

PEOPLE'S REPUBLIC OF CHINA FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT

CROSS SECTION (5/5)

SCALE: V=1:200 | No.1-16 | MAR. 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

Appendix 7-1 Drawings of Airfield Facilities (16) Cross Section (5/5)



APPENDIX 7-2 Designing of pavement structure

1) Design Aircraft

B-767-200 (Maximum takeoff weight 143.9t; 317,000lb)

ii) Annual Departure

Forecasted traffic is as shown in following Table.

Aircraft	Gear Type	Forecast Traffic	Maximum Take-off Weight	
B-767	dual tandem	14,812	7,406	143,800 kg
MD-82	dual	11,430	5,715	68,200 kg
B-737	dual	2,814	1,407	49,900 kg
YN-7	dual	3,404	1,702	23,500 kg

First, all aircrafts are converted to the same landing gear type as the design aircraft according to following factors.

To Convert From	To	Multiply
		Departures By
single wheel	dual wheel	0.8
single wheel	dual tandem	0.5
dual wheel	dual tandem	0.6
double dual tandem	dual tandem	1.0
dual tandem	single wheel	2.0
dual tandem	dual wheel	1.7
dual wheel	single wheel	1.3
double dual tandem	dual wheel	1.7

Secondary, the conversion to equivalent annual departures of the design aircraft should be determined by the following formula:

$$\log R_1 = \log R_2 \times (\frac{W2}{W1})^{1/2}$$

where;

 R_1 = equivalent annual departures by the design aircraft

R₂ = annual departures expressed in design aircraft landing gear

 W_1 = wheel load of the design aircraft

 W_2 = wheel load of the aircraft in question

The result of calculation is shown in following Table.

Aircraft	Dual Tandem Gear Departure	Wheel L	oad		gn	Equivalent Departures Aircraft	
B~767	7,406	18120	kg	18120	kg	7,406	3 .
MD-82	3.429	16110	kg	18120	kg	2,154	!
B-737	844	11500	kg	18120	kg	214	L
YN-7	1,021	5300	kg	18120	kg	42	2
Total						9,816	3

iii) Strength of Sub-grade

The sub-grade soil in Tianhe is classified into CL (low compressive clay.) According to the Chinese road design manual, the strength of sub-grade consisting of CL is generally estimated as following Table.

In this design, the CBR value 6 and plate bearing coefficient K_{75} = 4 kg/cm³ are assumed based on this table.

				I				
主契分类	A 44 47 17	化 表 性 土	不受冻结	冻结的	压缩性和	排水性	现场	地基反力 系 数 k15
	77 54 14 T S	代表性土	基础的评价	可能性	膨胀性	11 A LE	CBR	、 (公斤/ 厘米³)
砾 石 和 砾石质土	GW	级配好的砂石或砂砾混合土,细 颗粒少或没有	优	无或很少	几乎没有	化	60~80	8.8以上
	G P	级配不好的砂石或砂砾混合土, 细颗粒少或没有	良或优	无或很少	· 几乎没有	依	25~60	8.3以上
	d	粉土质砾石, 砾石、砂与粉土混 合土	良或优	少或平常	很少	可成不可	40~80	8.3以上
	G Mu	粉土质砾石, 砾石、砂与粉土混 合土	Ŕ	少或平常	少	不可或实际 上不透水	20~40	5.5~8.3
	GC	粘土质砾石, 砾石、砂与粘土混 合土	良	少或平常	少	不可或实际 上不透水	20~40	5.5~8.3
砂和	s w	级配好的砂或砂石, 细颗粒少或 设有	R	无或很少	几乎没有	化	20~40	5.5~8.3
砂质土	SP	级配不好的砂或砾石质砂, 细颗 粒少或设有	可成良	无或很少	 几乎没有	优	10~25	5.5~8.3
	SM d	粉土质砂,砂与粉土混合土	ii.	少或大	很少	可或不可	20~40	5.5~8.3
	3 W u	粉土质砂,砂与粉土混合土	可或良	少或大	少或平常	不可或实际 上不透水	10~20	5.5~8.3
	s c	粘土质砂,砂与粘土混合土	可或良	少或大	少咸平常	不可或实际上不透水	10~20	5.5~8.3
粉土和 粘 土 LL:<50	ML	无机质的粉土及根细砂、石粉、 粉土质或粘土质细砂或塑性小的粘 土质粉土	可或不可	平常或	少或平常	可嵌不可	5~15	2.8~5.5
	CL	小于一般塑性的无机质粘土,砾 石质粘土、 砂质 粘土、 粉土质 粘 土、粘结力大的粘土	可或不可	平常或大	平常	实际上	5~15	2.8~5.5
	OL	塑性小的有机质粉土及粉土质粘 土	不可	平常或大	平常或火	不可	4~8	2.8~5.5
粉土和 枯 土 LL>50	мн	无机质的粉土云母质或轻质细砂 或粉土质土,弹性大的粉土	不 可	平常或 很 大	大	可或不可	4~8	2.8~5.5
	СН	塑性大的无机质粘土, 粘性大的 粘土	不可或很不可	平常	大	实际上不透水	3~5	1.4~2.8
	ОН	小于一般塑性的有机质粘土,有 机质数土	不可或很不可	平常	大	实际上不透水	3~5	1.4~2.8
五有机 加 土	,	泥炎或其他重有机质土	不适	少	很大	可或不可		-

iv) Flexural Strength of Concrete

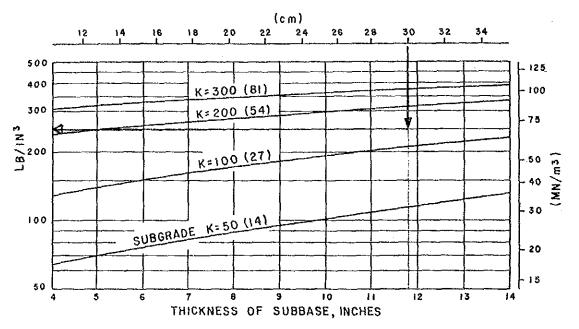
The flexural strength of concrete of 45 kg/cm³ is determined considering the experiences of pavement construction works in Wuhan.

v) Sub-base

The lime mixed crushed stone is assumed to be used the material for sub-base.

The thickness of 30 cm for sub-base is determined.

The K-value of 250 $1b/in^2$ on the top of sub-base is estimated by the following design chart of F.A.A.



WELL-GRADED CRUSHED AGGREGATE

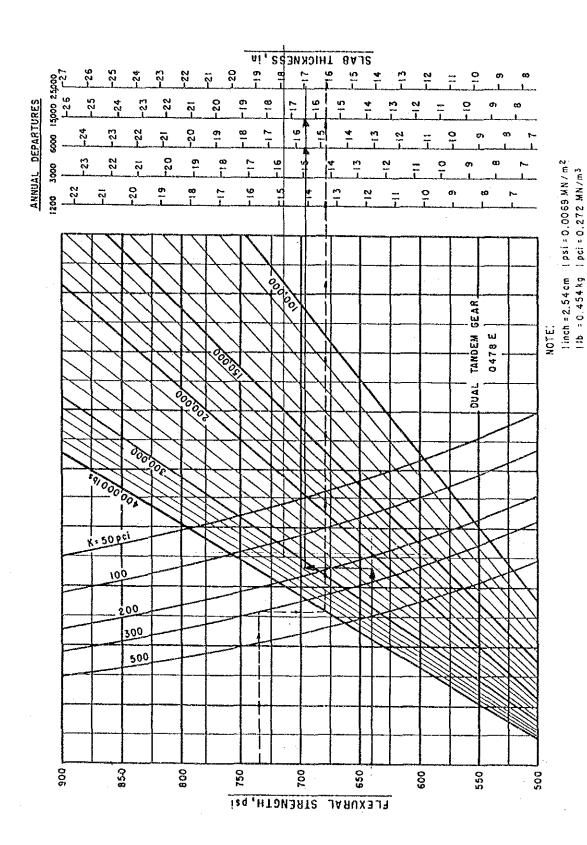
cf: Sub-grade $K = 4 \text{ kg/cm}^3 \longrightarrow 145 \text{ lb/in}^3$

vi) Thickness of Concrete Slab

The thickness of concrete slab in critical area is determined by the following design chart of F.A.A.

The estimated thickness for annual departure 6000 is 15.57 in and for annual departure 1500 is 16.40 in.

Therefore 15.9 in (#40 cm) is necessary for annual departure 9800.



RIGID PAVEMENT DESIGN CURVES - DUAL TANDEM SEAR

FIGURE 3-16.

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vii) Typical Cross Section

The typical cross section of pavement in the runway and the reduction of concrete slab thickness in the exit taxiway is determined according to the following figure that shown in F.A.A. Advisory Circular.

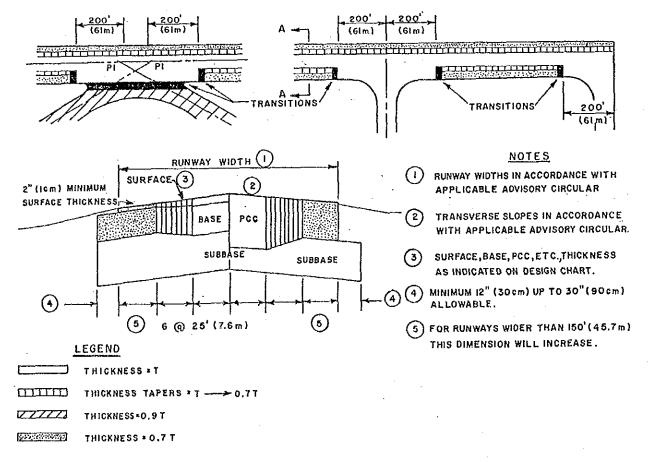


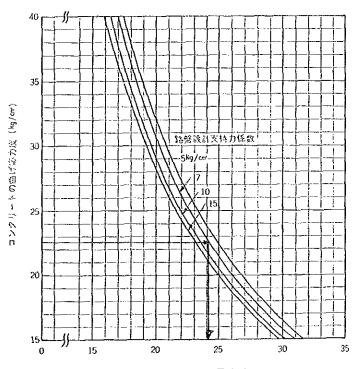
FIGURE 3-1. TYPICAL PLAN AND CROSS SECTION FOR RUNWAY PAVEMENTS

viii) Concrete Slab Thickness in G.S.E. Way

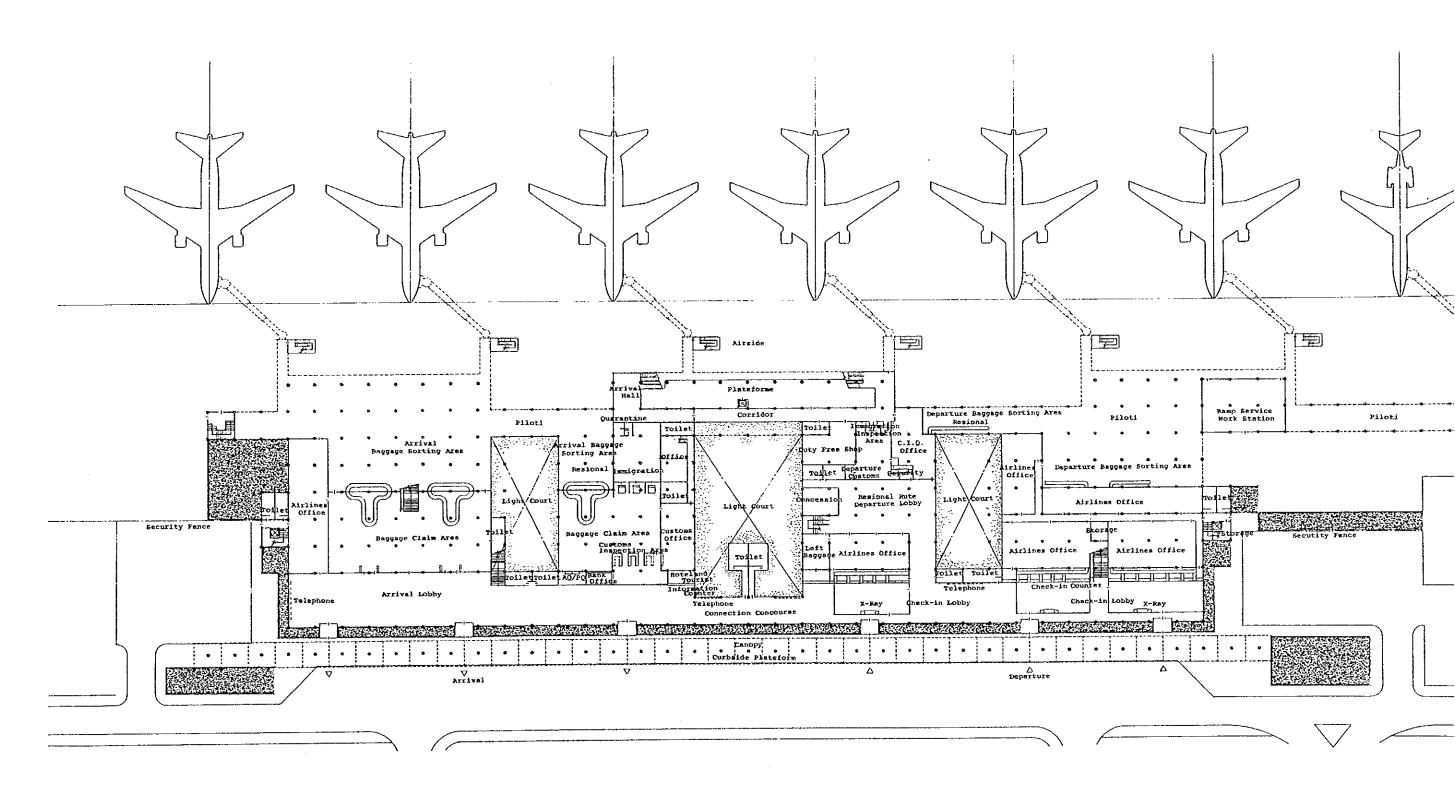
The concrete slab thickness in G.S.E. way is determined by J.C.A.B. airport Pavement Design Manual.

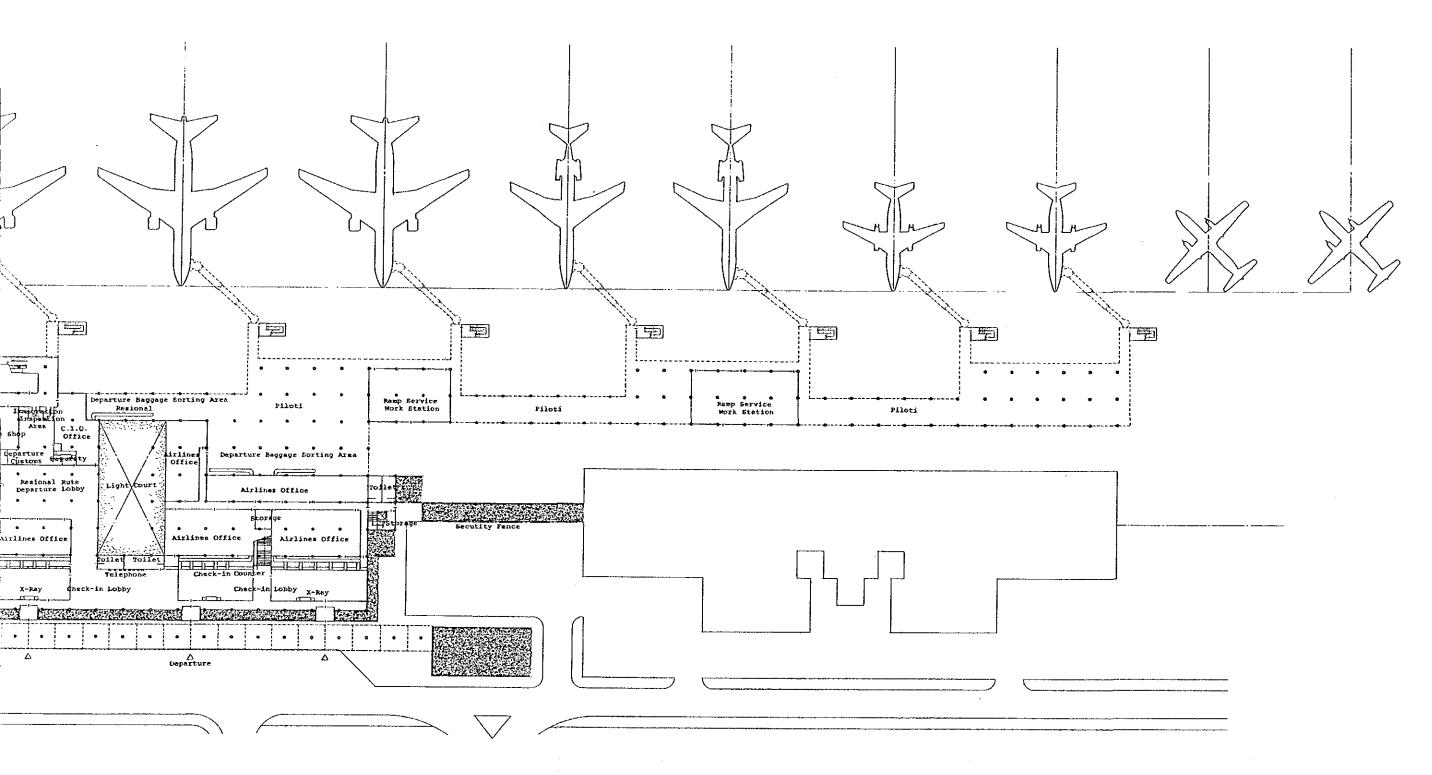
The design load of G.S.E. way is 50t toeing tractor and necessary safety factor is 2.0.

The thickness of 24 cm is necessary for concrete slab based on the following design chart.



