

## **Appendix-4**

# **Minutes of Discussions**

**Minutes of Discussions  
on the Preparatory Survey  
on the Project for Clean Energy Promotion Using Solar Photovoltaic System**

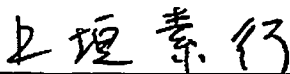
The Government of Japan (hereinafter referred to as "GoJ") has established Cool Earth Partnership as a new financial mechanism. Through this, GoJ is cooperating actively with developing countries' efforts to reduce greenhouse gasses emissions, such as efforts to promote clean energy. A new scheme of grant aid, "Program Grant Aid for Environment and Climate Change", was also created by GoJ as a component of this financial mechanism. According to the initiative of Cool Earth Partnership, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), in consultation with GoJ, decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Clean Energy Promotion Using Solar Photovoltaic System in Belize (hereinafter referred to as "the Project").

JICA sent to Belize the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Motoyuki UEGAKI, Director, Planning Division, Financing Facilitation and Procurement Supervision Department, JICA, and is scheduled to stay in the country from 9th August, 2009 to 23rd August, 2009.

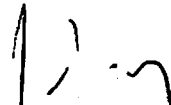
The Team held discussions with the concerned officials of the Government of Belize and conducted a field survey.

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets.

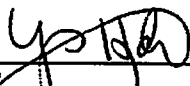
Belize City, 14th August, 2009



Motoyuki UEGAKI  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
JAPAN



Joseph WAIGHT  
Financial Secretary  
Ministry of Finance  
BELIZE



Yvonne HYDE  
Chief Executive Officer  
Ministry of Economic Development,  
Commerce, Industry & Consumer Protection  
BELIZE



Cadet HENDERSON  
Chief Executive Officer  
Ministry of Works  
BELIZE

## ATTACHMENT

### 1. Current Situation

Belize is the country that depends on Hydro electric power and imported electricity from Mexico to meet the electric energy requirements of about 80% of the population. In the dry season, hydroelectric power becomes unstable, thus causing fluctuations in electrical supply in various parts of the country. Most of the electrical energy used in the country comes from Mexico. The high costs of energy have resulted in high costs in food production, processing and manufacturing. Government of Belize is promoting the use of alternative energy sources such as wind and solar energy to reduce the dependency in foreign energy source for the purpose of the reduction of the food production cost and minimization of the environmental pollution.

In this situation, both sides confirm that the Project, which introduces photovoltaic (PV) power generation systems connected with the national power grid, is one of the pilot systems to achieve Belizean policy of using alternative energy sources.

### 2. Objective of the Project

The objective of the Project is to promote clean energy utilization and achieve emissions reductions by installing the photovoltaic system to be connected to the national grid.

### 3. Responsible Organization and Implementing Organization

The responsible organization is Ministry of Finance. (The organization chart of the responsible ministry is shown in Annex-1.)

The implementing organization is Ministry of Works. (The organization chart of the implementing organization is shown in Annex-2.)

### 4. Items Requested by the Government of Belize

4-1. After discussions with the Team, the installation of the on-grid power generating system using photovoltaic including following equipment for Government Office Complex at Belmopan was requested by the Belizean side.

(1) Solar module (panel) total capacity might be more than 200kw

(2) Junction Box

(3) Power Conditioner

(4) Transformer

(5) Data collecting and display device

4-2. The Belizean side explained that there is no duplication between requested contents of the Project and any other plans implemented by the other donors or the Belizean side.

4-3. The Belizean side has understood that the final component and the design of the Project shall be determined at the timing of 2<sup>nd</sup> phase of the Preparatory Survey.

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4-4. The Team will report the findings and items requested by the Belize side to JICA Headquarters and the GoJ.

5. Japan's Program Grant Aid for Environment and Climate Change

The Belizean side understood the Japan's Program Grant Aid for Environment and Climate Change scheme explained by the Team, (as described in Annex-4, 5 and 6) .

6. Schedule of the Study

6-1. The Team will proceed to further survey in Belize until 23rd August, 2009 as the 1<sup>st</sup> phase of the Preparatory Survey.

6-2. After the completion of the 1<sup>st</sup> phase of the Preparatory Survey, the Team will report the results to JICA Headquarters and GoJ.

6-3. If the Cabinet of GoJ will approve the Project based on the results of the Preparatory Survey, JICA will conduct the Preparatory Survey 2 for design.

7. Other Relevant Issues

7-1. Land for Installation of the PV system

The Belizean side proposed the three candidate sites for the Project. Both sides conducted the site survey and confirmed the priority of the candidates as follows (see Annex-3);

(1) site next to Social Security Office

(2) site next to Belize House

(3) site next to Gymnasium of the University of Belize, within the area of the University

The Team explained that Japan's Program Grant Aid for Environment and Climate Change might not be able to cover all the requested candidates, and the selection of the candidates should be made from the viewpoint of necessity, technical and financial viability, sustainability and cost-effectiveness, in accordance with the Japanese Government's ODA policy. The Belizean side understood the explanation from the Team.

Concerning the securing the land, Ministry of Works shall make necessary procedures for the re-registration of the land for the Project, under the cooperation with Belmopan City Council, after the submission of the detailed design of the Project from the Team.

7-2. Procurement of Equipment

The Team explained that, in accordance with the policy of GoJ, products of Japan shall be procured for major equipment in the Project. The Belizean side understood and agreed on it.

7-3. Coordination with Related Organization

The Ministry of Works shall be the focal point for the Project and responsible for the coordination with related organizations. The Belizean side agreed to establish a consultative committee in order to coordinate with the Japanese side which consists of the Embassy of Japan in Kingston, Jamaica, the JICA office in Belize, and the procurement agency. The

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Terms of References of the Consultative Committee is referred to Annex-9.

**7-4. Application of the Related Laws and Regulations**

The Belizean side explained that a new law regulating connection between the power station(s) and the national power grid is under preparation, and would be completed not later than March 2010. The Team explained that the surplus power which the PV system would create should be sold to Belize Electricity Limited, and requested the Belizean side to permit the selling of the surplus power.. The Belizean side understood and agreed on the request by the Team.

**7-5. Environmental and Social Considerations**

The Team explained the outline of JICA Environmental and Social Considerations Guideline (hereinafter referred to as "the JICA Guideline") to the Belizean side. The Belizean side took the JICA Guideline into consideration, and explained that the Project would not require EIA (Environment Impact Assessment) in terms of the size and type of the Project. In the event that any procedures of the environmental and social considerations is required in terms of the internal laws and regulations in Belize, the Belizean side shall make necessary measurements based on the related laws and regulations without delay.

**7-6. Operation and Maintenance**

The Belizean side agreed to secure and allocate the necessary budget and personnel for the operation and maintenance of the facilities procured and installed under the Project.

In this context, the Belizean side strongly requested that the Project should include the training for the operation and maintenance of the on-grid power generating system using photovoltaic because the system is not introduced in Belize.

**7-7. Tax exemption**

The Belizean side agreed that the Belizean side shall be responsible for the exemption and/or reimbursement (payment/assumption) of all customs, tax, levies and duties incurred in Belize for implementation of the Project.

**7-8.** The Belizean side requested that the contents of the Project should include the fence surrounding the PV system for the safety of the public. The Team explained that the Project should be planned in consideration of the safety for the public pointed out by the Belizean side.

**7-9.** The Belizean side shall ensure the security of all concerned Japanese nationals working for the Project, if deemed necessary.

**7-10.** The Belizean side shall provide necessary numbers of counterpart personnel to the Team during the period of their studies in Belize.

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7-11. The Belizean side shall submit all the answers to the Questionnaire, which the Team handed to the Belizean side, by 21st of August, 2009.

<List of Annex>

Annex-1 Organization Chart of Ministry of Finance

Annex-2 Organization Chart of Ministry of Works

Annex-3 Site Location Map

Annex-4 Program Grant Aid for Environment and Climate Change

Annex-5 General Flow of Program Grant Aid for Environment and Climate Change

Annex-6 Flow of Funds for Project Implementation

Annex-7 Project Implementation System

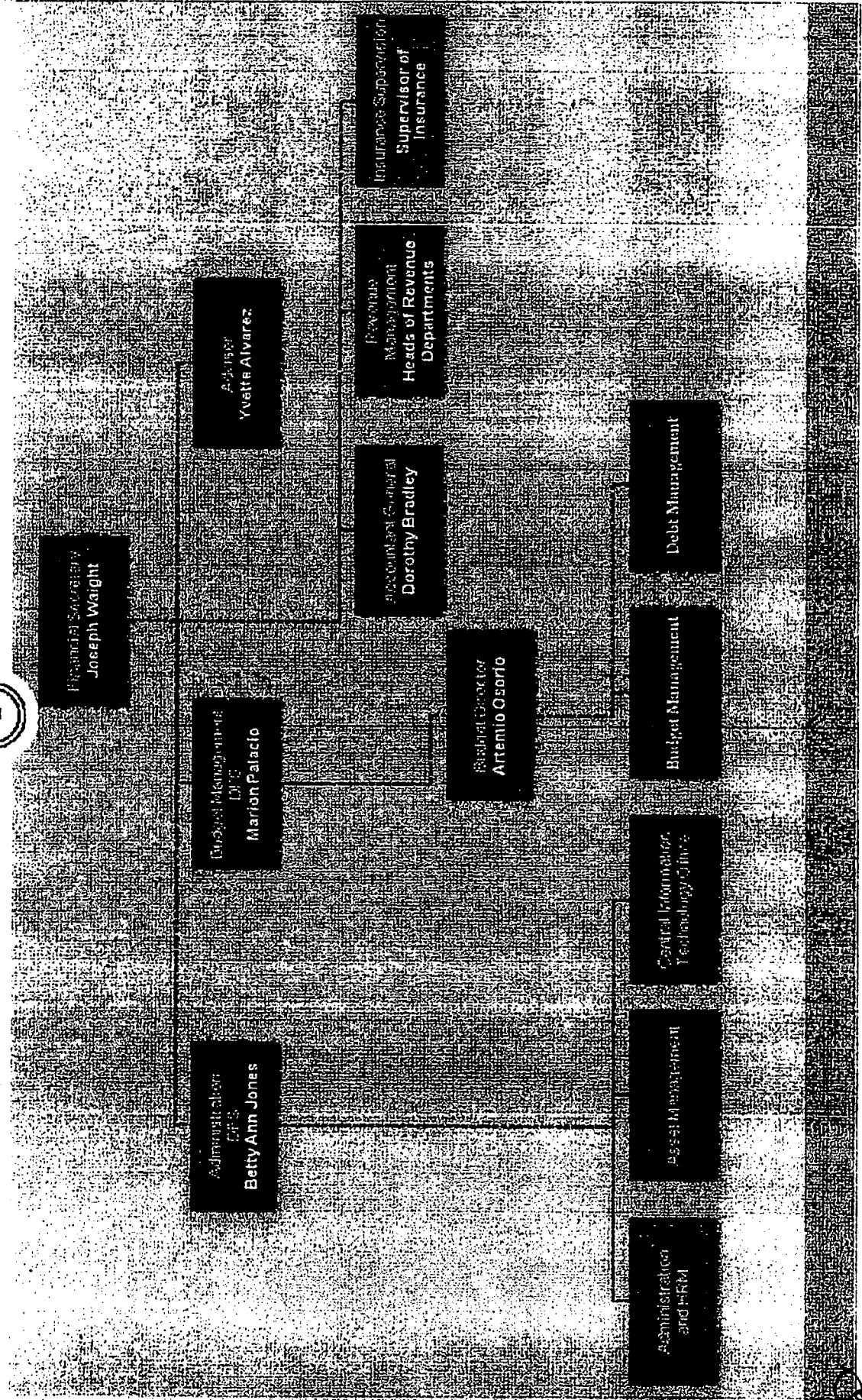
Annex-8 Major Undertakings to be taken by Each Government

Annex-9 Terms of References of the Consultative Committee

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# Current Functional Organisation of the Ministry

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# GOVERNMENT OF BELIZE

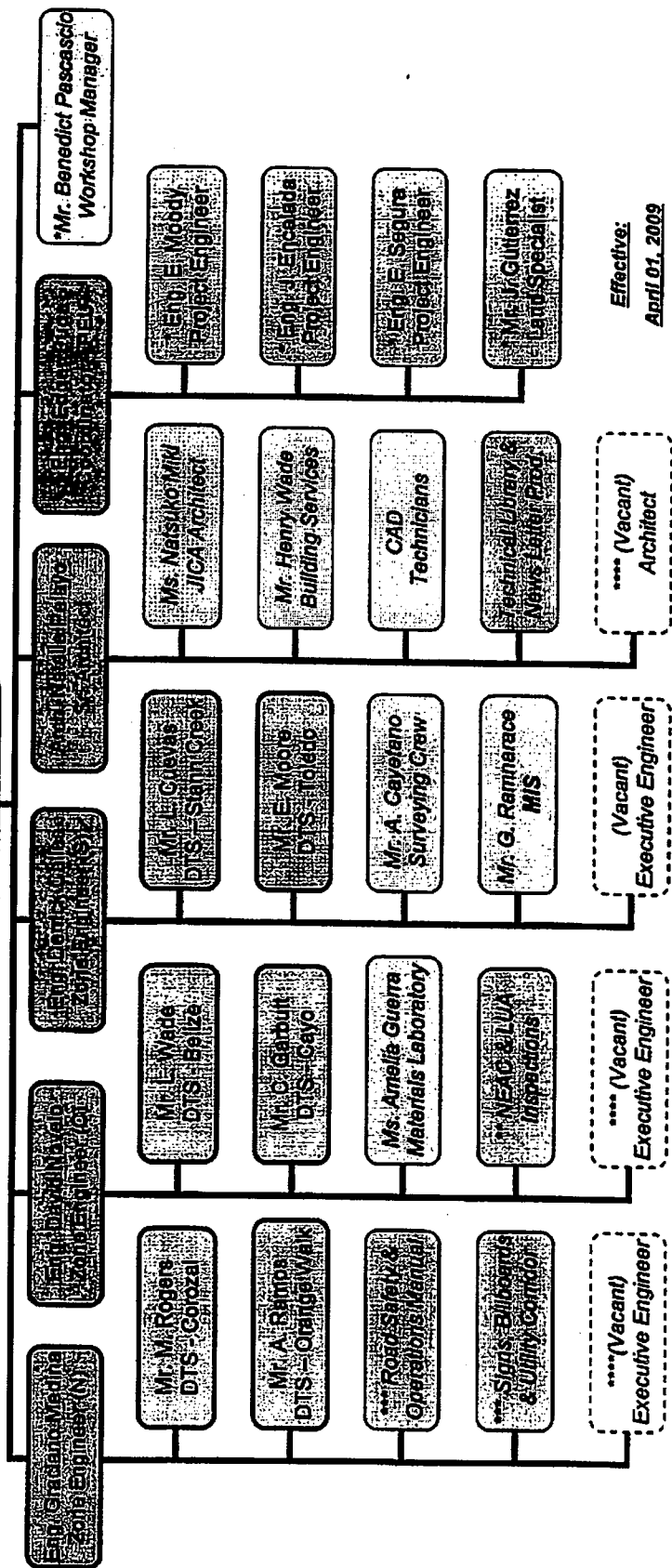
## Ministry of Works



### Public Works Technical Staff Organogram

**NB:** General in-house structural designs, project monitoring and supervision to be shared among all Engineers, and Explosives and Bitumen storage / safety is the responsibility of the Chief Engineer.

