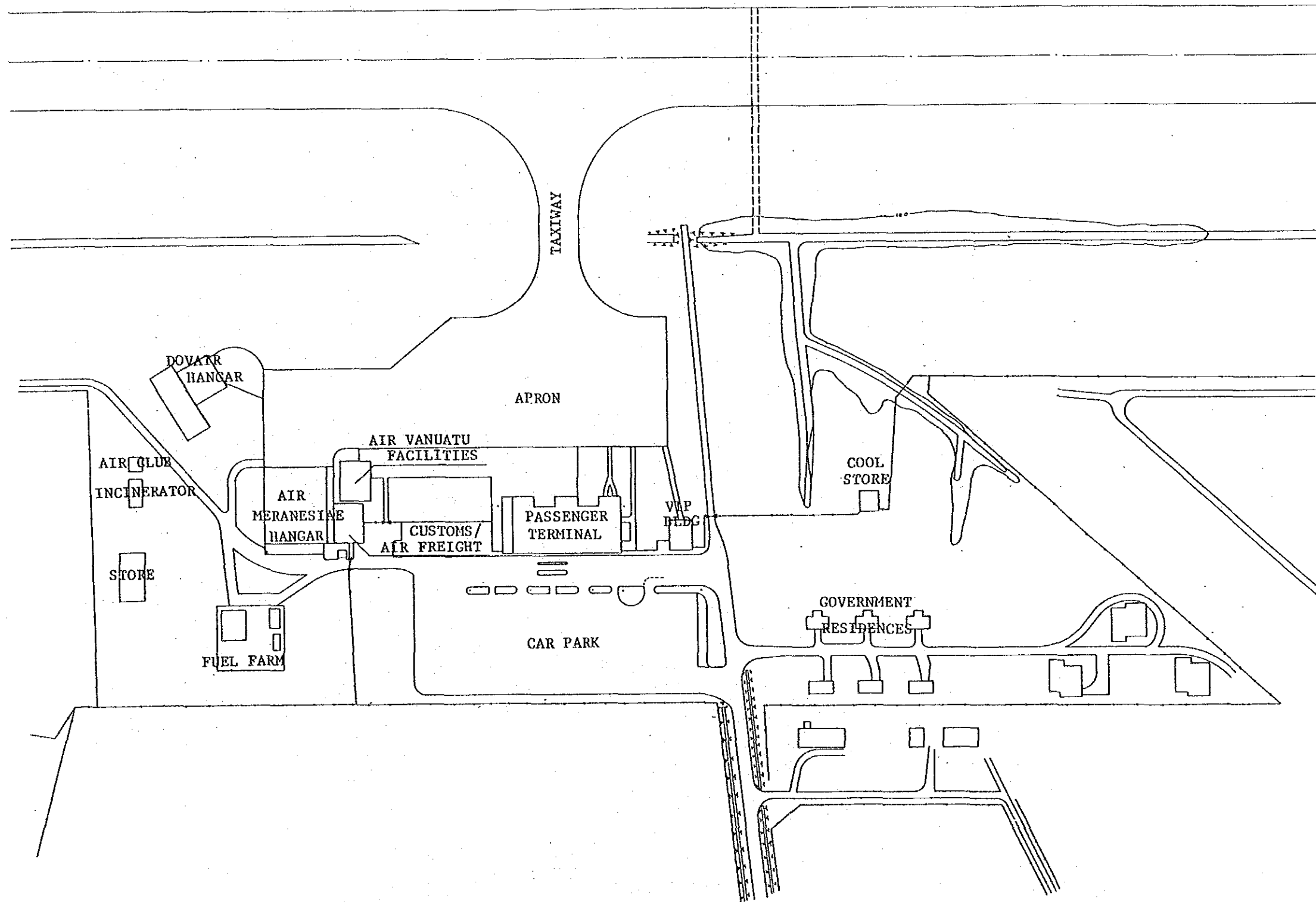
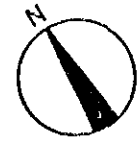


4.4 Drawings

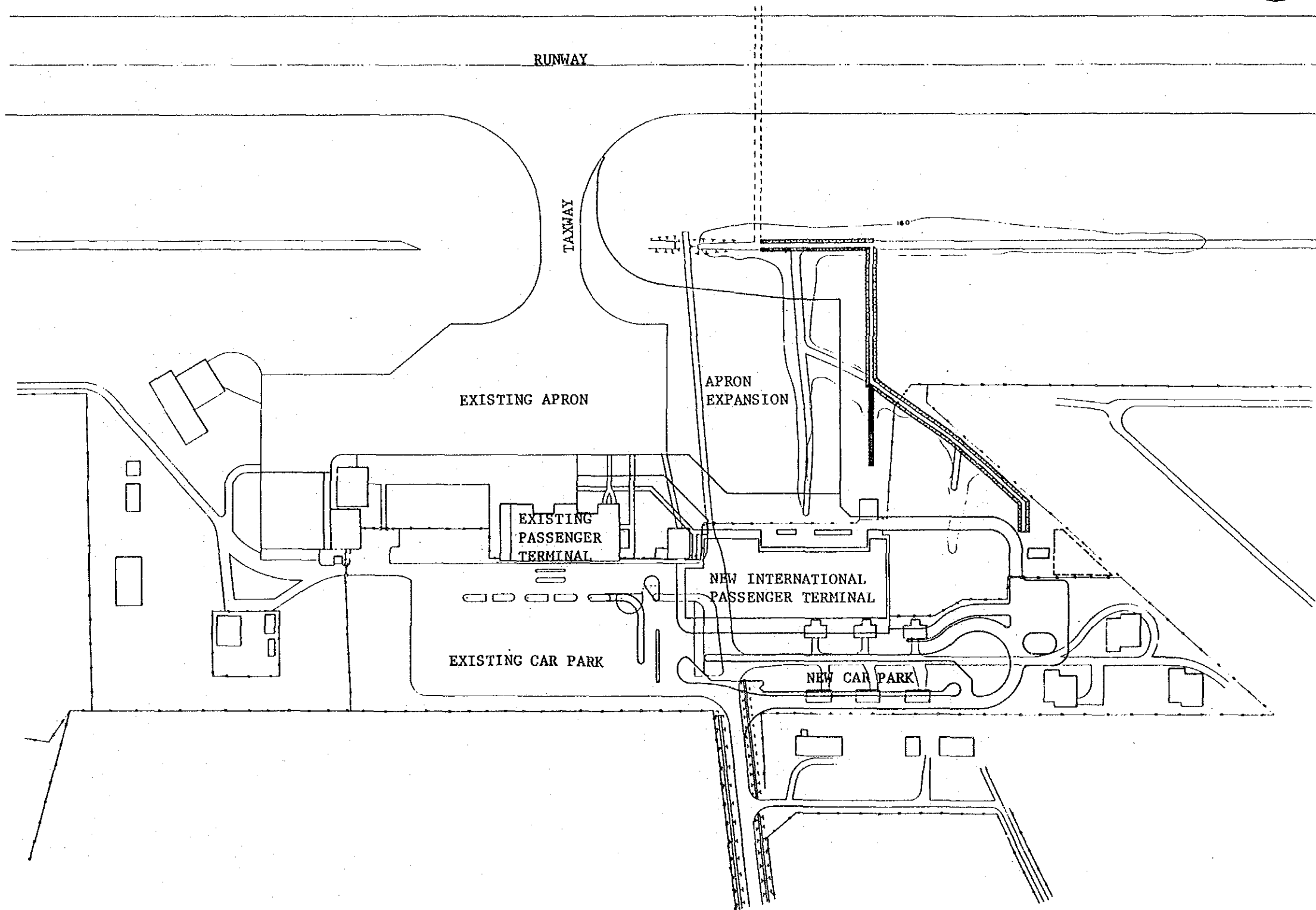
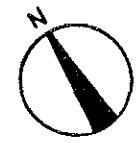
List of Drawings

1. Existing Layout Plan of Terminal Area
2. Proposed Layout Plan of Terminal Area
3. Ground Floor Plan of International Passenger Terminal Building
4. First Floor Plan of International Passenger Terminal Building
5. Elevation of International Passenger Terminal Building
6. Typical Section of International Passenger Terminal Building
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10. Electrical Equipment Layout Plan of International Passenger Terminal Building (Ground Floor)
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21. Equipment Layout Plan of Locator's Shelter



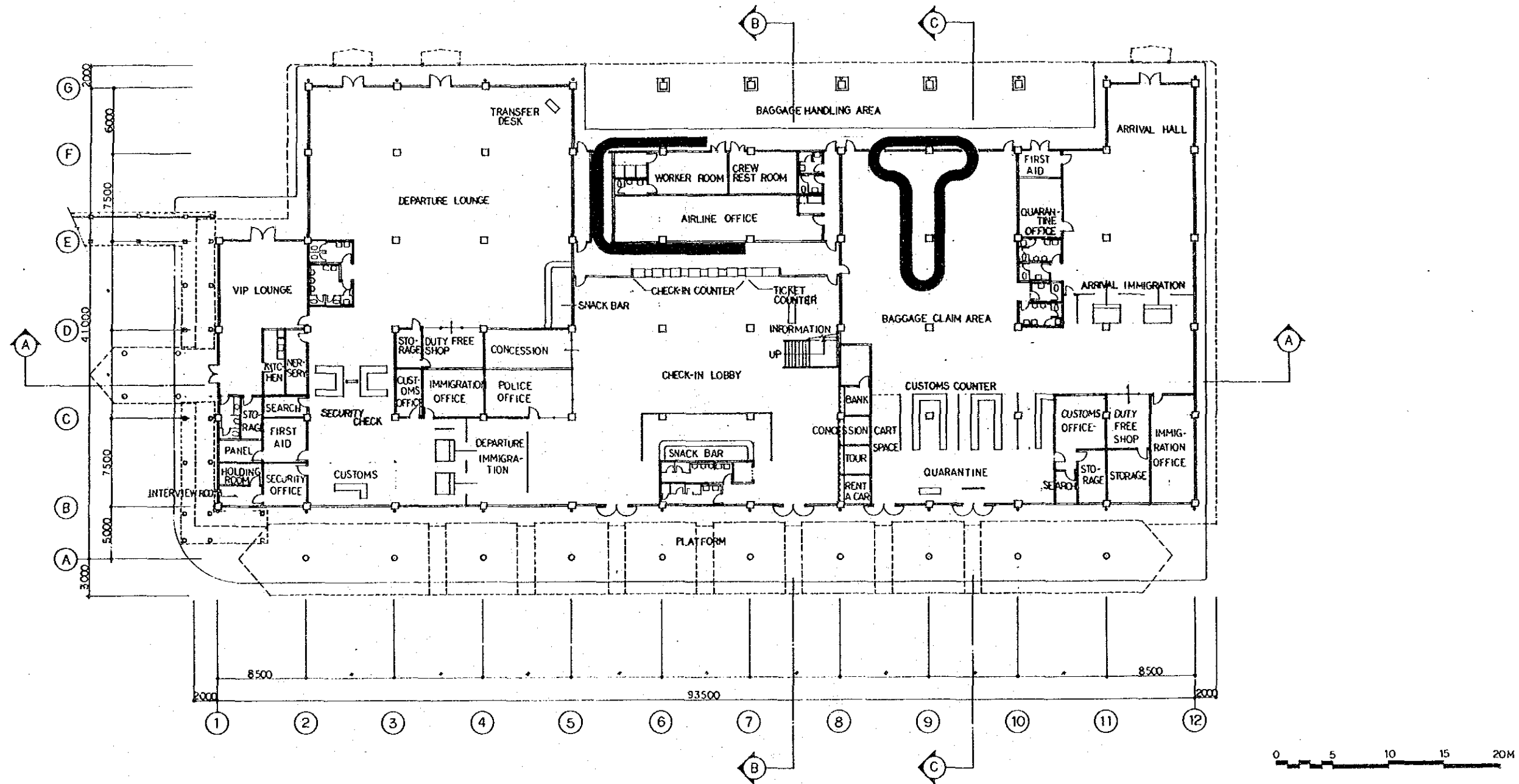
Existing Layout Plan of Terminal Area

S = 1 : 1,000



Proposed Layout Plan of Terminal Area

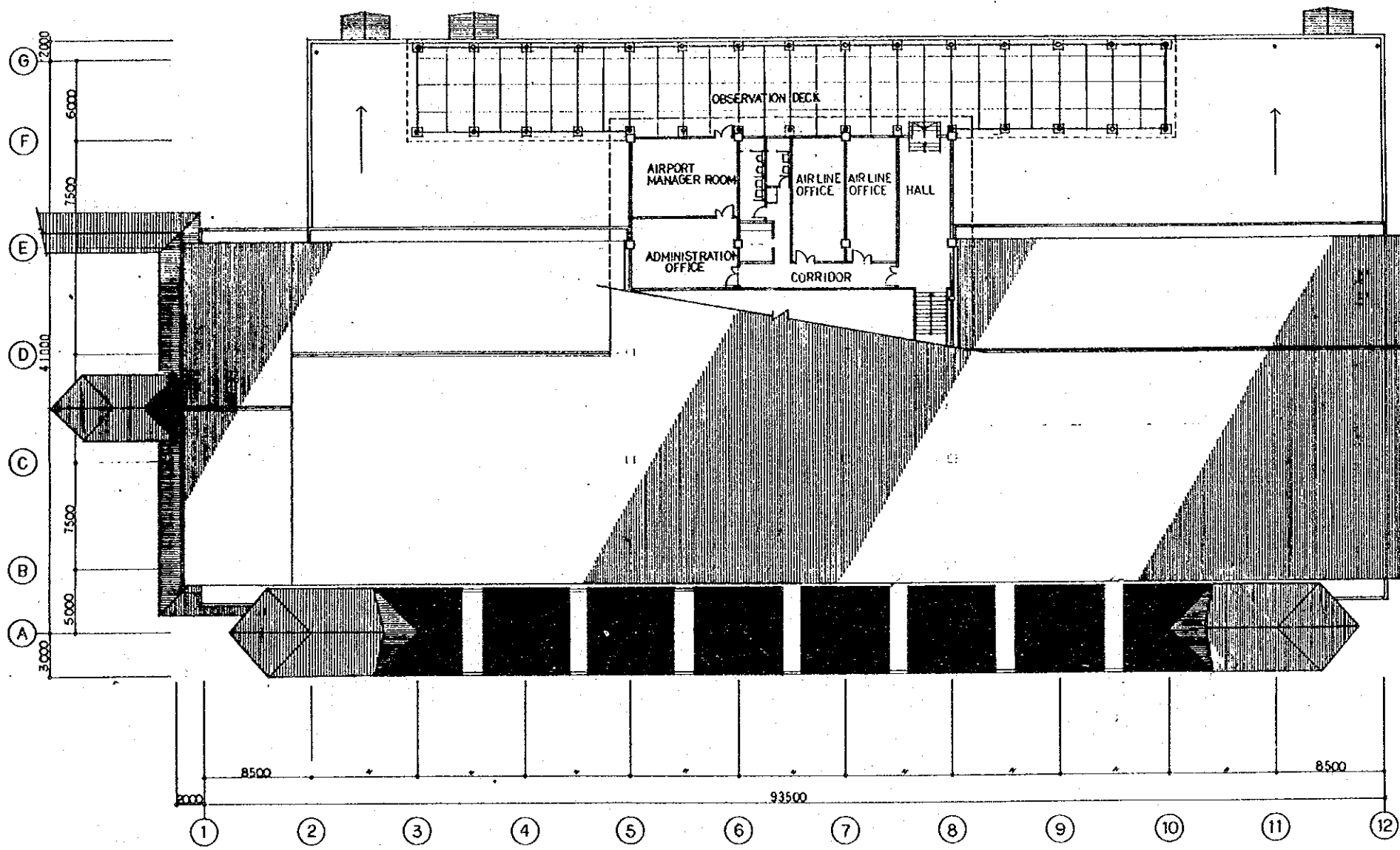
S = 1 : 1,000



GROUND FLOOR PLAN

Ground Floor Plan of International Passenger Terminal Building

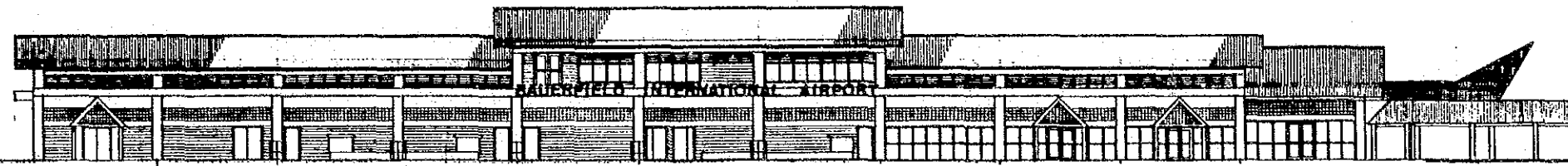
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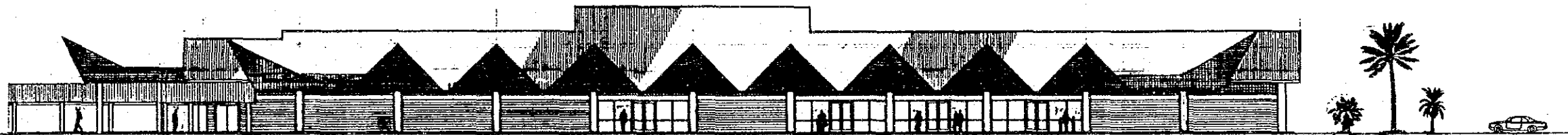
FIRST FLOOR PLAN

First Floor Plan of International Passenger Terminal Building

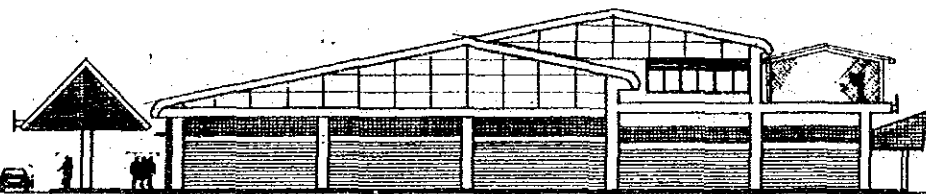
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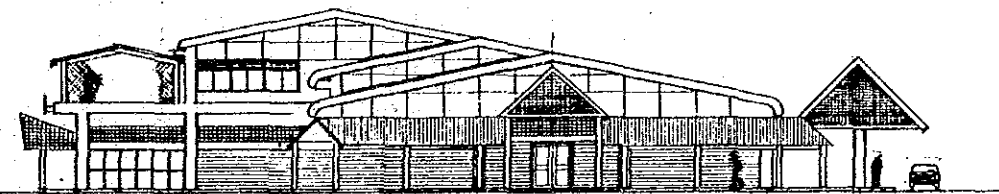
NORTH ELEVATION



SOUTH ELEVATION



EAST ELEVATION

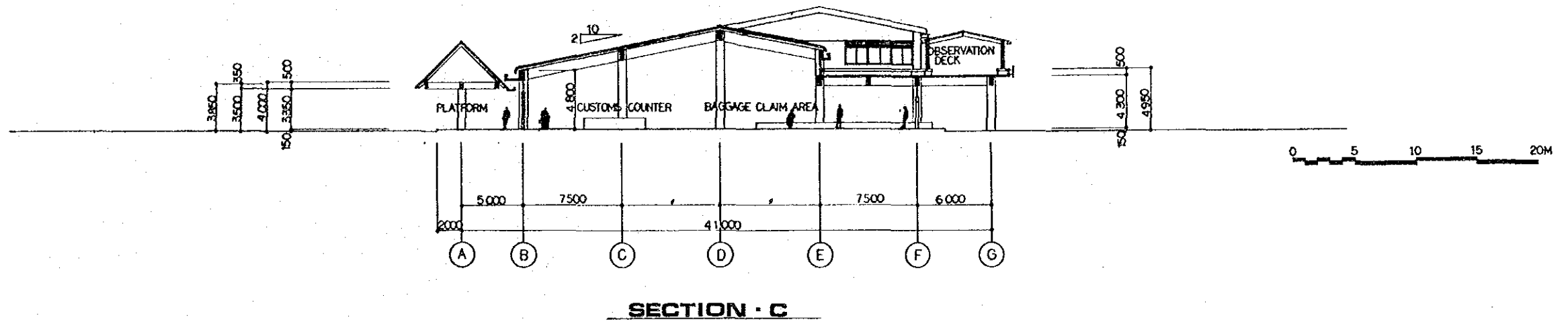
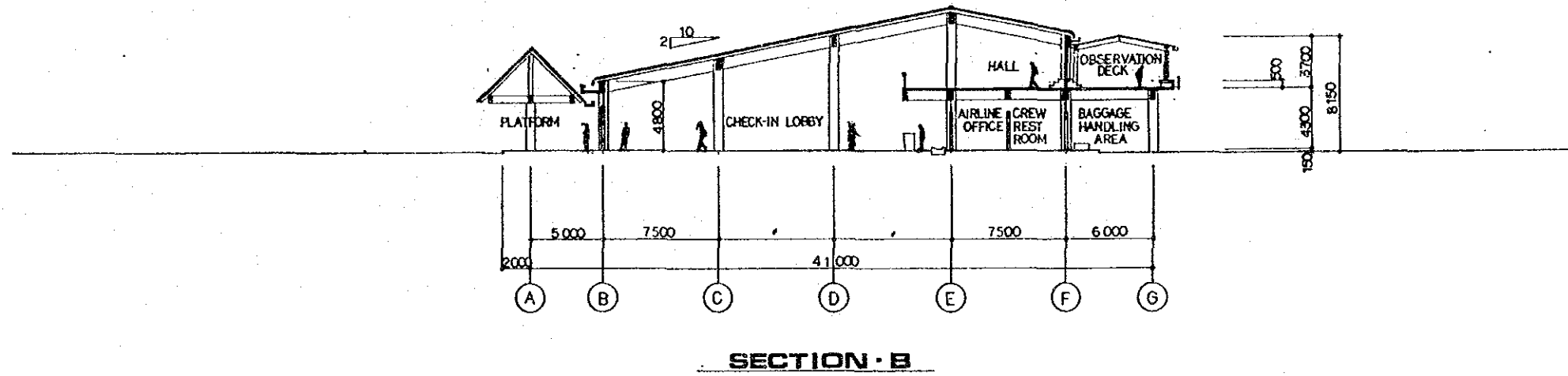
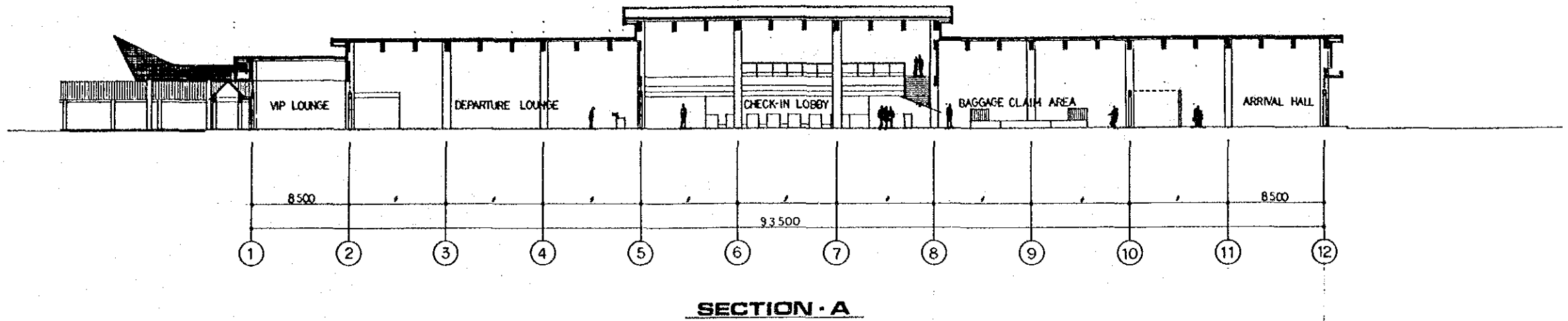


