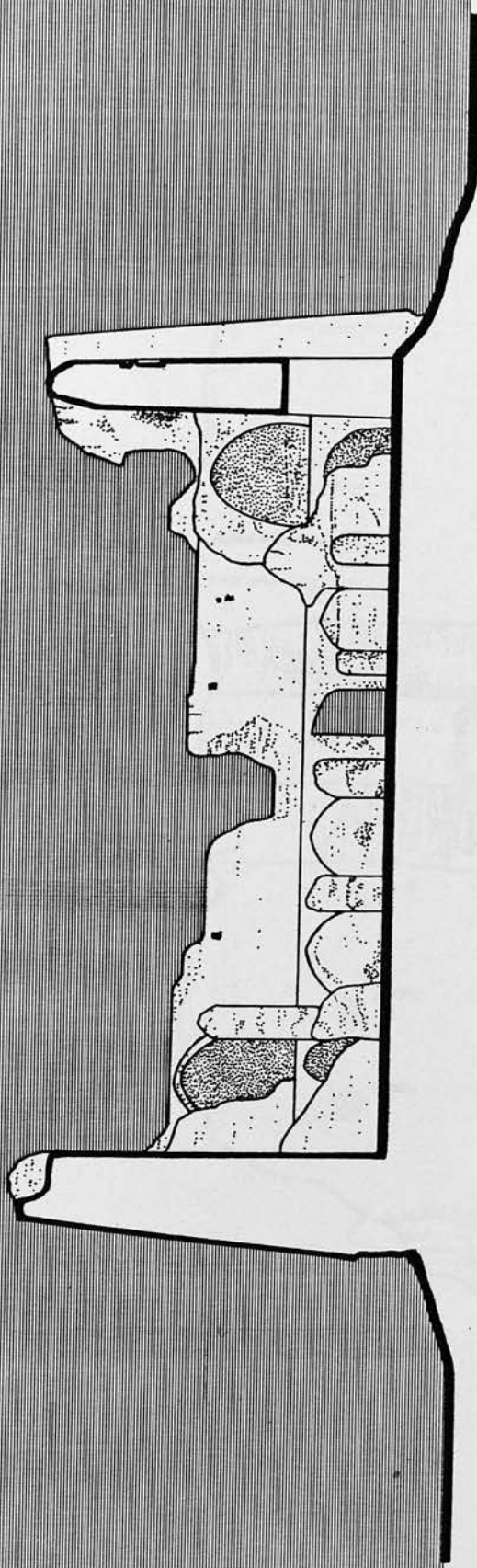
Sc. 1: 200



DARZIN-IRAN
Fort No. One
SOUTH ELEVATION
Present Condition

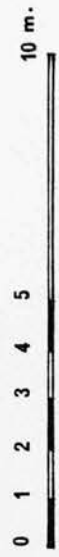
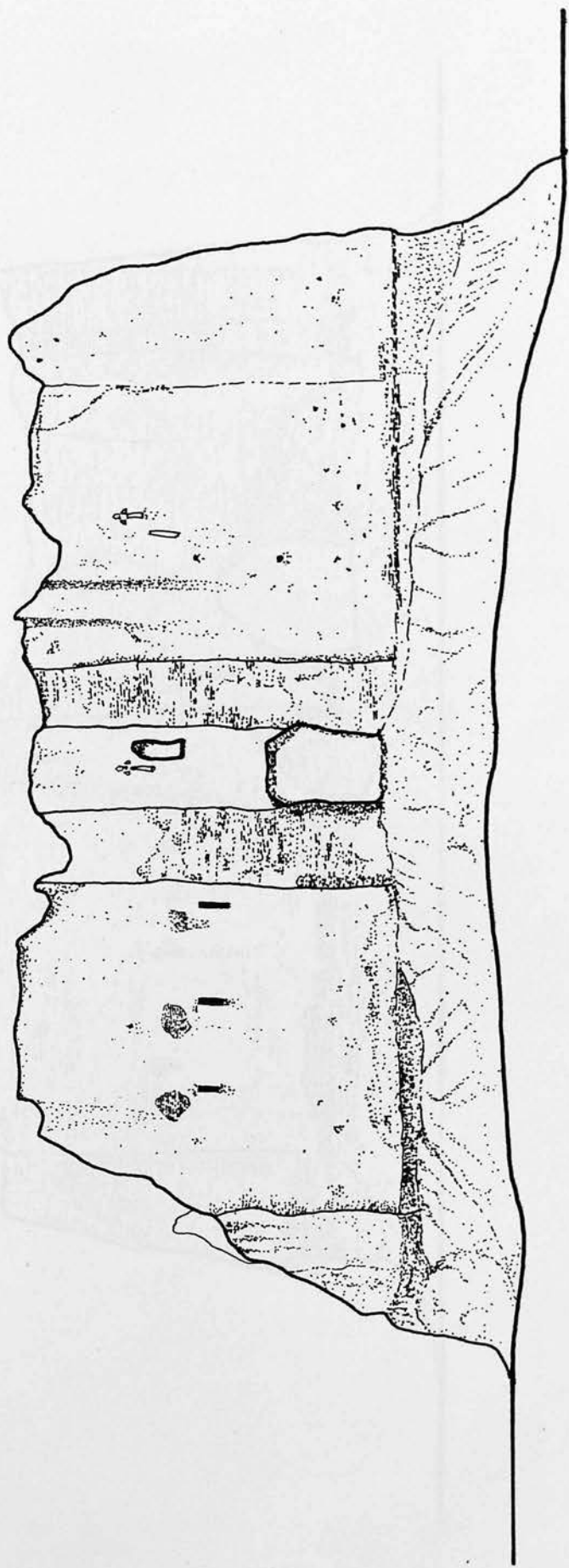


DARZIN - IRAN
Fort No. Two
PLAN
 Present condition
 Sc. 1,200

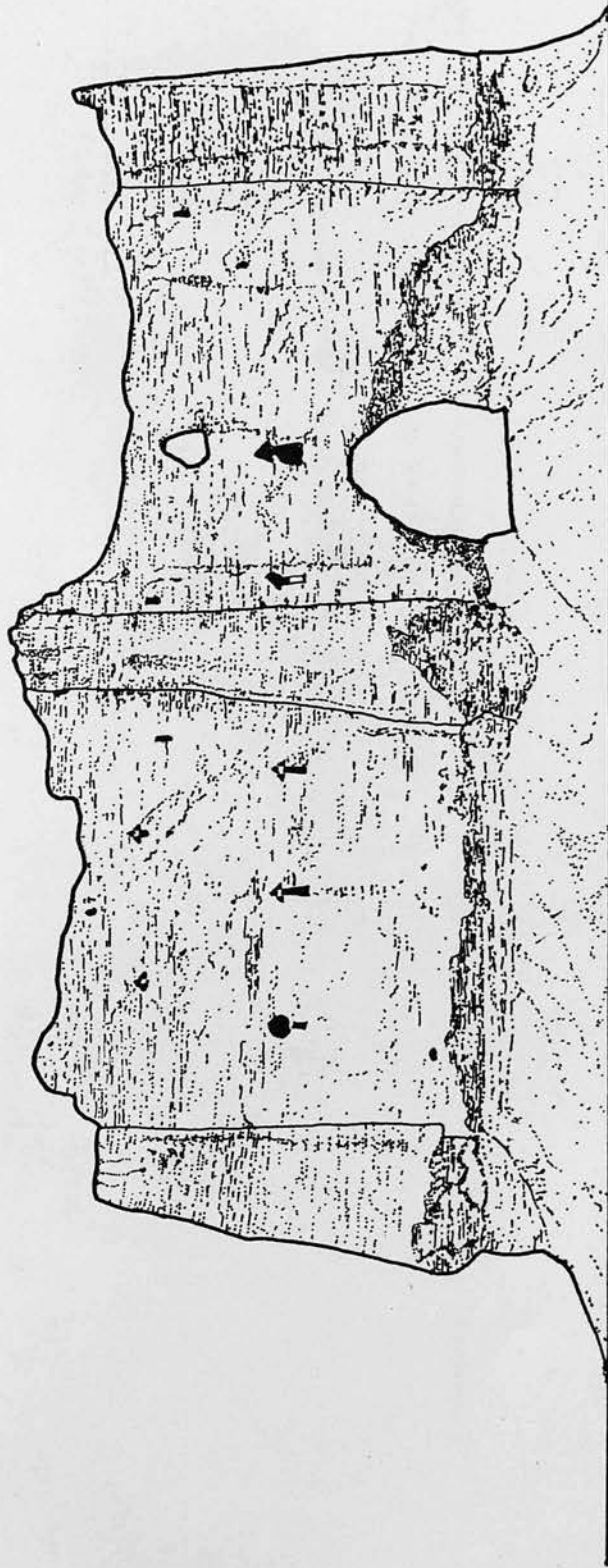


DARZIN-IRAN
Fort No. Two
SECTION A-A
Present condition
Sc. 1:200

DARZIN—IRAN
Fort No. Two
NORTH ELEVATION
Present condition

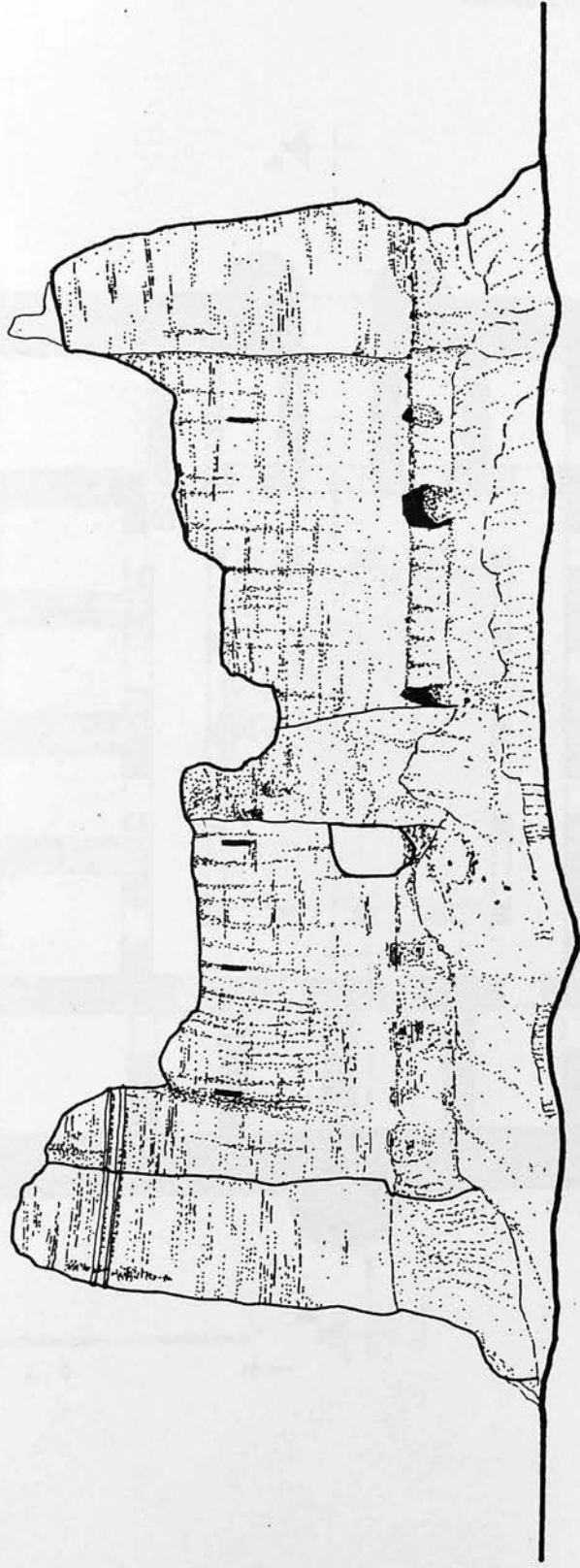


DARZIN-IRAN
Fort No. Two
SOUTH ELEVATION
Present condition



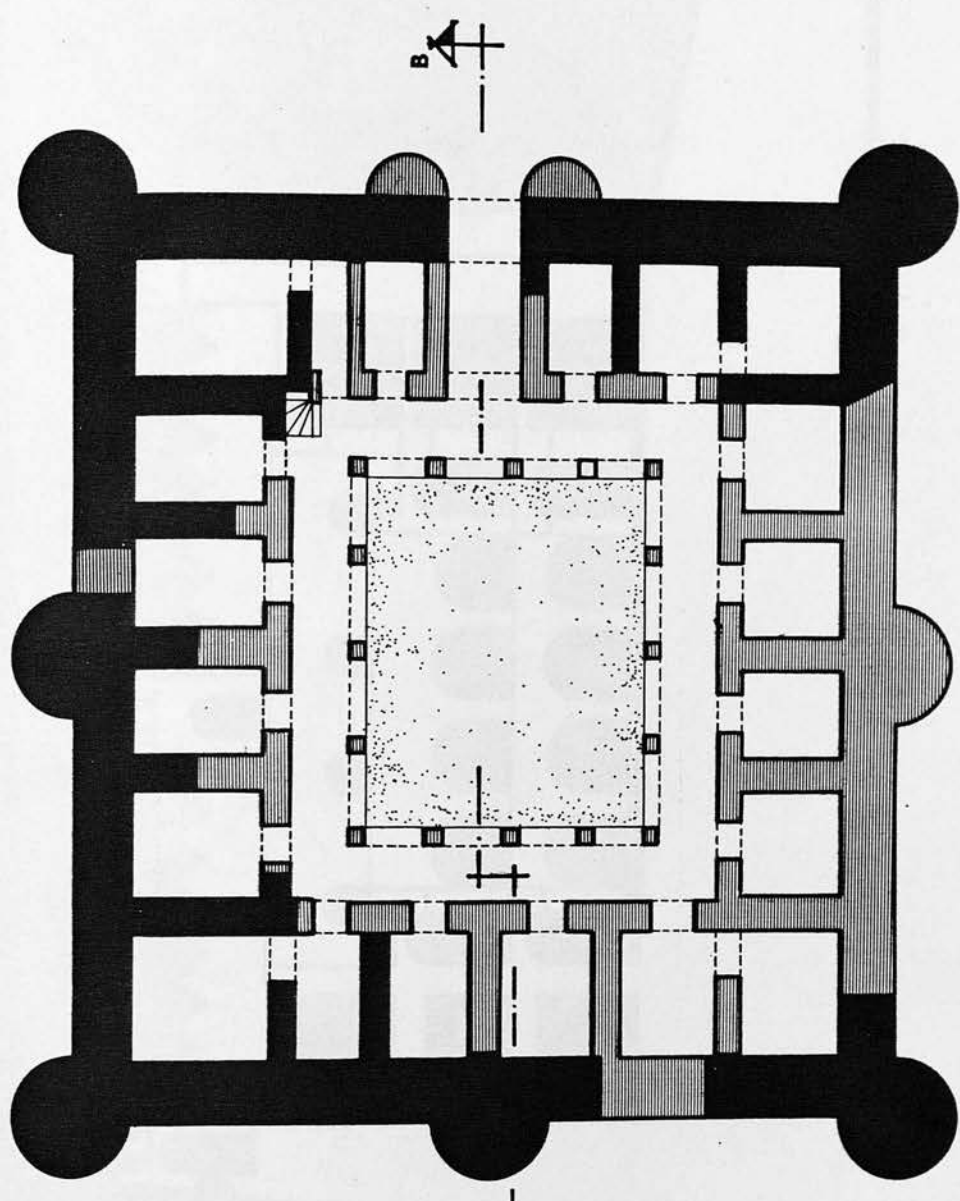
0 1 2 3 4 5 10 m.

