

THE GOVERNMENT OF MAURITIUS
MINISTRY OF ENERGY, WATER RESOURCES AND POSTAL SERVICES
CENTRAL WATER AUTHORITY

THE DETAILED DESIGN
ON
THE PORT LOUIS WATER SUPPLY PROJECT
IN MAURITIUS

FINAL REPORT (2)

COST ESTIMATE

FOR

LOT II : CIVIL WORKS (DAM AND APPURTENANT STRUCTURES
INCLUDING CLOSURES OF DIVERSION TUNNEL)

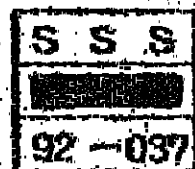
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MARCH 1982

JAPAN INTERNATIONAL COOPERATION AGENCY



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THE PORT LOUIS WATER SUPPLY PROJECT
 COST ESTIMATE
 FOR
 LOT II : CIVIL WORKS (DAM AND APPURTENANT STRUCTURES INCLUDING
 CLOSURE OF DIVERSION TUNNEL)

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1. GENERAL

This report presents the construction cost for the implementation of the Lot II, Civil Works for Dam and Appurtenant Structures including Closure of Diversion Tunnel of the Port Louis Water Supply Project. The Project is divided into three contract lots which will be scheduled to be concluded through the international competitive tenders.

The total construction cost of the Lot II of the Project is estimated at the price level of January 1991 as follows:

Foreign currency	:	US\$43,091,893	(68%)
Local currency	:	RS.282,651,029	(32%)
<hr/>			
Total (equivalent to)	:	US\$63,723,344	(100%)

Construction cost of the Lot II Work is estimated on the basis of the detailed design drawings, specifications and the proposed construction plan and schedule developed in the study of this design stage. In order to make an accurate cost estimate, unit price estimate method is mainly applied for each work. Furthermore, the estimate procedures and the breakdown of the unit cost are applied taking into account of a prevailing estimate procedures in Mauritius, a recent international tendering system and a financial source.

The unit prices are estimated and analyzed on the basis of local conditions, the proposed construction method, accurate unit rates of labour wages, material and equipment costs, and cost data referring to the recent tender prices on the similar projects in Mauritius.

The summary of construction cost is shown in Table 1.1

Table 1.1 Summary of Construction Cost for Lot II Work

Division No.	Description	Foreign Currency (US\$)	Local Currency (Rs.)	Total Amount Equivalent (US\$)
A.	General	1,011,000	10,104,000	1,748,518
B.	Cofferdams	1,525,969	8,635,197	2,156,276
C.	Main Dam	16,255,981	96,341,175	23,288,180
D.	Spillway	8,590,031	45,703,113	11,926,021
E.	Intake	438,092	2,406,670	613,761
F.	River Outlet Works	312,007	3,043,390	534,161
G.	Hydro-Mechanical Works	1,759,250	2,430,920	1,936,690
H.	Electrical Works	576,286	804,147	634,979
I.	Building Works	312,988	2,236,906	476,263
J.	Repair for Existing Municipal Dike	320,457	3,938,197	607,917
Total of Direct Cost		31,102,061	175,643,715	43,922,759
K.	Engineering and Administration Cost	3,732,247	21,077,246	5,270,732
Sub-total		34,834,308	196,720,961	49,193,491
L.	Physical Contingency	3,483,431	19,672,096	4,919,350
Sub-total		38,317,739	216,393,057	54,112,841
M.	Price Contingency	4,774,154	66,257,972	9,610,503
Total of Construction Cost		43,091,893	282,651,029	63,723,344

2. BASIC CONDITIONS

Basic conditions and assumptions applied for this cost estimate are presented below:

- The unit prices and rates are based on the current prices for labour, material and equipment as of January 1991.
- The estimated cost is imposed of a foreign currency portion expressed in US Dollar and a local currency portion of Mauritian Rupee. The total amount is converted into US Dollar as an equivalent price.
- The exchange rates are employed in consideration of the prevailing exchange rate in January 1991 same as those applied for cost estimate of the Lot I Work. The exchange rates used in this cost estimate are as follows:

$$\text{US\$ 1.0} = \text{Yen 130} = \text{Rs. 13.7}$$

- The work quantities are calculated from the detailed design drawings and the technical specifications of the tender documents of Lot II Contract. The work quantities are shown in APPENDIX A, PRICED BILL OF QUANTITIES.
- The construction works will be carried out by a contractor selected through an international competitive tender in accordance with a guidelines of CWA in Mauritius and a financial source.
- The Employer will furnish the construction plants, equipment and facilities listed in Section 4.2 c and will lease them to the contractor free of charge.
- Annual price escalation rates are assumed to be 3 per cent for the foreign currency portion and 7 per cent for the local currency portion.
- In principle, the import taxes and duties on construction equipment and material which are imported for construction of the Project are excluded from this cost estimate.

3. CONSTITUTION OF CONSTRUCTION COST

The construction cost consists of a direct cost (contract cost) and an indirect cost. The direct construction cost is estimated based on the work items and quantities derived from the detailed design. This cost includes the labour wages, material cost, equipment cost and contractor's indirect cost such as overhead and profit. The direct construction cost is estimated in the Priced Bill of Quantities as shown in APPENDIX A.

While, the indirect cost includes the administration expenses of the CWA, engineering services, physical contingency and price escalation.

(1) Direct Construction Cost (Contract Cost)

Lot II: Civil Works for Dam and Appurtenant Structures including Closure of Diversion Tunnel

(2) Indirect Cost

- Administration expenses
- Engineering services
- physical contingency
- Price escalation

4. DIRECT CONSTRUCTION COST

4.1 General

Lot II Civil Works for Dam and Appurtenant Structures including Closure of Diversion Tunnel consist of;

A: GENERAL

Costs for insurance of Works and third party insurance; supply, installation, operation and subsequent removal of temporary water supply facility, electric power supply and telecommunication system; operation and subsequent removal of waste water treatment and sewerage system; supply, installation, operation and subsequent removal of soil testing equipment; and boreholes and exploratory excavation.

B: COFFERDAMS

Diversion and care of water during construction in the Terre Rouge River including removal of water from foundation of cofferdams; construction and subsequent removal of upstream and downstream primary cofferdams; construction of main cofferdam; and maintenance and closure of the diversion tunnel gate.

C: MAIN DAM

Construction of main dam including drilling and grouting for foundation treatment; inspection gallery and grout tunnels; measuring apparatus; and slope protection on both abutments.

D: SPILLWAY

Construction of spillway including steel bridge and roadway.

E: INTAKE

Construction of intake structure.

F: WATER SUPPLY AND RIVER OUTLET WORKS

Construction of water supply and river outlet facilities including valve chamber access shaft; and plug concrete in the diversion tunnel.

G: HYDRO-MECHANICAL WORKS

Intake gates and hoists, trash racks, steel conduit with valves for water supply; and trash racks, bulkhead gate, steel conduit with valves for river outlet.

H: ELECTRICAL WORKS

Electrical facilities for dam control house, inspection gallery, gate control house, valve chamber including access shaft, grouting tunnel, outdoor lighting, grounding system, power receiving and distribution system, emergency power supply system and dam leakage water drainage system.

I: BUILDING AND BUILDING SERVICE WORKS

Construction of dam control house, gate control house, and valve chamber.

J: REPAIR FOR EXISTING MUNICIPAL DIKE

Repairing work by boulder backfill, concrete blocks and cement grouting.