コンクリートスラブ厚 (cm) 村図-8-7 コンクリートスラブ厚設計曲線(設計荷重レエ-1)



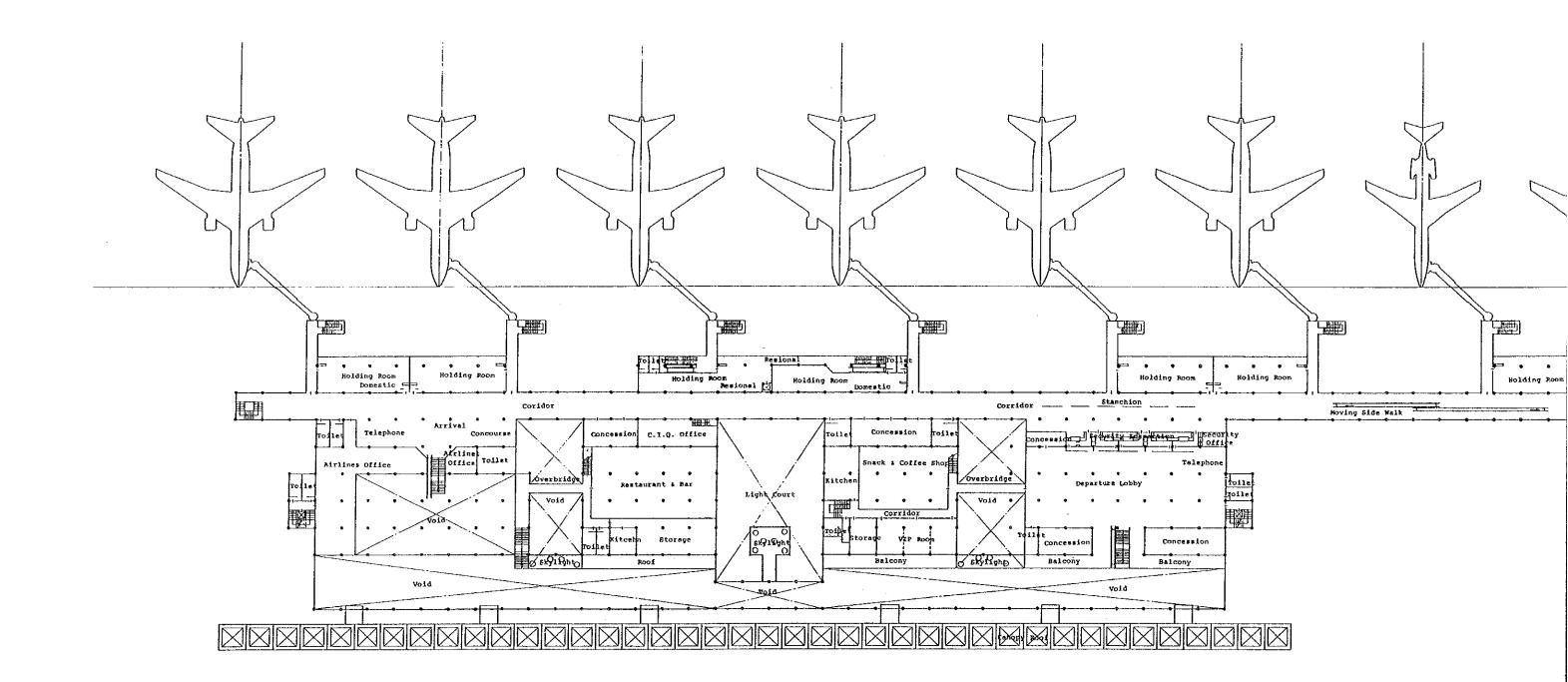


FIRST FLOOR PLAN

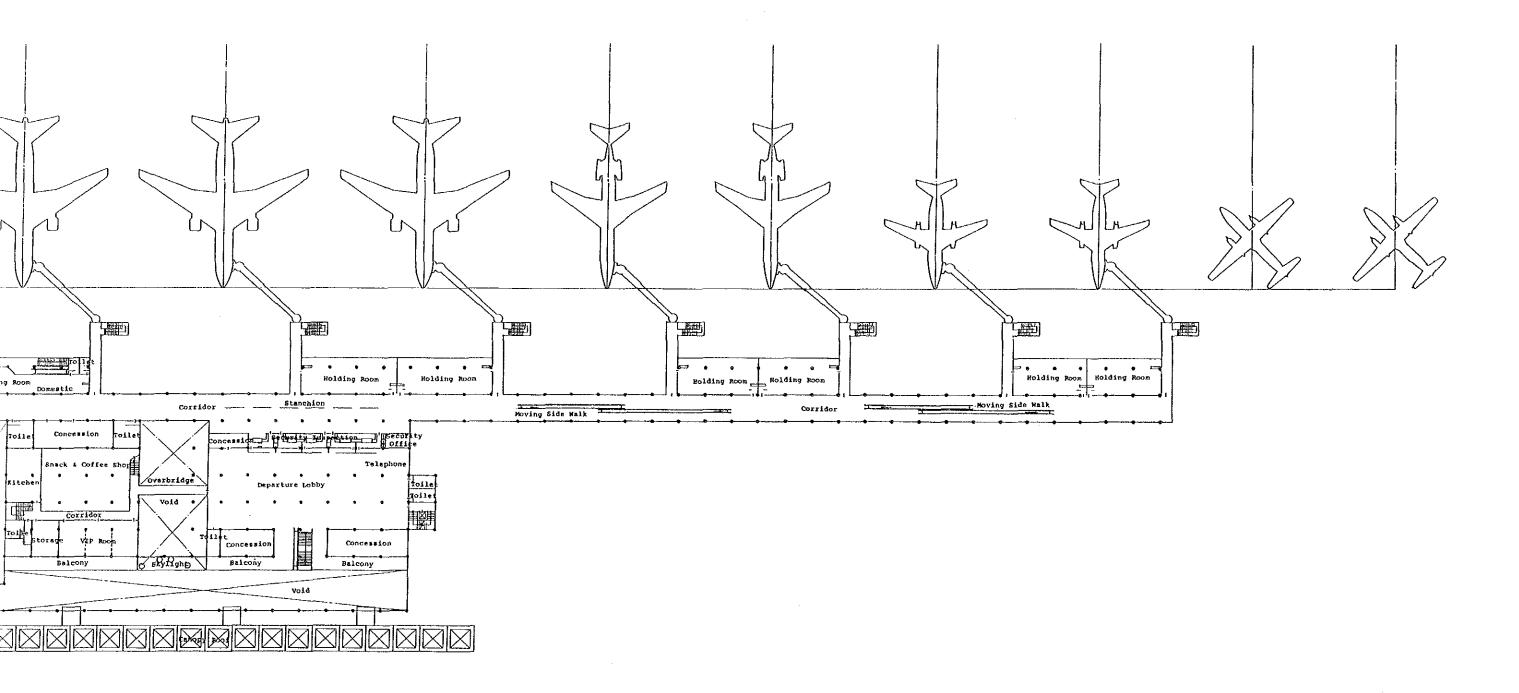
Appendix 7-3 Drawings of Passenger Terminal Building (1) First Floor Plan



PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT PASSENGER TERMINAL BUILDING 1ST. FLOOR PLAN 1: 1000 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A-154



SECOND FLOOR PLAN

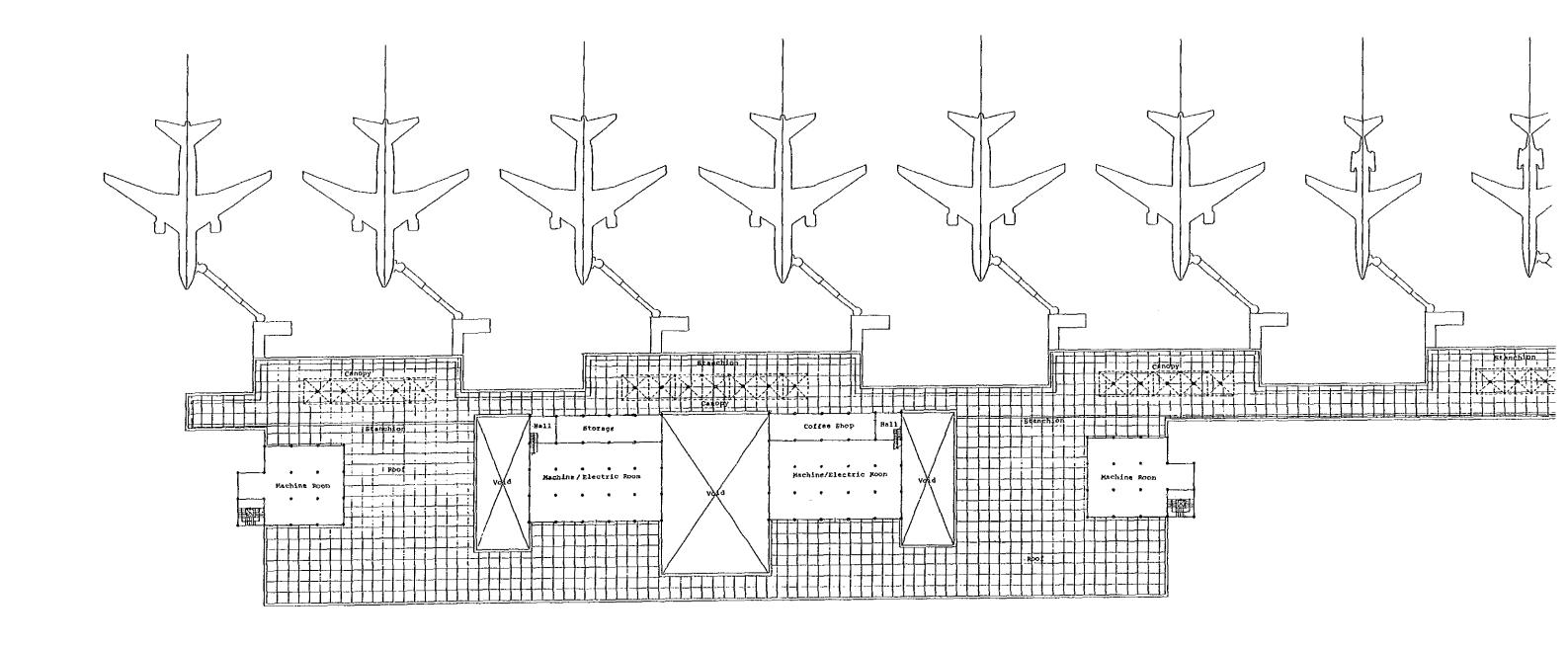


SECOND FLOOR PLAN

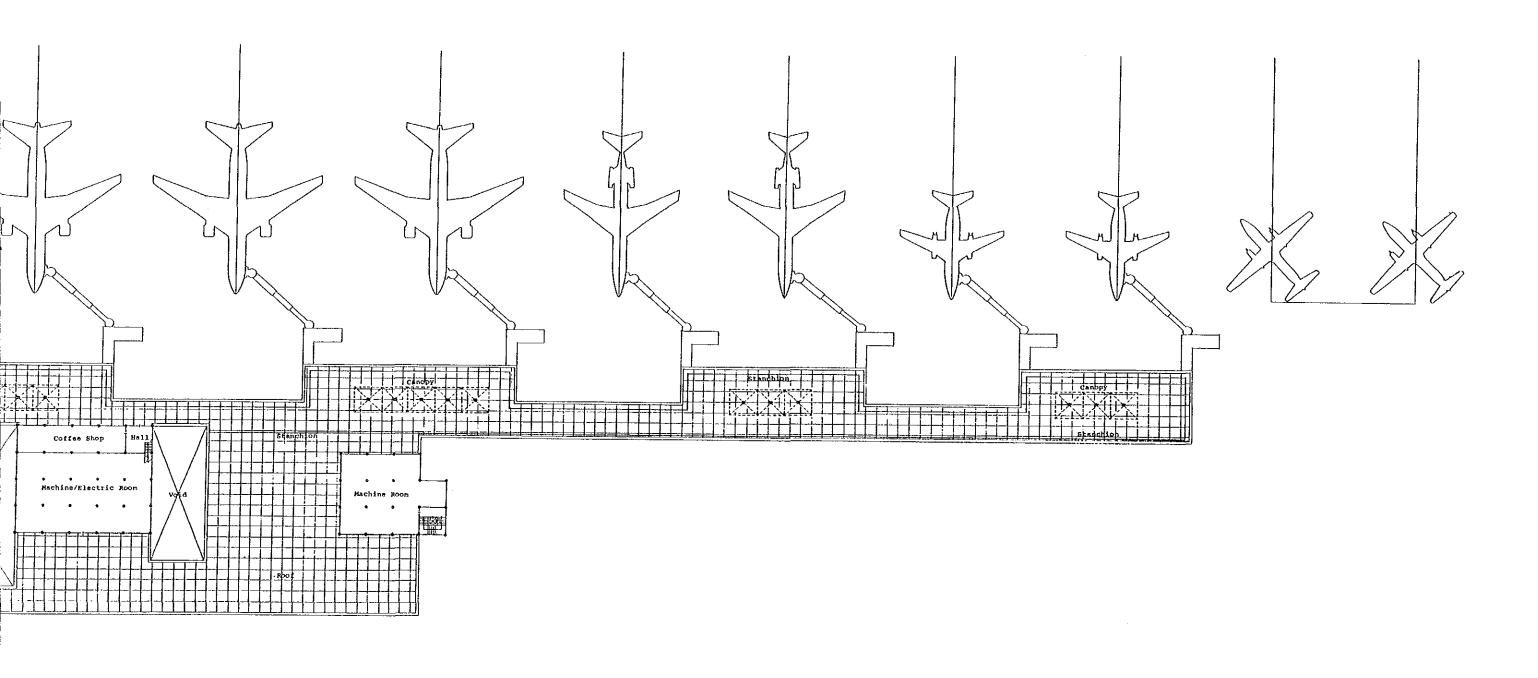
0 5 10 20 30 40 50M

Appendix 7-3 Drawings of Passenger Terminal Building (2) Second Floor Plan

PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT PASSENGER TERMINAL BUILDING 2ND. FLOOR PLAN 1:1000 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A -155



THIRD FLOOR PLAN

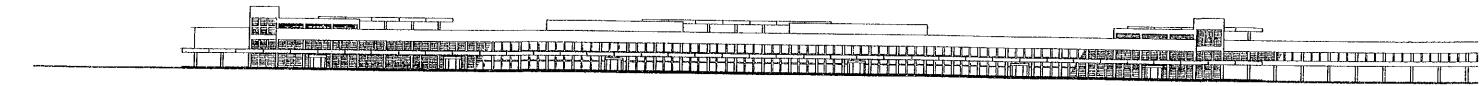


THIRD FLOOR PLAN

Appendix 7-3 Drawings of Passenger Terminal Building
(3) Third Floor Plan

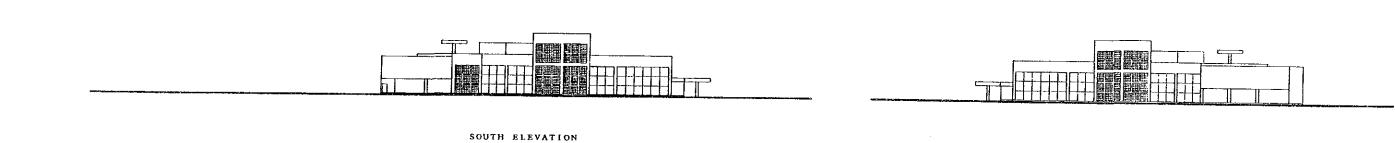


PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT PASSENGER TERMINAL BUILDING 3RD. FLOOR PLAN 1: 1000 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A -156

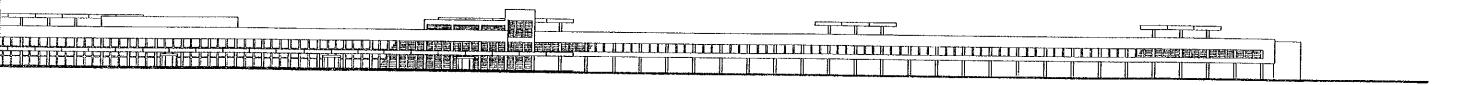


CURBSIDE ELEVATION

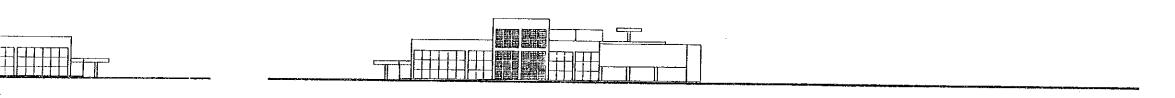
NORTH ELEVATION



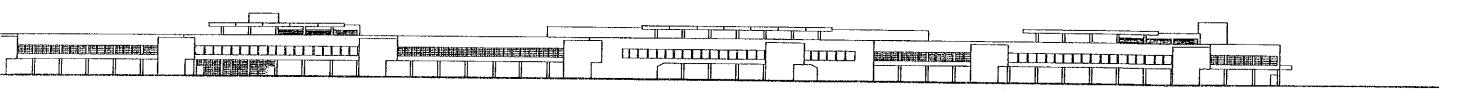
AIRSIDE ELEVATION



CURBSIDE ELEVATION



NORTH ELEVATION

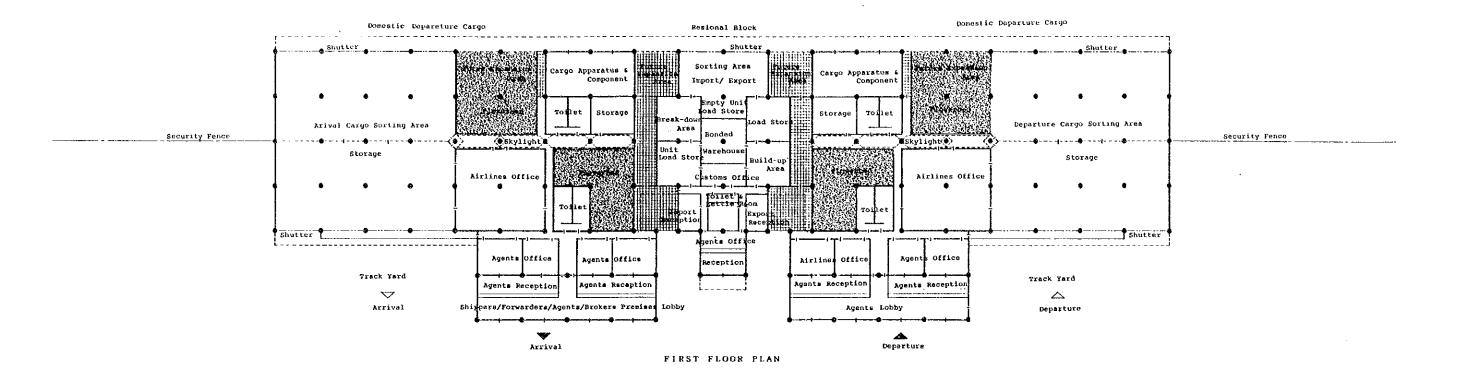


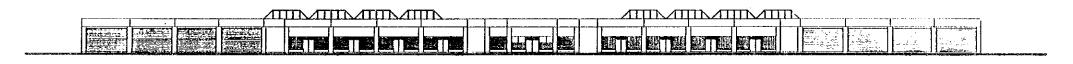
AIRSIDE ELEVATION



Appendix 7-3 Drawings of Passenger Terminal Building (4) Elevations

PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT PASSENGER TERMINAL BUILDING ELEVATIONS Scale 1: 1000 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A-157