Fig. 63



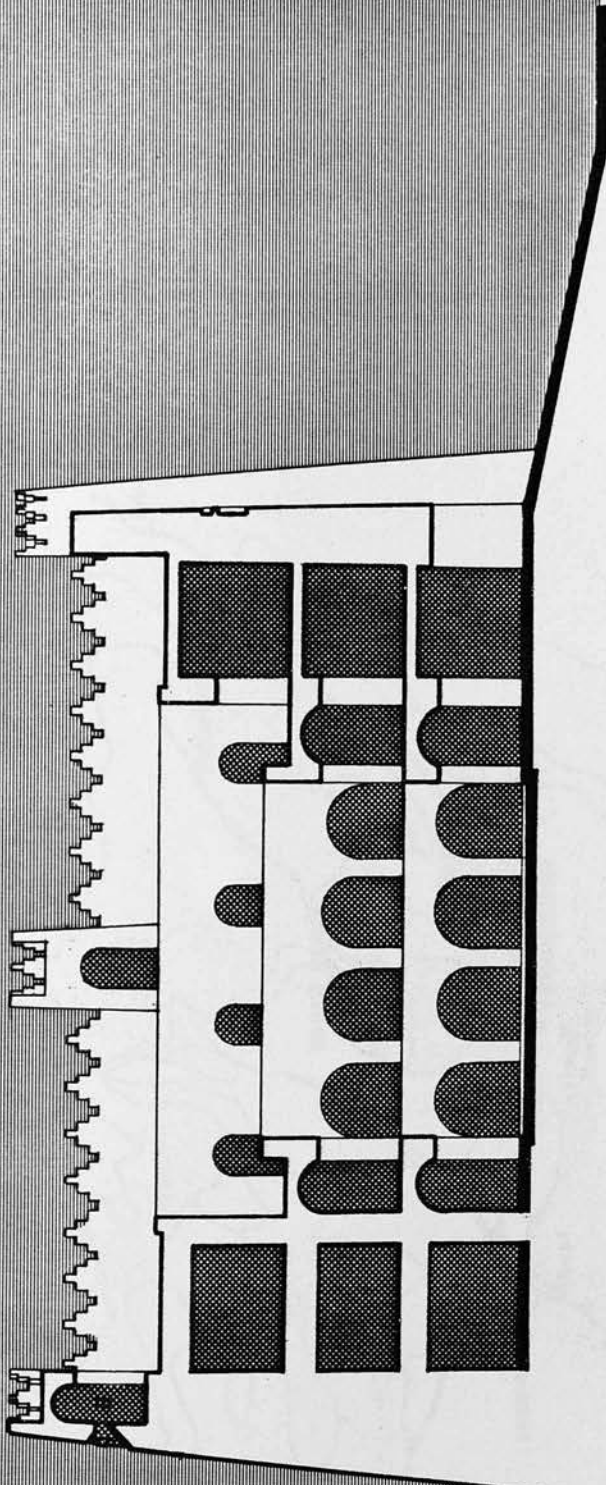
DARZIN-IRAN
Fort No. Two
WEST ELEVATION
Present condition

EXISTING PARTS
RECONSTRUCTED PARTS



0 1 2 3 4 5 10 m.

DARZIN- IRAN
Fort No. Two
RECONSTRUCTION PLAN
Sc. 1: 200



DARZIN-IRAN
Fort No. Two
SECTION B-B
RECONSTRUCTED
Sc. 1:200

BOST - Afghanistan
Location map
Sc. 1:4,000,000

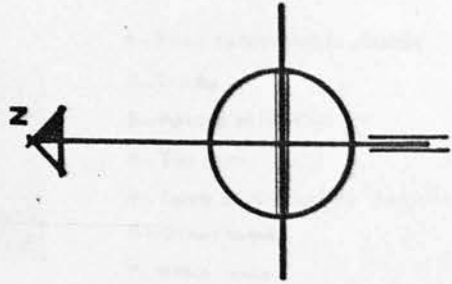
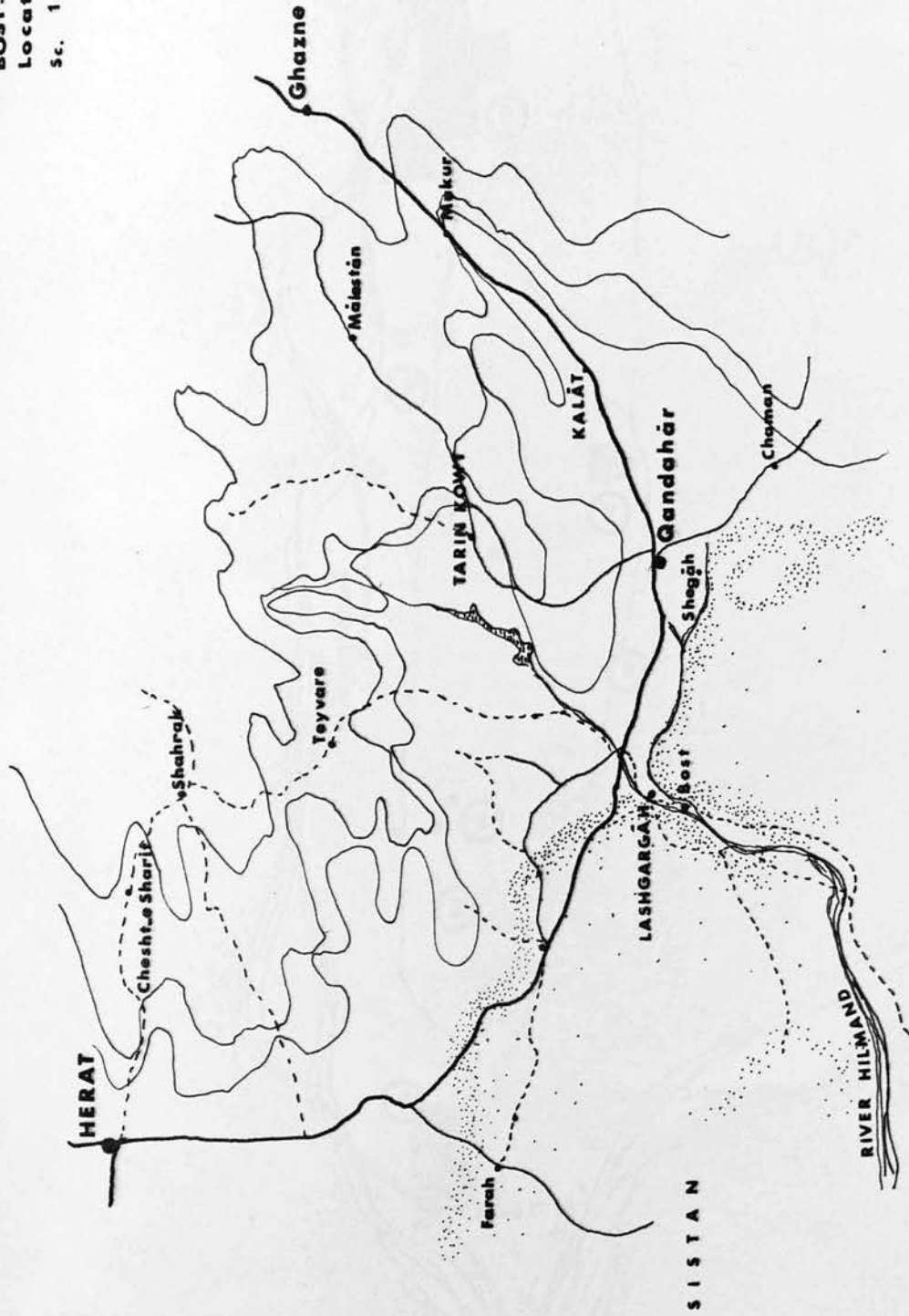


Fig. 67



- 1 - Road to Gandahār - Herāt
- 2 - Tracks
- 3 - Palace of Mas'ud
- 4 - The fort
- 5 - Tomb of Shāhzāde Sarbāz
- 6 - Other tombs
- 7 - Other ruins

BOST - AFGHANISTAN
 Sketch plan of the site
 Sc. 1: 50,000

0 500 1000 2000 m.

- A - Greater enclosure
- B - Smaller enclosure
- C - Citadell
- D - THE ARCH
- E - THE WELL
- F - Interior fortified
- 1 - Eastern entrance gateway
- 2 - East postern gate
- 3 - West postern
- 4 - Gateway to the smaller enclosure
- 5 - Inner curtain wall
- 6 - Corridor
- 7 - Present road

BOST - AFGHANISTAN
THE FORT
PLAN
 Sc. 1:5000

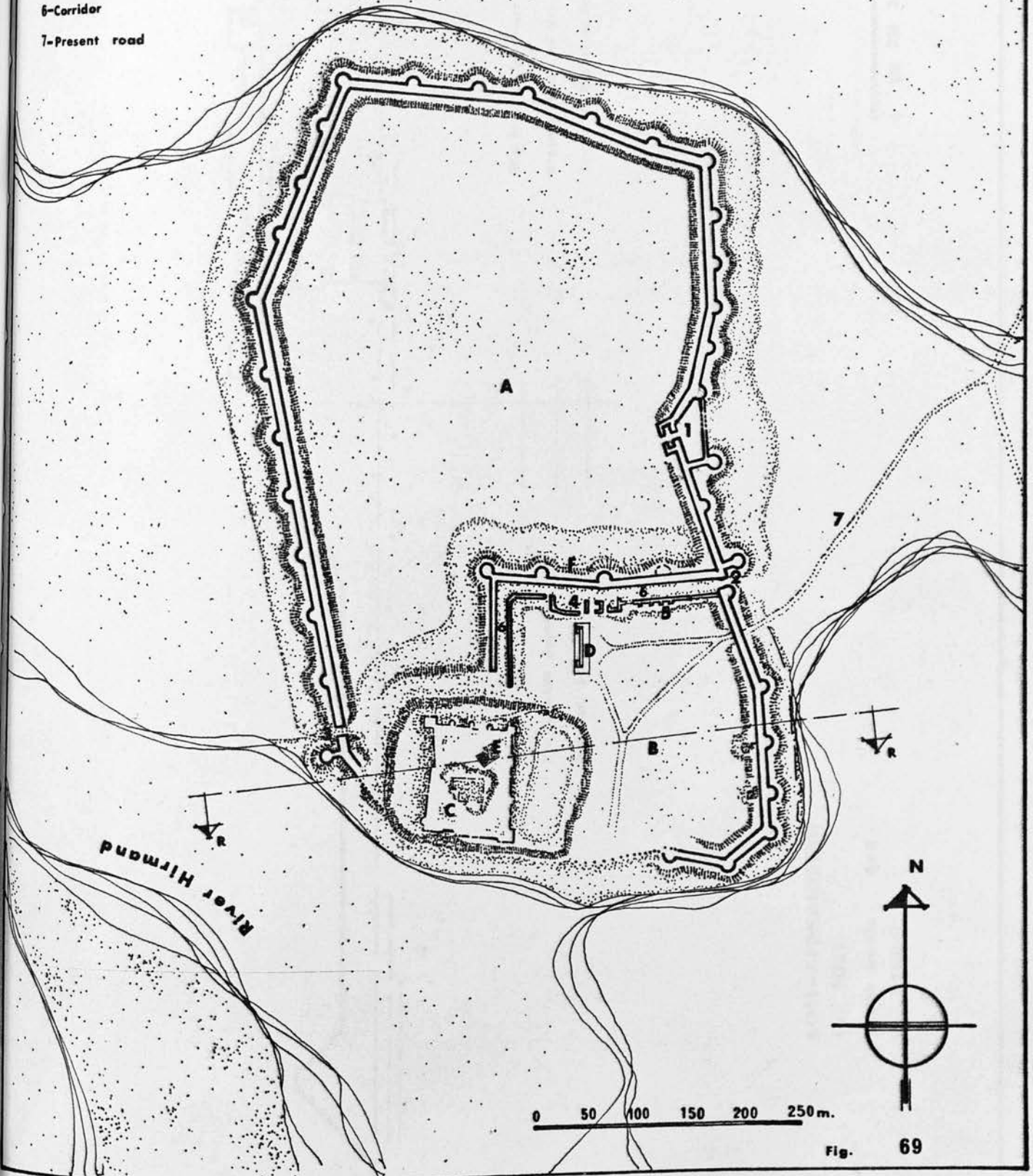
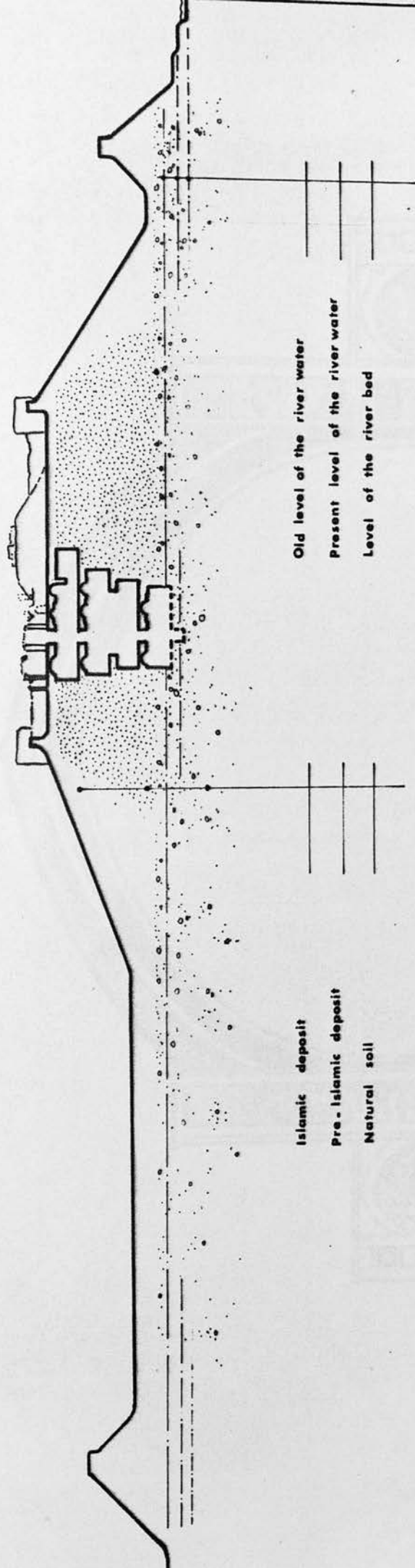