Proportion of the above-mentioned costs are as follows:

Division No.	Foreign Currency Portion (%)	Local Currency Portion (%)	Weight (%)
A.	57.8	42.2	4.0
B.	70.8	29.2	4.9
C.	69.8	30.2	53.0
D.	72.0	28.0	27.2
E.	71.4	28.6	1.4
F.	58.4	41.6	1.2
G.	90.8	9.2	4.4
H.	90.8	9.2	1.4
I.	65.7	34.3	1.1
J.	52.7	47.3	1.4
TOTAL	70.8	29.2	100.0

4.2 Cost Component of Direct Construction Cost

The direct construction costs of civil works are estimated by adopting the method of unit price multiplied by the corresponding work quantity and lump sum prices, based on labour wages and the cost of materials, construction equipment and plants. However, major construction plants, facilities and most of the access and haul roads; such as aggregate production and concrete batcher plants, and waste water treatment plant; main building works including the office, quarters, concrete and soil testing laboratory; electrical power supply system; water supply system; and telecommunication system; and access roads around the damsite and haul roads to the quarry site; are excluded from the Lot II Civil Works. The contractor's indirect cost consisting of overhead expense and profit is included in the unit price of each work item.

The Lot II Civil Works also include hydromechanical works such as intake gates, trash racks, guide frames and hoists, steel conduit pipes and valves for the water supply and river outlet works, and closure of the diversion tunnel gate.

These are planned to be manufactured abroad and imported to Port Louis and transported to and installed at the job site. These prices are estimated on the basis of the recent international contract prices of similar equipment units in Mauritius, and include costs of design, materials, manufacturing, painting, packing, delivery and other costs necessary for transporting to the Project site.

The cost of imported equipment and materials is estimated at CIF price at Port Louis in foreign currency portion. The import tax and duties for the construction equipment procured from foreign countries are not included in the cost estimate, on the condition that such equipment shall be exported immediately after completion of the Project.

The costs for supply and delivery of imported items, ocean freight and insurance are considered in foreign currency portion. The cost for unloading and other charges at port and inland transportation expenses are estimated in local currency portion.

The main components of the cost are described as follows:

a. Labour Wages

All the labours required for the construction are assumed to be local labours and the cost is computed in the local currency portion. However, some foreign technicians such as foreman, mechanics and specialist are considered for the special works. This foreign labour wage is computed in the foreign and local currencies taking into account the annual income, air fare and living allowances, etc.

Daily labour wages are estimated at the average rates between the standard and currently prevailing wages obtained in Mauritius. The labour wages are estimated at the rate of 7 working hours per day and 40 hours per week according to the labour regulation.

The applied labour wages, which include the labour's all fringe benefits such as vacation and sick leaves, charge of insurance, medical care, living allowance and others, are shown in Table 4.1

Table 4.1 Basic Labour Wages for Cost Estimate

Description	Unit	Foreign Currency (US\$)	Local Currency (Rs.)	
			Open	Tunnel
Foreign, foremen	m.d.	171.23	570	
Foreman	m.d.	—	350	525
Mechanic	m.d.	—	300	450
Electrician	m.d.	—	300	450
Operator	m.d.	—	300	450
Assistant operator	m.d.	—	220	330
Driver A	m.d.	—	270	405
Driver B	m.d.	—	240	360
Rigger	m.d.	—	240	360
Carpenter	m.d.	—	220	330
Concrete worker	m.d.	—	200	300
Driller	m.d.	—	220	330
Mason	m.d.	—	240	360
Steel worker	m.d.	—	220	330
Skilled labour	m.d.	—	240	360
Common labour	m.d.	—	170	225

- Notes:
1. Exchange rate : US\$1.0 = Rs.13.7 = ¥130.0
 2. Extra payment for over time :
 - Normal overtime : 50%
 - Night work : 50%
 - Holidays and Sundays : 100%
 3. Extra payment for tunnelling : 50% up

b. Material Cost

Several construction materials may be purchased by the contractor in local markets. However, availability of these materials in large amount is little. Therefore, local materials employed in the cost estimate are only sand, gravel, rubble stone, ready mixed concrete, concrete products and timber. Some material prices of the said items were collected in the Port Louis area. These prices are assumed to be purchased price at site including inland transportation expenses from the markets. Here, the local materials are considered to include the indirect foreign cost such as the equipment depreciation cost and imported raw material cost, etc.

Most of major material costs could not be collected in Mauritius. Therefore, the costs other than the above-mentioned items are all assumed as the imported materials from abroad, taking into consideration of the insufficient supply in Mauritius.

As for the costs of all imported materials, these are estimated on the basis of CIF prices at Port Louis including freight and insurance premium in the foreign currency portion, referring to the prevailing prices in Japanese market. The costs of handling charge at port and inland transportation expenses to the damsite are estimated in the material prices in the local currency portion.

Material costs used for the cost estimate are listed in Table 4.2

Table 4.2 Construction Material Cost for Lot II Work

Description	Unit	Foreign Portion (US\$)	Local Portion (Rs.)
Gasoline	lit.	0.91	0.62
Light oil (Diesel)	lit.	0.52	0.36
Lubricant	lit.	2.41	1.65
Portland cement	ton	111.68	76.5
Air-entraining agent	kg	1.85	1.26
Reinforcing bar, deformed	ton	584.62	400.46
Annealed iron wire, 0.8 mm	kg	1.06	0.73
Structural steel	ton	619.50	424.36
H-shape steel, 150 x 150 mm	ton	588.30	423.00
Joint plate	kg	0.56	0.43
Base plate	kg	0.56	0.43
Bolt	pc.	0.24	0.18
Tie rod	no.	3.82	2.92
Steel pipe	no.	4.08	3.12
Nail	kg	0.93	0.64
Dynamite, open	kg	8.41	5.76

Description	Unit	Foreign Portion (US\$)	Local Portion (Rs.)
Dynamite, tunnel	kg	12.39	8.49
Electric detonator, std. 6	pc.	3.01	2.06
Timber, plank	m ³	238.69	13,080.00
Timber, square	m ³	211.68	11,600.00
Timber, plate	m ³	243.21	13,328.00
Plywood	m ²	10.34	7.09
Metal form, 300 x 1,500 mm	pc.	22.92	15.70
Metal form, 200 x 1,500 mm	pc.	22.21	15.21
Metal form, 150 x 1,500 mm	pc.	18.00	12.33
Metal form, 100 x 1,500 mm	pc.	15.58	10.67
Separator	pc.	0.42	0.32
Cone	pc.	0.29	0.22
Steel batter	kg	0.39	0.30
U-clip	pc.	0.50	0.38
Hook bolt	pc.	1.57	1.20
Pipe support	pc.	0.45	0.34
Form release agent	lit.	2.21	1.52
P.V.C. waterstop, type A	m	10.93	7.81
P.V.C. waterstop, type B	m	10.50	7.67
Concrete aggregate, fine	m ³	10.12	92.40
Concrete aggregate, coarse	m ³	7.53	68.80
Sand	m ³	16.64	152.00
Gravel	m ³	11.82	108.00
Rubble stone	m ³	8.32	76.00
Fresh concrete, ready mixed	m ³	72.26	660.00
Wire fabric net	m ²	4.69	3.21
Wire mesh	m ²	2.66	1.82
Gabion mattress	m	13.39	10.24
Concrete block	pc.	0.44	4.00
Reinforced concrete pipe, 1,000 mm dia.	m	70.56	414.30
Reinforced concrete pipe, 600 mm dia.	m	53.20	312.36
Reinforced concrete pipe, 250 mm dia.	m	14.00	82.20

Description	Unit	Foreign Portion (US\$)	Local Portion (Rs.)
Perforated P.V.C. pipe, 250 mm dia.	m	24.03	17.40
P.V.C. pipe, 75 mm dia.	m	6.56	4.66
Geo-textile pipe	m	18.50	13.30
Perforated steel pipe, 400 mm dia.	m	47.63	34.35
Perforated steel pipe, 300 mm dia.	m	35.72	25.76
Perforated steel pipe, 200 mm dia.	m	18.70	13.70
Steel pipe, 300 mm dia.	m	35.72	25.76
Steel pipe, 200 mm dia.	m	18.17	13.15
Steel pipe, 150 mm dia.	m	12.78	9.25
Steel pipe, 100 mm dia.	m	7.38	5.34
Steel pipe, 50 mm dia.	m	2.36	1.70
Steel pipe, 38 mm dia.	m	1.64	1.23
Steel pipe, 25 mm dia.	m	0.64	0.46
Bit	pc.	49.63	37.96
Insert bit	pc.	130.15	99.57
Rod	pc.	322.25	246.75
Sleeve	pc.	79.61	60.90
Shank rod	pc.	238.55	182.48
Boring road	pc.	36.50	27.92
Tube core barrel	pc.	174.38	133.41
Core lifter	pc.	42.39	32.43
Diamond bit	pc.	396.98	303.69
Packer rubber	pc.	31.82	24.34
Injection pipe	pc.	95.02	72.69
Pressure meter	pc.	35.73	27.33
Injection hose	m	62.68	47.98
Return valve	pc.	77.35	59.17
Bentnito	ton	229.85	165.70
Anchor bar, 32 mm dia.	m	3.17	2.19
Anchor bar, 29 mm dia.	m	2.57	1.78
Anchor bar, 25 mm dia.	m	2.00	1.23
Bearing shoe, 50 ton	ea.	482.32	347.71

