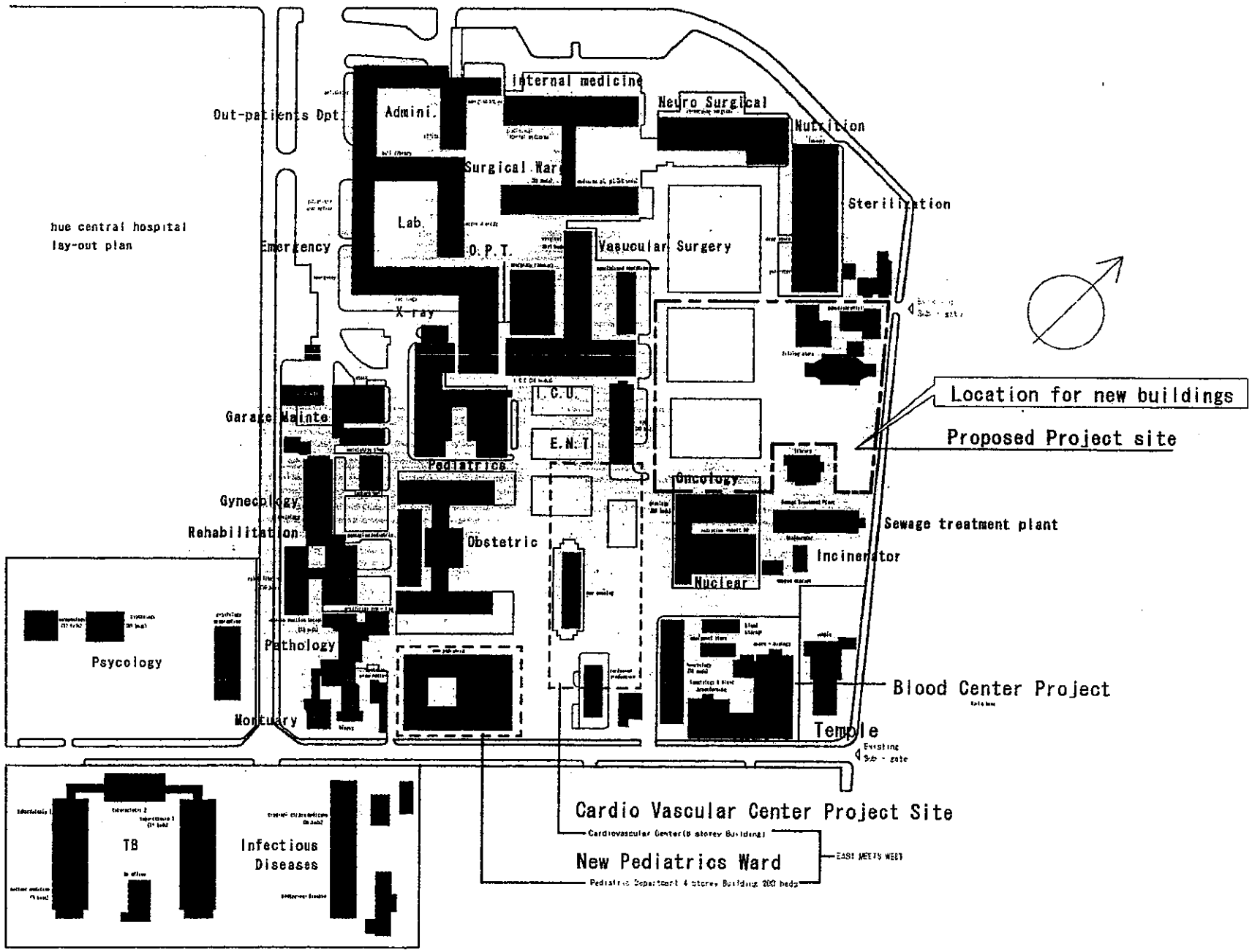
５．建築・設備関連図面（フエ中央病院）

（１）現況配置図　dw-1
（２）関連施設 1 階平面図　dw-2
（３）関連施設 2 階平面図　dw-3
（４）新小児病棟 1－4 階平面図　kt-02～05
（５）新循環器センター1－6 階平面図　kt-01～06
（６）電気設備　既存病院系統図　資料-1～2
（７）電気設備　地下ケーブル系統図　資料-3～8
（８）給水設備　系統図　資料-9
（９）排水設備　主放流経路　資料-10
（10）放流水質　フエ人民委員会環境部によるフエ病院放流水質検査　資料-11



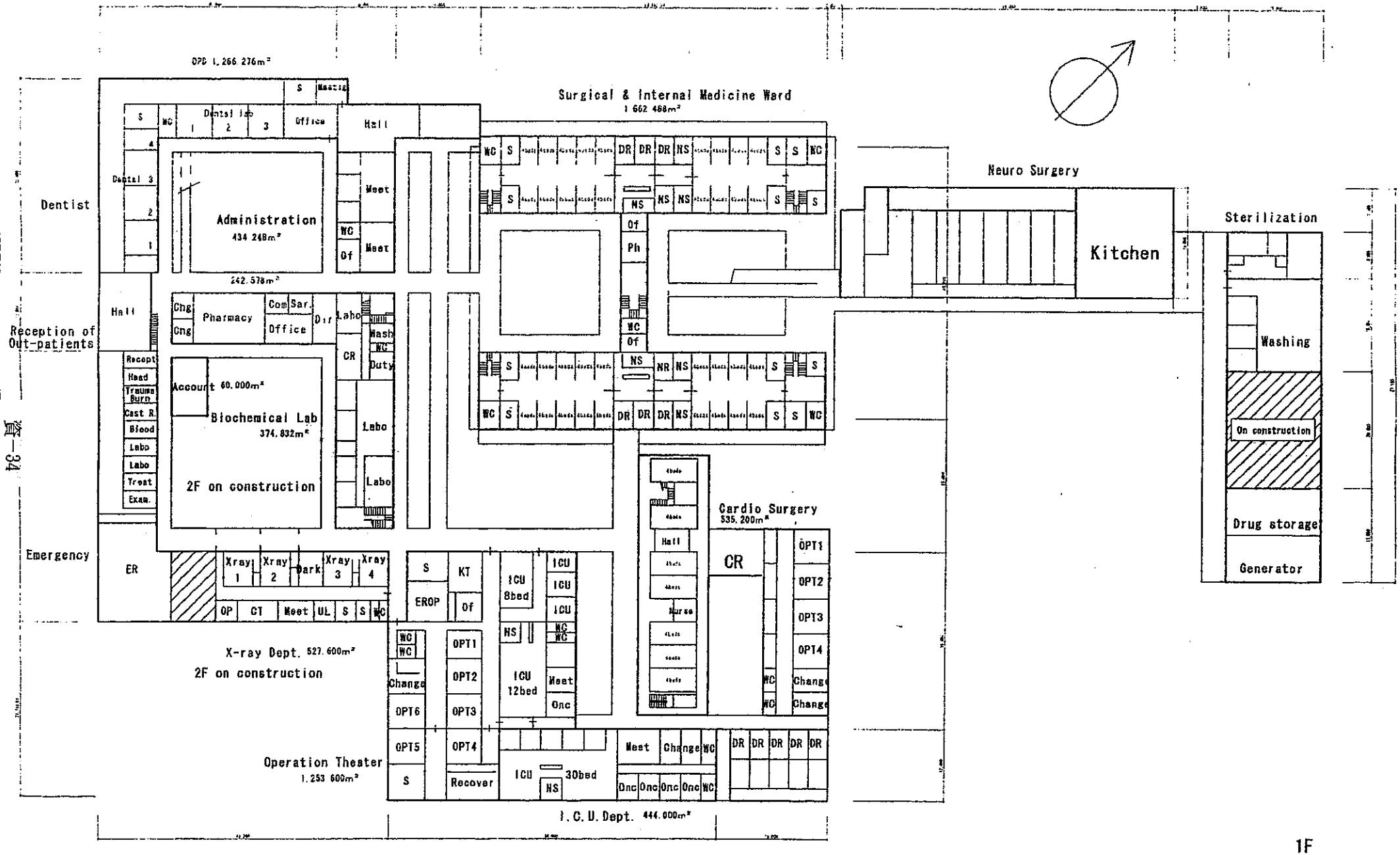
Hue central hospital

Location :
Hue City - VietNam

Existing site plan

scale : 1 ≒ 2500

dw-01



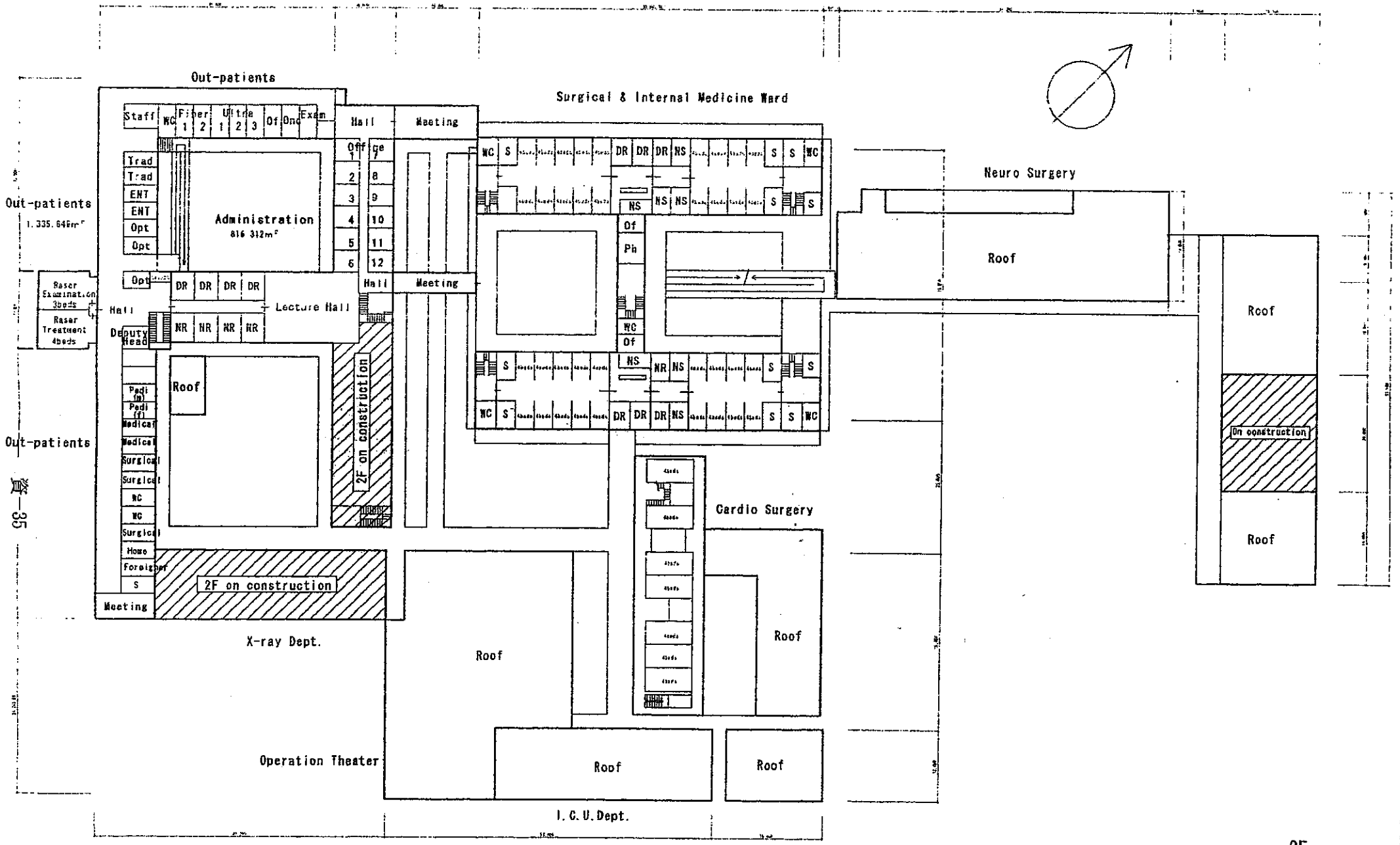
Project for the improvement of Hue central hospital