WEST ELEVATION



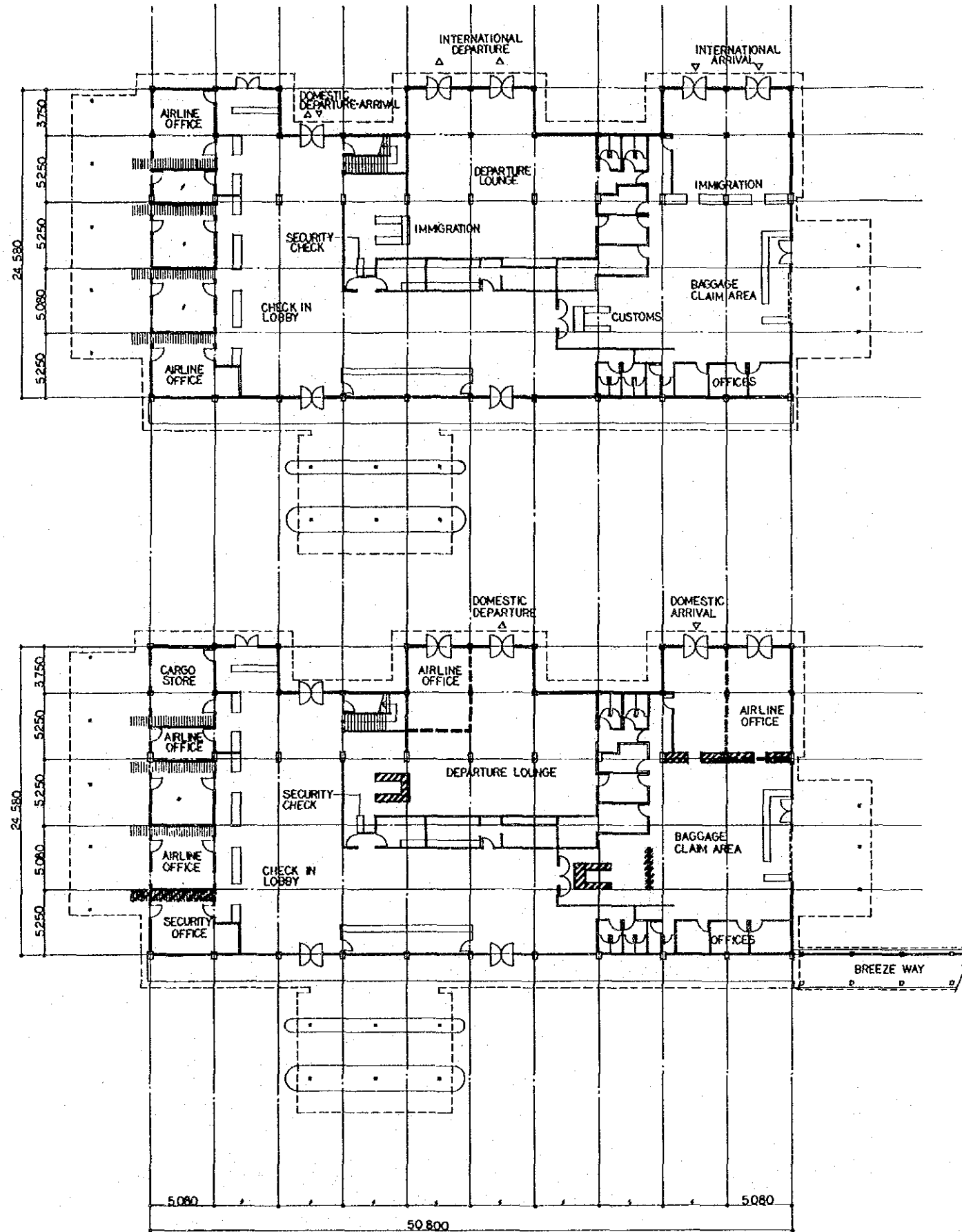
Elevation of International Passenger Terminal Building

S = 1 : 400



Typical Section of International Passenger Terminal Building

S = 1 : 400



EXISTING PLAN 1/100

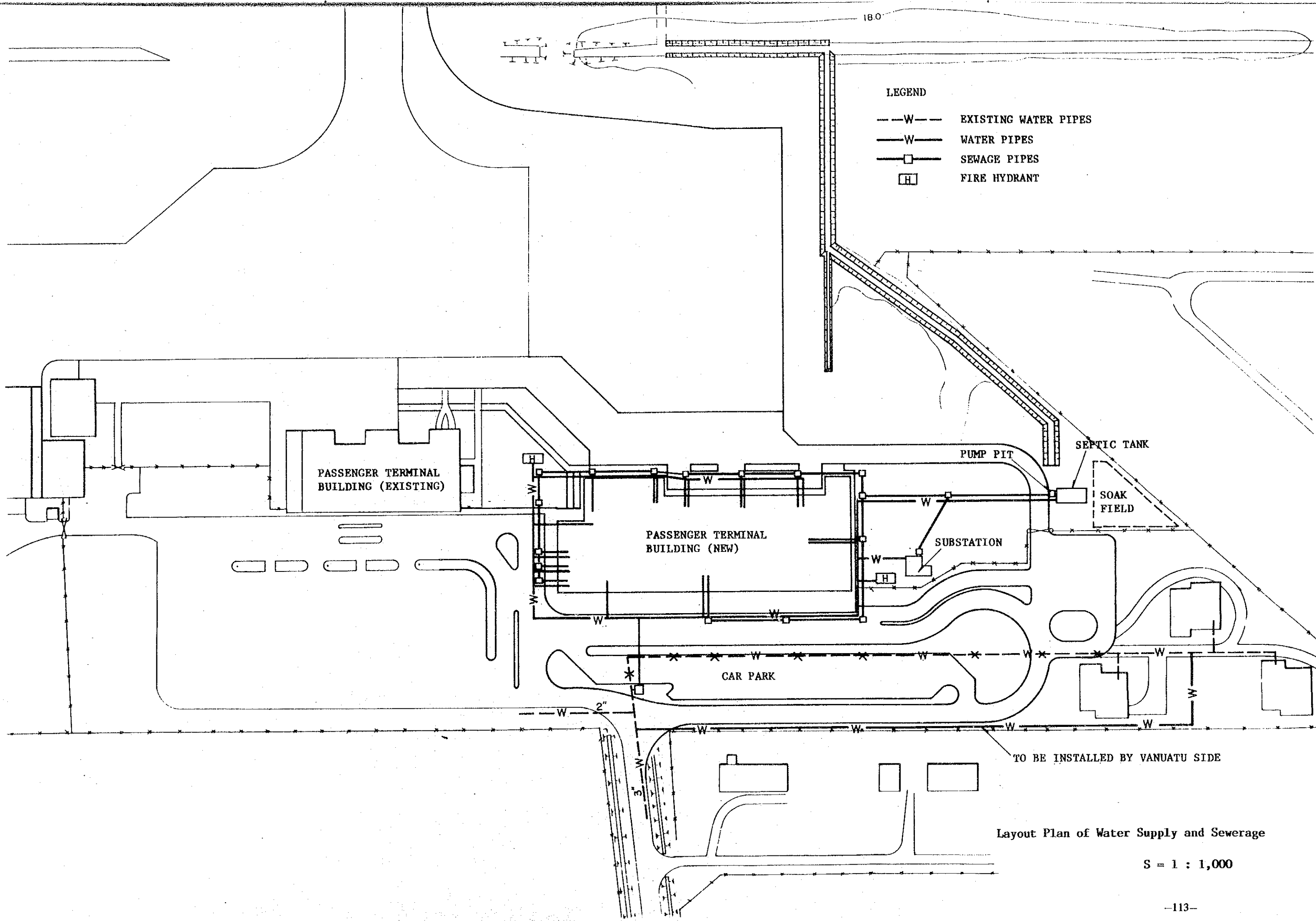
RENOVATION PLAN 1/100

--- ADDITIONAL WALL TO BE CONSTRUCTED
 //// TO BE DEMOLISHED



Renovation Plan of Existing Terminal Building

S = 1 : 400



- LEGEND
- W--- EXISTING WATER PIPES
 - W— WATER PIPES
 - SEWAGE PIPES
 - FIRE HYDRANT

PASSENGER TERMINAL BUILDING (EXISTING)

PASSENGER TERMINAL BUILDING (NEW)

CAR PARK

PUMP PIT

SEPTIC TANK

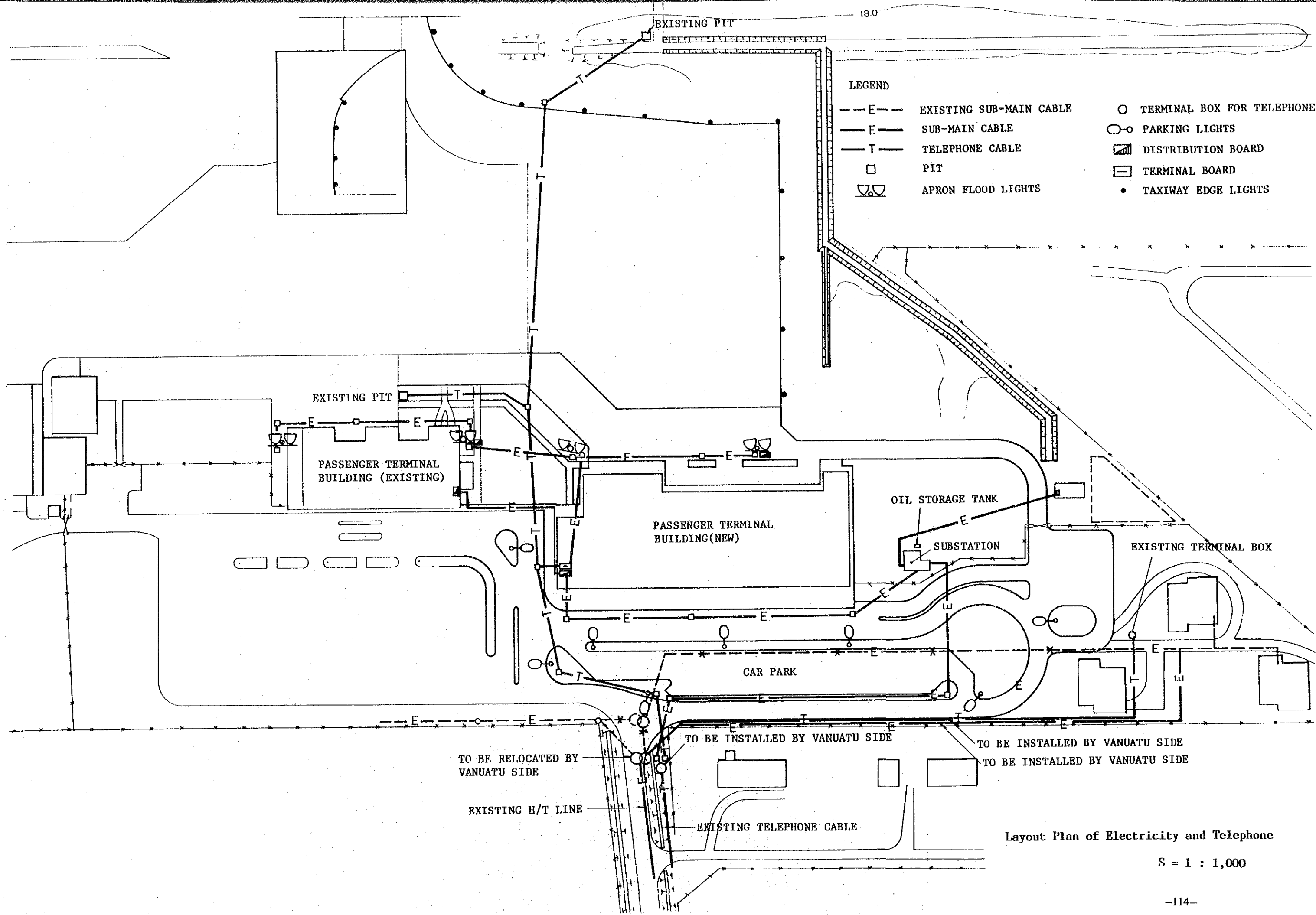
SOAK FIELD

SUBSTATION

TO BE INSTALLED BY VANUATU SIDE

Layout Plan of Water Supply and Sewerage

S = 1 : 1,000



LEGEND

- E--- EXISTING SUB-MAIN CABLE
- E— SUB-MAIN CABLE
- T— TELEPHONE CABLE
- PIT
- ☉ APRON FLOOD LIGHTS
- TERMINAL BOX FOR TELEPHONE
- PARKING LIGHTS
- ▣ DISTRIBUTION BOARD
- ▢ TERMINAL BOARD
- TAXIWAY EDGE LIGHTS

TO BE RELOCATED BY VANUATU SIDE

TO BE INSTALLED BY VANUATU SIDE

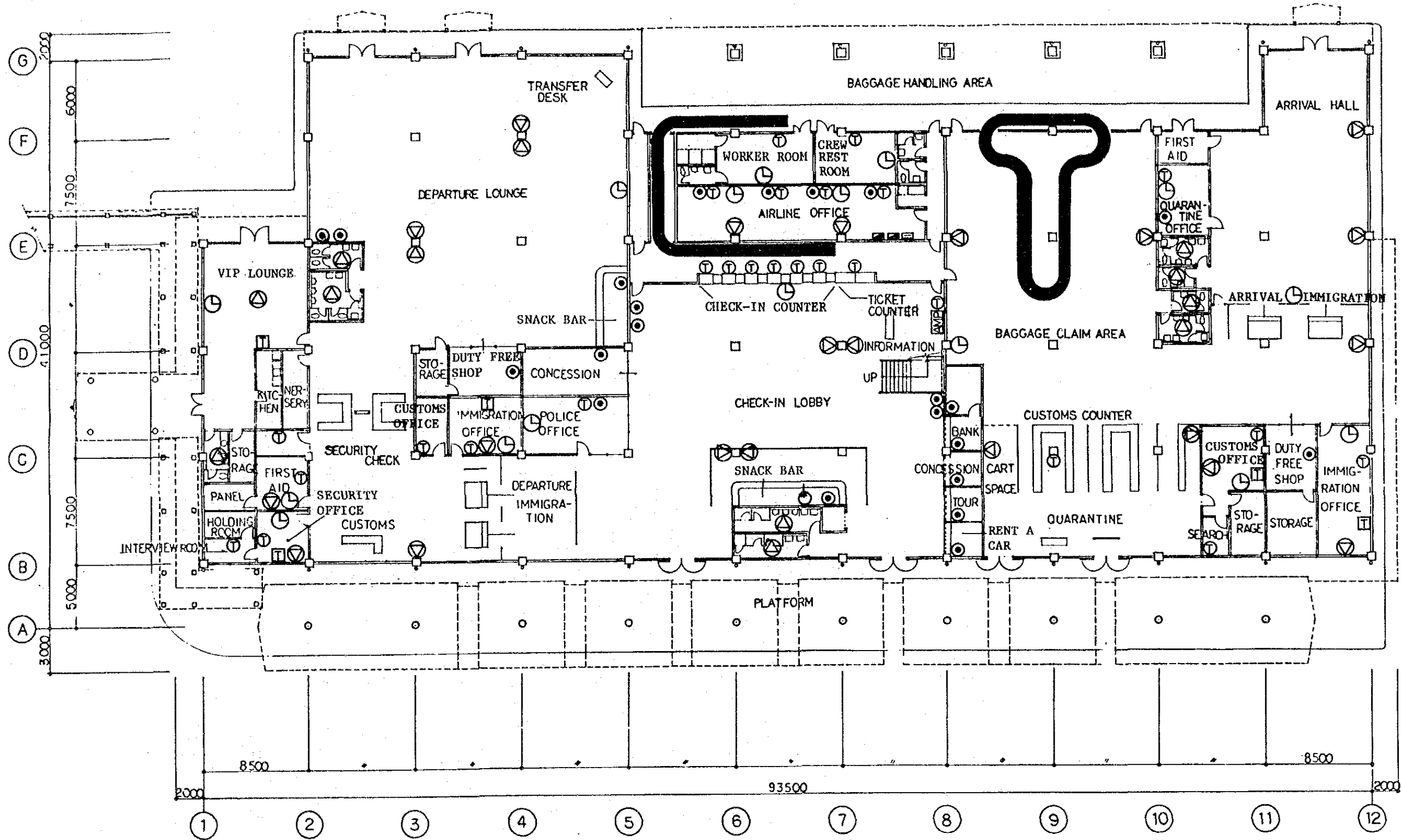
TO BE INSTALLED BY VANUATU SIDE

EXISTING H/T LINE






EXISTING TELEPHONE CABLE







Layout Plan of Electricity and Telephone

S = 1 : 1,000



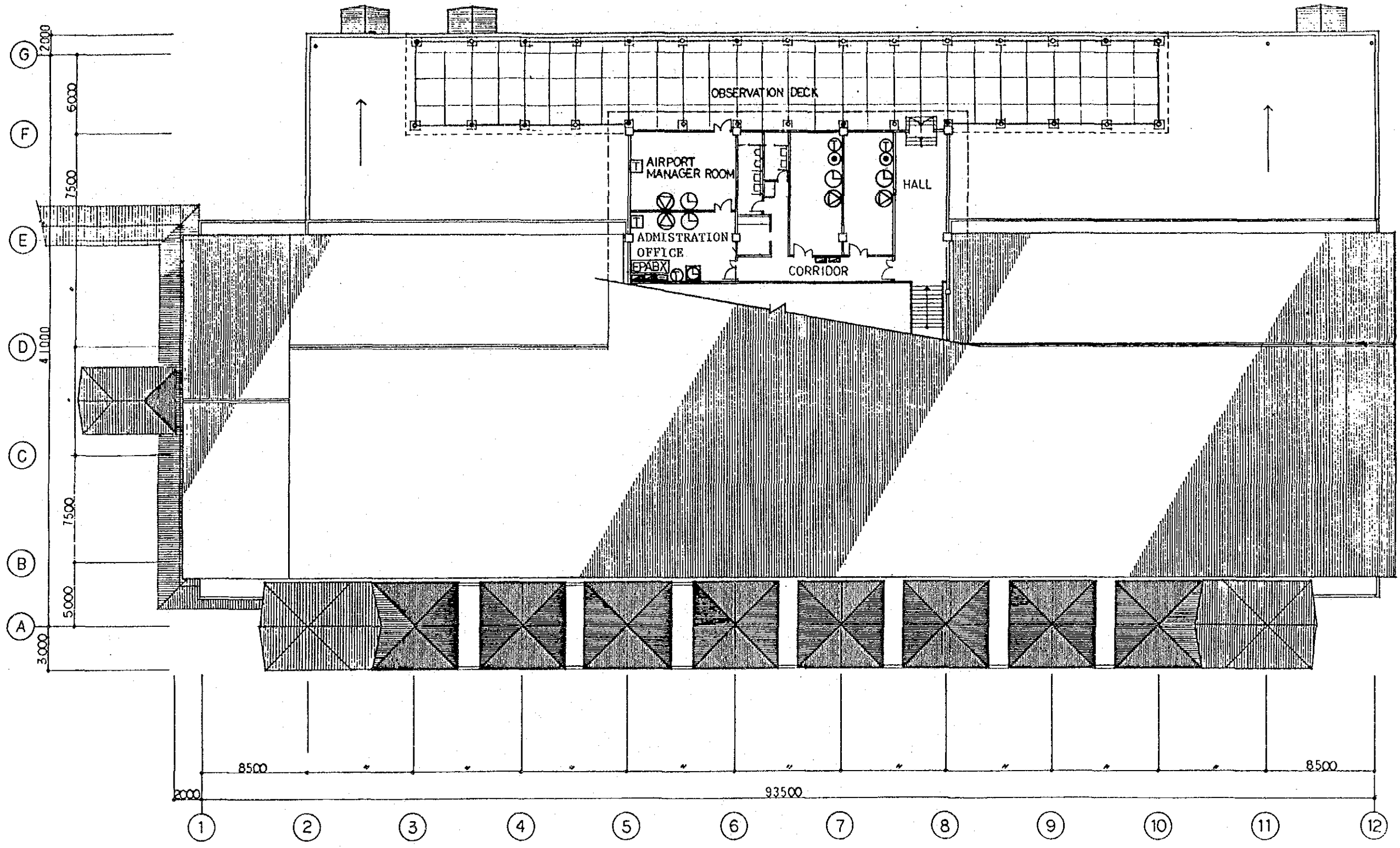
LEGEND

-  DISTRIBUTION BOARD
-  TELEPHONE TERMINAL BOARD
-  THREE PHASE POWER OUTLET
-  TELEPHONE OUTLET
-  INTERNAL COMMUNICATION TELEPHONE

-  MASTER TELEPHONE
-  SECONDARY CLOCK
-  MASTER CLOCK
-  PA SPEAKER UNIT
-  PA AMPLIFIER W/CHIME
-  ELECTRONIC TELEPHONE EXCHANGER

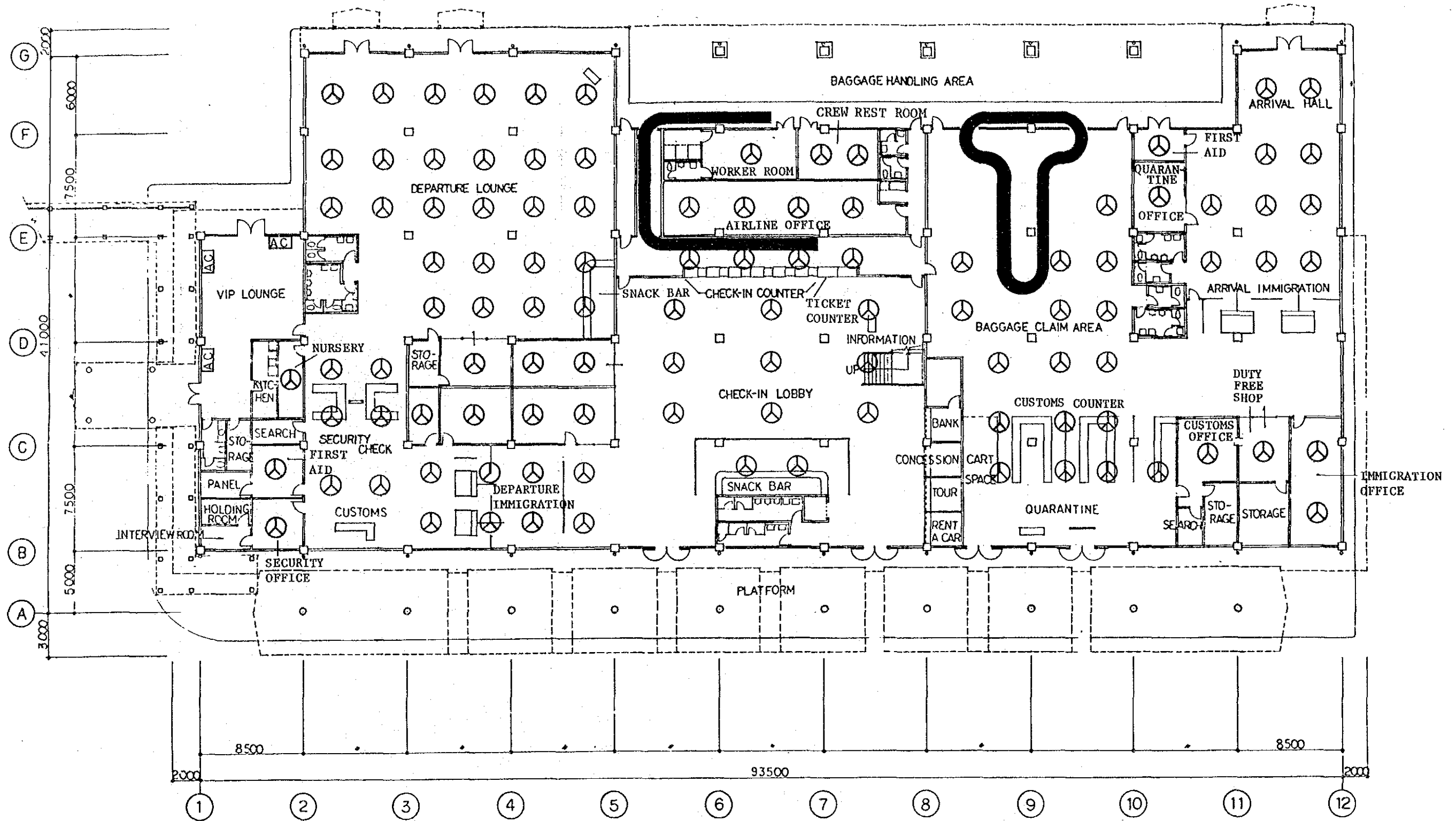
**Electrical Equipment Layout Plan of
International Passenger Terminal Building (Ground Floor)**



S = 1 : 300



Electrical Equipment Layout Plan of
International Passenger Terminal Building (First Floor)