Description	Unit	Foreign Portion (US\$)	Local Portion (Rs.)
Elastic bearing pad	ea.	29.17	20.96
Bituminous joint filler	m ²	15.96	11.51
Joint filler	m ²	12.64	9.04
Asphalt, emulsion	lit.	0.35	0.24
Grass	m ²	—	0.44
Bamboo	pc.	—	0.07
Expansion cupling	pc.	3.96	2.88
Conduit box	pc.	9.40	6.85
T-cheese	pc.	7.90	5.48
Hole in anchor	no.	1.65	1.13
Cast iron pipe	m	24.19	17.40
Water level gauge staff	m	30.00	20.00
Twin-tube hydraulic type pore pressure meter	no.	1,640.00	10,000.00
Air pneumatic type pore pressure meter	no.	1,860.00	10,900.00
Earth pressure meter	set	3,430.00	20,000.00
Multi-layer settlement meter	no.	310.00	1,790.00
Water level detector	set	98,000.00	132,500.00
Water level indicator	set	5,000.00	7,500.00
Seismometer	set	13,500.00	45,250.00
Inclinometer	set	140.00	500.00
Horizontal deflection meter	set	2,900.00	9,900.00
Thermometer, 40 mm dia.	no.	420.20	310.70
Submergible pump, 100 mm dia.	set	2,200.00	1,590.00
Submergible pump, 100 mm dia. (H=65m)	set	8,140.00	5,870.00
Electric charge	kWh	0.17	0.99

Note: Exchange rate: US\$1.0 = Rs.13.7 = ¥130.0

c. Equipment Cost

The Employer will furnish the construction plants, equipment and facilities listed hereunder, and will lease them, free of charge, to the contractor excluding operation and maintenance charge.

Plants, Equipment and Facilities	Capacity	Unit
(1) Aggregate plant, skid-mounted, motor-driven, washing type		1 lot
	<u>Product Size (mm)</u>	<u>Production (ton/hr.)</u>
	80 - 40	4 - 5
	40 - 20	15 - 20
	20 - 5	20 - 25
	5 - 0	45 - 50
(2) Cement silo, steel plate division type	100 ton	1 set
(3) Batcher plant, unit type fully automatic batcher	40 m ³ /hr	1 set
(4) Waste water treatment and sewerage system	200 m ³ /hr.	1 lot
(5) Construction facilities yard including motor pool, stock and assembly yards, etc.	—	1 lot
(6) Buildings and premises such as utility buildings, laboratory, office and dormitory, first aid building, warehouse, cement ware house, repair shop, etc.	—	1 lot
(7) Concrete testing equipment	—	1 lot
(8) Water supply system, electric power supply system, telecommunication system and sewerage system	—	1 lot
(9) Access road around the damsite	—	k m
(10) Haul roads to the quarry site	—	k m

In this cost estimate, all construction plants, equipment and facilities other than mentioned above are assumed to be provided by the contractor. The prices of construction equipment are prevailing prices in international market especially in Japan in January 1991. The equipment cost is estimated based on the CIF price at Port Louis including freight and insurance premium, handling charge, inland transportation expenses and other incidental charges. The import duties of the equipment is excluded in the cost estimate.

Rates of the hourly equipment cost are estimated based on the CIF price at Port Louis and calculated in consideration of Japanese standards of life-time, salvage value, depreciation rate, maintenance and repair rates, and management expenses rate.

The equipment cost is divided into foreign and local currency portion as follows:

i) Foreign currency portion

- Depreciation rate (calculated based on salvage value of 10 percent)
- Maintenance and repair rates and management expenses rate (70 percent of the CIF price)

ii) Local currency portion

- Maintenance and repair rates and management expenses rate mainly labour cost (30 percent of the CIF price)
- Other local incidentals.

The equipment cost is listed in Table 4.3.

Table 4.3 Construction Equipment Cost for Lot II Work

Equipment	CIF Price (US\$)	Capacity	Unit	Unit Price		Fuel (lit.)
				Foreign Currency (US\$)	Local Currency (Rs.)	
Bulldozer w/ Ripper	135,400	15 ton	hr.	30.8	104.8	18.6
Bulldozer w/ Ripper	217,500	21 ton	hr.	49.4	169.6	30.2
Bulldozer w/ Ripper	308,800	32 ton	hr.	60.5	207.5	44.2
Bulldozer	101,500	11 ton	hr.	21.8	75.0	13.7
Bulldozer	126,100	15 ton	hr.	27.1	92.5	17.9
Bulldozer	203,100	21 ton	hr.	43.5	149.0	26.7
Bulldozer	288,500	32 ton	hr.	58.1	199.4	33.8
Bulldozer w/ Rake	126,900	15 ton	hr.	29.9	102.8	17.9
Bulldozer w/ Rake	204,800	21 ton	hr.	44.0	150.0	26.7
Bulldozer w/ Rake	301,200	32 ton	hr.	60.5	207.5	33.8

Equipment	CIF Price (US\$)	Capacity	Unit	Unit Price		Fuel (lit.)
				Foreign Currency (US\$)	Local Currency (Rs.)	
Backhoe	119,300	0.6 m ³	hr.	20.9	70.9	16.0
Backhoe	188,700	1.0 m ³	hr.	32.9	113.0	22.6
Backhoe	240,300	1.2 m ³	hr.	41.9	143.9	25.8
Wheel loader	30,500	0.6 m ³	hr.	8.1	27.8	5.2
Wheel loader	51,400	1.2 m ³	hr.	13.7	46.3	7.8
Wheel loader	114,200	2.1 m ³	hr.	23.3	80.2	13.3
Wheel loader	206,500	3.5 m ³	hr.	42.0	143.9	24.1
Tractor shovel	54,200	0.8 m ³	hr.	14.3	49.4	7.7
Tractor shovel	67,700	1.2 m ³	hr.	18.5	63.7	11.1
Tractor shovel	86,300	1.4 m ³	hr.	18.5	63.7	13.1
Tractor shovel	151,500	2.2 m ³	hr.	30.8	105.8	23.8
Tractor shovel	225,900	3.2 m ³	hr.	46.0	157.2	29.8
Tractor shovel, side dump	131,200	1.5 m ³	hr.	32.0	110.0	13.3
Rocker shovel	80,600	0.25 m ³	hr.	19.5	66.8	—
Rocker shovel	108,300	0.35 m ³	hr.	26.2	89.4	—
Rocker shovel	155,700	0.60 m ³	hr.	37.7	128.5	—
Dump truck	47,600	6 ton	hr.	8.6	29.8	8.8
Dump truck	50,800	8 ton	hr.	9.2	31.9	9.4
Dump truck	72,200	11 ton	hr.	11.3	39.1	12.4
Dump truck	111,700	15 ton	hr.	15.5	52.4	13.1
Dump truck	187,000	20 ton	hr.	25.8	88.4	16.7
Dump truck	301,200	32 ton	hr.	35.6	121.3	26.7
Ordinary truck	28,300	6 ton	hr.	5.9	20.6	6.5
Ordinary truck	39,600	8 ton	hr.	8.3	27.8	8.2
Ordinary truck	63,000	11 ton	hr.	11.0	37.0	11.1
Ordinary truck w/ crane	39,100	4 ton	hr.	7.0	23.6	6.5
Tractor & trailer	110,800	20 ton	hr.	21.5	73.0	15.7
Water tanker	47,900	5,500~6,500 l	hr.	9.7	32.9	5.2
Battery locomotive	101,500	4 ton	hr.	18.3	61.7	—
Muck car	5,400	2 m ³	day	7.2	24.7	—
Lift for shaft	20,800	1 m ³	day	30.0	102.8	—