Location : Hue City - VietNam

Existing Target Building plan

1F scale : 1 - 600

dw-02



Project for the improvement of Hue central hospital

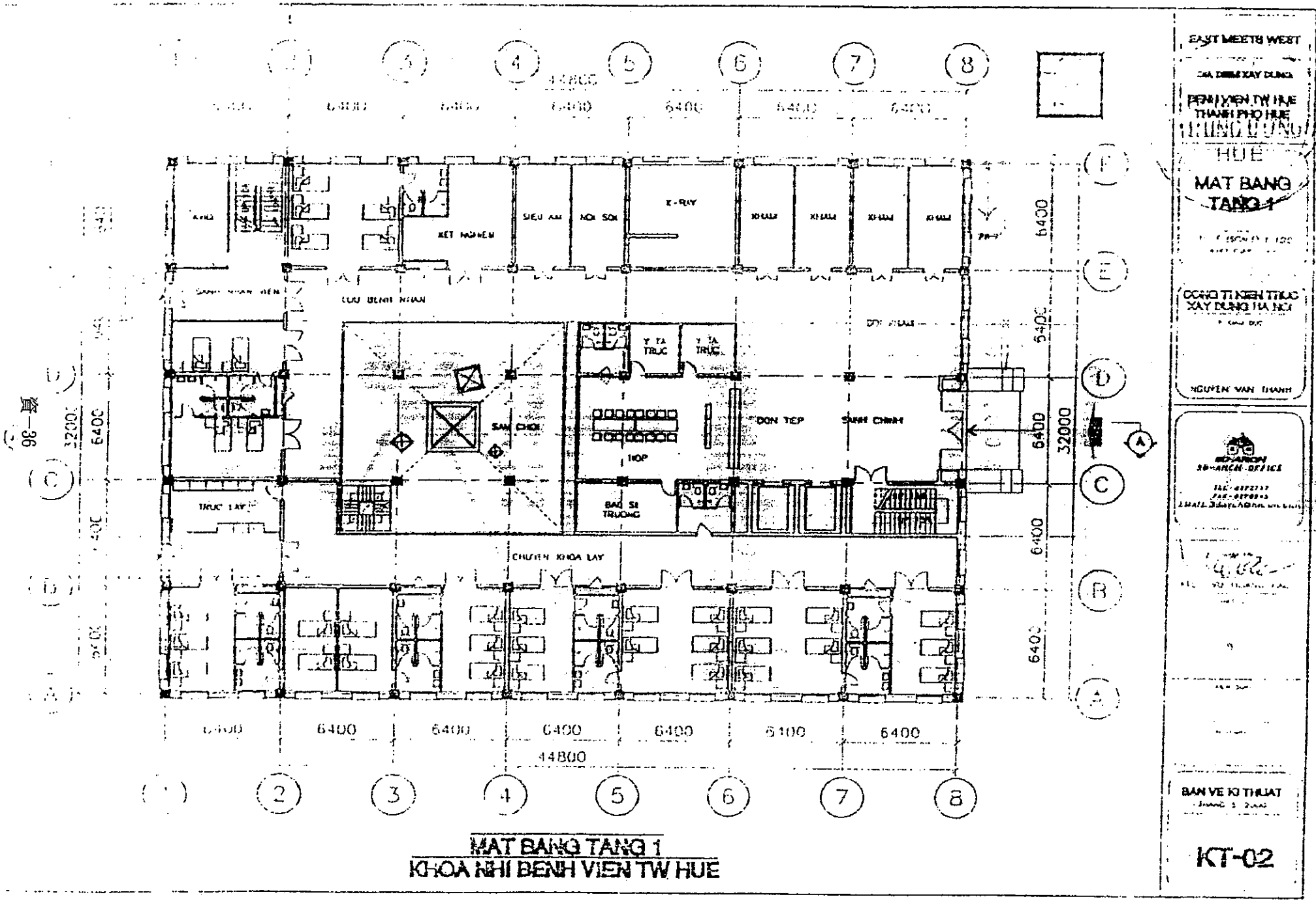
Location : Hue City - VietNam

2003-1-23 Architect T.Horigome

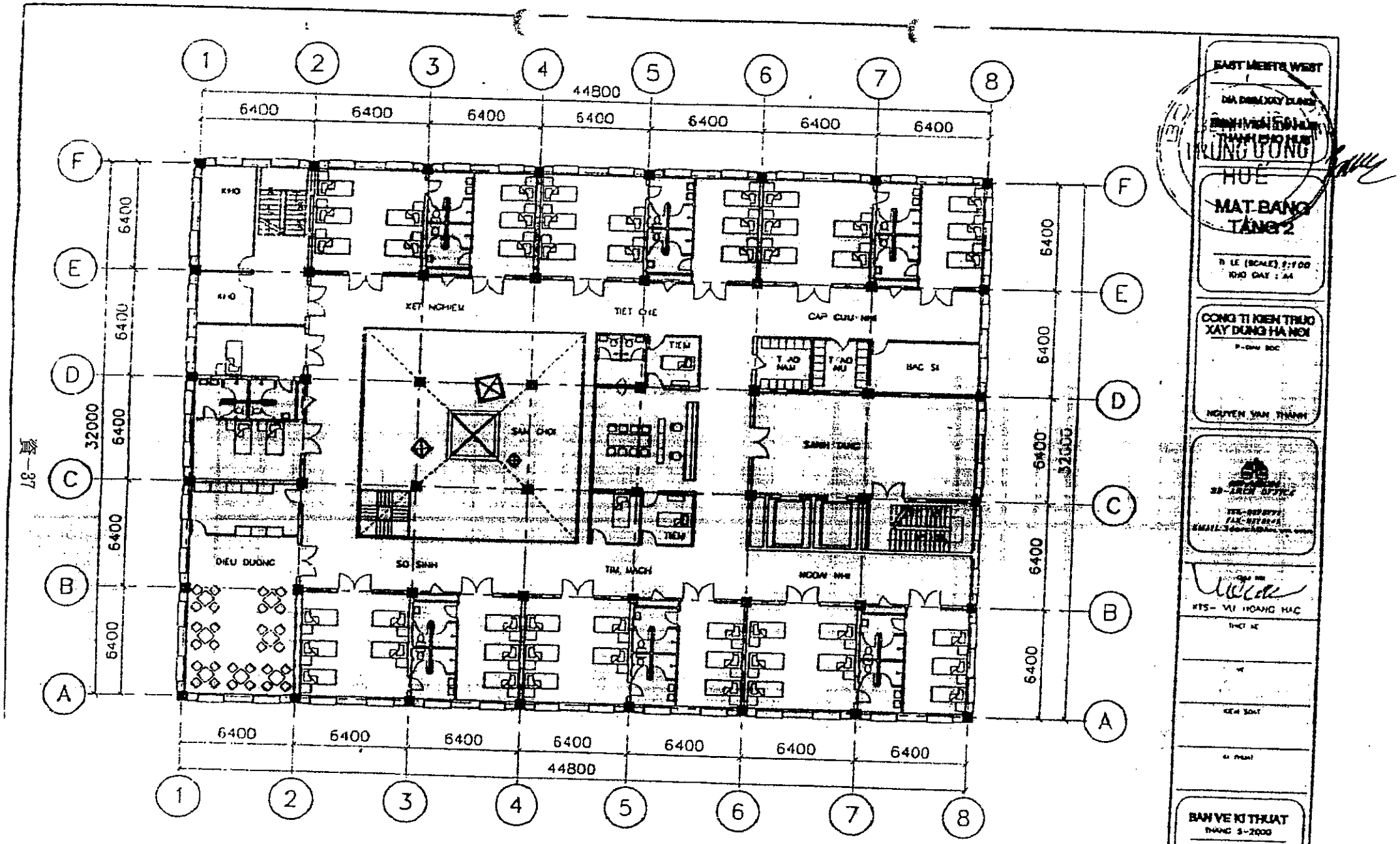
Existing Target Building plan

2F scale : 1 - 600

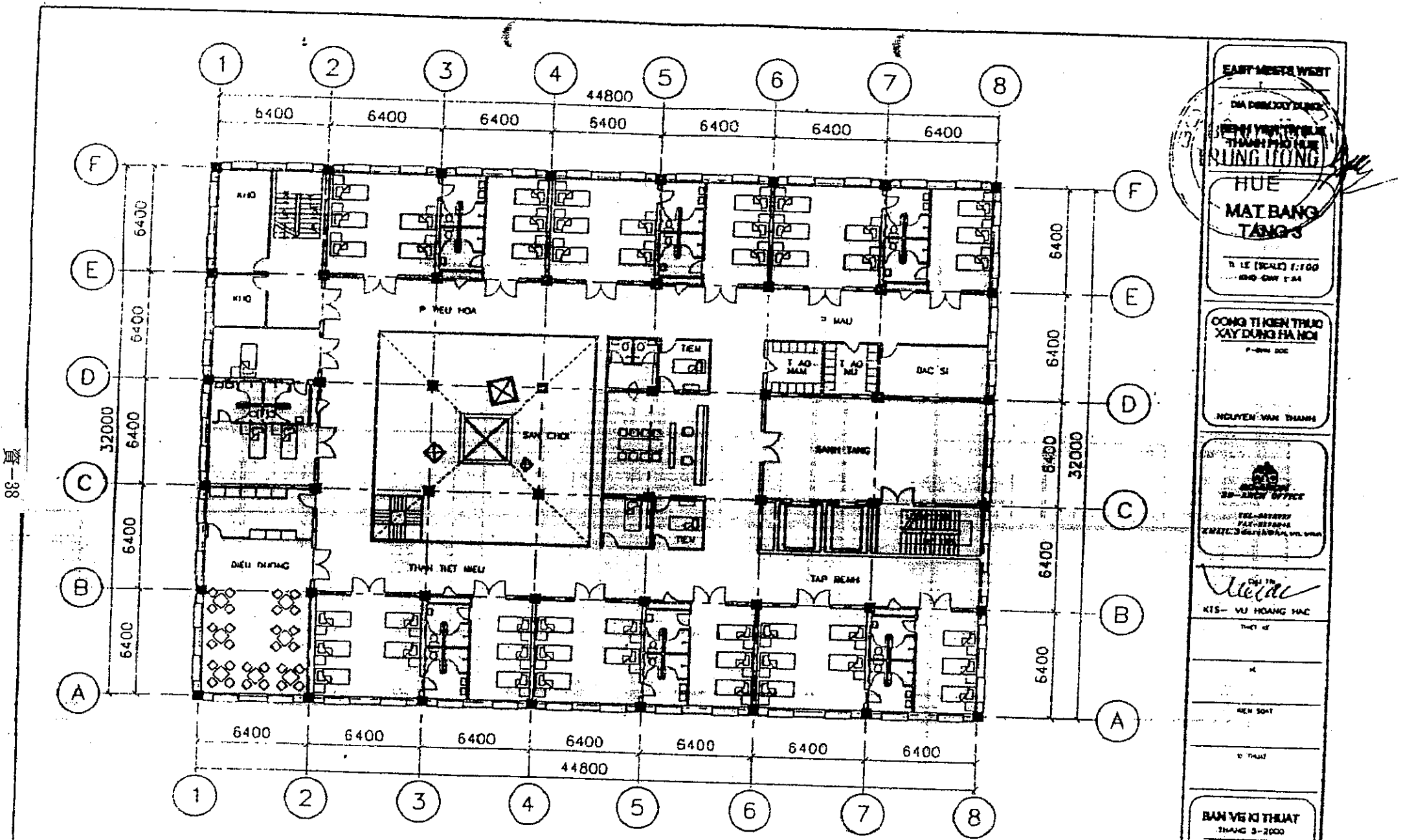
dw-03



MẶT BẰNG TẦNG 1
KHOA NHI BỆNH VIỆN TW HUẾ



MAT BANG TANG 2



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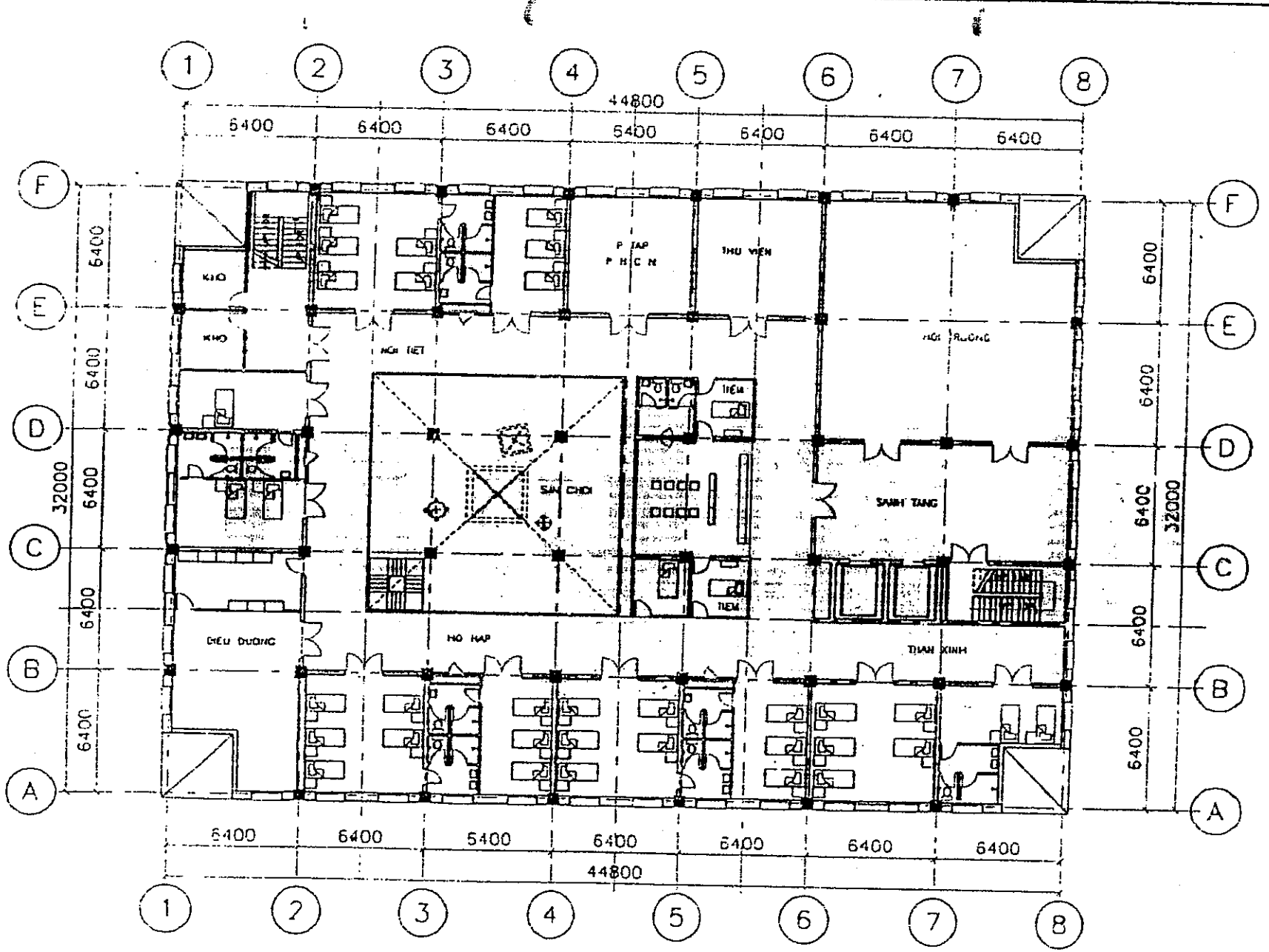