- Contract Officers
- .. Alternate for CE
- ... Shared responsibility
- .... To be hired in 90 days



Effective:  
April 01, 2009

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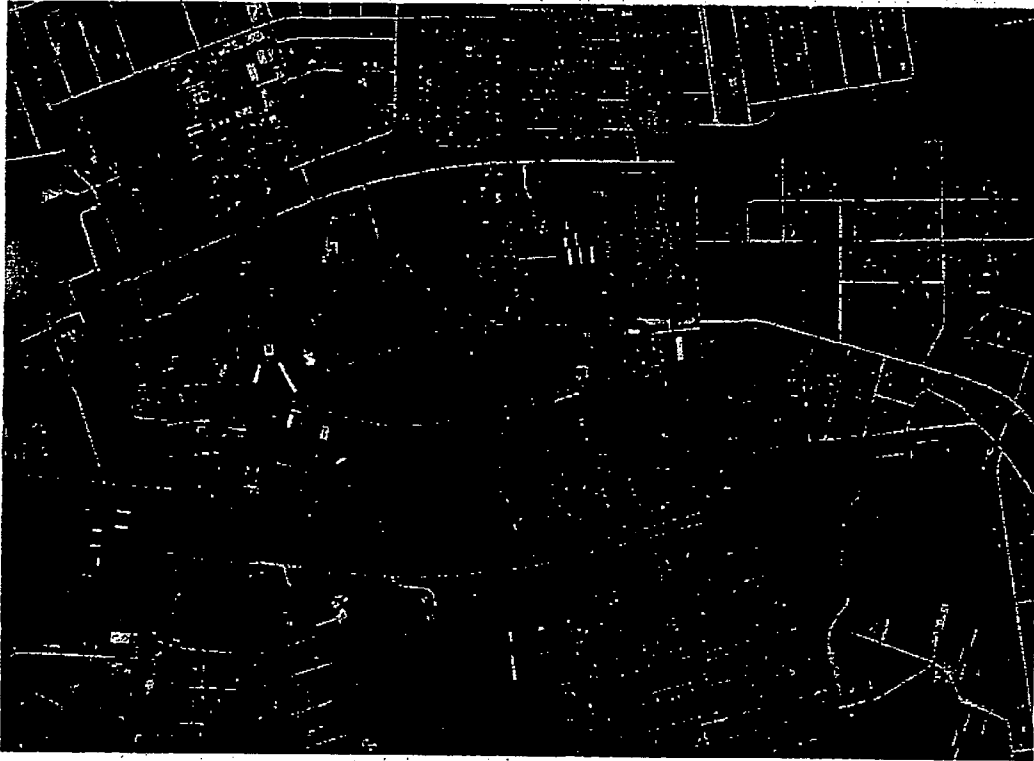


Figure Aerial View

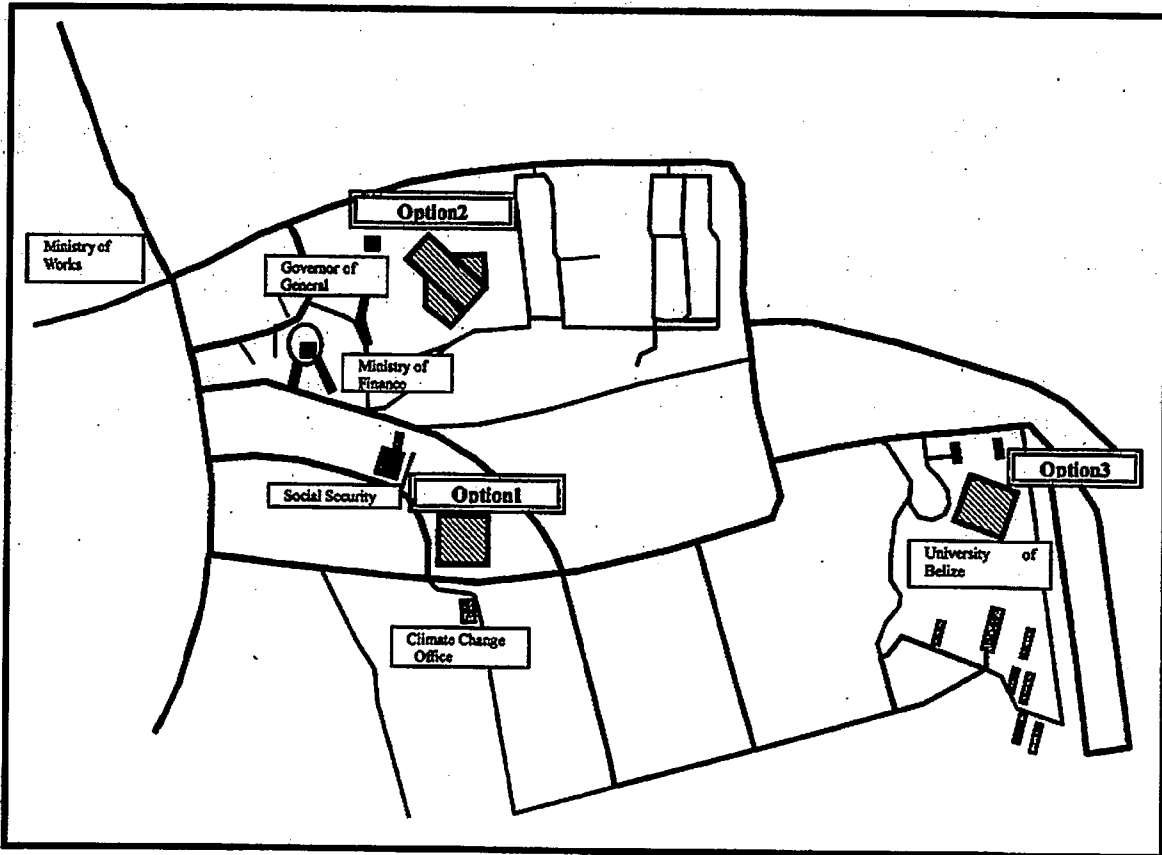


Figure Location of candidate site

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**Program Grant Aid for Environment and Climate Change**  
**of the Government of Japan**  
 (Provisional)

The Grant Aid provides a recipient country (hereafter referred to as "the Recipient") with non-reimbursable funds to procure the facilities, equipment, and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

Based on "Cool Earth Partnership" initiative of the Government of Japan, the Program Grant Aid for Environment and Climate Change (hereafter referred to as "GAEC") aims to mitigate effects of global warming by reducing GHGs emission (mitigation; e.g. improvement of energy efficiency) and to take adaptive measures (adaptation; e.g. measures against disasters related to climate change, including disaster prevention such as enhancing disaster risk management). GAEC may contain multiple components that can be combined to effectively meet these needs.

1. Procedures for GAEC

GAEC is executed through the following procedures.

Preparatory Survey 1	Preparatory Survey for project identification conducted by Japan International Cooperation Agency (JICA)
Application	Request made by a recipient country
Appraisal & Approval	Appraisal by the Government of Japan and Approval by the Cabinet
Determination of Implementation	The Notes exchanged between the Government of Japan and the Recipient Country
Grant Agreement (hereinafter referred to as the "G/A")	Agreement concluded between JICA and the Recipient
Preparatory Survey 2	Preparatory Survey for design conducted by JICA
Implementation	Procurement through the Procurement Agency by the Recipient

Firstly, if the candidate project for a GAEC is identified by the Recipient and the Government of Japan, the Government of Japan (the Ministry of Foreign Affairs) examines it whether it is eligible for GAEC. When the request is deemed appropriate, JICA, in consultation with the Government of Japan, conducts the Preparatory Survey (hereafter referred to as "the Survey") on the candidate project as Phase 1 of the Survey with Japanese consulting firms.

Secondly, the Recipient submits the official request to the Government of Japan, while the appropriateness, necessity and the basic components of the project are examined in the course of Phase 1 of the Survey,

Thirdly, the Government of Japan appraises the project to see whether it is suitable for Japan's GAEC, based on the Survey report prepared by JICA, and the results are then submitted to the Cabinet for approval.

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Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the Recipient.

Fifthly, JICA engages Grant Agreement (G/A) with the Recipient and executes the Grant by making payments of the amount agreed in the E/N and strictly monitors that the funds of the Grant are properly and effectively used.

Procurement Management Agent is designated to conduct the procurement services of products and services (including fund management, preparing tenders, contracts) for GAEC on behalf of the Recipient. The Agent is an impartial and specialized organization that will render services according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the Agreed Minutes ("A/M").

## 2 Preparatory Survey

### 1) Contents of the Survey

The purpose of the Preparatory Survey (hereafter referred to as "the Survey"), conducted by JICA on a requested project (hereafter referred to as "the Project"), is to provide the basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Survey are as follows:

- Confirmation of background, objectives, and benefits of the Project and institutional capacity of agencies and communities concerned of the Recipient necessary for project implementation.
- Evaluation of relevance of the Project to be implemented under the Grant Aid Scheme for Environment and Climate Change from a technical, social, and economic point of view.
- Confirmation of items agreed upon by both parties concerning the basic concept of the Project.
- Preparation of the design of the Project and reference document for tender.
- Estimation of cost for the Project.

The contents of the original request will be modified, as found necessary, in the design of the Project according to the guidelines of Japan's Grant Aid scheme.

The Government of Japan requests the Government of the Recipient to take whatever measures necessary to ensure its responsibility in implementing the Project. Such measures must be guaranteed even if they may fall outside the jurisdiction of the implementing organization of the Recipient. This has been confirmed by all relevant organizations of the Recipient through the Minutes of Discussions.

### 2) Selection of consulting firms

For the smooth implementation of the Survey, JICA will conduct the Survey with registered consulting firms. JICA selects the firms based on proposals submitted by firms with interest in implementing the Survey. The firms selected will carry out the Preparatory Survey and prepare a report, based on the terms of reference set by JICA.

## 3. Implementation of GAEC after the E/N

### 1) Exchange of Notes (E/N)

The content of GAEC will be determined in accordance with the Notes exchanged by the two

Governments concerned, in which items including, objectives of the project, period of execution, conditions and amount of the Grant Aid are confirmed.

2) Details of Procedures

Details of procedures on procurement and services under GAEC will be agreed between the authorities of the two governments concerned at the time of the signing of the G/A.

Essential points to be agreed are outlined as follows:

- a) JICA will supervise the implementation of the Project.
- b) Products and services will be procured and provided in accordance with JICA's "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change."
- c) The Recipient will conclude a contract with the Agent.
- d) The Agent is the representative acting in the name of the Recipient concerning all transfers of funds to the Agent.

3) Focal points of "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change"

a) The Agent

The Agent is the organization, which provides procurement of products and services on behalf of the Recipient according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the A/M.

b) Agent Agreement

The Recipient will conclude the Agent Agreement, in principle, within two months after the signing of the G/A, in accordance with the A/M. The scope of the Agent's services will be clearly specified in the Agent Agreement.

c) Approval of the Agent Agreement

The Agent Agreement is prepared as two identical documents and the copy of the Agent Agreement will be submitted to JICA by the Recipient through the Agent. JICA confirms whether the Agent Agreement is concluded in conformity with the E/N, A/M, and G/A and the Procurement Guidelines for the Program Grant Aid for Environment and Climate Change then approves the Agent Agreement.

The Agent Agreement concluded between the Recipient and the Agent will become effective after the approval by JICA in a written form.

d) Payment Methods

The Agent Agreement will stipulate that "Regarding all transfers of the fund to the Agent, the Recipient will designate the Agent to act on behalf of the Recipient and issue a Blanket Disbursement Authorization ("the BDA") to conduct the transfer of the fund (hereinafter referred to as "the Advances") to the Procurement Account from the Recipient Account.

The Agent Agreement will clearly state that the payment to the Agent will be made in Japanese yen from the Advances and that the final payment to the Agent will be made when the total remaining amount become less than three percent (3%) of the Grant and its accrued interests excluding the Agent's fees.

e) Products and Services Eligible for Procurement

Products and services to be procured will be selected from those defined in the G/A.

f) Selection of firms

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In principle, firms of any nationality could be contracted as long as the firms satisfy the conditions specified in the tender documents.

The same applies for any individual consultants who will be involved in the Project and provide services necessary for the training and guidance related to the Project.

The consultants that will be employed to do detail design and supervise the work for the Project, however will be in principle, Japanese nationals recommended by JICA for the purpose of maintaining technical consistency with the Study.

g) Method of Procurement

When conducting the procurement, sufficient attention will be paid to transparency in selecting the firms and for this purpose, competitive tendering will be employed in principle.

h) Tender Documents

The tender documents should contain all information necessary to enable tenderers to prepare valid offers for the products and services to be procured by GAEC.

The rights and obligations of the Recipient, the Agent and the firms supplying products and services should be stipulated in the tender documents to be prepared by the Agent. Aside from this, the tender documents will be prepared in consultation with the Recipient.

i) Pre-qualification Examination of Tenderers

The Agent may conduct a pre-qualification examination of tenderers in advance of the tender so that the invitation to the tender can be extended only to eligible firms. The pre-qualification examination should be performed only with respect to whether the prospective tenderers have the capability of concluding the contracts.

For this, the following points should be taken into consideration:

- (1) Experience and past performance in contracts of similar kind
- (2) Financial credibility (including assets such as real estate)
- (3) Existence of offices and other items to be specified in the tender documents.
- (4) Their potentialities to use necessary personnel and facilities.

j) Tender Evaluation

The tender evaluation should be implemented on the basis of the conditions specified in the tender documents.

Those tenderers which substantially conform to the technical specifications and other stipulations of the tender documents, will be judged in principle on the basis of the submitted price, and the tenderer who offers the lowest price will be designated as the successful tenderer.

The Agent will submit a detailed evaluation report of tenders to JICA for its information, while the notification of the results to the tenderers will not be premised on the confirmation by JICA.

k) Additional procurement

If there is any remaining balance after the competitive and/or selective tendering and/or direct negotiation for a contract, and if the Recipient would like to procure additional items, the Agent is allowed to conduct this additional procurement, following the points mentioned below:

- (1) Procurement of same products and services

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When the products and services to be additionally procured are identical with the initial tender and a competitive tendering is judged not efficient, additional procurement can be conducted by a negotiated contract with the successful tenderer of the initial tender.