Equipment	CIF Price (US\$)	Capacity	Unit	Unit Price		Fuel (lit.)
				Foreign Currency (US\$)	Local Currency (Rs.)	
Crawler crane	173,500	22.5 ton	hr.	32.3	111.0	6.3
Crawler crane	338,500	40 ton	hr.	57.2	196.3	7.0
Crawler crane	396,000	50 ton	hr.	66.9	229.1	8.7
Truck crane	247,900	25 ton	hr.	35.5	121.3	9.5
Truck crane	399,400	40~45 ton	hr.	57.2	196.3	11.4
Truck crane	1,032,300	80 ton	hr.	147.8	573.1	(R) 10.4 (C) 6.8
2-boom crawler drill	143,800	100 kg class	hr.	41.0	139.7	—
Crawler drill	63,500	180 kg class	hr.	20.8	70.9	—
Drifter	9,900	80 kg	day	28.1	96.6	—
Leg hammer	2,000	30 kg	day	5.8	19.5	—
Jack hammer	1,500	20 kg	day	4.4	14.4	—
Pick hammer	277	7 kg	day	0.8	3.1	—
Steel bender	—	—	hr.	3.1	10.4	—
Concrete breaker	1,100	40 kg	day	3.1	10.3	—
Concrete breaker	29,600	1,200 kg	day	68.3	234.3	—
Motor grader	71,900	2.8 m	hr.	14.8	57.1	6.5
Motor grader	88,000	3.1 m	hr.	18.2	61.7	8.2
Macadam roller	59,400	10~12 ton	hr.	11.6	40.1	7.1
Tire roller	65,500	8~20 ton	hr.	12.8	44.2	7.2
Tamping roller	84,600	13.5~20.7 ton	hr.	13.5	46.3	—
Vibrating roller	35,400	3 ~ 5 ton	hr.	12.3	42.2	4.0
Vibrating roller	101,500	8 ~ 10 ton	hr.	35.3	121.3	18.9
Vibrating compactor	1,500	90 kg	day	4.1	13.4	1.0
Rammer	2,900	120 kg	day	7.7	26.7	1.3
Tamper	1,900	60~100 kg	day	5.0	16.4	G 0.8
Agitator truck	50,700	3.0~3.2 m ³	hr.	10.7	37.0	8.6
Agitator truck	73,600	4.5 m ³	hr.	15.5	53.4	11.3
Concrete pump car	97,300	45 m ³ /hr	hr.	23.0	79.2	7.5
Concrete pump car w/boom	162,500	40~45 m ³ /hr	hr.	38.3	131.6	10.1
Concrete bucket	3,900	1.0 m ³	day	10.2	35.0	—

Equipment	CIF Price (US\$)	Capacity	Unit	Unit Price		Fuel (lit.)
				Foreign Currency (US\$)	Local Currency (Rs.)	
Concrete bucket	8,800	1.5 m ³	day	23.3	80.2	—
Concrete bucket	19,300	2.0 m ³	day	51.2	175.7	—
Concrete vibrator	1,000	φ 45 mm	day	2.3	7.2	—
Concrete vibrator	1,500	φ 60 mm	day	3.9	10.3	—
Concrete mixer	78,000	0.5 m ³	hr.	21.9	75.0	—
Concrete pump	115,100	40~45 m ³ /hr	hr.	34.5	118.2	—
Concrete placer	61,800	3 m ³	hr.	16.9	57.5	—
Agitator car	51,000	3 m ³	hr.	13.4	46.3	—
Concrete spray gun	40,600	6 m ³ /hr	hr.	9.2	30.8	—
Grout plant	210,700	100 l/min	day	26.3	89.9	—
Grout pump	13,300	200 l	day	23.6	81.2	—
Grout mixer	5,500	200 l x 2	day	9.8	33.9	—
Boring machine	12,400	3.7 kW	day	18.2	62.7	—
Boring machine	18,300	5.5 kW	day	26.9	92.5	—
Boring machine	34,200	11 kw	day	50.3	172.7	—
Down-the-hole hammer	40,100	400 mm	day	114.0	390.5	—
P-F gauge recorder	17,600	60 l/min.	day	32.0	110.0	—
P-F gauge recorder	20,300	120 l/min.	day	36.9	126.4	—
Rail, l = 100 m	1,400	15 kg/m	day	0.5	2.0	—
Chain saw	1,400	500 mm	day	4.1	13.4	G 0.7
Belt conveyor (G)	2,300	7 m	day	7.2	24.7	G 1.2
Belt conveyor (E)	1,500	7 m	day	4.7	15.5	—
Welding machine	1,000	300 A	day	0.8	3.1	—
Asphalt kettle	6,200	3,000 l	day	13.1	45.2	—
Asphalt sprayer	20,100	1,000~1,500 l	hr.	5.6	18.5	G 2.6
Air compressor (P)	38,200	10.6 m ³ /min.	day	54.5	187.0	15.3
Air compressor (S)	97,300	27.0 m ³ /min.	hr.	5.3	18.5	—
Blower	175,200	65 m ³ /min.	hr.	10.7	37.0	—
Fan	860	50 m ³ /min.	day	0.8	2.0	—
Diesel generator	4,000	5 kVA	day	5.1	17.5	1.2

Equipment	CIF Price (US\$)	Capacity	Unit	Unit Price		Fuel (lit.)
				Foreign Currency (US\$)	Local Currency (Rs.)	
Diesel generator	7,300	10 kVA	day	9.3	31.9	1.9
Diesel generator	15,200	25 kVA	day	17.9	60.6	3.7
Submersible pump	320	φ 50 mm	day	0.7	2.0	—
Submersible pump	980	φ 80 mm	day	2.0	6.2	—
Submersible pump	1,500	φ 100 mm	day	3.1	10.3	—
Turbine pump, 45 m	3,100	φ 50 mm	day	5.3	18.5	—
Turbine pump, 70 m	5,300	φ 80 mm	day	9.1	30.8	—
Turbine pump, 70 m	7,200	φ 100 mm	day	12.4	42.2	—
Deep well pump, 75 m	7,200	φ 80 mm	day	12.3	42.2	—
Sand pump	1,500	φ 80 mm	day	3.5	12.3	—
Batcher plant	375,400	40 m ³ /hr.	hr.	16.9	57.5	—
Cement silo	113,900	100 ton	day	2.0	6.2	—
Aggregate plant	1,598,000	50 ton/hr.	hr.	52.0	117.8	—
Waste water treatment	1,150,000	200 m ³ /hr.	hr.	36.5	124.4	—

d. Contractor's Indirect Cost

Contractor's indirect cost is to be overhead expenses and profit for the contractor. The overhead expenses comprise general administrative expenses and field expenses. The general administrative expenses are salaries and allowances for the contractor's personnel, legal welfare expenses, international travelling and communication expenses, depreciation, insurance and so on. The field expenses and allowances are the cost of the contractor's personnel, camp operation, labour control expenses, inland travelling expenses, security, insurance and bond, stationary and communication expenses and so on.

The overhead expenses and profit are distributed to the price or lump sum of each work item. These expenses are estimated at 20 percent of direct unit cost comprising labour wages, material costs and equipment cost. The breakdown is as follows:

- Field administration and supervision : 10%
- Corporated overhead and profit : 7%
- Security and safety control : 2%
- Other incidentals : 1%

e. Direct Construction Cost

The unit prices for various work items in the Bill of Quantities are estimated in accordance with the above conditions. The unit prices for Lot II Contract are as shown in APPENDIX A and these breakdowns are attached as APPENDIX B.