MAT BANG TANG 4

EAST MEETS WEST

DUNG U'ONG

MAT BANG TANG 4

TI LE (SCALE) 1:100

KHO GIAY : A4

CONG TI KIEN TRUC XAY DUNG HA NOI

NGUYEN VAN THANH

KTS- VU HOANG HAC

BAN VE KI THUAT

THANG 5-2000

KT-05

GHI CHÚ:

-CAC MOC GIOI A-B-C-D-E-H XAC DINH VI TRI **(KHU A)** DIEN TICH DAT : 67.855 M2

-CAC MOC GIOI K-L-M-N XAC DINH VI TRI **(KHU B)** DIEN TICH DAT : 8.803 M2

-CAC MOC GIOI P-R-S-T XAC DINH VI TRI **(KHU C)** DIEN TICH DAT : 12.608 M2

-TONG DIEN TICH DAT (A)+(B)+(C) 89.366 M2

-PHAN CONG TRINH XAY MOI VA MO RONG

-NHA MAI NGOI DA CO NIEN HAN SU DUNG TU 80 DEN 100 NAM (KIEN TRUC CO CUA PHAP DUOC XAY DUNG TU DAU THE KY) CONG TRINH DU KIEN CAI TAO

-NHA MAI BANG CHONG NONG BANG FIBROCIMEN DUOC XAY DUNG TRUOC NAM 1975

-PHAN CONG TRINH PHA DO DOT 1

-PHAN CONG TRINH NANG TANG

-CONG TRINH DANG CAI TAO VA MO RONG

-GIOI HAN SU DUNG DAT CUA NHA CHUA

DUONG LE LOI

SCALE = 1:500

VI TRI XAY DUNG
TRUNG TAM TIM MACH 6 TANG

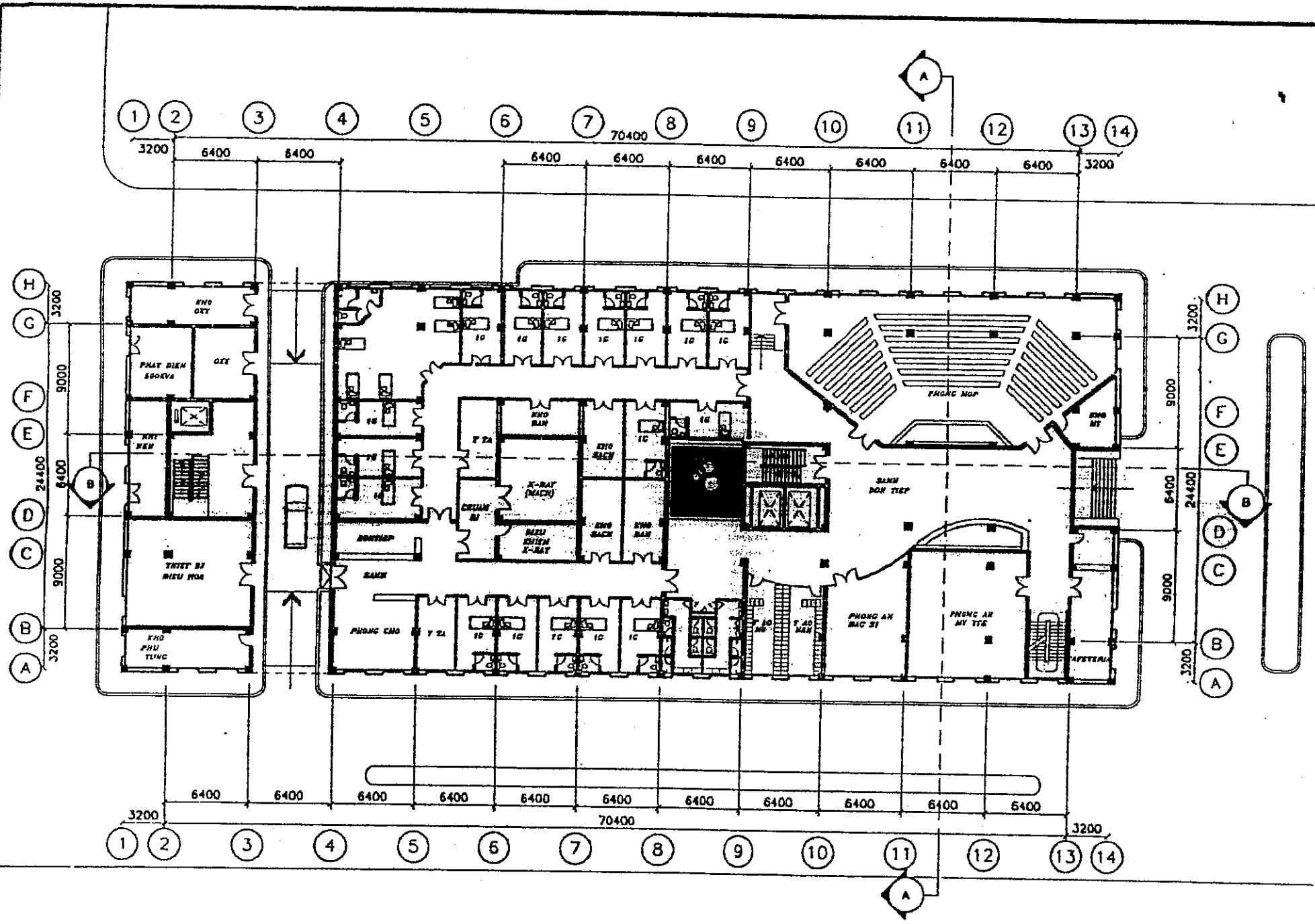
MAT BANG VI TRI PHOUNG AN CHON

TRUNG TA
TIM MACH

MAT BANK
VI TRI
PA CHON

CHU THICH

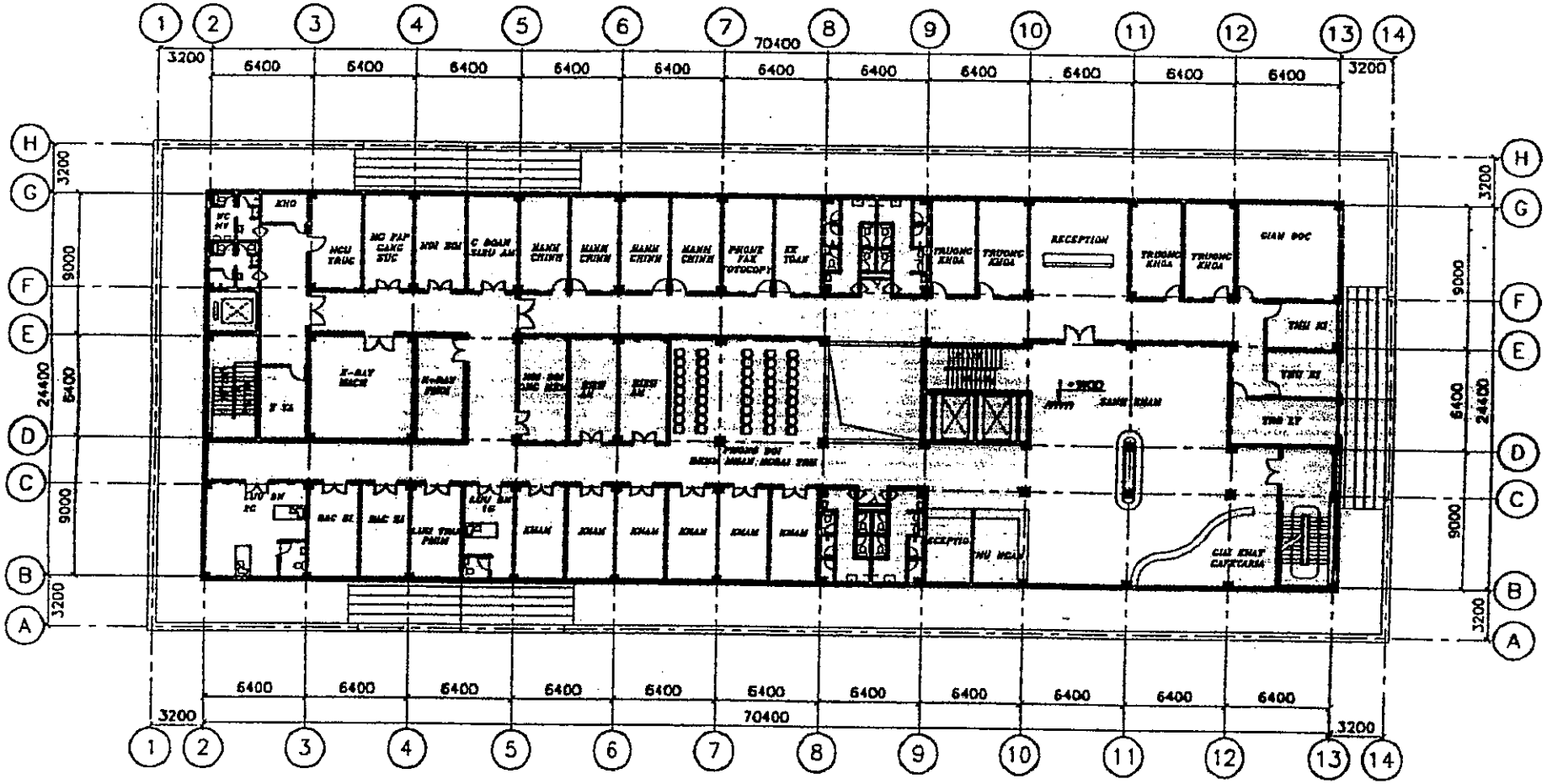
KT-01



MẶT BẰNG TẦNG 1 TỈ LỆ 1/200

CẤP CỨU& SẢNH ĐÓN TIẾP

KT-02