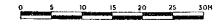




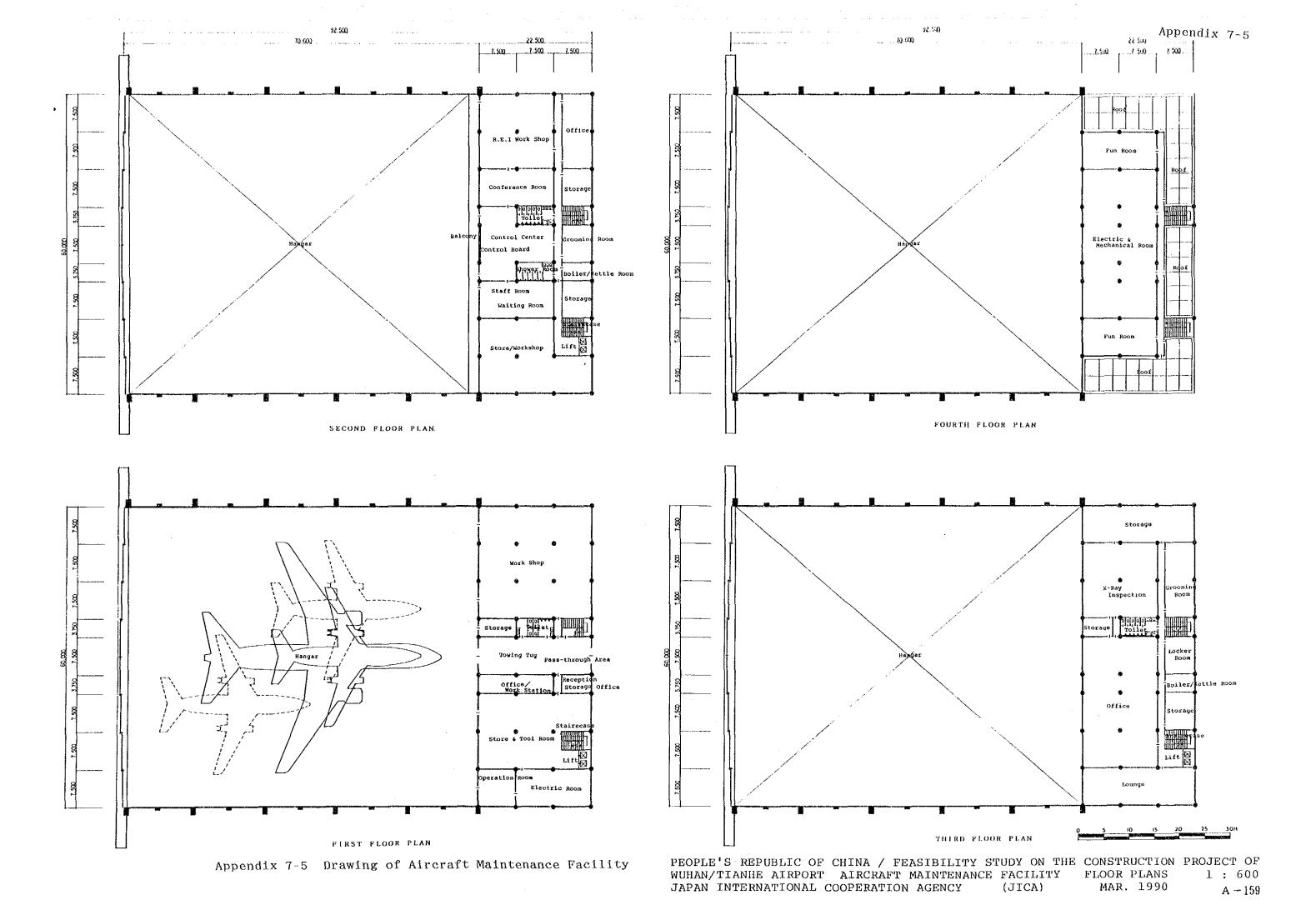
CURBSIDE ELEVATION

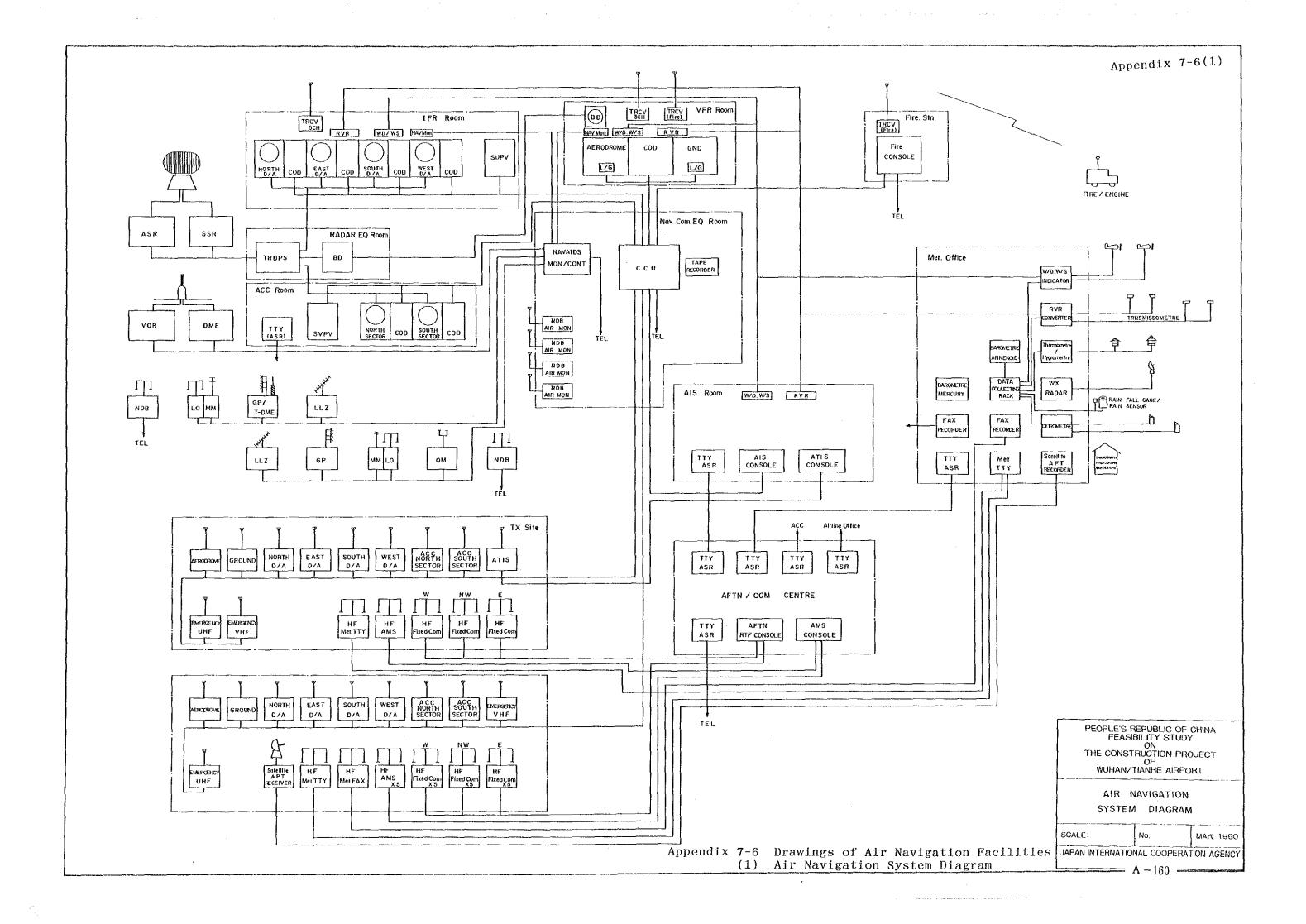


AIRSIDE ELEVATION



Appendix 7-4 Drawing of Cargo Terminal Building

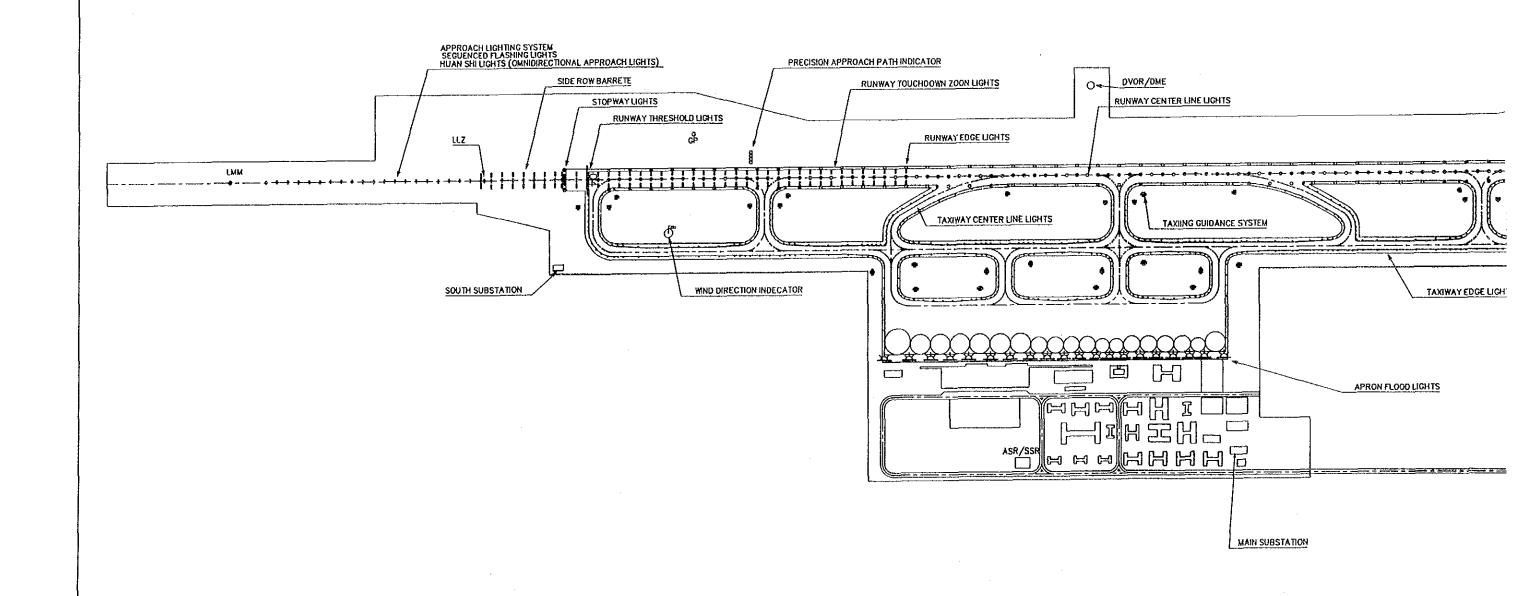




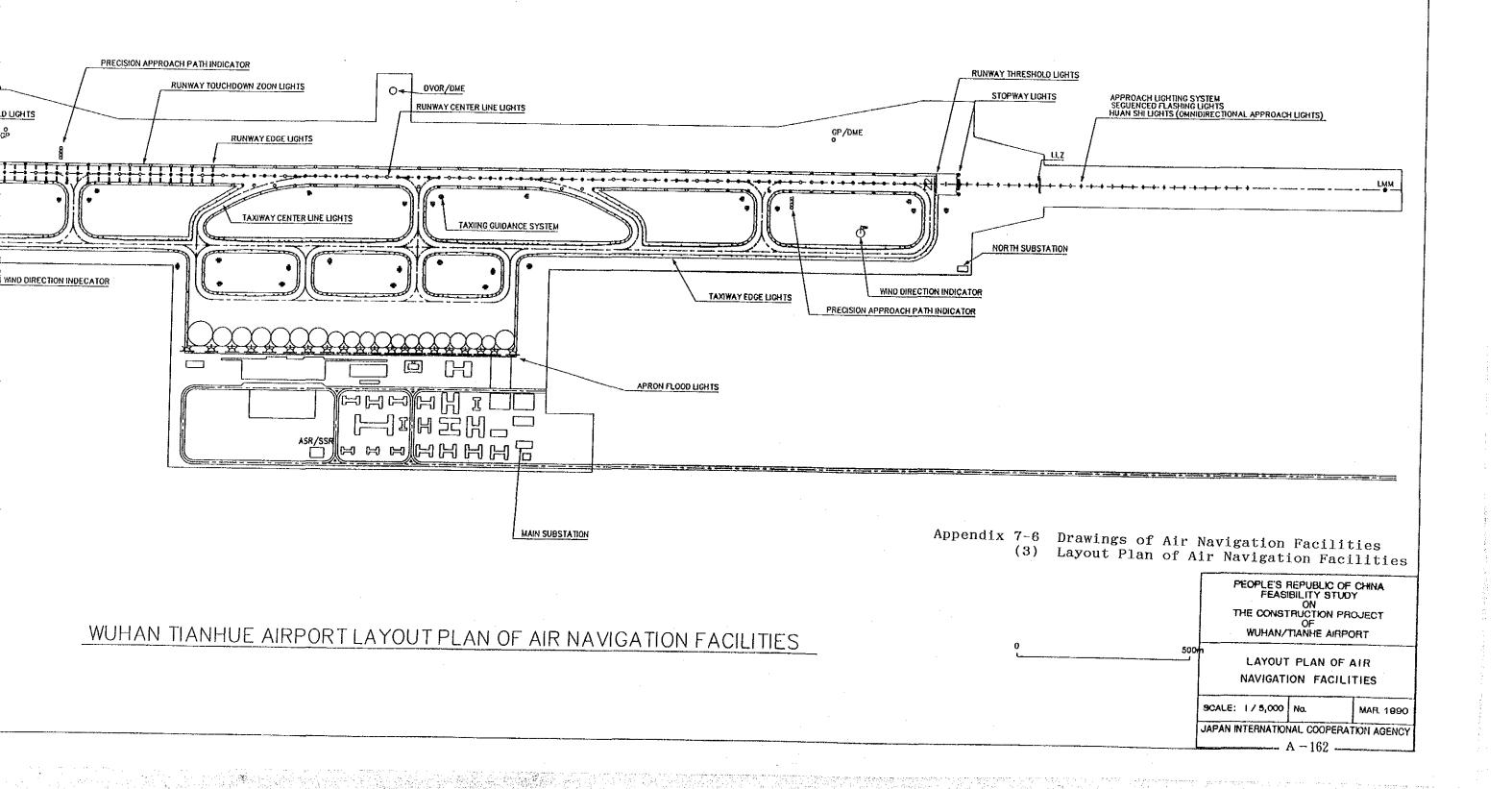
Appendix 7-6 Drawings of Air Navigation Facilities
(2) Wuhan Tianhe Airport Single Line Diagram