Fig. 69

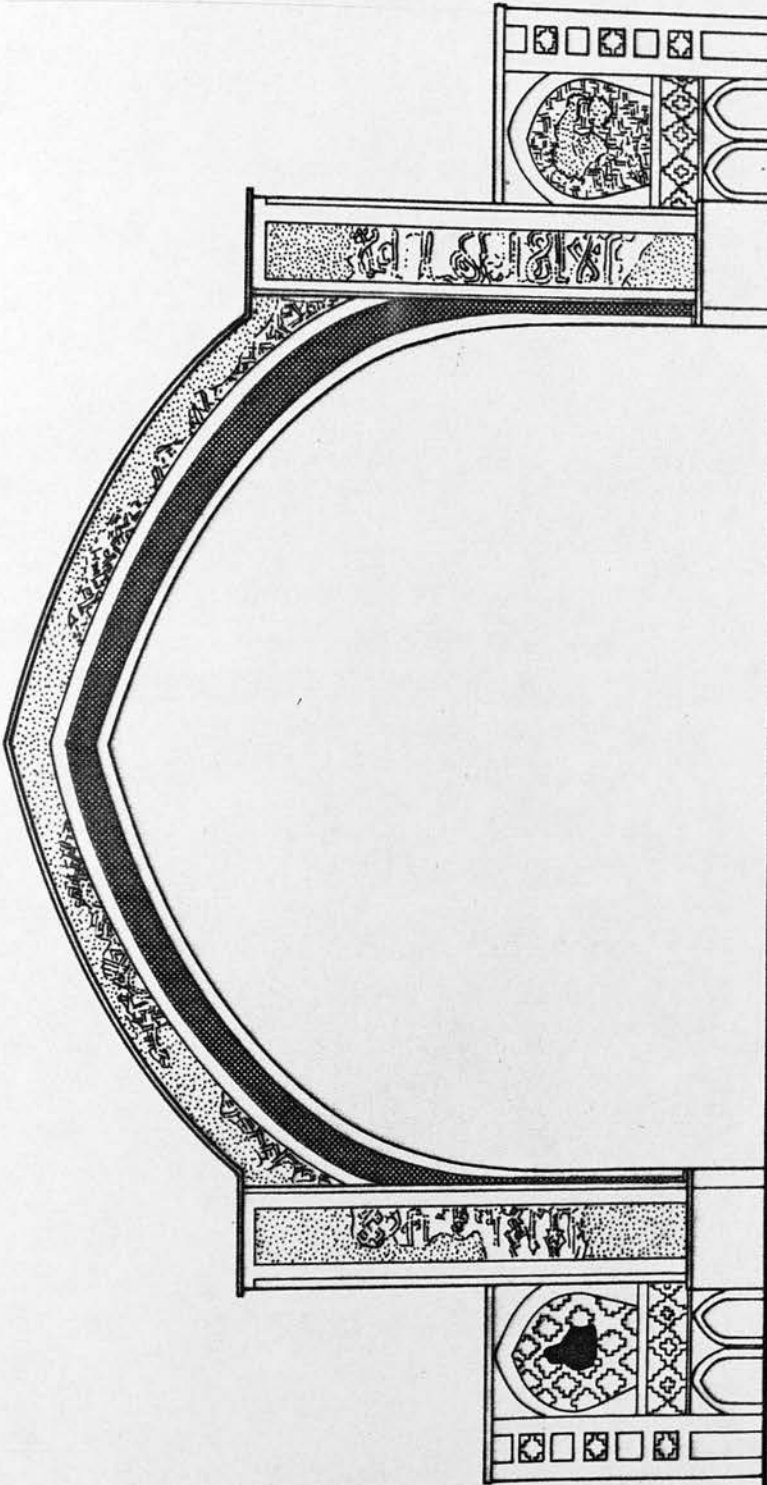


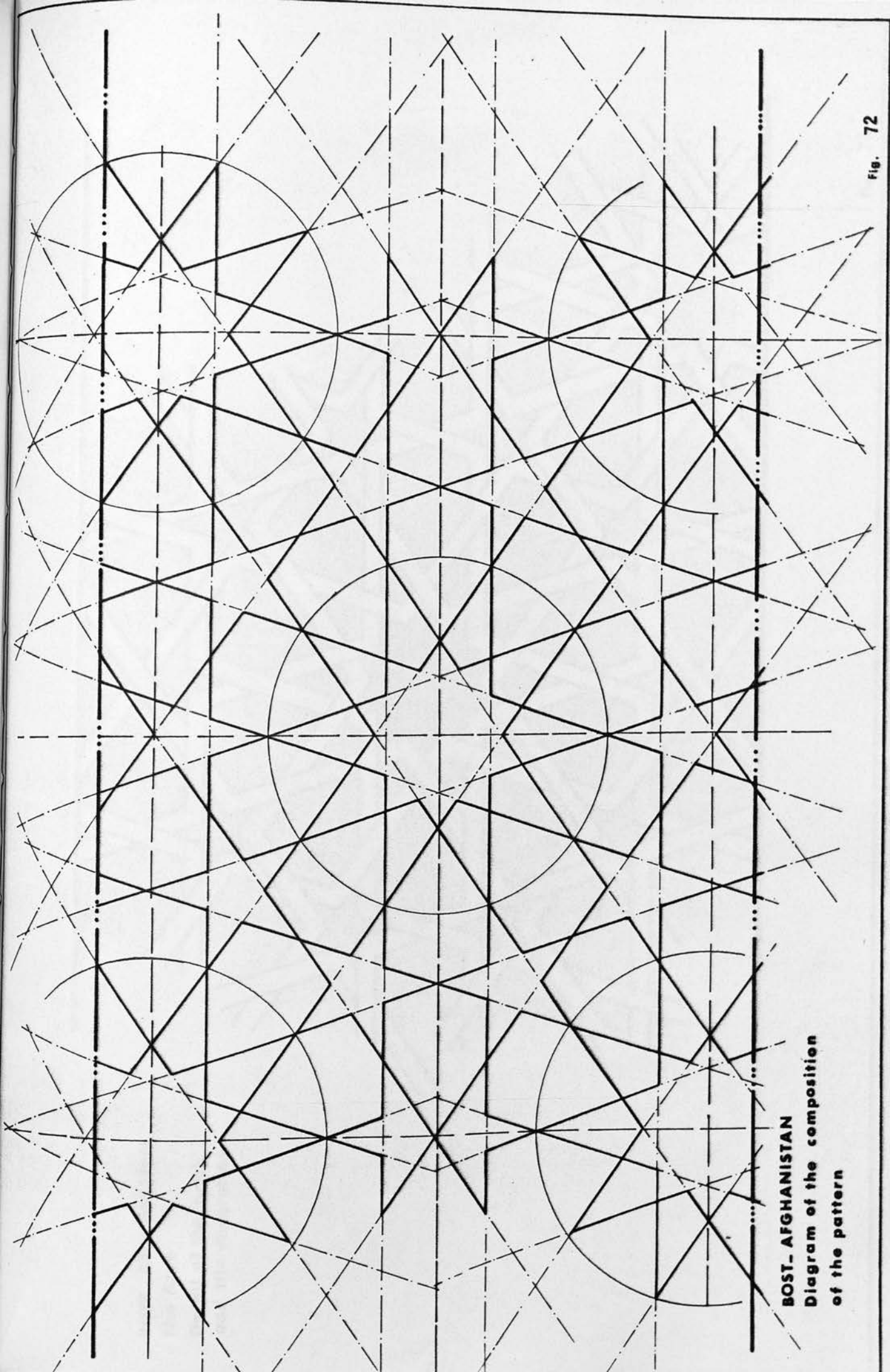
BOST - AFGHANISTAN
THE FORT

Sketch profile R - R
 Sc. 1:1500

Fig. 70

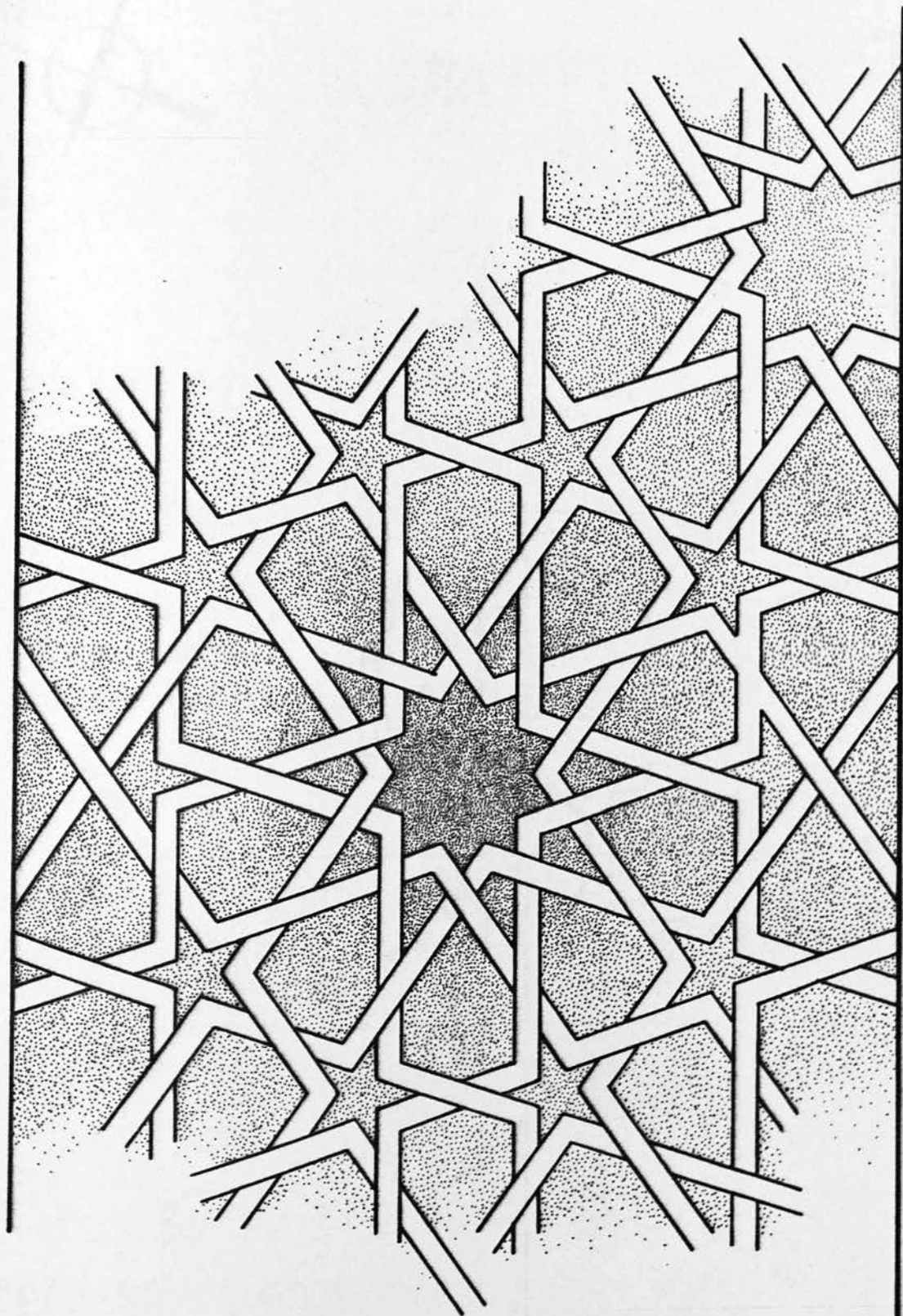
BOST-**AFGHANISTAN**
THE ARCH
EAST ELEVATION
Sc. 1:150