The direct construction cost for civil works, Lot II, is estimated at about US\$43.9 million equivalent in total, comprising US\$31.1 million in foreign currency (70.8%) and Rs.175.6 million in local currency portion (29.2%).

5. INDIRECT COST

5.1 Administration Expenses and Engineering Services

The cost of CWA's administration expenses for running cost of office, stationary, consumables, etc. is estimated at 12 percent of the local currency portion of the direct construction cost. On the other hand, cost for the engineering services is also estimated at 12 percent of the foreign currency portion of the direct cost based on the necessary construction supervision required for all over the Project, including the pre-construction and construction stages, assuming that these services are made by the expatriate consultant.

The administration expenses and the engineering services are estimated at about US\$5.3 million, comprising US\$3.7 million in foreign currency (70.8%) and Rs.21.1 million in local currency (29.2%).

5.2 Contingency

The contingencies are provided to cope with the unforeseen physical conditions (physical contingency) and price escalation due to inflation. The physical contingency amounting to 10 percent of the direct cost is assumed. Financial

contingency for the project cost is assumed that the escalation rate will be 3% per annum for the foreign currency portion and 7% per annum for the local currency portion.

6. ANNUAL DISBURSEMENT SCHEDULE

Fiscal year for the disbursement schedule is assumed to start in July and end in June next year considering Mauritian Fiscal Year. According to the construction time schedule, the construction cost for the Project are assumed to be disbursed as shown in Table 6.1

Table 6.1 Disbursement Schedule of Construction Cost, Lot II Work

(Unit: 1,000 Rs.)

Description	Total			1994			1995			1996		
	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total
A. General	13,851 (1,011)	10,104	23,954 (1,749)	4,986 (364)	3,637	8,623 (629)	3,740 (273)	2,728	6,468 (472)	5,125 (374)	3,738	8,863 (647)
B. Cofferdams	20,906 (1,526)	8,635	29,542 (2,156)	12,543 (916)	5,181	17,724 (1,294)	2,091 (153)	864	2,955 (216)	6,272 (458)	2,591	8,863 (647)
C. Main Dam	222,707 (16,256)	96,341	319,048 (23,288)	77,947 (5,690)	33,719	111,666 (8,151)	122,489 (8,941)	52,988	175,477 (12,809)	22,271 (1,626)	9,634	31,905 (2,329)
D. Spillway	117,684 (8,590)	45,703	163,387 (11,926)	11,768 (859)	4,570	16,338 (1,193)	82,379 (6,013)	31,992	114,371 (8,348)	23,537 (1,718)	9,141	32,678 (2,385)
E. Intake	6,002 (438)	2,407	8,409 (614)	0 (0)	0	0 (0)	6,002 (438)	2,407	8,409 (614)	0 (0)	0	0 (0)
F. River Outlet Works	4,275 (312)	3,044	7,319 (534)	0 (0)	0	0 (0)	1,069 (78)	761	1,830 (134)	3,206 (234)	2,283	5,489 (401)
G. Hydro-Mechanical Works	24,101 (1,759)	2,431	26,532 (1,937)	0 (0)	0	0 (0)	4,820 (352)	486	5,306 (387)	19,281 (1,407)	1,945	21,226 (1,549)
H. Electrical Works	7,895 (576)	804	8,699 (635)	0 (0)	0	0 (0)	1,974 (144)	201	2,175 (159)	5,921 (432)	603	6,524 (476)
I. Building Works	4,288 (313)	2,237	6,525 (476)	0 (0)	0	0 (0)	1,715 (125)	895	2,610 (191)	2,573 (188)	1,342	3,915 (286)
J. Repair for Existing Municipal Dike	4,391 (320)	3,938	8,329 (608)	0 (0)	0	0 (0)	0 (0)	0	0 (0)	4,391 (321)	3,938	8,329 (608)
Total of Direct Cost	426,100 (31,102)	175,644	601,744 (43,923)	107,244 (7,828)	47,107	154,351 (11,266)	226,279 (16,517)	93,322	319,601 (23,329)	92,577 (6,757)	35,215	127,792 (9,328)
K. Engineering and Administrative Cost	51,131 (3,732)	21,077	72,209 (5,271)	12,869 (939)	5,653	18,522 (1,352)	27,153 (1,982)	11,199	38,352 (2,799)	11,109 (811)	4,226	15,335 (1,119)
Sub-total	477,231 (34,834)	196,721	673,953 (49,193)	120,113 (8,767)	52,760	172,873 (12,618)	253,432 (18,499)	104,521	357,953 (26,128)	103,686 (7,568)	39,441	143,127 (10,447)
L. Physical Contingency	47,722 (3,483)	19,672	67,393 (4,919)	12,011 (877)	5,276	17,287 (1,262)	25,343 (1,850)	10,451	35,794 (2,613)	10,368 (757)	3,944	14,312 (1,045)
Sub-total	524,953 (38,318)	216,393	741,346 (54,113)	132,124 (9,644)	58,036	190,160 (13,880)	278,775 (20,349)	114,972	393,747 (28,741)	114,054 (8,325)	43,385	157,439 (11,492)
M. Price Contingency	65,406 (4,774)	66,258	131,664 (9,610)	12,251 (894)	13,061	25,312 (1,848)	34,989 (2,554)	35,733	70,722 (5,162)	18,166 (1,326)	17,464	35,630 (2,601)
Total Project Cost	590,359 (43,092)	282,651	873,010 (63,723)	144,375 (10,538)	71,097	215,472 (15,728)	313,764 (22,902)	150,705	464,469 (33,903)	132,220 (9,651)	60,849	193,069 (14,093)

Note: 1. Figures in () are costs in 1,000 US\$.
2. Price contingency is assumed as 3% for foreign currency and 7% for local currency in annual.

APPENDIX A PRICED BILL OF QUANTITIES

SUMMARY OF BILL OF QUANTITIES

Division No.	Description	Foreign Currency Portion (US\$)	Local Currency Portion (Rs.)	Total Equivalent Price (US\$)
A.	GENERAL	1,011,000	10,104,000	1,748,518
B.	COFFERDAMS	1,525,969	8,635,197	2,156,276
C.	MAIN DAM	16,255,981	96,341,175	23,288,180
D.	SPELLWAY	8,590,031	45,703,113	11,926,021
E.	INTAKE	438,092	2,406,670	613,761
F.	RIVER OUTLET WORKS	312,007	3,043,390	534,153
G.	HYDRO-MECHANICAL WORKS	1,759,250	2,430,920	1,936,690
H.	ELECTRICAL WORKS	576,286	804,147	634,979
I.	BUILDING WORKS	312,988	2,236,906	476,263
J.	REPAIR FOR EXISTING MUNICIPAL DIKE	320,457	3,938,197	607,917
TOTAL		31,102,061	175,643,715	43,922,759