MẶT BẰNG TẦNG 2 TỈ LỆ 1/200
BỆNH NHÂN NGOẠI TRÚ & HÀNH CHÍNH

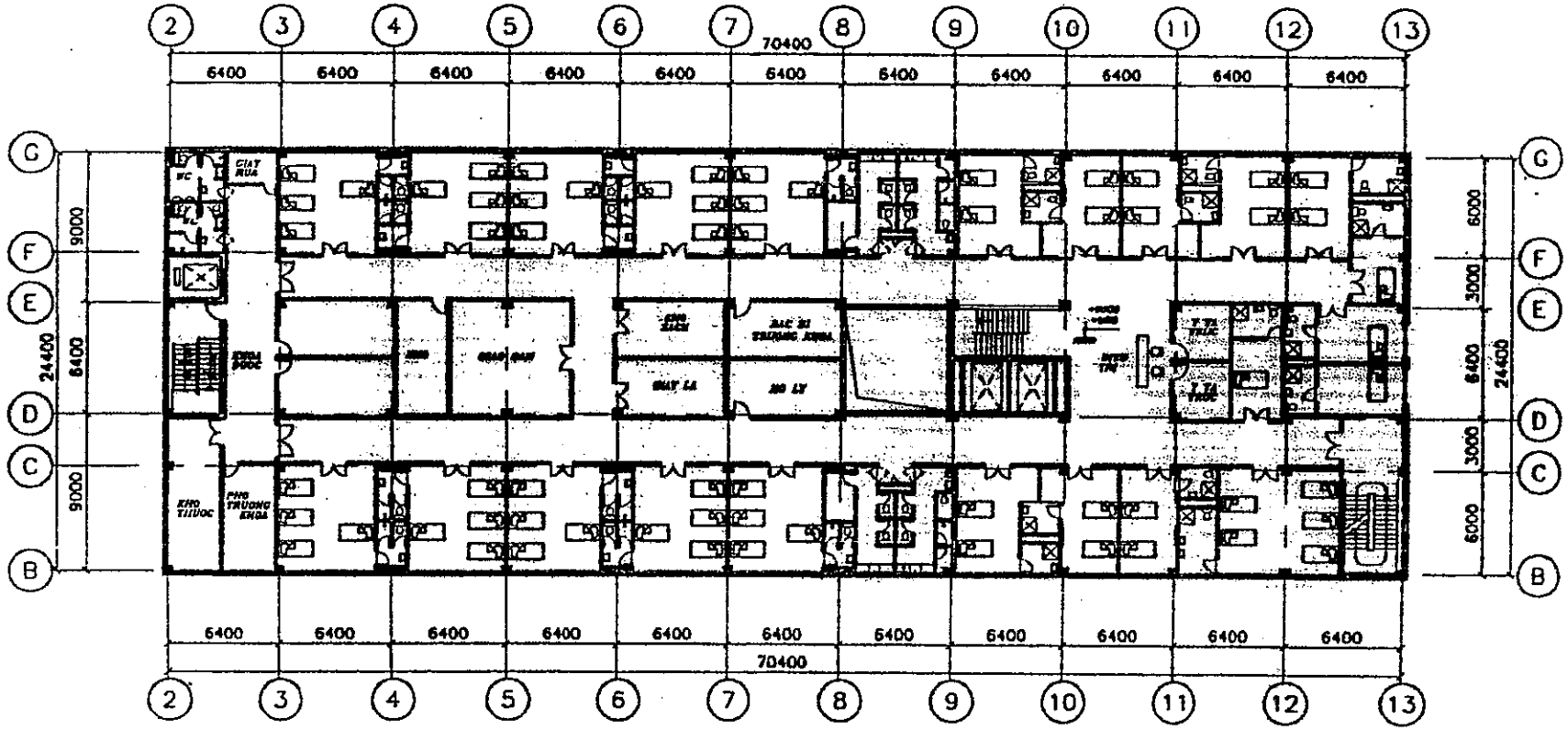
SỞ Y TẾ

TRUNG TÂM TIM MẠCH

MẶT BẰNG TẦNG 2

CHỦ TRÌ

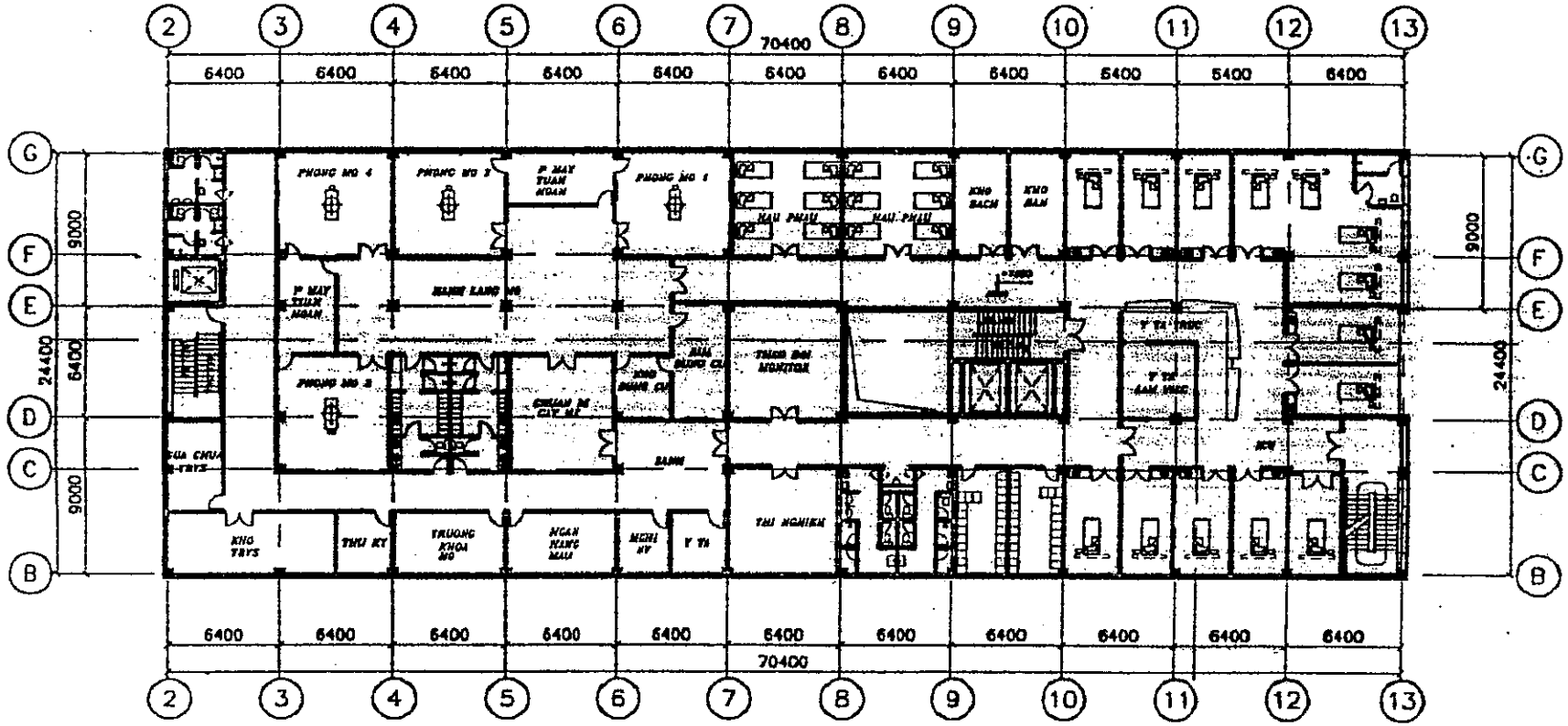
KT-03



MẶT BẰNG TẦNG 6&4 TỈ LỆ 1/200

ĐIỀU TRỊ

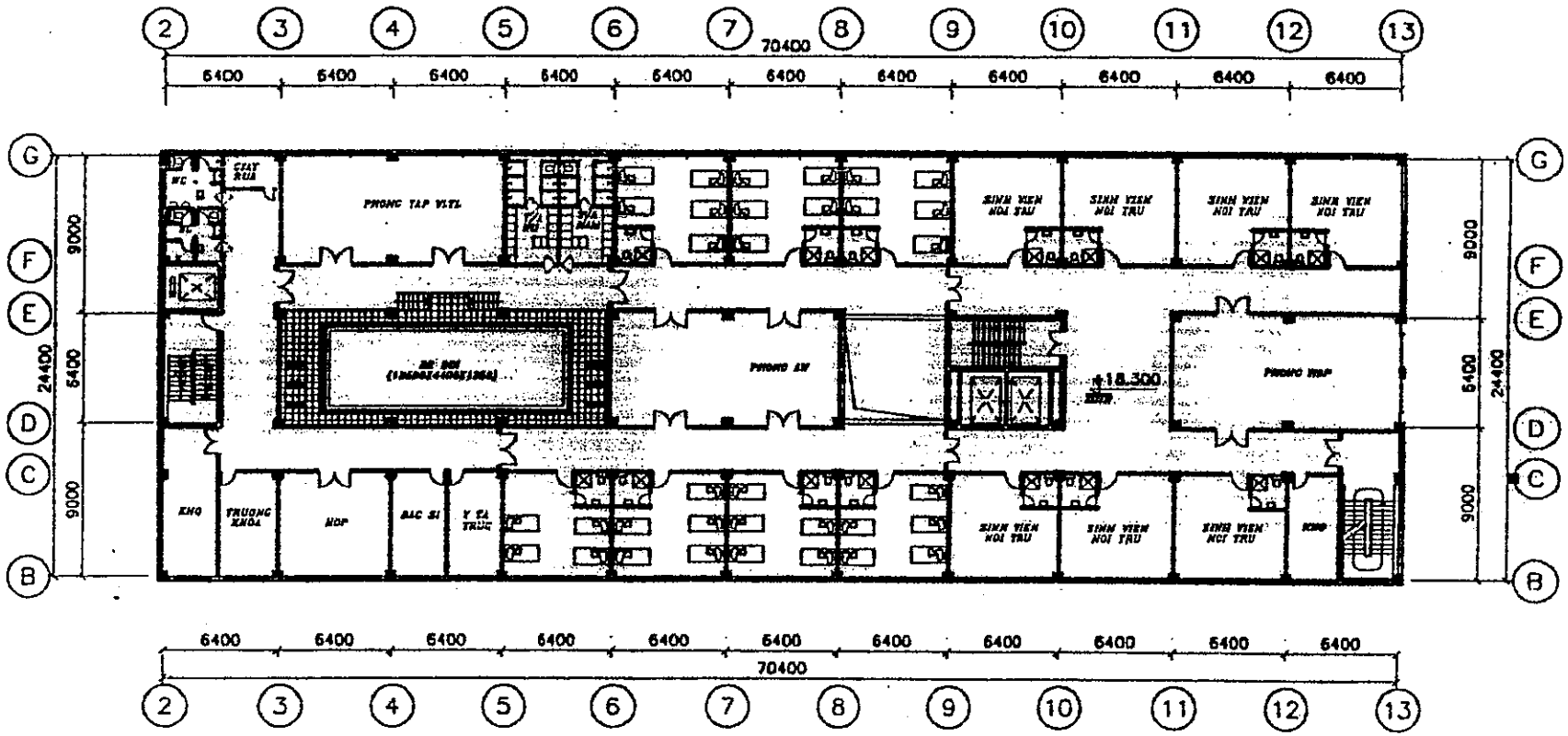
KT-04



MẶT BẰNG TẦNG 5 TỈ LỆ 1/200

GIẢI PHẪU &HẬU PHẪU

KT-05



MẶT BẰNG TẦNG 6 TỈ LỆ 1/200

SINH VIÊN NỘI TRÚ & VẬT LÝ TRỊ LIỆU

KT-05

HUE CENTRAL HOSPITAL

UNDERGROUND CABLES SYSTEM

1. High Voltage from Hue Electricity Department to Hospital:
   - Underground cables from Hue Electricity Department to Electricity Pole at the corner of Nguyen Hue - Hai Ba Trung Street
   - High voltage go along 4 electricity poles of 14 meter high

2. Underground cables bring electricity from high voltage pole at the end of power line to low voltage station.

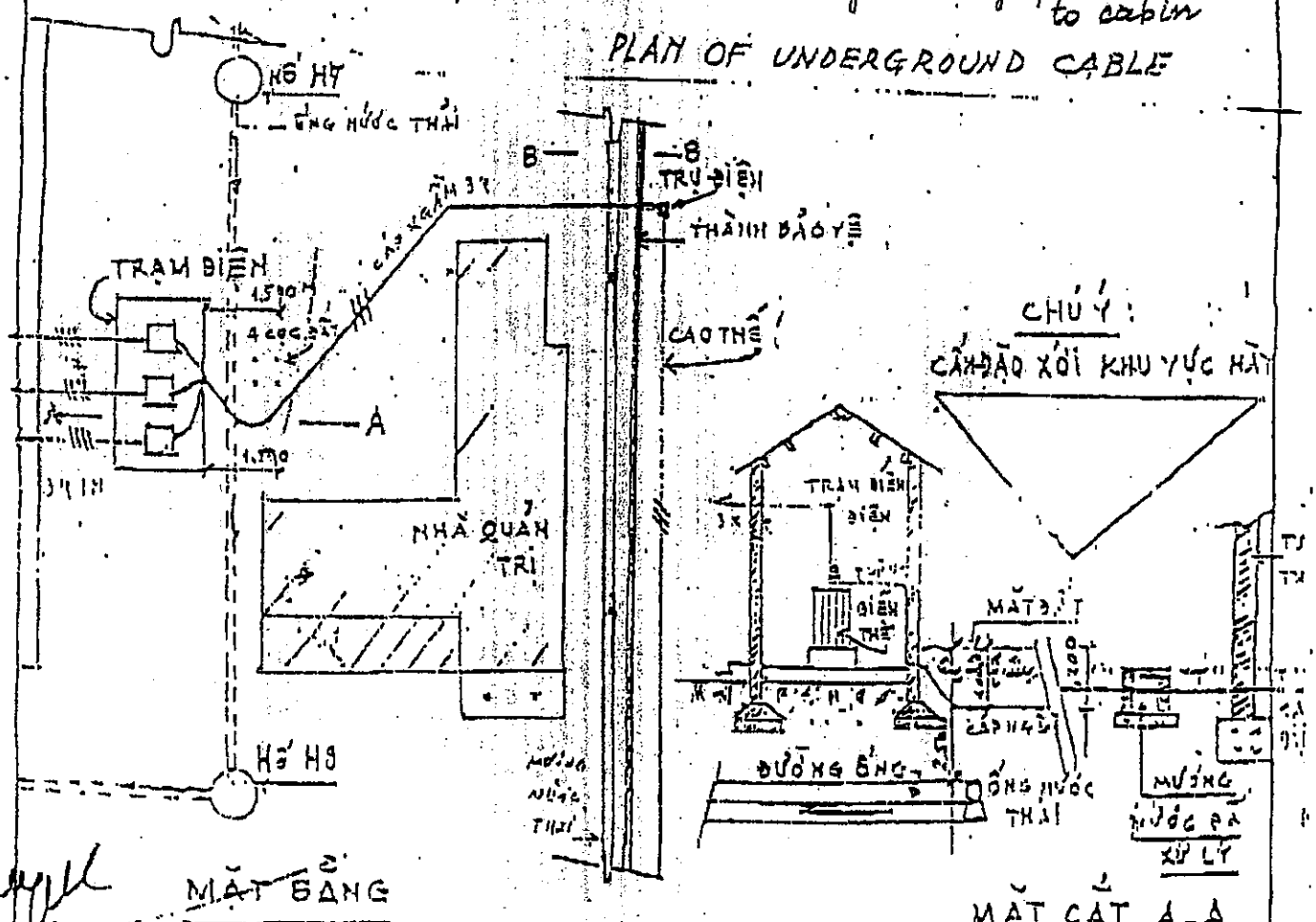
3. Underground cables system bring electricity from the low voltage station to Buildings A,B,C,D.

4. There are electricity boxes in each Buildings with automatic control panels.

The whole electricity system of Hue Central Hospital is over 1 billion VND and need to be periodically maintained.