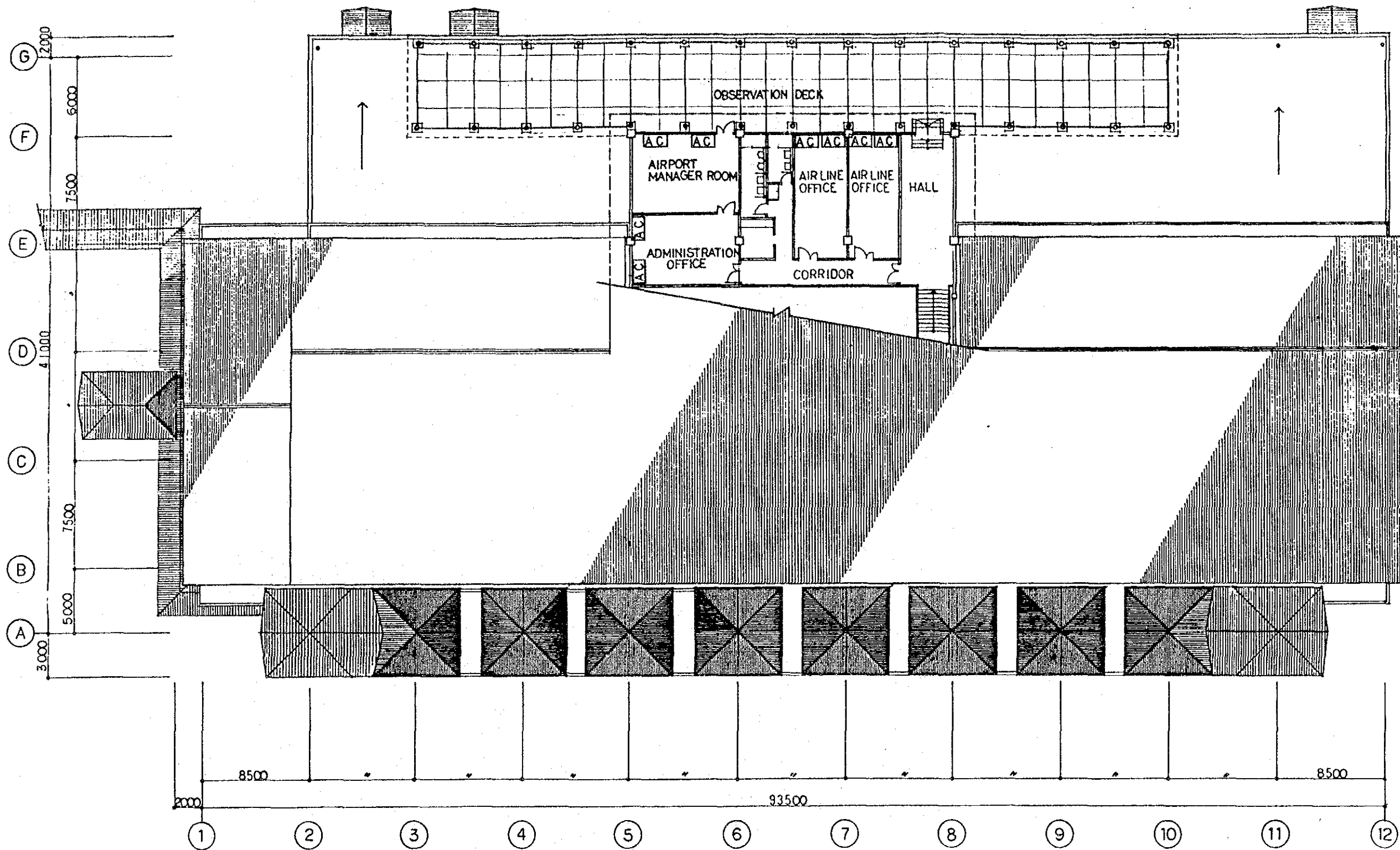
S = 1 : 300



- LEGEND
-  CEILING FAN
 -  AIR CONDITONER

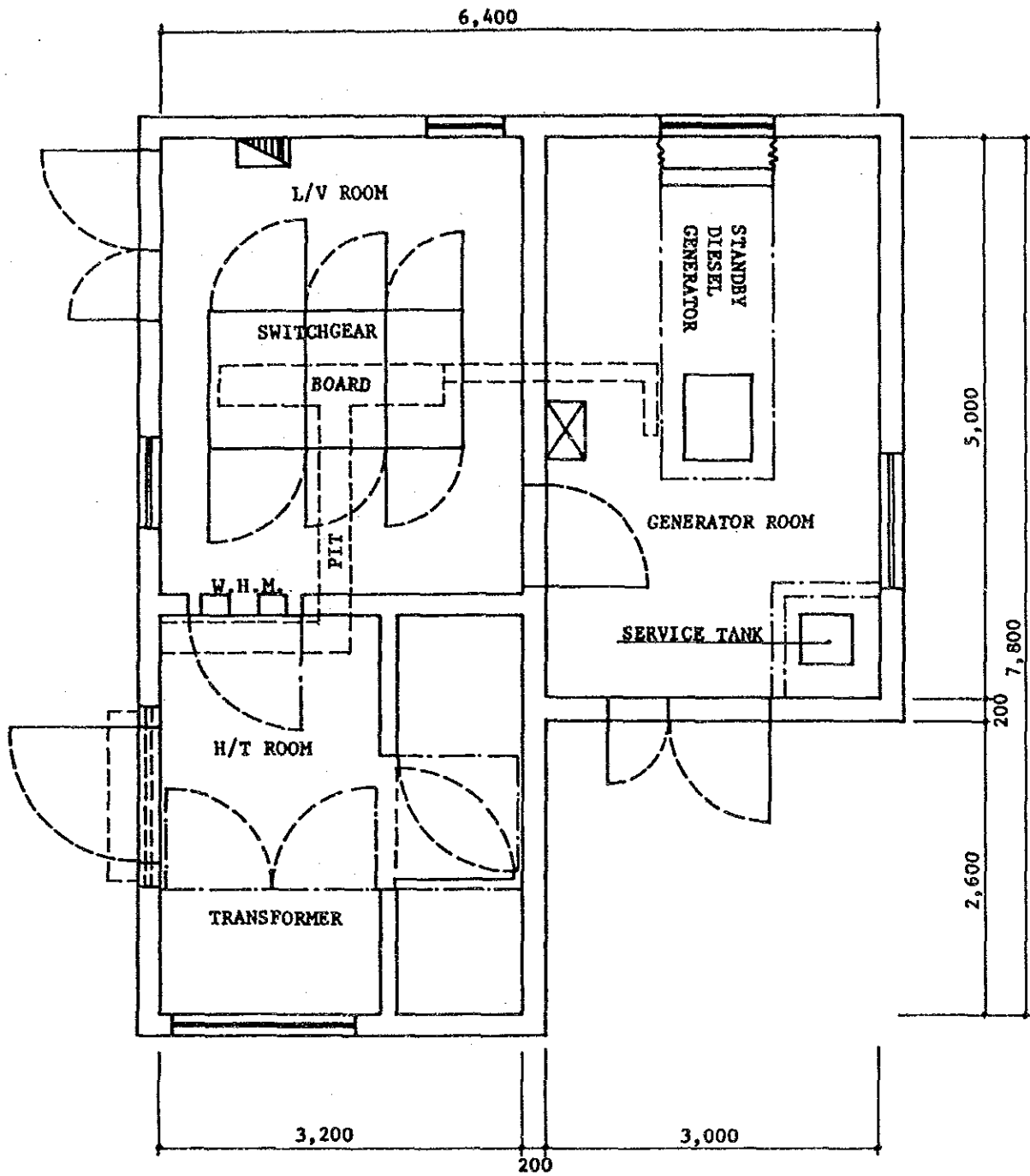
Air Conditioners and Ceiling Fans Layout Plan of
International Passenger Terminal Building (Ground Floor)

S = 1 : 300





Air Conditioners and Ceiling Fans Layout Plan of
International Passenger Terminal Building (First Floor)

S = 1 : 300

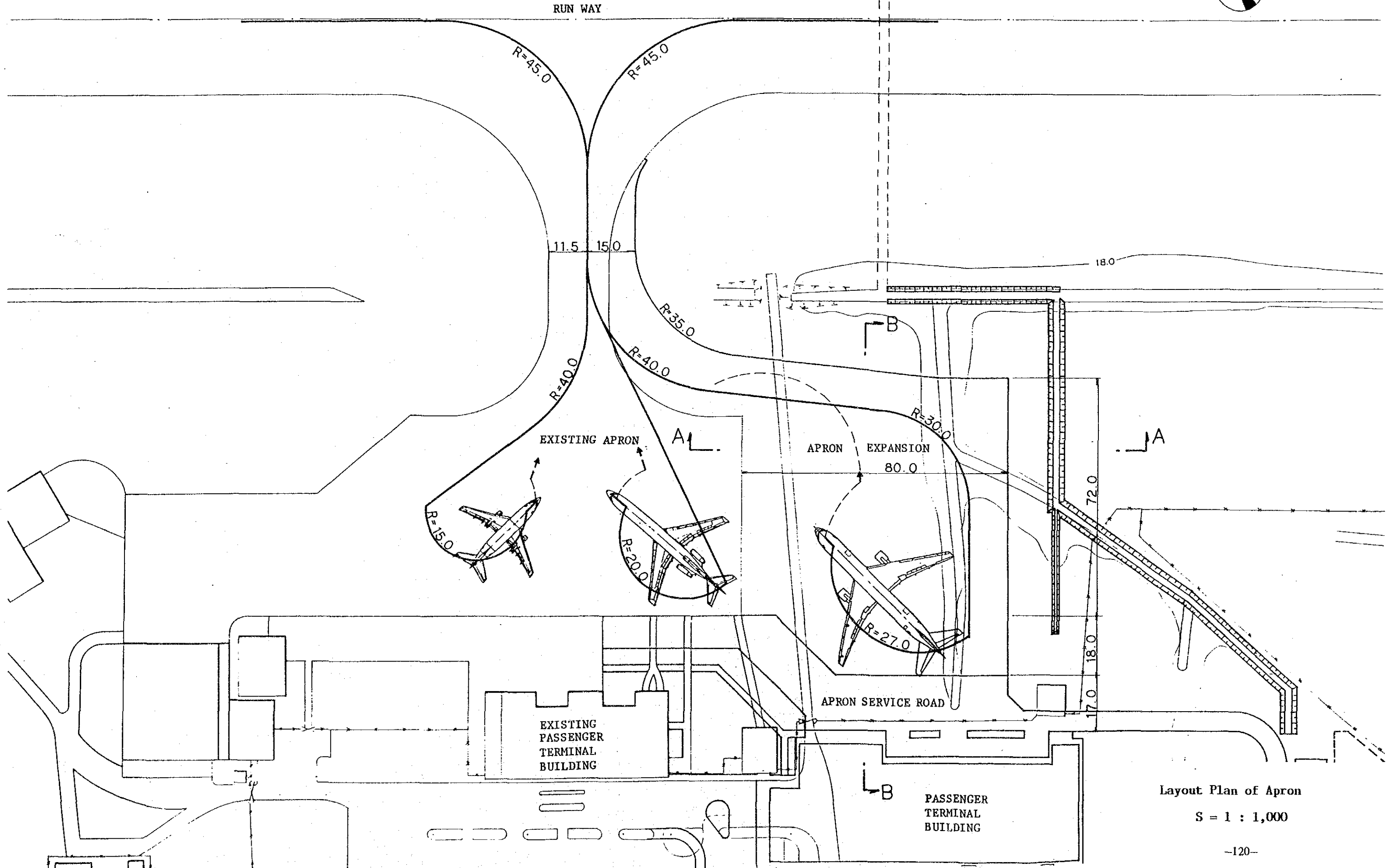
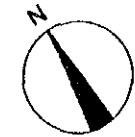


