

## Appendix to Bid

### Part 8 : Generating Plant

The Bidder shall complete all blank spaces on the following form of functional guarantees and form of technical particulars.

#### Form of Functional Guarantees

##### 1. Hydraulic Turbine

- (1) Rated output operating at the proposed rated Speed under the stated design head. ....kW
- (2) Rated output at stated minimum head. ....kW
- (3) Efficiency for the turbine operating under the stated design head and proposed rated speed
  - (a) with an output of 100% ..... kW ..... %
  - (b) with an output of 80% ..... kW ..... %
  - (c) with an output of 60% ..... kW ..... %
  - (d) with an output of 40% ..... kW ..... %
- (4) Speed regulation or speed rise when 100% rated load is shed
  - (a) Governor closing time of guide vanes at design head will be ..... sec
  - (b) Maximum runaway speed at maximum net head. Generator unloaded and unexcited Guide vanes fully open ..... rpm

##### 2. Synchronous Generator

- (1) Rated continuous output ..... kVA  
under  
rated voltage ..... V  
rated frequency ..... Hz  
rated power factor .....
- (2) Efficiency with all losses including thrust bearing, excitation system and amplifier losses corrected continue to 75 °C.

Power Factor

	0.8 lagging	1.0
100% rate output	..... %	..... %
90% rate output	..... %	..... %
70% rate output	..... %	..... %
50% rate output	..... %	..... %

- (3) Temperature rise at rated output, rate voltage power factor and rated frequency, and at ambient air temperature of 40 °C and water temperature of 25 °C.

Method of Measurement

(a) Stator windings	.....	..... °C
(b) Rotor windings	.....	..... °C
(c) Stator core	.....	..... °C
(d) Rotor core	.....	..... °C
(e) Bearing (max. temp.)	.....	..... °C

3. Main Transformer

- (1) Continuous rated output .....kVA
- (2) No-load loss at rated frequency .....Hz
- (3) Load loss at 75 °C, rated frequency and output :
- |                    |         |
|--------------------|---------|
| (a) At nominal tap | .....kW |
| (b) At maximum tap | .....kW |
| (c) At nominal tap | .....kW |
- (4) Efficiency at 75 °C, full load and rated frequency :
- |                    |         |
|--------------------|---------|
| (a) At nominal tap | ..... % |
| (b) At nominal tap | ..... % |
| (c) At nominal tap | ..... % |
- (5) Maximum temperature rise at rated output
- |                                       |          |
|---------------------------------------|----------|
| (a) Oil by temperature                | ..... °C |
| (b) Winding by resistance measurement | ..... °C |

## Form of Technical Particulars for Generating Plant

1. **Turbine**
  - (1) Manufacture's name .....
  - (2) Type .....
  - (3) Direction of rotation viewed from the generator clockwise
  - (4) Rated speed .....rpm
  - (5) Specified speed at net head .....m-kW
  - (6) Critical cavitation factor .....
  - (7) Runaway speed :
    - (a) at minimum net head ..... rpm
  - (8) Flywheel effect of turbine rotating parts ( $GD^2$ ) ..... ton-m<sup>2</sup>
  - (9) Required flywheel effect of complete unit ( $GD^2$ ) ..... ton-m<sup>2</sup>
  - (10) Turbine maximum hydraulic thrust :
    - (a) at starting – up ..... tons
    - (b) during station ..... tons
  - (11) Elevation of centre line of turbine shaft EL ..... m
  - (12) Runner :
    - (a) Material and type of construction .....
    - (b) Discharge diameter ..... mm
    - (c) Number of runner blade ..... nos
    - (d) Total weight ..... kg
  - (13) Shaft :
    - (a) Material .....
    - (b) Diameter ..... mm

- (14) Shaft seal :
- (a) Type .....
- (b) Required quantity of sealing water ..... litre/min
- (15) Weight of runner and shaft assembly, with lifting device ..... tons
- (16) Turbine bearing :
- (a) Type .....
- (b) Material .....
- (c) Maximum temperature to bearing metal at cooling water temperature of 25 °C ..... °C
- (d) Grade of oil to be used .....
- (17) Spiral case :
- (a) Material and construction .....
- (b) Dimensions ..... mm
- (c) Diameter of inlet section ..... mm
- (18) Draft tube :
- (a) Type .....
- (b) Material ..... mm
- (c) Distance between center line of spiral case and vertical center line of draft tube .....
- (d) Dimension of draft tube outlet ..... mm
- (19) Guide vanes :
- (a) Material .....
- (b) Number of guide vane ..... nos
- (c) Leakage from guide vanes at inlet valve fully opened ..... lit/min
- (20) Guide vanes servomotor :
- (a) Type of servomotor .....
- (b) Motor capacity ..... kW

- (c) Capacity of servomotor ..... kg
- (21) Governor
- (a) Type of governor .....
- (b) Manufacturer .....
- (c) Speed dead band ..... %
- (d) Dead time ..... sec
- (e) Speed droop adjustable range ..... %
- (f) Turbine speed adjustment range ..... S
- (g) Servomotor cushioning time ..... sec
- (h) Equivalent closing time ..... sec
- (22) Weight
- (a) Total weight of turbine and governor complete ..... kg
- (b) Heaviest lift during erection ..... kg
- (c) Weight of turbine rotating parts ..... kg
- (23) Largest package
- (a) Item .....
- (b) Weight ..... kg
- (c) Dimension, length x width x height ..... mm
- (24) Heaviest package
- (a) Item .....
- (b) Weight ..... kg
- (c) Dimension x width x height ..... mm
- (25) Efficiency curve. To be attached.
- (26) Capability curve. To be attached.
- (27) Method of removal of runners and guide vane. Provide a description.
- (28) Turbine shaft sealing system. Provide a description.
- (29) Shaft, couplings and bearing arrangement. Provide a description.

(30) Bearing and lubricating system. Provide a description.

2. Synchronous Generator

- (1) Manufacturer's name .....
- (2) Type .....
- (3) Rated voltage ..... V
- (4) Rated power factor ..... Hz
- (5) Rated speed ..... rpm
- (6) Design runaway speed ..... rpm
- (7) Direction of rotation viewed from the turbine .....
- (8) Flywheel effect of generator rotating part ( $GD^2$ ) .....  $\text{ton}\cdot\text{m}^2$
- (9) Flywheel effect of generator plus separate flywheel ( $GD^2$ ) .....  $\text{ton}\cdot\text{m}^2$
- (10) Short circuit ratio .....
- (11) Deviation factor of open circuit wave form .....
- (12) Inherent voltage regulation
  - (a) At 1.0 power factor ..... %
  - (b) At 0.8 power factor (lagging) ..... %
- (13) (a) Direct axis transient reactance, saturated ( $X_d$ ) ..... %
  - (b) Direct axis subtransient reactance, unsaturated ( $X'_d$ ) ..... %
  - (c) Negative sequence reactance ( $X_2$ ) ..... %
  - (d) Zero sequence reactance ( $X_0$ ) ..... %
  - (e) Direct axis synchronous ..... %
- (14) Maximum voltage rise when shedding continuous rated load at rated power factor under actual service conditions with speed control and voltage control equipment in operation .....
- (15) KVAR capability of the generator for rated temperature rise
  - (a) Zero power factor leading ..... KVAR
  - (b) Zero power factor leading ..... KVAR

- (16) Stator
- (a) Dimension for shipment .....mm
  - (b) Weight for shipment ..... tons
  - (c) Outside dimension of stator frame ..... mm
  - (d) Stator winding resistance per phase at 75 °C ..... ohms
- (17) Rotor
- (a) Pole length ..... mm
  - (b) Type of pole damper windings .....
  - (c) Maximum diameter ..... mm
  - (d) Weight for shipment ..... ton
- (18) Main shaft
- (a) Material .....
  - (b) Diameter ..... mm
- (19) Bearings
- (a) Type of thrust bearing .....
  - (b) Type of journal bearing .....
  - (c) Estimated hydraulic thrust load on thrust bearing ..... ton
  - (d) Maximum possible temperature with continuous operation of the bearing ..... °C
  - (e) Bearing forced oil lubrication offered Yes/No
  - (f) Bearing cooling type .....
- (20) Material of insulation
- (a) Stator conductors in core .....
  - (b) Stator end windings .....
  - (c) Stator core plates .....
  - (d) Fields windings .....