ĐƯỜNG DÂY ĐIỆN CAO THẾ VÀO CABIN → High voltage power line to cabin

PLAN OF UNDERGROUND CABLE

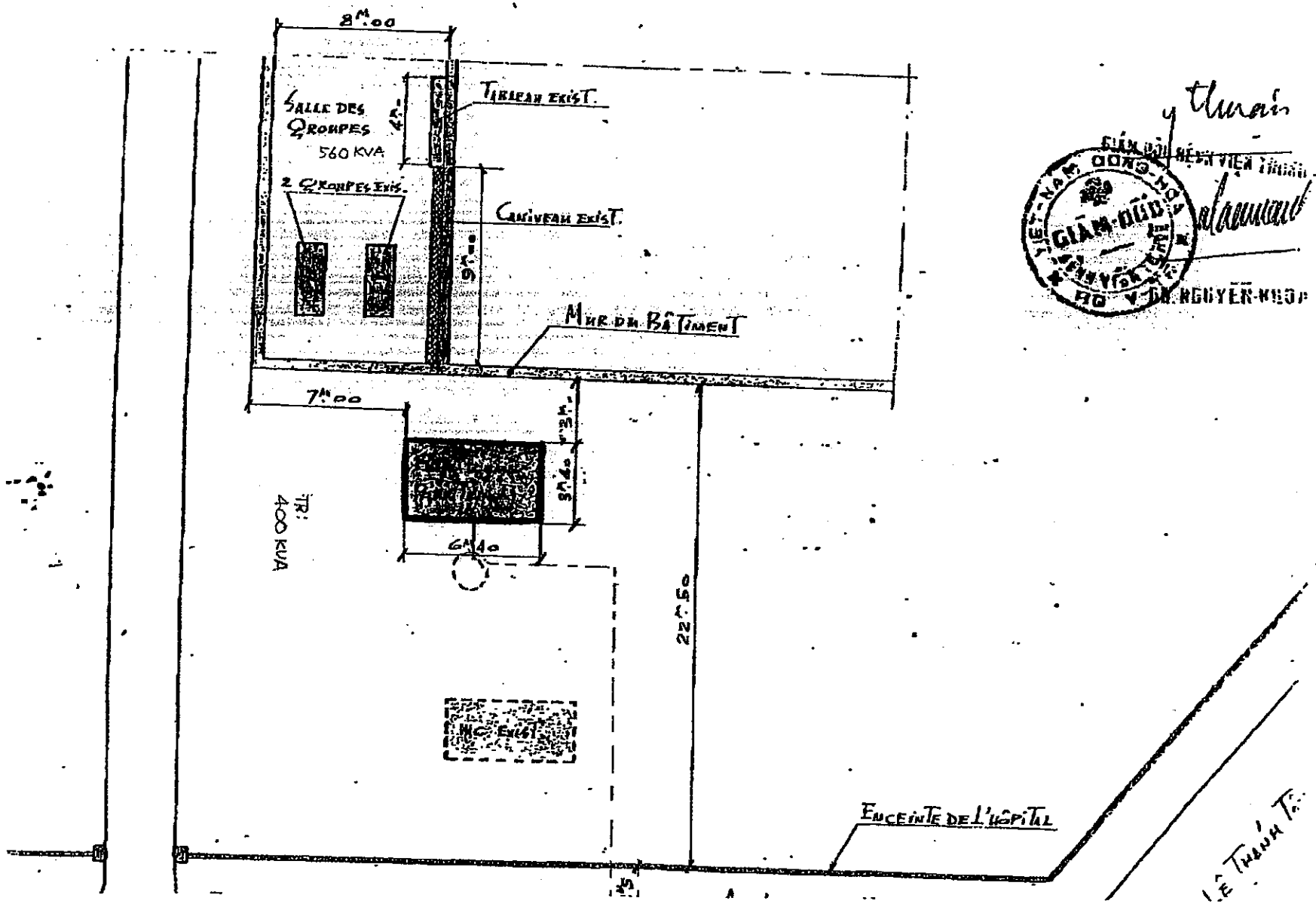


MẶT BẰNG

MẶT CẮT A-A

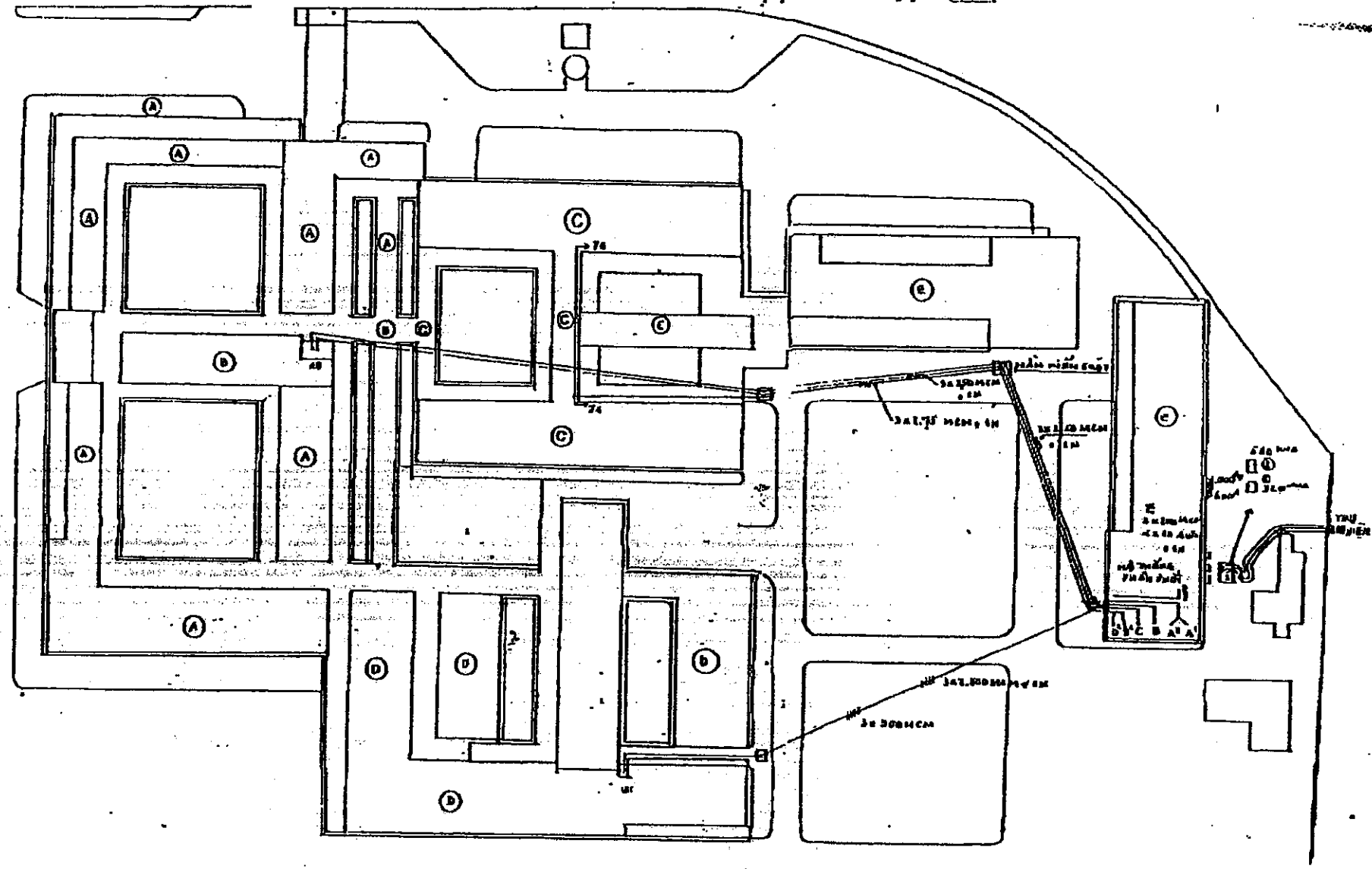
HÔPITAL HUÉ

EMPLACEMENT DU NOUVEAU POSTE DE TRANSFORMATI



資-47

資料-2



Underground cable system → HỆ THỐNG ĐIỆN CÁP NGẦM
(power)

GIÁM ĐỐC

NGÀY 9-8-79

Thamkhảo bản vẽ công trình trả

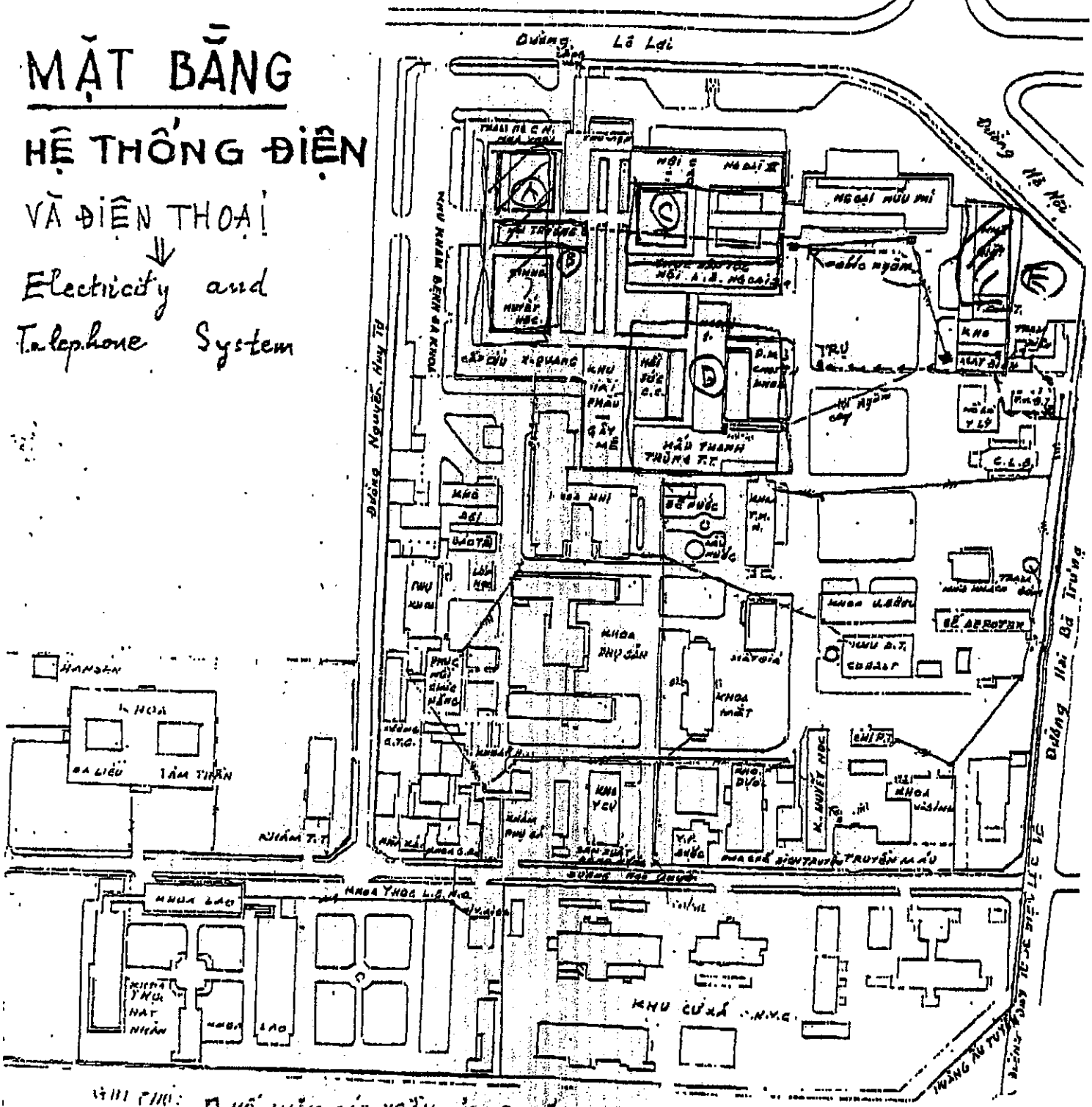
1.. Đường cable hoàn toàn tốt có khả năng phát triển lâu trả.

2.. Giảm phân phối khu nhà D cần có 1 hệ thống song song phòng khi sự cố không bị gián đoạn

資料-4

BỆNH VIỆN TRUNG ƯƠNG HUẾ
HUẾ CENTRAL HOSPITAL

MẶT BẰNG
HỆ THỐNG ĐIỆN
VÀ ĐIỆN THOẠI
⇓
Electricity and Telephone System



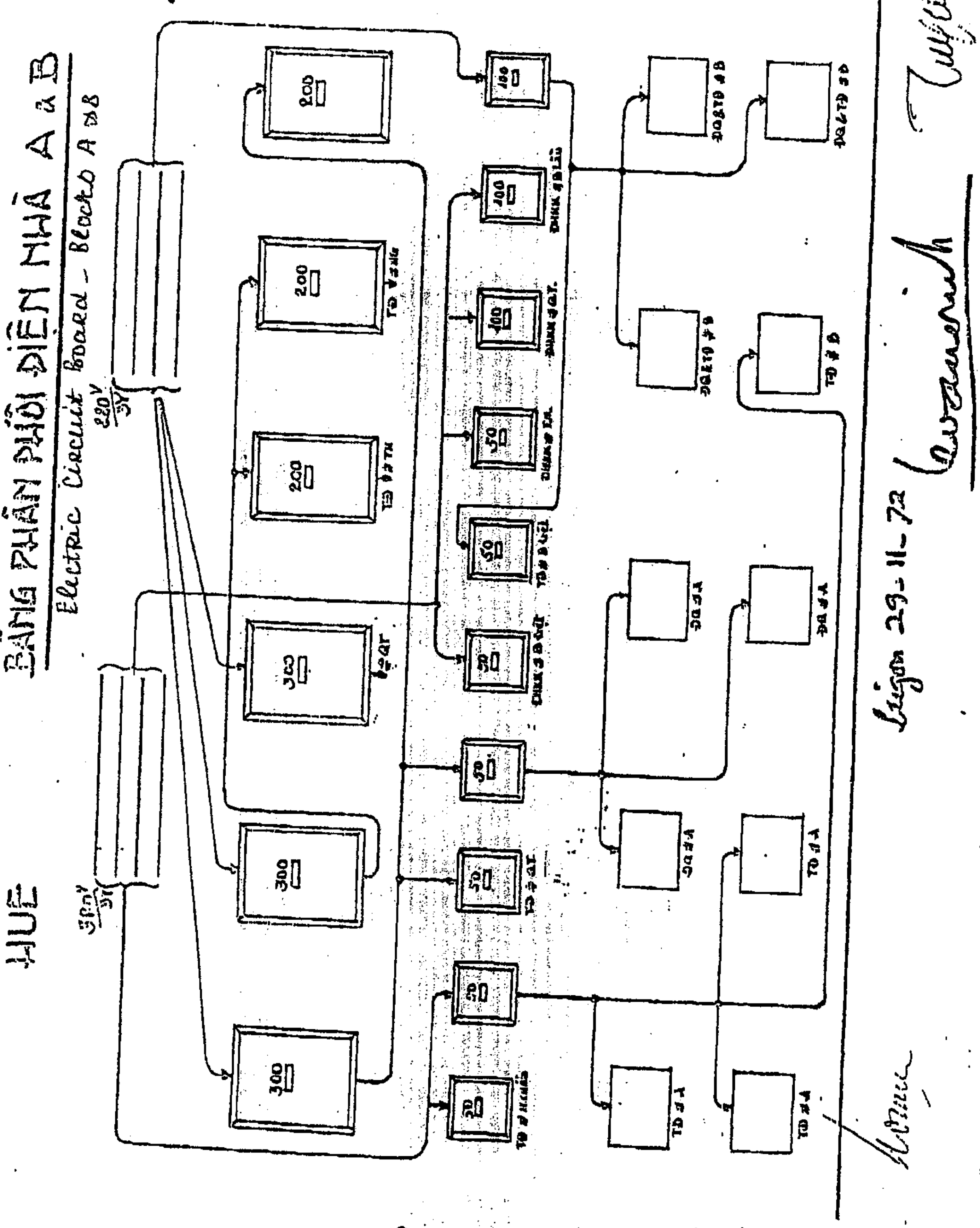
Ghi chú: ▭ Hố thăm cáp ngầm của hệ thống cable ngầm.
• Trụ điện của hệ thống dây trời.