LEGEND

-  DISTRIBUTION BOARD
-  AUTOSTART, STOP CONTROL PANEL

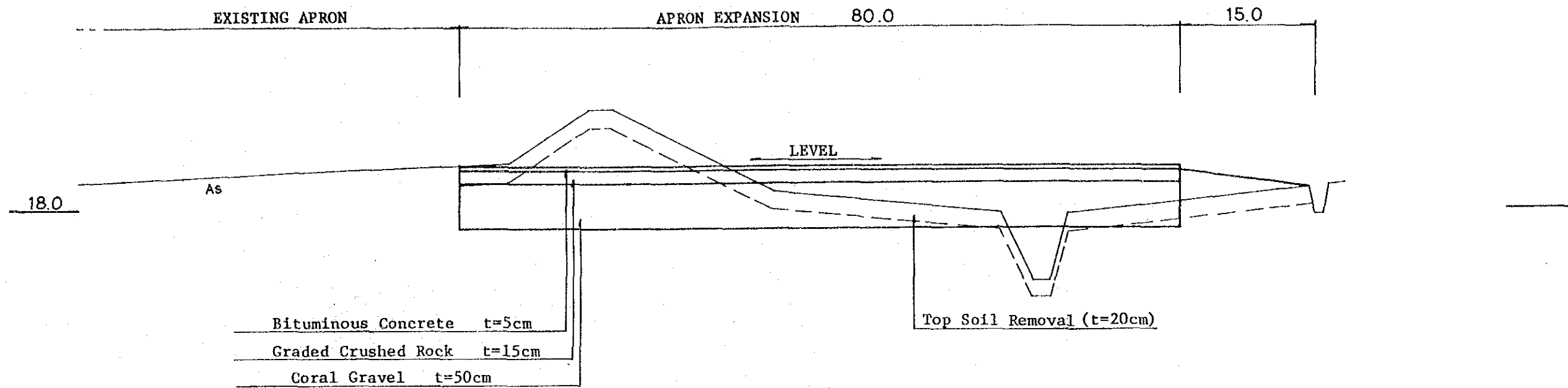


Equipment Layout Plan of Switchgear House

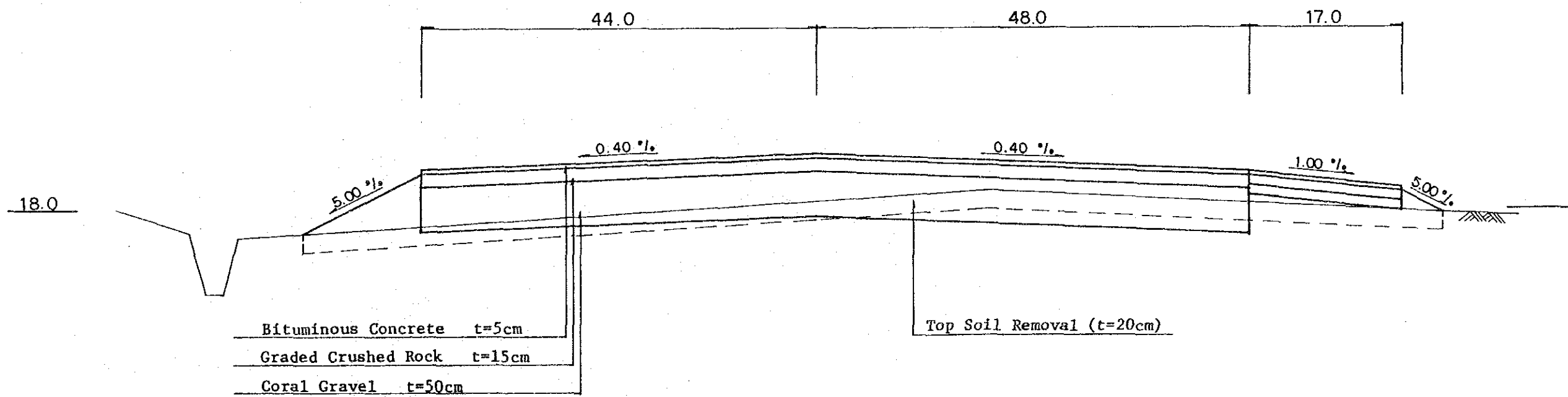


Layout Plan of Apron
S = 1 : 1,000

SECTION A - A $V = 1 : 50$
 $H = 1 : 500$

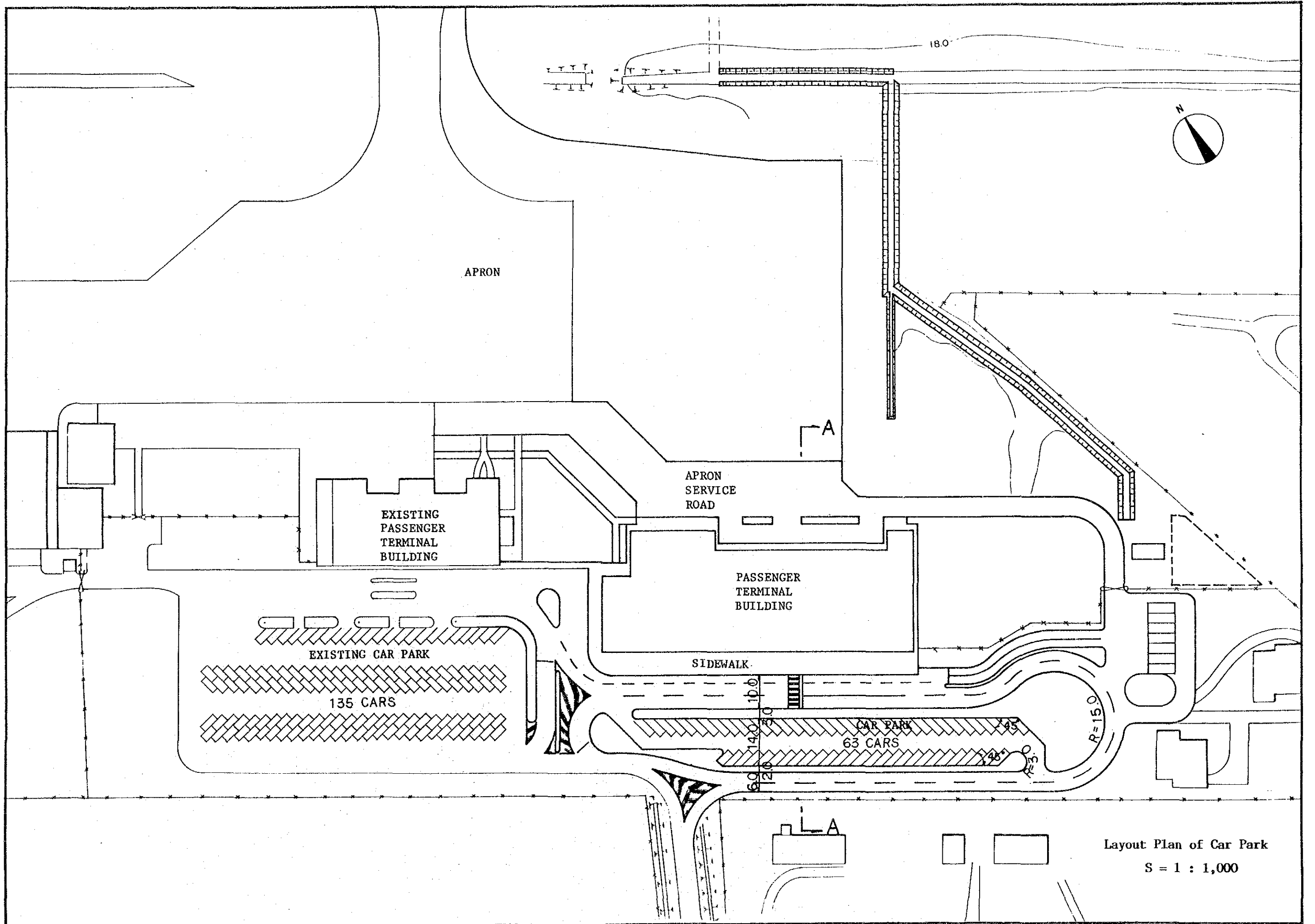


SECTION B - B $V = 1 : 50$
 $H = 1 : 500$

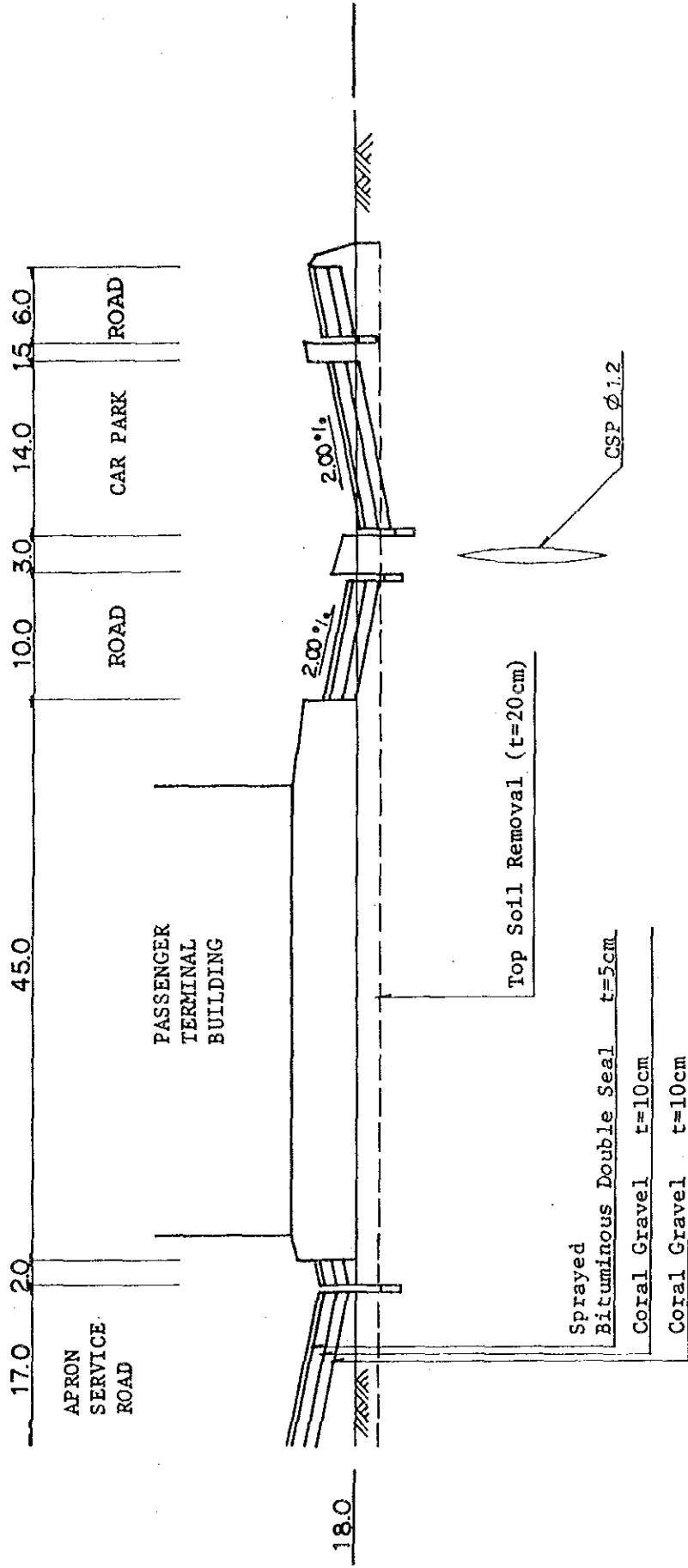


Typical Cross Section of Apron

$V = 1 : 50, H = 1 : 500$

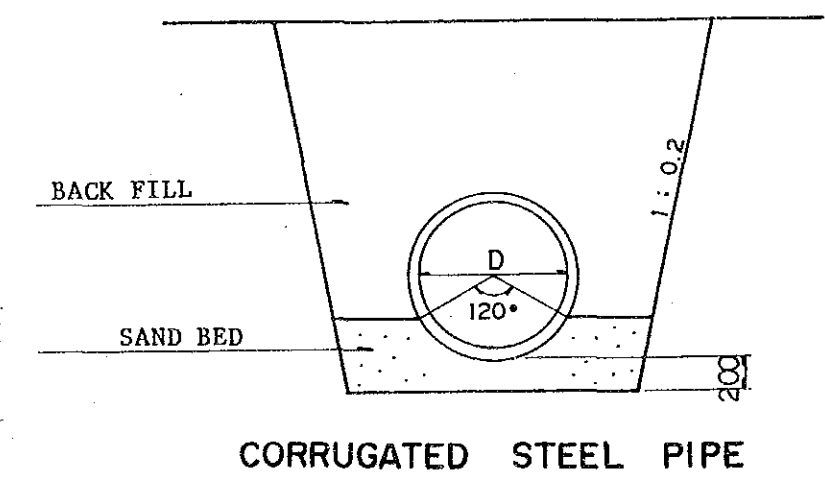
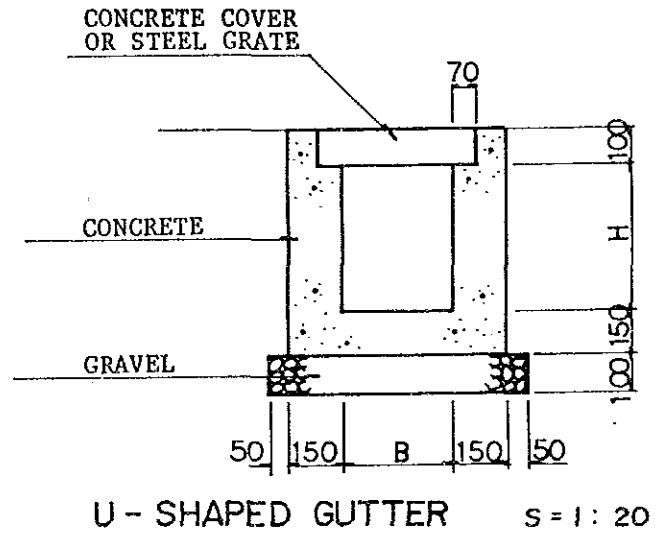
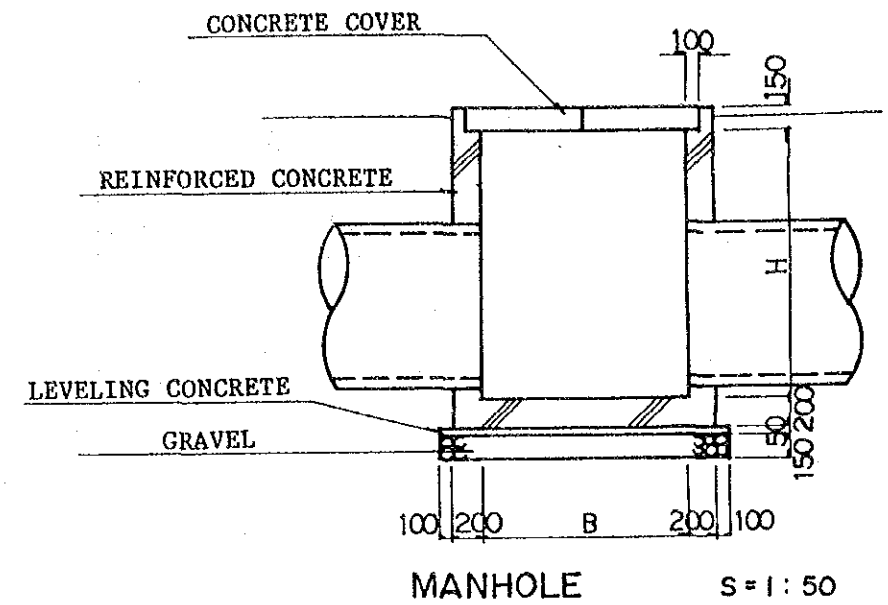
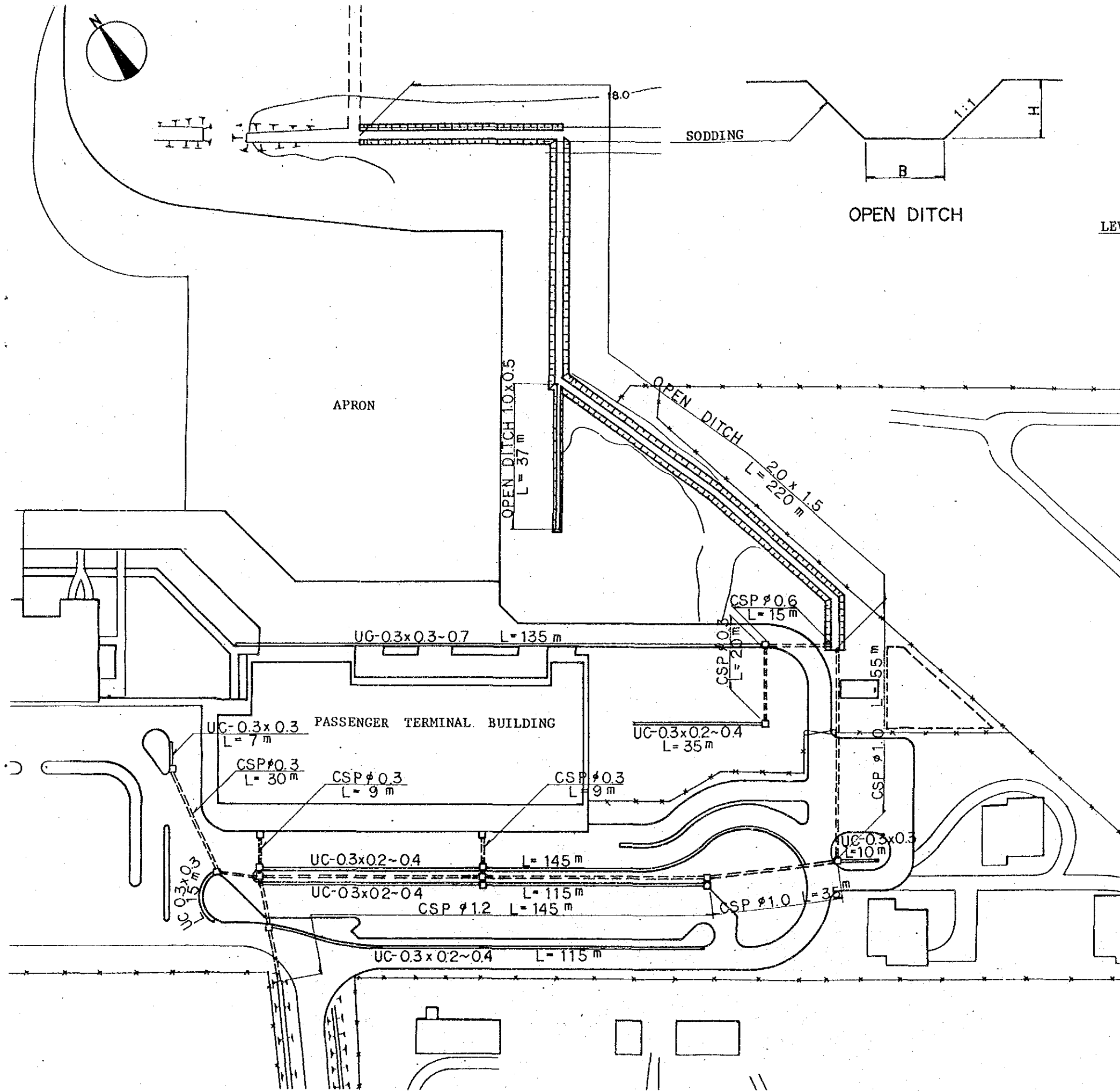


SECTION A -- A V = 1 : 50
H = 1 : 500

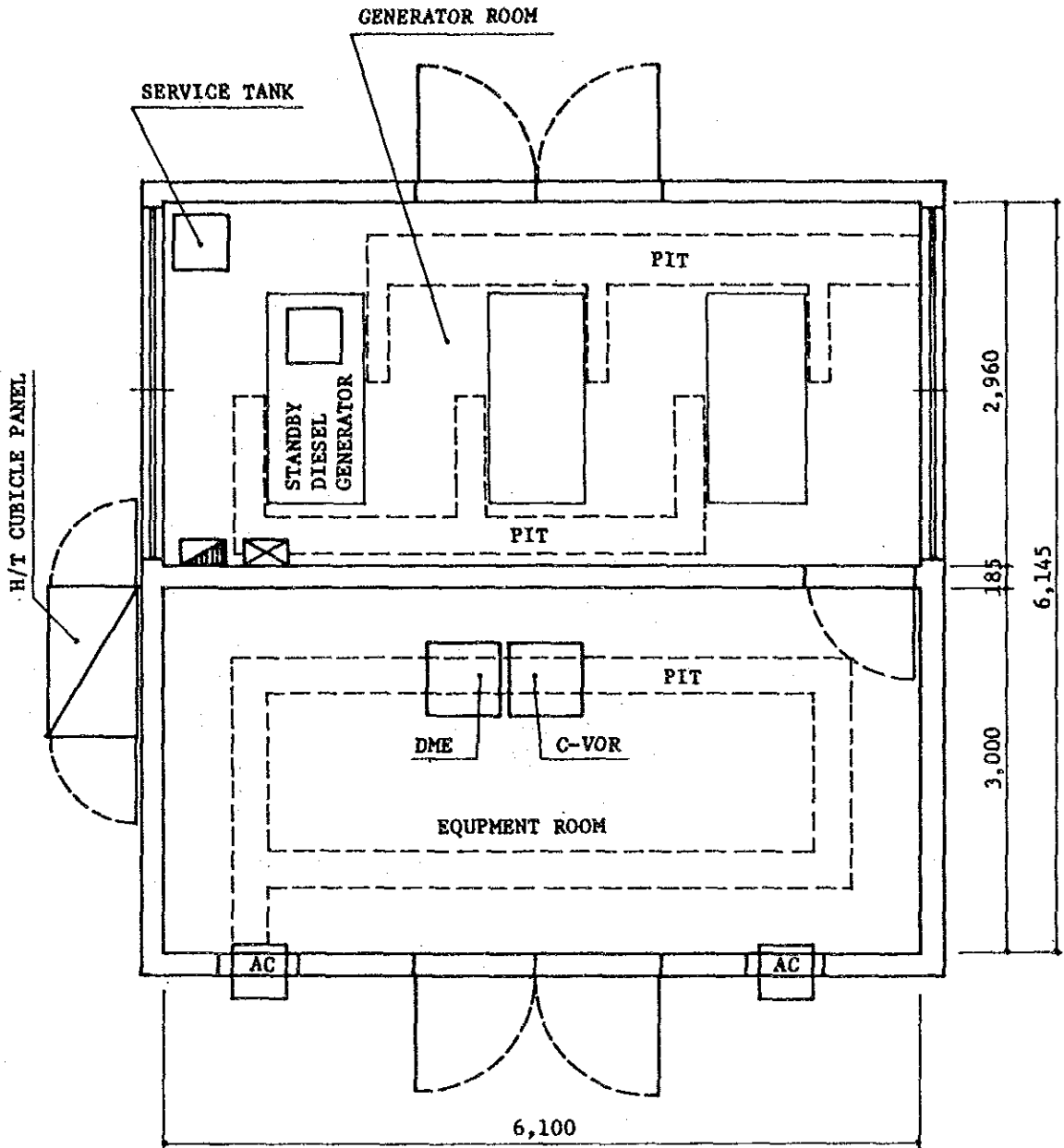


Typical Cross Section of Car Park

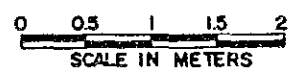
V = 1 : 50, H = 1 : 500






Layout Plan of Drainage System
 $S = 1 : 1,000$

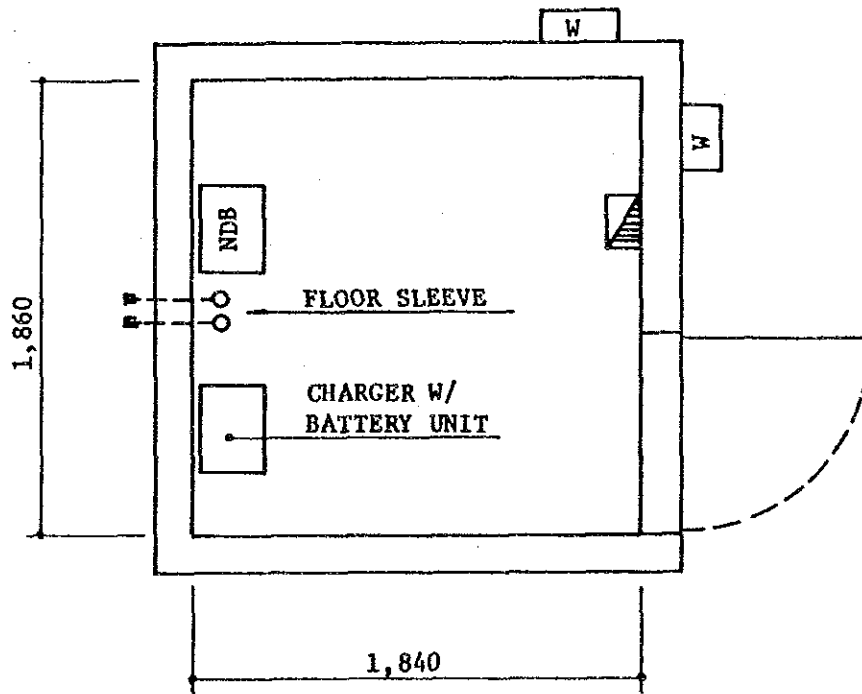


LEGEND





-  DISTRIBUTION BOARD (FDB)
-  AUTOSTART, STOP CONTROL PANEL
-  AIR CONDITIONER

Equipment Layout Plan of VOR/DME's Shelter



LEGEND

-  DISTRIBUTION BOARD (FDB)
-  W.H.M. BOARD

Equipment Layout Plan of Locator's Shelter

S = 1 : 30

CHAPTER 5. IMPLEMENTATION PROGRAMME

CHAPTER 5. IMPLEMENTATION PROGRAMME

5.1 Basis of Project Implementation

This Project will be implemented in accordance with the rules and regulations of Japan's Grant Aid Programme. After the Project is approved by both the Governments of Vanuatu and Japan, Notes will be exchanged for the Project as mutually agreed upon, and project implementation will begin. A Japanese consultant will be selected by the Government of Vanuatu, and will carry out a detailed design and preparation of tender documents for the facilities and equipment. After completion of the detailed design and preparation of the tender documents, a Japanese construction company will be selected by tendering, and the construction work will start. As for the air navigation equipment, a Japanese company will be selected by other tendering.

The executing agency of the Project is the Ministry of Civil Aviation, Communications, Energy and Tourism of the Government of Vanuatu. Upon completion of the Project, management and maintenance of the facilities will be performed by the Civil Aviation Department of the executing agency.

The Project consists of construction work and installation of air navigation equipment, and will be implemented in two stages.

First Stage : Construction of the New International Passenger Terminal Building and Installation of Air Navigation Equipment.

Second Stage: Renovation of the Existing Terminal, and Construction of the Apron, Road and Car Park.

5.2 Scope of Work

The scope of the work under Japanese grant aid and scope of the work for the Vanuatu side are as follows:

Table 5.1 Scope of Work

Item	Scope of Japanese Side Work	Scope of Vanuatu Side Work
Construction of new passenger terminal building	<ul style="list-style-type: none"> - Construction of Building - Air conditioning, electricity, water supply sewage - Finishing works (excl. interior finishes for airline offices, concessions, and snack bar) - Other facilities (check-in counters, baggage claim counters, metal detector, etc.) 	<ul style="list-style-type: none"> - Land acquisition - Felling of trees - Demolishing of houses - Ordinary furniture
Renovation of existing terminal building	<ul style="list-style-type: none"> - Removal of CIQ counter - Removal of one gravity roller conveyor - Installation of additional wall for new airline offices - Repair of damaged ceiling of side facing car park - Repair of damaged floor tiles 	<ul style="list-style-type: none"> - Ordinary furniture
Road and car park	<ul style="list-style-type: none"> - Earth works - Pavement works - Storm water drainage works - Vegetation works - Lighting of car park - Installation of traffic signs 	<ul style="list-style-type: none"> - Land acquisition - Felling of trees - Demolishing of houses - Security fencing works - Replacement of transformer - Relocation of utilities to remaining houses

Table 5.1 Scope of Work (continued)

Item	Scope of Japanese Side Work	Scope of Vanuatu Side Work
Apron	<ul style="list-style-type: none"> - Earth works - Pavement works - Storm water drainage works - Apron flood lights - Apron edge lights - Marking - Apron service road - Widening of the existing taxiway 	<ul style="list-style-type: none"> - Extension of the existing fuel pipe and installation of fuel hydrants - Ground service equipment parking area
VOR/DME Locator	<ul style="list-style-type: none"> - Replacement - Supply of maintenance equipment and spare parts - Four-wheel drive motor vehicle for maintenance 	<ul style="list-style-type: none"> - Flight Check
Others	<ul style="list-style-type: none"> - Relocation of the cool storage - Construction of covered passageway - Switchgear house for the new terminal building - Construction of a septic tank 	<ul style="list-style-type: none"> - Nil

Furthermore, the following measures shall be taken by the Government of Vanuatu:

- To provide data and information necessary for the Project.
- To provide power supply, water supply, drainage, telephone access and other incidental facilities to the project site.
- To ensure prompt unloading, customs clearance, and customs duty exemption of the products for the Project at the port of disembarkation in Vanuatu.
- To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of materials for the construction, equipment, and services under the verified contracts.

5.3 Implementation Schedule

After the Exchange of Notes between the Governments of Vanuatu and Japan, a detailed design and preparation of tender documents, and tender evaluation of the first stage of construction are to be carried out, concluding the first stage of the construction contract. Construction of the international passenger terminal building, which requires the longest period to complete, and installation of the air navigation equipment, which is high priority, will be included in the first stage. Approx. four (4) months will be required from the Exchange of Notes to conclusion of the construction contract.

Approx. sixteen (16) months will be required for the ensuing building works.

The next year, upon the Exchange of Notes for the second stage of construction, the contract for construction of the apron, road and car park will be concluded. Construction of the apron, road and car park will be carried out in the second stage. Seven (7) months will be required for the construction of the apron, road, and car park after the conclusion of the construction contract.

Prior to commencement of the civil works for the apron, it is necessary that the fuel pipes for the hydrants be in place. The installation of these pipes is in the Scope of Work of the Vanuatu side, and will require six (6) months for design and piping.

As for the C-VOR/DME and Locator, tender and tender evaluation are to be carried out after E/N(2), and then the contract is to be concluded.

Approx. nine (9) months will be required for manufacturing, installation, and adjustment after the conclusion of the contract.

As the flight check will be performed by the Corporation of New Zealand Limited, it is necessary for the Government of Vanuatu to arrange the flight check schedule with them in order to ensure prompt handover upon completion of the works.

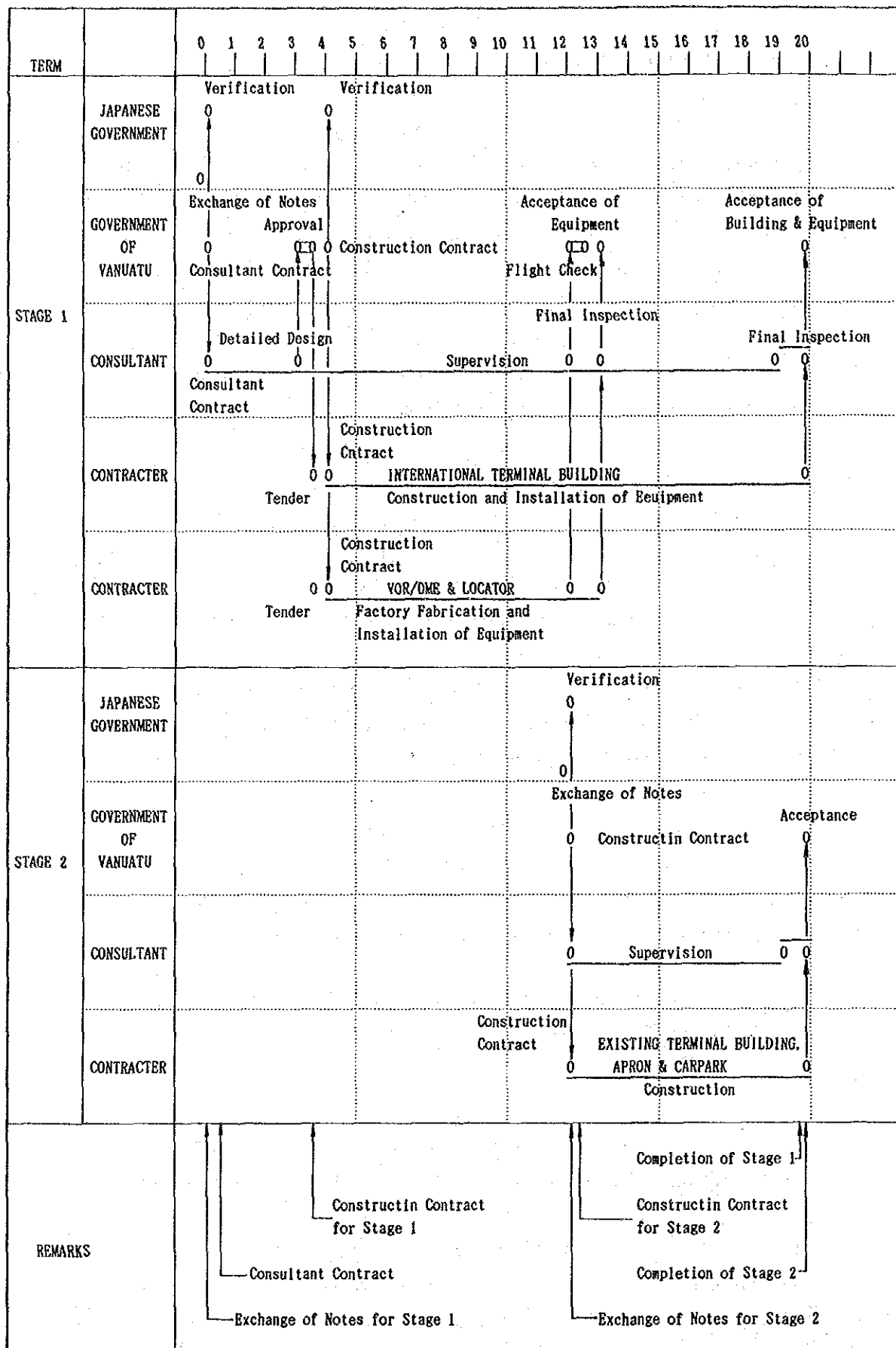


Fig. 5.3.1 Implementation Schedule of the Project

5.4 Construction Plan

(1) Basic Conditions

The construction methods shall fit the local conditions and be planned for smooth execution. The construction plan shall be prepared with a knowledge of the supply of materials and equipment and the availability of the work force.

(2) Matters to be Attended to

The rainy season in Vanuatu lasts from November to April, when precipitation is considerable. As the civil works and foundation works of the buildings will be slowed down due to the rain, the construction schedule during the rainy season shall be carefully studied.

The project site is close to the airport terminal facilities and the airport is to be kept operating during the construction period. Therefore, safety and security controls of the construction works must be perfectly carried out in order to avoid any hindrance to aircraft safety or damage to third parties.

(3) Construction Plan

The contract for construction of the facilities is considered to be divided into two stages; the first stage is construction of the new international passenger terminal building, and the second stage is construction of the apron, car park, etc. Therefore, the following matters should be considered.

- Close coordination between the building work and pavement work around the building
- Effective use of construction equipment and temporary facilities for construction

As for the air navigation equipment, progress control is particularly important because of its influence on aircraft operation.

5.5 Construction Supervisory Services

In accordance with the principle of Japan's Grant Aid Programme and the provisions of the Basic Design, the consultant will organize a project team for the detailed design and the construction supervision. In the construction supervision stage the consultant will dispatch a resident engineer. Furthermore, the necessary experts will be dispatched for short periods as required during the progress of the work.

5.6 Procurement Plan

Necessary materials and equipment shall be procured after determination of their availability and quality in Vanuatu. Other materials and equipment will be imported when necessary.

1) Materials and Equipment to be Imported

Some kinds of equipment, such as air navigation equipment which are made to order and are to be imported will require precise scheduling because of the nature of the process; ordering --> manufacturing --> packing --> shipping. Close coordination with the executing agency of the Project is crucial to ensure prompt and careful unloading, customs clearance, and shipment to the site.

2) Material and Equipment to be Procured Locally

The method of procurement for the sand and aggregate (major materials produced in Vanuatu) should be decided after studying the place and capacity of production, quality, and availability of transportation.

The following equipment and materials would be procured in Vanuatu.

Equipment and Materials Available in Vanuatu

<u>Construction Equipment</u>	<u>Construction Materials</u>
. Concrete Mixer	. Cement
. Small Trucks	. Sand
. Dump Trucks	. Aggregate
	. Concrete blocks

5.7 Maintenance Cost

According to "Estimates of Revenue and Expenditure 1988", the budget of the Civil Aviation Department in 1988 is VT63.2 million in revenues and VT69.4 million in expenditures, so there is a deficit of VT6.2 million. However, this budget includes the management and maintenance costs of 26 airports in this country other than Bauerfield. The revenues and expenditures of Bauerfield International Airport were VT47.5 million and VT21.4 million respectively in 1987; this indicates a good financial condition.

There are 60 staff members who participate in the management and maintenance of this airport currently, and there is a plan to increase the number to 75.

Costs required for operation and maintenance after the construction of the new international passenger terminal and renovation of the existing terminal for domestic services, expansion of the apron, road and car park, and replacement of air navigation equipment are estimated as follows, taking into account the above organisation strengthening and the increase of the building floor area to be maintained.

Electricity/telephone/ Air terminal supplies	VT 30 million
Air Terminal Staff Salary	VT 5 million
Technical Section Staff Salary	VT 11 million
<hr/>	
Total	VT 46 million

On the other hand, airport revenues when the passenger traffic reaches the volume of air traffic demand forecasted for after the completion of the Project will be as follows :

Landing charges and Departure Tax	VT	85 Million
Air Traffic Rights and Other charges	VT	6 Million
Miscellaneous Revenue	VT	25 Million
<hr/>		
Total	VT	116 Million

The above estimate indicates that the airport's financial condition will be quite good and that the revenues will sufficiently cover the expenditures for operation and maintenance of the facilities after the completion of the Project.

5.8 Project Costs to be borne by the Government of Vanuatu

Costs of the work to be executed by the Vanuatu side are estimated as follows:

a. Removal of the government residences	VT 17 million
b. Furniture	VT 8 million
c. Utility service up to the boundary of the new terminal site	VT 3 million
d. Ground service equipment parking area	VT 2 million
e. Extension of fuel pipe and installation of fuel hydrants	VT 24 million
f. Flight check	VT 2 million
<hr/>	
Total	VT 56 million

CHAPTER 6. PROJECT EVALUATION

CHAPTER 6. PROJECT EVALUATION

This Project constitutes the major part of the development of Bauerfield International Airport, and will, in company with other projects, permit the introduction of B-767 class wide-bodied jet aircraft. Other related projects to be implemented with external financial assistance from various countries include the runway extension, improvement of the airfield lights, etc.

The existing terminal facilities was planned to cope with only one B-737 class aircraft, and has already become inadequate for present operations. This capacity problem is considered a hindrance to tourism development. After the implementation of the Project, Bauerfield International Airport will have sufficient capacity with improved safety to serve as the gateway to Vanuatu. Introduction of B-767 class aircraft will establish rapid and efficient transport connection with other countries and is expected to enhance tourism industry. In addition, because operation of B-767 aircraft is less expensive than older generation aircraft, such as B-737, B-727, etc., it is expected to decrease air fare and to make tourism industry of Vanuatu more competitive to the other South Pacific islands.

Tourism is the most important sector for foreign exchange earnings, and GDP in trade, restaurant and hotel shares one third of the total GDP. Therefore, development of tourism industry is one of the most important objectives in the Second National Development Plan. An increase of tourists will contribute to the development of the national economy of the Republic of Vanuatu through income from transportation, hotels, restaurants, etc. and in generation of employment in those services.

Therefore, the Project will contribute to the development of the national economy and the promotion of the economic self-reliance of the nation, and is considered to be highly significant for the Republic of Vanuatu.