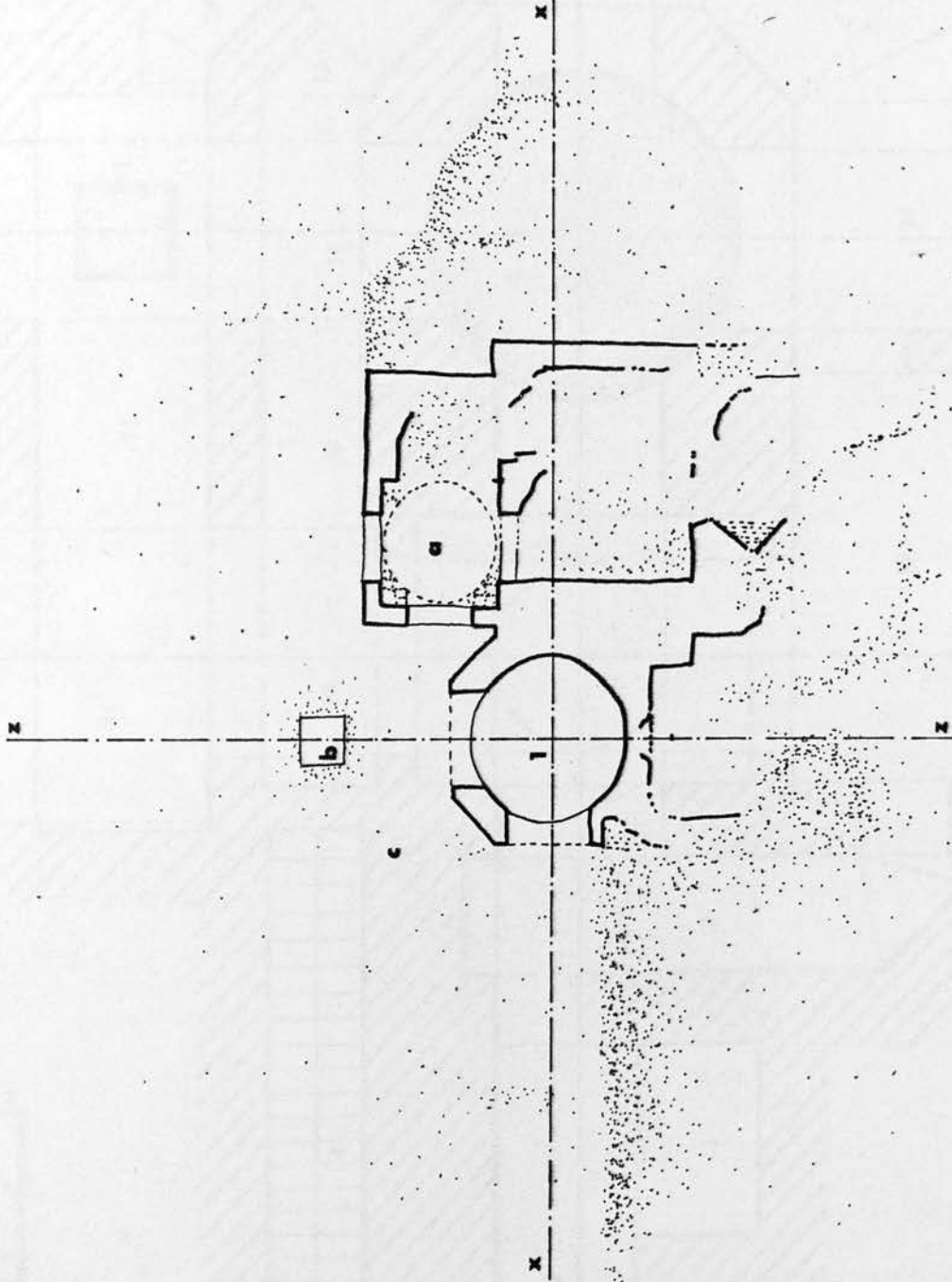


BOST. - AFGHANISTAN
Diagram of the composition
of the pattern

BOST. - AFGHANISTAN
The Arch
Detail of the brick
and tile decoration

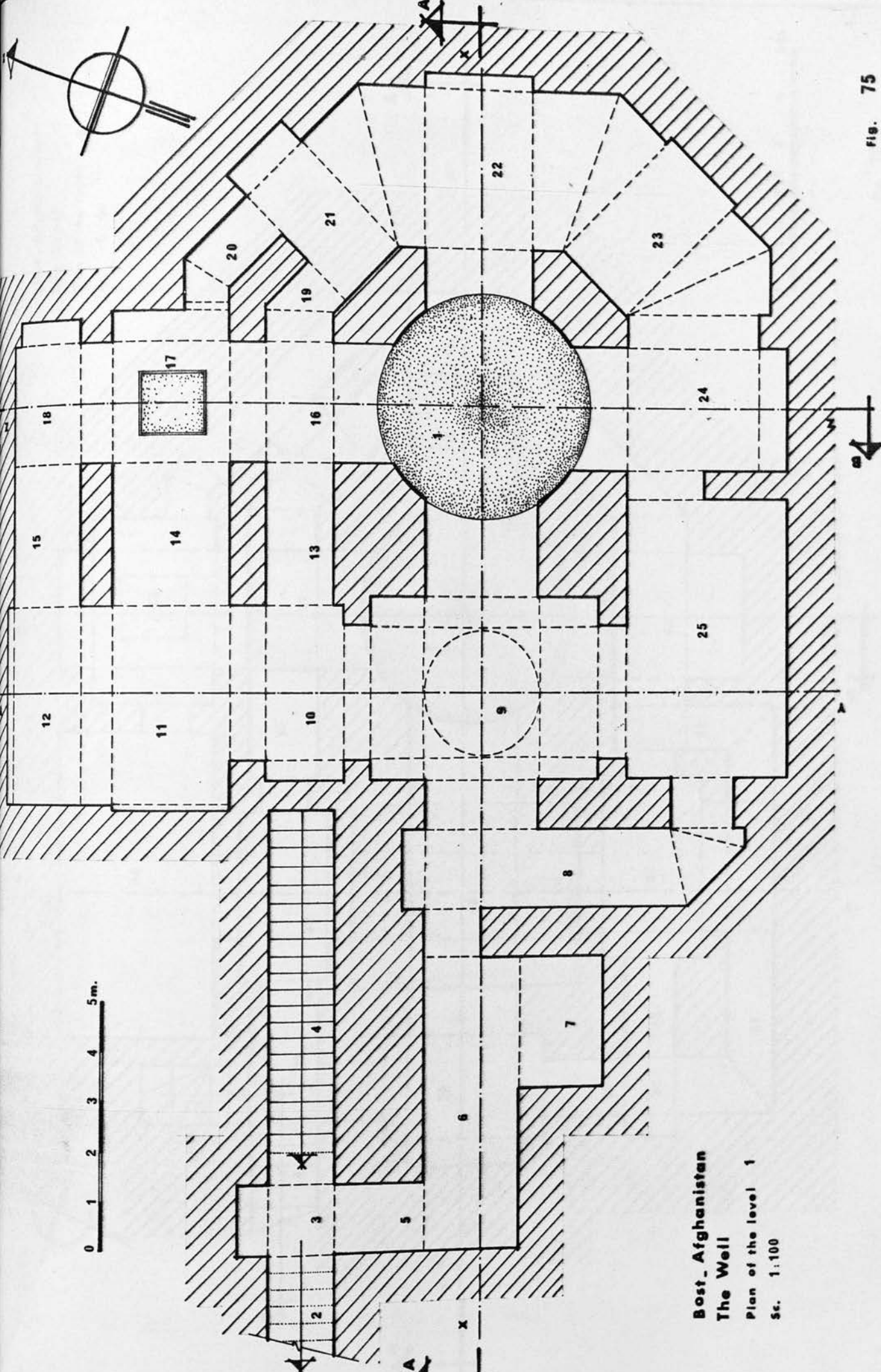


- 1-Central shaft
- a-Domed chamber
- b-Opening in the vault
of the chamber no. 17
- c-courtyard



Bost-Afghanistan
THE WELL

Sketch plan of the ground
level structure
Sc. 1:200



Bost, Afghanistan
The Well
Plan of the level 1
Sc. 1:100

East - Afghanistan
The Well
Plan of the level 2
Sc. 1: 00

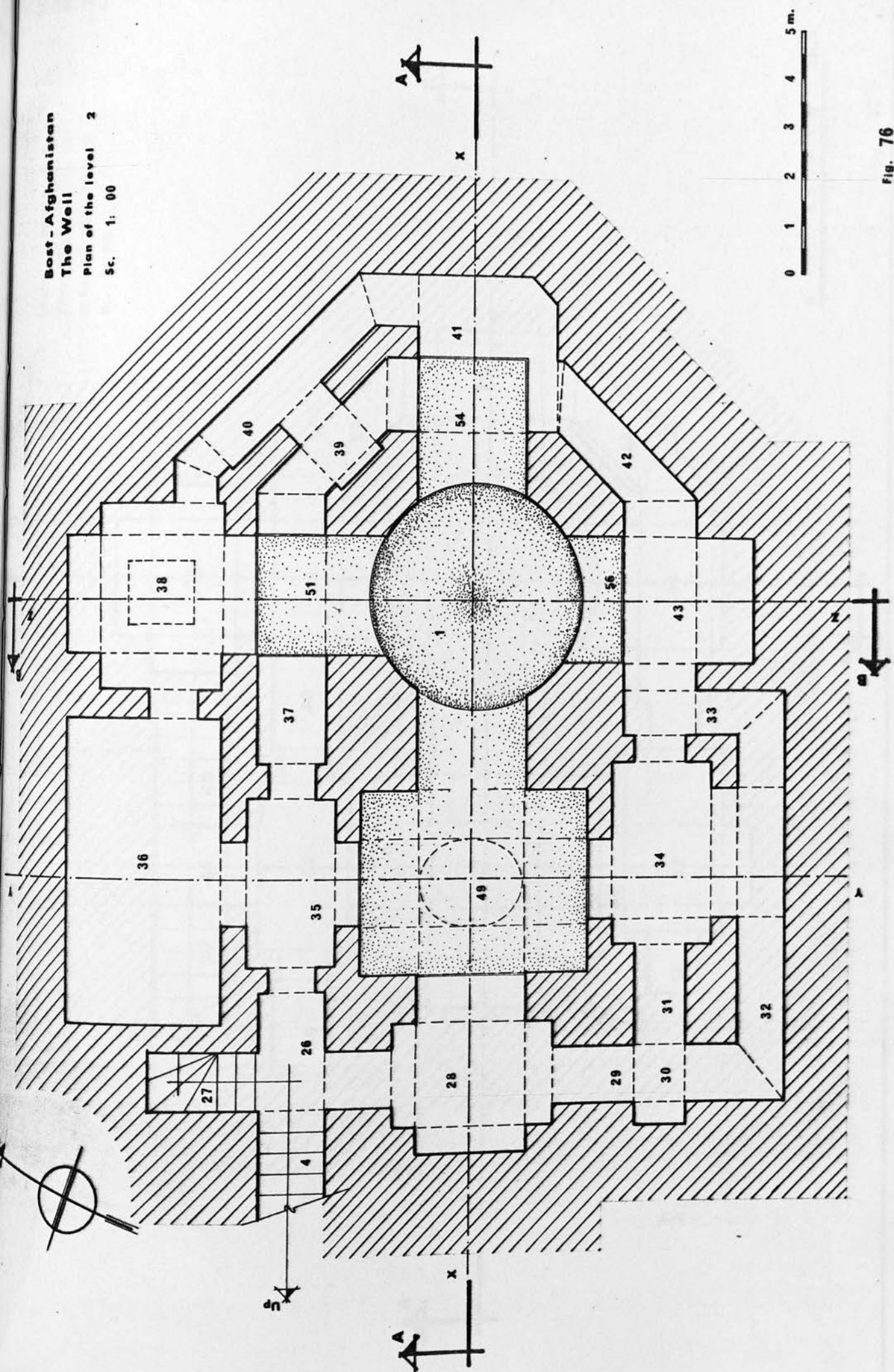


Fig. 76

BOST, AFGHANISTAN
The Well
PLAN OF THE LEVEL 3
Sc. 1:100

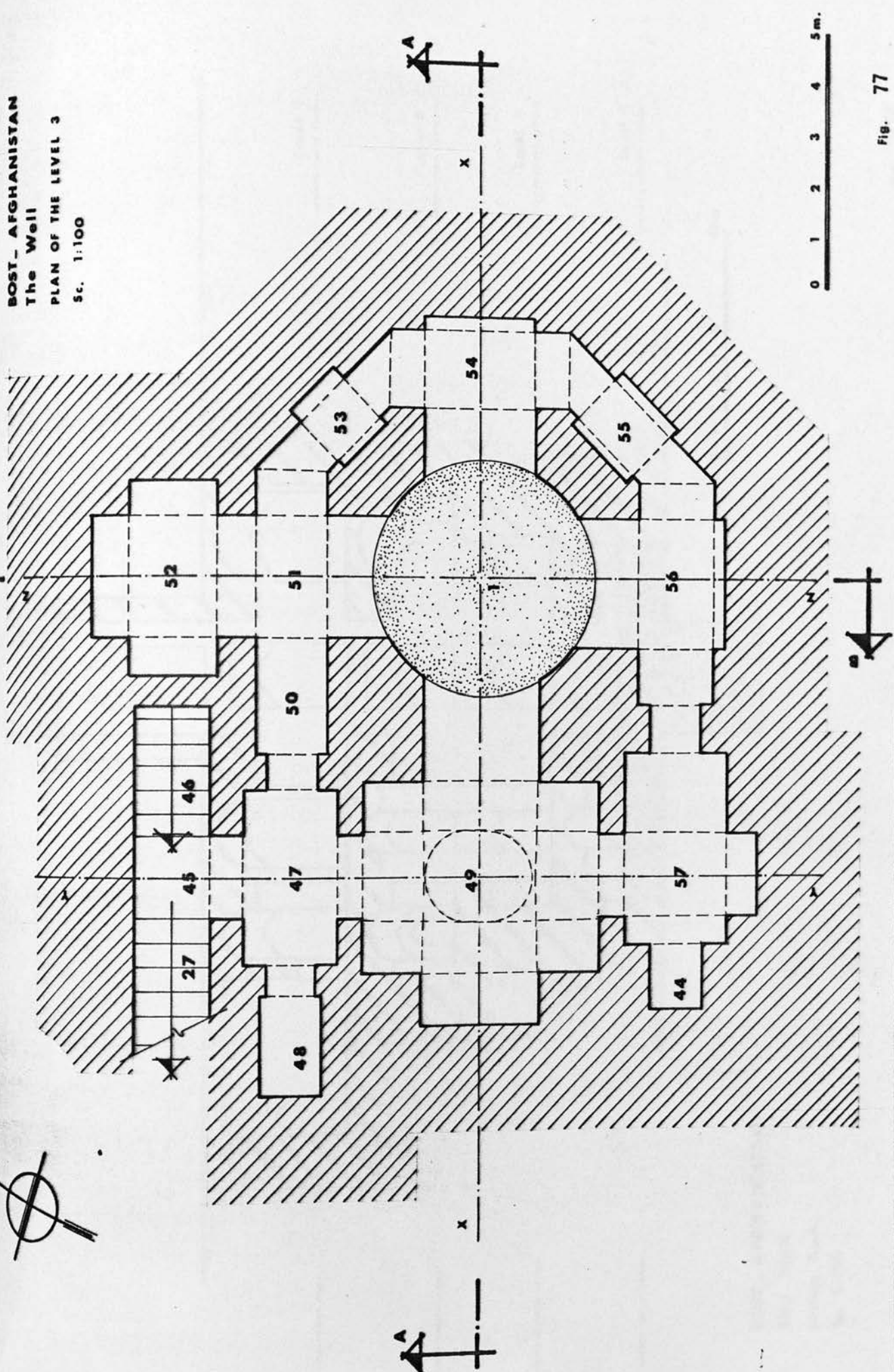
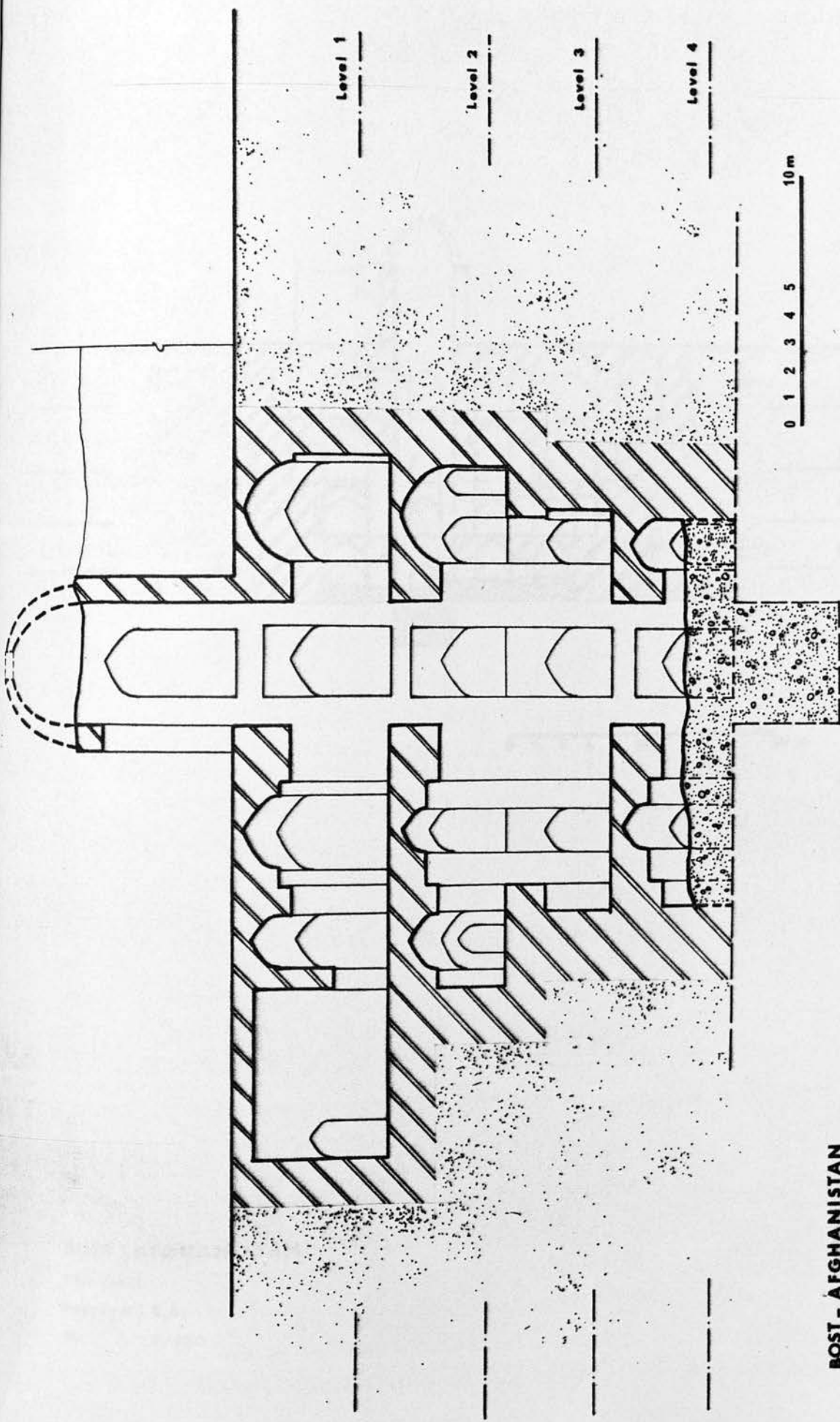
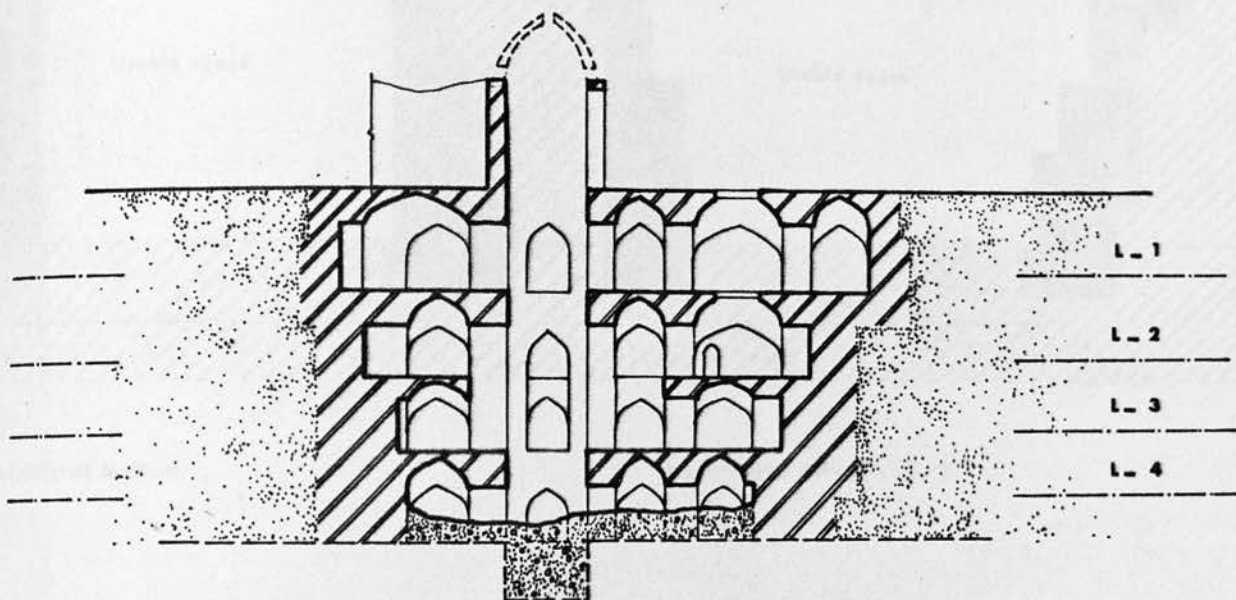


Fig. 77



BOST - AFGHANISTAN
The Well
 Section A-A
 Sc. 1:200



0 2 4 6 8 10 20 m.