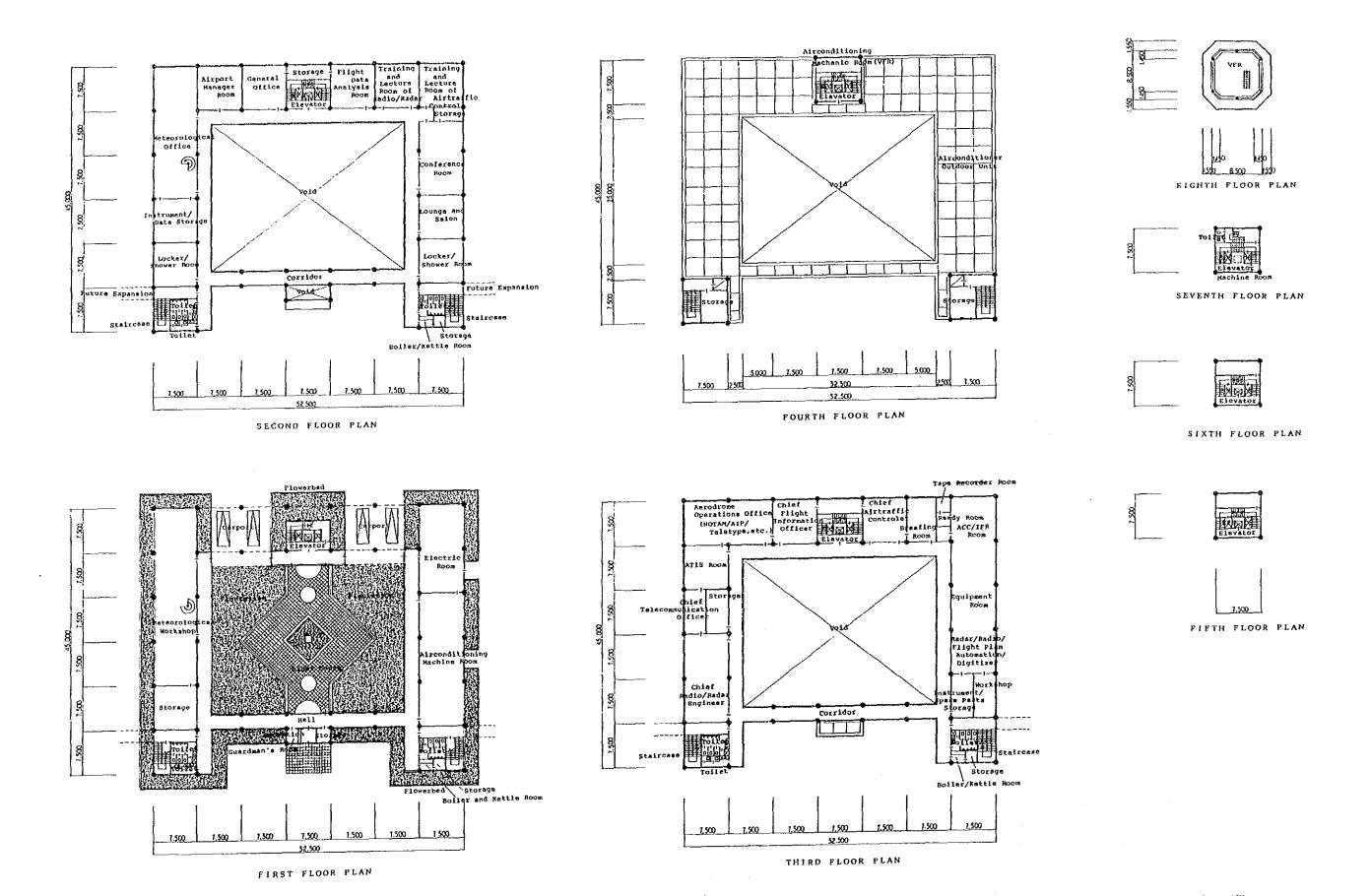
DAPAN INTERNATIONAL COURT PATION AGENCE

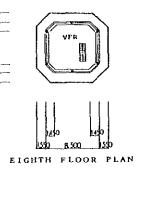
A - 161



WUHAN TIANHUE AIRPORT LAYOUT PLAN OF AIR NAVIGATION FACILITI





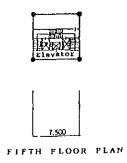


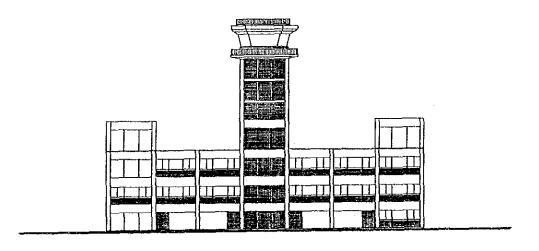


SEVENTH FLOOR PLAN

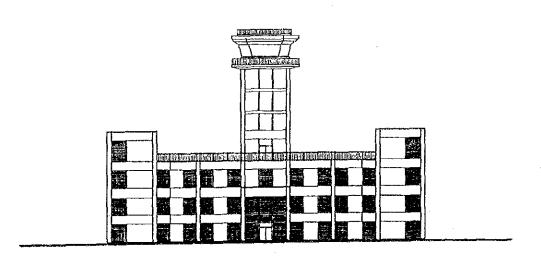


SIXTH FLOOR PLAN





AIRSIDE ELEVATION



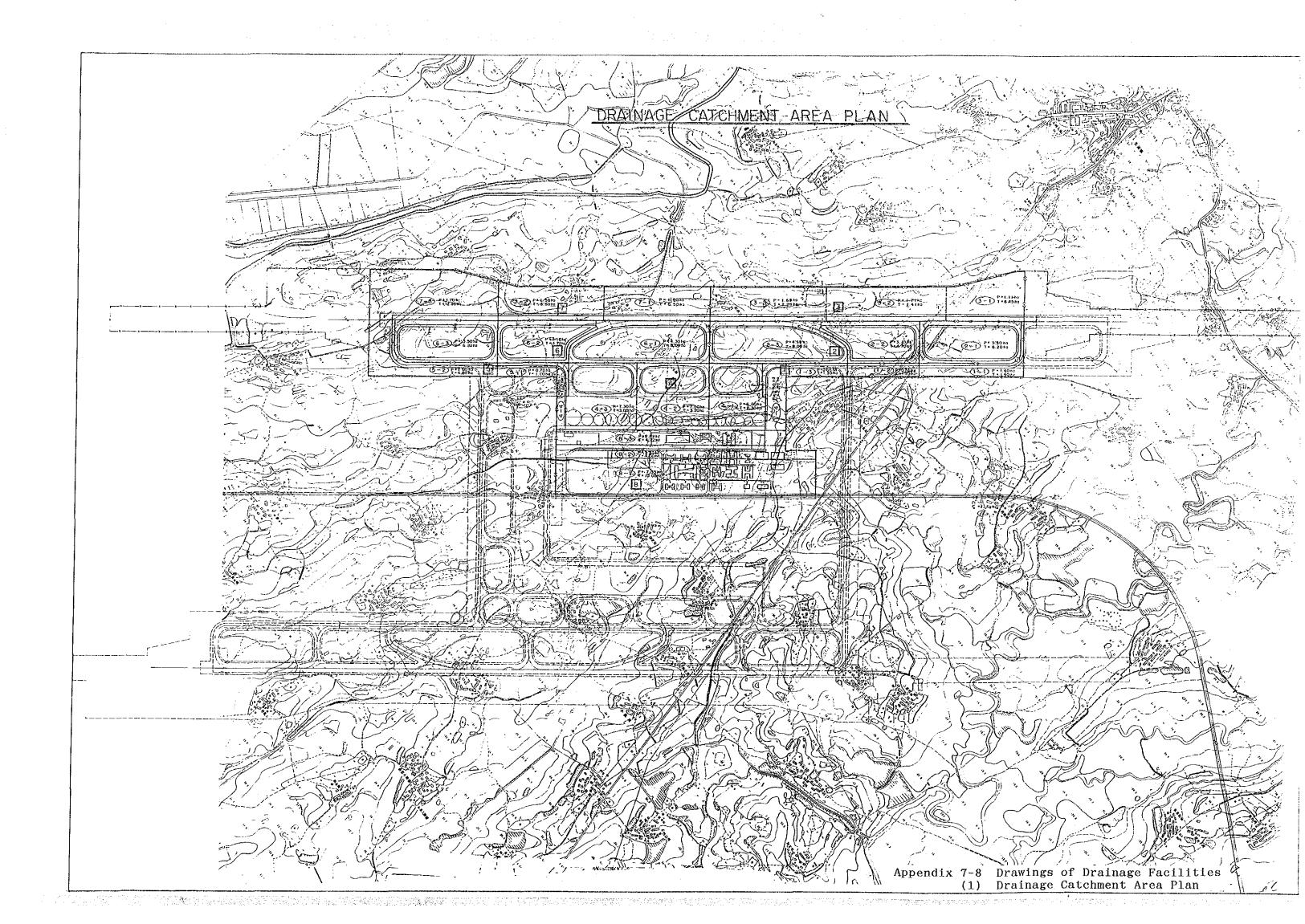
CURBSIDE ELEVATION

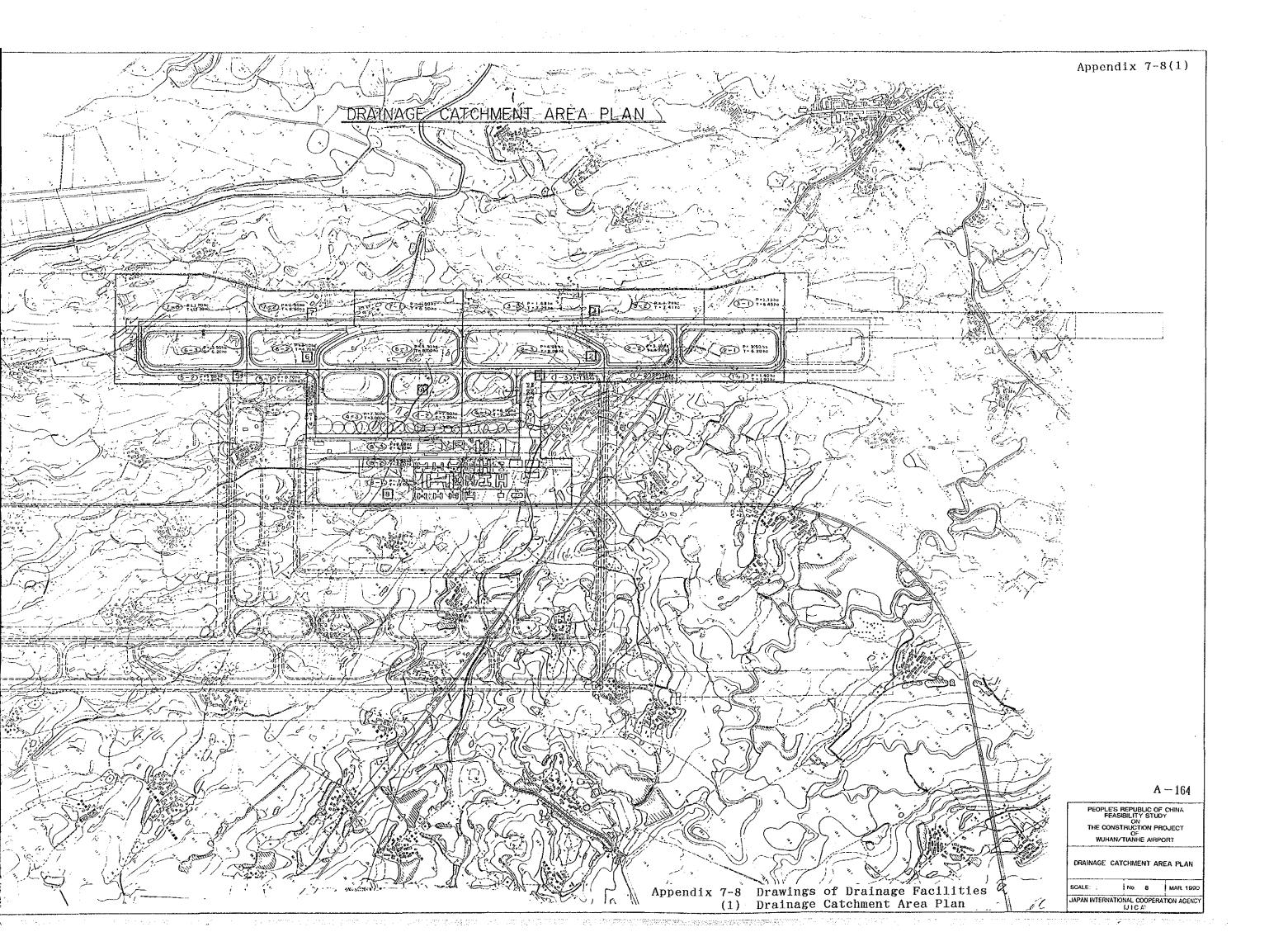


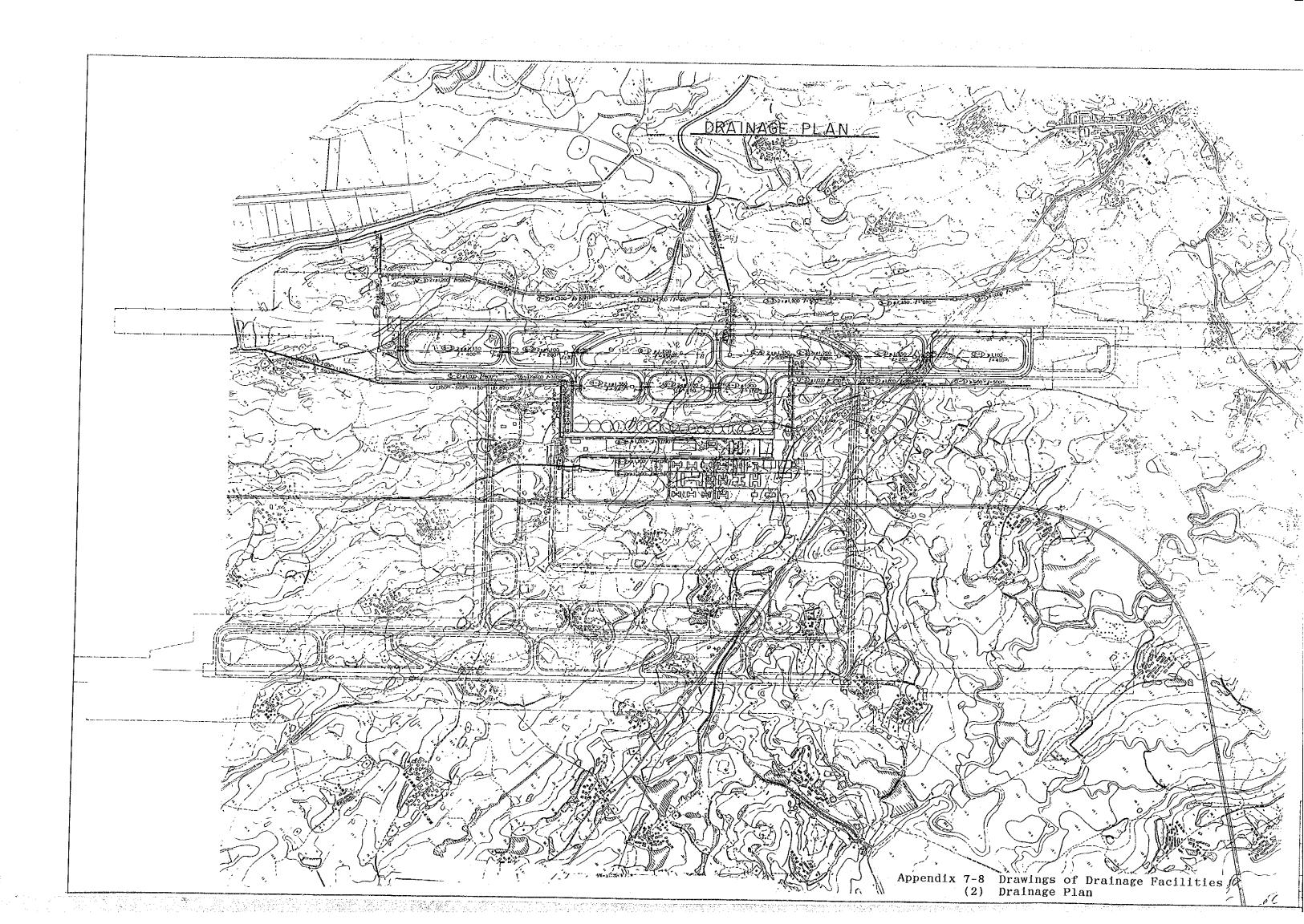
Appendix 7-7 Drawing of Air Traffic Control Tower and Meteorological Building

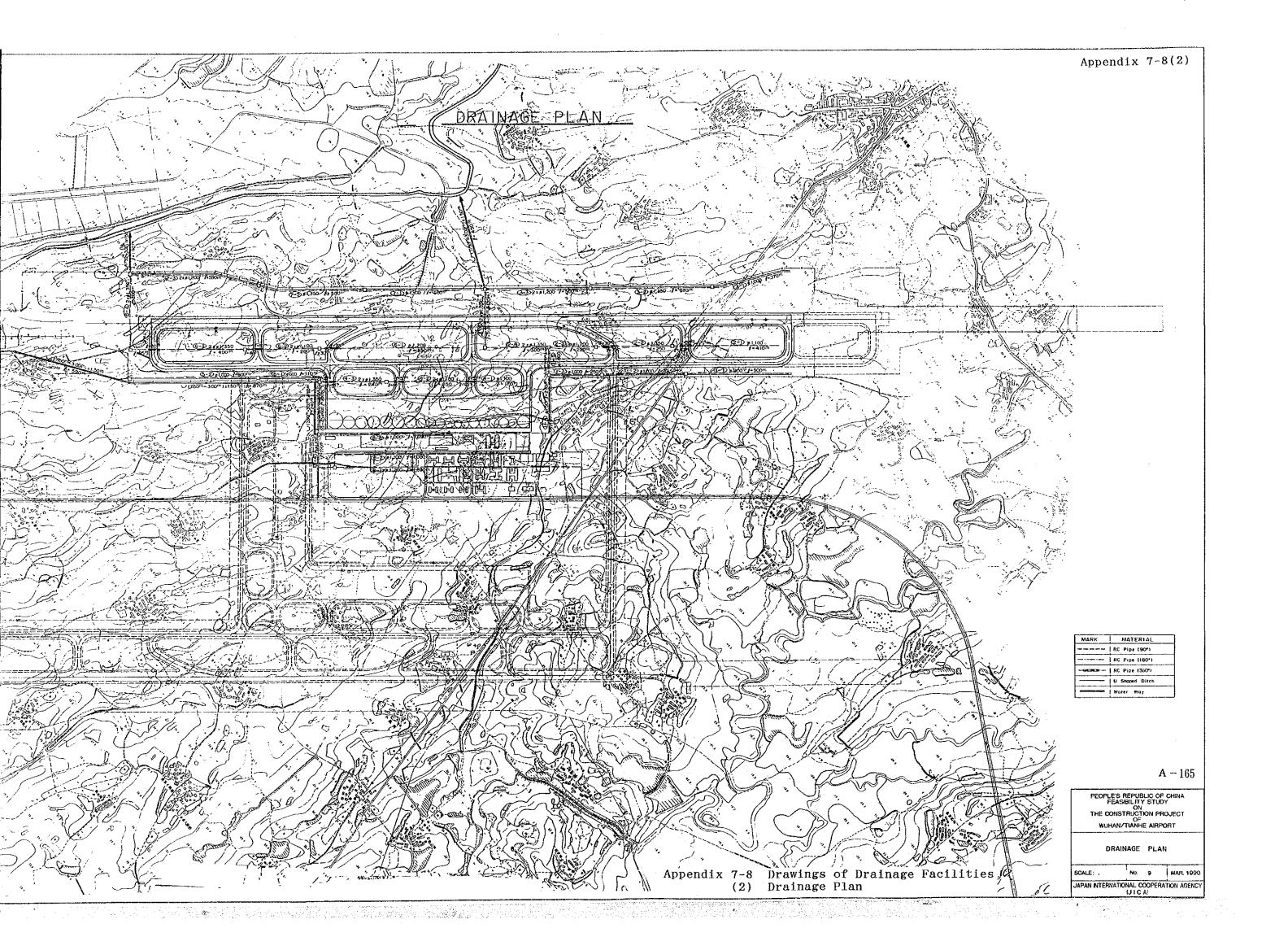
PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT AIR TRAFFIC CONTROL TOWER/METEOROLOGICAL BUILDING 1 : 600 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) FLOOR PLANS AND ELEVATIONS $_{\rm A}-163$