- (21) Flywheel
- (a) Diameter ..... mm
  - (b) Weight ..... kg
- (22) Excitation system
- (a) Manufacturer .....
  - (b) Exciter rated voltage ..... V
  - (c) Exciter ceiling voltage ..... V
  - (d) Response ratio .....
  - (e) A.C Exciter output ..... kW
  - (f) Exciter voltage when generator is operating at rated output and rated voltage ..... V
  - (g) Exciter current when generator is operating at rated output and rated voltage ..... A
  - (h) Excitation transformer capacity .....
  - (i) Class, ratio and rating required for voltage transformer for AVR .....
  - (j) D.C current required to trip field circuit breaker ..... A
  - (k) D.C current required to close field circuit breaker ..... A
- (23) Cooling air quantity for free ventilation type generator ..... m<sup>3</sup>/min
- (24) Generator space heater ..... kW
- (25) Neutral grounding resistor
- (a) Manufacturer .....
  - (b) Resistance .....
  - (c) Current rating .....
  - (d) Time rating .....
  - (e) Required dimensions for housing .....



- (26) Surge protective equipment
- (a) Manufacturer's name .....
  - (b) Resistance .....
  - (c) Current rating .....
  - (d) Time rating .....
  - (e) Required dimensions for housing .....
- (27) Surge protective equipment
- (a) Manufacturer's name .....
  - i) Surge arresters .....
    - ii) Capacitors .....
  - (b) Number
    - i) Surge arresters .....
    - ii) Capacitors .....
  - (c) Rated voltage ..... V
    - i) Surge arresters ..... V
    - ii) Capacitors ..... V
  - (d) Nominal discharge current of surge arresters ..... kA
  - (e) Capacitance of capacitors .....micro/farad/  
phase
  - (f) Withstand voltage ..... kV
    - i) Full-wave lightning impulse 1.2 x 50 micro-seconds ..... V
    - ii) Power-frequency ..... mm
  - (g) Required dimensions for housing
- (28) Weight
- (a) Total weight including exciter and bedplate ..... kg
  - (b) Heaviest lift during erection ..... kg

- (29) Largest package
- (a) Item .....
- (b) Heaviest lift during erection ..... kg
- (c) Dimension, length x width x height ..... mm
- (30) Heaviest package
- (a) Item .....
- (b) Weight .....kg
- (c) Dimensions, length x width x height .....mm

Note : Main dimensions of plant offered and clearance required for installation operation and/or removal shall be shown on Tenderer's drawing.

3. Main Transformer

- (1) Manufacturer's name .....
- (2) Rated output ..... kVA
- (3) Rated voltage
- (a) High voltage winding (no-load) ..... kV
- (b) Low voltage winding (no-load) ..... V
- (4) Rated frequency ..... Hz
- (5) Number of phase .....
- (6) Phase connections
- (a) High voltage winding .....
- (b) Low voltage winding .....
- (c) Vector symbol .....
- (7) Cooling system .....
- (8) Withstand voltage
- |                               | <u>H.V side</u> | <u>L.V side</u> |
|-------------------------------|-----------------|-----------------|
| (a) Full-wave lightning       |                 |                 |
| Impulse 1.2 x 50 micro second | ..... kV        | ..... kV        |
| (b) Induced voltage           | ..... kV        | ..... kV        |
| (c) Applied voltage           | ..... kV        | ..... kV        |

- (9) Exciting current at nominal tap
  - (a) At rated voltage .....A
  - (b) At 105% of rated voltage .....A
  - (c) At 110% of rated voltage .....A
- (10) Inherent voltage regulation at 75 °C
  - (a) At 1.0 power factor .....%
  - (b) At 0.8 power factor (lagging) ..... %
- (11) Class of insulation of windings .....
- (12) Type of core .....
- (13) Type of brushing .....
- (14) Volume of insulation oil .....
- (15) Weight and dimension
  - (a) Core and coil assembly .....kg
  - (b) Tank and fittings .....kg
  - (c) Oil .....kg
  - (d) Total weight .....kg
  - (e) Heaviest package weight for delivery .....kg
  - (f) Heaviest lift during erection .....kg
  - (g) Largest package dimensions for delivery .....kg
  - (h) Overall dimension excluding bushings .....mm
  - (i) Overall dimension including bushings .....mm

**4. Station- Service Transformer**

- (1) Manufacturer's name .....
- (2) Rated output ..... kVA
- (3) Rated voltage
  - (a) Primary windings (no-load) ..... kV
  - (b) Secondary winding (no-load) ..... V
- (4) Rated frequency ..... kV

- (5) Number of phase .....
- (6) Phase connections
  - (a) Primary windings .....
  - (b) Secondary windings .....
  - (c) Vector symbol .....
- (7) Cooling system .....
- (8) Withstand voltage .....

	<u>Primary winding</u>	<u>Secondary winding</u>
(a) Full-wave lightning impulse 1.2 x 50 micro seconds	..... kV	..... kV
(b) Induced voltage	..... kV	..... kV
(c) Applied voltage	..... kV	..... kV
(9) Exciting current at nominal tap		
(a) At rated voltage		..... A
(b) At 105% of rated voltage		..... A
(c) At 110% of rate voltage		..... A
(10) Inherent voltage regulation at 75 °C		
(a) At 1.0 power factor		
(b) At 0.8 power factor (lagging)		
(11) Class of insulation of windings		.....
(12) Type of bushings		.....
(13) Volume of insulation oil		.....
(14) Weight and dimension		
(a) Total weight		..... kg
(b) Overall dimension		..... mm

**5. 20 kV Switchgear**

**(1) Circuit breaker**

- (a) Manufacturer** .....
- (b) Type** .....
- (c) Rated voltage** .....kV
- (d) Withstand** .....
- i) Full-wave lightning impulse 1.2 x 50 micro-second** .....kV
  - ii) Power-frequency** ..... kV
- (e) Rated normal current** ..... V
- (f) Rated short-circuit breaking current** ..... kA
- (g) Rated interrupting time** ..... cycle
- (h) Rated operating sequence** .....
- (i) D.C. current required to trip** ..... A
- (j) D.C. current required to close** ..... A
- (k) Weight** ..... kg
- (l) Overall dimensions** ..... mm

- (2) Current transformers
- (a) Manufacturer's name .....
  - (b) Number .....
  - (c) Type .....
  - (d) Highest system voltage ..... kV
  - (e) Withstand voltage
    - i) Full-wave lightning impulse 1.2 x 50 micro-second ..... kV
    - ii) Power-frequency ..... kV
  - (f) Rated current ratio ..... A
  - (g) Rated output ..... VA
  - (h) Rated short-time thermal current ..... kA
  - (i) Accuracy class .....
- (3) Grounding voltage transformer
- (a) Manufacturer's name .....
  - (b) Number .....
  - (c) Type .....
  - (d) Highest system voltage ..... kV
  - (e) Rated primary voltage ..... kV
  - (f) Rated secondary voltage ..... V
  - (g) Rated residual voltage ..... V

**(h) Rated output**

**(i) For secondary winding** ..... VA

**(ii) For residual voltage winding** ..... VA

**(i) Withstand voltage**

**(i) Full-wave lightning impulse 1.2 x 50 micro-second** ..... kV

**(ii) Power-frequency** ..... kV

**(j) Rated output**

**i) For secondary winding** ..... kV

**ii) For residual voltage winding** ..... kV

**(4) Cubicle enclosure**

**(a) Manufacturer's name**

**(b) Number of panels**

**(c) Degree of protection**

**(d) Power- frequency test voltage**

**(e) Weight**

**(f) Dimensions**

(5) **Three-pole disconnecting switch**

- (a) Manufacturer .....
- (b) Type .....
- (c) Rated voltage .....
- (d) Withstand voltage ..... kV
  - i) Full-wave lightning impulse 1.2 x 50 micro-second ..... kV
  - ii) Power-frequency ..... kV
- (e) Pressure relief class .....
- (f) Weight ..... kg
- (g) Dimensions ..... mm

6. **Switchgear at generator voltage (6.6 kV)**

(1) **Circuit breaker**

- (a) Manufacturer .....
- (b) Type .....
- (c) Rated insulation voltage ..... V
- (d) Rated operational voltage ..... V
- (e) Rated thermal current ..... A
- (f) Rated current of overcurrent release device ..... A
- (g) Rated short-circuit breaking current ..... kA
- (h) Rated operating sequence .....
- (i) D.C. current required to trip ..... A
- (j) D.C. current required to close ..... A
- (k) Power frequency test voltage ..... V



- (2) Current transformers
- (a) Manufacturer .....
  - (b) Number .....
  - (c) Type .....
  - (d) .....
  - (e) Rated insulation voltage ..... V
  - (f) Rated frequency test voltage ..... V
  - (g) Rated current ratio ..... A
  - (h) Rated output ..... VA
  - (i) Rated short time thermal current ..... kA
  - (j) Accuracy class .....
- (3) Voltage transformers
- (a) Manufacturer's name .....
  - (b) Number .....
  - (c) Type .....
  - (d) Rated insulation voltage ..... V
  - (e) Rated primary voltage ..... V
  - (f) Rated secondary voltage ..... V
  - (g) Rated output ..... VA
  - (h) Power-frequency test voltage ..... kV
  - (i) Accuracy class .....