BOST_AFGHANISTAN

THE WELL

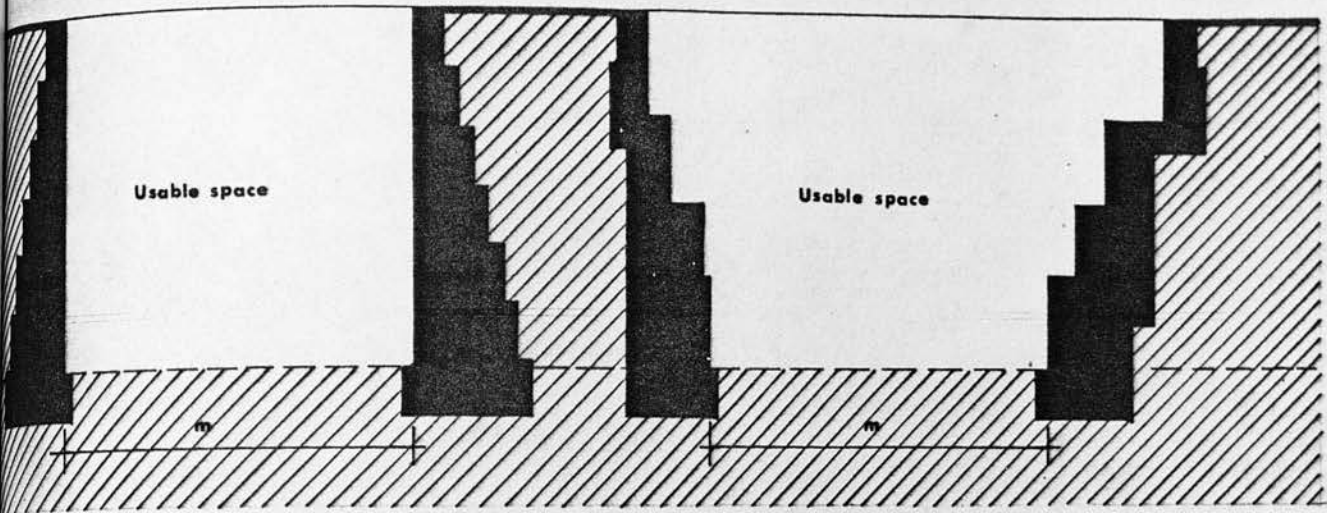
Section B.B.

Sc. 1:400

BOST-AFGHANISTAN

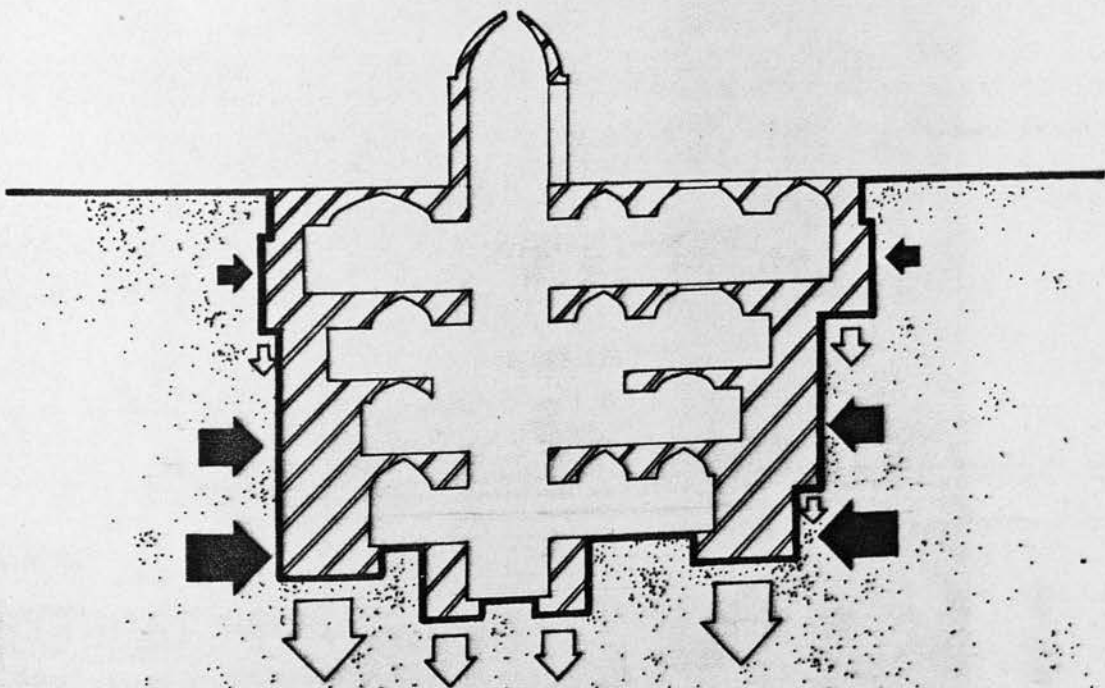
THE WELL

Diagram of the construction
of the side walls

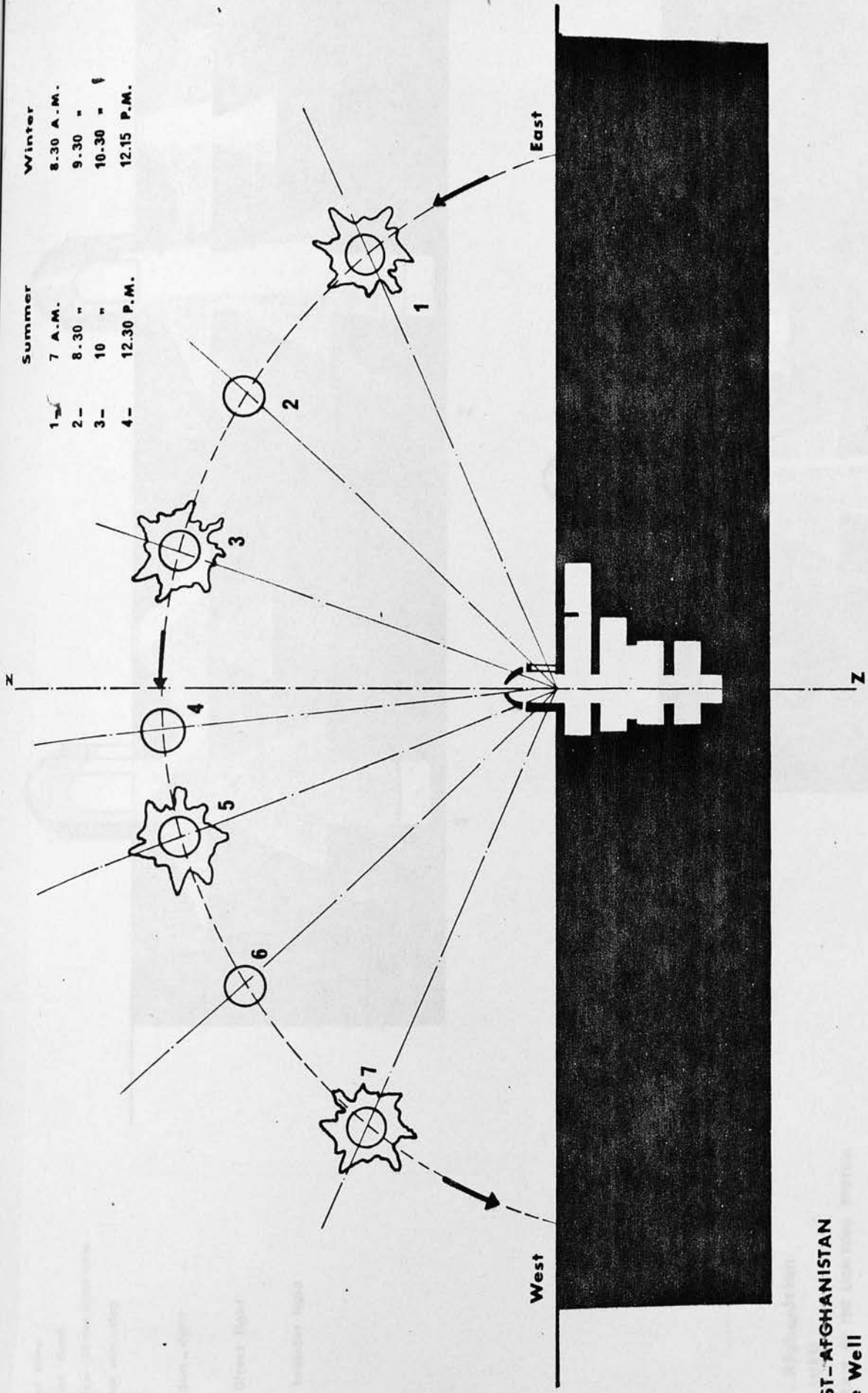


a-Traditional method

b-principle used at the well



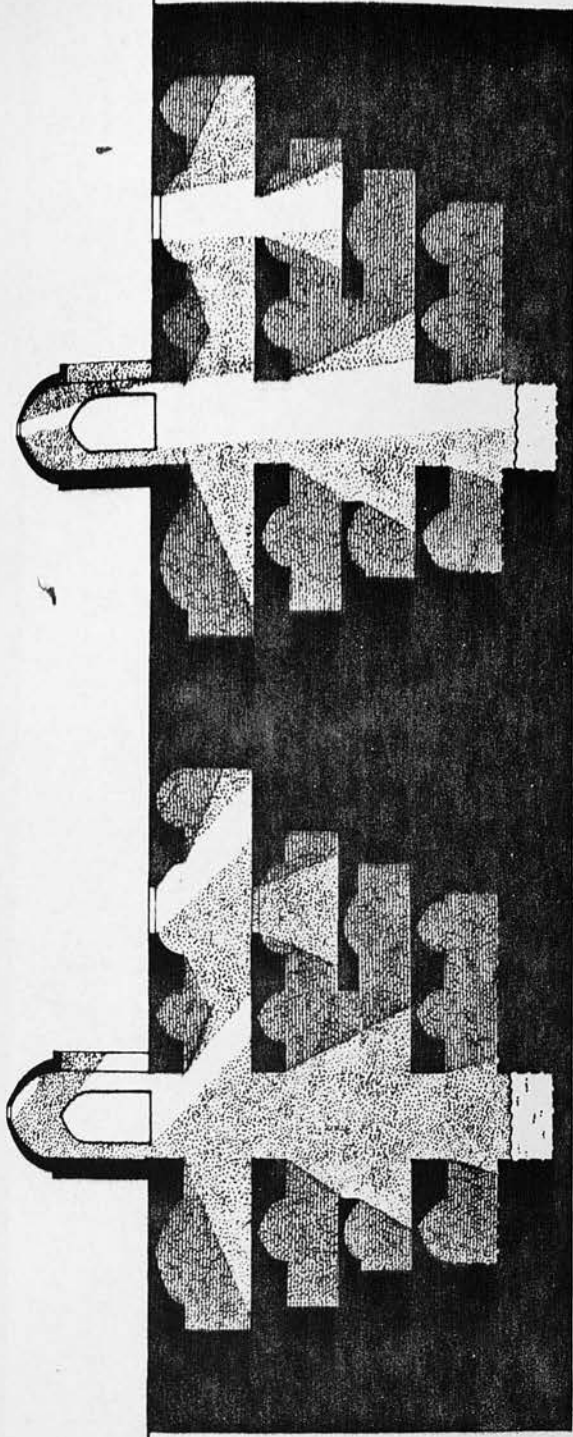
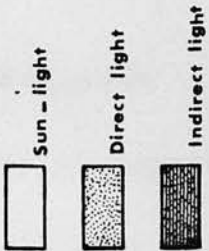
c- Possible form for the structure
of the exterior walls



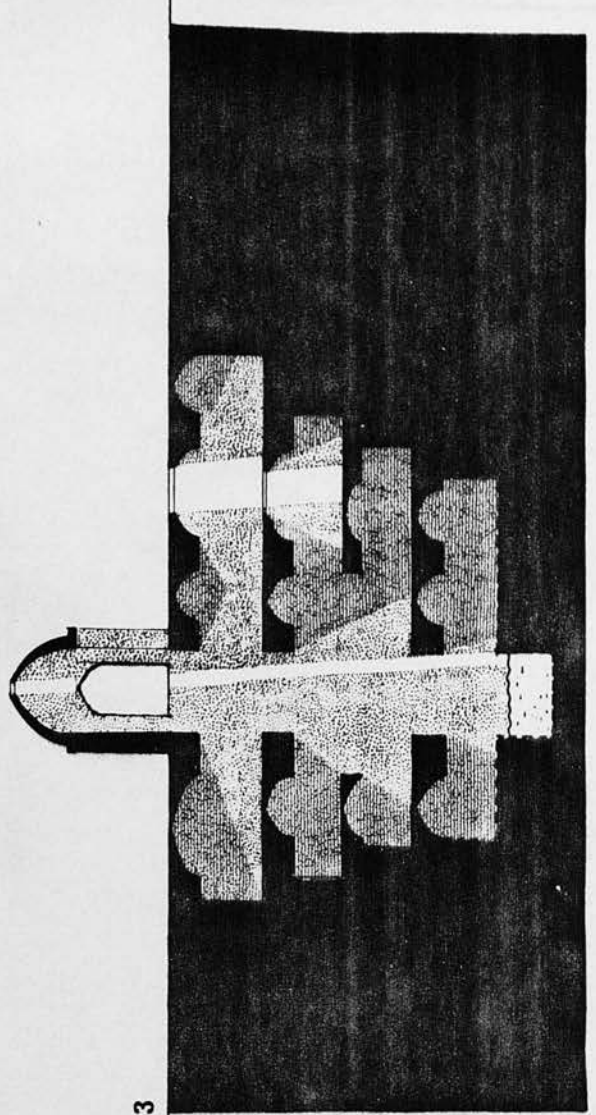
Summer		Winter	
1- 7 A.M.	2- 8.30 "	8.30 A.M.	9.30 "
3- 10 "	4- 12.30 P.M.	10.30 "	12.15 P.M.