(2) Other procurements

When products and services other than those mentioned above in (1) are to be procured, the procurement should be conducted through competitive tendering. In this case, the products and services for additional procurement will be selected from among those in accordance with the G/A.

l) Conclusion of the Contracts

In order to procure products and services in accordance with the guideline, the Agent will conclude contracts with firms selected by tendering or other methods.

m) Terms of Payment

The contract will clearly state the terms of payment. The Agent will make payment from the "advances," against the submission of the necessary documents from the firm on the basis of the conditions specified in the contract. When the services are the object of procurement, the Agent may pay certain portion of the contract amount in advance to the firms on the conditions that such firms submit the advance payment guarantee worth the amount of the advance payment to the Agent.

4) Undertakings required by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the Recipient is required to undertake necessary measures as the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project.
- b) To provide facilities for distributing electricity, water supply and drainage and other incidental facilities in and around the sites.
- c) To ensure all the expense and prompt execution for unloading, customs clearing at the port of disembarkation and domestic transportation of products purchased under the Grant Aid,
- d) To ensure that customs duty, internal taxes and other fiscal levies that may be imposed in the Recipient with respect to the purchase of the Components and the Agent's services will be exempted by the Government of the Recipient.
- e) To accord all the concerned parties, whose services may be required in connection with supply of the products and services under the contracts, such facilities as may be necessary for their entry into the Recipient and stay therein for the performance of their work.

5) "Proper use of funds"

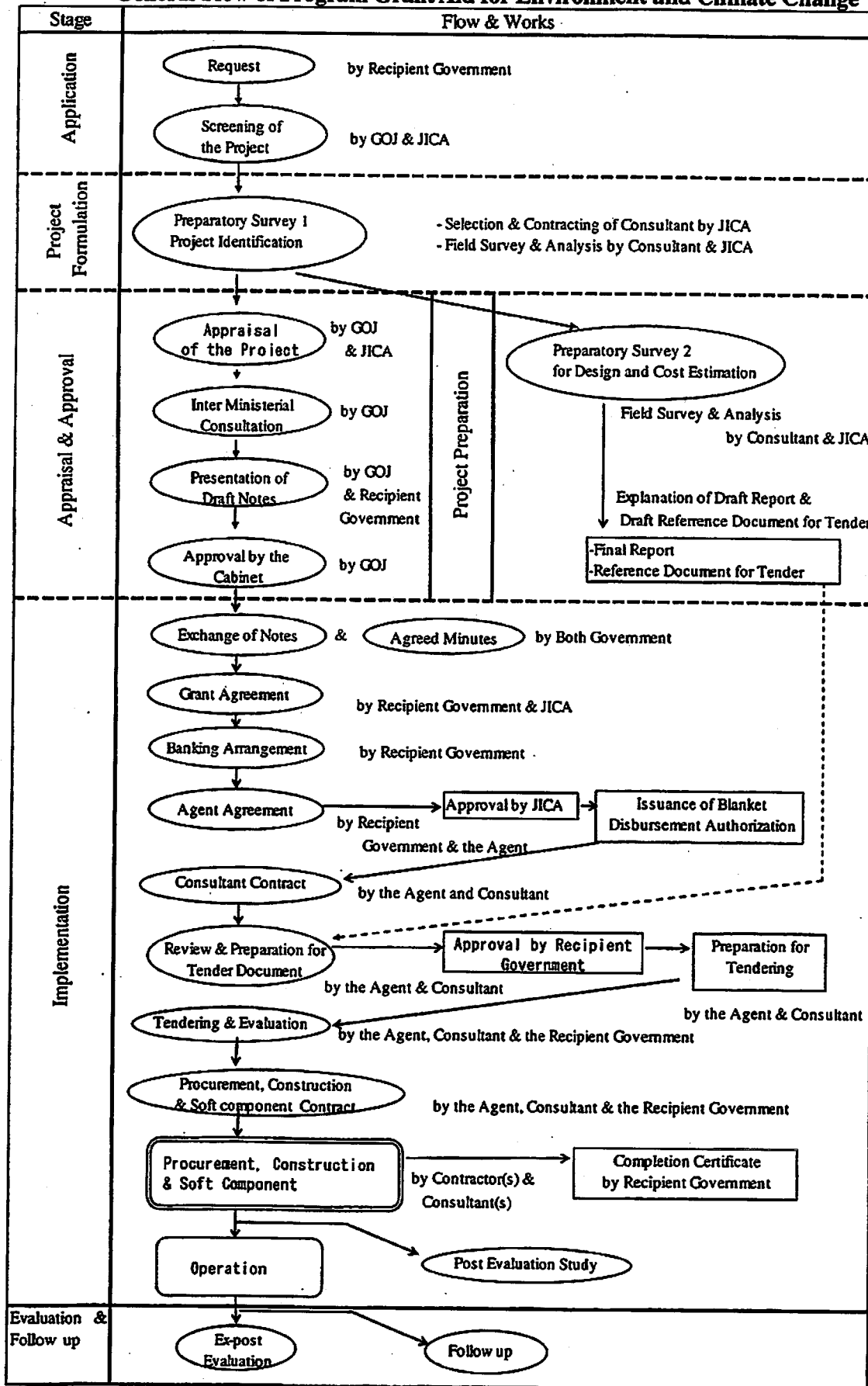
The Recipient is required to operate and maintain the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign personnel necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

6) "Export and Re-export" of products

The products purchased under the Grant and its accrued interest will not be exported or re-exported from the Recipient.

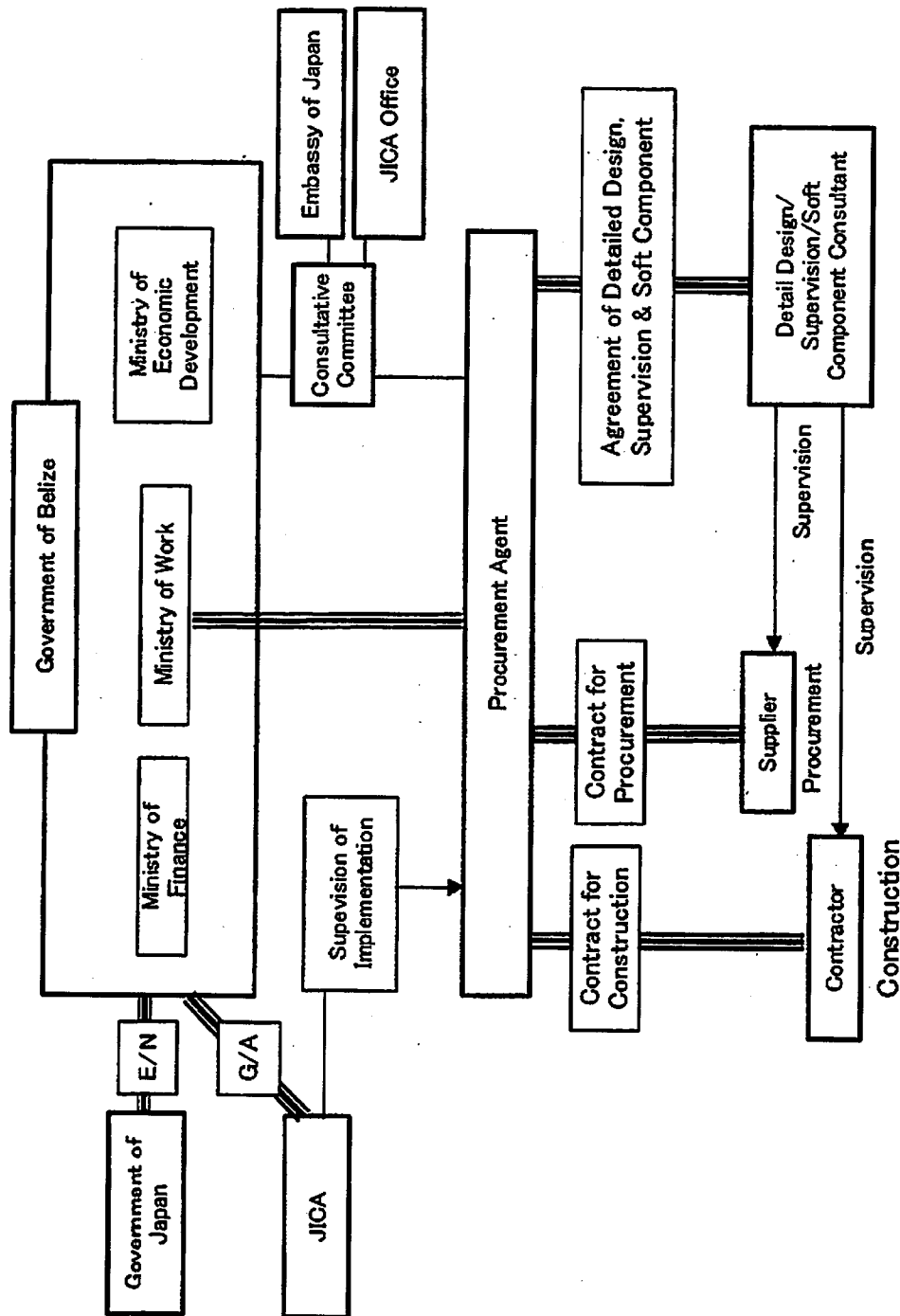
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**General Flow of Program Grant Aid for Environment and Climate Change**



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# Project Implementation System

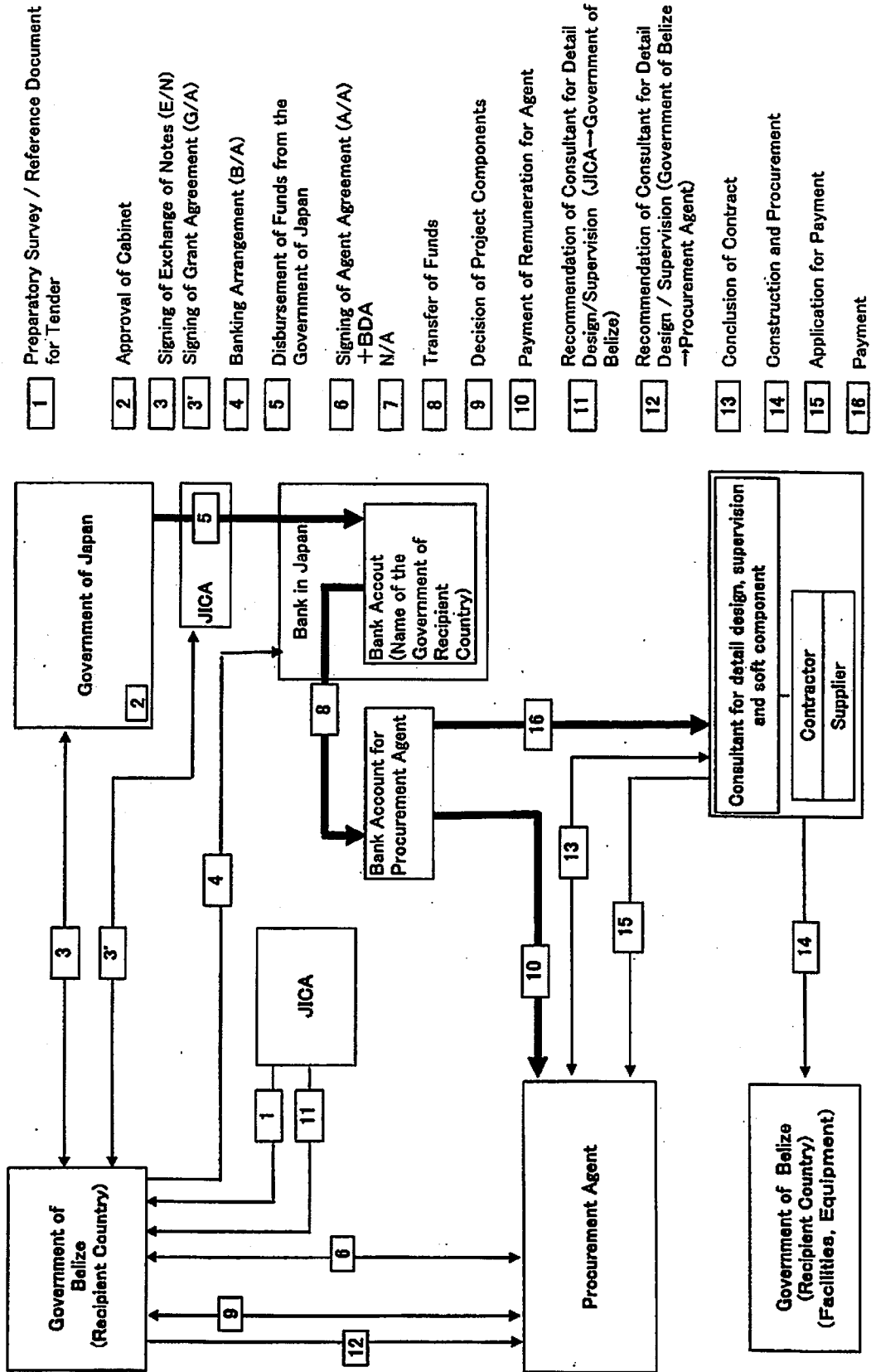


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Flow of Funds for Project Implementation

Implementation Flow  
Cash Flow



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## Major undertakings to be taken by each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		•
2	To clear, level and reclaim the site when needed urgently		•
3	To construct gates and fences in and around the site		•
4	To construct a parking lot if necessary		•
5	To construct roads		
	1) Within the site	•	
	2) Outside the site and Access road		•
6	To construct the facility and install the equipment	•	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities if necessary:		
	1) Electricity		
	a. The power distribution line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer for the site	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for conveying storm water, sewage, etc. from the site)		•
	b. The drainage system within the site (for sewage, ordinary waste, storm water, etc.)	•	
	4) Gas Supply		
	a. The city gas main to the site		•
	b. The gas supply system within the site	•	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
8	To bear the following commissions applied by the bank in Japan for banking services based upon the Bank Arrangement (B/A):		
	1) Payment of bank commission		•
9	To ensure prompt unloading and customs clearance at the port of disembarkation in the recipient country		
	1) Marine or air transportation of the products from Japan or third countries to the recipient	•	
	2) To exempt or bear tax and customs clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site	•	
10	To accord Japanese nationals and / or nationals of third countries, including persons employed by the agent whose services may be required in connection with the Components such facilities as may be necessary for their entry into recipient country and stay therein for the performance of their work.		•
11	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the Components and to the employment of the Agent will be exempted by the Government of recipient country		•
12	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant.		•
13	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the purchase of the Components as well as for the agent's fees.		•
14	To ensure environmental and social consideration for the Programme.		•

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for you

Terms of Reference of the Consultative Committee (Provisional)

1. To confirm an implementation schedule of the Programme for the speedy and effective utilization of the Grant and its accrued interest.
2. To discuss the modifications of the Programme, including modification of the design of the facility.
3. To exchange views on allocations of the Grant and its accrued interest as well as on potential end-users.
4. To identify problems which may delay the utilization of the Grant and its accrued interest, and to explore solutions to such problems.
5. To exchange views on publicity related to the utilization of the Grant and its accrued interest.
6. To discuss any other matters that may arise from or in connection with the G/A.