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
A GENERAL									
/01	Cost for Insurance of Works	L.S.			437,000	0		437,000	G6.2
/02	Cost for Third Party Insurance	L.S.		0		5,987,000		437,007	G6.2
/03	Supply, installation, operation and subsequent removal of temporary water supply facility	L.S.		18,000		110,000		26,029	G5.3
/04	Supply, installation, operation and subsequent removal of temporary electric power supply	L.S.		15,000		57,000		19,161	G5.3
/05	Supply, installation, operation and subsequent removal of temporary telecommunication system	L.S.		12,000		10,000		12,730	G5.3
/06	Waste water treatment and sewerage system	L.S.		300,000		2,000,000		445,985	G5.3
/07	Boreholes and exploratory excavations	Provisional sum		38,000		150,000		48,949	G6.4
/08	Supply, installation, operation and subsequent removal of soil testing equipment	L.S.		123,000		430,000		154,387	G5.4
/09	Operation and maintenance of medical facilities	month	34	2,000		40,000		167,270	G5.2
TOTAL OF ITEMS A					1,011,000	10,104,000		1,748,518	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
B COFFERDAMS									
B1	Maintenance and River Diversion								
/01	Maintenance and closure of the diversion tunnel gate	L.S.		135,000		400,000		164,197	T1.4.2
Subtotal of item B1				135,000		400,000		164,197	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
B2 Earthwork									
/01	Open-cut excavation, common	m3	38,300	2.5	95,750	12.0	459,600	129,297	T2.4.6
/02	Open-cut excavation, weathered rock	m3	7,700	3.5	26,950	15.7	120,890	35,774	T2.4.6
/03	Open-cut excavation, rock	m3	2,000	7.2	14,400	37.2	74,400	19,831	T2.4.6
/04	Excavation of sand and gravel	m3	750	2.1	1,575	9.9	7,425	2,117	T2.4.6
/05	Main cofferdam embankment, Zone 1 (core)	m3	21,500	3.0	64,500	18.1	389,150	92,905	T2.6.2
/06	Main cofferdam embankment, Zone 3 (coarse filter)	m3	9,700	13.6	131,920	118.0	1,144,600	215,467	T2.6.3
/07	Main cofferdam embankment, Zone 4 (rock)	m3	128,300	6.2	795,460	35.2	4,516,160	1,125,107	T2.6.4
/08	Main cofferdam embankment, Zone 5 (rock riprap)	m3	6,800	5.7	38,760	38.2	259,760	57,721	T2.6.5
/09	Surface course for main cofferdam crest (zone 6)	m2	1,520	1.1	1,672	14.3	21,736	3,259	T5.2.5
/10	Reinforcing bar	ton	116.4	816.0	94,982	4419.9	514,476	132,535	T4.1.18
/11	Primary cofferdam, upstream	L.S.			50,000		311,000	72,701	T1.3.3
/12	Downstream cofferdam	L.S.			75,000		416,000	105,365	T1.3.3
	<u>Subtotal of item B2</u>				1,390,969		8,235,197	1,992,079	
	<u>TOTAL OF ITEM B</u>				1,525,969		8,635,197	2,156,276	

Item No.	Work	Unit	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
			Quantity	Unit Price	Amount	Unit Price		
C MAIN DAM								
C1 Earthwork								
/01	Clearing and stripping at main dam site, borrow area and quarry site							
	a) Main dam	m2	66,700	0.4	26,680	3.0	200,100	41,286 T2.2.3
	b) Quarry site	m2	53,000	0.4	21,200	3.0	159,000	32,806 T2.2.3
	c) Borrow area	m2	200,000	0.4	80,000	3.0	600,000	123,796 T2.2.3
	d) Reservoir area	m2	332,000	0.4	132,800	3.0	996,000	205,501 T2.2.3
/02	Excavation common, for foundation of main dam and in open-cut for core wall and drain channel	m3	191,000	2.5	477,500	12.0	2,292,000	644,799 T2.4.6
/03	Excavation sand and gravel, for foundation of main dam	m3	9,000	2.1	18,900	9.9	89,100	25,404 T2.4.6
/04	Excavation weathered rock, for							
	a) Main dam	m3	46,000	3.5	161,000	15.7	722,200	213,715 T2.4.6
	b) Right abutment	m3	48,200	3.5	168,700	15.7	756,740	223,936 T2.4.6
	c) Inspection tunnel	m3	2,200	3.5	7,700	15.7	34,540	10,221 T2.4.6
/05	Excavation rock, for							
	a) Main dam	m3	10,700	7.2	77,040	37.2	398,040	106,094 T2.4.6
	b) Right abutment	m3	95,800	7.2	689,760	37.2	3,563,760	949,888 T2.4.6
	c) Inspection tunnel	m3	1,500	7.2	10,800	37.2	55,800	14,873 T2.4.6
/06	Underground excavation, for							
	a) Inspection tunnel	m3	2,410	50.6	121,946	263.5	635,035	168,299 T2.5.6
	b) Grout tunnel No.1	m3	600	50.6	30,360	263.5	158,100	41,900 T2.5.6
	c) Grout tunnel No.2	m3	5,100	50.6	258,060	263.5	1,343,850	356,151 T2.5.6
/07	Trench excavation, all classes, for							
	a) Main dam	m3	11,300	11.0	124,300	53.2	601,160	168,180 T2.4.6
	b) Inspection tunnel	m3	60	11.0	660	53.2	3,192	893 T2.4.6

Item No.	Work	Unit	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause	
			Quantity	Unit Price	Amount	Unit Price			Amount
/08	Main dam embankment, Zone 1 (core), including hauling, placing and compaction	m3	242,900	3.0	728,700	18.1	4,396,490	1,049,612	T2.6.2
/09	Main dam embankment, Zone 2 (fine filter), including crushing, processing, hauling, placing and compaction	m3	68,800	12.6	866,880	108.5	7,464,800	1,411,756	T2.6.3
/10	Main dam embankment, Zone 3 (coarse filter), including hauling, placing and compaction	m3	63,200	13.6	859,520	118.0	7,457,600	1,403,870	T2.6.3
/11	Main dam embankment, Zone 4 (rock), including hauling, placing and compaction	m3	985,200	6.2	6,108,240	35.2	34,679,040	8,639,557	T2.6.4
/12	Main dam embankment, Zone 5 (riprap), including hauling, placing and compaction	m3	21,300	5.7	121,410	38.2	813,660	180,801	T2.6.5
/13	Surface course for main dam crest	m2	1,800	1.1	1,980	14.3	25,740	3,859	T5.2.5
/14	Compacted sand and gravel fill as base course for main dam crest	m3	300	18.7	5,610	145.6	43,680	8,798	T5.2.5
/15	Compacted gravel and cobble fill as subbase course for main dam crest	m3	530	17.8	9,434	150.3	79,659	15,249	T5.2.5
/16	Placing selected material for shoulder protection at dam crest	m3	2,230	5.3	11,819	35.2	78,496	17,549	T2.7.6
/17	Sod facing on cutting slope on right abutments	m2	2,300	0.3	690	20.5	47,150	4,132	T2.10.5

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/18	Backfill with free drainage materials at portal portion of inspection tunnel	m3	30	2.9	87	21.7	651	135	T2.7.6
/19	Backfill with random material for drain ditch and pit of inspection tunnel	m3	10	3.0	30	18.0	180	43	T2.7.6
/20	Gravel bedding for foundation of cable duct	m3	20	12.1	242	168.4	3,368	488	T2.7.6
/21	Excavation for plug concrete for core foundation	m3	7,220	7.2	51,984	37.2	268,584	71,589	T2.5.6
				Subtotal of item C1		67,967,715		16,135,180	
				11,174,032					