- (4) Grounding voltage transformer
- (a) Manufacturer's name .....
  - (b) Number .....
  - (c) Type .....
  - (d) Rated insulation voltage .....V
  - (e) Rated primary voltage .....V
  - (f) Rated secondary voltage .....V
  - (g) Rated residual voltage .....V
  - (h) Rated output
    - i) For secondary winding .....VA
    - ii) For residual voltage winding .....VA
  - (i) Power-frequency test voltage .....V
  - (j) Accuracy class
    - i) For secondary winding .....
    - For residual winding .....
- (5) Enclosure
- (a) Manufacturer's name .....
  - (b) Number of panels .....
  - (c) Degree of protection .....
  - (d) Power frequency controller offered .....V
  - (e) Weight .....kg
  - (f) Dimensions .....mm

**7. Control and Relay Board**

- (1) Manufacturer's name .....
- (2) Number of panels .....
- (3) Degree of protection .....
- (4) Programmable controller offered Yes/ No
- (5) Weight ..... kg
- (6) Dimensions ..... mm

**8. Battery Charger**

- (1) Manufacturer's name .....
- (2) Type of rectifier .....
- (3) Rated D.C. output voltage ..... V
- (4) Rated D.C. output voltage ..... V
- (5) Weight ..... kg
- (5) Dimensions ..... mm

**9. Storage Batteries**

- (1) Manufacturer's name .....
- (2) Type .....
- (3) Capacity of 5 hours rating ..... AH
- (4) Number of cells ..... nos
- (5) Nominal voltage per cell ..... V

**10. Maintenance Tools and Machine Shop Equipment**

**Bidder is to list all equipment to be finished in accordance with clauses 14.2.13 and 14.2.14**

## Appendix to Bid

### Part 9 : Drawings and Documents Submitted with Bid for Information

The Bidder shall insert in the following table the serial number of his drawings and/or documents relating to the subject items listed, and shall attach the said drawings and documents to the bid.

Item	Specification or Other Reference and Bid Submission Required	See Drawing or Document No.
1	<p>Appendix to Bid – Part 2</p> <p>Method statement outlining methods of construction for the Works.</p> <p>Preliminary programme based on the method statement showing phasing of main activities and completion dates for completion of earthworks for Dam Management Complex and for the whole of the Works.</p>	
2	<p>1.9 Temporary Works</p> <p>Proposal for erection of all temporary works including Engineers Site Office and facilities</p>	
3	<p>1.9.3 Proposed break down of lump sum for Establishment</p>	
4	<p>1.9.4 Proposal for water supply system</p>	
5	<p>1.9.4 Proposal for electric power</p>	
6	<p>1.9.4 Proposal for telecommunication system</p>	
7	<p>1.9.5 Proposal for temporary roads and bridges</p>	
8	<p>1.9.6 Proposal for Contractor's site office and facilities</p>	
9	<p>2. Proposal for water control plant</p>	

10	3.	Proposal for surface excavation	
11	4.	Proposal for tunneling	
12	5.6	Proposal for drilling and grouting	
13	6.	Proposal for all embankment construction including sources of materials, quarry operation, haul routes, methods of preparing and placing materials.	
14	9.1	Proposal for concrete production.	
15	9.9.4	Proposal for cooling concrete	
16	10.1	Proposal for construction of permanent access roads	
17	10.6	Proposal for road surfacing	
18	11.	General proposal for fabrication and installation of metalwork.	
19	12.	Proposal for the design, manufacture erection testing and commissioning of water control plant.  Details of proposed subcontractor to be included in Part 5.	
20	13	Proposal for instrumentation including, but not limited to details of specialized instruments to be furnished.	
21	14	Proposal for Generating Plant:  Part 9 of the Appendix to Bid is to be completed.  Other data supplied by Bidder is to be noted here and appended.	

22	15	Proposal for the relocation of the power transmission line which shall include, but not be limited to subcontractual arrangements for the design and implementation.	
23	16.4	Details of proposed drainage pumps.	
24	16.6	Details of proposed water level sensor and recorder.	
25	16.9	Details and technical brochures of all items of maintenance equipment to be provided.	
26	16.10	Proposal for the design and implementation of the electrical installation	
27	17	General proposal for Building Works	

The Bidder shall complete either the following form of Bank Guarantee or may provide another security acceptable to the Employer.

## Form of Bid Security (Bank Guarantee)<sup>1</sup>

WHEREAS, \_\_\_\_\_ [name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated \_\_\_\_\_ [date] for the execution of \_\_\_\_\_ [name of Contract] (hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that We \_\_\_\_\_ [name of Bank] of \_\_\_\_\_ [name of country] having our registered office at \_\_\_\_\_ [address] (hereinafter called "the Bank") are bound unto \_\_\_\_\_ [name of Employer] (hereinafter called "the Employer") in the sum of \_\_\_\_\_ [amount]<sup>2</sup> for which payment well and truly to be made to the said Employer the Bank binds himself, his successors, and assigns by these presents.

SEALED with the Common Seal of the said Bank this \_\_\_\_\_ days of \_\_\_\_\_ 20\_\_\_\_.

THE CONDITIONS of this obligation are:

- (1) if the Bidder withdraws his Bid during the period of Bid validity specified in the Form of Bid; or
- (2) if the Bidder refuses to accept the correction of errors in his Bid; or
- (3) if the Bidder, having been notified of the acceptance of his Bid by the Employer during the period of Bid validity;
  - (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or
  - (b) fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders;

we undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

<sup>1</sup> The Bidder shall complete either this form of Bank Guarantee or may provide another security acceptable to the Employer

<sup>2</sup> The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of the Employer's country or an equivalent amount in a freely convertible currency. This figure should be the same as shown in Clause 17.1 of the Bidding Data. The attention of joint venture bidders is drawn to Clause 17.3 of the Instructions to Bidders.



This Guarantee will remain in force up to and including the date 28 days after the date of expiration of the Bid Validity, as stated in the Instruction to Bidders, or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

With reference to clause 1832 of the Indonesian Civil Law (Kitab Undang-undang Hukum Perdata), the Bank shall relinquish the special rights of claim in assist belonging to the Contractor and for the seizure and sale of such assist for the discharge of his debts as required in clause 1831 of Indonesian Civil Law.

DATE SIGNATURE OF THE BANK \_\_\_\_\_

WITNESS \_\_\_\_\_

SEAL \_\_\_\_\_

\_\_\_\_\_  
*[ signature, name, and address ]*

**SECTION 8.**

**BILL OF QUANTITIES**

# BILL OF QUANTITIES

## PREAMBLE TO THE BILL OF QUANTITIES

1. The Bill of Quantities shall be read in conjunction with this Preamble, the Instructions to Bidders, the General Conditions of Contract, the Specifications, and the Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. For the purpose of ascertaining the value and amount of work done, the Works shall be measured at such frequency as may be necessary for the purpose of payment under Clause 42 (Payment Certificates) of the Conditions of Contract. Permanent Works shall be measured net, notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the Contract.
4. Quantities of items in the Bill of Quantities shall be measured in accordance with the method of measurement described in Clause 9 of this Preamble.
5. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Equipment, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
6. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
7. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.
8. General directions and descriptions of work and materials are not necessarily repeated nor summarised in the Bill of Quantities. References to the relevant sections of the contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
9. The method of measurement of completed work for payment shall be in accordance with the relevant measurement and payment clause for each pay item described in Specifications.

10. Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:

(a) Where there is a discrepancy between amounts in figures and in words, the amount in words will govern; and

(b) Where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit rate and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit rate, in which event the total amount as quoted will govern and the unit rate will be corrected.

11. Except where otherwise specified or detailed in the Bill of Quantities labour, including the supervision thereof, materials, Contractor's Equipment, temporary works, transport to and from the Site and in and about the Works and all other resources of any kind required for the execution, completion and rectification of defects of the Works shall not be measured and the cost thereof shall be deemed to be included in the prices of other items in the Bill Quantities.

12. Where the Contract provides for part of the Contract Price to be payable in a Foreign portion Currency and part in a local portion, the total price shall be the sum the of the Foreign Currency portion and local currency portions plus an enhancement of 10% for Indonesian value-added tax (VAT).