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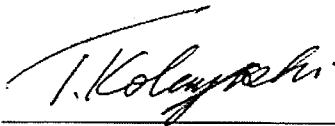
## Technical Notes

### On the Preparatory Survey on The Project for Clean Energy Promotion Using Solar Photovoltaic System In the Plurinational State of Bolivia

The Minutes of Discussion for the captioned Project was signed between Mr. Junichi Akiyama, leader of Preparatory Survey Team of JICA, Ing. Oscar Coca, Ministro de Hidrocarburos y Energia, Dr. Juan del Granado, Honorable Major of La Paz and Lic. Javier Fernandez, Viceminister of Public Investment and External Financing on July 31 2009.

The Team had carried out detailed survey at the sites and held discussion with the engaged staffs of Ministerio de Hidrocarburos y Energia; and Gobierno Municipal de La Paz. In the course of discussion, among the parties have confirmed the additional items described in the attached sheets for supplementary documents of the Minutes of Discussion.

La Paz, October 28, 2009



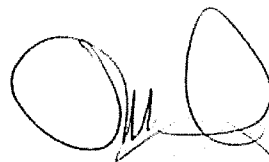
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Toshiaki Kobayashi  
Team Leader of the Consultant  
Preparatory Survey Team  
Nippon Koei Co., Ltd.



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Ing. Rosalio Tinta  
Director de Energias Alternativas  
Viceministerio de Electricidad y  
Energias Alternativas  
Ministerio de Hidrocarburos y Energia  
Bolivia



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Dra. Lourdes Murillo Cuentas  
Directora Municipal de Salud  
Gobierno Municipal de La Paz

## ATTACHMENT

### 1. Implementation Schedule

In response to the request about implementation schedule, the Team explained of the tentative expected implementation schedule of the Project as shown in ANNEX-1. According to the schedule, the Project is scheduled to be completed in the end of July 2011.

### 2. Necessary Area of Project Site

The Team has shown necessary working areas for Site 1, 2 and 3 in Miraflores Hospital Complex. We mutually confirmed the necessary dimension for the PV systems. Based on the confirmed dimension, the Team explained necessary preparation works that partially need demolishing obstacles hindering installation such as walls and trees, making clearing and leveling in the sites.

We mutually confirmed that necessary preparation works for the installation as such the above will be executed before starting the installation works.(ANNEX-2)

### 3. Design of PV System

The Team has explained about the Design of PV System regarding following items:

#### 3.1 Electrical System

The Team explained the electrical single line diagram of PV system and methodology and principle of the grid-interconnection. Based on the explanation, we mutually have agreed on the basic idea and composition of single line diagram shown in ANNEX-3.

#### 3.2 Technical Specification of PV System

The Team has explained about technical specifications and necessary Grid-interconnection matters (ANNEX-4) which has been determined based on confirmation about compatibility with the Grid System of La Paz that Electropaz S.A. operates and Grid-interconnection matters described in Minutes of Meeting (ANNEX-5).

#### 3.3 Monitoring Display Panel in Miraflores Hospital Complex

The Team has explained about Monitoring display Panel that is expected to be installed inside the hospital in order to demonstrate available data to be collected from PV systems. Based on the discussion, we mutually confirmed that the Monitoring Display Panel will be installed in the walls nearby the entrance of the gastroenterology ward/hospital.

The Monitoring Display Panel is planned to be demonstrated for momentarily power (kW) consumption and solar power generation (kwh/Day, kwh/Month), etc. The detailed specification will be discusses later.

### **3.4 Organization Setup for Operation and Maintenance**

The Team has confirmed that necessary organization (personnel) for operation and maintenance will be organized for the PV systems prior to the commissioning.

#### **ANNEX-1**

Expected implementation schedule

#### **ANNEX-2**

Drawings for Work Area

#### **ANNEX-3**

Drawings for the arrangement of PV system

#### **ANNEX-4**

Technical Specification of PV System

#### **ANNEX-5**

Minutes of Meeting with Electropaz



(ANNEX-1)

Project Implementation Schedule(tentative)

Clean Energy Promotion Using Solar Photovoltaic System in the Pururinatational State of Bolivia

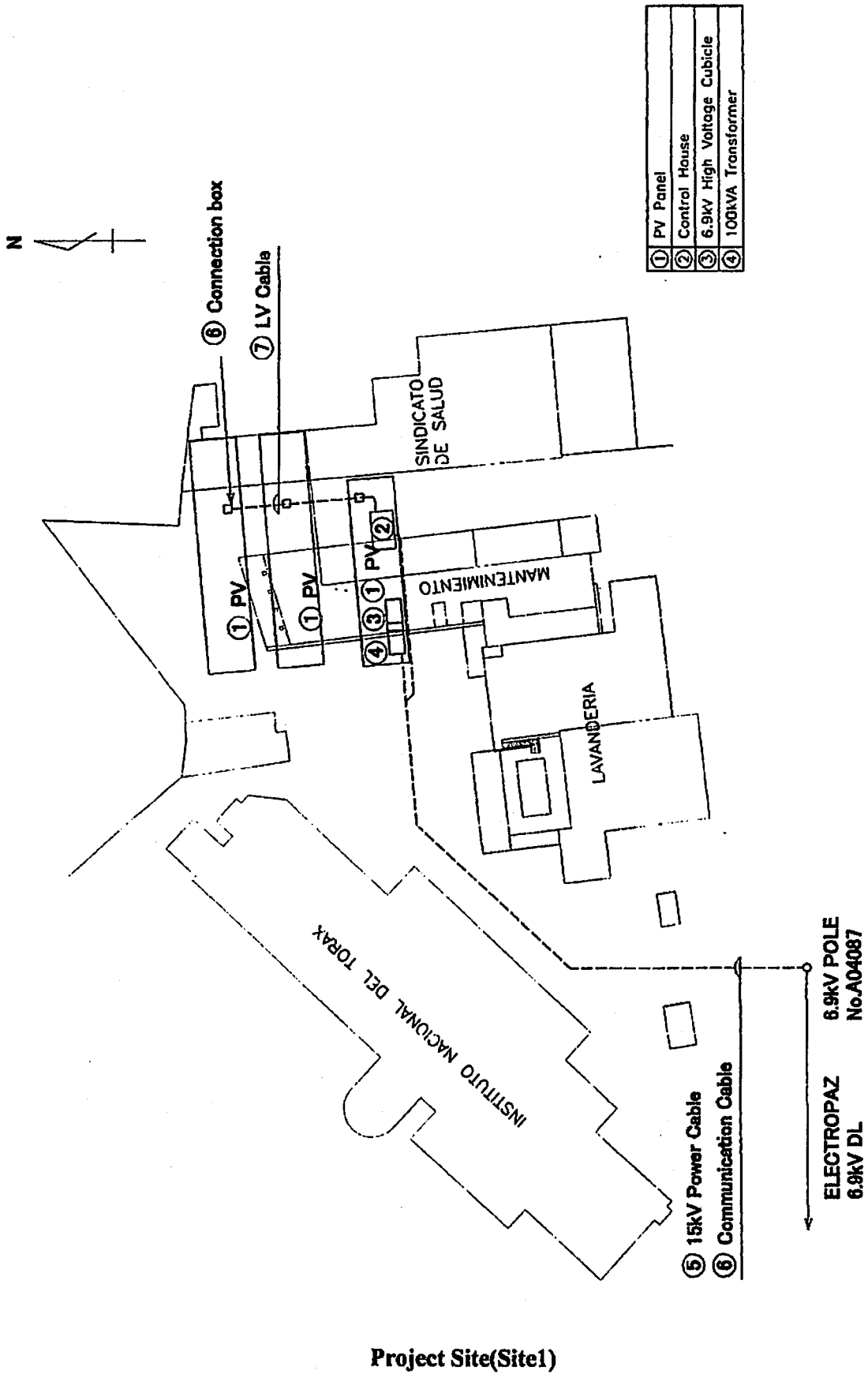
Work Items	2009			2010												2011							
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	
Preparatory Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selection of Consultant for Project Supervision	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tendering Stages	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finalization of Tender Document	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tender Openings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Evaluation of Tender	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contract with a Tenderer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Certification of Japanese Government	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Procurement of PV System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Design and Drawing of PV system	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ocean and Inland Transportation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction and Commissioning of PV System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note1: This tentative schedule is drafted by the Consultant according to the ordinary Japanese Grant Aid Scheme without any official consent from JICA and other authorities concerned on this schedule

Therefore, there is some possibilities of schedule alteration after reviewing

Note2: Training for operation and maintenance to the team members consisting of Gobierno Municipal de la Paz(GMIP) and Ministerio de Hidrocarburos y Energia(MHE) will be carried out during this Implementation Schedule

(ANNEX-2)

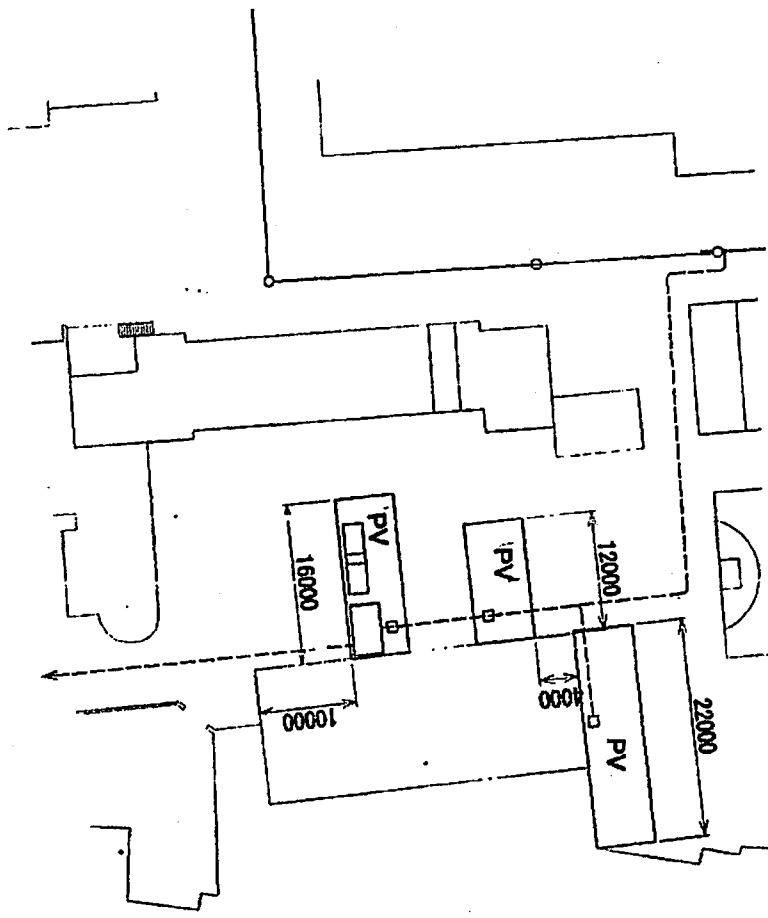


Project Site(Site1)

Ⓟ

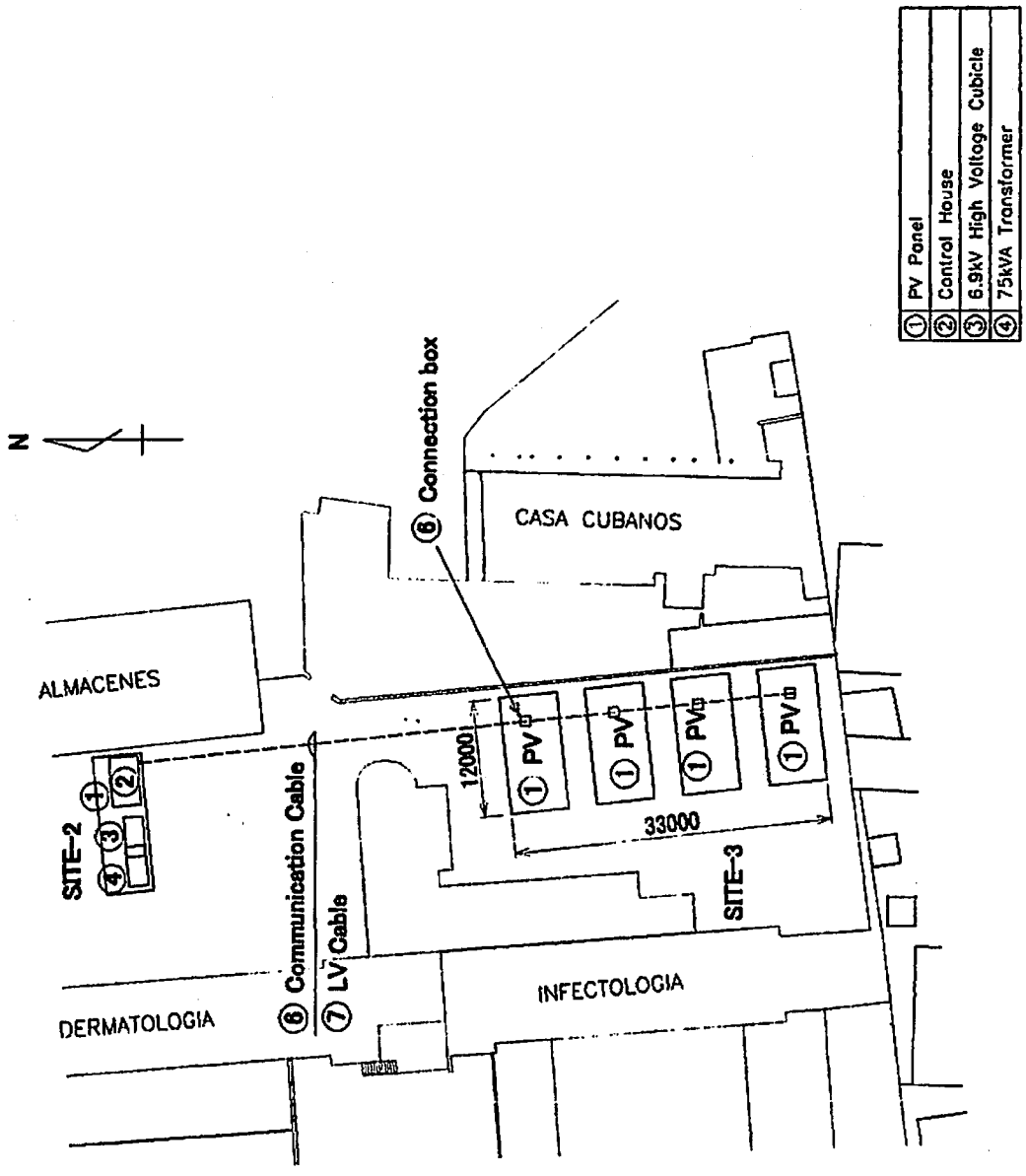


(ANNEX-2)