CHAPTER 7. CONCLUSION AND RECOMMENDATIONS

CHAPTER 7. CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The Project for Constructing the Terminal Building of Bauerfield International Airport, includes construction of a new international passenger terminal building, renovation of the existing terminal for domestic services, expansion of the existing apron, road and car park, and renewal of the C-VOR/DME and Locator. The Project is expected to contribute greatly to the development of the national economy of the Republic of Vanuatu though removing the bottleneck that hinders tourism development. Therefore, it is judged significant that the Project be implemented under the grant and program of the Government of Japan.

7.2 Recommendations

- (1) The existing fuel hydrants are scheduled to be extended by the Vanuatu side. The extension work of the fuel hydrant pipe must be completed before the commencement of the expansion of the apron.
- (2) The terminal building will be designed to reduce the maintenance work or to make it as easy as possible. Regular maintenance work after its completion will, however, be required for some electrical and mechanical facilities, etc., in order to maintain the original level of performance.
- (3) Periodic maintenance of the apron pavement will be required because the apron surface will suffer some damage in service, as a result of the sharp manoeuvring of aircraft and spilled oil.
- (4) The flight check of the VOR/DME and Locator will be performed by the Corporation of New Zealand Limited. Close coordination on the flight check schedule should be made in advance in order to operate the VOR/DME and Locator soon after the installation and adjustment work.

- (5) This Project will produce satisfactory results only when all the related projects for introduction of B-767 class aircraft are completed. Therefore, it is advisable to accelerate the implementation of those projects.

APPENDIX

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Appendix - A

List of the Study Team Members

Site Survey

Mr. Masamichi WATANABE (Team Leader / Project Supervisor)	Deputy Director, Construction Division, Aerodrome Department, Civil Aviation Bureau, Ministry of Transport
Mr. Jotaro NISHIBATA (Project Supervisor / Air Navigation)	Chief of Reliability Management Section, Radio Engineering Division, Air Traffic Services Department, Civil Aviation Bureau, Ministry of Transport
Mr. Toshio NAKAMURA (Coordinator)	Grant Aid Planning and Survey Department, Japan International Cooperation Agency
Mr. Shota MORITA (Airport Engineer)	Pacific Consultants International
Mr. Tokio ODA (Airport Architect)	Pacific Consultants International
Mr. Yoshihiro URABE (Building Services Engineer)	Pacific Consultants International
Mr. Keiichi TAKEDA (Airport Engineer / Navigation Aid)	Pacific Consultants International
Mr. Toru SHIMADA (Airport Engineer / Civil Work)	Pacific Consultants International
Mr. Shozo KAWASAKI (Architect / Cost Estimate)	Pacific Consultants International

Explanation of the Draft Final Report

Mr. Masamichi WATANABE
Mr. Toshio NAKAMURA
Mr. Shota MORITA
Mr. Tokio ODA
Mr. Toru SHIMADA

APPENDIX-B

SCHEDULE OF SITE SURVEY

Site Survey

- June 12 Sunday 18:05 Mr. Morita, Mr. Oda, Mr. Urabe, Mr. Takeda, Mr. Shimada and Mr. Kawasaki departed from Narita for Sydney by JL777.
- June 13 Monday 06:30 Mr. Morita and other five members arrived at Sydney.
11:00 They departed for Suva by FJ915/FJ145 and arrived at 19:45.
- June 14 Tuesday Mr. Morita and other five members visited JICA office and Japanese Embassy to explain the summary of the site survey.
12:45 They departed for Port Vila by FJ122/FJ710 and arrived at 21:15
- June 15 Wednesday Explanation of Inception Report to Minister of Civil Aviation, First and Second Secretary.
Vanuatu side stated that there was a proposal for widening the runway strip from Australia.
- Explanation of Inception Report to the Director of Civil Aviation, Deputy Director, Airport Commandant, Director of Public Works, and personnel from National Planning and Statistics Office and Department of Lands, and presented a questionnaire.
- Site Investigation at airport and preliminary topographical survey. Hearing on problems from Airport Manager. Hearing about security from ICAO adviser.
- June 16 Thursday Presentation of Terminal Building Layout Plan to Director of Civil Aviation, Deputy Director, Airport Commandant, Plant Quarantine Officer, Immigration Officer and airlines. Submission of questionnaire to each of them.
- Hearing on the existing condition of air navigation facilities and related problems from JICA Expert.
- Collection of data and information at Public Works Department, National Planning and Statistics Office.
- 20:00 Team Leader Mr. Watanabe, Mr. Nishibata, and Mr. Nakamura departed from Narita for Sydney by JL771.

June 17 Friday Explanation of preliminary demand forecast to Deputy Director of Civil Aviation.

Hearing about security of terminal building from the Police Training and ICAO adviser.

Collection of data and information on construction materials, etc.

06:15 Team Leader Mr. Watanabe and other two members arrived at Sydney. They visited the JICA office and had a discussion with AIDIB.

June 18 Saturday Traffic fact-finding at airport

Site investigation about air navigation facilities.

June 19 Sunday Traffic fact-finding at airport.

09:15 Team Leader Mr. Watanabe and other two members departed for Port Vila by AN580, and arrived at 14:35

June 20 Monday Explanation of merits and demerits of widening runway strip to Minister of Civil Aviation and First Secretary. Discussion about policy of terminal facilities layout.

Explanation and discussion on the above with Director of Civil Aviation and the Deputy Director.

Collection of data and information at the electric power company and airlines, etc.

June 21 Tuesday Discussion on the policy of terminal facilities layout with Minister of Civil Aviation, First and Second Secretary. Vanuatu side said that the runway strip would not be changed from 150m.

June 22 Wednesday Presentation of alternatives of basic layout of terminal facilities to Minister of Civil Aviation, First and Second Secretary.

Collection of data and information on construction materials, etc.

June 23 Thursday Discussion on draft of "Minutes of Discussions" (M/D) with Director of Civil Aviation.

Collection of data and information on construction materials, etc.

Hearing about customs and quarantine.

June 24 Friday Minister of Civil Aviation and Second Secretary informed the Team about basic layout plan of terminal facilities on which the Basic Design would be based.

Collection of data and information at Posts and Telecommunications, etc.

Discussion on amendment of M/D.

Signing of M/D between Government of Vanuatu and the JICA mission.

June 26 Sunday 11:35 Team Leader Mr. Watanabe, Mr. Nishibata and Mr. Nakamura departed for Suva by FJ715/FJ135, and arrived at 17:00.

June 27 Monday Collection of data and information of construction materials.

Team Leader Mr. Watanabe and other two members reported progress to JICA office.

12:45 Team Leader Mr. Watanabe and other two members departed for Sydney by FJ122/FJ916 and arrived at 20:40.

June 28 Tuesday Discussion on preliminary demand forecast with Director of Civil Aviation and Deputy Director.

Discussion on apron plan with Director of Civil Aviation, Deputy Director, JICA Expert, oil companies and airlines.

Collection of data and information at Department of Water Supply and the company

09:30 Team Leader Mr. Watanabe and other two members departed for Narita by JL778 and arrived at 20:15.

June 29 Wednesday Discussion on road and car park plan with Deputy Director of Civil Aviation and Airport Commandant.

Confirmation of the scope of work of Vanuatu side.

Collection of data and information on construction materials.

June 30 Thursday Presentation of and discussion on amended Terminal Building Layout Plan to Director of Civil Aviation, Deputy Director, Airport Commandant, Plant Quarantine Officer, Immigration Officer and airlines.

Collection of data and information on construction materials.

July 1 Friday Made out Minutes of Meeting.

Preliminary topographical survey of VOR/DME and Locator.

Collection of data and information on construction materials.

July 2 Saturday Site investigation at Bauerfield Airport.

July 3 Sunday 04:35 Mr. Morita and other five members departed for Sydney by AN1583 and arrived at 09:35

July 4 Monday Report of progress at JICA Office.

Hearing on details and policy of the aid for Bauerfield Airport by Australia from AIDAB.

09:30 Mr. Oda, Mr. Urabe, Mr. Shimada and Mr. Kawasaki departed for Narita by JL772 and arrived at 18:00.

July 5 Tuesday 09:30 Mr. Morita and Mr. Takeda departed for Narita by JL778 and arrived at 20:15.

Explanation of Draft Final Report

Sep. 8 Thursday 20:00 Team Leader, Mr. Watanabe, Mr. Nakamura, Mr. Morita, Mr. Oda and Mr. Shimada departed from Narita for Sydney by JL771.

9 Friday 06:15 Team Leader, Mr. Watanabe and other four members arrived at Sydney.

Explanation of the outline of the draft final report to JICA office. Discussion with AIDAB at JICA Office.

11 Sunday 09:15 Mr. Nakamura, Mr. Morita and Mr. Shimada departed for Port Vila by AN580 and arrived at 14:35.

- 12 Monday Submission of the draft final report to the Government of Vanuatu.
- 11:00 Team Leader Mr. Watanabe and Mr. Oda departed for Suva by FJ915/FJ715 and arrived at 18:15.
- 13 Tuesday Explanation of the draft final report to Minister of Civil Aviation, First and Second Secretary.
- Team Leader, Mr. Watanabe and Mr. Oda visited JICA office and Japanese Embassy and explained the outline of the draft final report.
- 19:00 They departed for Port Vila by FJ710 and arrived at 21:15.
- 14 Wednesday Discussion on the draft final report with Minister of Civil Aviation, First Secretary and Second Secretary.
- Joint meeting with Australian study team.
- 15 Thursday Discussion on the detailed layout of terminal building with Director and Deputy Director of Civil Aviation, Immigration Officer, police, airlines etc.
- 16 Friday Signing of Minutes of Discussions.
- Confirmation of the scope of the renovation work of the existing terminal building.
- 18 Sunday 11:35 Team Leader Mr. Watanabe and other four members departed for Suva by FJ715 and arrived at 15:35.
- 19 Monday Report of the discussion results to JICA office and Japanese Embassy.
- 16:00 departed for Sydney by FJ136/FJ916, and arrived at 20:40.
- 20 Tuesday Report of the discussion results to JICA office.
- 21 Wednesday 09:30 departed for Narita by JL772 and arrived at 18:00.

Minutes of Discussions

ON
THE BASIC DESIGN
OF
THE PROJECT FOR CONSTRUCTING THE TERMINAL BUILDING
OF
BAUERFIELD INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF VANUATU

In response to the request of the Government of the Republic of Vanuatu, the Government of Japan decided to conduct a basic design study on the Project for Constructing the Terminal Building of Bauerfield International Airport (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to the Republic of Vanuatu the study team headed by Mr. Masamichi WATANABE, Deputy Director, Construction Division, Aerodrome Department, Civil Aviation Bureau, Ministry of Transport from June 12 to July 5, 1988.

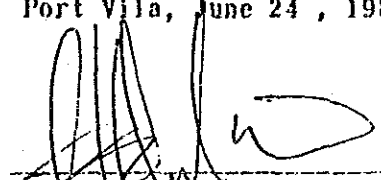
The team had a series of discussions on the Project with the officials concerned of the Government of the Republic of Vanuatu and conducted a field survey in Bauerfield International Airport area.

As a result of the study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Port Vila, June 24, 1988

渡辺正道

MASAMICHI WATANABE
Leader
Basic Design Study Team
Japan International
Cooperation Agency



HAROLD C. QUALAO
Minister for Civil Aviation,
Communications, Energy
and Tourism

ATTACHMENT

1. Objective of the Project

The objective of the Project is to construct a new terminal building and other related facilities ; to renovate the existing terminal building; and to provide a certain air navigation facilities to meet Bauerfield International Airport upgrading plan.

2. Executing Agency

The executing agency for the Project is the Ministry of Civil Aviation, Communications, Energy and Tourism of the Government of Vanuatu.

3. Proposed Project Site

The proposed project site is as shown at Annex I.
The Government of Vanuatu will demolish the existing houses in the shaded area, and clear the site.

4. Requests by the Government of Vanuatu

- (1) The major items requested by the Government of Vanuatu are as shown at Annex II.
- (2) The Government of Vanuatu requested that two stands for B-767 class aircraft be provided by Japan's Grant Aid, if possible. The Japanese Team stated that the construction of two stands for B-767 class aircraft would be subject to the budget to be allocated to the Project.
- (3) The Japanese Team will convey to the Government of Japan the desire of the Government of Vanuatu that the Government of Japan takes the necessary measures to cooperate in implementing the Project and provide the necessary facilities and equipment within the scope of Japan's Grant Aid Program.



5. Grant Aid Program

- (1) The Government of Vanuatu will take the necessary measures as listed in Annex III on condition that the Grant Aid by the Government of Japan is extended to the Project.
- (2) The Vanuatu side understood that Japan's Grant Aid System, as explained by the Team, includes the principle of using a Japanese consulting firm and a Japanese general contractor for the implementation of the Project.
- (3) The Government of Vanuatu will undertake to provide the necessary budget and personnel for the proper and effective operation and maintenance of facilities and equipment provided under the Grant Aid.

6. Other Countries' Assistance

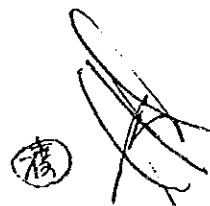
- (1) The Vanuatu side stated that assistance given, approved or requested from other countries for developing Bauerfield International Airport was as follows:

(a) Past Assistance

- | | |
|---------------------------------------|--|
| i) Australia | Strengthening of the existing runway, taxiway and apron to provide for operations by B-767 class aircraft. |
| ii) United Kingdom | Installation of PAPI on Runways 11 and 29. |
| iii) France
(Caisse Centrale Loan) | Supply of one Rapid Intervention Fire Vehicle and one Major Crash Tender. |
| iv) New Zealand | Supply of Emergency First Aid Trailer. |

(b) Approved Assistance

- | | |
|--------------------|---|
| i) EC | Provision of Air Navigation Center and Control Tower.
(Project approved 1982. Consultants for implementation to be appointed this year.) |
| ii) United Kingdom | Obstruction Lights and Improved Curved Approach Lighting System for Runway 11. |



(c) Assistance Requested

i) Australia

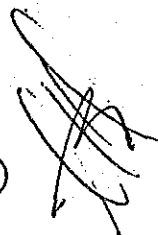
Extension of runway by up to 600 meters and associated facilities, including approach lighting system, to permit operations by Boeing 767 class aircraft.

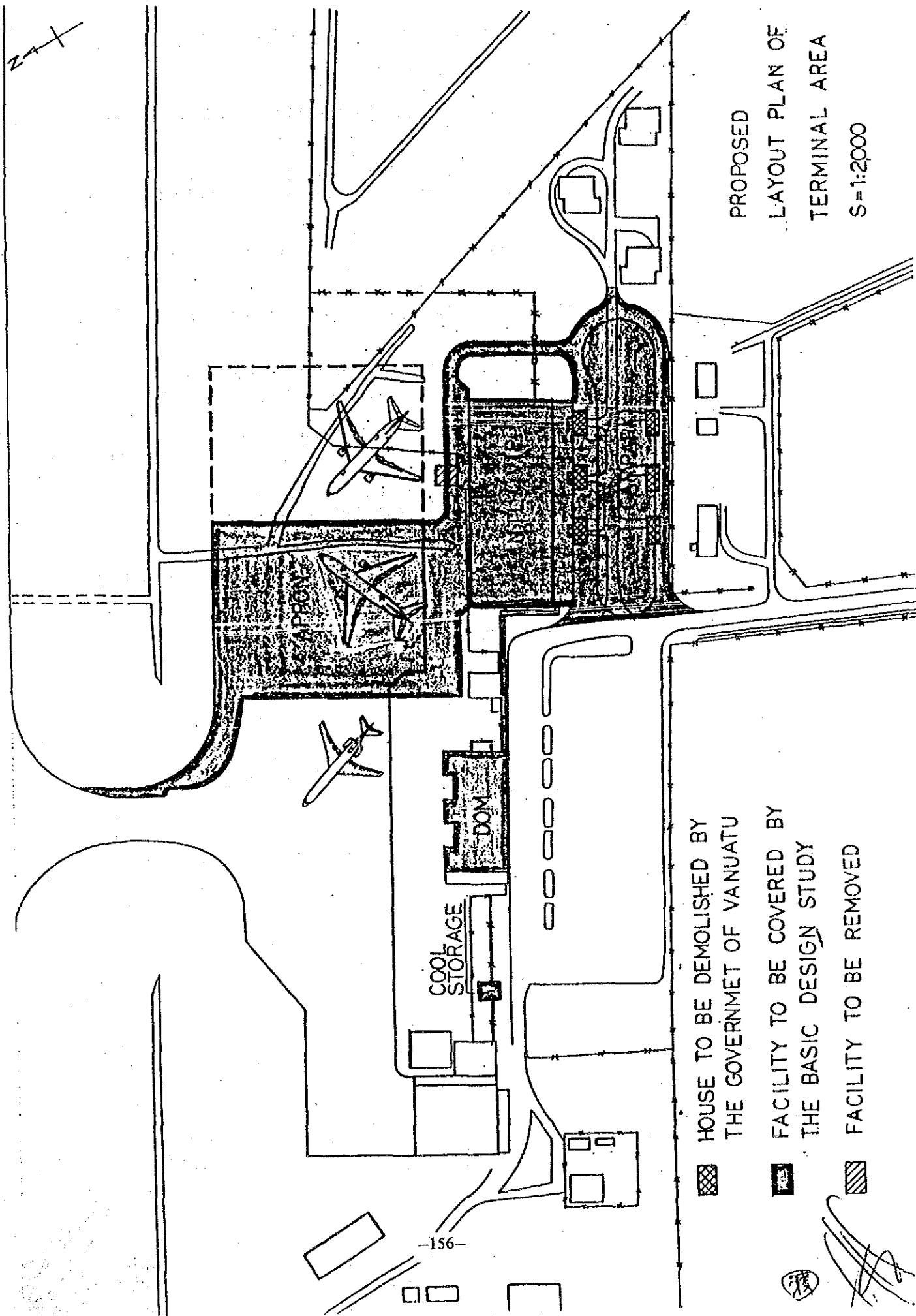
Training of Fire Service, Security and Airport Management staff.

ii) New Zealand

Provision of Perimeter Security Fence.

(2) The Team confirmed that the Vanuatu side would coordinate and complete the above mentioned projects without delay.





PROPOSED
 LAYOUT PLAN OF
 TERMINAL AREA
 S=1:2000

- HOUSE TO BE DEMOLISHED BY THE GOVERNMENT OF VANUATU
- FACILITY TO BE COVERED BY THE BASIC DESIGN STUDY
- FACILITY TO BE REMOVED

MAJOR ITEMS REQUESTED BY THE GOVERNMENT OF VANUATU

1. Terminal Buildings and Related Facilities

- (1) To construct a new international terminal building and to renovate the existing terminal building for domestic services
- (2) To expand the apron to accommodate two B-767 class aircraft, including marking, edge lights and floodlights, but excluding fuel hydrant facilities
- (3) To construct the necessary ancillary facilities such as road and carpark with marking, signs and lighting, etc.
- (4) To provide the following equipment to handle the passengers and baggage :
 - Necessary furniture such as check-in counters, CIQ counters, chairs in public hall, etc. except for offices (Int'l and Dom. terminals)
 - Baggage conveyors for arrival and departure areas (Int'l terminal)
 - Walk through and hand type metal detectors (Int'l and Dom. terminals)
 - Scales for check-in baggage (Int'l terminal)
 - Public address system (Int'l and Dom. terminals)
 - Telephone and interphone (Int'l and Dom. terminals)
 - Septic tank (Int'l terminal)
 - Emergency generator service (Int'l and Dom. terminals)
 - Air conditioning in the limited area (Int'l and Dom. terminals)
 - Fire hydrant (Int'l and Dom terminals)
- (5) To relocate the cool storage in the cargo area
- (6) To accommodate VIP room in the new terminal building

2. Air Navigation Facilities

- (1) To replace the VHF Omnidirectional Range (VOR) / Distance Measuring Equipment (DME) and Locator

MEASURES TO BE TAKEN BY THE GOVERNMENT OF VANUATU.

1. To demolish the existing houses on the site, and to clear the site for the Project before construction starts.
2. To provide data and information necessary for the Project.
3. To provide power supply, water supply, drainage, telephone access and other incidental facilities to the Project site.
4. To ensure prompt unloading and customs clearance, customs duty exemption of the products for the Project at the port of disembarkation in Vanuatu.
5. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of materials for the construction, equipment, and services under the verified contracts.

A handwritten signature in black ink is located in the bottom right corner of the page. To the left of the signature is a circular stamp, which appears to be a seal or official mark, though its details are not clearly legible.

MINUTES OF MEETING

1. Date : June 30, 1988
2. Place : Conference Room, Ministry of Civil Aviation *FRED TAU*
3. Attendant :
- | | |
|---------------------|--|
| Mr. Julian Forsyth | Director of Civil Aviation |
| Mr. Chris Phelps | Deputy Director of Civil Aviation |
| Mr. Joseph Kasten | Airport Commandant |
| Mr. Gordon Haines | Principal Immigration Officer |
| Ms. Jane Hammacott | Burns Philp (Vanuatu) Air Pacific/Air Niu Guinea |
| Mr. Keith Malloy | Air Vanuatu |
| Mr. Joseph Laloyer | Air Caledonic |
| Mr. Floyd Smith | Ansett/Air Nauru/Air Melanesiae |
| Mr. Geoff Hough | Senior Collector of Customs |
| Mr. Kalonpa Malang | Collector of Customs (Bauerfield) |
| Mr. Bob Weller | Senior Plant Quarantine Officer |
| Mr. Brian Mahon | Director of Police Training |
| Mr. Paul Hofmeister | Air Bar |
| Mr. Tokio Oda | PCI |
| Mr. Yoshihiro Urabe | PCI |
| Mr. Keiichi Takeda | PCI |
| Mr. Toru Shimada | PCI |
| Mr. Shozo Kawasaki | PCI |
- [Handwritten signature]*

4. Subject : Design of Passenger Terminal Buildings

5. Major Item Discussed:

The discussion was made on the proposed layout plan of the new international passenger terminal building and the renovation plan of the existing terminal building as a domestic terminal, etc., between the Facilitation Committee, Ministry of Civil Aviation, the Government of Vanuatu and the JICA Study Team.

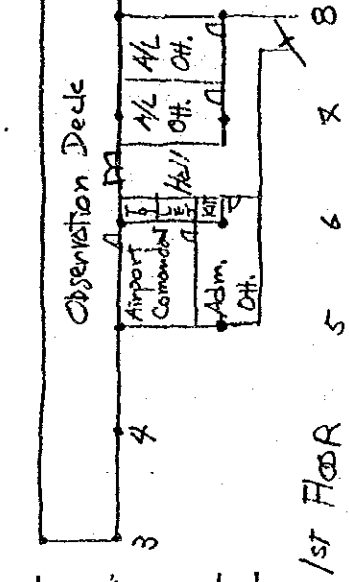
The followings are the comments from the Facilitation Committee. The JICA Study Team will further study and do the best efforts to meet the comments as much as possible.

(1) Layout Plan of New Terminal Building (Attachment-1)

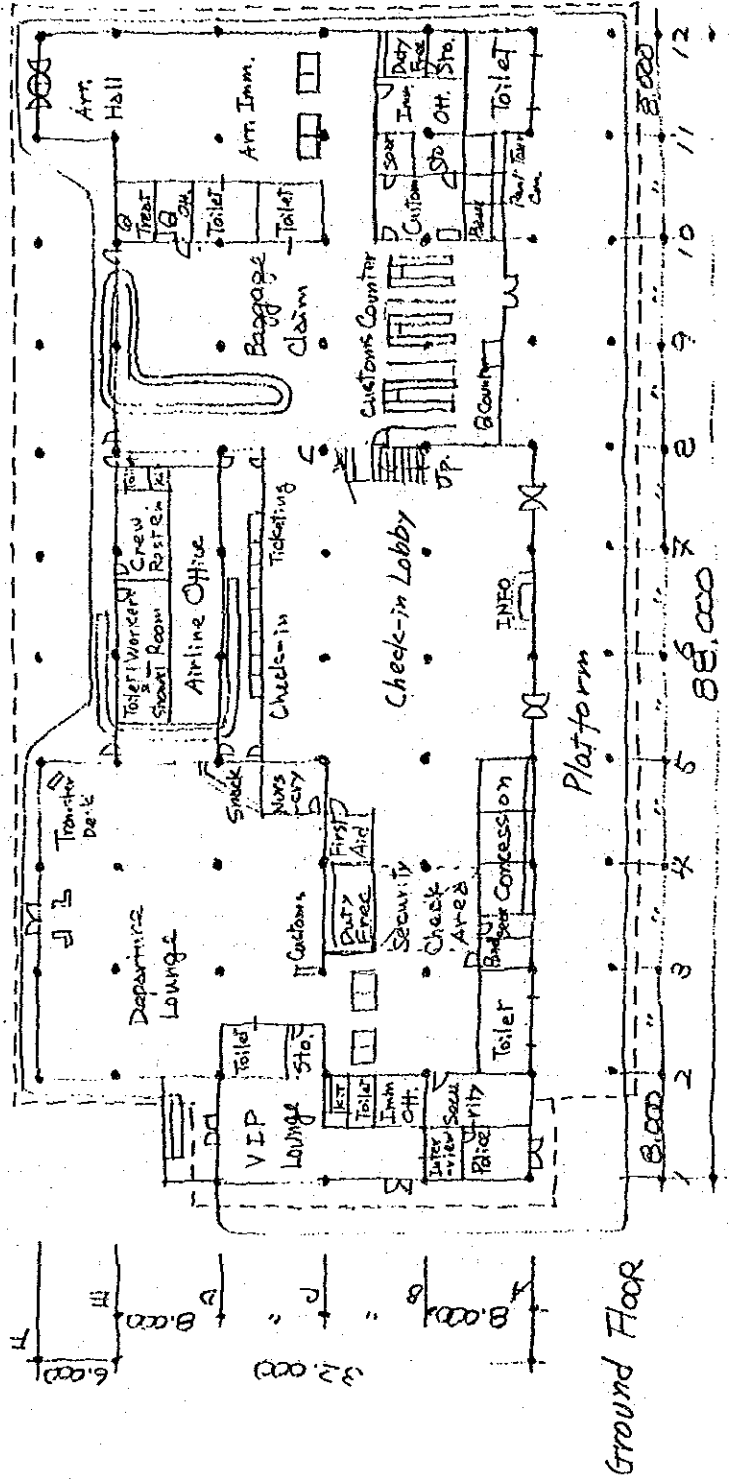
- a) The proposed new international passenger terminal building seems to meet the demand expected in 1995. However, the member of Committee considered that the building will be used for at least twenty years because finance for expansion of the international terminal building in the future may be difficult. Therefore they would like to request to enlarge the floor space as much as possible in this project.
- b) The airline office on the ground floor should be used for operational purpose only. Administrative offices should be on the first floor.