13. Where reference is made in the Bill of Quantities to specific Drawings or parts of the Specification or Conditions of Contract, unless otherwise stated, such references shall not limit general requirements stated elsewhere in the Contract.

14. The cost analysis of the Unit Rates for major pay items shall be prepared in the forms for Unit Rate Analysis and Summary of Unit Rate Analysis as attached herein. The bill item number and unit of the works of the rate analysis shall be consistent with the bill item number and unit of those entered in the Bill of Quantities. In case of discrepancy between the figures of the Unit Rate in the Bill of Quantities and the analysis of the Unit Rate, the figures in the Bill of Quantities shall govern.

For the purpose of the cost analysis major items shall include items C.2, C.3.2., C.3.4, D.1.1, D.2.1, D.3.1, D.5.1, E.2.1, E.2.2, E.4, E.5, E.8, F.1, F.2.1, F.2.2, F.2.3, F.3.1, F.3.2, F.3.3, G.5, I.6.1, I.6.2, I.6.3, I.9, I.10.1, I.10.3, I.12.1, I.12.3, J.1, J.5 and any other unit rate whose price is greater than 0.5% of the Bid Price.

15. The following abbreviations are used in the Bill of Quantities:

L.S	: Lump Sum
m <sup>3</sup>	: cubic metre
m <sup>2</sup>	: square metre
m	: linear metre

km : kilometre

ha : hectare

No : number

kg : kilogram

dia. : diameter

tonne : metric ton

**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES  
 SUMMARY OF BILL OF QUANTITIES**

Bill No.	General Summary	Amount	
		Foreign Portion Rp	Local Portion Rp
A	GENERAL		
B	WATER CONTROL		
C	SURFACE EXCAVATION AND EARTH WORKS		
D	TUNNELLING		
E	DRILLING AND GROUTING		
F	EMBANKMENT CONSTRUCTION		
G	PROTECTION AND SUPPORT OF EXCAVATION		
H	DRAINAGE		
I	CONCRETE PRODUCTION AND CONCRETE CONSTRUCTION		
J	ROAD CONSTRUCTION		
K	FURNISHING AND INSTALLING METALWORK		
L	WATER CONTROL PLANT		
M	INSTRUMENTATION OF STRUCTURES		
N	GENERATING PLANT		
O	RELOCATION OF POWER TRANSMISSION LINE		
Q	BUILDING WORKS		

Sum of Foreign and Local Portions

Value-added Tax

Bid Price

Exchange Rate(s) used by Bidder in determining foreign portion of bid price:

1 Japanese Yen = .....Indonesian Rupiah

1 US dollar = .....Indonesian Rupiah

1 Other = .....Indonesian Rupiah



FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES

**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate			Amount		Specification Reference	Payment Clause	
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp				
<b>D. TUNNELLING</b>											
D.1	Underground Excavation :										
D.1.1	for Diversion Tunnel	m <sup>3</sup>	18,300						4.1	4.1.9	
D.1.2	for Outlet Tunnel	m <sup>3</sup>	2,300						4.1	4.1.9	
D.2	Furnishing and Installing Steel Rib Supports and Accessories :										
D.2.1	for Diversion Tunnel	tonne	200						7.7	7.7.7	
D.2.2	for Outlet Tunnel	tonne	37						7.7	7.7.7	
D.3	Production and Placing Shotcrete Lining :										
D.3.1	for Diversion Tunnel	m <sup>3</sup>	1,800						7.2	7.2.15	
D.3.2	for Outlet Tunnel	m <sup>3</sup>	360						7.2	7.2.15	
D.4	Furnishing and Installing Steel Mesh Reinforcement :										
D.4.1	for Diversion Tunnel	kg	11,400						7.5	7.5.4	
D.4.2	for Outlet Tunnel	kg	5,400						7.5	7.5.4	
D5	Furnishing and Installing Rock Bolts :										
D.5.1	for Diversion Tunnel (25 mm dia.)	m	17,400						7.3	7.3.7	
D.5.2	for Outlet Tunnel (22 mm dia.)	m	1,200						7.3	7.3.7	
				Sub total for Bill D, Tunnelling:							
<b>E. DRILLING AND GROUTING</b>											
E.1	Cone Drilling (66 mm dia.) :										
E.1.1	from within Gallery	m	1,200						5.3	5.3.4	
E.1.2	from Surface	m	4,900						5.3	5.3.4	
E.2	Rotary Drilling Holes for Grouting (48 mm dia.) :										
E.2.1	from within Gallery	m	5,200						5.2	5.2.6	
E.2.2	from Surface	m	14,400						5.2	5.2.6	
E.2.3	from Tunnels	m	1,100						5.2	5.2.6	
E.3	Drill set-up for drilling grout hole	No.	4,100						5.4	5.4.2	
E.4	Wash and Water Pressure Testing	No.	4,100						5.5	5.5.2	
E.5	Cement used in Pressure Grouting	tonne	410						5.6	5.6.9	
E.6	Fine aggregate used in Pressure Grouting	tonne	2						5.6	5.6.9	
E.7	Hook-up to Holes and Connections for Grouting	No.	4,100						5.8	5.8.1	
E.8	Casing pipe for pressure grouting	tonne	10						5.9	5.9.4	
				Bill E, Drilling and Grouting:							



**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES**

**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate			Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp			
<b>F. EMBANKMENT CONSTRUCTION</b>										
F.1	Dam Embankment Impervious Zone including Contact Slurry and Contact Material	m <sup>3</sup>	119,000						6.2	6.2.16
F.2	Dam Embankment Semi-pervious Zone :									
F.2.1	in Upstream Semi-pervious Zone	m <sup>3</sup>	33,000						6.3	6.3.8
F.2.2	in Downstream Fine Semi-pervious Zone	m <sup>3</sup>	24,000						6.3	6.3.8
F.2.3	in Downstream Coarse Semi-pervious Zone	m <sup>3</sup>	25,000						6.3	6.3.8
F.3	Dam Embankment Pervious Zone :									
F.3.1	in Inner Pervious Zone	m <sup>3</sup>	96,000						6.4	6.4.9
F.3.2	in Outer Pervious Zone including Surface Treatment	m <sup>3</sup>	495,000						6.4	6.4.9
F.3.3	in Riprap Zone	m <sup>3</sup>	10,000						6.4	6.4.9
F.4	Special Compaction for Dam Embankment :									
F.4.1	in Impervious Zone Embankment	m <sup>3</sup>	1,800						6.6	6.6.5
F.4.2	in Upstream and Downstream Semi-pervious Zone	m <sup>3</sup>	3,000						6.6	6.6.5
				Sub total for Bill F, Embankment Construction:						
<b>G. PROTECTION AND SUPPORT OF EXCAVATION</b>										
G.1	Construction of Wet Stone Masonry	m <sup>3</sup>	500						7.9	7.9.8
G.2	Construction of Stone Pitched Slope Protection	m <sup>3</sup>	900						7.9	7.9.8
G.3	Construction of Cobble Stone Foundation	m <sup>3</sup>	200						7.8	7.8.3
G.4	Construction of Mat Gabions	m <sup>3</sup>	100						7.6	7.6.5
G.5	Shotcrete Concrete in Surface Excavation including Drain Pipe and Gravel; 10 cm in Thickness	m <sup>2</sup>	13,000						7.2	7.2.15
G.6	Furnishing and Installing Steel Mesh Reinforcement in Surface Excavation	kg	34,000						7.5	7.5.4
G.7	Furnishing and Placing Full Face Sodding and Strip Sodding including Maintenance Watering	m <sup>2</sup>	35,000						7.1	7.10.5
G.8	Furnishing and Installing Grouted Anchor Bar including Drilling and Grouting; 25 mm in Diameter	m	12,500						7.4	7.4.6
				Sub total for Bill G, Protection and Support of Excavation:						
<b>H. DRAINAGE</b>										
H.1	Construction of Surface Drains :									
H.1.1	Type 1-1 (Wet Stone Masonry)	m	2,700						8.3	8.3.5
H.1.2	Type 1-2 (Wet Stone Masonry)	m	2,700						8.3	8.3.5
H.1.3	Type 2-1 (Wet Stone Masonry) with Concrete Cover	m	80						8.4	8.4.5
H.1.4	Type 2-2 (Wet Stone Masonry) with Grating Cover	m	50						8.4	8.4.5
H.1.5	Type 3-1 (Reinforced Concrete)	m	420						8.5	8.5.5
H.1.6	Type 3-2 (Reinforced Concrete) with Grating Cover	m	30						8.5	8.5.5
H.2	Construction of Catch Basins (Wet Stone Masonry)	m <sup>3</sup>	50						8.6	8.6.5
				Sub total for Bill H, Drainage:						

FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES

BILL OF QUANTITIES

Item No.	Description	Unit	Quantity	Rate		Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp		
<b>CONCRETE PRODUCTION AND CONCRETE CONSTRUCTION</b>									
1.1	Furnishing and Placing PVC Waterstop: 300mm wide	m	4,500					9.2	9.20.6
1.2	Furnishing and installing PVC Pipe Drains 50 mm dia.:								
1.2.1	50 mm in Diameter as Weephole	m	100					9.22	9.22.2
1.2.2	100 mm in Diameter for Bridge	m	15					9.22	9.22.2
1.3	Furnishing and installing Perforated PVC Pipe 250 mm dia.	m	900					9.23	9.23.4
1.4	Furnishing and installing Perforated PVC Pipe 200 mm dia.	m	300					9.23	9.23.4
1.5	Furnishing and Placing Joint Filler or Joint Sealant:								
1.5.1	Elastic Joint Filler 10 mm in Thickness	m <sup>2</sup>	350					9.21	9.21.5
1.5.2	Polysulphide Mastic Joint Sealant	litre	600					9.21	9.21.5
1.5.3	Bitumen-Rubber Mastic Joint Filler (GAS or equivalent)	litre	6,400					9.21	9.21.5
1.6	Furnishing and installing Deformed Reinforcement Bars:								
1.6.1	in Diversion Tunnel	tonne	290					9.25	9.25.5
1.6.2	in Spillway	tonne	500					9.25	9.25.5
1.6.3	in Gallery	tonne	260					9.25	9.25.5
1.6.4	in Hydropower Station	tonne	140					9.25	9.25.5
1.6.5	in Other Structures	tonne	100					9.25	9.25.5
1.7	Furnishing and Placing Dowel Bars 25 mm dia including PVC sleeve	tonne	3					9.26	9.26.5
1.8	Furnishing and Placing Metal Seals	m	40					9.27	9.27.3
1.9	Production and Construction of Concrete Type A for Diversion Tunnel Lining	m <sup>3</sup>	6,800					9.2	9.30.3
1.10	Production and Construction of Concrete Type B:								
1.10.1	in Gallery and Entrance	m <sup>3</sup>	5,700					9.2	9.30.3
1.10.2	in Inclined Intake Structure	m <sup>3</sup>	900					9.2	9.30.3
1.10.3	in Hydropower Station	m <sup>3</sup>	4,500					9.2	9.30.3
1.10.3	in Other Structures	m <sup>3</sup>	50					9.2	9.30.3
1.11	Production and Construction of Concrete Type C	m <sup>3</sup>	120					9.2	9.18.2
1.12	Production and Construction of Concrete Type D:								
1.12.1	in Spillway	m <sup>3</sup>	52,000					9.2	9.30.3
1.12.2	in Outlet Tunnel	m <sup>3</sup>	1,400					9.2	9.30.3
1.12.3	in Concrete Plug in Diversion Tunnel	m <sup>3</sup>	1,000					9.2	9.30.3
1.12.4	in Adit	m <sup>3</sup>	100					9.2	9.30.3
1.12.5	in Other Structures	m <sup>3</sup>	2,500					9.2	9.30.3
1.13	Production and Construction of Concrete Type E:								
1.13.1	in Structures	m <sup>3</sup>	1,000					9.2	9.30.3
1.13.2	Backfill Concrete in Seams, Defects and Faults:	m <sup>3</sup>	200					9.2	9.30.3
1.14	Furnishing and installing Precast Concrete Beams Spillway Bridge including Tensioning and Erection	L.S.						9.28, 9.29	9.28.5
1.15	Furnishing and installing Precast Concrete Diaphragms for Spillway Bridge including Tensioning and Erection	L.S.						9.28, 9.29	9.28.5
1.16	Furnishing and installing Precast Concrete Panels for Spillway Bridge including Erection	L.S.						9.28, 9.29	9.28.5
Sub total for Bill I, Concrete Production and Concrete Construction:									

**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES**

**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate			Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp			
<b>J. ROAD CONSTRUCTION</b>										
J.1	Excavation for Road Construction	m <sup>3</sup>	152,000					10.4.2	3.4.12.4	
J.2	Placing and Compacting Suitable Fill for Common Embankment	m <sup>3</sup>	6,100					10.5	10.5.7	
J.3	Production and Construction of Crushed Stone Sub-Base Course	m <sup>3</sup>	7,300					10.8	10.8.4	
J.4	Production and Construction of Penetration Macadam Base Course	m <sup>3</sup>	2,000					10.9	10.9.4	
J.5	Production and Construction of Hot Asphalt Mix Surface Course; Minimum 50 mm thick	m <sup>2</sup>	17,000					10.10	10.10.6	
J.6	Production and Construction of Concrete Pavement; 150 mm thick	m <sup>2</sup>	1,700					10.11	10.11.4	
J.7	Furnishing and Installing Guard Rail	m	1,000					10.12	10.12.3	
				Sub total for Bill J, Road Construction:						
<b>K. FURNISHING AND INSTALLING METALWORK</b>										
K.1	Miscellaneous Metalwork (Galvanised)	kg	7,000					11.2	11.2.4	
K.2	Miscellaneous Metalwork (Painted)	kg	4,500					11.2	11.2.4	
K.3	Miscellaneous Metalwork (Stainless Steel)	kg	500					11.2	11.2.4	
K.4	Miscellaneous Metal Work in Underground Works :									
K.4.1	for Diversion Tunnel Plugs (Grout and Cooling Pipes)	L.S.						11.3	11.3.4	
K.4.2	for Adit Concrete Filling (Grout Pipes)	L.S.						11.4	11.4.4	
				Sub total for Bill K, Furnishing and installing Metalwork:						
<b>L. WATER CONTROL PLANT</b>										
L.1	Furnishing and Installing Water Control Plant for Outlet Facilities :									
L.1.1	Bulkhead Gate; B 2.0 m x H 2.0 m including Gate Guide, Hoist, Air-Vent, etc	L.S.						12.8	12.26	
L.1.2	Emergency Water Outlet Gate; B 2.0 m x H 1.65 m including Gate Guide, Lifting Beam, Hoist, etc	L.S.						12.9	12.26	
L.1.3	Trash Rack for Bulkhead Gate and Low Water Outlet Gate	L.S.						12.5, 12.6	12.26	
L.1.4	Outlet Pipe; 1400 mm dia., 650 mm dia., and 250 mm dia., including Transition Pipe, Reducer, Installation Stand, etc.	L.S.						12.10	12.26	
L.1.5	Control and Guard Gates with Auxiliary Facilities; for 650 mm dia. Outlet Pipe	L.S.						12.11, 12.12	12.26	
L.1.6	Control and Guard Gates with Auxiliary Facilities; for 250 mm dia. Outlet Pipe	L.S.						12.11, 12.12	12.26	
L.1.7	Overhead Travelling Crane (3 tonne) and Operating Stand in Control and Guard Gates Operation Room	L.S.						12.13.4, 12.13.5	12.26	
L.1.8	Electrical Equipment for Control and Guard Gates including local control panels and ultrasonic flow meters.	L.S.						12.1, 12.8, 12.9, 12.11, 12.12, 12.13	12.28	
L.2	Furnishing and Installing Water Control Plant for hydro-power Station :									
L.2.1	Outlet Pipe comprising 1400 mm dia. section, 1400 mm to 800 mm reducer, and 800 mm dia. section	L.S.						12.10	12.26	
L.2.2	Tailrace Gate; B 2.15 m x H 2.075 m including Gate Guide, Hoist, etc	L.S.						12.14	12.26	
L.2.3	Drainage Pipe Valve 150 mm dia.	L.S.						12.17	12.26	
L.3	Furnishing and Installing Flap Gate 600 mm dia.	L.S.						12.15	12.26	
L.4	Furnishing and Installing Closure Gate for Diversion Tunnel; B 6.2 m x H 5.6 m including Gate Guide, etc	L.S.						12.16	12.26	
				Sub total for Bill L, Water Control Plant:						

FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES

**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate		Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp		
M.	<b>INSTRUMENTATION OF STRUCTURES</b>								
M.1	Supplying and Installing Electrical Piezometers:								
M.1.1	in Embankment	No.	20					13.2.6	13.2.6
M.1.2	in Borehole	No.	4					13.2	13.2.8
M.2	Supplying and Installing Foundation Deformation Meter (including Drilling and Backfilling Drilled Hole)	No.	1					13.3	13.3.6
M.3	Supplying and Installing Electrical Tri-axial Joint Meters	No.	2					13.3	13.3.6
M.4	Supplying and Installing Probe Extensometer with Magnat/Reed Switch Transducer	No.	1					13.3	13.3.6
M.5	Supplying and Installing Strong Motion Accelerograph with Recorder	No.	2					13.4	13.4.4
M.6	Supplying and Installing Surface Movement Markers:								
M.6.1	on Upstream Surface of Embankment Dam	No.	6					13.5	13.5.4
M.6.2	on Downstream Surface of Embankment Dam	No.	9					13.5	13.5.4
M.6.3	on Dam Crest	No.	6					13.5	13.5.4
M.6.4	on Natural Ground	No.	4					13.5	13.5.4
M.6.5	Movement Marker Bench Mark	No.	3					13.5	13.5.4
M.6.6	Movement Marker Control Station	No.	2					13.5	13.5.4
M.7	Supplying and Installing Terminal Box for Instruments in gallery	No.	3					13.7	13.7.4
M.8	Supplying and Installing Digital Readout Unit	No.	2					13.9	13.9.3
M.9	Supplying and Installing Stand Pipe Piezometer in Borehole	No.	7					13.6	13.6.3
M.10	Supplying and Installing Seepage Measuring Facilities	No.	2					13.8	13.8.3
Sub total for Bill M, Instrumentation of Structures:									

**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
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**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate		Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp		
N.	<b>GENERATING PLANT</b>								
N.1	Furnishing and installing Turbines and Auxiliaries :								
N.1.1	Hydraulic Turbine (Horizontal Francis: 1,650KW, H= 64.3m, Q= 3m <sup>3</sup> /s)	Set	1					14.2.3	14.12
N.1.2	Governor (Electric governor Dn:30% Dp:60%)	Set	1					14.2.4	14.12
N.1.3	Inlet Valve (Butterfly or Biplane Valve $\phi = 0.8m$ )	Set	1					14.2.5	14.12
N.1.4	Cooling Water System, if necessary	Set	1					14.2.8	14.12
N.1.5	Drainage & Dewatering System.	Set	1					14.2.9	14.12
N.1.6	Oil Storage & Transfer System, if necessary	Set	1					14.2.10	14.12
N.1.7	Compressed Air Supply System, if necessary	Set	1					14.2.11	14.12
N.1.8	Maintenance Tools Machine Shop Equipment	Lot	1					14.2.13, 14.2.14	14.12
N.1.9	Spare Parts	Lot	1					14.2.15	14.12
N.1.10	Instruction Employer's Personnel and Attendance of Employer at Shop Tests	Lot	1					14.1.7, 14.1.20	14.12
N.1.11	Flow Meter System	Set	1					14.2.12	14.12
N.2	<b>Furnishing and installing Generators and Excitation System :</b>								
N.2.1	Generator (Horizontal 2MVA 750rpm 6.6kV p10.8)	Set	1					14.3.2	14.12
N.2.2	Excitation System (Brushless exciter & AVR two indoor cubicles)	Set	1					14.3.3	14.12
N.2.3	Neutral Grounding Cubicle	Set	1					14.5.5	14.12
N.2.4	Spare parts	Lot	1					14.3.5	14.12
N.3	<b>Furnishing and installing Main Transformer (2000KVA 6.6/20KV)</b>							14.4	14.12
N.4	<b>Furnishing and installing Outdoor Cubicle :</b>								
N.4.1	20KV DS Cubicle (one outdoor cubicle 20 KV MOF, DS, LA, DS, CH)	Lot	1					14.5.4	14.12
N.4.2	20KV CB Cubicle (one outdoor cubicle 24KV CB, PT, CT, CH)	Set	1					14.5.4	14.12
N.4.3	6.6KV Cubicle (one outdoor cubicle 6.8 KV DS, PT, CT, CH)	Lot	1					14.5.4	14.12
N.5	<b>Furnishing and installing indoor Cubicle :</b>								
N.5.1	6.6KV CB cubicle (one indoor cubicle VCB 7.2KV 1KA, DS, PT, CT, Ar, CH)	Lot	1					14.5.5	14.12
N.5.2	Station Tr. Cubicle (one indoor cubicle St.Tr: 6.6/4.2 150KVA, PF, PT, CT)	Lot	1					14.5.5	14.12
N.5.3	DC Supply System (one indoor cubicle, Charger, Inverter, Battery, MCCB)	Lot	1					14.5.5	14.12
N.5.4	Switchgear for Krapak s/s one indoor cubicle, 24KV CB, PT, CT, CH	Lot	1					14.5.5	14.12
N.6	<b>Furnishing and installing Control and Protection Equipment (six panels)</b>							14.6	14.12
N.7	<b>Furnishing and installing Cables and Fittings :</b>								
N.7.1	20KV Power Cables (CVT 3c 35m)	Lot	1					14.7	14.12
N.7.2	6.6KV Power Cables (CVT 3c 100m)	Lot	1					14.7	14.12
N.7.3	Low Voltage Cables (PVC-CVV, CVV-S)	Lot	1					14.7	14.12
N.8	<b>Furnishing and installing Ancillary Equipment :</b>								
N.8.1	Telephone System (PABX 20 telephone sets)	Lot	1					14.8.2	14.12
N.8.2	Lighting Auxiliary (Lighting fixture Distribution panels conduit wires)	Lot	1					14.8.3	14.12

FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES

BILL OF QUANTITIES

Item No.	Description	Unit	Quantity	Rate			Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp		
N.9	Furnishing and installing Grounding System	Lot	1						14.12	
N.10	Furnishing and installing Overhead Travelling Crane (15ton, span= 9.5m, lift=20m, Hoist=1 tonne)	Set	1					14.10	14.12	
N.11	Furnishing and installing Transmission Lines :									
N.11.1	Steel Towers (20KV 1cct h=20m)	Set	2					14.11.26	14.12	
N.11.2	Concrete Poles (20KV 1cct h=13m)	No.	280					14.11.27	14.12	
N.11.3	Insulators and Fittings (Suspension : 254mm)	Lot	1					14.11.25	14.12	
N.11.4	Power Conductors (AAAC 120 sq. 14km)	km	14					14.11.24	14.12	
N.11.5	Telecommunication Lines (CCCP-AP-SS-0.65mm-20P)	km	14					14.11.28	14.12	
				Sub total for Bill N, Generating Plant:						
O.	RELOCATION OF POWER TRANSMISSION LINE									
O.1	Relocation of Power Transmission Line	L.S.						15	15.4	
				Sub total for Bill O, Relocation of Power Transmission Line:						

**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES**

**BILL OF QUANTITIES**

Item No.	Description	Unit	Quantity	Rate			Amount		Specification Reference	Payment Clause
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp			
<b>P. MISCELLANEOUS WORKS</b>										
P.1	Bridge Bearings :									
P.1.1	for Spillway Bridge including Elastomeric Bearing Pad (350 x 280 x 73) and Rubber Sheet (40 x 10 x 3)	No.	6					16.2	16.2.6	
P.1.2	for Access Road Bridge including Elastomeric Bearing Pad (350 x 280 x 53) and Rubber Sheet (40 x 10 x 20)	No.	10					16.2	16.2.6	
P.2	Bridge Expansion Joints :									
P.2.1	in Spillway Bridge	L.S.						16.3	16.3.5	
P.2.2	in Access Road Bridge	L.S.						16.3	16.3.5	
P.3	Permanent Electrical Installation :									
	Gallery and General Lighting Installation	L.S.						16.10	16.10.2.2	
	Power Supply Facilities	L.S.						16.10	16.10.3.3	
P.4	Supplying and installing Submersible Drainage Pumps :									
P.4.1	Drainage for Gallery: 0.2 m <sup>3</sup> /min with Automatic Pump Operation System	No.	2					16.4	16.4.5	
P.4.2	Drainage for Hydropower Station: 0.5 m <sup>3</sup> /min	No.	2					16.4	16.4.5	
P.5	Reconstruction Wet Stone Masonry Steps to Goa Kac	L.S.						16.8	16.8.4	
P.6	Furnishing and installing Trash Boom in Reservoir including Concrete Anchor	L.S.						16.7	16.7.4	
P.7	Supplying and installing Reservoir Water Level Sensor with Recorder	L.S.						16.6	16.6.5	
P.8	Supplying and installing Water Level Staff Gauge :									
P.8.1	for Reservoir Water Level installed on Inclined Intake Structure	No.						16.5	16.5.5	
P.8.2	for Downstream River Water Level installed on Concrete Wall	No.						16.5	16.5.5	
P.9	Provision of Maintenance Equipment :									
P.9.1	Patrol Boat with Trailer	No.	1					16.9	16.9.7	
P.9.2	Patrol Vehicles (4-WD)	No.	2					16.9	16.9.7	
P.9.3	Station Wagon	No.	2					16.9	16.9.7	
P.9.4	Dump Truck (6 tonne)	No.	1					16.9	16.9.7	
P.9.5	Grass Cutters	No.	3					16.9	16.9.7	
				Sub total for Bill P. Miscellaneous Works:						
<b>Q. BUILDING WORKS</b>										
Q.1	Hydropower Station (including excavation, filling, grading, foundation, reinforced concrete, roofing, concrete block, brick, plastering, door & windows, glazing, miscellaneous metal, interior finishing, tile, sanitary, electrical and painting works)	L.S.							17	17.5
Q.2	Garage (including excavation, filling, grading, foundation, reinforced concrete, roofing, concrete block, brick, plastering, door & windows, glazing, miscellaneous metal, interior finishing, tile, sanitary, electrical and painting works)	L.S.							17	17.5
Q.3	Guard House (including excavation, filling, grading, foundation, reinforced concrete, roofing, concrete block, brick, plastering, door & windows, glazing, miscellaneous metal, interior finishing, tile, sanitary, electrical and painting works)	L.S.							17	17.5
Q.4	External Works (including excavation, filling, grading, foundation, fence, drain cover, flag stone, retaining wall, tree planting, concrete block, plastering, concrete paving, tile, sanitary, electrical and painting works)	L.S.							17	17.5
				Sub total for Bill Q. Building Works:						