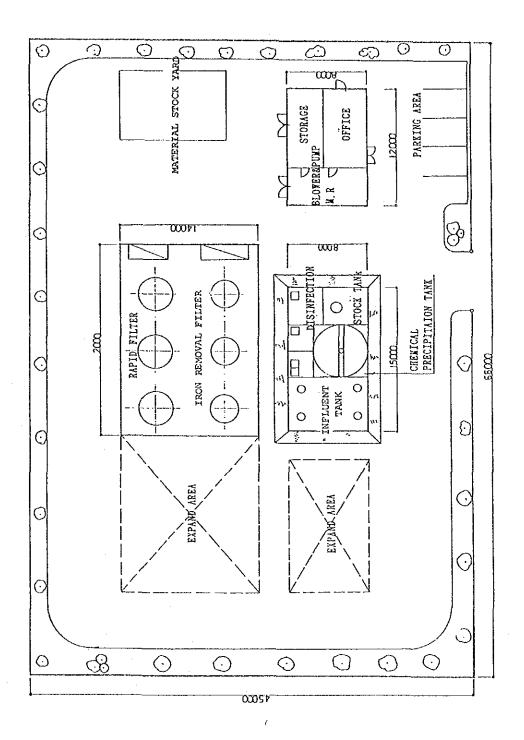




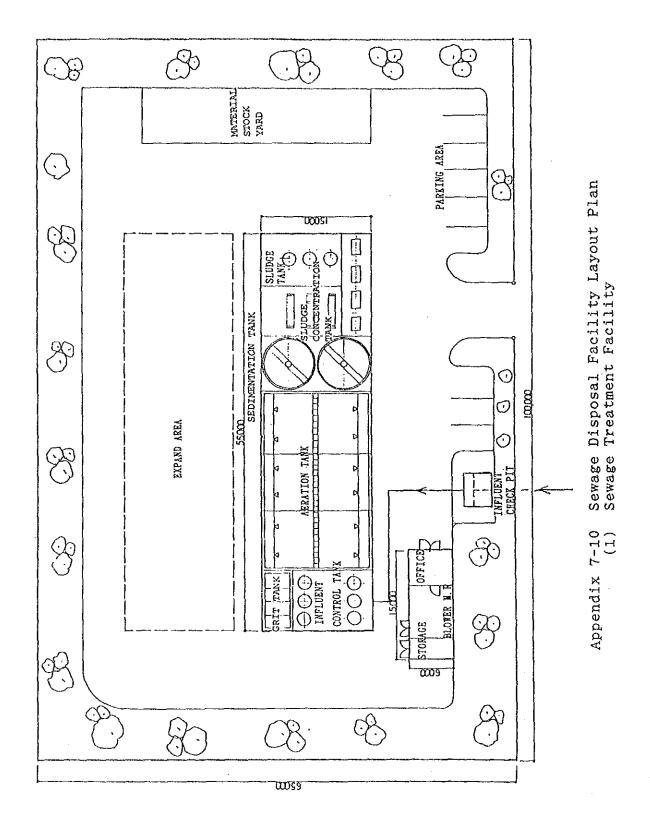




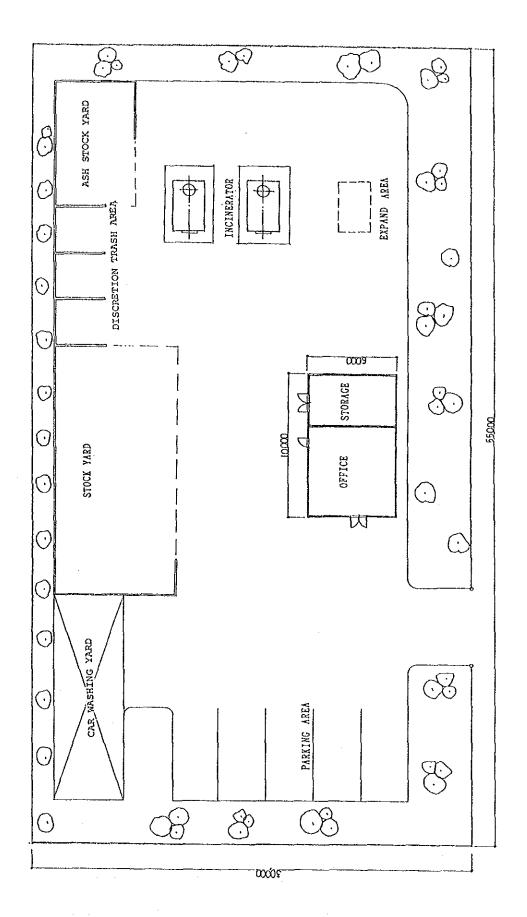




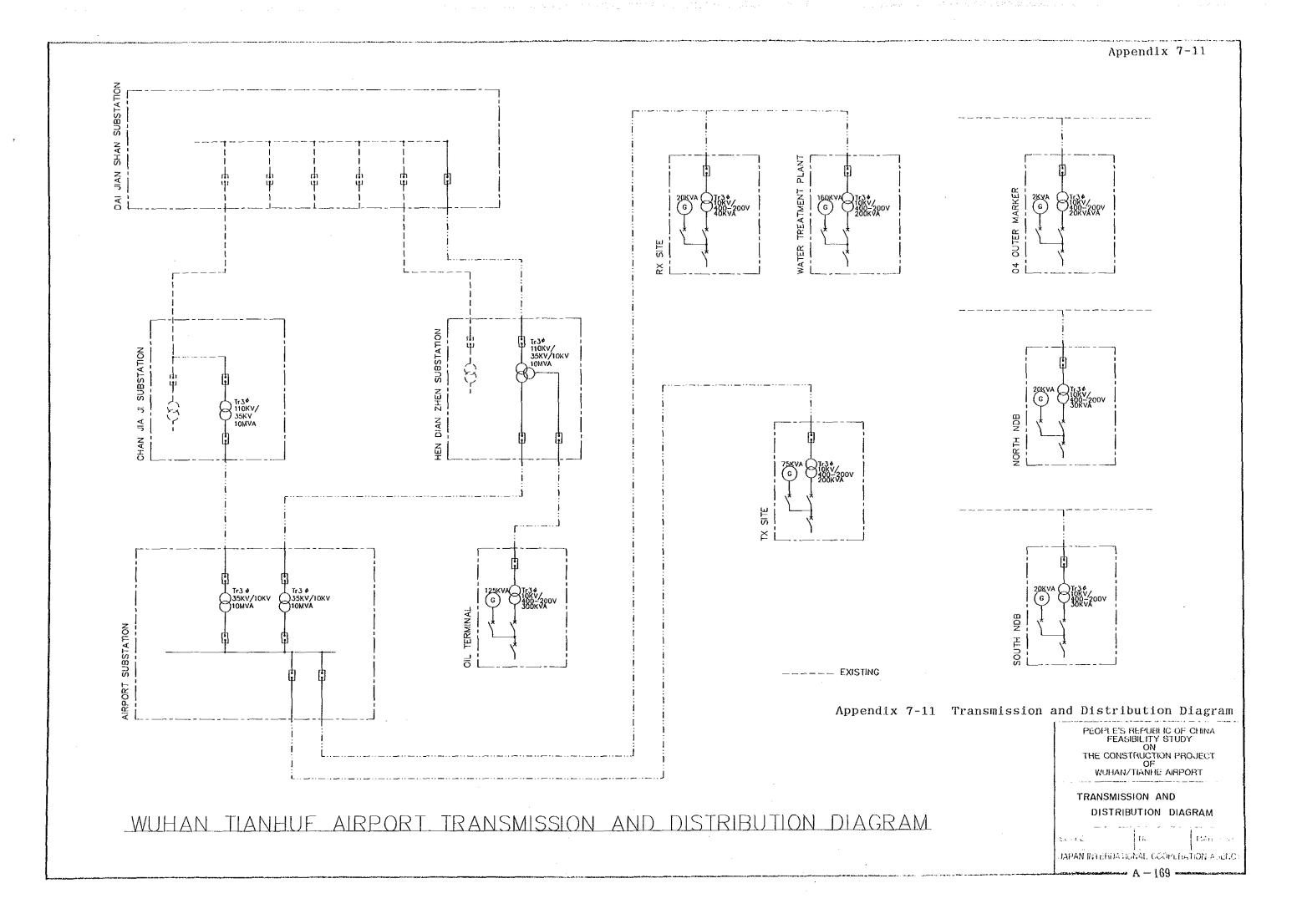
Appendix 7-9 Water Treatment Facility Layout Plan

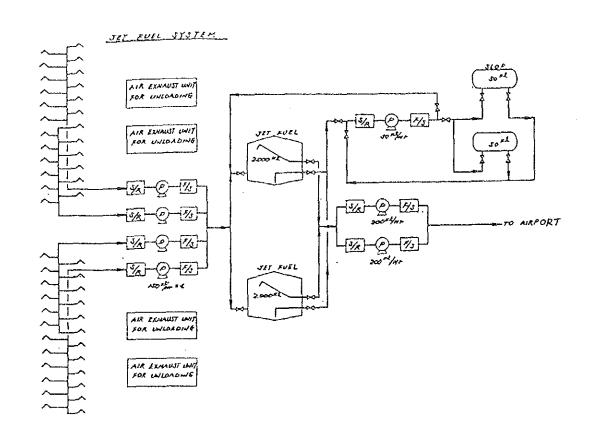


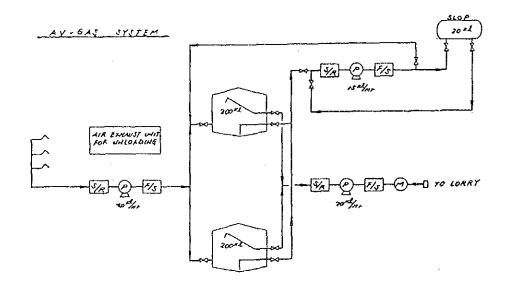
A - 167



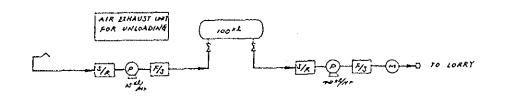
Appendix 7-10 Sewage Disposal Facility Layout Plan (2) Trash Disposal Facility





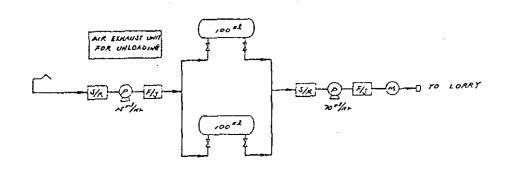


GASOLINE AND OITSEL OIL SYSTEM

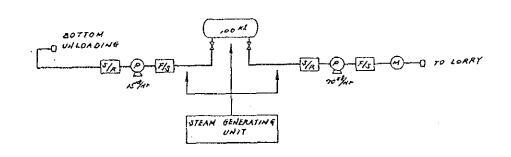


LEGENQ					
STMBOL	DESCRIPTION				
@	PUMP				
<i>F</i> /s	FILTER SEPARATOR				
1/2 ×	STRAINER				
@	FLOW METER				
^	UNLOADING ARM				
D—	COUPLING				
	FLOATING SULTION PIPE				

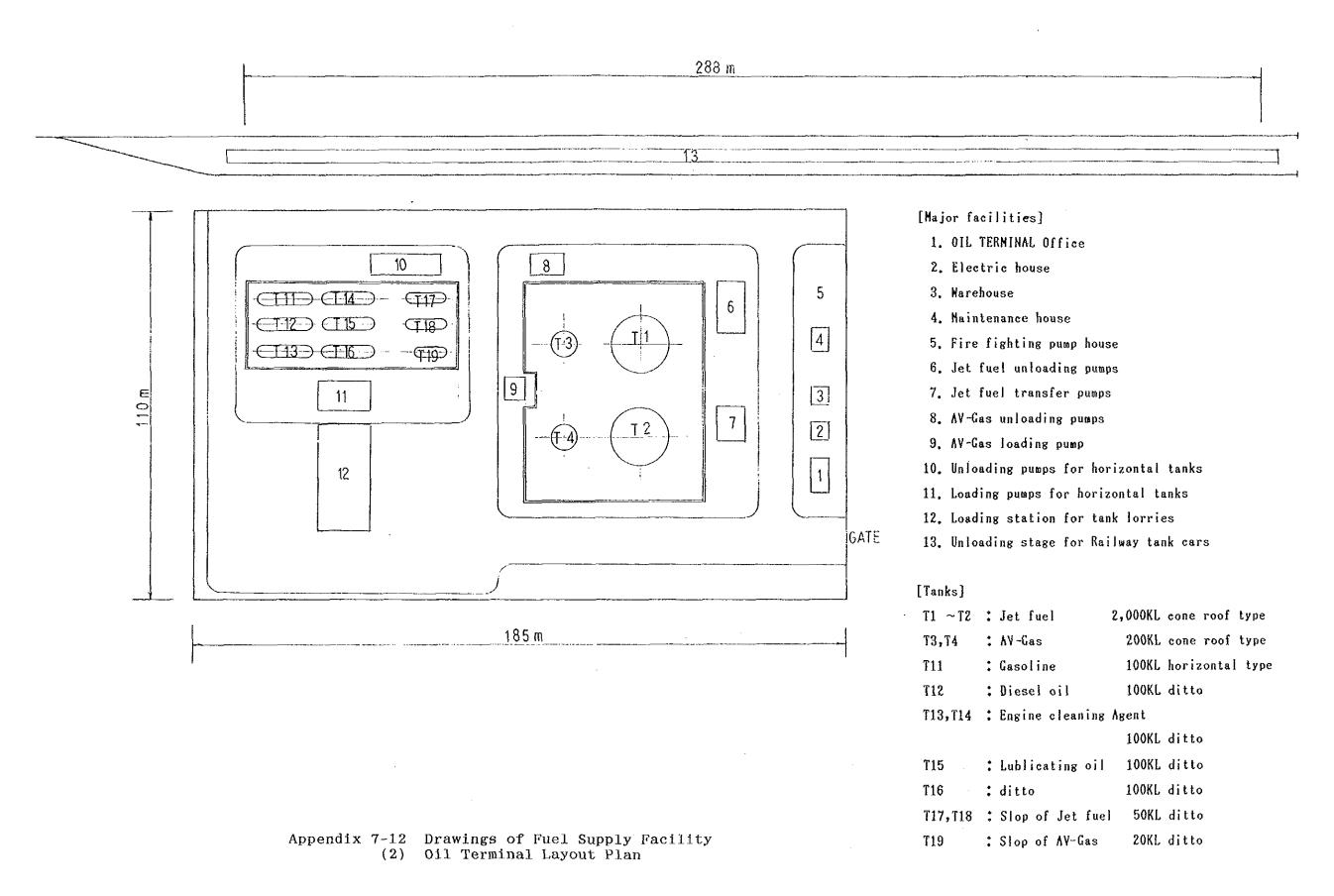
ENGINE CLEANING AGENT SYSTEM



LUBLICATINE OIL SYSTEM



Appendix 7-12 Drawings of Fuel Supply Facility
(1) System Flow Diagram for Oil Terminal



LEGENO

HLTER SEPARATOR

FLOW METER

HYDRANT VALVE

STRAINER

COUPLING

FLOATING
SULTION PIPE

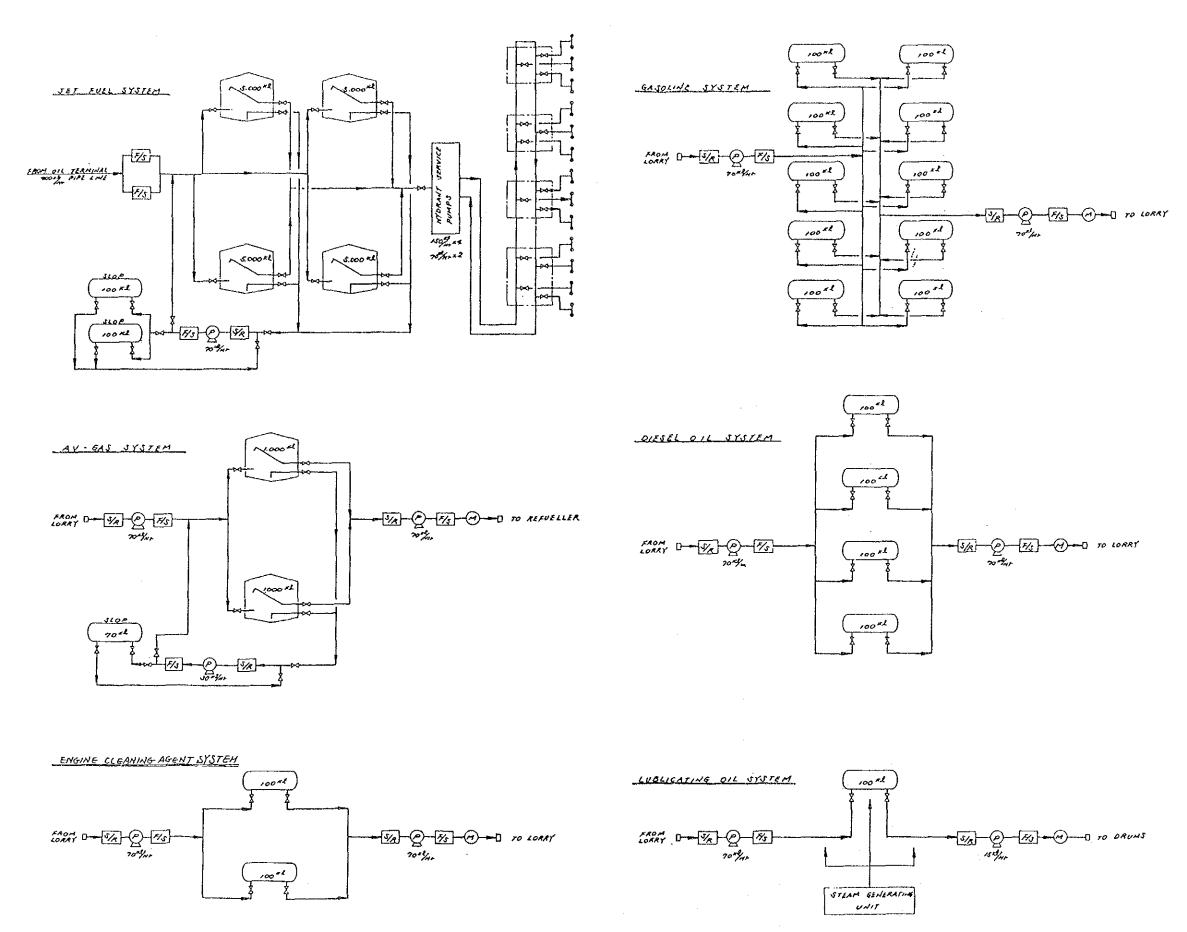
SYMBOL DESCRIPTION

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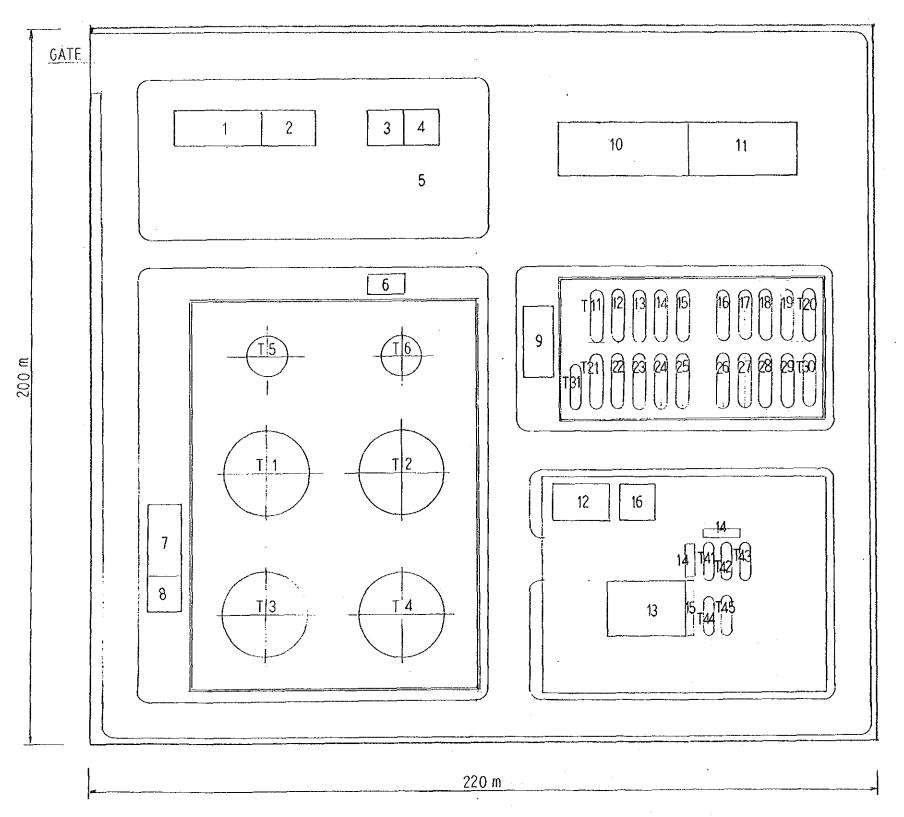
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Appendix 7-12 Drawings of Fuel Supply Facility
(3) System Flow Diagram for Airport Fuel Depot.