a) Hệ thống chính: Hệ thống điện Bệnh viện gồm có hai phần
1) Đường dây cao thế từ Sở điện lực về Bệnh [illegible] 24 trụ sắt thẳng dây, đi
2) Hệ thống điện trong Bệnh viện: Điện [illegible] KV
Trạm biến thế: 4 tháng 11 công suất
1 cái 500 KVA đang sử dụng thường [illegible] Bà Trưng.
1 cái 320 KVA dự phòng với 1 máy đi [illegible] KVA sử dụng khi cần
1 cái 65 KVA và
1 cái 65 KVA Hiệu chỉnh Ngô Quyền
Máy phát điện: 2 máy C5 150 KVA [illegible] dùng cho hệ thống khi mất điện

* TỔNG ĐÀI ĐIỆN THOẠI 5 máy 100 của.
→ → → CÁP NGẦM
TRỤ phân phối.. Trải đi khắp B.V. cho tất cả các sở đều có máy điện thoại - 5 máy [illegible]

Lê - Văn - Vịnh
INGÉNIEUR ÉLECTRONICIEN EFREP
INGÉNIEUR CONSEIL
262/14, Truong-Minh-Ky GIA-ĐỊNH
Boîte Postale 2427 SAIGON

資料-5

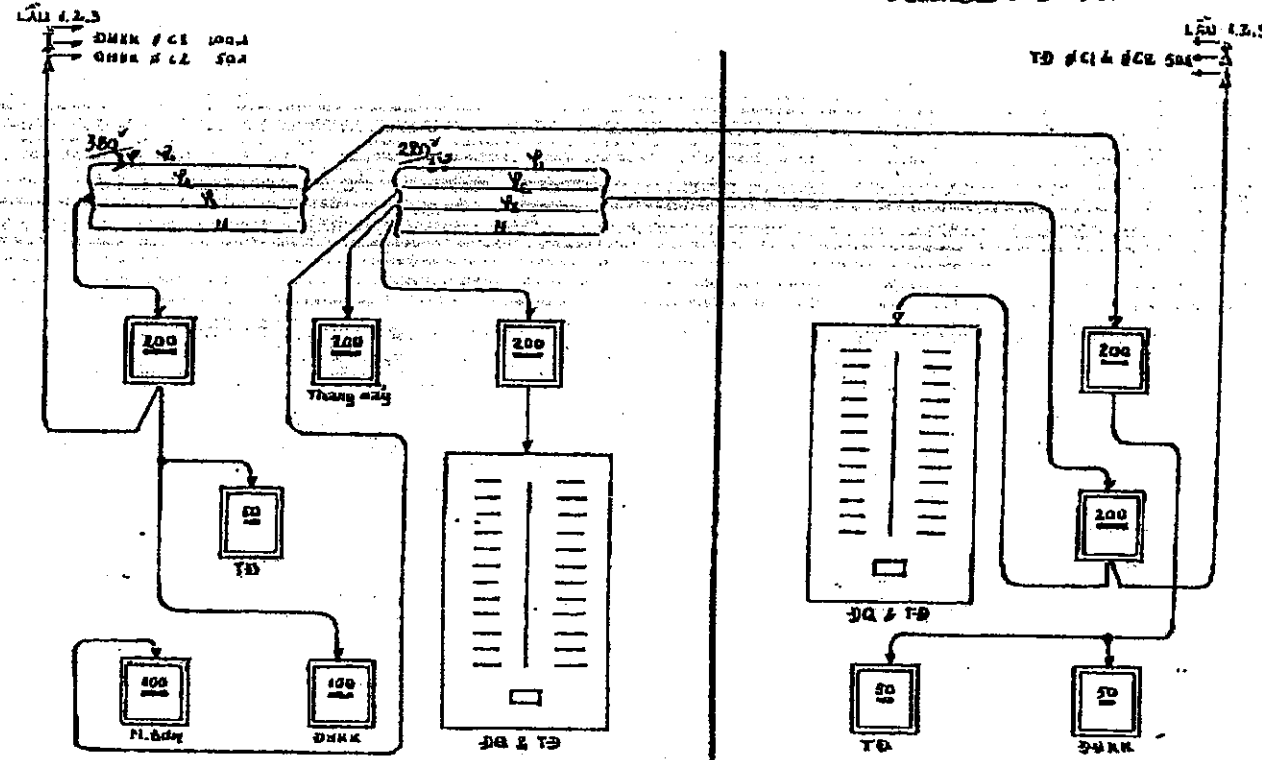


TO : MR. SHIMADA
(ORIGINAL)

From : SATO / HA
(10 pages)

BỆNH VIỆN TRUNG ƯƠNG HUẾ
(Hue Central Hospital)

BẢNG PHÂN PHỐI ĐIỆN NHÀ C
Electric Circuit Board - Block C



KHU C1 (Block C1)

KHU C2 (Block C2)

Saigon 29-11-72

Le - Vinh - Vinh

INGENIEUR ELECTROTECHNICIEN CONSEIL
INGENIEUR CONSEIL
268/1/4, Trương Minh Giảng GIA-ĐỊNH
Dây Thoại 21137 SAIGON