Project Site (Site2)

(ANNEX-2)

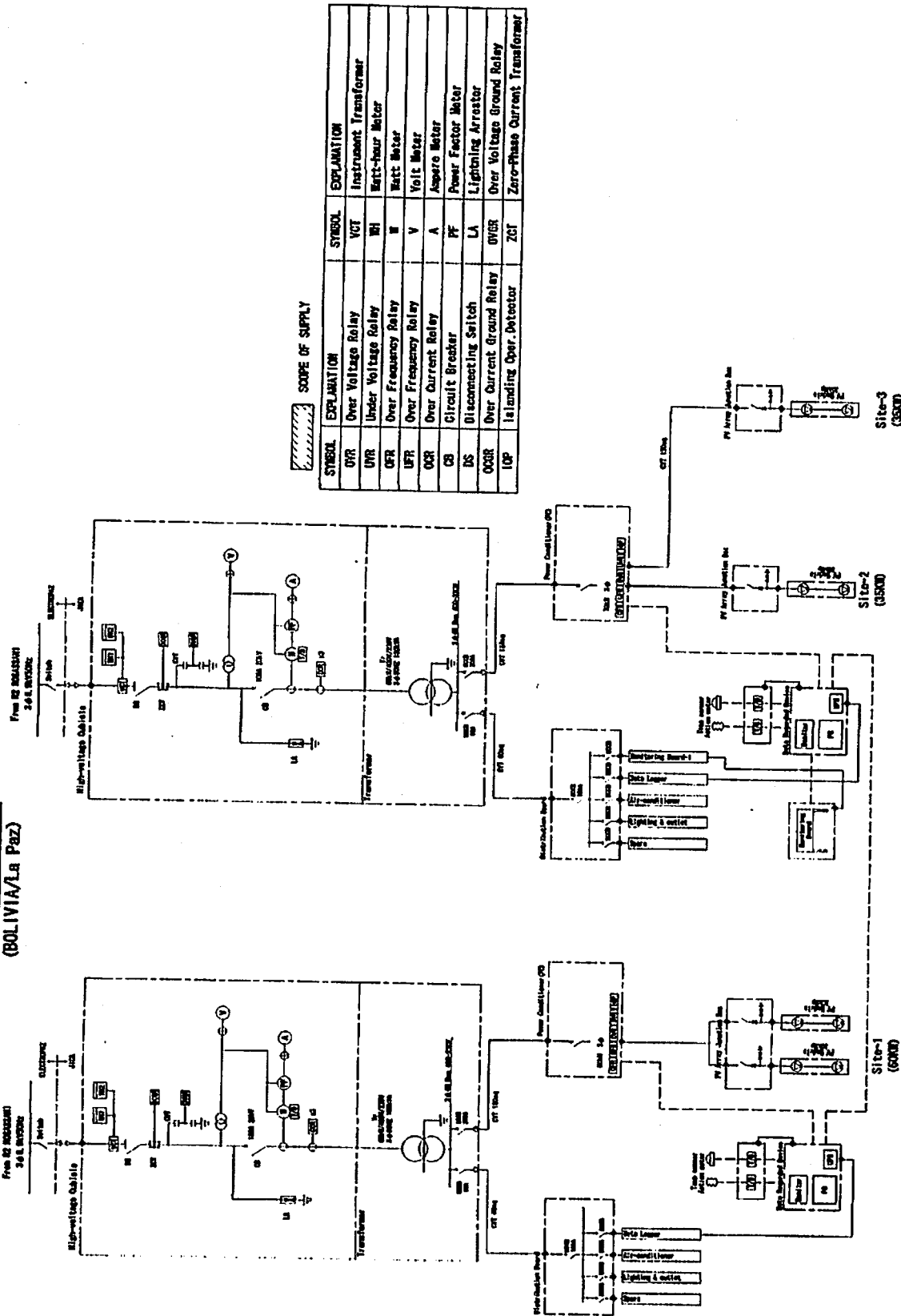


Project Site (Site3)

46

Single Line Diagram  
(BOLIVIA/La Paz)

For Explanation Purpose Only



SCOPE OF SUPPLY

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION
OVR	Over Voltage Relay	VCT	Instrument Transformer
UVR	Under Voltage Relay	WH	Watt-hour Meter
OFI	Over Frequency Relay	W	Watt Meter
UFI	Under Frequency Relay	V	Volt Meter
OCR	Over Current Relay	A	Amperes Meter
CB	Circuit Breaker	PF	Power Factor Meter
DS	Disconnecting Switch	LA	Lightning Arrester
OCGR	Over Current Ground Relay	OVR	Over Voltage Ground Relay
IOP	Islanding Oper. Detector	ZCT	Zero-Phase Current Transformer

THE PROJECT FOR CLEAN ENERGY PROMOTION USING SOLAR PHOTOVOLTAIC SYSTEM THE PLURINATIONAL STATE OF BOLIVIA	DRAWING TITLE SINGLE LINE DIAGRAM FOR MIRAFLORES BOLIVIA	PREPARED BY	NIPPON KOEI CO., LTD
		DRAW. NO.	
		CHECKED BY	
		APPROVED BY	
		DATE	

**(ANNEX-4)**

**Technical Specification of PV System**

**1. PV Module**

- (1) Type : Crystalline or Amorphous  
(2) Capacity : Rated capacity of PV module is specified by manufacturer  
(3) Performance : The modules supplied are required to be tested at Standard Test Condition (STC). The copy should be supplied with the modules.  
The following data should be available in the module report.

- maximum power
- open circuit voltage
- short circuit current
- maximum power voltage / current

(STC: Surface temp.:25 degree Celsius, Air mass:1.5, Radiation 1000W/m<sup>2</sup>)

**2. PV Array**

**(1) Tilting Angle and Azimuth Direction**

- : The tilting angle is 20 degrees  
: The azimuth direction is the North

**(2) Layout**

Sufficient number of modules in series and parallel will be used to obtain the required PV array current, voltage and power output. The designed total capacity of the PV array shall not less than 130kWp.

**(3) Lightning Surge Protection**

- : Lightning surge protection must be provided for the PV array.

**3. Structure**

The frame of support structure of PV array shall be hot dip galvanized steel. The bolts and nuts for the support structure shall be stainless steel. The structure must be designed to withstand wind speed at 30 meters per second.

**4. Junction Box**

- (1) A diode for reverse power protection shall be provided for each DC input circuit.  
(2) The protection system for induced lightning shall be provided in the junction box.  
(3) The box shall be both waterproof and dustproof

## 5. Power Conditioner

- (1) Capacity : Site 1 (60kW), Site 2 (35kW), Site 3 (35kW)
- (2) DC Input : Specified by manufacturer.
- (3) AC Output : AC 400V
- (4) Power Factor : Over 85%
- (5) Conversion Efficiency : Over 90%

### (6) Protection System

The protection system must be provided the following functions.

- > Monitoring function of voltage and frequency
- > Control function of output voltage
- > Islanding operation prevent function
- > Control function of automatic voltage

### (7) Protection Device

The protection device must be provided the following relays.

- > Over Voltage Relay (OVR) , Under Voltage Relay (UVR)
- > Under Frequency Relay (UFR) , Over Frequency Relay (OFR)

## 6. Insulating Transformer

AC400V/AC400V with contact preventing plate

## 7. Data Logging System

### (1) Personal Computer

Monitor, Hard disk, Data logger, UPS

### (2) Meteorological data

Solar irradiation, Ambient temperature

### (3) System data

Power output (kW), DC current / voltage, AC current / voltage

## 8. Operating Display Board

Display: Solar irradiation (kW/m<sup>2</sup>), Power output (kW), Temperature (degree Celsius)

Solar power generation (kWh/Day, kWh/Month)

(ANNEX-5)

**Minutes of Meeting**  
**Confirmation of Technical Matters**  
**Grid-interconnection of PV System**

**1. Preamble**

130kWp Photovoltaic generating system will be interconnected to the 6.9 kV distribution line of Electropaz. The following items were confirmed with Electropaz for preparation of technical specifications for grid-interconnection of PV system. The technical specifications for the Contract of 130 kWp PV system Project will be provided by Nippon Koei (NK). NK will explain the Project of JICA as per attached sheet No.5.

**2. Attendance and Date**

(1) Oct 19 2009 at Electropaz

Electropaz : Ing. Orlando Perez, Ing. Ricardo Zambrana,  
Ing. Sergio Bustillos, Ing. Javier Porrez

NK : T. Kobayashi, H. Egawa, K. Fujita, M. Kumasu, J. Masaki, Viviana

JICA : Carmen (Partially)

(2) Oct 20 2009 at Electropaz

Electropaz : Ing. Orlando Perez, Ing. Sergio Bustillos,  
Ing. Javier Porrez(Partially)

NK : K. Fujita, M. Kumasu, Viviana

**3. Subject for discussion and results**

The results are added after above discussion.

3.1 The date of interconnection may be July 2011, but not fixed.

Please refer Attachment 5.

3.2 Standards: JIS (Japanese Industrial Standards)

IEC (International Electrotechnical Commission)

3.3 Connection Points:

Two PV generating system will be planned to connect to 6.9 kV distribution line (D/L) of Electropaz as follows:

(1) 60 kWp power from Site-1 will be connected with 6.9 kV D/L pole  
No. A04087

(2) 70 kWp power from Site-2 & -3 will be connected with 6.9 kV D/L pole  
No. A04046

6.9 KV D/L is connected from Los Lednes line (A04) of LT-42 10MVA transformer in

Rosassini substation. Pole mounted switch will be provided by Electropaz and 15kV cable from PV system will be connected by the Project of JICA as the boundary point.

#### 3.4 Single Line Diagram

Single line diagram prepared by NK attached will be designed and specified. Protection system including CB, DS, PT, CT, Relays, etc. enclosed in outdoor cubicle as mentioned on the single line diagram will be provided under this Project of JICA. Single line diagram will be revised by NK according to the results of discussion.

#### 3.5 Stability and Quality of Grid of Electropaz

Fluctuation range of V, F, Pf, etc. at the interconnected points will be designed as follows:

- (1) Fluctuation range of voltage :  $\pm 7.5\%$  at 6.9 kV
- (2) Fluctuation range of frequency :  $\pm 0.2$  Hz at 50 Hz (49.1 to 50.9 Hz for load shedding)
- (3) Power factor : more than 85 %
- (4) High Harmonic distortion:
  - Total current distortion rate is 5% or less
  - Each current distortion rate is 3% or less
- (5) Short circuit current : 12.5 kA at 6.9 kV

#### 3.6 Protection devices for Grid-interconnection

The following protection devices will be provided under this Project for both accident/trouble of PV system side and Grid side.

- (1) Protection for PV generating system:
  - OVR(over voltage relay), UVR (under voltage relay)
- (2) Protection for Grid side:
  - OFR (over frequency relay), UFR (under frequency relay)

#### 3.7 Countermeasure for isolated operation of PV system

The following countermeasures when the failure of Grid system will be considered for reliability and security of PV system. Basically PV system has no isolated operation.

When any abnormality is detected in the system by protection relays, PV generating system shall be separated from the Grid.

#### 3.8 The following data/specifications will be supplied by Electropaz

- (1) Watt-hour meter of 0.5 class for dealing including memory
- (2) 15 kV Power cable
- (3) CB, etc
- (4) Short circuit current at connection point
- (5) Test items for commissioning before interconnected

#### 3.9 Transformers of 100 kVA

CB

- (1) Altitude: 3,700m (note: Standard of Electropaz is 4,000m)
- (2) Temperature :  $-15^{\circ}\text{C}$  to  $40^{\circ}\text{C}$
- (3) Type : Outdoor, ONAN
- (4) Ratings : 50Hz, 6.9kV/400-230V,

Electropaz requested to provide dual winding transformer for 6.9kV and 12kV, because of up-grade schedule of distribution line in future (within 10years).

However, this request has big problems for the Project, such as modifications of 6.9kV cubicle including CT, PT and measuring equipment.

Therefore, the official/dicided schedule/plan of up-grading of distribution line from 6.9kV to 12kV. After receiving the official schedule/plan, the design will be re-considered.

It is noted that the winding for 6.9kV shall has delta-connection and taps are 7,245-7,072-6,900-6,727-6,555V

- (5) Connection Group : Dyn  
Primary side: Dyn 6.9kV Delta-connection  
Secondary side : 400-230V: Y-connection & Neutral ground)
- (6) Withstand impulse voltage :  
Primary side :  $1.2 \times 50\mu\text{sec}$ , 95kV for 6.9kV,  
Secondary side : 30kV for 400-230V
- (7) Withstand voltage 50Hz:  
6.9 kV: 38kV one min., 400-230V : 10kV one min.

### 3.10 Grounding resistance

- (1) Transformer neutral : less than  $10\ \Omega$
- (2) PV mounting structure, cubicle : less than  $100\ \Omega$
- (3) Others : less than  $100\ \Omega$

### 3.11 Phase arrangement: IEC

R – S – T – N : from left to right, from top to bottom, from front to back for AC

N – P : from left to right, P-N from top to bottom, front to back for DC

### 3.12 Commissioning test before interconnection

Test items will be informed from Electropaz.

## 4. Attachment

- (1) Single Line Diagram(submitted separately)
- (2) Attached sheet No.5(submitted separately)
- (3) Reference documents(submitted separately)

The above are confirmed by NK and Electropaz on Oct. 27, 2009.



**NK: Fujita, Kumasu :**  
**Electropaz :Ing. Orlando Perez R**

**-end -**

**Minutes of Discussions**  
**on**  
**the Preparatory Survey (Outline Design)**  
**on**  
**The Project for Introduction of Clean Energy by Solar Electricity Generation System**  
**in Belize**

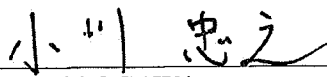
(Explanation on Draft Final Report)

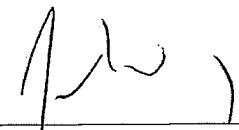
In August 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched to Belize a Preparatory Survey Team on the Project for Introduction of Clean Energy by Solar Electricity Generation System (hereinafter referred to as "the Project"), to hold discussions with relevant officials of the Government of Belize to conduct field surveys and to make technical evaluations. After discussing results of the Preparatory Survey in Japan, JICA prepared a Draft Final Report of the Outline Design.