Appendix 7-12 Drawings of Fuel Supply Facility
(4) Airport Fuel Depot Layout Plan

[Major Facilities]

- 1. AIR PORT DEPOT Office
- 2. Electric house
- 3. Warehouse
- 4. Maintenance house
- 5. Fire fighting pump house
- 6. Delivering pumps
- 7. Hydrant pumps and filter-separaters
- 8. Filter-separaters for jet fuel reception
- 9. Delivering pumps from horizontal tanks
- 10. Unloading station w/pumps

from tank lorries

11. Delivering station for refuellers, tank lorries and drums

- 12. LP Gas station office
- 13, LP Gas filling station
- 14. LP Gas unloading station
- 15. LP Gas pumps and compressors
- 16. Sprinkler pump for LP Gas facilities

[Tanks]

T1 ~T4 : Jet fuel 5,000KL cone roof type
T5,T6 : AV-Gas 1,000KL cone roof type
T11 ~T20 : Gasoline 100KL horizontal type
T21 ~T24 : Diesel oil 100KL ditto
T25,T26 : Engine cleaning Agent

100KL ditto

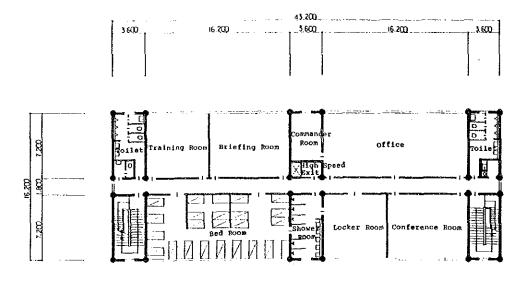
T27 : Lublicating oil 100KL ditto
T28 : ditto 100KL ditto

T28 : ditto 100KL ditto
T29,T30 : Slop of Jet fuel 100KL ditto

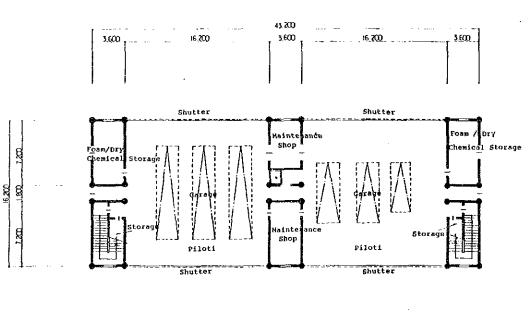
T31 : Slop of AV-Gas 70KL ditto

Appendix 7-13 Boiler Station Layout Plan

53000

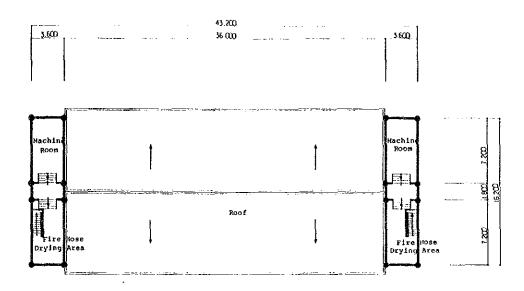


SECOND FLOOR PLAN

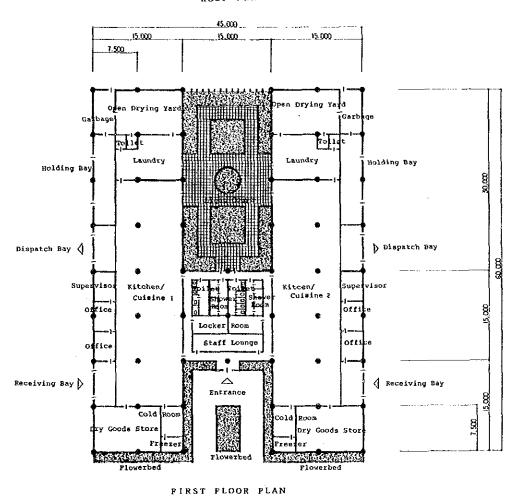


FIRST FLOOR PLAN



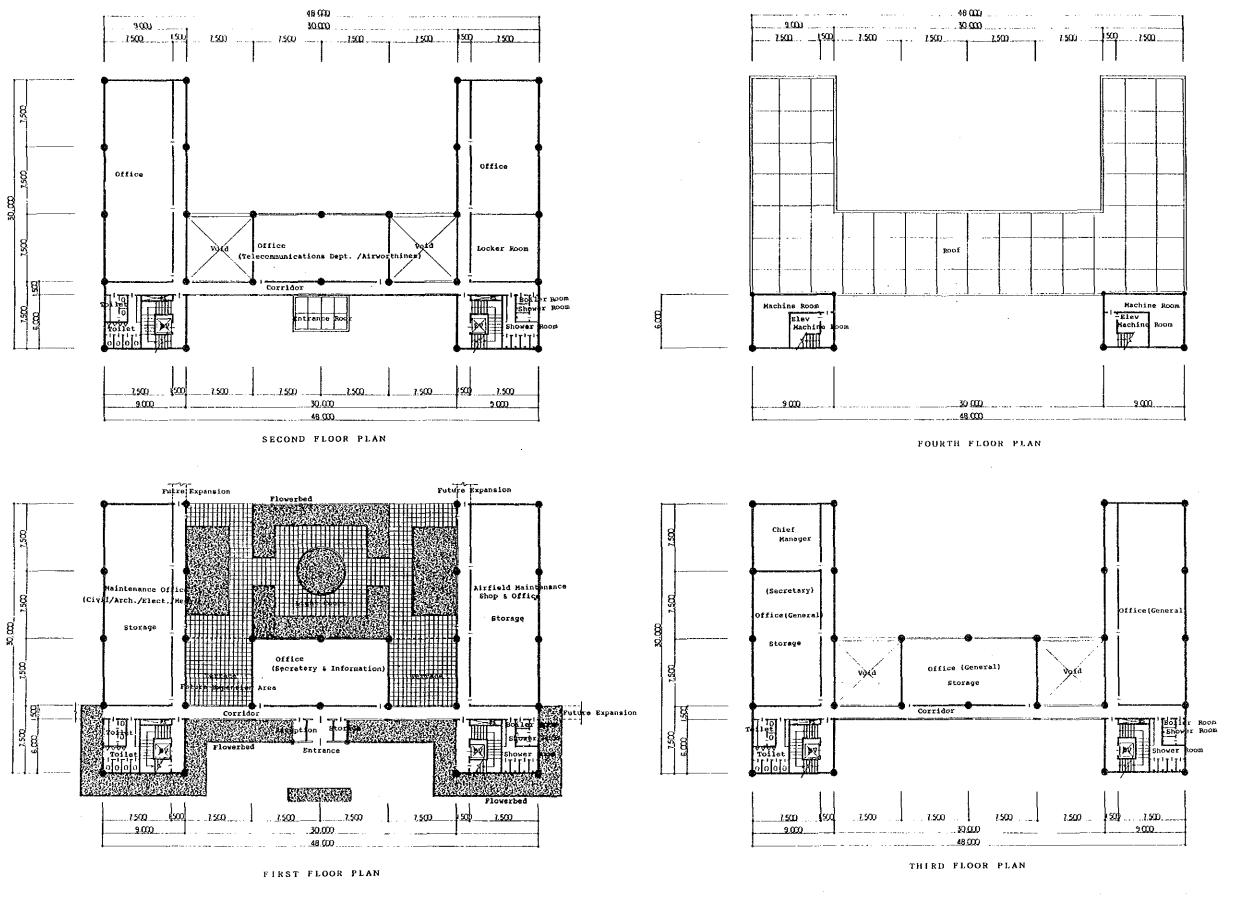


ROOF PLAN

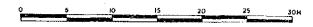


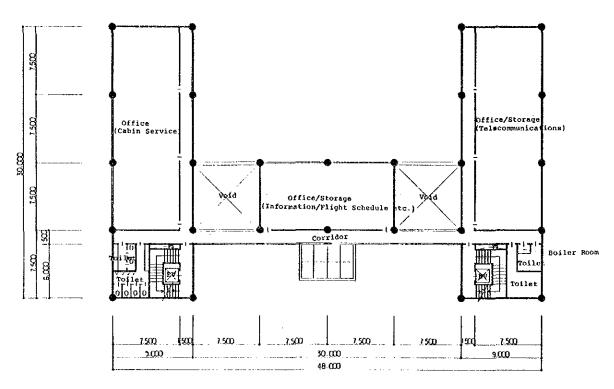
Appendix 7-14 Drawings of Related Buildings
(1) Firefighting Building and Catering Building

PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT RESCUE AND FIRE-FIGHTING/CATERING FACILITY 1:400/1:600 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A-175

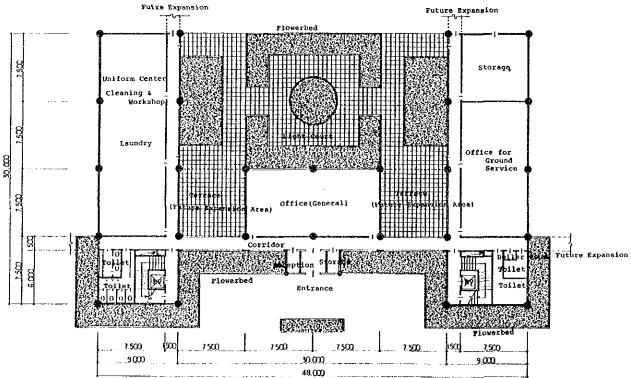


(2) Administration Building (Airport Authority)

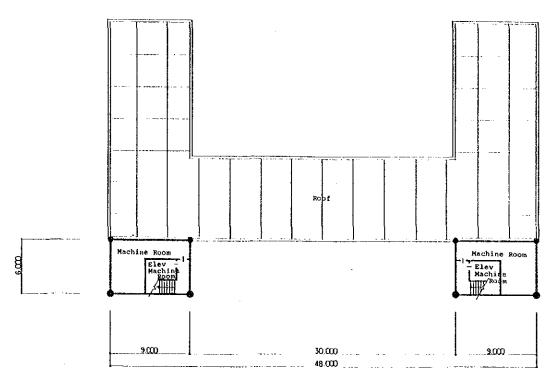




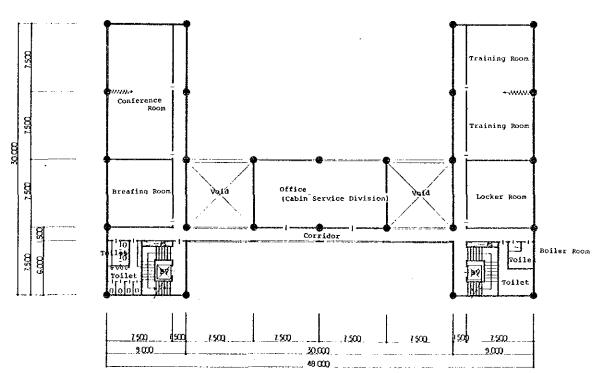
SECOND FLOOR PLAN



FIRST FLOOR PLAN



FOURTH FLOOR PLAN

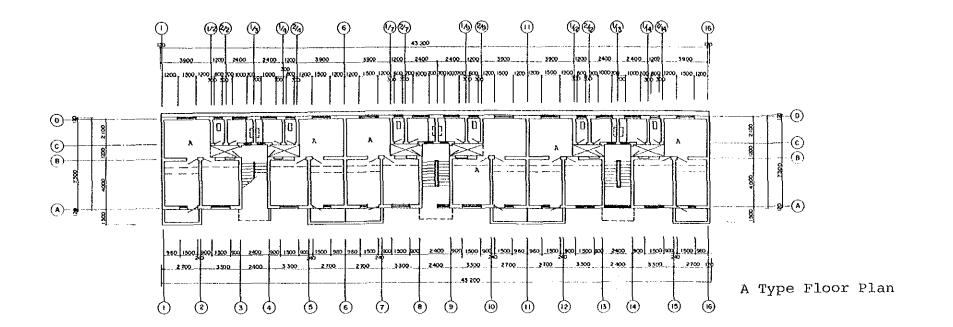


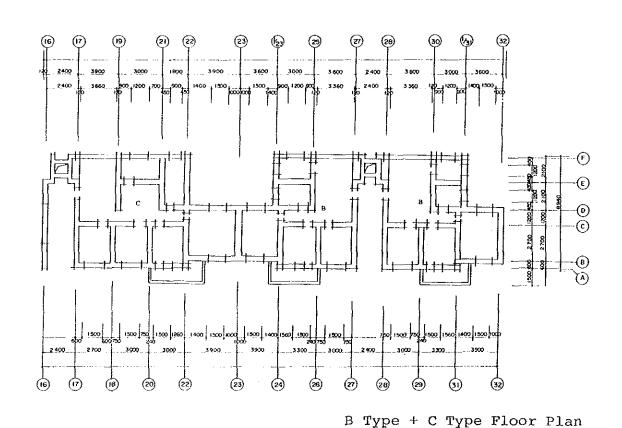
THIRD FLOOR PLAN



Appendix 7-14 Drawings of Related Buildings
(3) Administration Building (Airline)

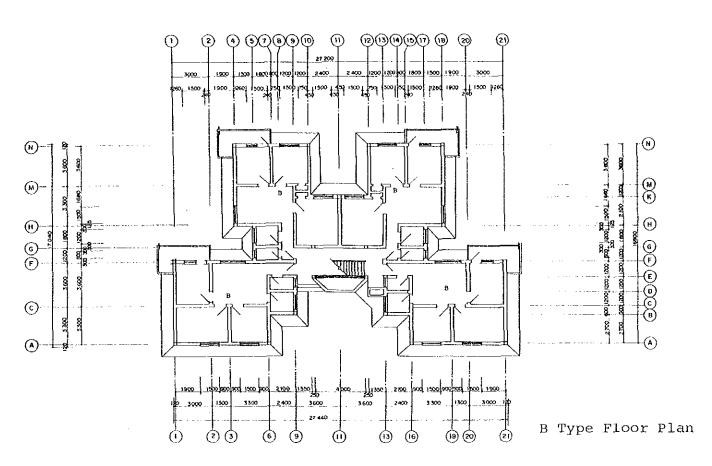
PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT ADMINISTRATION BUILDING (A/L) FLOOR PLANS 1:400 JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A-177