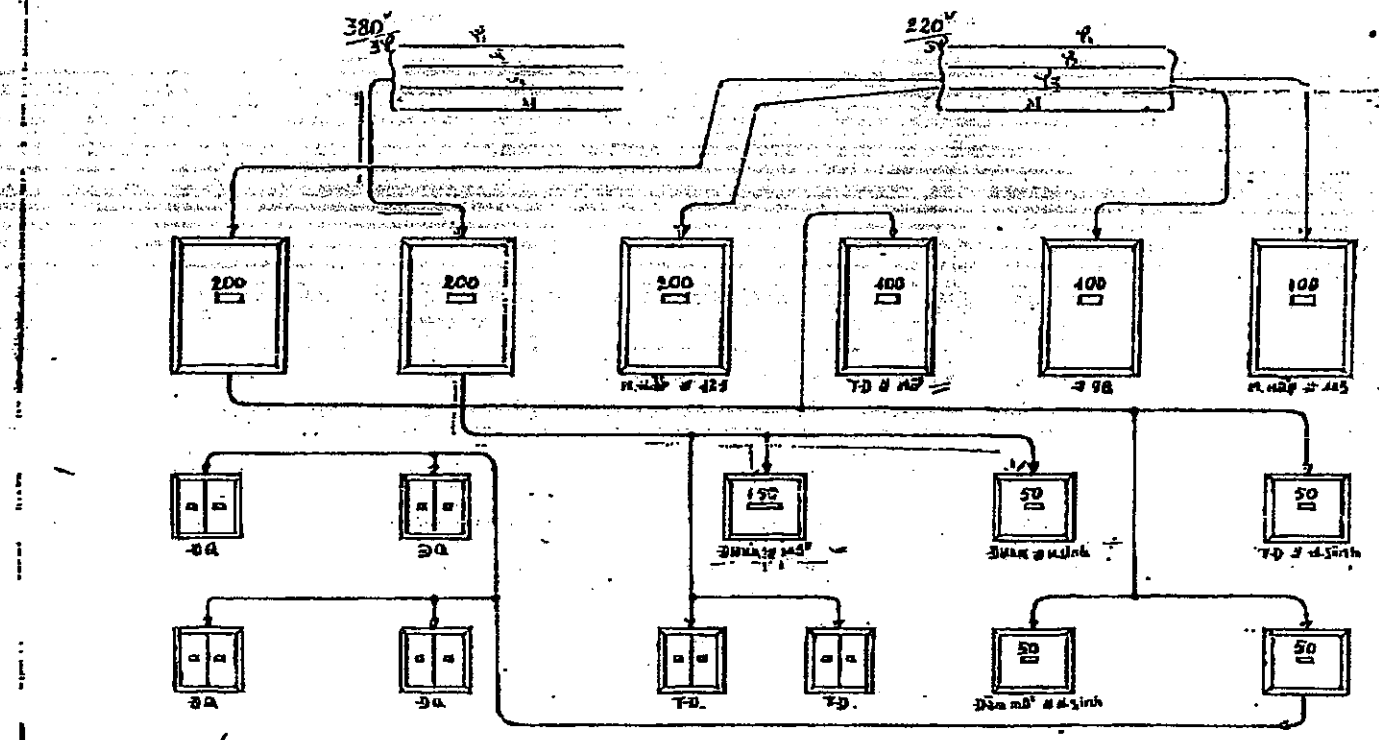
資-51

資料-6

BỆNH VIỆN TRUNG ƯƠNG
HUẾ

BẢNG PHÂN PHỐI ĐIỆN NHÀ D

Electric Circuit Board - Block D



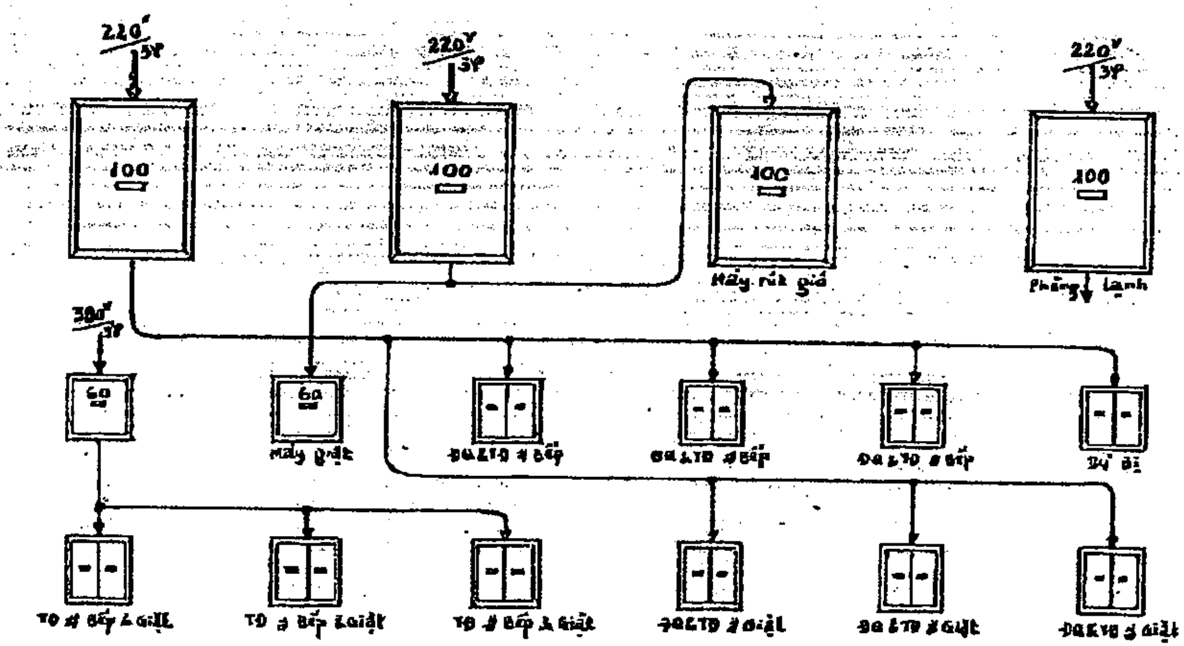
Saigon 29-11-72

BỆNH VIỆN TRUNG ƯƠNG
HUE

BẢNG PHÂN PHỐI ĐIỆN NHÀ E

Electric Circuit Board - Block E

Lê - Văn - Vịnh



Saigon 29-11-72

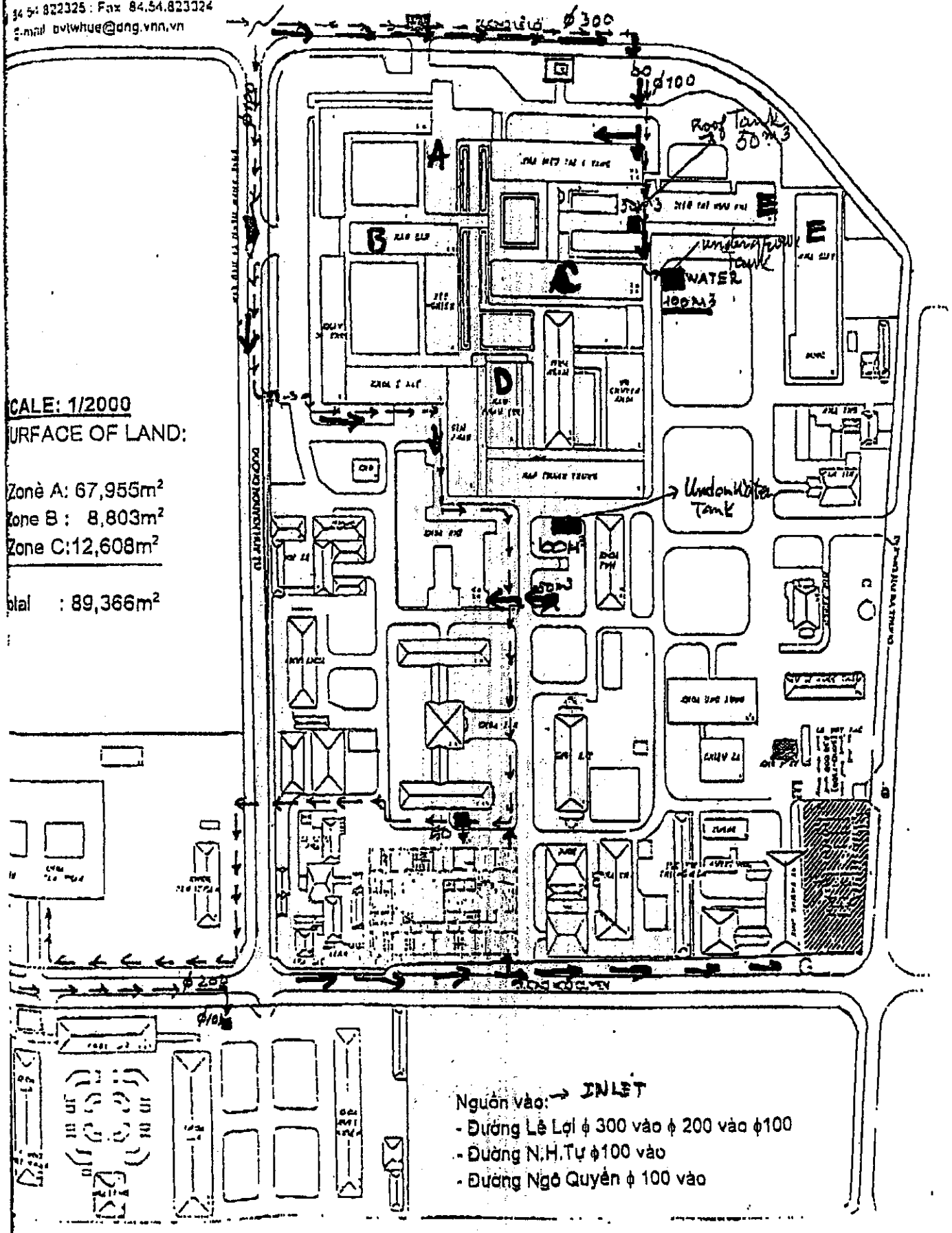
資料-9

BỘ Y TẾ
BỆNH VIỆN TRUNG ƯƠNG HUẾ
16 LÊ LỢI, HUẾ, VIỆT NAM
Tel: 822325 ; Fax: 84.54.823324
E-mail: bvtwhue@dng.vnn.vn

Water consumption
800 m³/day

→ ϕ 300: Lê Lợi Street
→ ϕ 100: Ng. Huy Tự Street
2 water tank 50 m³

Main gate



SCALE: 1/2000
SURFACE OF LAND:

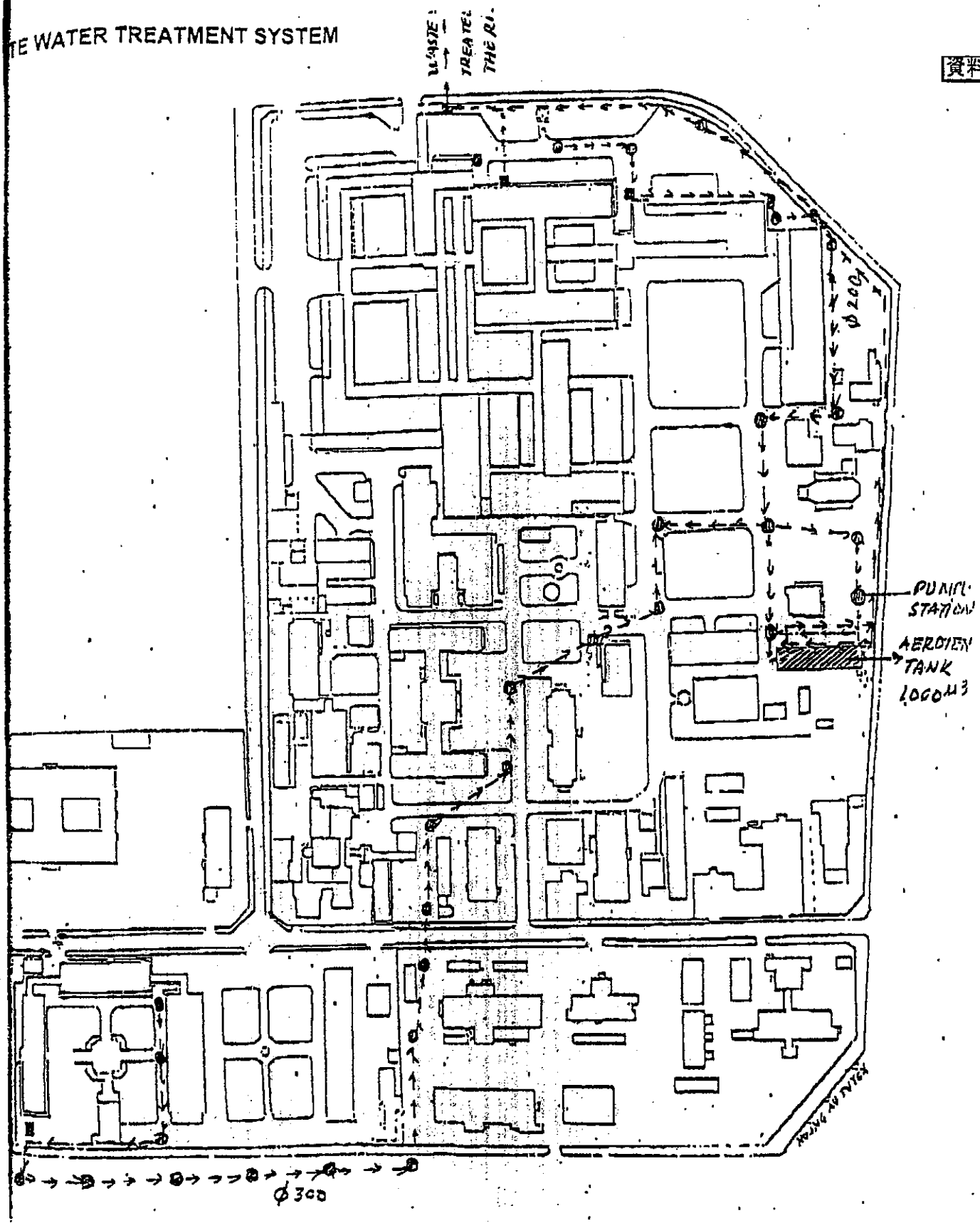
Zone A: 67,955m²
Zone B : 8,803m²
Zone C:12,608m²

Total : 89,366m²

Nguồn vào: → INLET
- Đường Lê Lợi ϕ 300 vào ϕ 200 vào ϕ100
- Đường N.H.Tự ϕ100 vào
- Đường Ngô Quyền ϕ 100 vào

TE WATER TREATMENT SYSTEM

資料-10



ANALYSIS RESULTS OF WASTEWATER SAMPLE AND HUONG RIVER

Location: Hue Central Hospital
Date: June 22, 1999
Weather status: Sunny, temperature 35°C, speed = 0.22 m/s, w = 74%
Measuring equipment:

+ SpectrometerDR 2000 (USA)
+ Meter DO (USA)
+ Meter pH (Germany)
+ Analysis balance (China)
+ Meter BOD (Germany)

No.	Location to take sample	t^{o} H_2O °C	pH	DO mg/l	SS mg/l	BOD_5 mg/l	COD mg/l	NH_4^+ mg/l	Total P mg/l	Total coliform MPN/100ml	Remarks
1	Hospital's wastewater sample before treatment, taken at tank	28.6	6.8	2.1	56	124	186	3.8	7.8	$7.6 , 10^5$	*
2	Hospital's wastewater sample after treatment, taken at culvert outlet	28.5	7.2	3.8	25	22	54	1.4	7.2	0	*
3	Hospital's wastewater sample after treatment, taken inside culvert pipe	28.5	7.1	3.8	30	28	58	1.4	7.2	150	*
4	Water sample of Huong river taken at Phu Xuan bridge, approx. 7m from the river bank	30.2	7.1	5.7	15	4.6	12.5	0.2	0.14	$6.8 , 10^3$	**
	* TCVN 5945 - 1995 (column B)		5.5-9	-	100	50	100	1	6	10,000	
	** TCVN 5942 - 1995 (column B)		5.5-9	> or =2	80	<25	<35	1	-	10,000	

Analysis maker

Director

KẾT QUẢ PHÂN TÍCH MẪU NƯỚC THẢI VÀ SÔNG HƯƠNG

Tại: Bệnh viện Trung ương Huế

Ngày: 22/6/1999

Điều kiện thời tiết: Trời nắng, $t^{o}kk = 35, ^{o}C$, v = 0,22 m/s, w = 74%

Thiết bị đo: + Máy quang phổ kế DR 2000, USA

+ Máy đo DO, USA

+ Máy đo pH, Germany

+ Cân phân tích, China

+ Máy đo BOD, Đức

資—57

TT	Địa điểm lấy mẫu	$t^{o}H_2O$ ^{o}C	pH	DO mg/l	SS mg/l	BOD_5 mg/l	COD mg/l	NH_4^+ mg/l	Tổng P mg/l	Totalcoliform MPN/100ml	Ghi chú
1	Mẫu nước thải bệnh viện trước khi xử lý, lấy ngay bể chứa	28,6	6,8	2,1	56	124	186	3,8	7,8	$7,6.10^5$	*
2	Mẫu nước thải bệnh viện sau khi xử lý, lấy ngay miệng cống thải	28,5	7,2	3,8	25	22	54	1,4	7,2	0	*
3	Mẫu nước thải bệnh viện sau khi xử lý, lấy ngay trên đường cống dẫn thải	28,5	7,1	3,8	30	28	58	1,4	7,2	150	*
4	Mẫu nước sông Hương, lấy ngay khu vực cầu Phú Xuân, cách bờ khoảng 7m	30,2	7,1	5,7	15	4,6	12,5	0,2	0,14	$6,8.10^3$	**
	* TCVN 5945 - 1995 (cột B)		5,5-9	-	100	50	100	1	6	10.000	
	** TCVN 5942 - 1995 (cột B)		5,5-9	≥2	80	<25	<35	1	-	10.000	

Cán bộ phân tích

Giám đốc

資料-11
(越語原文)

CIVIL ENGINEERING AND FOUNDATION TECHNIQUE JOINT VENTURE (COFEC)

REPORT ON GEOLOGICAL SURVEY

Location: Hue Central Hospital
Hue City

Surveyor: Engineer Luong Van Sau

Inspector: Engineer Phan Manh Hung

Approved by: Le Duc Phuc
Deputy Director of COFEC

Hanoi, July 1999

A – Explanation

Page

B – Annexes

Civil Engineering and Foundation
Technique Joint Venture (COFEC)

Socialist Republic of Vietnam
Independence – Freedom – Happiness
***

EXPLANATION

GEOLOGICAL SURVEY

PROPOSED CONSTRUCTION SITE

HUE CENTRAL HOSPITAL

1. OUTLINES

The geological survey at Hue Central Hospital has been conducted based on the technical functions and Economic Contract No. 12/99/HDKT signed on 14 April 1999 between Hue Central Hospital and Civil Engineering & Foundation Technique Joint Venture (COFEC).

Having performed the Economic Contract No. 12/99/HDKT, COFEC already mobilised a driller GX-1T and SPT machine GOUDA to the site from 20/6/1999 to 11/7/1999 under instruction of Engineer Phan Manh Hung.

Laboratory tests are carried out by Engineer Khuat Thi Van.

Revision and making up of reports are made by Engineer Luong Van Sau under inspection of Engineer Phan Manh Hung.

All the survey, testing and report-making works are in accordance with the relevant regulations of Vietnam with reference of foreign technique ASTM.

The quantity for surveying work has been implemented in Table 1:

Table 1

No.	Items of works	Unit	Quantity
1	Boring – 14 holes	m	310
2	Testing at site - Standard penetration test - Static penetration test – 5 holes	 times m	 146 81
3	Testing at laboratory	samples	62

2. SURVEY METHODS

2.1. Boring and samples taking

Use pipe drilling method with single sample taken, diameter ϕ110, pump with bentonite in combination with driving pipe ϕ130, which are used on the top soil layer to prevent collapse of boring hole.

Undisturbed sample is put in sample tube.
Disturbed sample is put in tube for standard penetration test.