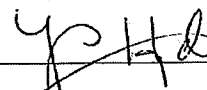
In order to explain and to consult with the concerned officials of Belizean side on the components of the Draft Final Report, JICA dispatched to Belize a Preparatory Survey Team for Draft Final Report Explanation (hereinafter referred to as "the Team"), which is headed by Mr. Tadayuki OGAWA, Senior Adviser of JICA, from August 29 to September 4, 2010.


As a result of the discussions held between JICA and concerned officials of the Government of Belize, the main items described on the attached sheets are confirmed.

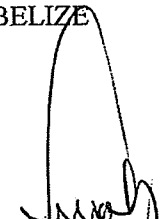
Belmopan, September 3, 2010

  
\_\_\_\_\_  
Tadayuki OGAWA  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
JAPAN

  
\_\_\_\_\_  
Joseph WAIGHT  
Financial Secretary  
Ministry of Finance  
BELIZE

  
\_\_\_\_\_  
Yvonne HYDE  
Chief Executive Officer  
Ministry of Economic Development,  
Commerce, Industry & Consumer Protection  
BELIZE

  
\_\_\_\_\_  
Cadet HENDERSON  
Chief Executive Officer  
Ministry of Works  
BELIZE

  
\_\_\_\_\_  
Santos MAHUNG, Ph.D.  
President  
University of Belize  
BELIZE

## ATTACHMENT

### 1. Components of the Draft Final Report

The Ministry of Finance (hereinafter referred to as "MOF") and the Ministry of Works (hereinafter referred to as "MOW") accepted in principle the components of the Draft Final Report explained by the Team. The Belizean side shall inform the Team in writing of the comments on the Draft Final Report and the Draft Technical Specification by September 10, 2010.

### 2. Program Grant Aid for Environment and Climate Change of the Government of Japan

The Belizean side understood the contents of the Minutes of Discussions signed by JICA and the Belizean side on August 14, 2009 (hereinafter referred to as "the previous M/D"), and agreed to take the necessary measures confirmed on the previous M/D for smooth implementation of the Project following procedures of the Program Grant Aid for Environment and Climate Change of the Government of Japan as shown in **Annex-1**.

### 3. Confirmation of progress made from the previous M/D

#### 3.1. Project site and capacity of PV system

JICA and the Belizean side confirmed that project site is University of Belize (hereinafter referred to as "UB"). The Team explained that the capacity of solar photovoltaic system (hereinafter referred to as "PV system") can be increased up to 350kWp from 200kWp in the previous M/D based on the result of outline design and cost estimation. The Belizean side accepted the change of PV capacity. Because of the change of the capacity of PV system, total land required will be 8,265m<sup>2</sup> (≒2.04 acres).

#### 3.2. Responsible Organization and Implementing Agency

JICA and the Belizean side confirmed that the MOF is the responsible organization, and the MOW is the implementing agency for the Project.

### 4. Equipment to be procured

The Team explained that the list of equipment to be procured is as shown in **Annex-2** based on the result of the 4<sup>th</sup> Preparatory Survey conducted in June 2010. After discussions, JICA and the Belizean side agreed to procure the major equipment such as PV module, Power Conditioner and Transformer from Japan.

### 5. Procurement Process for the Project

JICA and the Belizean side reconfirmed that procurement process will be supervised by the Procurement Agent (hereinafter referred to as "the Agent") who is recommended by the Government of Japan through necessary consultations with the Consultative Committee (hereinafter referred to as "the Committee"). JICA and the Belizean side also reconfirmed the roles of the Agent as follows;

- (1) The Agent will render the services stipulated in the provisions of the G/A (Grant Agreement) as well as the E/N (Exchange of Notes) for the Project;
- (2) The Agent will implement the procurement procedures necessary for the Project according to the provisions of the G/A and E/N and any other relevant guidelines
- (3) JICA will provide a Final Report to the Agent; and
- (4) The Agent will undertake the procurement according to the contents of the Final Report of the Outline Design.

The Team explained that if tender price exceeds the amount agreed on G/A and E/N, quantity or/and items of the equipment would be reduced until the cost for the Project comes down to the amount agreed on G/A and E/N.

The Belizean side agreed that if there is a remaining amount of the cost for the Project after tenders, additional items of equipment would be procured based on priorities which will be set by the Committee.

The Belizean side also understood that decision on addition or reduction of the equipment to be procured would be made through necessary consultations with members of the Committee.

## 6. Project Cost

The Belizean side agreed that the cost for the Project should not exceed the upper limit of amount agreed on in E/N. JICA and the Belizean side also agreed that the cost for the Project contains procurement cost of equipment, the cost for transportation up to the site for the Project, installation cost, the Consultant fee, the Agent fee, and the cost for soft component for the technical support of operation and maintenance (O&M) of equipment.

## 7. Confidentiality of the Project

### (1) Detailed specifications of the Facilities and Equipment

JICA and the Belizean side agreed that all the information related to the Project including detailed drawings and specifications of the facilities and equipment and other technical information shall not be disclosed to any outside parties (i.e. outside of JICA, the Belizean side and the Agent) before conclusion of all the contract(s) for the Project.

### (2) Confidentiality of the Cost Estimation

The Team explained the estimated cost of the Project as described in **Annex-3**. JICA and the Belizean side agreed that the estimated cost for the Project should never be duplicated or disclosed to any outside parties (i.e. outside of JICA, the Belizean side and the Agent) before tender for the Project. The Belizean side understood that the estimated cost for the Project attached as Annex-3 is not final and is subject to change as a result of examination through revision of the Outline Design Study.

## 8. The Consultative Committee

The Belizean side agreed that the MOW will chair the Committee in order to facilitate consultation and procurement process. The Terms of Reference of the Committee are outlined in Annex-9 of the previous M/D.

The members of the Committee are as follows:

- (1) Representative(s) of MOW (Chair)
- (2) Representative(s) of MOF
- (3) Representative(s) of Ministry of Economic Development, Commerce, Industry & Consumer Protection
- (4) Representative(s) of UB
- (5) Representative(s) of Belize Electricity Limited (BEL)
- (6) Representative(s) of JICA Belize Office

The first meeting of the Committee shall be held after signing of the consulting services agreement between the Agent and the Consultant. Further meetings shall be held upon the request of either the Belizean side or the Japanese side. The Procurement Agent may advise JICA and the Belizean side on the necessity to call for a meeting of the Committee.

## 9. Other Relevant Issues

### 9.1. Undertakings required by the Belizean side

The Team requested the Belizean side to abide by the following undertakings by the Belizean side in addition to major undertakings described in the previous M/D and in Annex-4 of this M/D. The Belizean side agreed to do so.

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(1) Land usage for PV system

The owner of the land to be used for the following purposes of the Project is UB. The Belizean side has reconfirmed that there is no objection to use the land for the Project.

- 1) for PV arrays
- 2) for underground cables (22kV and 600V) including communication cables
- 3) for power transformer and 11kV metal enclosed cubicle
- 4) for control house
- 5) for warehouse for spare parts

The Government of Belize obtained the official approval letter for the usage of the above land by UB on June 25, 2010. The Belizean side agreed that the Memorandum of Understanding for the above land between UB and the MOF shall be concluded prior to opening General Procurement Notice by the Agent.

(2) Environmental and Social Considerations

The Belizean side reconfirmed that both Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE) are not required for the implementation of the Project. Belizean side shall obtain official confirmation letter from Department of Environment by September 15, 2010.

(3) Official Permission for Power Generation by Public Utilities Commission

The Belizean side agreed that the official permission for the installation of PV system interconnected with national grid shall be obtained by MOW from PUC prior to opening General Procurement Notice by the Agent. Dedicate account for the operation and maintenance (O&M) of the PV system shall be opened by MOF before the completion of the installation work.

(4) Application of the Related Laws and Regulations

- 1) The Belizean side agreed that structural design for frames to mount PV panels and power conditioner house shall comply with the Architectural Codes and Standards in Japan in consideration of relevant laws and regulations as well as natural conditions in Belize.
- 2) Electrical design for Grid-connected PV system should be conducted in accordance with JIS/JEC/JEM/JCS and BEL Standard (IEC).

(5) Customs and Tax Exemption

The Belizean side agreed that MOF shall be responsible for the exemption of all customs, tax, levies and duties incurred in Belize for the implementation of the Project.

(6) Assignment of Counterpart Personnel

1) Overall project management

The Belizean side assigned following personnel for overall project management and coordination.

MOF: Ms. Raquel GUERRA  
MOW: Mr. David NOVELO

2) Soft Component

The Belizean side agreed to assign necessary personnel in accordance with the soft component plan proposed by the Team.

MOW will assign the focal Counterpart Personnel for the soft component.

Other personnel will be assigned from other organizations as required at the time of

*Qf.*  
*Q ypr*

project implementation.

(7) Security against vandalism

The Belizean side agreed to take necessary measures against vandalism at the project site, such as i) regular patrol (24 hours a day / 7 days a week) and ii) installation of sensor with alarm, to secure the PV system.

9.2. Ownership and Operation and Maintenance (O&M) Responsibilities of Equipment

The Belizean side has reconfirmed that the MOF is the final owner of Equipment and responsible for securing necessary budget and personnel for operation and maintenance (O&M) of Grid-connected PV system procured and installed under the Project. The Belizean side confirmed that the Equipment procured under the Project shall be operated and maintained by MOW and UB with the necessary assistance by Belize Electricity Limited (BEL) and other related organizations.

<List of Annex>

Annex-1 Program Grant Aid for Environment and Climate Change

Annex-2 List of Major Equipment

Annex-3 Project Cost Estimation (Confidential)

Annex-4 Major Undertakings to be taken by each Party

Annex-5 Layout Drawing of PV system

Handwritten initials and marks, including a circled '9', 'ypl', a large 'D', and a signature.

Program Grant Aid for Environment and Climate Change  
of the Government of Japan  
(Provisional)

The Grant Aid provides a recipient country (hereafter referred to as “the Recipient”) with non-reimbursable funds to procure the facilities, equipment, and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

Based on “Cool Earth Partnership” initiative of the Government of Japan, the Program Grant Aid for Environment and Climate Change (hereafter referred to as “GAEC”) aims to mitigate effects of global warming by reducing GHGs emission (mitigation; e.g. improvement of energy efficiency) and to take adaptive measures (adaptation; e.g. measures against disasters related to climate change, including disaster prevention such as enhancing disaster risk management). GAEC may contain multiple components that can be combined to effectively meet these needs.

1. Procedures for GAEC

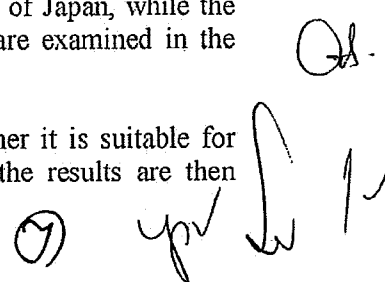
GAEC is executed through the following procedures.

Preparatory Survey 1	Preparatory Survey for project identification conducted by Japan International Cooperation Agency (JICA)
Application	Request made by a recipient country
Appraisal & Approval	Appraisal by the Government of Japan and Approval by the Cabinet
Determination of Implementation	The Notes exchanged between the Government of Japan and the Recipient Country
Grant Agreement (hereinafter referred to as the “G/A”)	Agreement concluded between JICA and the Recipient
Preparatory Survey 2	Preparatory Survey for design conducted by JICA
Implementation	Procurement through the Procurement Agency by the Recipient

Firstly, if the candidate project for a GAEC is identified by the Recipient and the Government of Japan, the Government of Japan (the Ministry of Foreign Affairs) examines it whether it is eligible for GAEC. When the request is deemed appropriate, JICA, in consultation with the Government of Japan, conducts the Preparatory Survey (hereafter referred to as “the Survey”) on the candidate project as Phase 1 of the Survey with Japanese consulting firms.

Secondly, the Recipient submits the official request to the Government of Japan, while the appropriateness, necessity and the basic components of the Program are examined in the course of Phase 1 of the Survey,

Thirdly, the Government of Japan appraises the Program to see whether it is suitable for Japan's GAEC, based on the Survey report prepared by JICA, and the results are then



submitted to the Cabinet for approval.

Fourthly, the Program, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the Recipient.

Fifthly, JICA engages Grant Agreement (G/A) with the Recipient and executes the Grant by making payments of the amount agreed in the E/N and strictly monitors that the funds of the Grant are properly and effectively used.

Procurement Management Agent is designated to conduct the procurement services of products and services (including fund management, preparing tenders, contracts) for GAEC on behalf of the Recipient. The Agent is an impartial and specialized organization that will render services according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the Agreed Minutes ("A/M").

## 2. Preparatory Survey

### 1) Contents of the Survey

The purpose of the Preparatory Survey (hereafter referred to as "the Survey"), conducted by JICA on a requested project (hereafter referred to as "the Project"), is to provide the basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Survey are as follows:

- Confirmation of background, objectives, and benefits of the Project and institutional capacity of agencies and communities concerned of the Recipient necessary for project implementation.
- Evaluation of relevance of the Project to be implemented under the Grant Aid Scheme for Environment and Climate Change from a technical, social, and economic point of view.
- Confirmation of items agreed upon by both parties concerning the basic concept of the Project.
- Preparation of the design of the Project and reference document for tender.
- Estimation of cost for the Project.

The contents of the original request will be modified, as found necessary, in the design of the Project according to the guidelines of Japan's Grant Aid scheme.

The Government of Japan requests the Government of the Recipient to take whatever measures necessary to ensure its responsibility in implementing the Project. Such measures must be guaranteed even if they may fall outside the jurisdiction of the implementing organization of the Recipient. This has been confirmed by all relevant organizations of the Recipient through the Minutes of Discussions.

### 2) Selection of consulting firms

For the smooth implementation of the Survey, JICA will conduct the Survey with registered consulting firms. JICA selects the firms based on proposals submitted by firms with interest in implementing the Survey. The firms selected will carry out the Preparatory Survey and prepare a report, based on the terms of reference set by JICA.



3. Implementation of GAEC after the E/N

1) Exchange of Notes (E/N)

The content of GAEC will be determined in accordance with the Notes exchanged by the two Governments concerned, in which items including, objectives of the project, period of execution, conditions and amount of the Grant Aid are confirmed.

2) Details of Procedures

Details of procedures on procurement and services under GAEC will be agreed between the authorities of the two governments concerned at the time of the signing of the G/A.