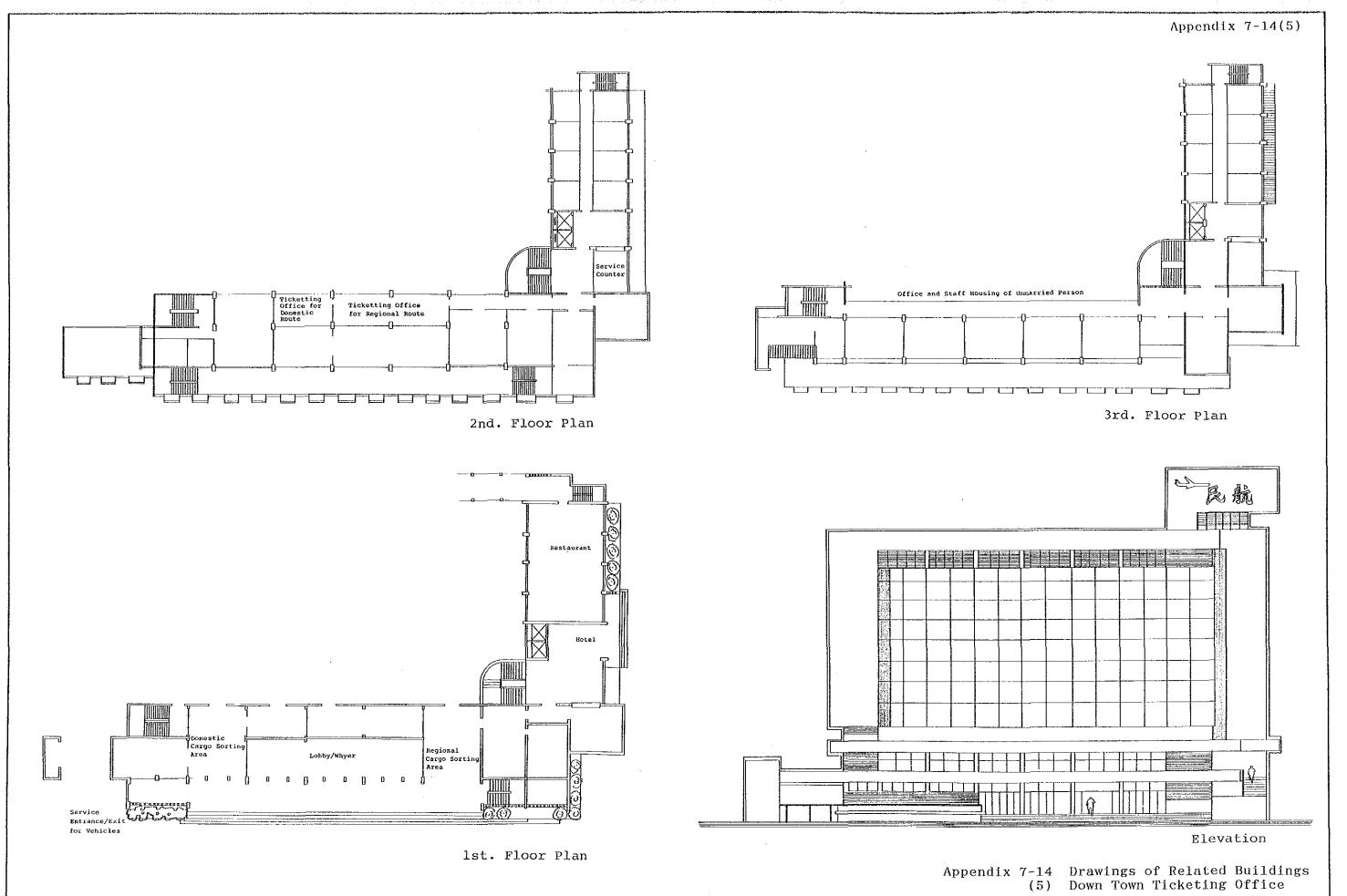
Legend:

A: A Type Staff Housing (2Bed Rooms + Hall = Floor Area 55Sq.M/Family)
B: B Type Staff Housing (3Bed Rooms + Hall = Floor Area 75Sq.M/Family)
C: C Type Staff Housing (4Bed Rooms + Hall = Floor Area 95Sq.M/Family)

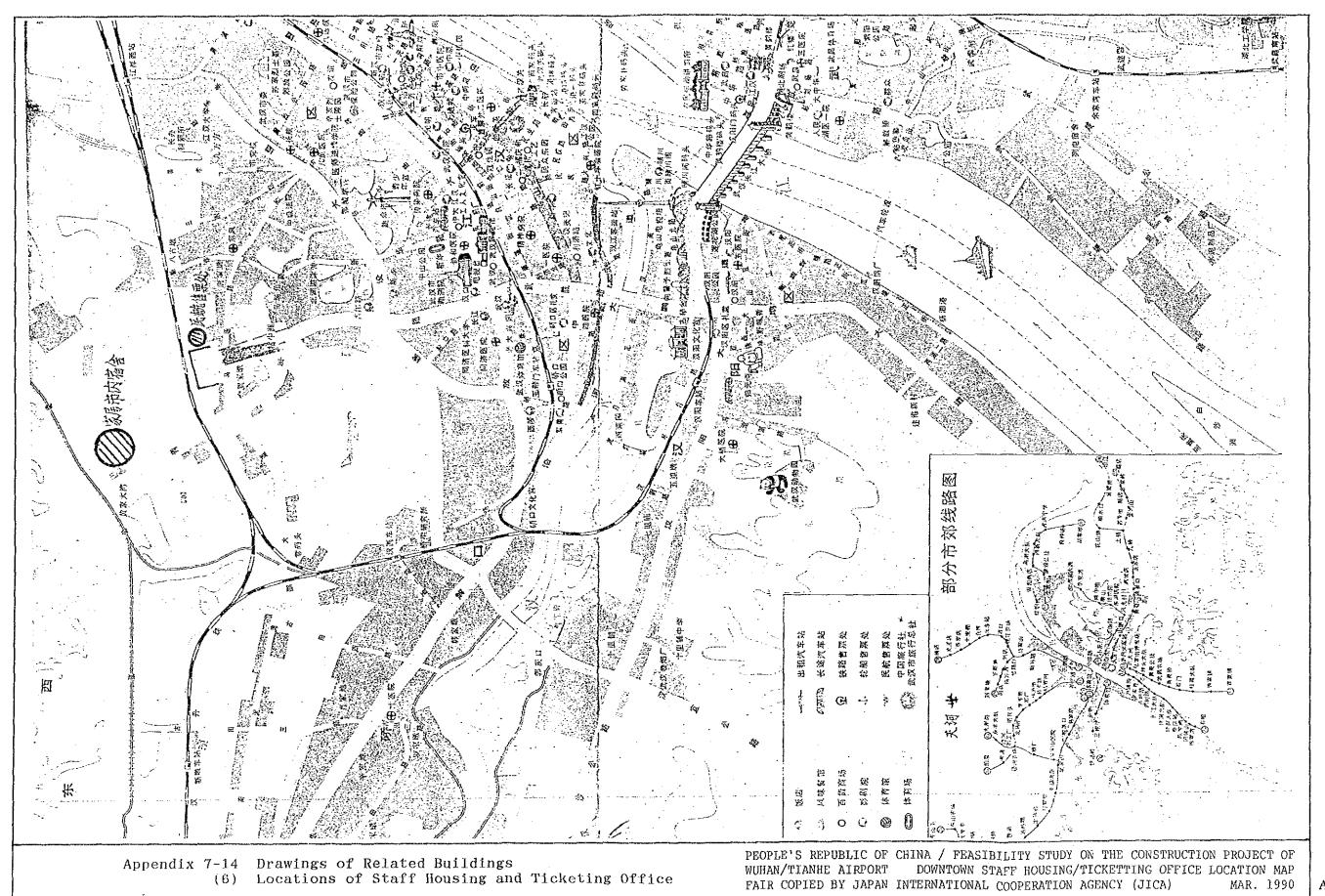


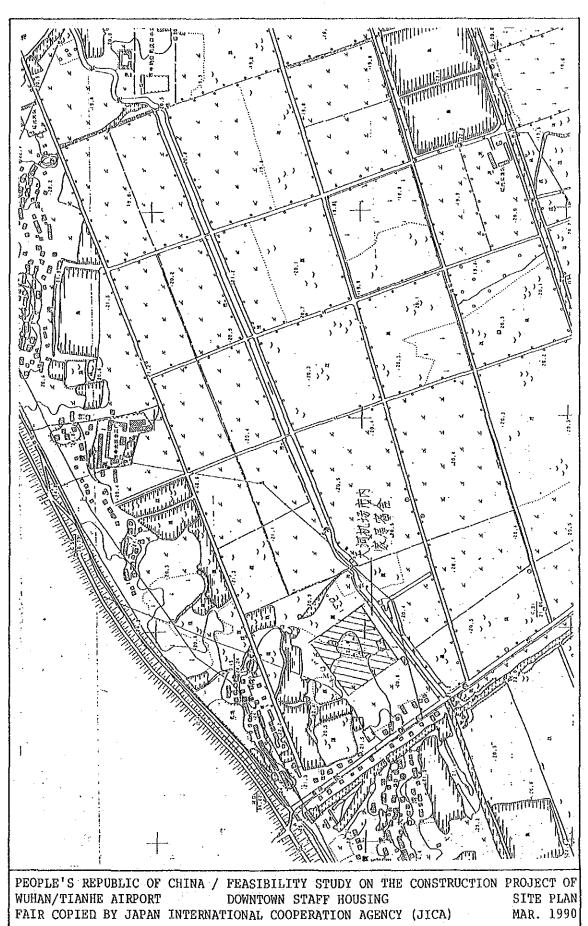
Appendix 7-14 Drawings of Related Buildings
(4) Down Town Staff Housing

PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT DOWNTOWN STAFF HOUSING FLOOR PLANS 1:300 FAIR COPIED BY JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 A -178

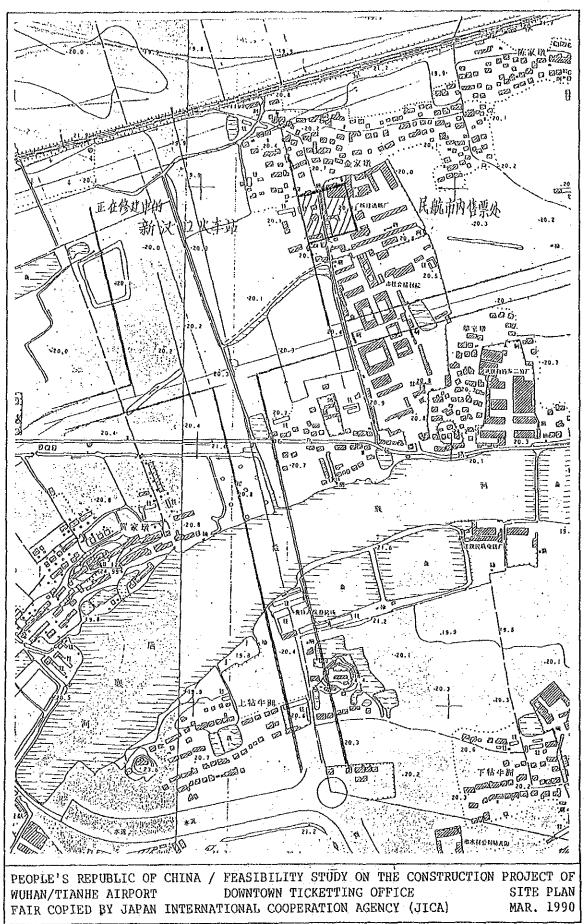


PEOPLE'S REPUBLIC OF CHINA / FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT DOWNTOWN TICKETTING OFFICE PLANS AND ELEVATION 1 : 400 FAIR COPIED BY JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) MAR. 1990 $_{\rm A-179}$

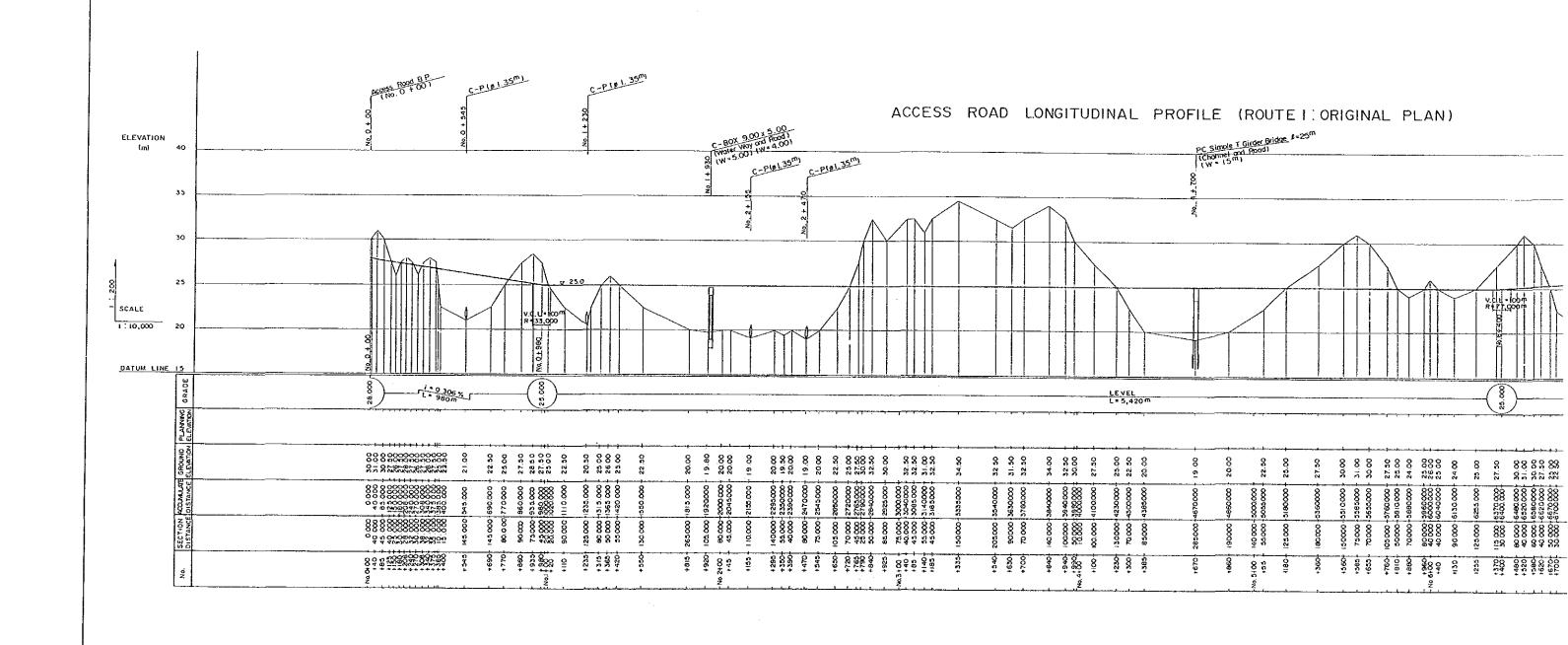


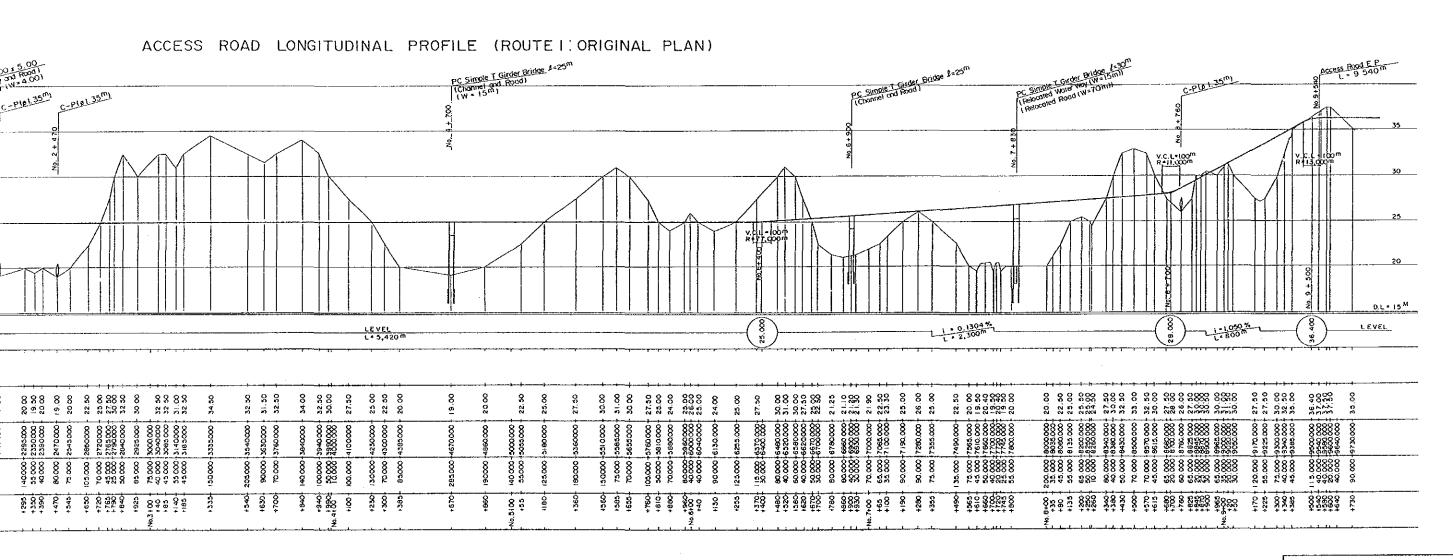


Appendix 7-14 Drawings of Related Buildings
(7) Site Plan of Staff Housing
A-181



Appendix 7-14 Drawings of Related Buildings
(8) Site Plan of Ticketing Office
A-182





PEOPLE'S REPUBLIC OF CHINA FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT

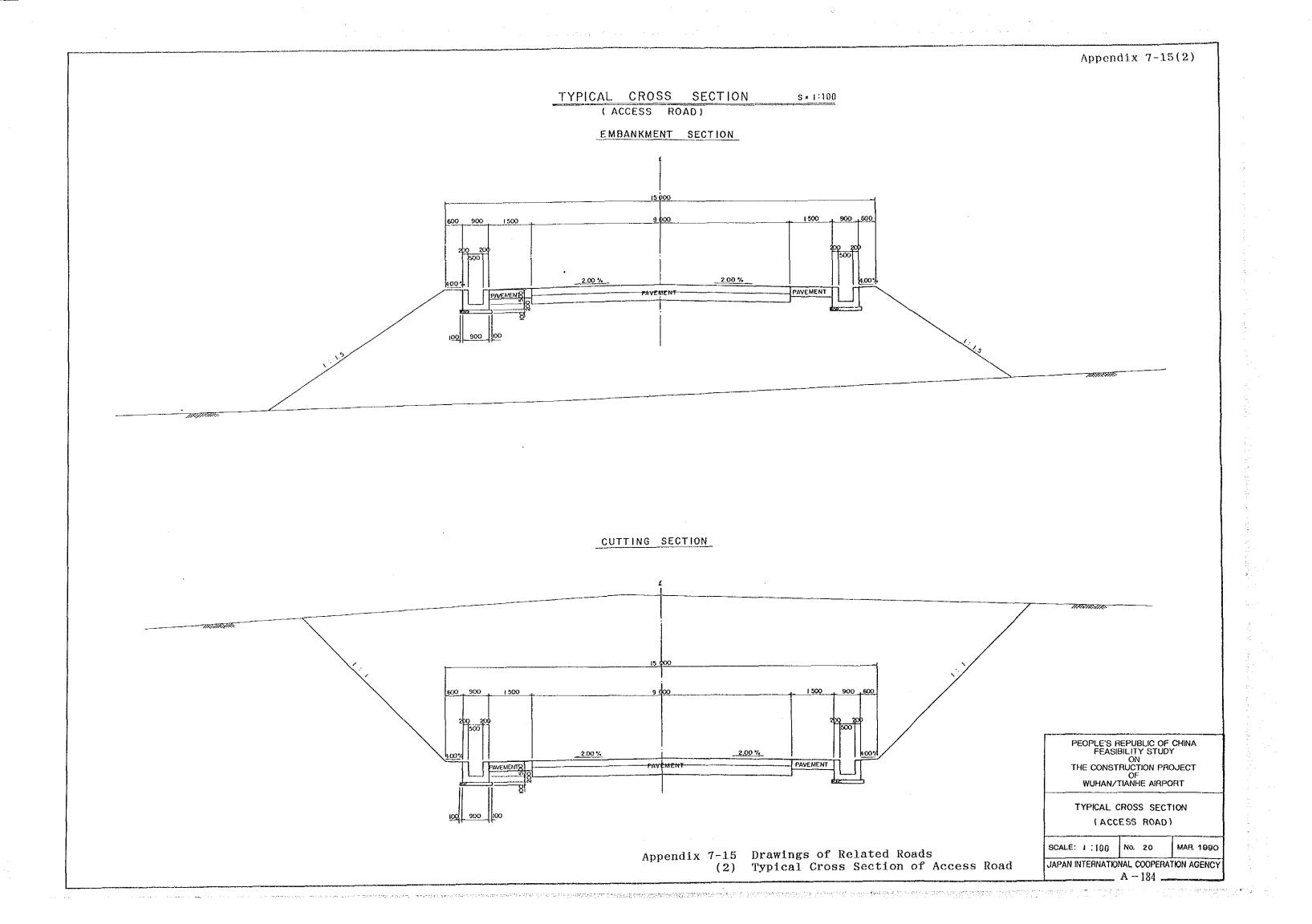
ACCESS ROAD LONGITUDINAL PROFILE
(ROUTE | : ORIGINAL PLAN)