BOST - AFGHANISTAN
The Well
 DIAGRAM OF THE POSITION OF THE
 SUN AT THE DIFFERENT TIME OF
 A DAY

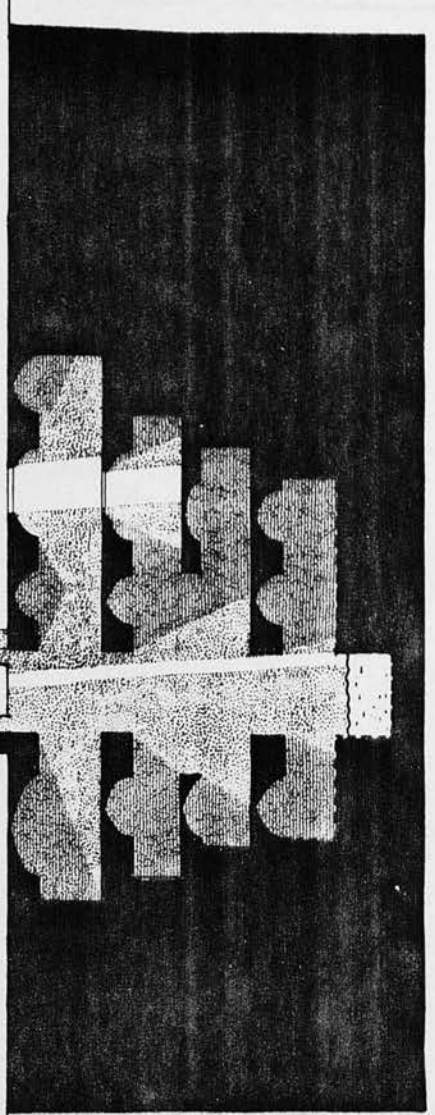
- 1 - Winter time
- 2 - Summer time
- 3 - Position of the light at a summer mid-day



1

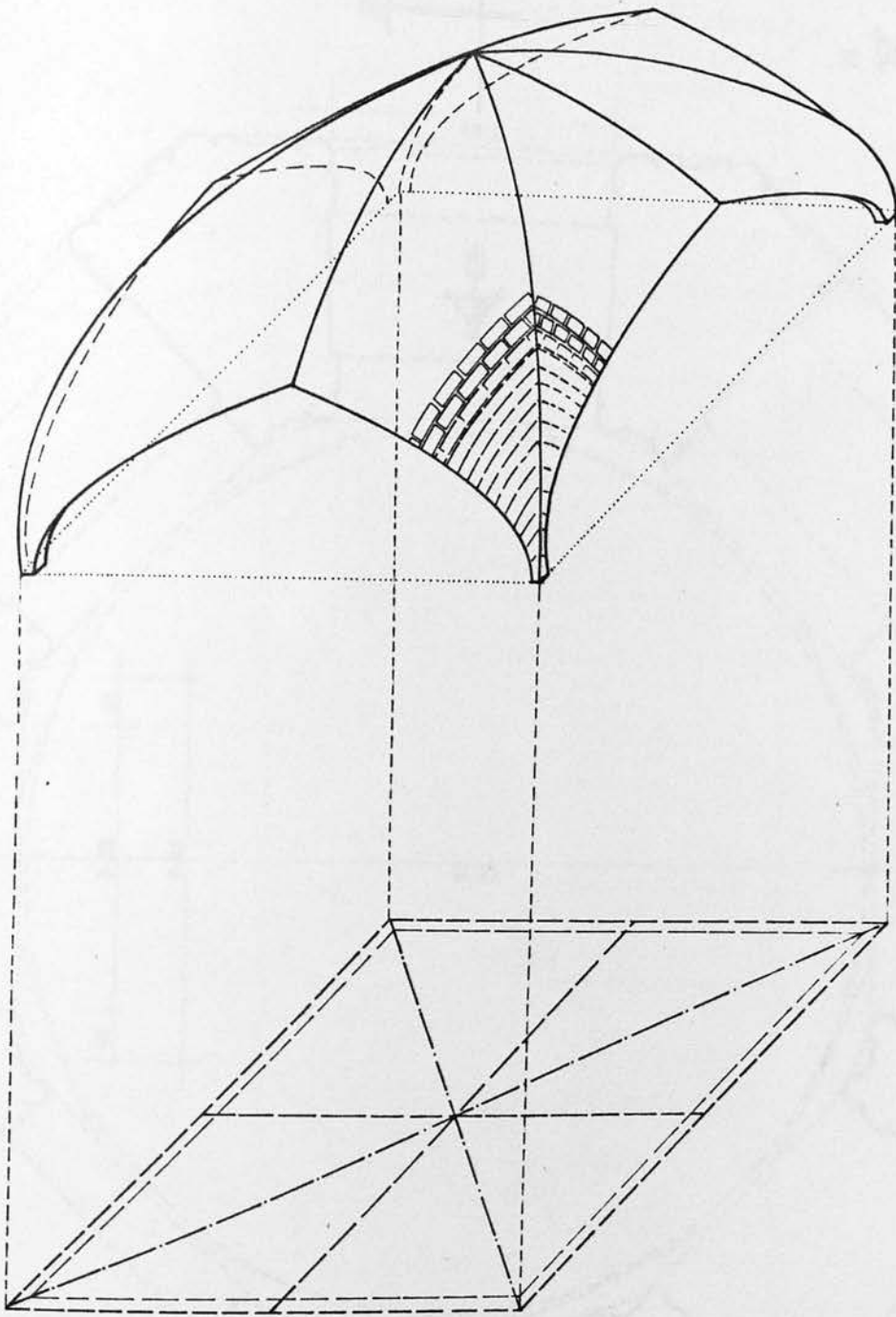


2



**Bost - Afghanistan
THE WELL**

DIAGRAM OF THE LIGHTING SYSTEM



BOST - AFGHANISTAN

THE WELL

Structure of the cross vaults

Bost-Aghnistan
Shrine of shāh-zāde sarbāz
PLAN
Sc. 1:100

0 1 2 3 4 5 m.

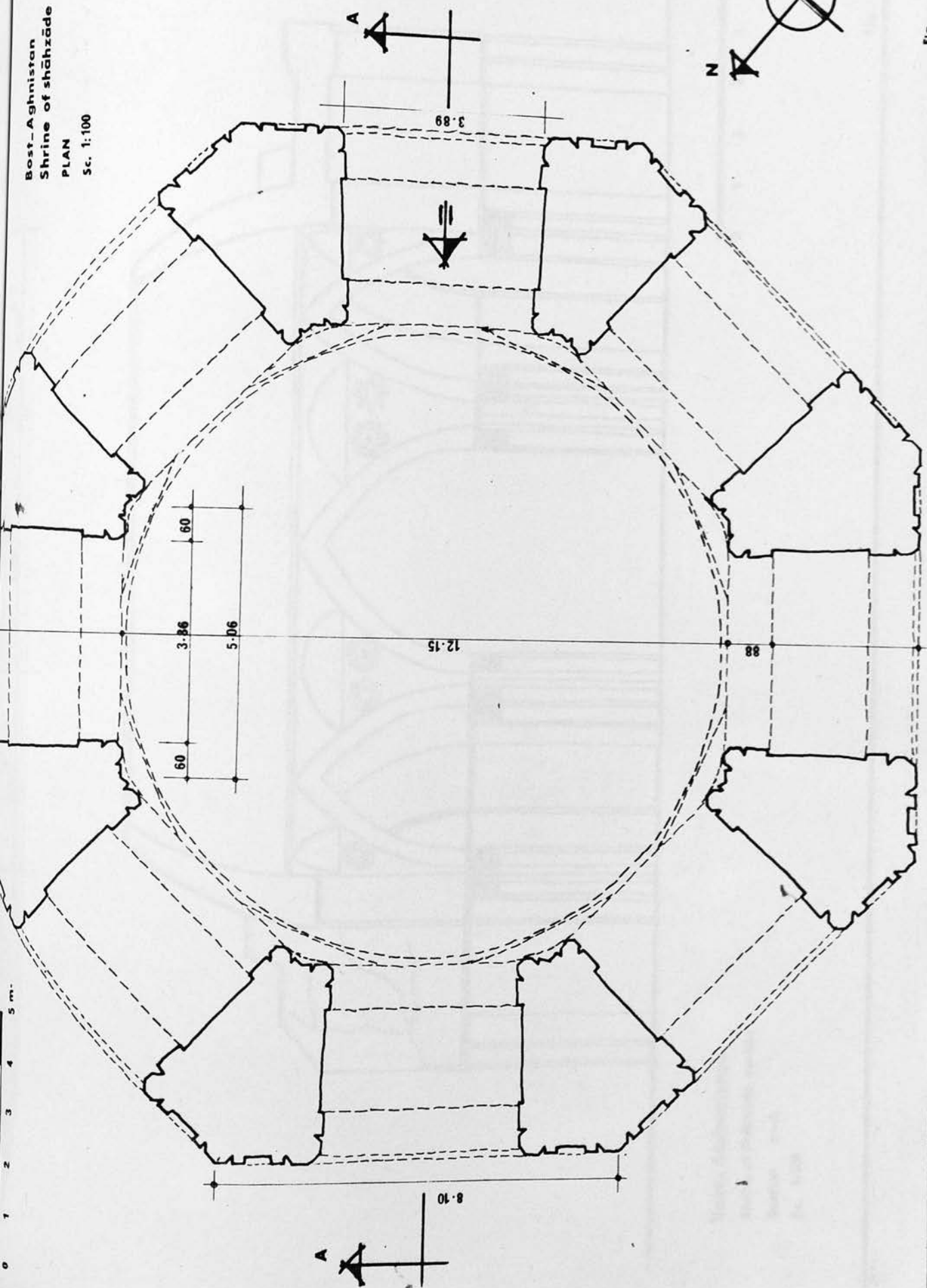
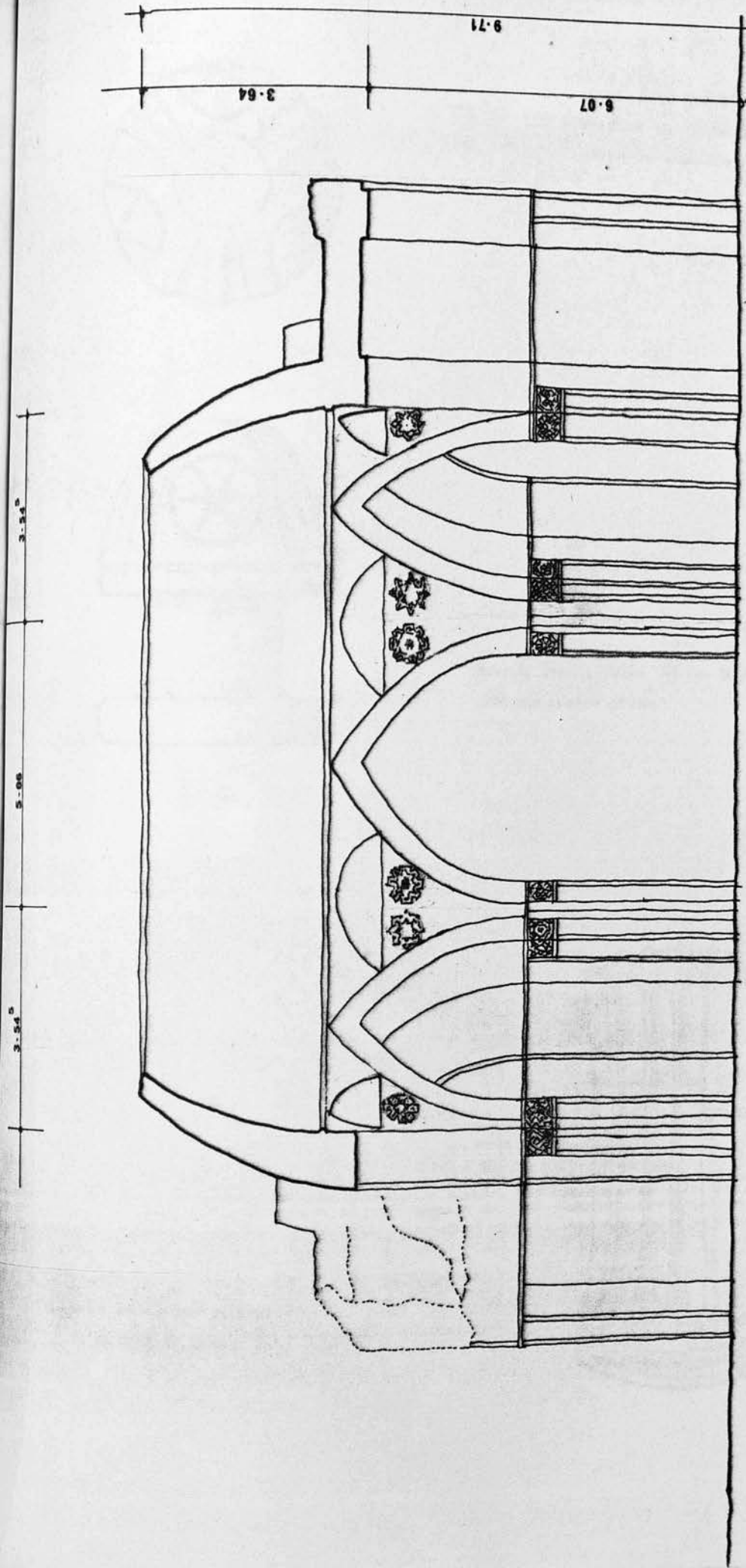
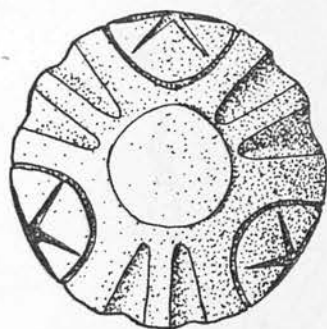