- c) The airlines require individual offices which are accessible to the public and have some storage capacity for transfer baggage, etc.
 - d) A separate exit from arrival area for tour groups should be provided.
 - e) Larger concession areas were required at the arrival area.
 - f) In order to achieve the above d) and c) the toilet at the eastern side of the building could be removed.
 - g) There was no requirement for two toilets in the arrival hall but the quarantine area should be enlarged to include a health office capable of accepting stretchers.
 - h) The first aid post should open into the departure/transit lounge.
 - i) The nursery should be next to the toilet.
 - j) The departure immigration check should be before the security check.
 - k) Access should be provided from the VIP to the departure security check.
 - l) A small access door should be provided for returning trolleys to the arrival area.
 - m) Consideration throughout the design should be given to disabled passengers.
 - n) The snack bar for public should be relocated inside the public hall.
 - o) Departure lounge should have two exits (gates) so as to handle two departure flights simultaneously.
- (2) The proposed renovation plan of the existing terminal building as a domestic terminal (Attachment-2) was basically accepted by the Committee.
- (3) The proposed design basis for building facilities (Attachment-3) was basically accepted by the Committee with the following comments :
- a) The departure lounge may be equipped with more ceiling fans than the other areas because it is located downwind and passengers stay there long.
 - b) The snack bar requires a three phase power supply with several sockets.

Floor Area	Area
1st Floor	2,944
2nd Floor	264
Sub total	3,208
Canopy	1,048
Total	4,256 sq.m

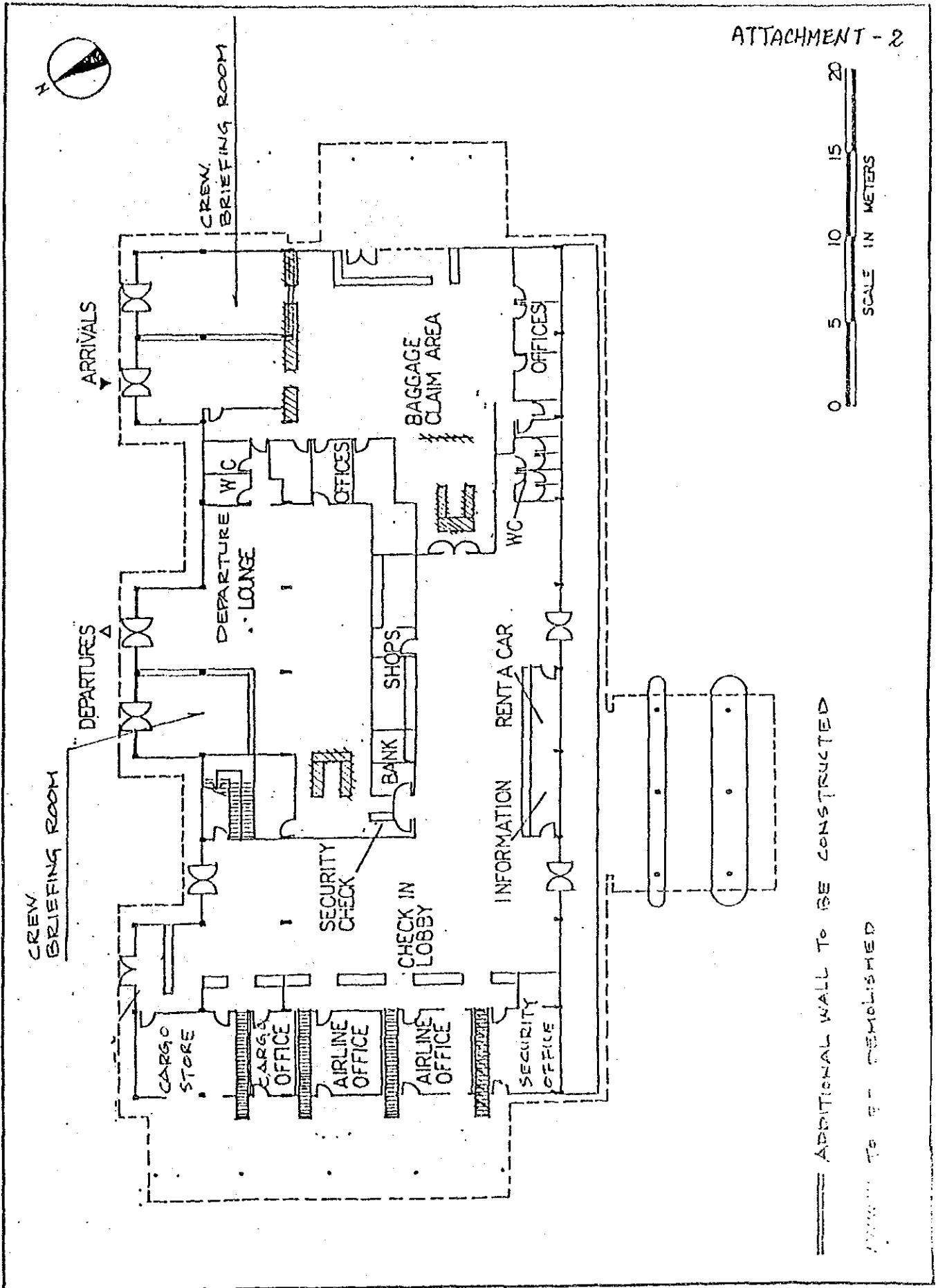


1st Floor



Ground Floor

Passenger Terminal Building "Dunrobin International Airport" ALT-D 51400



ADDITIONAL WALL TO BE CONSTRUCTED

WALL TO BE DEMOLISHED

PRIORITY	EQUIPMENT AND FACILITY	NEW TERMINAL BUILDING	EXISTING BUILDING
1	LIGHTING FIXTURES	DESIGN ILLUMINANCE (AVERAGE) OFFICE AREA : 250 LUX PUBLIC AREA : 150 LUX CURB SIDE : 30 LUX	NO MODIFICATION
2	EMERGENCY LIGHTS	PUBLIC AREA ONE/70 m ²	EXISTING LIGHTS WILL BE USED
3	SOCKET OUTLET	OFFICE AREA ONE/15 m ² PUBLIC AREA ONE/60 m ² (OFFICE WILL BE PROVIDED WITH AT LEAST ONE SOCKET OUTLET)	NO MODIFICATION
4	WALK THROUGH TYPE METAL DETECTOR	1 SET	1 SET
5	HAND TYPE METAL DETECTOR	3 SETS	1 SET
6	TOILET	INCLUDE ONE TOILET FOR DISABLED PASSENGER	NO MODIFICATION
7	FIRE HYDRANT	1 SET (OUTDOOR) 2 SETS (INDOOR)	1 SET (INDOOR)
8	FIRE EXTINGUISHER	PUBLIC AREA ONE/400 m ²	EXISTING EXTINGUISHER WILL BE USED
9	GENERATOR SERVICE	OFFICE AREA : 50% OF LIGHTING FIXTURES PUBLIC AREA : 50% OF LIGHTING FIXTURES CURBAREA : 50% OF LIGHTING FIXTURES SOCKET OUTLET FOR COMPUTER	ONLY PUBLIC AREA WILL BE PROVIDED WITH GENERATOR SERVICE

PRIORITY	EQUIPMENT AND FACILITY	NEW TERMINAL BUILDING	EXISTING BUILDING
10	L/V SWITCHGEAR PANEL	1 LOT	NO MODIFICATION OF EXISTING POWER SUPPLY SYSTEM
11	WEIGH SCALE	6 SETS	EXISTING WEIGH SCALE WILL BE USED
12	PUBLIC ADDRESS (WITH CHEME)	TO BE INSTALLED IN PUBLIC AREA, AIRLINE OFFICE, STAFF OFFICE AND VIP ROOM	AMPLIFIER AND SPEAKER WILL BE REPLACED
13	CLOCK	TO BE INSTALLED IN PUBLIC AREA, AIRLINE OFFICE, STAFF OFFICE AND VIP ROOM	EXISTING CLOCK WILL BE REPLACED
14	TELEPHONE (WITH EPABX) CITY CALL AND INTERNAL COMMUNICATIONS ARE AVAILABLE BY MASTER TELEPHONE	PIPE AND OUTLET BOX WILL BE INSTALLED FOR THE FOLLOWING PUBLIC TELEPHONE (PUBLIC HALL, DEPARTURE LOUNGE), AIRLINE OFFICE, POLICE OFFICE, QUARANTINE OFFICE AND DUTY FREE SHOP MASTER TELEPHONE WILL BE PROVIDED FOR THE FOLLOWING AIRPORT COMMANDANT, CHIEF OF ADMIN., CHIEF OF SECURITY, CHIEF OF IMMIGRATION, CHIEF OF CUSTOM AND VIP ROOM INTERNAL COMMUNICATION TELEPHONE WILL BE PROVIDED IN AIRLINE OFFICE AND STAFF OFFICE	NO MODIFICATION OF THE EXISTING PUBLIC TELEPHONE NO MODIFICATION OF AIRLINES TELEPHONE LINE NO INSTALLATION INTERNAL COMMUNICATION TELEPHONE WILL BE PROVIDED IN AIRLINE OFFICE AND STAFF OFFICE
15	BELT CONVEYER	CHECK IN BAGGAGE CONVEYER BAGGAGE CLAIM CONVEYER	NO INSTALLATION

PRIORITY	EQUIPMENT AND FACILITY	NEW TERMINAL BUILDING	EXISTING BUILDING
16	SEPTIC TANK WITH SOAK FIELD	ALL SEWAGE WATER WILL BE GATHERED TO A NEW SEPTIC TANK	NO MODIFICATION (NO CONNECTION TO NEW SEPTIC TANK)
17	VENTILATING SYSTEM CEILING FAN	TO BE PROVIDED IN PUBLIC AREA, STAFF OFFICE OF GROUND FLOOR, AND AIR-LINE OFFICE OF GROUND FLOOR	NO MODIFICATION
	VENTILATING FAN	TO BE PROVIDED IN TOILET OF 1ST FLOOR ONLY	NO INSTALLATION
18	AIR CONDITIONER	TO BE PROVIDED IN AIRPORT COMMANDANT ROOM, ADMIN. ROOM, 1ST FLOOR OF AIR-LINE OFFICE AND VIP LOUNGE	NO INSTALLATION
19	KITCHEN	KITCHENET TO BE PROVIDED	NO MODIFICATION

MINUTES OF MEETING

Julian Forsyth
DCA

1. Date : June 29, 1988
2. Place : Deputy Director's Office , CAD
3. Attendant : Mr. Chris Phelps *CP* Deputy Director of Civil Aviation
Mr. Joseph Kasten Airport Commandant, Bauerfield
Mr. Toru Shimada *TS* PCI
4. Subject : Layout plan of Road and Carpark
5. Major Item Discussed :
 - 1) Proposed private car parking space (150 and 50 lots in existing and new carpark respectively) is considered to have sufficient space. About 25 taxi standing will be provided on the east of terminal building. Bus standing will be provided on the south of new carpark, along the road.
 - 2) East end of curb will be used for taxi loading. West end of curb will be used for public bus loading/unloading. The remainder will be used for four buses and private cars loading/unloading.
 - 3) Pedestrian crossing is necessary in front of international terminal.
 - 4) Traffic sign board (stop, give way, no entrance, etc.) will be provided where necessary.

MINUTES OF DISCUSSIONS

1. Subject : Air Navigation Facilities
2. Date : June 28, 1988
3. Place : Civil Aviation Department
Director's Room
4. Attendant : The Government of Vanuatu

[Handwritten initials]
Mr. J. Forsyth : Director of Civil Aviation
Mr. C. Phelps : Deputy Director of Civil Aviation
Mr. Y. Tsuda : Expert Radio Engineer

The Japanese study team

[Handwritten initials] Mr. K Takeda : Air Navigation Engineer

5. Result of Discussion:

The following is the detail of the request by the Government of Vanuatu on the air navigation facilities to be included in the Japan's Grant Aid:

5.1 Replacement of Conventional VOR/DME

Replacement of the existing conventional VOR/DME at the existing location shall include the following equipment and facilities:

- VOR equipment : 1 set
50 watt dual equipment
- DME equipment : 1 set
1 kwatt dual equipment
- Power supply and emergency generator : 1 set

A surge absorbing transformer should be considered to be included in the power line in order to prevent the equipment from lightning surge voltage.

The power supply to new equipment whether DC or AC will be studied taking into account investment and maintenance costs, and ease of maintenance. If batteries are considered, lead acid batteries should be applied.

The identification code signal of the VOR should discriminate power source whether commercial or emergency generator.

- Building for VOR/DME equipment and generator : 1 set
Equipment room to be provided with air conditioning

An alternative study as to building (whether renovation of the existing building or prefabricated shelter or construction of a concrete structure building) should be carried out in order to minimize costs and stop of VOR/DME operations.

- Replacement of high tension power cable and transformer in the site : 1 L.S
- Provision of order wire : 1 set
VHF AM air band transceiver, 10 watt

5.2 Replacement of Locator "BA"

Replacement of the locator at the existing location should include the following:

- Transmitter : 1 set
Dual equipment, 25 watt RF power
- Vertical aerials* : 1 set
- Charger and batteries : 1 set
- Power distribution box outside the equipment shed : 1 set
- Locator monitor receiver : 1 set

*Note : Utilization of the existing aerials is subject to the further study how the stop of the locator operations can be minimized.

The existing facilities to be utilized will be equipment shed without air conditioning and radial earth.

5.3 Testing Equipment and Monitor Receiver

The new testing equipment and monitor receivers requested by the Government of Vanuatu are in order of priority as follows:

(1) Testing Equipment

- 1) Oscilloscope : 1 set
150 Mhz, one channel
- 2) Frequency counter : 1 set
200 Mhz, Accuracy: 1×10^{-7}

- 3) RF standard signal generator : 1 set
upto 150 Mhz
 - 4) Attenuator : 1 set
Bird 8322 or equivalent,
200 watt, 30dB, 500 Mhz
 - 5) Wattmeter : 2 sets
Bird 43 or equivalent
Element: 95 - 150 Mhz 2.5 watt : 1 piece
100 - 250 Mhz 100 watt : 1 piece
 - 6) DC power supply equipment : 1 set
Noiseless (series regulator) type
0 - 30 volt, 0 - 10 amp
 - 7) AF signal generator : 1 set
200 khz maximum, 600 ohm, 1 V RMS
- (2) Monitor Receivers
- 1) Air monitor receiver : 1 set
NRD-93 or RG81B or equivalent
100 khz - 30 Mhz
Accuracy: 10hz, digital display
 - 2) NDB monitor receiver : 1 set
- 5.4 Four-wheel Drive Motor Vehicle equipped with Transceiver
- 1) Four-wheel drive motor vehicle : 1 car
Toyota or Nissan, wagon type
 - 2) Transceiver with antenna : 1 set
VHF AM air band transceiver, 10 watt

The Japanese Study Team understood the above request and will study it in the basic design henceforce.

MINUTES OF MEETING

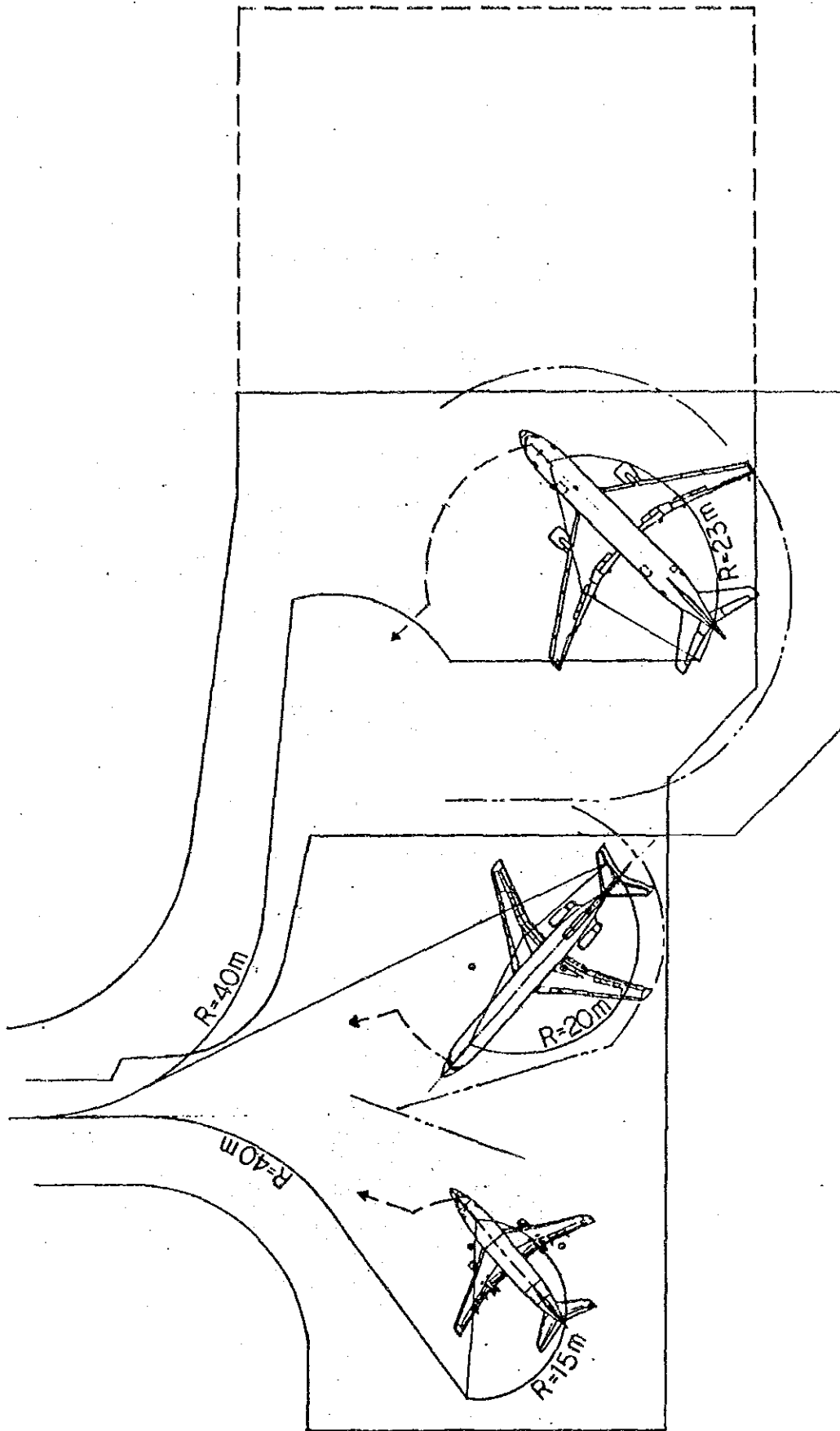
1. Date : June 28, 1988 (10:20 - 11:00)
2. Place : Director's office, CAD
3. Attendant : Mr. Julian Forsyth Director of Civil Aviation
Mr. Chris Phelps (WJP) Deputy Director of Civil Aviation
Mr. Toru Shimada PCI
4. Subject : Demand Forecast
5. Major Item Discussed :

1) Although further study will be carried out in the Basic Design Study, the following target demand is considered to be reasonable for the Project.

- Target year : 1995
- Design day : Average day of the peak month
- Target annual demand :
 - International : 150,000 pax. (approx.)
(Exclude transit 40,000 pax.)
 - Domestic : 100,000 pax. (approx.)
- Design day demand :
 - International : Dep. & Arr. : 570 pax.
Transit : 150 pax.
Movement : B767 : 2
B727 : 2
B737 : 4
 - Domestic : Dep. & Arr. : 340 pax.
Movement : DHC-8 : 4
DHC-6 : 12
BN2 : 8
- Peak hour demand :
 - International : Two way : B767 : 2 mvt
B727 : 1 mvt
Total Pax : 435 pax.
Dep. & Arr. : 360 pax.
Transit : 75 pax.
 - One way : B767 : 1 mvt
B727 : 1 mvt
Total pax. : 275 pax.
Dep. or Arr. : 200 pax.
Transit : 75 pax.
 - Domestic : Two way : DHC-8 : 1 mvt
DHC-6 : 3 mvt
BN2 : 2 mvt
Total Pax. : 85 pax.
 - One way : DHC-8 : 1 mvt
DHC-6 : 3 mvt
BN2 : 2 mvt
Dep. or Arr. : 85 pax.

MINUTES OF MEETING

1. Date : June 28, 1988 (14:00 - 15:00)
2. Place : Conference Room, CAD
3. Attendant : Mr. Julian Forsyth *JF* Director of Civil Aviation
Mr. Chris Phelps *CP* Deputy Director of Civil Aviation
Mr. Yoshio Tuda JICA Expert
Mr. Srendra Snbh Manager of BP South-West Pacific Limited in Vanuatu
Mr. Andrew Singh Manager of Sell
Capt. Bill Thompson Air Vanuatu
Mr. Toru Shimada *TS* PCI
4. Subject : Construction of Apron
5. Major Item Discussed :
 - 1) Maneuvering and parking position of aircraft proposed by PCI (Attachment-1) was accepted basically. (It was requested on June 29 that turning radii of B-767 should be larger in order to accommodate - 300 series.)
 - 2) The existing 4 inch fuel pipe is laid under the existing apron pavement. Lay out plan of the existing fuel pipe will be submitted by July 1.
 - 3) *Two* fuel hydrants will be provided for a new B767 aircraft stand.
 - 4) In case that the apron expansion is included in the 1988 Japan Grant Aid Project, extension of fuel pipe and installation of fuel hydrant should be completed by May 1989.
 - 5) BP and Shell will study a possibility of the above schedule. The result will be informed by July 1. (It was informed on June 29 that BP will be able to extend fuel pipe and provide hydrants to meet the above schedule.)
 - 6) Widening of the taxiway and expansion of the apron is able to be carried out in day time when international flight is not scheduled.
 - 7) As the existing CCR is to be utilized for new apron edge lights, an additional CCR will be required for extension of runway.



MINUTES OF DISCUSSIONS

ON
THE BASIC DESIGN
OF
THE PROJECT FOR CONSTRUCTING THE TERMINAL BUILDING
OF
BAUERFIELD INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF VANUATU

In response to the request of the Government of the Republic of Vanuatu, the Government of Japan decided to conduct a basic design study on the Project for Constructing the Terminal Building of Bauerfield International Airport (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to the Republic of Vanuatu the study team headed by Mr. Masamichi WATANABE, Deputy Director, Construction Division, Aerodrome Department, Civil Aviation Bureau, Ministry of Transport from June 12 to July 5, 1988.

As the result of the study, JICA prepared a draft report and dispatched a team headed by Mr. M. WATANABE to explain and discuss it from September 8 to 21, 1988.

Both parties had a series of discussions on the report and agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Port Vila, September 16, 1988

渡辺正道

MASAMICHI WATANABE
Leader
Basic Design Study Team
Japan International
Cooperation Agency

HAROLD G. WALTON
Minister for CIVIL Aviation,
Communications, Energy
and Tourism



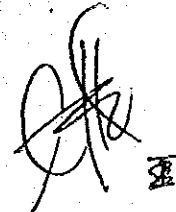
ATTACHMENT

1. Bauerfield International Airport is to be developed based on a 150 meter wide runway strip.
2. The Vanuatu side requested to implement the Project in Japanese FY 1988. However, the Study Team stated that it was impossible to take up the Project in FY 1988.
3. The Vanuatu side requested to include the installation of air navigational equipment in the scope of work for First Stage. The Study Team stated that it was, however, very difficult to include them in the First Stage due to the budget to be allocated to the First Stage of the Project, but they would convey this request to the Japanese Government.
4. (1) The Vanuatu side requested to provide a covered walkway from the new international passenger terminal building to the aircraft stands on the existing apron so as to avoid the inconvenience of passengers under rainfall.