Essential points to be agreed are outlined as follows:

- a) JICA will supervise the implementation of the Project.
  - b) Products and services will be procured and provided in accordance with JICA's "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change."
  - c) The Recipient will conclude a contract with the Agent.
  - d) The Agent is the representative acting in the name of the Recipient concerning all transfers of funds to the Agent.
- 3) Focal points of "Procurement Guidelines for the Program Grant Aid for Environment and Climate Change"

a) The Agent

The Agent is the organization, which provides procurement of products and services on behalf of the Recipient according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the A/M.

b) Agent Agreement

The Recipient will conclude the Agent Agreement, in principle, within two months after the signing of the G/A, in accordance with the A/M. The scope of the Agent's services will be clearly specified in the Agent Agreement.

c) Approval of the Agent Agreement

The Agent Agreement is prepared as two identical documents and the copy of the Agent Agreement will be submitted to JICA by the Recipient through the Agent. JICA confirms whether the Agent Agreement is concluded in conformity with the E/N, A/M, and G/A and the Procurement Guidelines for the Program Grant Aid for Environment and Climate Change then approves the Agent Agreement.

The Agent Agreement concluded between the Recipient and the Agent will become effective after the approval by JICA in a written form.

d) Payment Methods

The Agent Agreement will stipulate that "Regarding all transfers of the fund to the Agent, the Recipient will designate the Agent to act on behalf of the Recipient and issue a Blanket Disbursement Authorization ("the BDA") to conduct the transfer of the fund (hereinafter referred to as "the Advances") to the Procurement Account from the Recipient Account.

The Agent Agreement will clearly state that the payment to the Agent will be made in Japanese yen from the Advances and that the final payment to the Agent will be made when the total remaining amount become less than three percent (3%) of the Grant and its

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accrued interests excluding the Agent's fees.

e) Products and Services Eligible for Procurement

Products and services to be procured will be selected from those defined in the G/A.

f) Firm and Consultant

The firm and consultant who would contract with the Agent shall be Japanese Nationals.

The consultants that will be employed to do detailed design and supervise the work for the Project, will, however, be in principle, Japanese nationals recommended by JICA for the purpose of maintaining technical consistency with the Study.

g) Method of Procurement

When conducting the procurement, sufficient attention will be paid to transparency in selecting the firms and for this purpose, competitive tendering will be employed in principle.

h) Tender Documents

The tender documents should contain all information necessary to enable tenderers to prepare valid offers for the products and services to be procured by GAEC.

The rights and obligations of the Recipient, the Agent and the firms supplying products and services should be stipulated in the tender documents to be prepared by the Agent. Aside from this, the tender documents will be prepared in consultation with the Recipient.

i) Pre-qualification Examination of Tenderers

The Agent may conduct a pre-qualification examination of tenderers in advance of the tender so that the invitation to the tender can be extended only to eligible firms. The pre-qualification examination should be performed only with respect to whether the prospective tenderers have the capability of concluding the contracts.

For this, the following points should be taken into consideration:

- (1) Experience and past performance in contracts of similar kind
- (2) Financial credibility (including assets such as real estate)
- (3) Existence of offices and other items to be specified in the tender documents.
- (4) Their potentialities to use necessary personnel and facilities.

j) Tender Evaluation

The tender evaluation should be implemented on the basis of the conditions specified in the tender documents.

Those tenderers which substantially conform to the technical specifications and other stipulations of the tender documents will be judged in principle on the basis of the submitted price, and the tenderer who offers the lowest price will be designated as the successful tenderer.

The Agent will submit a detailed evaluation report of tenders to JICA for its information, while the notification of the results to the tenderers will not be premised on the confirmation by JICA.

k) Additional procurement

If there is any remaining balance after the competitive and/or selective tendering and/or

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direct negotiation for a contract, and if the Recipient would like to procure additional items, the Agent is allowed to conduct this additional procurement, following the points mentioned below:

(1) Procurement of same products and services

When the products and services to be additionally procured are identical with the initial tender and a competitive tendering is judged not efficient, additional procurement can be conducted by a negotiated contract with the successful tenderer of the initial tender.

(2) Other procurements

When products and services other than those mentioned above in (1) are to be procured, the procurement should be conducted through competitive tendering. In this case, the products and services for additional procurement will be selected from among those in accordance with the G/A.

l) Conclusion of the Contracts

In order to procure products and services in accordance with the guideline, the Agent will conclude contracts with firms selected by tendering or other methods.

m) Terms of Payment

The contract will clearly state the terms of payment. The Agent will make payment from the "advances," against the submission of the necessary documents from the firm on the basis of the conditions specified in the contract. When the services are the object of procurement, the Agent may pay certain portion of the contract amount in advance to the firms on the conditions that such firms submit the advance payment guarantee worth the amount of the advance payment to the Agent.

4) Undertakings required by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the Recipient is required to undertake necessary measures as the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project.
- b) To provide facilities for distributing electricity, water supply and drainage and other incidental facilities in and around the sites.
- c) To ensure all the expense and prompt execution for unloading, customs clearing at the port of disembarkation and domestic transportation of products purchased under the Grant Aid,
- d) To ensure that customs duty, internal taxes and other fiscal levies that may be imposed in the Recipient with respect to the purchase of the Components and the Agent's services will be exempted by the Government of the Recipient.
- e) To accord all the concerned parties, whose services may be required in connection with supply of the products and services under the contracts, such facilities as may be necessary for their entry into the Recipient and stay therein for the performance of their work.

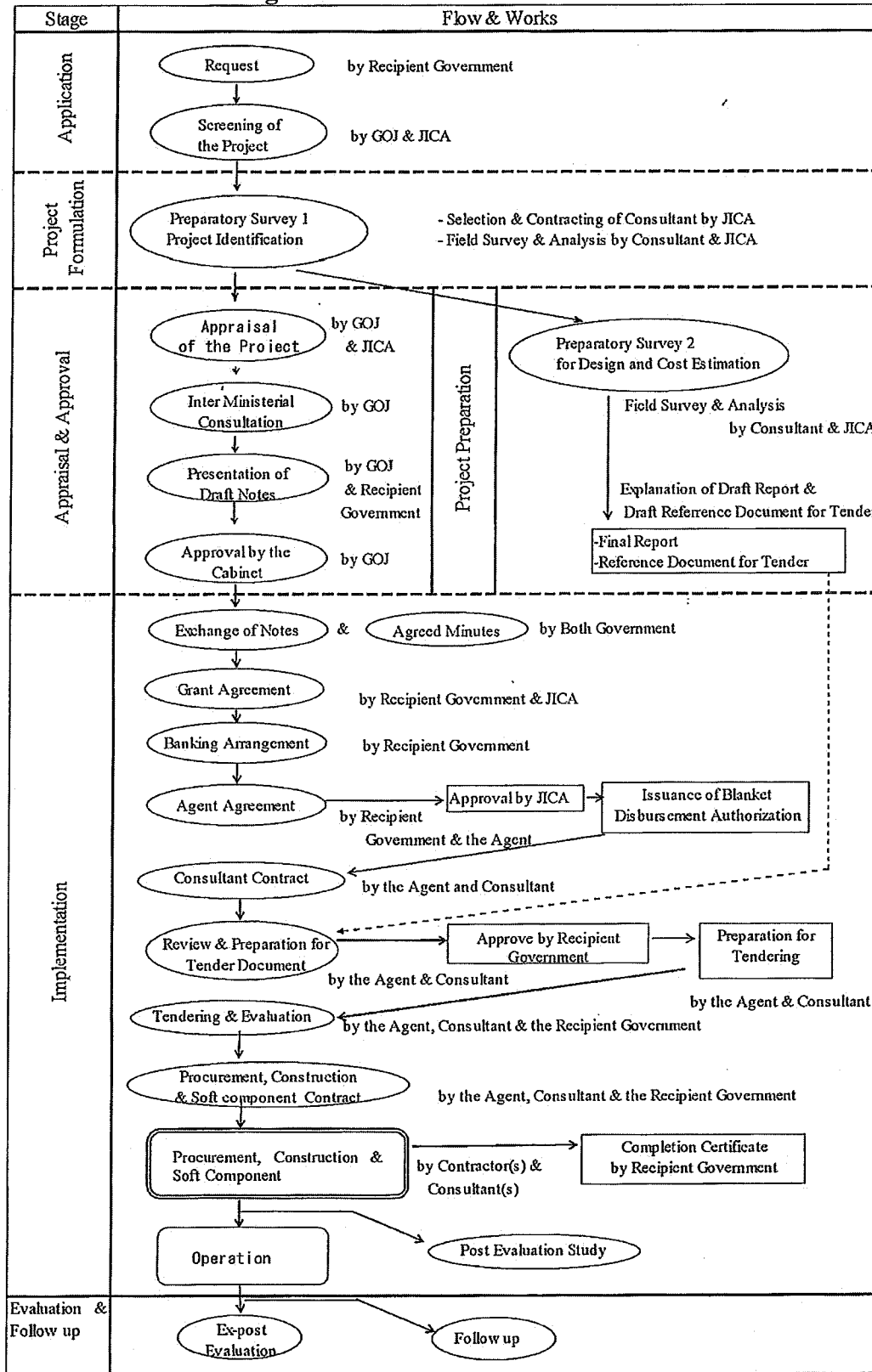
5) "Proper use of funds"

The Recipient is required to operate and maintain the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign personnel necessary for this operation and maintenance (O&M) as well as to bear all the expenses other than those covered by the Grant Aid.

6) "Export and Re-export" of products

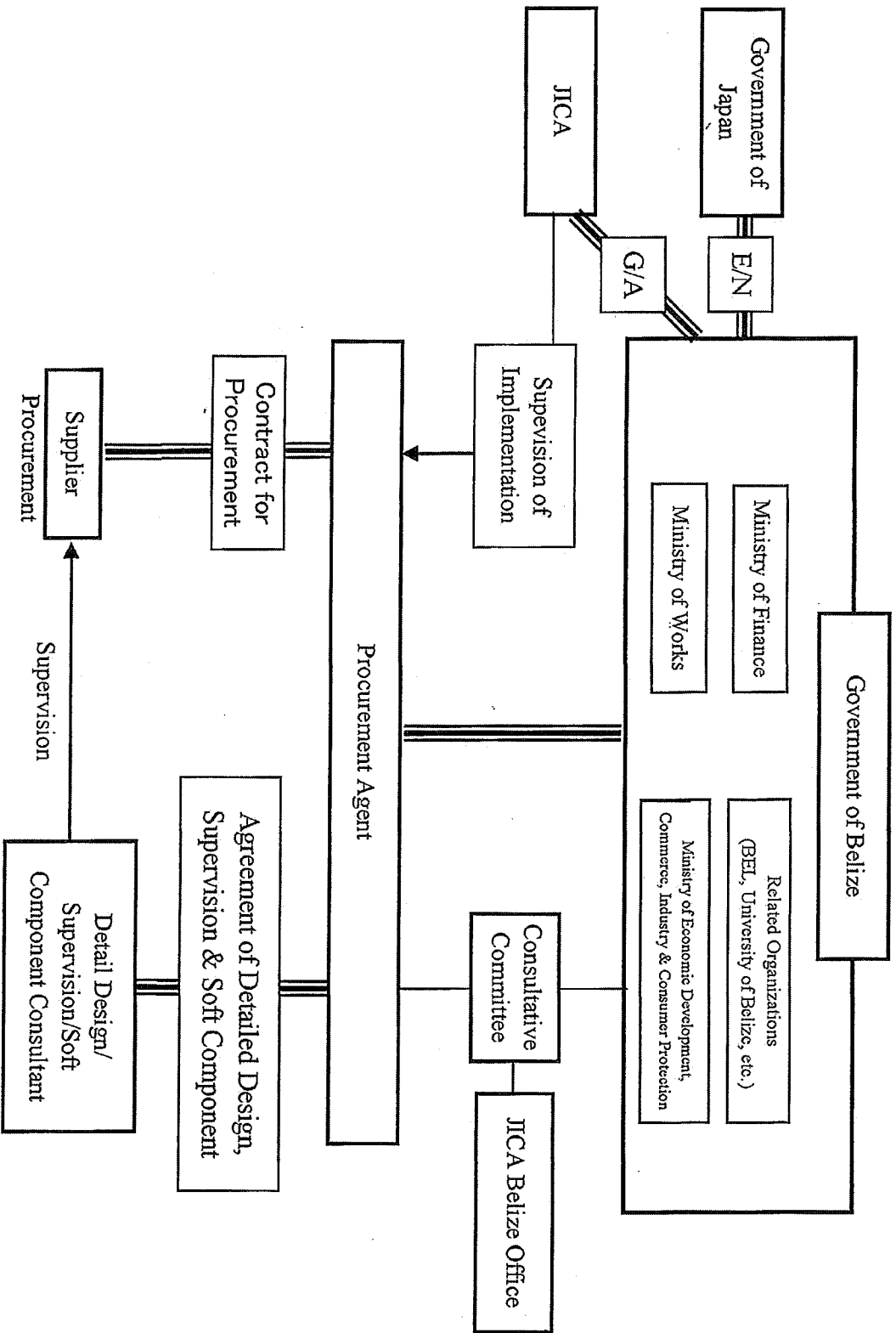
The products purchased under the Grant and its accrued interest will not be exported or re-exported from the Recipient.