Fig. 84

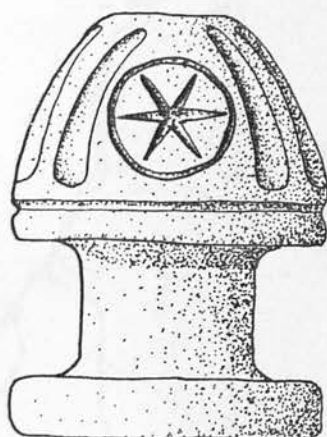


Bost - Afghanistan
Shrine of dhahzede sarbâx
Section A-A
Sc. 1:100



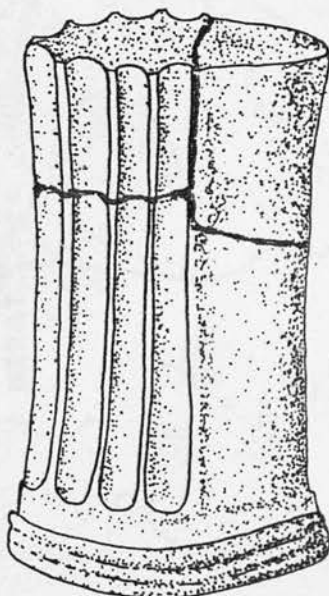
Bost- Afghanistan

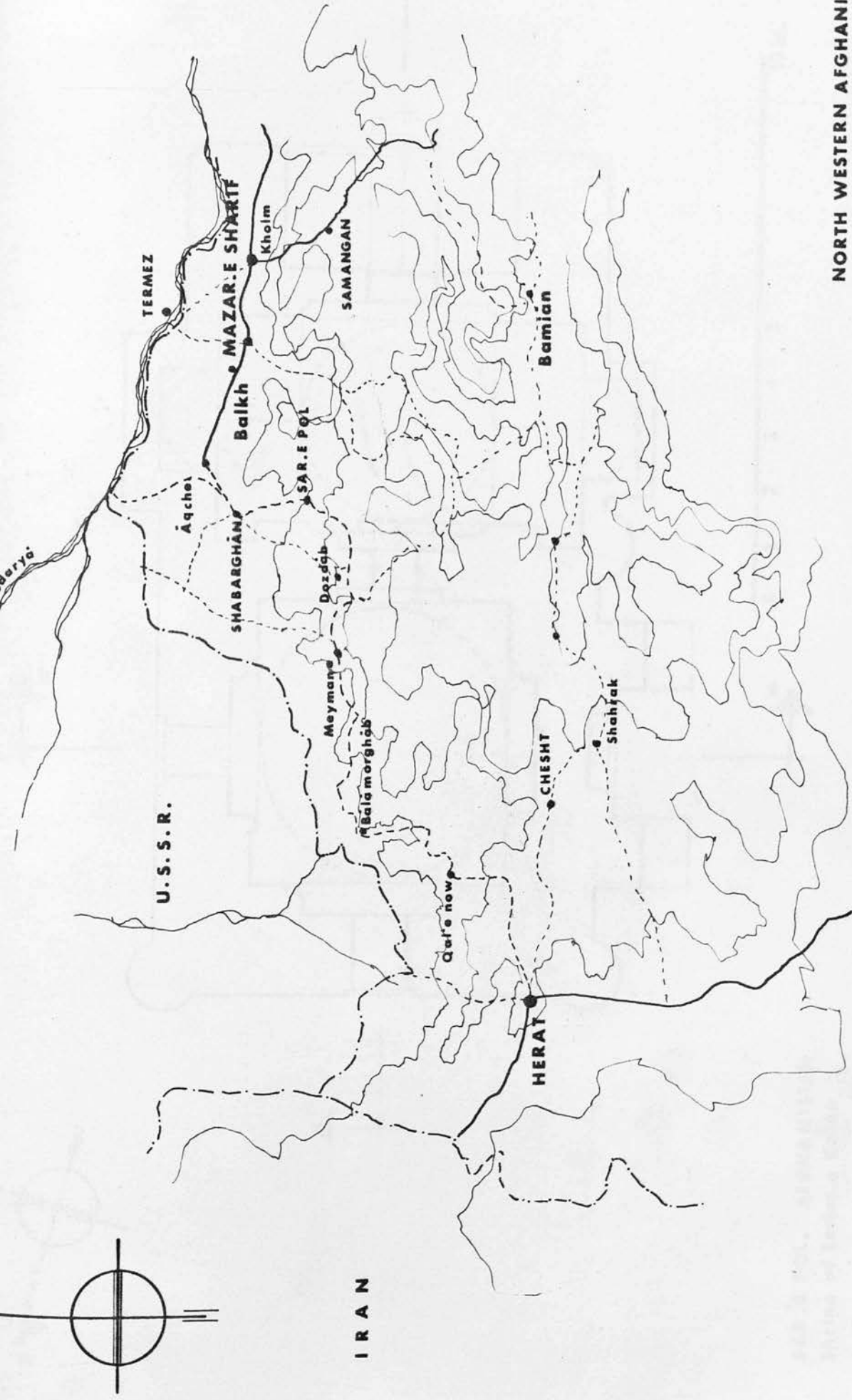
Parthian objects found in the
shrine of shāhzāde sarbāz



Marble objects about 45 cm. high
with the symbol of sun

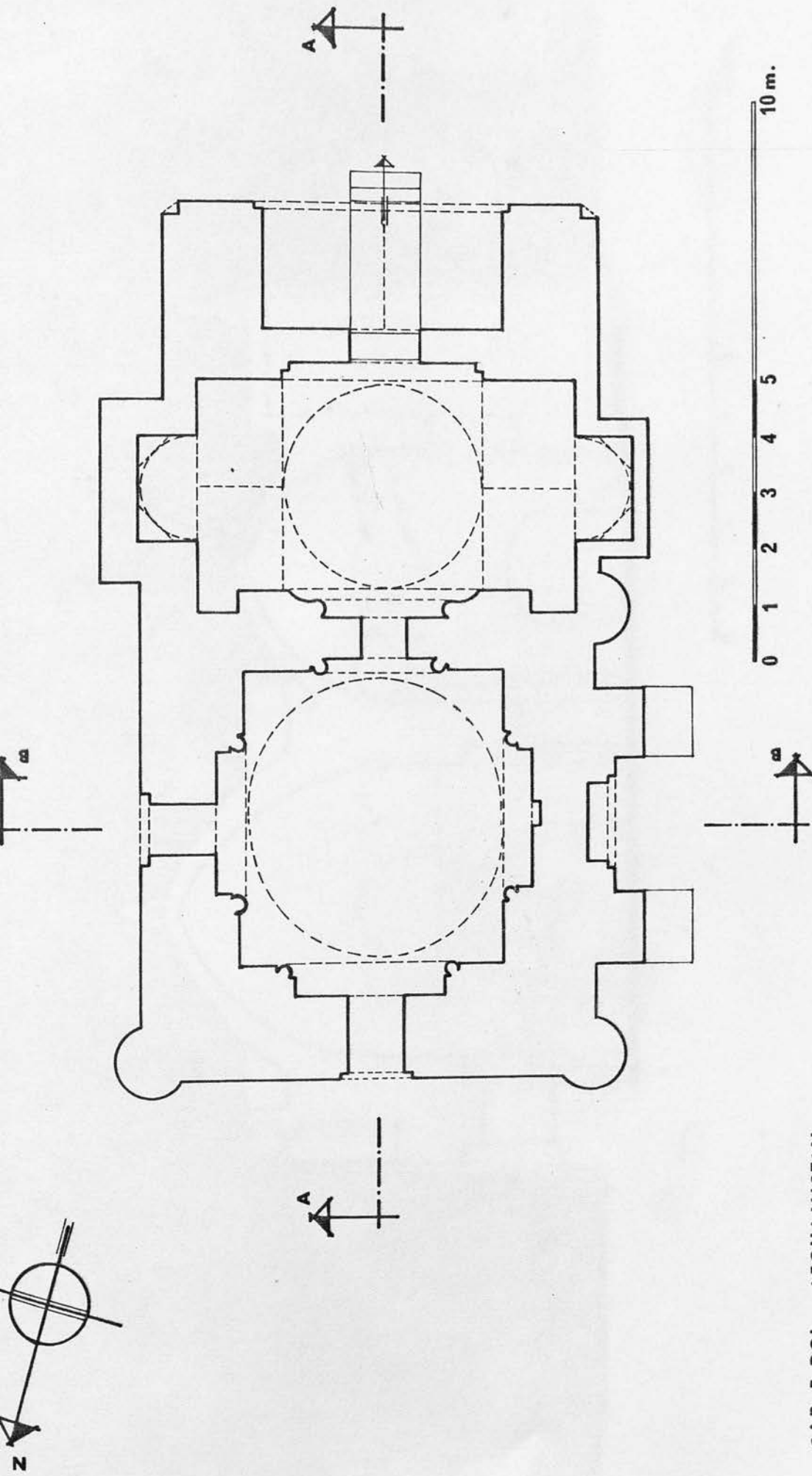
Drum of a fluted column
in Hellenistic style





NORTH WESTERN AFGHANISTAN

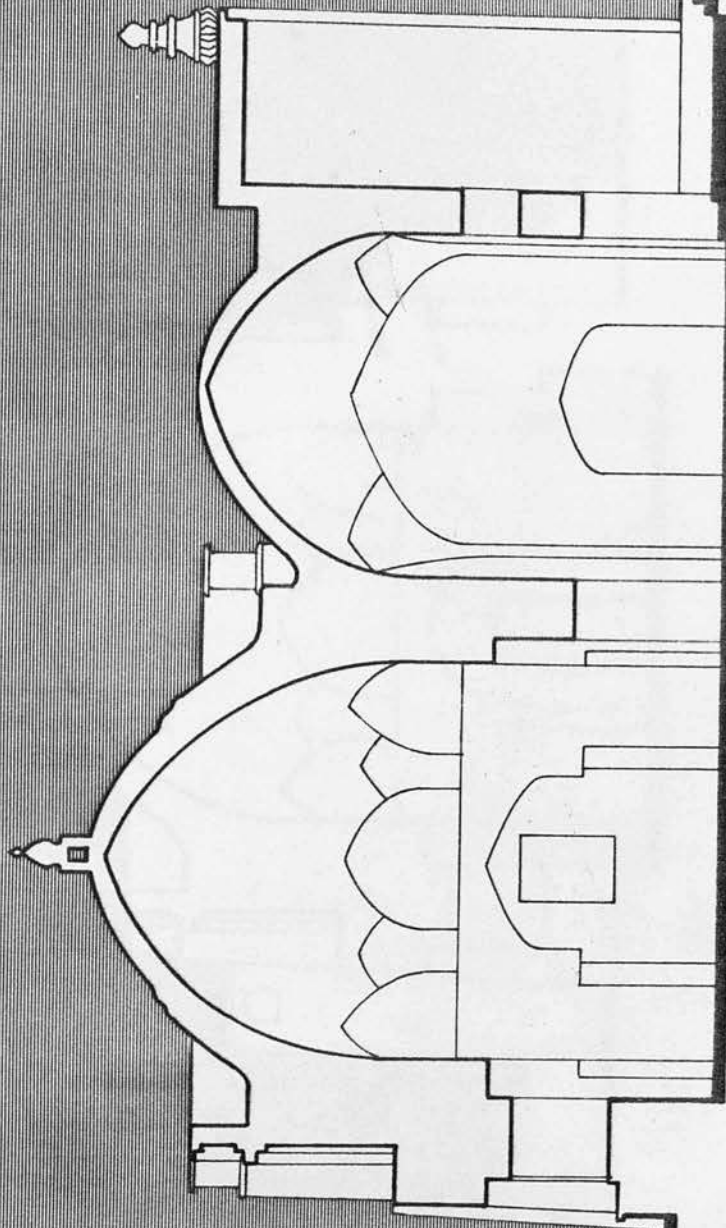
Sc. 1:4 000 000



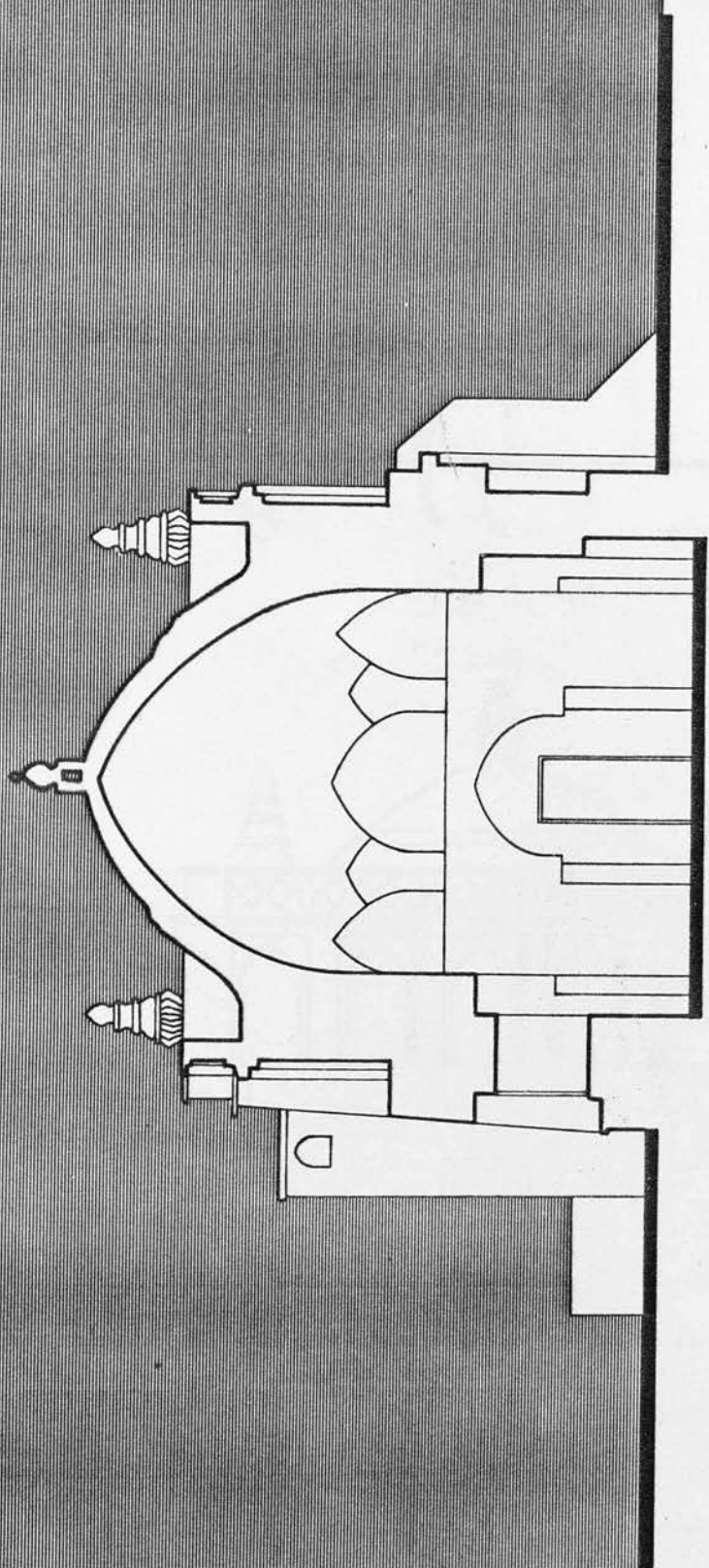
SAR-E POL, AFGHANISTAN
 Shrine of Emām.e Kalān