2.2. Standard Penetration Test

This test is conducted in all the boring holes. The instrument set for this standard penetration test has the following basic specification:

Sample tube:

- Inner diameter: ϕ35 mm
- Outer diameter: ϕ50.8 mm
- Length: 800 mm

*(Sorry, the next page is lacking, so we cannot translate item "**2.3. Static Penetration Test**". We will contact Hue Hospital later for getting this page)*

2.4. Laboratory test

According to technical functions, the undisturbed samples which are tested, have the following criteria:

- Soil grade
- Moisture
- Density
- Gravity
- ATTERBERG limit
- Accelerated compression test
- Shearing test

2.5. Underground water survey

The underground water survey is conducted during boring process with specifying stable water depth in the boring hole 24 hours after finishing boring hole.

3. SURVEY RESULTS

3.1. Layer

According to boring results of 14 boring holes within 32m scale in combination with other survey methods such as standard penetration test, static penetration test (5 holes) and laboratory test, we can divide structure of natural ground into 6 layers.

Layer 1: Filling

This is the top layer, located on the whole surveying area. The thickness changes from 1.2m to 2.8m, average 1.55m. This layer is a mixture of clay, sand, broken tile and brick.

Layer 2: Mixed clay

This is a strongly changeable layer, located uncontinuously on the surveying area. At cross section of geological layer III – III, there has not been found layer 2. At cross sections of geological layers IV – IV, VI – VI, layer 2 strongly changes, becomes weaker at boring hole K9, K11 to boring hole K7 and disappears at boring holes K5, K13. The depth of inner layers at some boring holes changes from 1.3m to 1.8m, the thickness changes from 1.5m to 2.7m, average 2.2m. The major component of layer is mixed clay of grey – yellow color, grey – green color, soft and plastic status.

Layer 3: Mixed clay

Layer 3 is located on the whole surveying area. The depth changes from 1.3m to 4.2m, the thickness changes from 3.0m to 11.2m, average 4.9m. The main component of this layer is mixed clay of grey – brown color, when it gets deeper, it changes to grey –black color, soft and plastic status. This is the weak soil layer, the thickness strongly changes.

Layer 4: Mixed clay with tiny grit

This layer is also located on the whole surveying area. The depth changes from 7.5m to 16.0m. The boring holes finish at depth 12.0m but have not found bottom layer. The major component of this layer is mixed clay with tiny grit of grey – yellow color, brown – red color, soft and plastic status. Tiny grit has main component of quartz of grey – white color and grey – green color, ϕ = 2 – 10mm, unevenly located but concentrates mainly in groups. This is a layer with average bearing capacity.

Layer 5: Mixed clay with gravel

All the boring holes when reaching the depth 20m, have found layer 5. The depth changes from 13.0m to 16.0m, the boring holes finish at depth 20m but have not found bottom layer. The main component of this layer is mixed clay of red – brown color, grey – white color, consisting of gravel in hard and plastic status to semi-hard. The

deeper it gets, the volume of gravel reduces, at some place, gravel have size of ϕ = 2cm – 3cm. This is a soil layer located at average depth, with considerable bearing capacity.

Layer 6: Clay

Layer 6 has been found at boring holes at depth 30m. The depth changes from 24.0m to 26.0m, the boring holes finish at depth 30 – 32m but have not found bottom layer. The main component of this clay is clay of brown – violet color mixed with grey – yellow color, semi-hard to hard status. This is a soil layer deeply located but has the best bearing capacity on the surveying area.

The above-divided layers have been met at survey points at the depths as mentioned in the following tables:

A. At location proposed to build 3-storey building

Table 2-1

Boring holes		K1, X1	K2	K3	K4, X2
Layer 1	From (m)	0.0	0.0	0.0	0.0
	To (m)	1.6	1.4	1.5	1.4
Layer 2	From (m)	1.6	1.4	1.5	1.4
	To (m)	4.2	3.8	3.0	3.0
Layer 3	From (m)	4.2	3.8	3.0	3.0
	To (m)	8.2	6.8	6.4	6.0
Layer 4	From (m)	8.2	6.8	6.4	6.0
	To (m)	14.0	14.0	16.0	15.0
Layer 5	From (m)	14.0	14.0	16.0	15.0
	To (m)	-	-	-	-

Location of the layers at this area is clear in cross sections I-I and II – II.

B. At location proposed to build 6-storey building

Table 2-2

Boring holes		K5, X3	K6	K7	K8	K9, X4	K10, X5
Layer 1	From (m)	0.0	0.0	0.0	0.0	0.0	0.0
	To (m)	2.8	1.8	1.5	1.2	1.8	1.8
Layer 2	From (m)	2.8	1.8	1.5	1.2	1.8	1.8
	To (m)	-	-	3.2	-	4.2	-
Layer 3	From (m)	2.8	1.8	3.2	1.2	4.2	1.8
	To (m)	6.4	6.4	6.3	6.5	13	13
Layer 4	From (m)	6.4	6.4	6.3	6.5	13	13
	To (m)	13	14	15.3	14.0	15.5	15.5
Layer 5	From (m)	13	14	15.3	14.0	15.5	15.5
	To (m)	24	25.5	25.0	24.0	26.0	26.0
Layer 6	From (m)	24	25.5	25.0	24.0	26.0	26.0
	To (m)	-	-	-	-	-	-

Location of the layers at this area is clear in cross sections III - III and IV – IV.

C. At location proposed to build 2-storey building

Table 2-3

Boring holes		K11	K12	K13	K14
Layer 1	From (m)	0.0	0.0	0.0	0.0
	To (m)	1.4	1.3	1.3	1.3
Layer 2	From (m)	1.4	1.3	1.3	1.3
	To (m)	4.0	4.0	-	3.8
Layer 3	From (m)	4.0	4.0	1.3	3.8
	To (m)	7.4	9.0	7.5	8.0
Layer 4	From (m)	7.4	9.0	7.5	8.0
	To (m)	-	-	-	-

Location of the layers at this area is clear in cross sections V - V and VI – VI.

3.2. Geological character

3.2.1. Physical and mechanical character

The physical and mechanical character of layers are specified by testing at laboratory and at site. Details of results are mentioned in Annex 4. Summary of testing results is mentioned in Annex 3 as below:

Table 3

Criteria	Mark	Unit	Average value of layers				
			2	3	4	5	6
Particle graduation	P	%					
>2			4.1	1.1	14.2	2.5	
2.0-0.5			3.3	3.3	12.7	6.0	0.4
0.5-0.25			3.8	5.2	10.5	21.5	0.8
0.1-0.0.25			37.9	20.3	16.2	14.5	5.8
0.1-0.05			23.5	20.8	13.6	20.5	11.9
0.05-0.005			19.4	40.6	18.7	15.0	40.8
<0.005			7.9	8.7	14.2	20.0	40.5
Natural moisture	W	%	32	41.9	22.3	16.4	30.1
Liquid limit	Wc	%	36.3	43.8	27.2	30.4	55.9
Plastic limit	Wd	%	26.5	32.6	16.4	16.0	30.2
Plasticity index	I s		9.84	11.2	10.8	14.4	25.8
Consistency	B		0.55	0.83	0.54	0.03	0.0
Natural weight	γ	g/cm3	1.84	1.73	2.0	1.97	1.93
Dry weight	γc	g/cm3	1.40	1.22	1.65	1.69	1.48
Gravity	Δ	g/cm3	2.69	2.68	2.70	2.75	2.71
Void coefficient	eo		0.928	1.20	0.655	0.625	0.830
Void	n	%	48.1	54.3	39.1	38.5	45.3
Saturation	G	%	92.6	93.8	91.9	72.2	98.0
Inner friction	ϕ	degree	16°02'	7°49'	17°39'	22°29'	20°01'
Cohesion	c	kg/cm2	0.125	0.089	0.181	0.187	0.368
Compression coefficient	a_{1-2}	cm2/kg	0.044	0.046	0.027	0.024	0.021
Standard resistance	N	hammer	4.7	3.2	14	33.4	39
Cone head resistance	qc	kg/cm2	11.33	6.9	48.8	171.7	
Friction	fs	kg/cm2	0.311	0.17	2.54	4.0	
Deformed module	Eo	kg/cm2	71	30	171	189	207
Nominal bearing capacity	Ro	kg/cm2	1.1	0.62	1.5	1.9	2.8

Note:

1. The soil layers with mark layer 4 and layer 5 are mixed clay with tiny grit, gravel, soft and plastic status (layer 4), plastic and hard up to semi-hard (layer 5). As there is a sample choice, the testing results at laboratory show that tiny grit and gravel volume in these layers are <15%. According to site description documents, the tiny grit and gravel volume in layers 4 and 5 are >25%, unevenly located but concentrate in groups. Therefore, the values qc and fs in layers 4 and 5 are rather high.

2. Total deformed module of clay Eo is calculated in the following formula:

$$Eo = \frac{\beta * m_k * (1 + eo)}{a}$$

of which:

m_k: conversion coefficient from testing result at laboratory based on regulation 20TCVN-74-87
β: deforming coefficient subject to soil type, mixed clay β=0.62, clay β=0.4

3. Nominal bearing capacity Ro of ground is calculated in the following formula:

$$Ro = m(Ab + Bh)\gamma_w + DC$$

of which

m: operative coefficient of ground (=1)
b = h = 1 (width and depth of foundation)
A, B, D: coefficients subject to inner friction of ground
C: cohesion

3.3. Survey results of underground water:

Underground water is surveyed in boring holes 24 hours after finishing drilling hole in Table 4:

Table 4

Boring hole	K1	K2	K3	K4	K5	K6	K7
Depth (m)	1.2	1.4	1.2	1.2	0.6	1.2	1.1

Boring hole	K8	K9	K10	K11	K12	K13	K14
Depth (m)	1.3	1.6	1.5	1.1	1.05	1.2	1.1

The above results show that water in boring hole is upper layer water, mainly exists in filling layer which closely relates to surface water.

4. CONCLUSION AND PROPOSALS

4.1. Conclusion

In consideration of testing results of 14 boring holes and 5 static penetration testing holes at location proposed to build Hue Central Hospital, we can evaluate geological conditions of foundation up to depth 32m as follows:

From surface to depth 32m, it is divided into 6 layers:

- Layer 1: Filling layer. This layer has thin thickness, mixed component, no meaning when building the Works.

- Layer 2: Mixed clay in soft and plastic status. This layer has thin thickness, unevenly located on the surveying area.

- Layer 3: Mixed clay in plastic and liquid status. This is a weak layer with considerable thickness and strongly changeable.

- Layer 4: Mixed layer with tiny grit in soft and plastic status. This is a soil layer with average bearing capacity, layer surface is strongly changeable.

- Layer 5: Mixed clay with gravel in soft – hard to semi-hard status. This is a soil layer with considerable bearing capacity, located at average depth.

- Layer 6: Clay in semi-hard to hard status. This is a soil layer with the best bearing capacity on the surveying area, deeply located.

- Underground water is not deep, thus when opening foundation of the Works, the underground water works may affect construction conditions.

4.2. Proposals

From the evaluation results on geological conditions within the proposed location for building Hue Central Hospital, we have some proposals for the items of the works as follows:

For the items of the works in 2-storey and 3-storey buildings:

These are the items with small bearing capacity, therefor we can use the shallow foundation option to be located on layers 2, 3 after foundation reinforcement.

In case of 3-storey building, if costs are affordable, it's better to use the shallow pile foundation to be located on layer 4.

For the items of the works in 6-storey building:

In case of this item, we should use pile driving option, pile on layer 5.

Hanoi, 31 July 1999

BORE HOLE LOG K1

PROJECT:HUE CENTRAL HOSPITAL

Station:	Hue City	Depth(m)	20.0
		Elevation(m)	3.5
Date Commenced.	26/6/1999	Coordinates(m) X	
Date Completed:	26/6/1999	Y	
Logged by.	Tran Van Hung	Boring type:	GX-IT
Checked by.	Phan Manh Hung	Underground water level(m):	1.2

Layer	Elevation	Depth	Thickness(m)	Log	SOIL AND ROCK DESCRIPTION	Scale(m)	Sample	Depth (m) from	Depth (m) to	Standard Penetration Test (SPT) 15	15	15	N (Blows/30cm) 30	SPT Chart N (Blows/30cm) 0 10 20 30 40 50
1	1.9	1.6	1.6		Backfill soil: Yellowish brown grey sand, mixed with rubble	0								
						1								
2	-0.7	4.2	2.6		Yellowish grey, greenish grey clay, plastic state.	2								
						3	U1	3.2	3.5					
						4	D1	3.5	3.95	2	2	3	5	
3	-4.7	8.2	4		Brownish grey clay, changing to blackish grey according to the depth, plastic to liquid state.	5								
						6	U2	5.8	6.0					
							D2	6.0	6.45	2	2	2	4	
						7								
						8	D3	8.0	8.45	1	2	3	5	
4	-10.5	14	5.8		Sandy clay with yellowish grey gravel, red brown, plastic state. The main content of gravel is quartz, D = 2-10mm, reach 30-40%, irregular disposition.	9								
						10	U3	9.8	10					
							D4	10	10.5	7	10	11	21	
						11								
						12	D5	12	12.45	5	7	8	15	
						13								
						14	D6	14	14.45	15	17	16	33	
5	-16.5	20.0			Sandy clay with reddish brown gravel, white grey, hard state. The content of gravel is > 25%, irregular disposition, the content of gravel decrease according to the depth, with gravel size is 2-3cm somewhere.	15								
						16	D7	16	16.45	5	7	8	15	
						17								
						18	D8	18	18.5	6	7	8	15	
						19								
						20	D9	20	20.05	50			>50	
					Finished at depth of 20m									

Note: U: Undisturbed sample - D: Disturbed sample - C: Rock sample
N: Standard Penetration Value (Blows/30cm)