**FLOOD CONTROL, URBAN DRAINAGE AND WATER RESOURCES DEVELOPMENT IN SEMARANG  
 COMPONENT: CONSTRUCTION OF THE JATIBARANG MULTIPURPOSE DAM  
 PACKAGE 1: JATIBARANG MULTIPURPOSE DAM INCLUDING APPURTENANT STRUCTURES**

**UNIT RATE ANALYSIS**

Item No. (As shown in the Bill of Quantities):.....  
 Description of Work Item: .....  
 Unit of Work Item:.....  
 Quantity of Work: .....

No.	Description	Unit	Quantity	Unit Cost		Amount	
				Foreign Portion Rp	Local Portion Rp	Foreign Portion Rp	Local Portion Rp
I	Materials: (Note 2) 1 2 3 etc.						
II	Labour: (Note 3) 1 2 3 etc.						
III	Equipment: (Note 4) 1 2 3 etc.						
Subtotal:							
IV	Overhead and Profit						
V	Total Amount						
VI	Unit Rate (carried to summary)						

**Notes for Guidance of Bidders**

**Note 1** Bidder shall complete one sheet in this format for each major pay item as defined in item 14 of the preamble to the Bill of Quantities

**Note 2** List all materials required to complete the work including their unit costs.

**Note 3** List all categories of labour required to complete the work including their unit cost.

**Note 4** List all equipment required to complete the work including the unit production capacity and unit cost.

(Blank)

**SECTION 9.**

**FORM OF AGREEMENT, FORMS OF PERFORMANCE  
SECURITY, AND BANK GUARANTEE FOR ADVANCE  
PAYMENT**

## Form of Agreement

### AGREEMENT

THIS AGREEMENT made the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_  
between \_\_\_\_\_ of  
\_\_\_\_\_ (hereinafter called "the Employer") of the one part and  
\_\_\_\_\_ of \_\_\_\_\_ (hereinafter  
called "the Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works should be executed by the Contractor, viz., \_\_\_\_\_, and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH as follows :

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz. :
  - (a) the Letter of Acceptance;
  - (b) the said Bid and Appendix to Bid;
  - (c) the Conditions of Contract (Part II);
  - (d) the Conditions of Contract (Part I);
  - (e) the Specifications;
  - (f) the Drawings;
  - (g) the Priced Bill of Quantities; and
  - (h) other documents, as listed in the Appendix to Bid.
3. In Consideration of the payment to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in Consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed the day and year first before written.

The Common Seal of \_\_\_\_\_ was hereunto affixed in the presence of was hereunto affixed in the presence of :

\_\_\_\_\_ or \_\_\_\_\_

Signed, sealed, undelivered by the said \_\_\_\_\_  
in the presence of : \_\_\_\_\_

Binding Signature of Employer \_\_\_\_\_

Binding Signature of Contractor \_\_\_\_\_

## **Forms of Performance Security and Bank Guarantee for Advance Payment**

Samples of acceptable forms of performance security are annexed. Bidders should not complete the forms at this time. Only the successful Bidder will be required to provide performance security in accordance with one of the samples, or in a similar form acceptable to the Employer.

**Annex A Form:**            **Alternative 1 Performance Bank Guarantee (Unconditional)**  
                                 **Alternative 2 Performance Bank Guarantee (Conditional)**  
                                 **Alternative 3 Performance Bond**

**Annex B Form:**            **Bank Guarantee for Advance Payment.**

Annex A Form : Alternative 1

**Performance Bank Guarantee (Unconditional)**

To \_\_\_\_\_  
*[name of Employer]*

\_\_\_\_\_  
*[address of Employer]*

WHEREAS \_\_\_\_\_ *[name and address of Employer]* (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. \_\_\_\_\_ dated \_\_\_\_\_ to execute \_\_\_\_\_ *[name of Contract and brief description of Works]* (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of \_\_\_\_\_ *[amount of Guarantee]*

\_\_\_\_\_ *[amount in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of \_\_\_\_\_ *[amount of Guarantee]* as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until a date 28 days from the date of issue of the Taking-Over Certificate.

With reference to Clause 1832 of the Indonesian Civil Law (Kitab Undang-undang Hukum Perdata), the Bank shall relinquish the special rights of claim on assets belonging to the Contractor and for the seizure and sale of such assets for the discharge of his debts as required in Clause 1831 of the Indonesian Civil Law.

**SIGNATURE AND SEAL OF THE GUARANTOR**

Name of Bank : \_\_\_\_\_

Address : \_\_\_\_\_

Date : \_\_\_\_\_



Annex A Form : Alternative 2

Performance Bank Guarantee (Conditional)

THIS AGREEMENT is made on the \_\_\_\_\_ day of \_\_\_\_\_  
20\_\_\_\_ between \_\_\_\_\_ *[name of bank]* of \_\_\_\_\_ *[address  
of bank]* (hereinafter called "the Guarantor") of the one part and  
*[name of Employer]* of \_\_\_\_\_ *[address of Employer]* (hereinafter called "the  
Employer") of the other part.

WHEREAS

- (1) this Agreement is supplemental to a contract (hereinafter called the Contract) made between \_\_\_\_\_  
*[name of Contractor]* of \_\_\_\_\_ *[address of  
Contractor]* (hereinafter called the Contractor) of the one part and the Employer of the other part whereby the Contractor agreed and undertook to execute the Works of \_\_\_\_\_ *[name of Contract and  
brief description of the Works]* for the sum of \_\_\_\_\_ *[amount in Contract currency]* being the Contract Price; and
- (2) the Guarantor has agreed to guarantee the due performance of the Contract in the manner hereinafter appearing.

NOW, THEREFORE, the Guarantor hereby agrees with the Employer as follows :

- (a) If the Contractor (unless relieved from the performance by any clause of the Contract or by statute or by the decision of a tribunal of competent jurisdiction) shall in any respect fail to execute the Contract or commit any breach of his obligations thereunder then the Guarantor will indemnify and pay the Employer the sum of *[amount of Guarantee], [amount in words]*, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, provided that the Employer or his authorized representative has notified the Guarantor to that effect and has made a claim against the Guarantor before the issue of the Defects Liability Certificate.
- (b) The Guarantor shall not be discharged or released from his guarantee by an arrangement between the Contractor and the Employer, with or without the consent of the Guarantor, or by any alteration in the obligations undertaken by the Contractor, or by any forbearance on the part of the Contractor, whether as to the payment,

time, performance, or otherwise, and any notice to the Guarantor of any such arrangement, alteration, forbearance is hereby expressly waived.

This Guarantee shall be valid until a date 28 days from the date of issue of the Taking-Over Certificate.

With reference to clause 1832 of the Indonesian Civil Law (Kitab Undang-undang Hukum Perdata), the Bank shall relinquish the special rights of claim on assets belonging to the Contractor and for the seizure and sale of such assets for the discharge of his debts as required in Clause 1831 of the Indonesian Civil Law.