PLAN

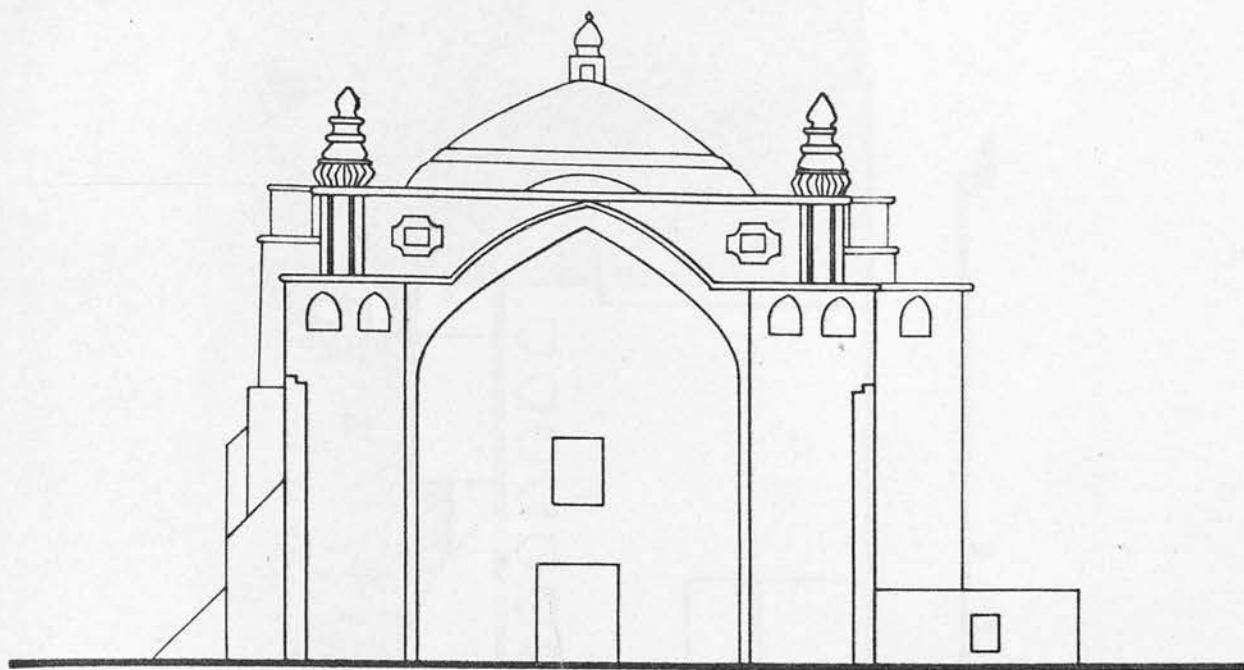
Sc. 1:100



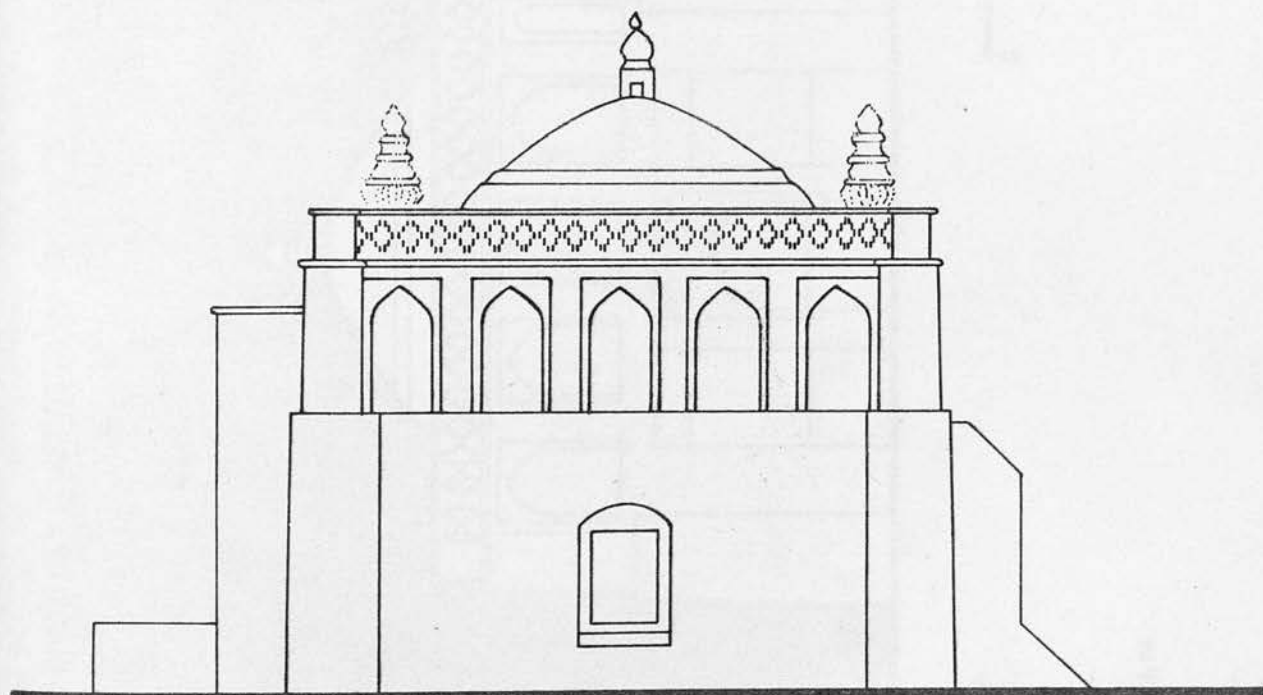
SAR-E POL, AFGHANISTAN
Shrine of Emām-e Kalān
SECTION A-A
Sc. 1:100



SAR-E POL, AFGHANISTAN
Shrine of Emām.e Kalān
SECTION B-B
Sc. 1:100



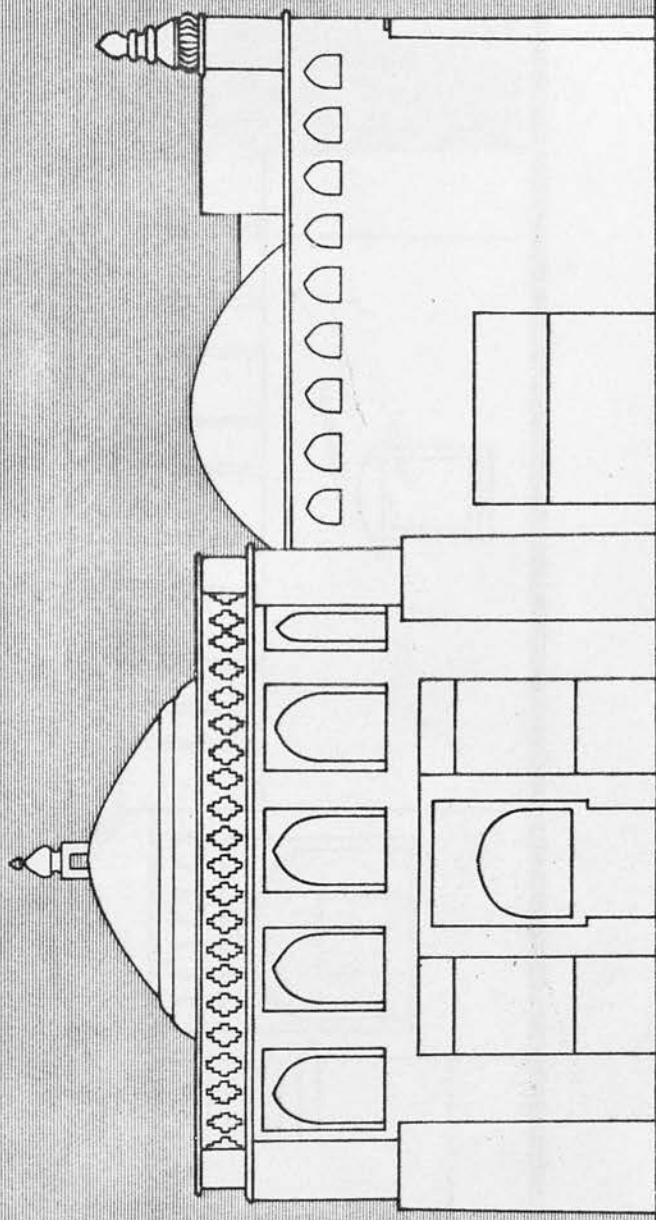
SOUTH ELEVATION



NORTH ELEVATION

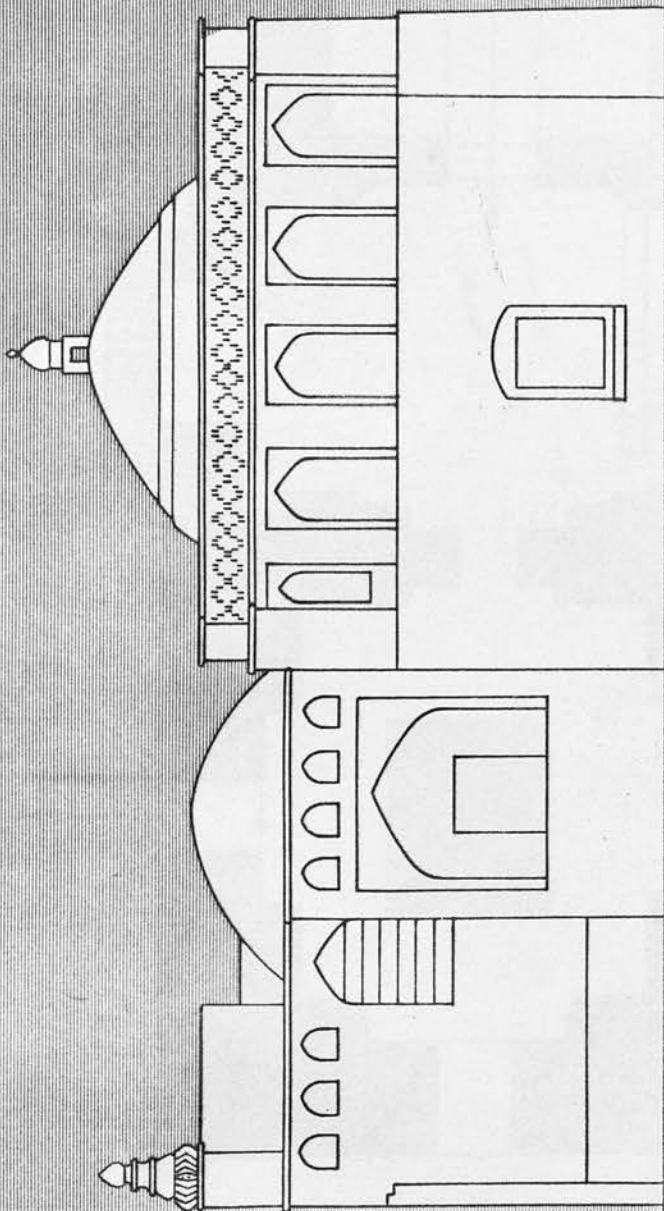
0 1 2 3 4 5m.

SAR-E POL, AFGHANISTAN
 Shrine of Emām.e Kalān
 sc. 1:100



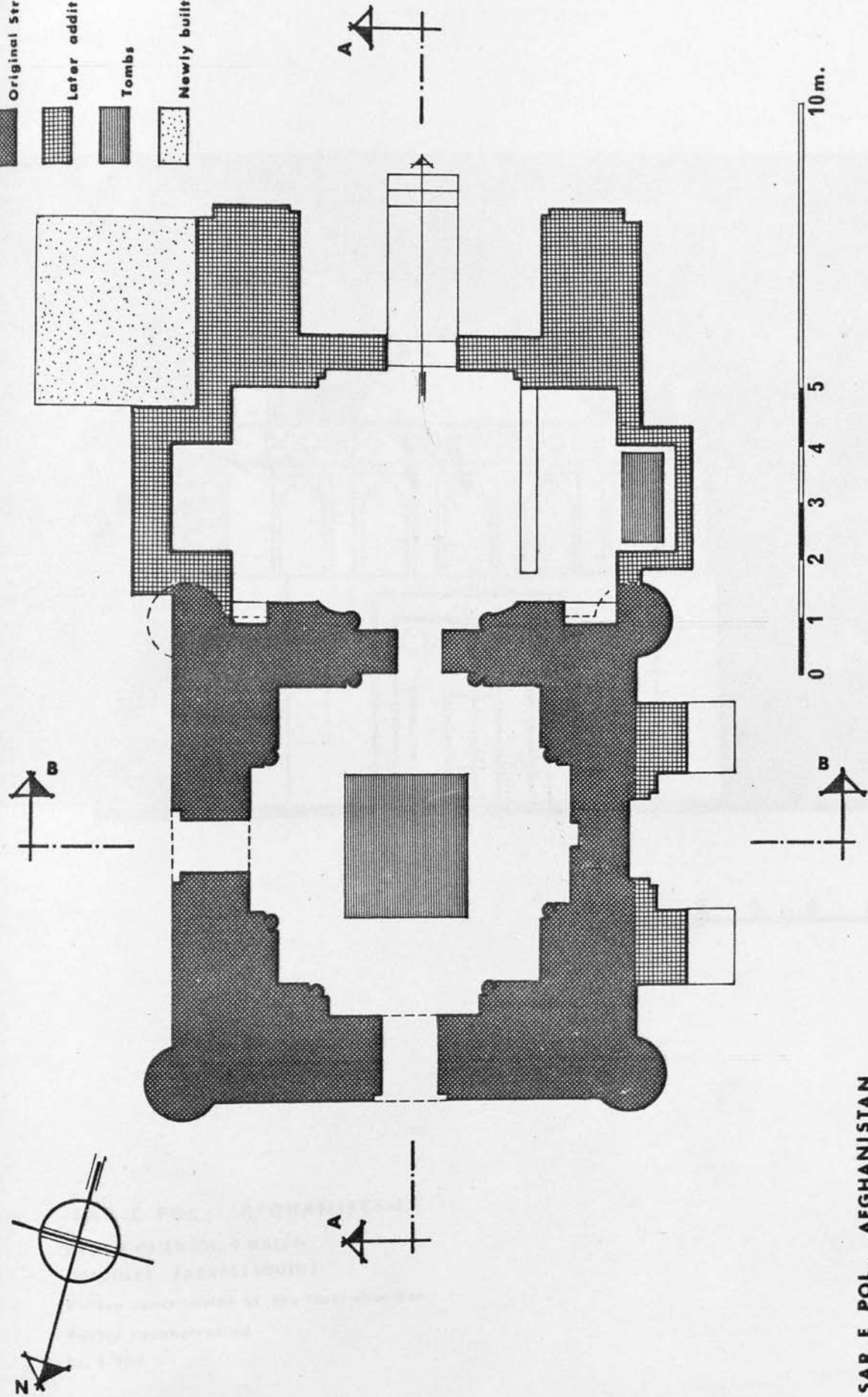
SAR-E POL, AFGHANISTAN
Shrine of Emām.e Kalān
WEST ELEVATION
Sc. 1:100



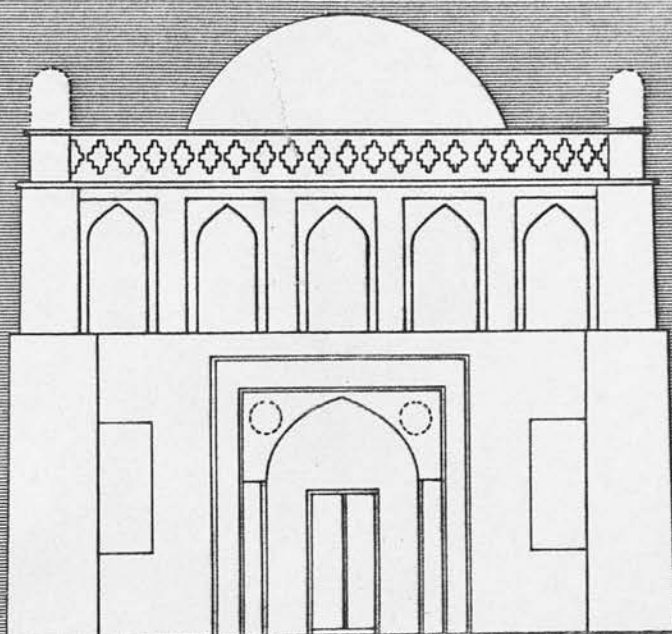


SAR-E POL, AFGHANISTAN
Shrine of Emām-e Kalān
EAST ELEVATION
Sc. 1:100

- Original Structure
- Later addition
- Tombs
- Newly built storage



SAR-E POL, AFGHANISTAN
Shrine of Emām.e Kalān
CHRONOLOGICAL PLAN
 Sc. 1:100



0 1 2 3 4 5m.

SAR-E POL, AFGHANISTAN

SHRINE OF EMÂM-E KALÂN
ORIGINAL FACADE (SOUTH)

Before construction of the front chamber

Partly reconstructed

Sc. 1:100