**General Flow of Program Grant Aid for Environment and Climate Change**





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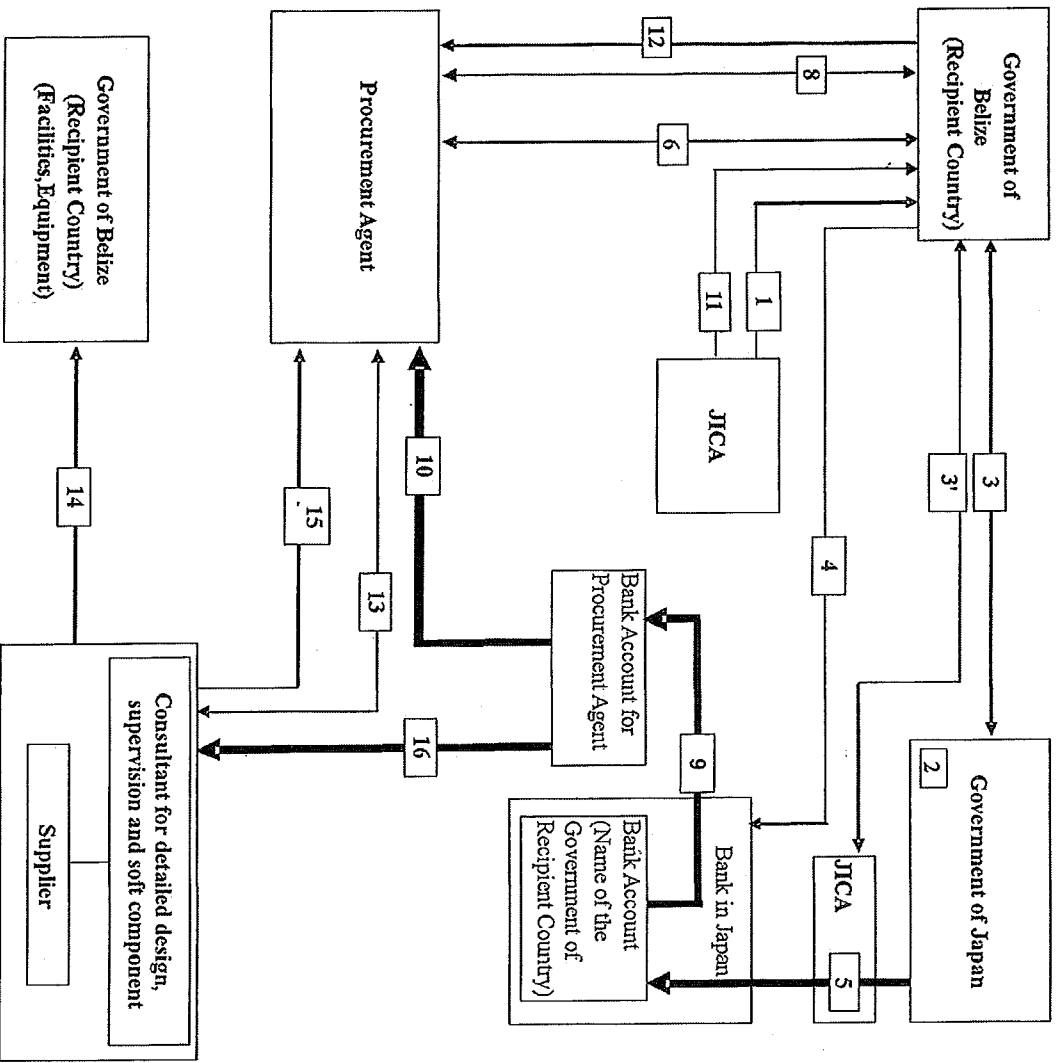
# Project Implementation System



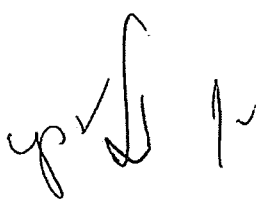

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# Flow of Funds for Project Implementation

 Implementation Flow  
 Cash Flow



- 1 Preparatory Survey / Reference Document for Tender
- 2 Approval of Cabinet
- 3 Signing of Exchange of Notes (E/N)
- 3' Signing of Grant Agreement (G/A)
- 4 Banking Arrangement (B/A)
- 5 Disbursement of Funds from the Government of Japan
- 6 Signing of Agent Agreement (A/A) + BDA
- 7 N/A
- 8 Decision of Project Components
- 9 Transfer of Funds
- 10 Payment of Remuneration for Agent
- 11 Recommendation of Consultant for Detailed Design/Supervision (JICA -> Government of Belize)
- 12 Recommendation of Consultant for Detailed Design / Supervision (Government of Belize -> Procurement Agent)
- 13 Conclusion of Contract
- 14 Construction and Procurement
- 15 Application for Payment
- 16 Payment

### List of Major Equipment

Components	Specifications	Q'ty	unit	Purpose
PV Module	Type: Silicon Crystal Module capacity: not less than 180Wp Total array capacity: more than 350kWp	1	lot	To generation power by solar
Mounting structure for PV module	Material: hot dip galvanizing steel	1	lot	To support PV module (arrays)
Junction Box	Construction: Outdoor, hanging type Equipment: line breaker, circuit isolator, lightning protection device, reverse flow diode	1	lot	To collect DC power of PV modules.
Power conditioner	Construction: Indoor, independent type Main circuit type: self-exciting voltage type Switching type: High frequency PWM Rated power output: more than 350kW Wire connection 3phase 3 wire, or 3 phase 4 wire Rated output voltage: AC400V or 230V Efficiency: more than 90 % Grid-connection protection function: UVR, OVR, UFR, OFR, islanding operation prevention (passive, active detection), prevent power supply after recovery	1	lot	To convert DC voltage by PV modules to AC voltage for connecting load and grid.
Outdoor step up transformer	3-phase, 500kVA, 11kV/400V/230V, 3 phases 4 wire, 60Hz, Outdoor, natural oil cooling type (ONAN), off-load tap changer $\pm 2.5\%$ , $\pm 5\%$	1	set	To step up 400V voltage to 11kV grid voltage
11 kV Switchgear for grid connection	Outdoor, metal enclosed cubicle type switchgear Equipment: Switchgear: 11 kV VCB, DS, LA, CT, VT Protective Relay: OCGR, OVGR, OCR Measuring: V, A, W, PF, WH	1	set	To connect 11kV grid
Low voltage distribution board	Indoor-hanging or independent Equipment: Molded case circuit breaker (MCCB)	1	lot	To supply station use AC power for PV control system and auxiliary equipment
Monitoring display	Outdoor type with supporting structure Display data: power output/day(kWh), instantaneous power potential(kW), irradiation (kWh/m <sup>2</sup> ), ambient temperature(°C), CO <sub>2</sub> emission(kg-C)	1	set	To display the monitoring data
Data management and monitoring system	1) Pyranometer 2) Thermometer 3) Data logger 4) Monitoring equipment (indoor)	1	set	To monitor meteorological data and system operating conditions
Control House	Steel construction W2,400 x L7,200 x H2,460 Accessories: door, light, air conditioner, dial thermometer Equipment: Power conditioner, load distribution board, monitoring device	1	unit	To install power conditioners, distribution board and data management and monitoring system

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### Project Cost Estimation (Confidential)

The project cost for solar PV system is estimated hereunder. However, it is noted that the estimated cost is subject to further examination for Approval of Grant Aid.

This page is closed due to the confidentiality.

- 2. Costs to be borne by Belizean side: Approximately US\$ 23,500 (equivalent to ¥2,170,000)**  
Initial expense for installation of PV system: Approximately US\$ 23,500 (equivalent to ¥2,170,000). The breakdown of the estimated project cost to be borne by Belizean side is as follows:

1 US\$ = ¥ 92.35

Item	Amount (US \$)	Equivalent (JP ¥)
1. Repair of access road	8,000	740,000
2. Extension of 11kV distribution line (approx. 28m)	9,000	830,000
3. Security Illumination	6,500	600,000
<b>Total (1+2+3)</b>	<b>23,500</b>	<b>2,170,000</b>

In addition to the above, the expenditures for Bank Agreement (B/A) and Authorization to Pay (A/P) for obtaining import permit from the government and others such as will be arranged.

- 3. Operation and Maintenance (O&M) Costs (annual cost): Approximately US\$ 14,850 (equivalent to ¥1,370,000)**

The budget for annual operation cost of PV power plant will be arranged for procurement of spare parts, operation and maintenance (O&M) staff management, periodical inspection of the equipment by BEL and general expenses so as to ensure the sustainable operation of PV system. The breakdown of operation and maintenance (O&M) costs of the PV system are as follows:

1 US\$ = ¥ 92.35

Items	Amount (US\$)	Equivalent (JP ¥)
1. Land lease cost	2,500	230,000
2. Equipment maintenance cost	5,000	460,000
3. Contract out cost for BEL	6,500	600,000
4. Management cost and others	850	80,000
<b>Total (1+2+3+4)</b>	<b>14,850</b>	<b>1,370,000</b>

#### 4. Costs estimate conditions

- (1) Time of cost estimation: July 2010
- (2) Current exchange rates: US\$ 1.00=JP¥92.35
- (3) Others: The above cost estimation was made according to the procurement rules and guideline of Japanese Grant Aid.



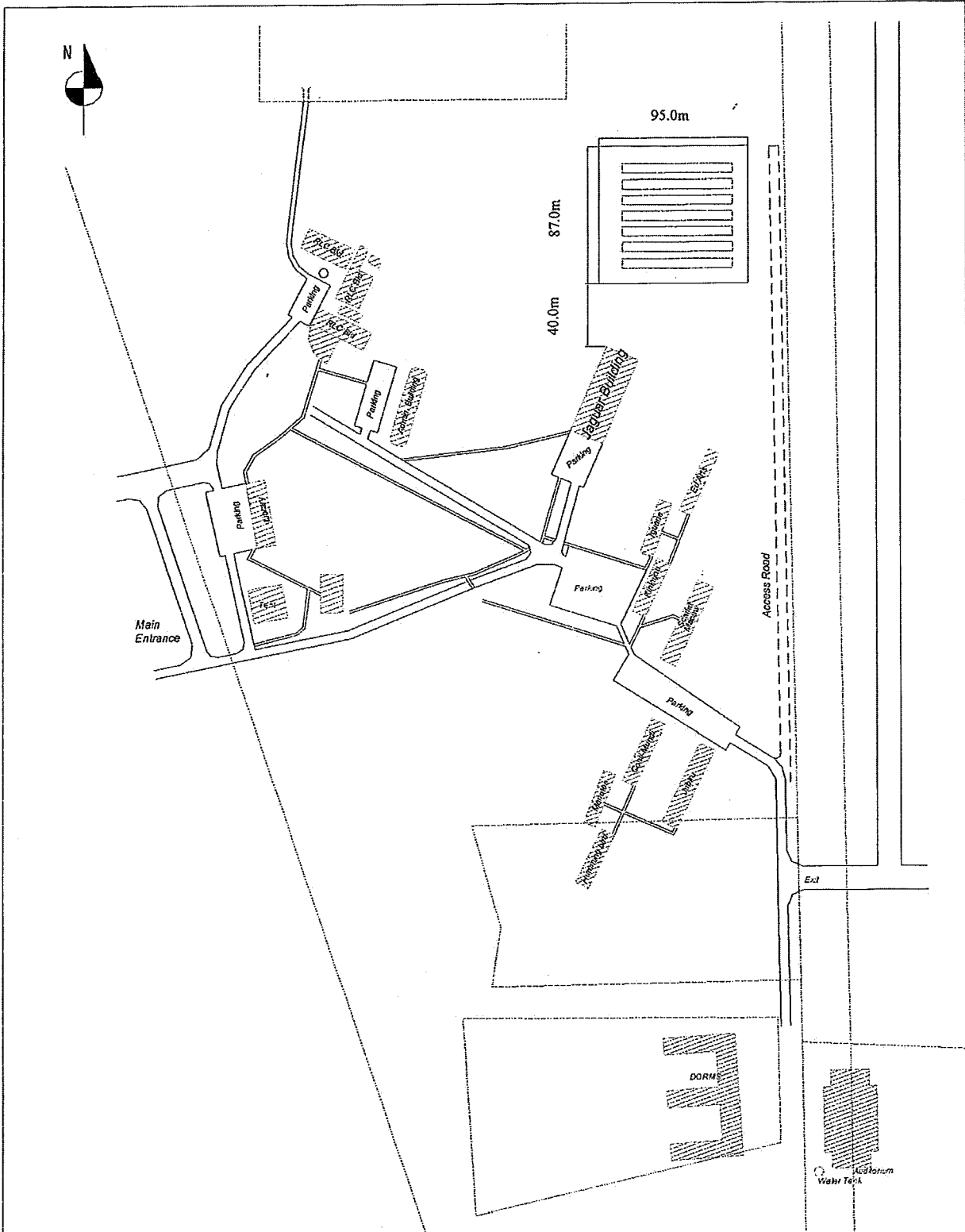
## Major undertakings to be taken by each Party

No.	Items	To be Covered by Japanese Grant	To be covered by MOF	To be covered by MOW	To be covered by UB	To be covered by BEL
1	To secure land		•	•		
2	To clear, level and reclaim the site			•		
3	To construct gates and fences in and around the site			•		
4	To construct a parking lot if necessary			•		
5	To construct roads					
	1) Within the site	•				
	2) Outside the site and Access road			•		
6	To construct the facility and install the equipment	•				
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities if necessary:					
	1) Electricity					
	a. The power distribution line to the site		•	•		•
	b. The drop wiring and internal wiring within the site	•				
	c. The main circuit breaker and transformer for the site	•				
	2) Water Supply					
	a. The city water distribution main to the site			•		
	b. The supply system within the site (receiving and elevated tanks)	•				
	3) Drainage					
	a. The city drainage main (for conveying storm water, sewage, etc. from the site)			•		
	b. The drainage system within the site (for sewage, ordinary waste, storm water, etc.)	•				
	4) Gas Supply					
	a. The city gas main to the site	n/a	n/a	n/a	n/a	n/a
	b. The gas supply system within the site	n/a	n/a	n/a	n/a	n/a
	5) Telephone System					
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building			•		
	b. The MDF and the extension after the frame/panel	•				
	6) Furniture and Equipment					
	a. General furniture			•		
	b. Project equipment	•				
8	To bear the following commissions applied by the bank in Japan for banking services based upon the Bank Arrangement (B/A):					
	1) Payment of bank commission		•			
9	To ensure all the expense and prompt execution of unloading and customs clearance at the port of disembarkation in the recipient country					
	1) Marine or air transportation of the products from Japan or third countries to the recipient	•				

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No.	Items	To be Covered by Japanese Grant	To be covered by MOF	To be covered by MOW	To be covered by UB	To be covered by BEL
	2) To ensure all the expense and prompt execution of unloading, tax exemption and customs clearance of the products at the port of disembarkation		•	•		
	3) Internal transportation from the port of disembarkation to the project site	•				
10	To accord Japanese nationals and / or nationals of third countries, including persons employed by the agent whose services may be required in connection with the Components such facilities as may be necessary for their entry into recipient country and stay therein for the performance of their work.		•	•		
11	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the Components and to the employment of the Agent will be exempted by the Government of Belize		•	•		
12	To maintain and use properly and effectively the facilities that are constructed and the equipment that is provided under the Grant					
	1) O&M cost management		•			
	2) Management of operation			•		
	3) Daily inspection of O&M			•	•	
	4) Periodic inspection and repair					•
13	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the purchase of the Components as well as for the agent's fees.		•			
14	To ensure environmental and social consideration for the Programme.		•	•		
15	To ensure to get permission from PUC for installation of PV system			•		
16	To ensure Electricity Tariff Agreement		•			•
17	Land agreement for Plant installation		•	•	•	
18	Land arrangement for temporary equipment stockyard			•		
19	Land leveling if required			•		
20	Security gates and fence around the site			•		
21	Construction of road					
	1) Outside the site and access road			•		
22	Terminal point of grid interconnection					
	1) Extension of 11kV distribution line (28m)		•	•		•
	2) Installation of Load Break Switch		•	•		•
	3) Connection of Power Cable to 11kV distribution line	•				
23	Responsibility of coordination during design stage					
	1) Electrical works		•	•		
	2) Civil and building works, if any		•	•		

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THE PROJECT FOR INTRODUCTION OF CLEAN ENERGY SOLAR ELECTRICITY GENERATION SYSTEM IN BELIZE	DRAWING TITLE	DRAW. NO.	PREPARED BY	
	UNIVERSITY OF BELIZE	BZ-E-104	CHECKED BY	
	LAYOUT DRAWING OF PV SYSTEM (350kW)		APPROVED BY	
			DATE	

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