(2) The Study Team proposed to shift the proposed location of the new international terminal building closer to the existing terminal building as shown in Alt-1A, page 4-9 in the Draft Final Report attached hereto (ANNEX III) in order to minimize the walking distance between two terminals. The Vanuatu side agreed to the above proposal and confirmed that the Government of Vanuatu will demolish the existing VIP building and clear the site by the start of the construction works.
5. The Vanuatu side requested to provide canopies at the entrance to the arrival hall and the exit from the departure lounge. The Study Team stated that the construction of canopies on airside would be subject to the budget to be allocated to the Project.
6. The Vanuatu side has agreed in principle to the basic design proposed in the Draft Final Report with minor but appropriate alteration as shown in ANNEX-I to be incorporated in the Final Report.
7. The Vanuatu side has understood Japan's grant aid system, including the principle of using a Japanese consulting firm and a Japanese general contractor for the implementation of the Project, and confirmed that the necessary measures will be taken by the Vanuatu side as shown in ANNEX-II which are manifested in the ANNEX-III of the MINUTES OF DISCUSSIONS on the Project signed on June 24, 1988 on condition that the grant aid by the Government of Japan would be extended to the Project. Especially, the Vanuatu side stated that

they would demolish the existing houses in the site and clear the site by the end of March, 1989 and notify Japanese side of the completion of those works through the official channel.

8. The Vanuatu side ensured the provision of necessary budget for the adequate personnel services, maintenance and operation expenses of the Terminal Building.
9. The Final Report (10 copies in English) will be submitted to the Vanuatu side by the end of October, 1988.

A handwritten signature and initials, possibly 'JF', are located in the bottom right corner of the page.

NECESSARY ALTERATION TO THE DRAFT FINAL REPORT

1. To revise the layout of the passenger terminal facilities as indicated in ANNEX IV in order to achieve Items 4 and 5 in ATTACHMENT based on ANNEX III.
2. To relocate the bank inside the building taking into account uses by both arrival and departure passengers and its security.
3. To encompass the snack bar in the checkin lobby by a partition so as to limit the place for the eating and drinking.
4. To rearrange the corridor straight to the observation deck from the staircase and to separate office area from the public area. The toilet on the first floor will be in the office area, and be utilized by staff only.
5. To rearrange the counter area for the rent a car and tour so as to be inside the building and be protected from the outside public area.
6. To provide a roof covering the observation deck. The roof will be connected with chain link fabric around the observation deck.
7. To relocate the public toilets outside to the checkin lobby area.
8. To modify the aesthetic solution of facade by replacing the square roof at each end with a long eaves.
9. To provide a name board of "Bauerfield International Airport" on the air side of the new international terminal building.
10. To make necessary revisions to the basic design of the international passenger terminal building on the building plans (ANNEX V and VI) which is prepared by incorporating all the comments from the organizations of Vanuatu related to the Project.

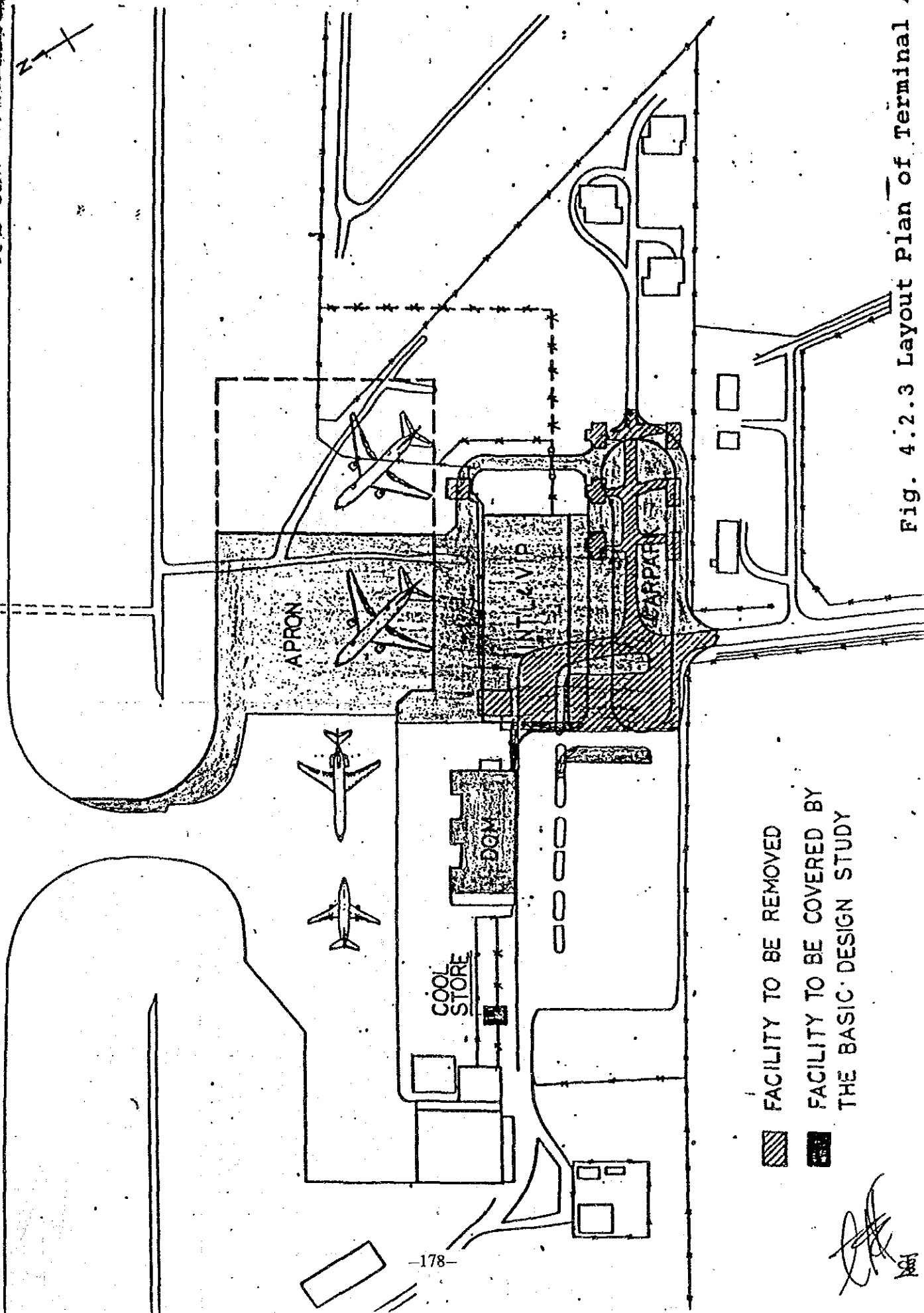


MEASURES TO BE TAKEN BY THE GOVERNMENT OF VANUATU

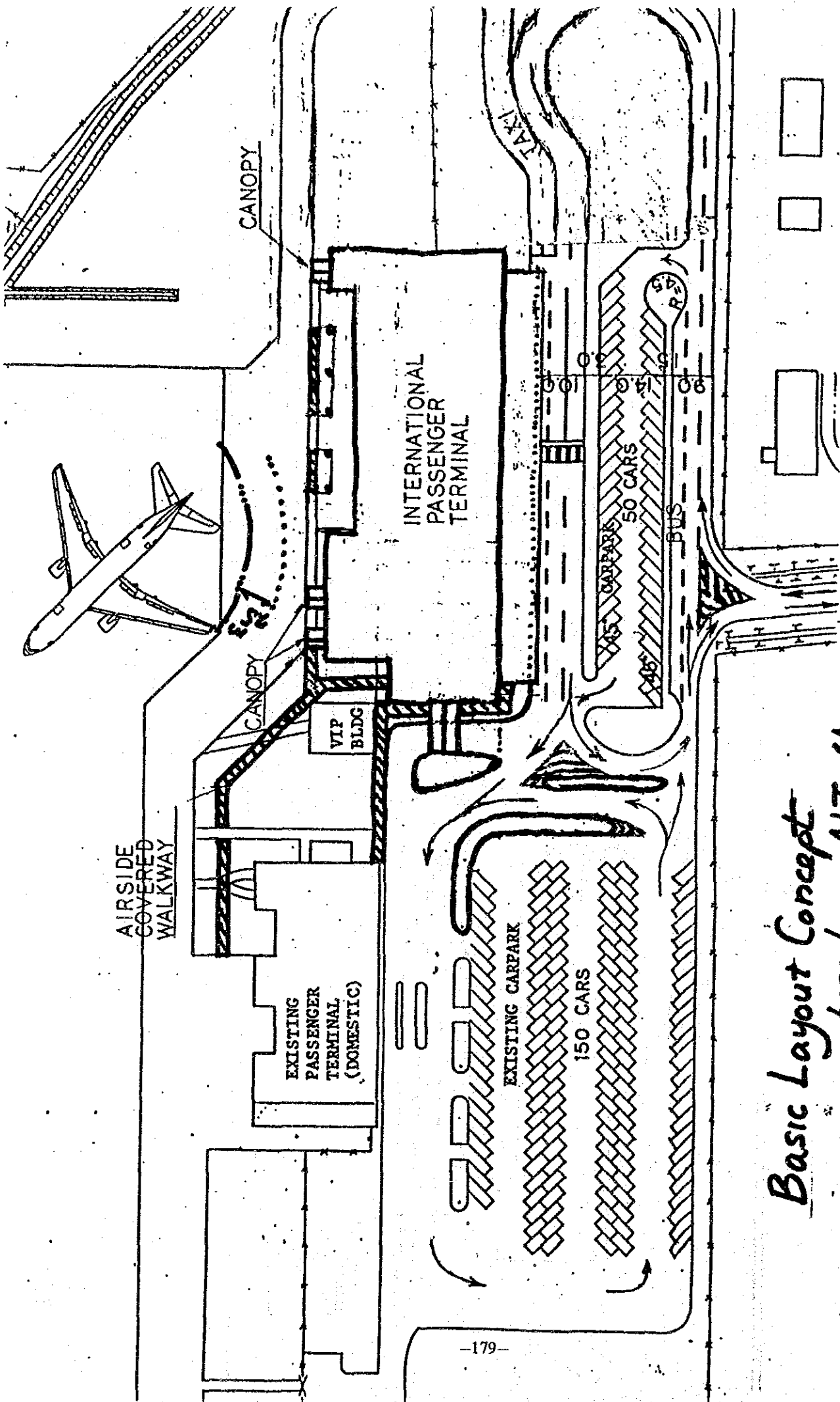
1. To demolish the existing houses on the site, and to clear the site for the Project before construction starts.
2. To provide data and information necessary for the Project.
3. To provide power supply, water supply, drainage, telephone access and other incidental facilities to the Project site.
4. To ensure prompt unloading and customs clearance, customs duty exemption of the products for the Project at the port of disembarkation in Vanuatu.
5. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of materials for the construction, equipment, and services under the verified contracts.



Fig. 4.2.3 Layout Plan of Terminal Area

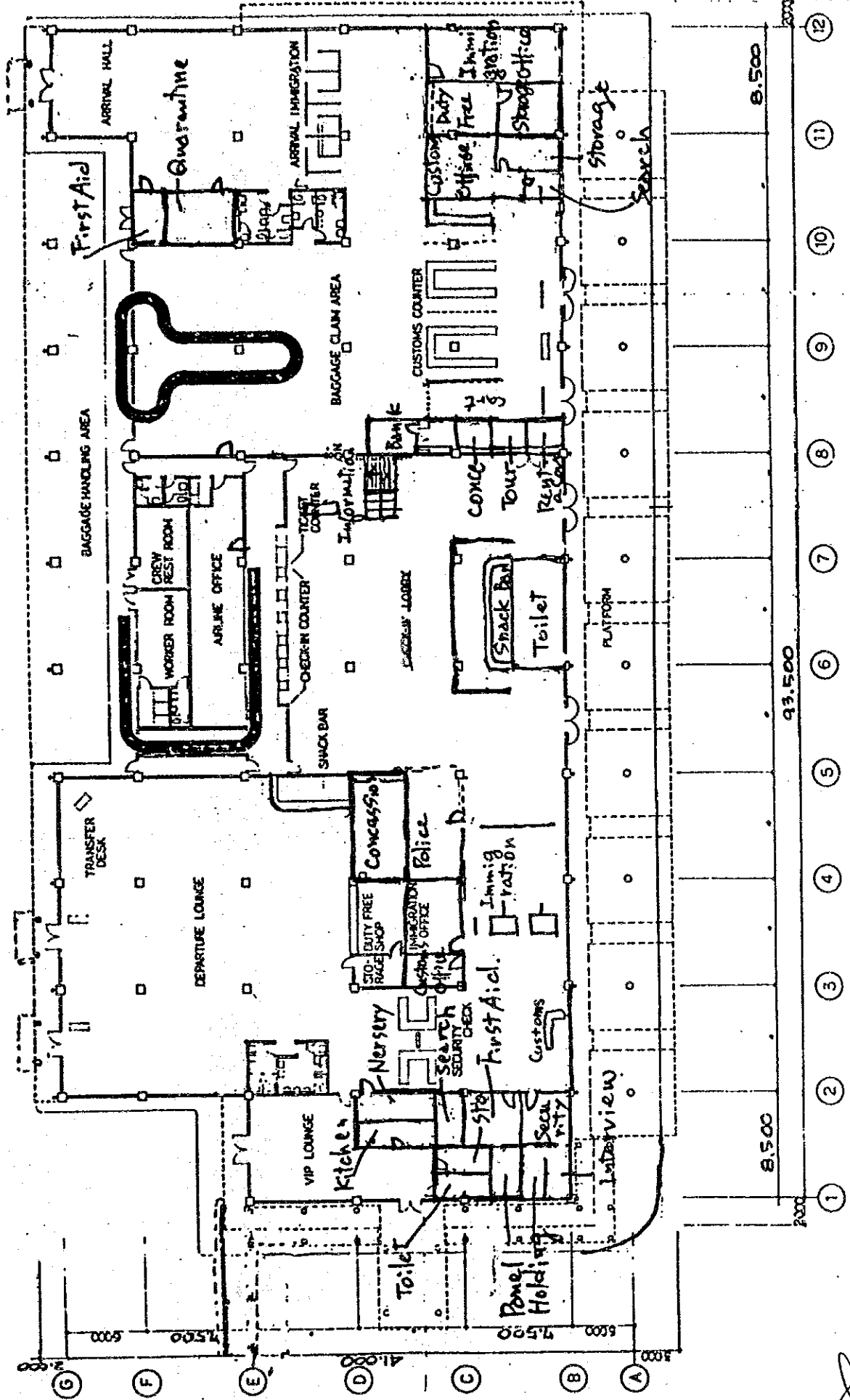


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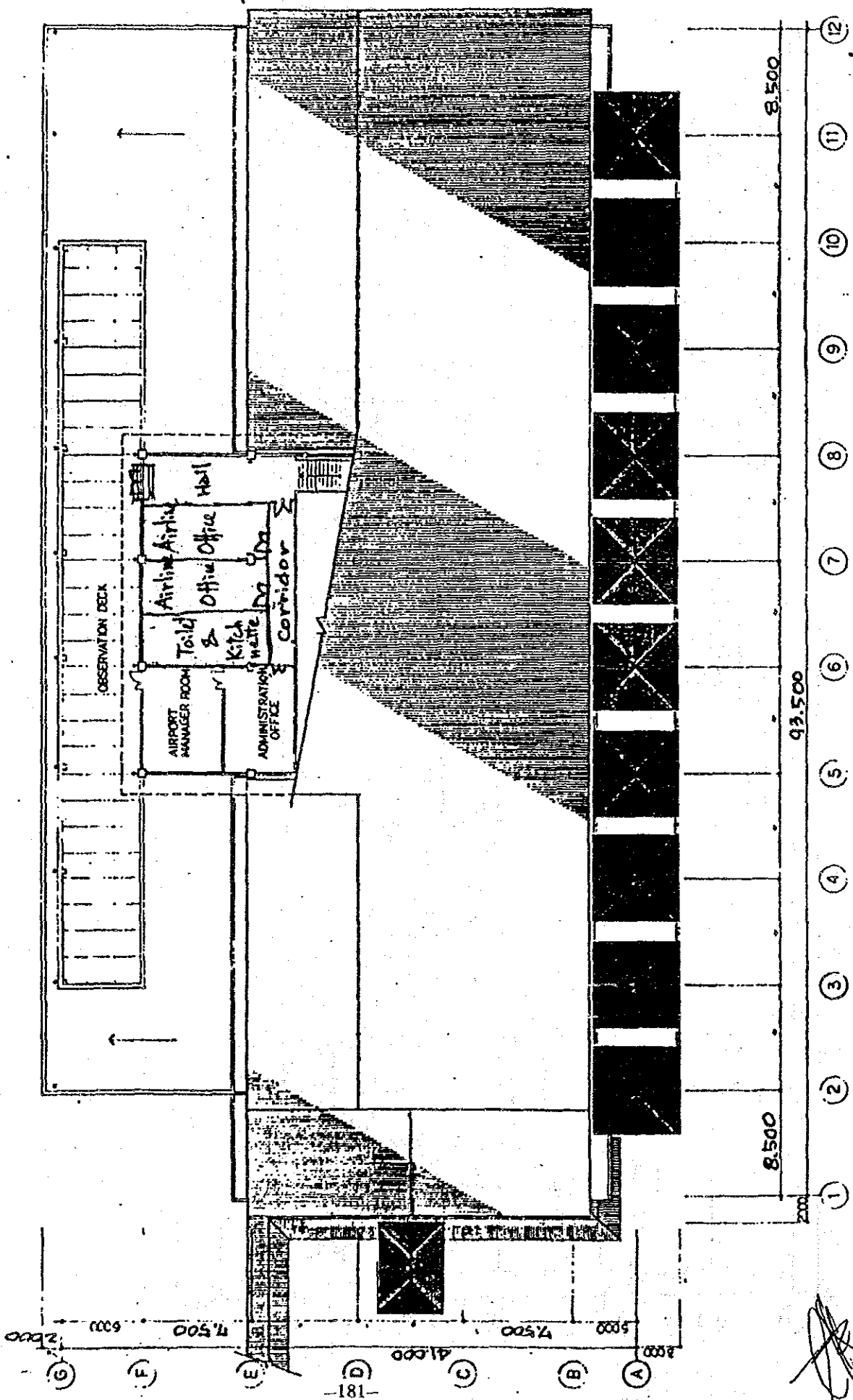
*Basic Layout Concept
based on ALT-1A*

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10/1



16 Sep. 1988 Revised

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16 Sep. 1988 Revised

FIRST FLOOR PLAN

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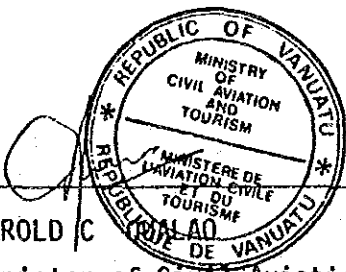
BAUERFIELD INTERNATIONAL AIRPORT DEVELOPMENT

RECORD OF DISCUSSION

At a joint meeting held between representatives of the Japanese Basic Terminal Design Study Team and the Governments of Australia and Vanuatu at Port-Vila on 14 September, 1988, it was confirmed that the Bauerfield International Airport Development Project would proceed on the basis of a 600 metre runway extension on the existing 150 metre strip, with the inclusion of other items as recommended by the Australian Civil Aviation Authority, and the construction of a new international terminal building and the provision of other related facilities on a site adjacent to the existing terminal, and that these projects would be undertaken as outlined in the accompanying Annexes I to III.

Port-Vila

16 September, 1988



HAROLD C
Minister of Civil Aviation,
Communications, Energy and
Tourism,
Republic of Vanuatu

ED PEEK
Second Secretary
(Development Assistance),
Australian High Commission,
Port-Vila

渡辺正道

MASAMICHI WATANABE
Leader
Basic Design Study Team,
Japan International
Cooperation Agency

The Representatives of VANUATU,

- noting that the Terminal Project would be implemented in two stages, asked that the provision and installation of air navigation equipment be included in the first stage, rather than in the second stage as proposed;
- noted that Japan proposed to commence Stage 1 of the Project in June, 1989, and asked that it be formally recorded that the Government of Vanuatu wished the Project to commence in 1988. To this end, they asked that the Project be presented to any meeting of the Japanese Cabinet which might be held before the next meeting of the Cabinet at which the consideration of aid projects was scheduled;
- noted that Stage 1 of the Project was planned for completion in February, 1991; and that Stage 2 of the Project was planned to commence in June, 1990, and to be completed in October, 1991;
- confirmed that the Government of Vanuatu wished the Bauerfield Airport Development Project to proceed on the basis of a 600 metre runway extension on the existing 150 metre strip; and
- indicated that the Government of Vanuatu wished the Project to commence as soon as possible

of [signature]

The Representatives of AUSTRALIA,

- stated that the Australian Government was seeking a precise statement of requirements from the Government of Vanuatu now that it had been advised of the nature of the Japanese international terminal project and the proposed timing of that project;
- stated that the Australian Government was still prepared to be flexible in its approach to its element of the project, both in regard to the nature of the project itself and its timing;
- advised that it was possible to commence the runway extension in May, 1989, and to complete construction in no more than 6 months; but that a number of matters would have to be finalised beforehand, including land acquisitions to the south-eastern and north-western ends of the runway and the securing of rights to coral deposits near Erakor Village;
- advised that there seemed to be no reason why Bauerfield should not be used by Boeing 767 aircraft, although some operational restrictions might have to be applied to the operation of Australian-registered aircraft in certain visibility conditions;
- noted and supported the request of the representatives of Vanuatu to have the air navigation equipment provided and installed in the first stage of the Japanese project;
- stated that AIDAB would await a formal report from the CAA, and indicated informally that AIDAB would agree to include in the Australian project those necessary additional items recommended in that report, its understanding being that this would not involve major additional cost; and
- confirmed that the Australian Government would fund the 600 metre runway extension on the existing 150 metre strip and the completion of ancillary works in response to the request of the Government of Vanuatu

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The Representatives of JAPAN,

- noted the presentations of the Representatives of Vanuatu and Australia;
- observed that moving the provision and installation of air navigation equipment from Stage 2 to Stage 1 of the Japanese Project could be difficult due to budgetary limitations; and
- noted the desire of the Government of Vanuatu to have the Japanese Project commence within the fiscal year 1988, but observed that this might be difficult because of the way in which the Japanese Grant Aid System operated

CA D SE

MINUTES OF DISCUSSION

1. Date : September 16, 1988
2. Place : Passenger Terminal Building, Bauerfield International Airport
3. Attendants : Mr. Chris Phelps DCA
 Mr. Martin Quaile PWD
 Mr. Tokio Oda PCI

4. Items Discussed :

The renovation of the existing passenger terminal building will consist of the following works.

- 1) To remove the existing government control counters and to repair the floor and the wall where those counters are located if necessary.
- 2) To provide two rooms for airlines in the existing departure lounge and arrival immigration area by providing necessary partitions.
- 3) To remove one of the existing roller conveyors in the airline office and to fill openings of the walls.
- 4) To repair damaged ceiling of landside canopy.
- 5) The following repairs were noted as were requested in the course of the inspection with the above officials of DCA and PWD in addition to the above works. However, those implementation can not be determined at present and will be subject to the budget availability.
 - (1) To upgrade the observation deck as much similar to the standard of the international terminal building as possible (roof and fence).
 - (2) To change airside downspout to gargoyle so as not to be choked by foreign material.
 - (3) To repaint the staircase to the observation deck.
 - (4) To repaint the suspended ceiling.
 - (5) To replace the plastic tiles in the check-in lobby with new ones.