Item No.	Work	Unit	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
			Quantity	Unit Price	Amount	Unit Price		
C2	Drilling and Grouting for Foundation Treatment of Main Dam and Spillway, and Dam Rims							
/01	Drilling curtain grout-holes without core sampling							
	(a) Vertical hole							
	(i) Section from 0 to 30m in length	m	13,770	51.7	711,909	280.5	3,862,485	T3.12.1
	(ii) Section from 30m to 70m in length	m	7,280	79.1	575,848	353.1	2,570,568	T3.12.1
	(b) Inclined hole							
	(i) Section from 0 to 30m in length	m	1,570	75.4	118,378	381.3	598,641	T3.12.1
	(ii) Section from 30m to 70m in length	m	930	94.3	87,699	454.4	422,592	T3.12.1
/02	Drilling consolidation and blanket grout holes without sampling	m	5,050	14.1	71,205	130.2	657,510	T3.12.1
/03	Core drilling							
	(a) Vertical hole							
	(i) Section from 0 to 30m in length	m	450	101.6	45,720	381.7	171,765	T3.12.2
	(ii) Section more than 30m in length	m	420	116.9	49,098	438.9	184,338	T3.12.2
	(b) Inclined hole							
	(i) Section from 0 to 30m in length	m	1,290	112.3	144,867	420.2	542,058	T3.12.2
	(ii) Section more than 30m in length	m	1,840	123.6	227,424	462.5	851,000	T3.12.2
/04	Water pressure test in borehole							
	(a) Under a single pressure	time	5,520	21.8	120,336	125.0	690,000	T3.12.3
	(b) Under varied pressure	time	800	27.3	21,840	156.3	125,040	T3.12.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause	
				Unit Price	Amount	Unit Price	Amount			
/05	Packer setting									
	(a) Depth not more than 9 m	time	1,830	15.6	28,548	154.3	282,369	49,159	T3.12.4	
	(b) Depth 10 m to 30 m	time	2,380	23.4	55,692	231.5	550,970	95,909	T3.12.4	
	(c) Depth more than 30 m	time	2,120	31.2	66,144	308.5	654,020	113,883	T3.12.4	
/06	Grouting	ton	1,300	121.6	158,080	1,605.5	2,087,150	310,427	T3.12.5	
/07	Material									
	(a) Cement	ton	1,300	191.6	249,080	131.0	170,300	261,511	T3.12.6	
	(b) Sand	ton	10	8.9	89	81.5	815	148	T3.12.6	
	(c) Bentonite	ton	10	298.3	2,983	215.0	2,150	3,140	T3.12.6	
/08	Backfill grouting									
	(a) Inspection tunnel	m3	20	57.7	1,154	400.1	8,002	1,738	T3.12.8	
	(b) Grout tunnel No.1 (right abutment)	m3	10	57.7	577	400.1	4,001	869	T3.12.8	
	(c) Grout tunnel No.2 (left abutment)	m3	120	57.7	6,924	400.1	48,012	10,429	T3.12.8	
					2,743,595		14,483,786	3,800,806		
				<u>Subtotal of item C2</u>						

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause	
				Unit Price	Amount	Unit Price	Amount			
C3	Concrete Work									
/01	Concrete, Class A, in blockout	m3	10	63.1	631	294.5	2,945	846	T4.1.18	
/02	Concrete, Class B for drain ditch	m3	110	57.4	6,314	279.4	30,734	8,557	T4.1.18	
/03	Concrete, Class C, in inspection gallery	m3	8,910	60.1	535,491	269.4	2,400,354	710,699	T4.1.18	
/04	Concrete, Class C, in tunnel lining	m3	3,610	60.3	217,683	350.5	1,265,305	310,041	T4.1.18	
/05	Concrete, Class C for gravity wall	m3	-						T4.1.18	
/06	Backfill concrete, Class E, in dam foundation	m3	-						T4.1.18	
/07	Concrete, Class E, plug concrete for core foundation	m3	7,220	45.9	331,398	224.5	1,620,890	449,711	T4.1.18	
/08	Concrete, Class F for levelling concrete	m3	20	45.0	900	215.1	4,302	1,214	T4.1.18	
/09	Form, F1 for items/01, /03, /04 and /05	m2	1,420	11.2	15,904	230.7	327,594	39,816	T4.1.18	
/10	Form, F2 for items/01, /03, /05 and /06	m2	7,860	15.1	118,686	157.5	1,237,950	209,047	T4.1.18	
/11	Reinforcing bar	ton	315	816.0	257,040	4,419.9	1,392,269	358,665	T4.1.18	
/12	Shotcrete on cutting slope on right abutment	m2	4,910	25.4	124,714	78.2	383,962	152,740	T4.2.7	
/13	Waterstop	m	700	13.8	9,660	70.3	49,210	13,252	T4.1.18	
	a) Type "A"	m	470	6.9	3,243	35.2	16,544	4,451	T4.1.18	
	b) Type "B"									
					1,621,664		8,732,059	2,259,039		
				<u>Subtotal of item C3</u>						

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
C4	Measuring Apparatus								
/01	Provision, installation, test operation of strain gage type pore pressure meter, including preservation during construction	no.	79	667.0	52,693	2,672.0	211,088	68,101	T10.8.1
/02	Provision, installation, test operation of strain gage type earth pressure meter, including preservation during construction	set	4	513.0	2,052	2,055.0	8,220	2,652	T10.8.1
/03	Provision, installation, test operation of multi-layer settlement meter, including preservation during construction								
	1) No.1 (Sta. No. 16)	set	1	7,593.0	7,593	30,414.0	30,414	9,813	T10.8.1
	2) No.2 (Sta. No. 10)	set	1	6,833.0	6,833	27,373.0	27,373	8,831	T10.8.1
	Sub-total (/03)				14,426		57,787	18,644	
/04	Provision of surface displacement survey points including installation, testing and maintenance								
	1) Crest	pcs	8	383.0	3,064	17,424.0	139,392	13,239	T10.8.2
	2) Slope	pcs	24	142.0	3,408	19,728.0	473,472	37,968	T10.8.2
	Sub-total (/04)				6,472		612,864	51,207	
/05	Provision, installation and test operation and maintenance of leakage measuring facility (not including a triangular weir at the outlet of inspection tunnel)	L.S.	-		107,412		576,220	149,472	T10.8.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/06	Provision of water level detector and indicator with gauging staff made of metal plate for reservoir including installation, testing and maintenance	L.S.	-	-	270,849	1,364,100	370,418	T10.8.4	
/07	Provision, installation and test operation and maintenance of relay terminal box and cable								
	1) Relay terminal box	no.	5	790.0	3,950	3,165.0	15,825	5,105	T10.8.5
	2) Cable (Chloroprene cabtyre)	m	6,150	4.0	24,600	14.0	86,100	30,885	T10.8.5
	3) Cable (Chloroprene cabtyre - heavy duty)	m	7,390	5.0	36,950	28.0	206,920	52,054	T10.8.5
	4) Cable (Multi core)	m	950	26.0	24,700	110.0	104,500	32,328	T10.8.5
	5) Converter	no.	1	1,580.0	1,580	6,330.0	6,330	2,042	T10.8.5
	Sub-total (/07)				91,780		419,675	122,414	
/08	Provision, installation and test operation and maintenance of recording and data processing system								
	1) Data acquisition controller	L.S.	-	-	20,910		83,710	27,020	T10.9.3
	2) Data processing system with periphery	L.S.	-	-	9,530		38,220	12,320	T10.9.3
	Sub-total (/08)				30,440		121,930	39,340	
/09	Installation of reference point for sediment monitoring	no.	8	383.0	3,064	17,424.0	139,392	13,239	T10.8.2
	Subtotal of item C4				579,188		3,511,276	835,487	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
C5	Drainage								
/01	Concrete pipe, 600mm dia.	m	20	67.8	1,356	729.7	14,594	2,421	T2.9.3
/02	P.V.C. pipe, 75mm dia.	m	110	9.2	1,012	18.8	2,068	1,163	T2.9.3
Subtotal of item C5					2,368		16,662	3,584	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
C6	Miscellaneous Metalwork								
/01	V-notched narrow crested weir	m2	0.9	28.2	25	22.2	20	26	T9.6.8
/02	Steel handrail, 35 mm dia. steel pipe of inspection gallery	m	280	2.1	588	5.2	1,456	694	T9.6.4
/03	Permanent steel support, H-150x150, for inspection tunnel & grout tunnel	ton	125	814.5	101,813	10,343.1	1,292,888	196,184	T2.5.6
/04	Grating for sump pit in inspection gallery	kg	220	0.8	176	28.8	6,336	638	T9.6.2
/05	Grating for drain ditch cover at entrance of inspection and grout tunnels	kg	180	0.8	144	28.8	5,184	522	T9.6.2
/06	Non-embedded metalwork for entrance of inspection and grout tunnels	kg	400	0.8	320	10.3	4,120	621	T9.6.2
/07	Dowel bars in inspection gallery	ton	10	939.5	9,395	2,848.2	28,482	11,474	T4.1.18
<u>Subtotal of item C6</u>					112,461		1,338,486	210,159	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
C7	Other Miscellaneous								
/01	Construction of concrete guard blocks on crest of dam including gravel bedding	no.	170	42.8	7,276	483.0	82,110	13,269	T5.2.7
/02	Bituminous coating for contraction joint for inspection tunnel, grout tunnels No.1 & No.2	m2	2,500	5.0	12,500	71.5	178,750	25,547	T4.1.18
/03	Gravel bedding (around portal of inspection tunnel)	m3	10	12.1	121	168.4	1,684	244	T2.7.6
/04	Gravel metaling (around portal of inspection tunnel)	m3	5	46.5	233	437.0	2,185	392	T2.7.6
/05	Base course (around portal of inspection tunnel)	m3	10	18.7	187	145.6	1,456	293	T5.2.5
/06	Sub-base course (around portal of inspection tunnel)	m3	20	17.8	356	150.3	3,006	575	T5.2.5
/07	Construction of lighting pole base	no.	20	100.0	2,000	1,100.0	22,000	3,606	T5.2.7
	<u>Subtotal of item C7</u>				22,673		291,191	43,926	
	<u>TOTAL OF ITEM C</u>				16,255,981		96,341,175	23,288,180	