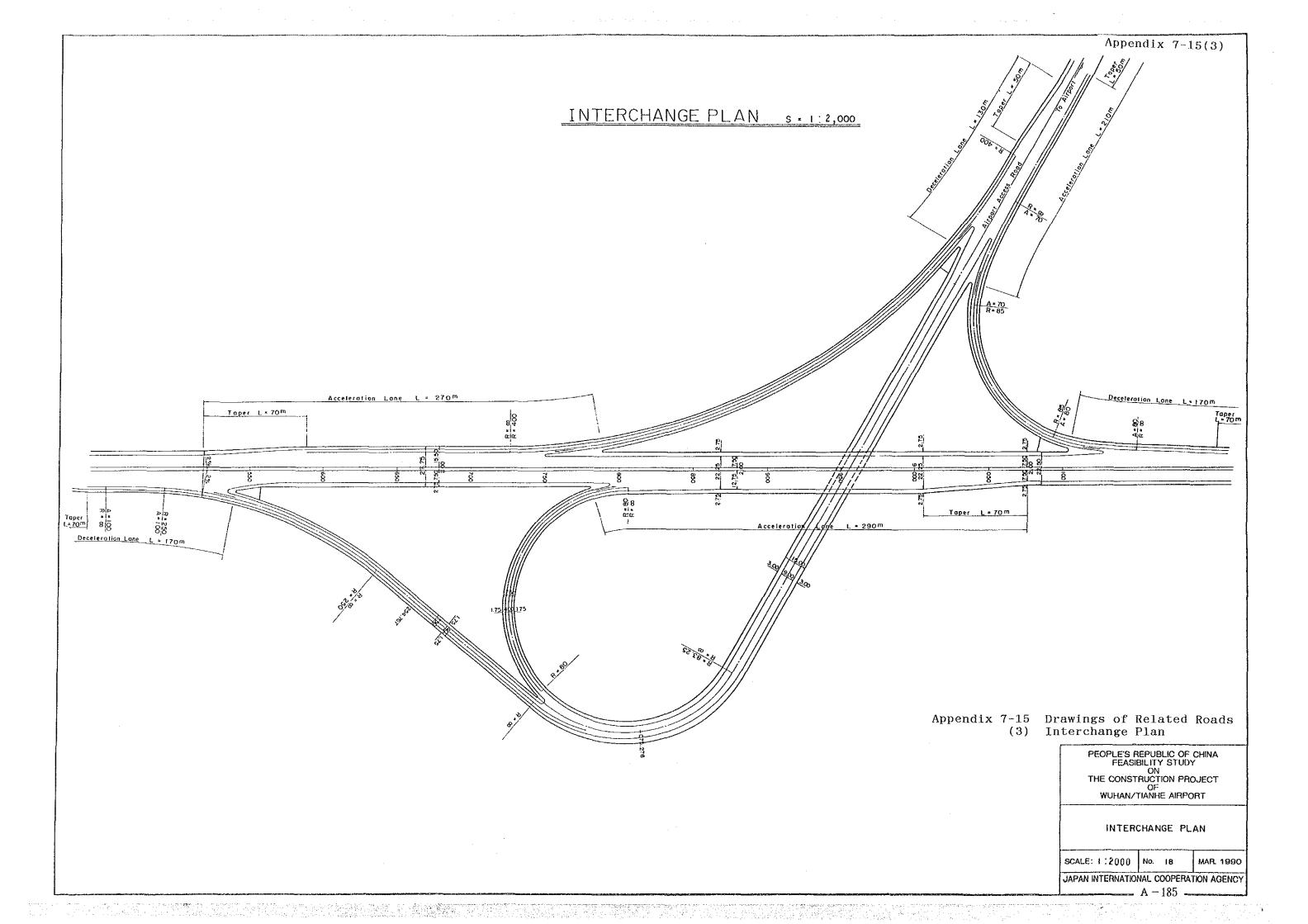
SCALE: Y : 1:406 No. 19 MAR. 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

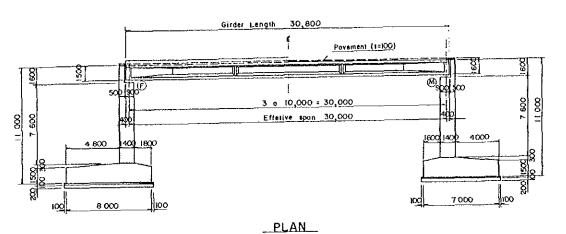
A - 183

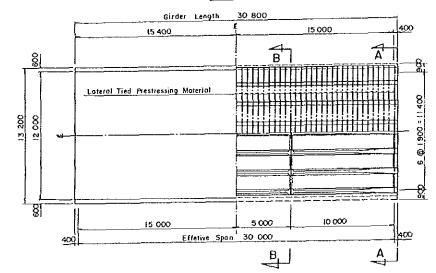
Appendix 7-15 Drawings of Related Roads
(1) Longitudinal Profile of Access Road

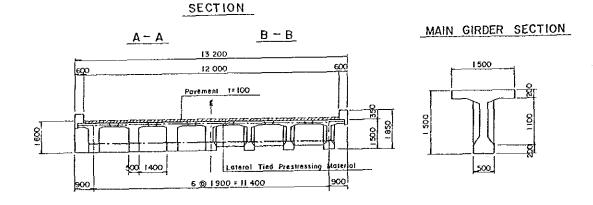




SIDE ELEVATION

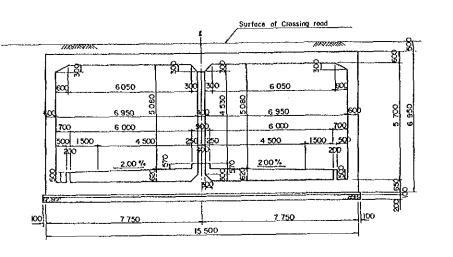




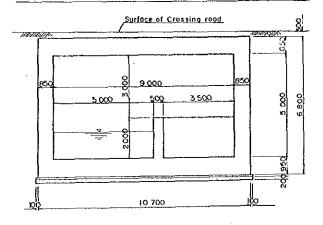


BRIDGE LIST

Location		Upper Structure					Substructure			Note
	Туре	Bridge Lengt	Width (m)	Areo (m²)	Girder Height	Abut Height	Concrete	Reinforcement Bar (1)	Form (m ^t)	11076
No.4 + 700	T na	25.0	12.0	300	1.4	9.0	520	26	630	Channel
No.6 + 900		25.0	12.0	300	1.4	7.5	380	19	500	Channel
No.7 + 830		30.0	12.0	360	1.5	11.0	700	35	920	Channel, Road



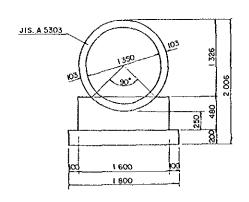
NO.1+930 BOX-CULVERT GENERAL VIEW



BOX - CULVERT LIST

Location	Size	Length	Overburden	Quartity List			Note
				Concile	Reinforcement Bor	Form	14016
NO.O - 180	(6.95x570) x 2	35.0	0.5	1060	106	1950	Access Road
NO.1 + 930	9.00 x 5.00	15.0	0.3	490	49	919	Waterway Roa
NO 1 7930	300 1 3.00	15.0	0.0				

PIPE - CULVERT GENERAL VIEW



PIPE - CULVERT LIST

Locotion	Type, Diameter	Overburden (m)	Length (m)	eleM
No.0 + 545	RC - 9 1 350	3.8	27.0	LR
No.1 + 230	• - \$ 350	3.0	34.0	L 50°
No.2 + 155	+ -# 350	4.5	29.0	LR
No2 + 470		4.5	36.0	R60°
No 8 + 760	+ -P 350	1.0	18.0	LR

PEOPLE'S REPUBLIC OF CHINA FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT

CONCRETE STRUCTURES GENERAL
VIEW (ACCESS ROAD)

SCALE: AS SHOWN NO. 21 MAR. 1990

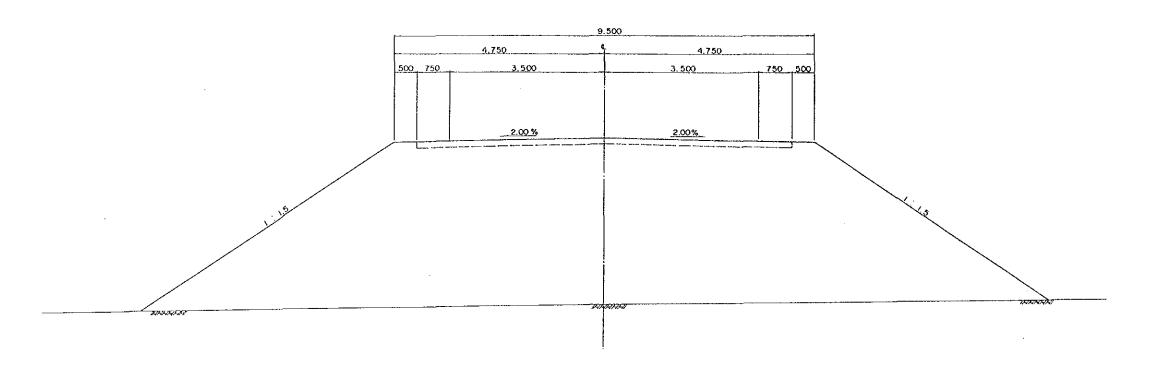
JAPAN INTERNATIONAL COOPERATION AGENCY

Appendix 7-15 Drawings of Related Roads
(4) Concrete Structures General View

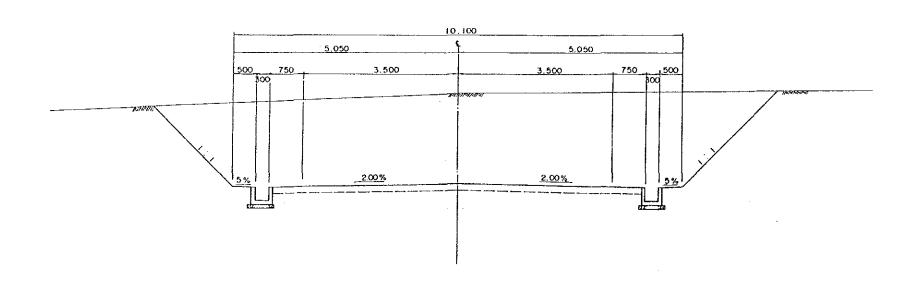
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Relocated Road Typical Cross Section 5 * 1:80

Embankment Areo



Cut Areo



PEOPLE'S REPUBLIC OF CHINA FEASIBILITY STUDY ON THE CONSTRUCTION PROJECT OF WUHAN/TIANHE AIRPORT

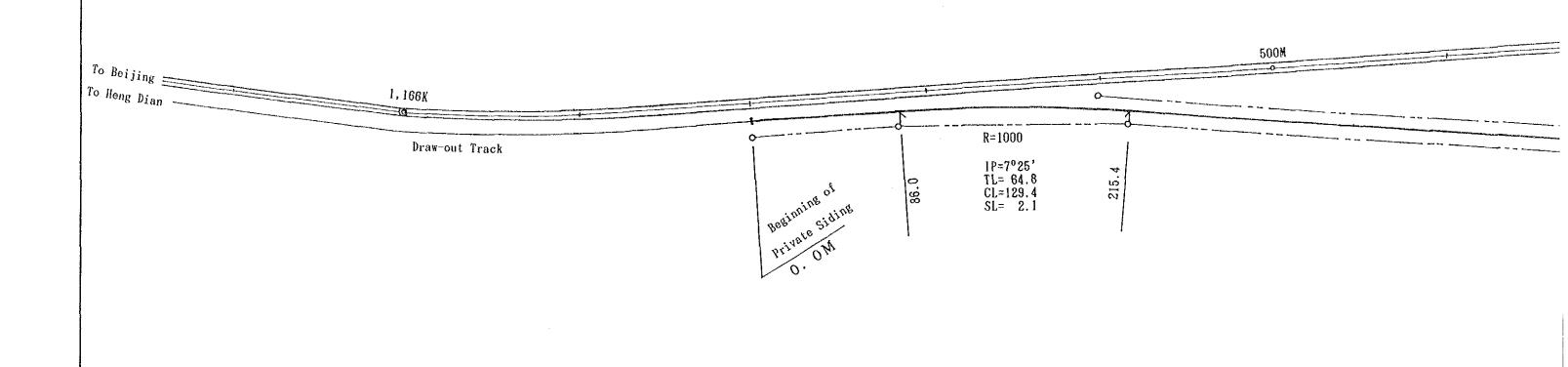
RELOCATED ROAD TYPICAL CROSS SECTION

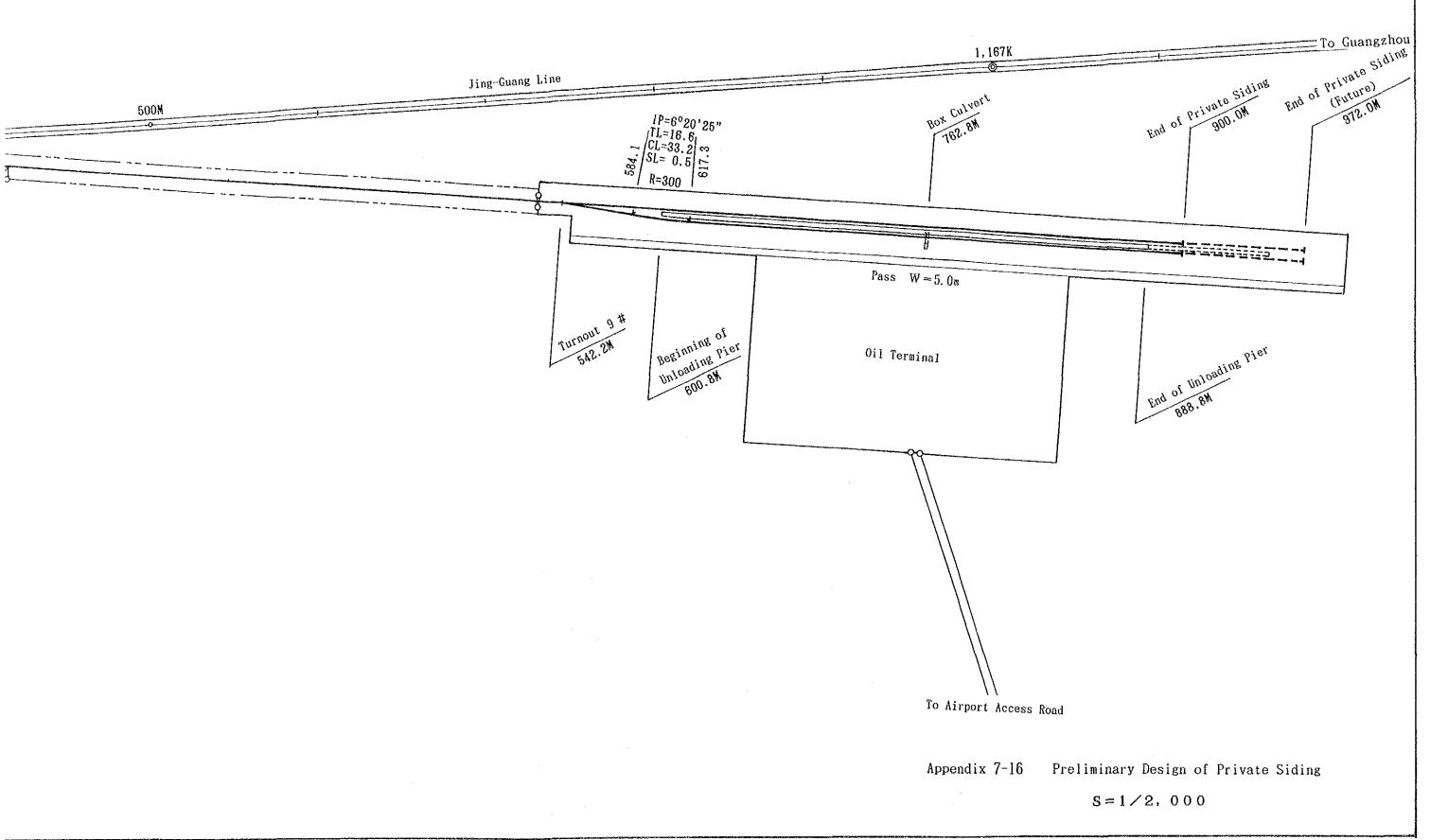
SCALE: 1:80 No. 22

JAPAN INTERNATIONAL COOPERATION AGENCY

Appendix 7-15 Drawings of Related Roads (5) Typical Cross Section of Relocated Road

_ A - 187 _





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