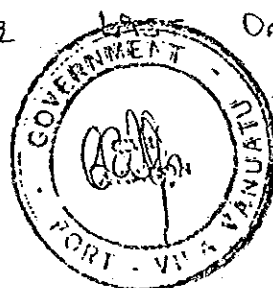
PRIORITY (2)

SHOUD

BIZ

ON2

PCI Tokio Oda



Appendix - D

List of Personnel Taking Part in Discussions

Embassy of Japan in Fiji

Mr. Toshio Isogai	Ambassador, Embassy of Japan in Fiji
Mr. Shunji Nishimura	Councilor, Embassy of Japan in Fiji
Mr. Katsuyuki Ozawa	Second Secretary, Embassy of Japan in Fiji

JICA Office in Fiji

Mr. Yoshio Yoshida	Resident Representative
Mr. Syunichi Mizuuchi	Assistant Resident Representative

JICA Office in Australia

Mr. Hitosi Sasaki	Chief Representative
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Government of the Republic of Vanuatu

Mr. Harold C. Qualao	Minister of Civil Aviation, Communications, Energy and Tourism
Mr. Clarence L. Marae	First Secretary, Ministry of Aviation, Communications, Energy and Tourism
Mr. Josias Moli	Second Secretary (Communications), Ministry of Aviation, Communications, Energy and Tourism
Mr. Frederick Tau	Second Secretary (Aviation), Ministry of Aviation, Communications, Energy and Tourism
Mr. Julian Forsyth	Director of Civil Aviation
Mr. Chris Phelps	Deputy Director of Civil Aviation
Mr. David Boag	Director of Public Works
Mr. Jules Ellis	National Planning and Statistics Office
Mr. Larry Hunt	Department of Lands
Mr. Joseph Kasten	Airport Commandant, Bauerfield International Airport
Mr. Gordon Hains	Principal Immigration Officer
Mr. Andrew Bambara	Deputy Principal Immigration Officer
Mr. Bob Weller	Senior Plant Quarantine Officer
Mr. Benuel Tarilongi	Quarantine Officer
Mr. Geoff M. Hough	Senior Collector of Customs
Mr. Kalopa Malang	Collector of Customs (Bauerfield)
Mr. Bryan Mahon	Director of Police Training
Mr. Tony Lee	Structural Engineer, Public Works Department
Mr. Tarosa E. Ismael	Director of Posts and Telecommunications
Mr. Anthony P. Simmons	Principal Engineer, Posts & Telecom. Dep.
Mr. Daniel Tuku	Foreman, Department of Water Supply

JICA Expert in Vanuatu

Mr. Yoshio Tsuda	Expert Radio Engineer, JICA
Mr. Goro Kumon	Expert Radio Engineer, JICA

Airlines

Mr. Peter W. Roberts	Chief Executive, Air Vanuatu
Mr. Keith Molloy	Air Vanuatu
Mr. Bill Thompson	Air Vanuatu
Ms. Jane Hammacott	Vanuatu Travel Service Ltd. Agent of Air Pacific and Air Niugini
Mr. Mark Dunn	Air Pacific
Mr. Joseph Laloyer	Manager, Air Caledonie
Mr. Peter Booth	General manager, Air Melanesiae
Mr. Floyd Smith	Manager, Air Melanesiae International
Mr. John Stephens	Air Melanesiae Bauerfield
Mr. Sato Kilman	General manager, DOVAIR

International Civil Aviation Organization

Mr. Gray E. Elphinstone	Aviation Security Adviser
Mr. Graham A. Lockwood	Aviation Security Adviser

Australian International Development Assistance Bureau

Mr. Rod Irwin	Department of Foreign Affairs
Mr. Graham Nicholls	Department of Foreign Affairs
Mr. Ed. Peek	Department of Foreign Affairs

Airport Consulting and Construction Australia Pty Ltd

Mr. Graham F. Hack Be	Director
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Others

Mr. Surendra Singh	Manager, BP South-West Pacific Ltd. Vanuatu
Mr. Andrew Singh	Manager, Sell
Mr. Jean-Claude Tranape	Engineer, UNELCO
Mr. Noel Gardner	Manager, Camelon McNamara
Mr. Paul Hofmeister	Air Bar

Appendix - E

List of Data Collected

<u>Data</u>	<u>Source</u>
Estimates of Revenues and Expenditures	Government of the Republic of Vanuatu
The Employment Act No.1 of 1983	Ditto
The Employment (Amendment) Act No.20 of 1986	Ditto
Socio-economic Development Strategies and External Assistance Priorities Volume I Main Report June 1988	Ditto
Vanuatu Facts & Figures 1987 Edition	National Planning and Statistics Office
Report of the Vanuatu Urban Census 1986	Ditto
Demographic Analysis : Marriage, Fertility and Infant Mortality Vanuatu Urban Census 1986	Ditto
Family Income and Expenditure Survey of Urban Areas 1985 Main Results	Ditto
Employment Survey 1983 : The Private Sector in the Urban Areas Volume I	Ditto
Vanuatu Overseas Trade 1983,1984	Ditto
Report on the Agricultural census 1983/1984 Part I The Result	Ditto
Report on the Agricultural census 1983/1984 Part III Summary of the Census	Ditto
Consumer Price Indices 1986	Ditto
Overseas Migration 1985	Ditto
Statistical Indicators 1987 4th Quarter	Ditto
Overseas Trade Part II Exports 1982-1987	Ditto

Monetary and Banking Statistics 4th Quarter 1987	Ditto
Annual Report and Statement of Accounts for 1987	Central Bank of Vanuatu
Quarterly Economic Review Vol.I Sep. 1986	Ditto
Ditto Vol.I Dec. 1986	Ditto
Ditto Vol.II Mar. 1987	Ditto
Ditto Vol.II Jun. 1987	Ditto
Ditto Vol.II Sep. 1987	Ditto
Investing in Vanuatu, a Guide to Entrepreneurs Mar.1983	Ministry of Finance, Commerce, Industry and Tourism
Employer's Guide	Vanuatu National Provident Fund
Pacific Population Paper No.1 Fertility and Mortality in Vanuatu The Demographic analysis of the 1979 Census	South Pacific Commission
Photogrammetric Plot Scale 1:2500 Sheet Efate 2153 Sheet Efate 2352 Sheet Efate 2353 Sheet Efate 2452 Sheet Efate 2453 Sheet Efate 2454 Sheet Efate 2455 Sheet Efate 2553 Sheet Efate 2554	British Government's Ministry of Overseas Development
Aeronautical Information Publication Vanuatu Aviation	Department of Civil
The Civil Aviation (Aircraft Landing Fees Regulations) (Amendment) Order No.20 of 1988	Ditto
The Civil Aviation (Air Navigation) Regulation No.21 of 1988	Ditto

Aerodrome Bauerfield Drainage de la Zone S.E.	Ditto
The Development of Civil Aviation in Vanuatu	ITA
Tender Enquiry Document, Bauerfield Airport Vanuatu, Pavement Rehabilitation	Australian Development Assistance Bureau
Planning Report, Bauerfield Airport Vanuatu, Review of Airport Development Options	Ditto
Engineering Report, Bauerfield Airport Vanuatu, Pavement Strength Evaluation, Determination of Allowable Aircraft Traffic Using APLES System	Australian International Development Assistance Bureau
Drawing "Hotel Le Lagon Nouveau Poste de Transformation"	UNELCO
Drawing "Hotel des Postes de Port Vila Ile Vate Poste de Transformation"	Ditto
Drawing "Aerodrome de Bauerfield Cables Alimentation Blocks Techniques"	Ditto
Drawing "Region de Tugabe Electrification Aerodrome"	Ditto
Drawing "Aerodrome de Bauerfield Cables D'Alimentation Aerogare & Blocs Techniques"	Ditto
Drawing "Cable Layout to VOR/DME"	Ditto
Drawing "Exemple de Facturation Moyenne Tension Tarifs en Vigueur a Port Vila"	Ditto
Water Supply Piping Layout around the Existing Terminal	Department of Water Supply
Sketch of Air Melanesiae New Passenger Terminal Building	Air Melanesiae
Air Melanesiae Flight Operations - Passenger Comparison 1985/86/87/88 -	Ditto
Air Tariff : Effective 19th October, 1987	Ditto

Schedule Issue No 2 Effective : 19 Oct. 1987	Ditto
Traffic Record at Vila Aug. 1987 to May 1988	DOVAIR
Schedule No.013 Effective from : 25/05/88	Ditto
Answer to Questionnaires	Airport Commandant
Answer to Questionnaires	Director of Meteorological Information
Answer to Questionnaires	Principal Immigration Officer
Answer to Questionnaires	Customs
Answer to Questionnaires	Quarantine
Answer to Questionnaires	Police
Answer to Questionnaires	Air Vanuatu
Answer to Questionnaires	Air Pacific
Answer to Questionnaires	Air Niugini
Answer to Questionnaires	Air Caledonie
Ground Handling Equipment Required for Bauerfield Airport	Air Vanuatu
Accommodation Guide for Port Vila and Other Islands, April 1988 to March 1989	
Australian Standards Catalogue of SAA Publications 1988	Standards Association of Australia
Cordell's Price Index of Building Materials June 1988 New South Wales Edition	Cordell Building Publications
Cordell's Building Cost Guide, Commercial and Industrial New South Wales, June 1988 Updated Quarterly 2	Ditto
Cordell's Building Cost Guide, Housing New Construction Incorporating Alterations,	Ditto

Additions, Extensions, Conversions,
Renovations, New South Wales, June 1988
Updated Quarterly 2

Appendix - F

CALCULATION OF FLOOR AREA REQUIREMENTS

1. Average waiting time and space per passenger and/or greeters and well-wishers.

Average waiting time and space per passenger and/or greeters and well-wishers are listed below.

These figures are calculated in consideration of the customs of Vanuatu, which are described hereunder;

- (1) Well-wishers are allowed to enter the check-in lobby, the same as the present condition.
- (2) It is estimated that a passenger will spend 10 minutes for check-in and 20 minutes in the public area. (*1)
- (3) The number of greeters and well-wishers per passenger is estimated to be 1.0 persons.

Average Waiting Time and Space per Person

Facility	Item	Average Waiting Time	Space per Person
Public Lobby	Passenger	30 min. (*1)	1.5m ²
	Well-wisher	30 min.	1.5m ²
Departure Lounge	Standing		1.0m ²
	Passenger	-	
	Seated		1.5m ²
	Passenger	-	

2. Performance Standard

Maximum waiting times at each location are listed hereunder:

* Check-in Lobby	20 min.
* Check-in Counter	15
* Outbound Immigration	15
* Security Check	15
* Departure Lounge	20
* Inbound Immigration	15
* Customs Check	15

(International Passenger Terminal Building)

3. Required Check-in Counters

$$\begin{aligned}
 \text{Check-in Counters Required} &= \frac{a}{60} \left(\frac{bdf + cge}{bf + cg} \right) \\
 &= \frac{256}{60} \left(\frac{0.5 \times 1.5 \times 230 + 0.5 \times 160 \times 1.3}{0.5 \times 230 + 0.5 \times 160} \right) \\
 &= 6.0 \dots\dots\dots 6 \text{ Counters}
 \end{aligned}$$

Where:

- a = Equivalent peak hour passengers
- b = Proportion of long haul flights 0.5
- c = Proportion of short haul flights 0.5
- d = Check-in time per long haul passenger 1.5 min.
- e = Check-in time per short haul passenger 1.3 min.
- f = Average seats per long haul aircraft 230
- g = Average seats per short haul aircraft 160

$$200 \text{ pax.} \times \frac{15 \text{ min.}}{60 \text{ min.}} = 50 \text{ pax.}$$

$$\text{Mean} + 2 \times \sqrt{50} = 64 \text{ pax.}$$

$$a = \frac{64 \times 60}{15} = 256 \text{ pax.}$$

$$\begin{aligned}
 \text{Required Ticket Counters} &= \text{Check-in Counters} \times 20\% \\
 &= 1.2 \dots\dots\dots 2 \text{ Counters}
 \end{aligned}$$

4. Required Immigration Counters

$$\text{Counters Required} = \frac{df}{60} = \frac{256 \times 0.9}{60} = 3.84 \dots 4 \text{ Counters}$$

Where:

- a = Equivalent peak hour passengers
- f = Time per passenger 0.9 min.

5. Required Security Counters

$$\text{Counters Required} = \frac{df}{60} = \frac{256 \times 0.3}{60} = 1.28 \dots 2 \text{ Counters}$$

Where:

- a = Equivalent peak hour passengers
- f = Time per passenger 0.3 min.

6. Departure Lounge

Number of seats in peak hour = 160 + 230 = 390 seats

Load Factor 80% = 390 x 0.8 = 312 pax.

$$\begin{aligned} \text{Area Required} &= a (bd + ce) \times D = (0.25 \times 1 + 0.75 \times 1.5) \times 1.1 \\ &= 471 \dots \dots \dots 470 \text{ m}^2 \end{aligned}$$

Where:

- a = Peak hour passengers 312 pax.
- b = Ratio of standing passenger 0.25
- c = Ratio of seated passenger 0.75
- d = Unit rate for standing passenger 1.0 m²
- e = Unit rate for seated passenger 1.5 m²
- D = Ineffective space ratio 1.1

7. Departure Public Area

Area Required = Check-in Lobby + Public Space

1) Check-in Lobby

$$\begin{aligned} \text{Area Required} &= L \times D \times R = 14.5 \times 10.0 \times 1.2 \\ &= 174 \text{ m}^2 \dots\dots\dots 180 \text{ m}^2 \end{aligned}$$

Where:

$$\begin{aligned} L &= \text{Counter length} && 6 \times 1.75 + 2 \times 2.0 = 14.5 \text{ m} \\ D &= \text{Queuing length} && 10.0 \text{ m} \\ R &= \text{Ineffective space ratio} && 1.2 \end{aligned}$$

2) Public Space

$$\begin{aligned} \text{Area Required} &= \frac{agh}{60} [b(1 + e) + c(1 + f) + d] \\ &= \frac{240 \times 30 \times 1.5}{60} [0.5(1 + 1) + 0.5(1 + 1) + 0] \\ &= 360 \text{ m}^2 \dots\dots\dots 360 \text{ m}^2 \end{aligned}$$

Where:

$$\begin{aligned} a &= \text{Equivalent peak hour passengers} \\ b &= \text{Long haul proportion} && 0.5 \\ c &= \text{Short haul proportion} && 0.5 \\ d &= \text{Transfer proportion} && 0 \\ e &= \text{Well-wishers per long haul passenger} && *1 \\ f &= \text{Well-wishers per short haul passenger} && *1 \\ g &= \text{Average waiting time} && 30 \text{ min.} \\ h &= \text{Space per person} && 1.5 \text{ m}^2 \end{aligned}$$

$$200 \text{ pax.} \times \frac{30 \text{ min}}{60 \text{ min}} = 100 \text{ pax.}$$

$$\text{Mean} + 2 \times \text{Standard deviation} = 10 + 2 \times \sqrt{100} = 120 \text{ pax.}$$

$$a = 120 \times \frac{60}{30} = 240 \text{ pax.}$$

$$\text{Total Area Required} = 180 + 360 = 540 \text{ m}^2$$

8. Required Immigration Counters

$$\text{Counters Required} = \frac{df}{60} = \frac{256 \times 0.9}{60} = 3.84 \dots 4 \text{ Counters}$$

Where:

d = Equivalent peak hour passengers 256 pax.
f = Time per passenger 0.9 min.

9. Required Customs Counters

$$\text{Counters Required} = \frac{cd}{60} = \frac{256 \times 1}{60} = 4.26 \dots 5 \text{ Counters}$$

Where:

c = Equivalent peak hour passengers 256 pax.
d = Time per passenger

10. Required Effective Length of Arrival Conveyor

$$\begin{aligned} \text{Length Required} &= SN \times L/F \times a \times b \times UL \\ &= 230 \times 0.8 \times 1.1 \times 0.5 \times 0.33 = 33.4 \dots 33.5 \text{ m} \end{aligned}$$

where:

(B-767)

SN = Seat Capacity by Type of Aircraft 230 seats
L/F = Load Factor 0.8
a = No. of Baggage per passenger 1.1
b = Waiting Ratio 0.5
UL = Length per passenger 0.33 m

(Domestic Passenger Terminal Building)

1. Required Check-in Counters

$$\text{Check-in Counters Required} = \frac{a}{60} \left(\frac{bdf}{bf} + \frac{cge}{cg} \right) = \frac{120}{60} \times 2 = 4.0 \quad \dots 4 \text{ Counters}$$

Where:

a = Equivalent peak hour passengers	
b = Proportion of long haul flights	0
c = Proportion of short haul flights	1
d = Check-in time per long haul passenger	0
e = Check-in time per short haul passenger	2.0 min.
f = Average seats per long haul aircraft	0
g = Average seats per short haul aircraft	19

$$85 \text{ pax.} \times \frac{15 \text{ min}}{60 \text{ min}} = 21 \text{ pax.}$$

$$\text{Mean} + 2 \times \text{Standard deviation} = 21 \text{ pax.} + 2 \times \sqrt{21} = 30 \text{ pax.}$$

$$a = \frac{30 \times 60}{15} = 120 \text{ pax.}$$

$$\text{Required Ticket Counters} = \text{Check-in Counters} \times 15\% \\ 0.6 \dots \dots \dots 1 \text{ Counter}$$

2. Required Security Counters

$$\text{Counters Required} = \frac{df}{60} = \frac{120 \times 0.3}{60} = 0.6 \dots 1 \text{ Counter}$$

Where:

d = Equivalent peak hour passengers	120 pax.
f = Time per passenger	0.3 min.

3. Check-in Lobby

$$\text{Area Required} = L \times D \times R = 9.0 \times 10 \times 1.2 \\ = 108.0 \dots \dots \dots 110 \text{ m}^2$$

Where:

L = Counter length	$4 \times 1.75 + 1 \times 2.0 = 9.0 \text{ m}$
D = Queuing length	10.0 m
R = Ineffective spare ratio	1.2

4. Departure Lounge

$$\begin{aligned} \text{Area Required} &= a(bd + ce) \times D = 85(0.25 \times 1 + 0.75 \times 1.5) \times 1.1 \\ &= 128 \dots\dots\dots 130 \text{ m}^2 \end{aligned}$$

Where:

a = Peak hour passengers	85 pax.
b = Ratio of standing passenger	0.25
c = Ratio of seated passenger	0.75
d = Unit rate for standing passenger	1.0 m ²
e = Unit rate for seated passenger	1.5 m ²
D = Ineffective space ratio	1.1

5. Public Hall

Area required = Departure Public Space + Arrival Public Space

1) Departure Public Space

$$\begin{aligned} \text{Area Required} &= \frac{agh}{60} [b(1 + e) + c(1 + f) + d] \\ &= \frac{111 \times 30 \times 1.5}{60} \times 3 = 249.7 \dots 250 \text{ m}^2 \end{aligned}$$

Where:

a = Peak hour passengers	
b = Long haul proportion	0
c = Short haul proportion	1
d = Transfer proportion	0
e = Well-wishers per long haul passenger	0
f = Well-wishers per short haul passenger	2
g = Average waiting time	30 min.
h = Space per person	1.5 m ²

$$85 \text{ pax.} \times \frac{30 \text{ min}}{60 \text{ min}} = 42.5 \text{ pax.}$$

$$\text{Mean} + 2 \times \text{Standard deviation} = 42.5 + 2 \times 42.5 = 55.5 \text{ pax.}$$

$$a = 55.5 \times \frac{60 \text{ min}}{30 \text{ min}} = 111 \text{ pax.}$$

2) Arrival Public Space

$$\text{Area Required} = \frac{ah}{60} [g + f(bd + ce)]$$

$$= \frac{130 \times 1.5}{60} \times [10 + (30 \times 2)] = 227.5 \dots 230 \text{ m}^2$$

Where:

a = Peak hour passengers	
b = Long haul proportion	0
c = Short haul proportion	1
d = Welcomers per long haul passenger	0
e = Welcomers per short haul passenger	2
f = Average waiting time for welcomers	30 min.
g = Average waiting time for passenger	10 min.
h = Space per person	1.5 m ²

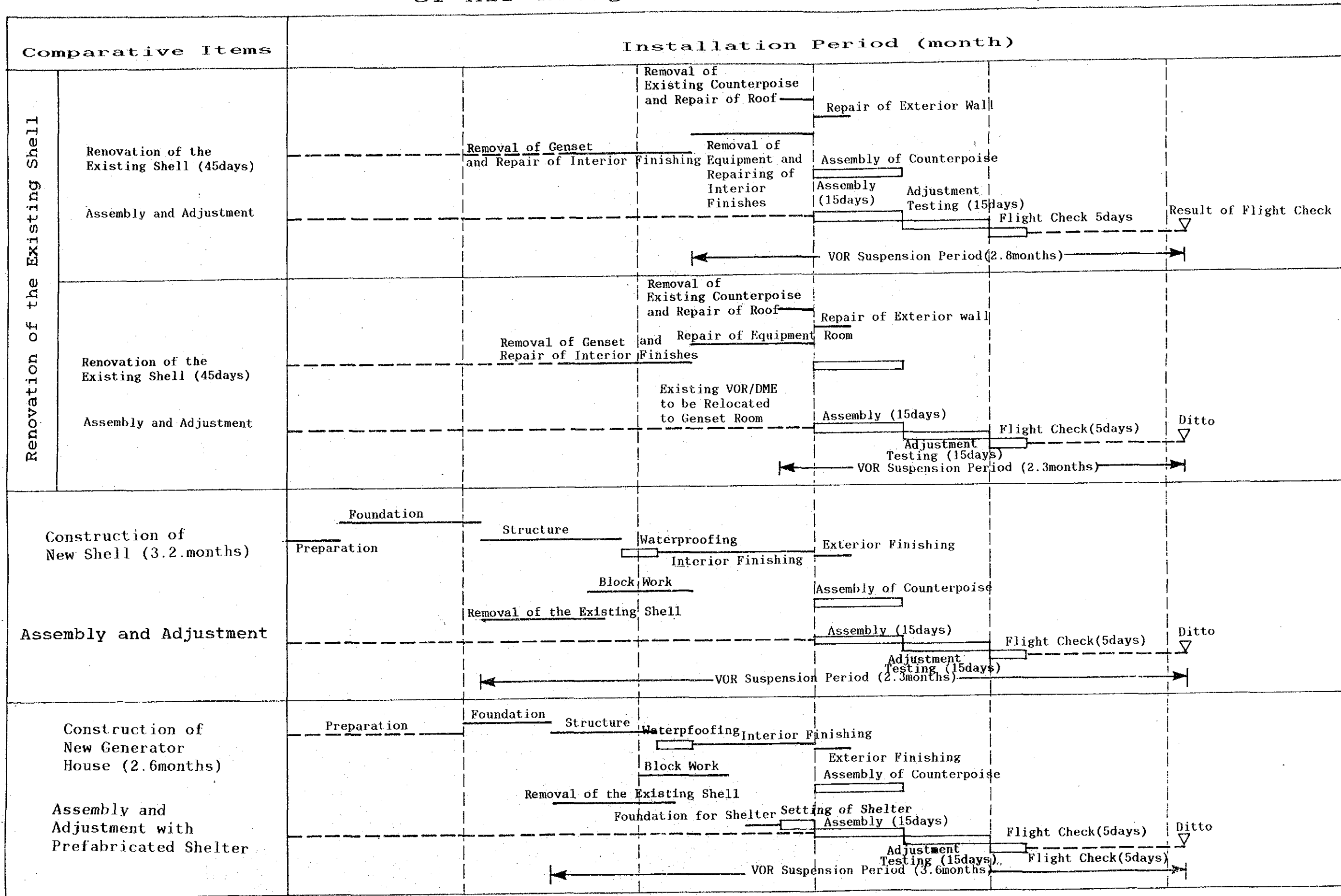
$$85 \times \frac{10 \text{ min}}{60 \text{ min}} = 14.2 \text{ pax.}$$

$$\text{Mean} + 2 \times \text{Standard deviation} = 14.2 + 2 \times \sqrt{14.2} = 21.7 \text{ pax.}$$

$$21.7 \times \frac{60 \text{ min}}{10 \text{ min}} = 130.2 \dots \dots \dots 130 \text{ pax.}$$

$$\text{Total Area Required} = 250 + 230 = 480 \text{ m}^2$$

Comparison of Replacement Schedule of Air Navigation Equipment



Appendix - H

HOURS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MON.																			BNE MAN B3					
TUE.																	POM, HIR			F28 NOU				CRV
WED.						F28 CRV			HIR, POM NOU			MAN BNE B3												
THU.															INU, HIR, AXL NOU MAN B3 CRV									
FRI.												MAN NOU CRV							MAN BNE B3					NOU CRV
SAT.																								
SUN.			SFO SYD B2																					

International Flight Schedule

Airport	Code
Auckland	AKL
Brisbane	BNE
Honiara	HIR
Nadi	NAN
Nauru	INU
Noumea	NOU
Port Moresby	POM
Sydney	SYD

HOURS	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
MON		SON			NUS					LNE	NUS		SON			
		LNE								LMP	EAE		OUH			
		TAH			TAH	LMP				LMP	TAH		TAH			
		NUS			NUS		SON			SON	NUS		SON			
TUE			SON	SON		NUS			NUS		SON		SON			
				LNB		LNB	VLS		TGH							
		YAH			NUS	IPA				IPA			TAH			
		NUS			NUS	SON			SON	SON			NUS			
WED		SON			NUS	NUS		NUS			NUS		SON			
		LNE								LNE	EAE		TGH			
		TAH			TAH	LMP				LMP	TAH		TAH			
		NUS			NUS		SON		SON	NUS			SON			
THU		SON		SON	NUS				NUS		SON		SON			
			LNB		NUS	LNB		TGH	EAE							
		TAH			NUS		DLY			DLY			TAH			
		NUS			NUS		SON		SON	SON			NUS			
FRI		SON			NUS						NUS		SON			
		LNE								LNE	OUH		TGH			
		TAH			TAH	LMP				LMP	TAH		TAH			
		NUS			NUS		SON		SON	NUS			SON			
SAT		SON		SON	NUS				NUS		SON		SON			
			LNB		NUS	LNB	VLS		TGH							
		TAH			NUS		DLY			DLY			TAH			
		NUS			NUS		SON		SON	SON			NUS			
SUN					SON	SON			SON				SON			
										TAH			TAH			
			NUS		NUS					NUS			SON			
							DLY			TAH						

Airport	Code
Aneityum	AUY
Aniwa	AWD
Craig Cove	CCV
Dillons Bay	DLY
Emae	EAE
Futuna	FTA
Ipota	IPA
Lamap	LMP
Lamen Bay	LNB
Longana	LOD
Lonorore	LNE
Maewo	MWF
Mota Lava	MTV
Norsup	NUS
Quoin Hill	QUH
Santo	SON
Sara	SSR
Sola	SLH
South West Bay	SWB
Tanna	TAH
Tongoa	TGH
Torries	YOH
Ulei	ULB
Valesdir	VLS
Vila	VLJ
Walaha	WLH
West Cost Santo	OLJ

Domestic Flight Schedule