Given under our hand on the date first mentioned above.

SIGNED BY \_\_\_\_\_  
for and on behalf of the Guarantor in the presence of:

\_\_\_\_\_  
(Witness)

SIGNED BY \_\_\_\_\_  
for and on behalf of the Employer in the presence of:

\_\_\_\_\_  
(Witness)

## Annex A Form : Alternative 3

### Performance Bond

By this Bond \_\_\_\_\_ [name and address of Contractor] as Principal (hereinafter called "the Contractor") and \_\_\_\_\_ [name, legal title and address of surety, bonding company or insurance company] as Surety (hereinafter called "the Surety"), are held and firmly bound unto \_\_\_\_\_ [name and address of Employer] as Obligee (hereinafter called "the Employer") in the amount of \_\_\_\_\_ [amount of Bond], \_\_\_\_\_ [amount in words], for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a written Agreement with the Employer dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for \_\_\_\_\_ [name of Contract] in accordance with the documents, plans, specifications and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto) then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever the Contractor shall be, and declared by the Employer to be, in default under the Contract, the Employer having performed the Employer's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a Bid or bids from qualified Bidders for submission to the Employer for completing the Contract in accordance with its terms and conditions, and upon determination by the Employer and the Surety of the lowest responsive Bidder, arrange for a Contract between such Bidder and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the Contract Price", as used in this paragraph, shall mean the total amount payable by Employer to Contractor under the Contract, less the amount properly paid by Employer to Contractor; or
- (3) pay the Employer the amount required by Employer to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Employer named herein or the heirs, executors, administrator, successors, and assigns of the Employer.

In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these present to be sealed with his corporate seal duly attested by the signature of his legal representative, this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

With reference to Clause 1832 of the Indonesian Civil Law (Kitab Undang-Undang Hukum Perdata), the Bank shall relinquish the special rights of claim on assets belonging to the Contractor and for the seizure and sale of such assets for the discharge of his debts as required in Clause 1831 of Indonesian Civil Law.

SIGNED ON \_\_\_\_\_ on behalf of \_\_\_\_\_

By \_\_\_\_\_ in the capacity of \_\_\_\_\_

In the presence of \_\_\_\_\_

SIGNED ON \_\_\_\_\_ on behalf of \_\_\_\_\_

By \_\_\_\_\_ in the capacity of \_\_\_\_\_

In the presence of \_\_\_\_\_

Annex B Form

Bank Guarantee for Advance Payment

To

\_\_\_\_\_ [name of Employer]

\_\_\_\_\_ [address of Employer]

\_\_\_\_\_ [name of Contract]

Gentlemen :

In accordance with the provisions of the Conditions of Contract, Subclause 60.7 ("Advance Payment") of the above-mentioned Contract, \_\_\_\_\_ [name and address of Contractor] (hereinafter called "the Contractor") shall deposit with \_\_\_\_\_ [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of \_\_\_\_\_ [amount of Guarantee], \_\_\_\_\_ [amount in words].

We, the \_\_\_\_\_ [bank of financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to \_\_\_\_\_ [name of Employer] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding \_\_\_\_\_ [amount of Guarantee], \_\_\_\_\_ [amount in words], such amount to be reduced periodically by the amounts recovered by you from the proceeds of the Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of Works to be performed thereunder or of any of the Contract documents which may be made between \_\_\_\_\_ [name of Employer] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

No drawing may be made by you under this guarantee until we have received notice in writing from you that an advance payment of the amount listed above has been paid to the Contractor pursuant to the Contract.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until \_\_\_\_\_ [name of Employer] receives full repayment of the same amount from the Contract.

With reference to Clause 1832 of the Indonesian Civil Law (Kitab Undang-Undang Hukum Perdata), the Bank shall relinquish the special rights of claim on assets belonging to the Contractor and for the seizure and sale of such assets for the discharge of his debts as required in Clause 1831 of Indonesian Civil Law.

Yours Truly,

SIGNATURE AND SEAL :

Name of Bank or Financial Institution : \_\_\_\_\_

Address : \_\_\_\_\_

Date : \_\_\_\_\_

**SECTION 10.**

**DRAWINGS**

**(Refer to Volume 3)**

**SECTION 11.**

**ELIGIBILITY FOR THE PROVISION OF GOODS,  
WORKS, AND SERVICES IN BANK-FINANCED  
PROCUREMENT**



# ELIGIBILITY FOR THE PROVISION OF GOODS, WORKS, AND SERVICES IN BANK-FINANCED PROCUREMENT

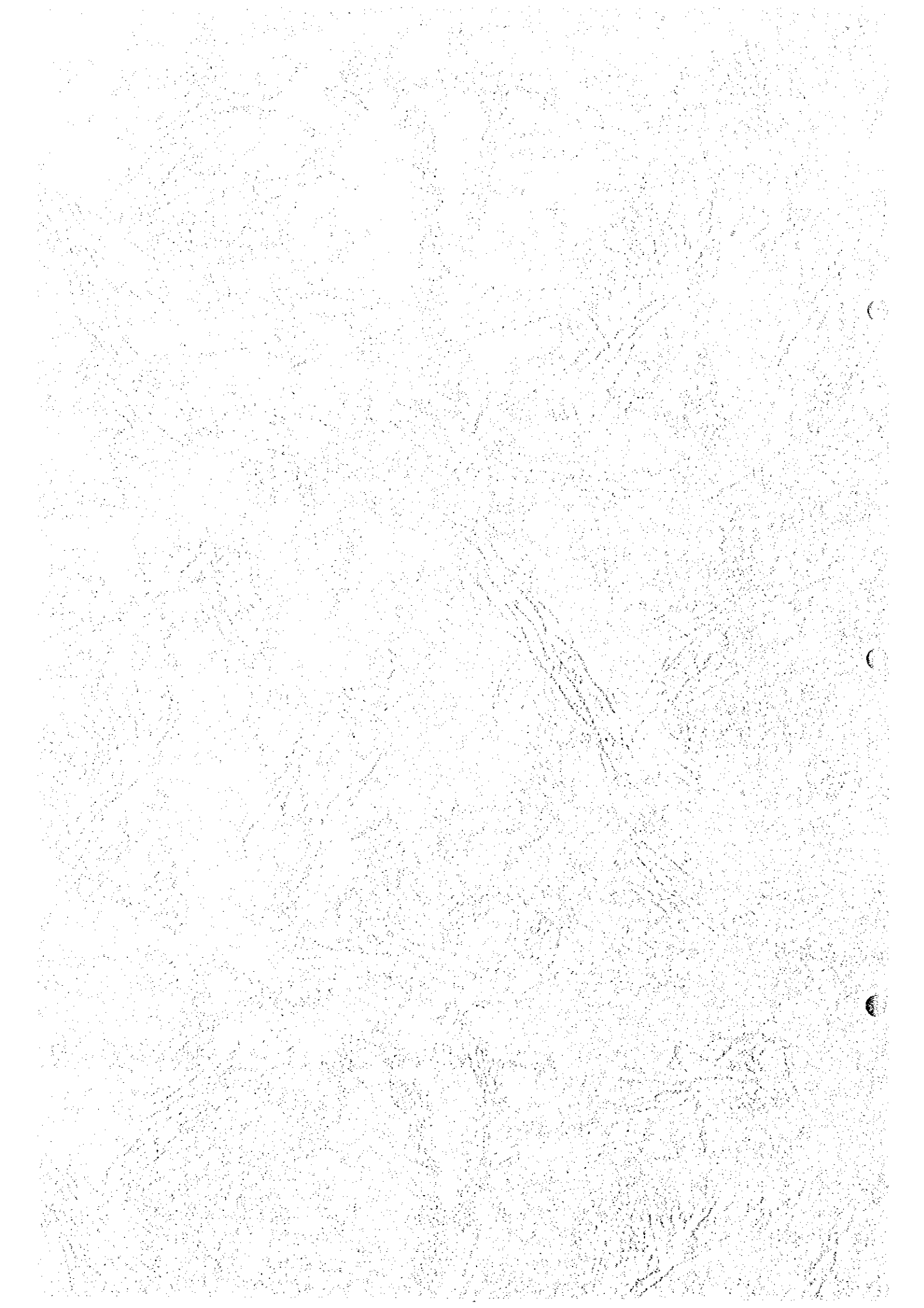
SOURCE : OECF LOAN HANDBOOK DATED, JANUARY, 1999

## 1. General Untying

Under general untying scheme, the eligible source countries are all countries and are









JICA