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D SPILLWAY									
D1	Earthwork								
/01	Clearing and stripping	m2	44,410	0.4	17,764	3.0	133,230	27,489	T2.2.3
/02	Excavation, common, in open-cul	m3	153,800	2.5	384,500	12.0	1,845,600	519,215	T2.4.6
/03	Excavation, weathered rock, in open-cut	m3	592,500	3.5	2,073,750	15.7	9,302,250	2,752,746	T2.4.6
/04	Excavation, rock in open-cut	m3	77,900	7.2	560,880	37.2	2,897,880	772,404	T2.4.6
/05	Trench excavation, all classes, for underdrain beneath slab	m3	290	13.4	3,886	64.0	18,560	5,241	T2.4.6
/06	Free draining backfill with selected gravel, for underdrain beneath slab	m3	230	12.4	2,852	121.6	27,968	4,893	T2.7.6
/07	Free draining backfilling behind wall	m3	14,120	3.9	55,068	22.2	313,464	77,949	T2.7.6
/08	25mm dia. anchor bar	m	4,810	12.0	57,720	49.2	236,652	74,994	T2.10.4
/09	29mm dia. anchor bar	m	21,600	12.7	274,320	49.9	1,077,840	352,994	T2.10.4
/10	32mm dia. anchor bar	m	11,900	13.6	161,840	50.8	604,520	205,966	T2.10.4

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/11	Stone pitching	m2	670	15.3	10,251	326.0	218,420	26,194	T2.10.5
/12	Sod facing	m2	4,600	0.3	1,380	20.5	94,300	8,263	T2.10.5
/13	Riprap at slope of spoil bank	m3	710	5.7	4,047	38.2	27,122	6,027	T2.6.5
/14	Gravel metalling	m3	250	46.5	11,625	437.0	109,250	19,599	T2.7.6
Subtotal of item D1					3,619,883		16,907,056	4,853,974	

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D2	Concrete Work								
/01	Concrete, class B, in drain ditch type B	m3	150	57.4	8,610	279.4	41,910	11,669	T4.1.18
/02	Concrete, class B, in concrete facing	m3	590	57.4	33,866	279.4	164,846	45,899	T4.1.18
/03	Concrete, class C, in weir	m3	4,140	68.9	285,246	276.7	1,145,538	368,862	T4.1.18
/04	Concrete, class C, in chute way	m3	5,030	64.2	322,926	262.6	1,320,878	419,340	T4.1.18
/05	Concrete, class C, in dam abutment and guide wall	m3	7,220	60.4	436,088	250.0	1,805,000	567,840	T4.1.18
/06	Concrete, class C, in stilling basin	m3	15,840	60.4	956,736	250.0	3,960,000	1,245,787	T4.1.18
/07	Concrete, class C, in side-channel	m3	13,190	68.9	908,791	276.7	3,649,673	1,175,190	T4.1.18

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/08	Waterstop, type "A"	m	3,320	13.8	45,816	70.3	233,396	62,852	T4.1.18
/09	Form F1 for item/01 to /07	m2	9,340	11.2	104,608	230.7	2,154,738	261,888	T4.1.18
/10	Form F2 for item/01 to /07	m2	6,030	15.1	91,053	157.5	949,725	160,376	T4.1.18
/11	Form F4 for item/02 to /06	m2	17,050	12.6	214,830	367.0	6,257,350	671,571	T4.1.18
/12	Reinforcing bar	ton	930	816.0	758,880	4,419.9	4,110,507	1,058,917	T4.1.18
/13	Bituminous joint filler in contraction joints	m2	5,800	25.7	149,060	132.6	769,080	205,197	T4.1.18
/14	Shotcrete on cutting slope on abutment mountain	m2	15,700	25.4	398,780	78.2	1,227,740	488,396	T4.2.7
/15	P.V.C. pipe for weep hole, 75 mm dia.	m	90	9.2	828	18.8	1,692	952	T2.9.3
Subtotal of item D2					4,716,118		27,792,073	6,744,736	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D3 Drainage and Aeration									
/01	P.V.C. perforated drain pipe, 250 mm dia.	m	1,100	30.9	33,990	148.9	163,790	45,945	T2.9.3
/02	Steel drain pipe, 150 mm dia.	m	50	16.7	835	116.8	5,840	1,261	T2.9.3
/03	Steel drain pipe, 250 mm dia.	m	60	35.2	2,112	345.2	20,712	3,624	T2.9.3
/04	Geo-textile-made drain	m	2,710	32.2	87,262	134.6	364,766	113,887	T2.9.3
					124,199		555,108	164,717	
Subtotal of item D3									

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D4	Road Work								
/01	Asphalt pavement	m2	2,210	1.1	2,431	14.3	31,603	4,738	T5.2.5
/02	Base course	m3	330	18.7	6,171	145.6	48,048	9,678	T5.2.5
/03	Subbase course	m3	660	17.8	11,748	150.3	99,198	18,989	T5.2.5
Subtotal of item D4					20,350		178,849	33,405	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D5	Miscellaneous Metalwork								
/01	Embedded metalwork	kg	5	0.8	4	17.2	86	10	T9.6.2
/02	Steel trap	kg	5	0.8	4	36.2	181	17	T9.6.2
Subtotal of item D5									
									267
									27

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
D6	Steel Bridge								
/01	Fabrication, transportation and painting								
	- Steel girder	kg	24,100	2.7	65,070	1.0	24,100	66,829	T11.11.4
	- Painting (shop)	m2	510	34.8	17,748	0.0	0	17,748	T11.11.4
	- Painting (splice)	m2	20	2.0	40	61.8	1,236	130	T11.11.4
	- Painting (field)	m2	520	2.2	1,144	68.6	35,672	3,748	T11.11.4
	<u>Subtotal of item D6 /01</u>				84,002		61,008	88,455	
/02	Incidental facilities for bridge								
	- Bearing shoe, 50 ton (Fix)	ea	3	598.6	1,796	968.3	2,905	2,008	T11.11.4
	- Bearing shoe, 50 ton (Mov.)	ea	3	622.9	1,869	985.9	2,958	2,085	T11.11.4
	- Expansion joint	kg	3,100	1.1	3,410	19.5	60,450	7,822	T11.11.4
	- Drainage hole including pipe and catch basin	ea	6	4.9	29	55.9	335	53	T11.11.4
	- Joint filler	m2	31	19.1	592	75.3	2,334	762	T4.1.18
	<u>Subtotal of item D6 /02</u>				7,696		68,982	12,730	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/03	Concrete work for superstructure								
	- Concrete class-C for parapet wall and its base for guardrail	m3	21	60.4	1,268	250.0	5,250	1,651	T4.1.18
	- Concrete class-G for slab	m3	45	58.1	2,615	229.1	10,310	3,368	T4.1.18
	- Reinforcement bar	ton	11	816.0	8,976	4,419.9	48,619	12,525	T4.1.18
	- Form F1	m2	210	11.2	2,352	230.7	48,447	5,888	T4.1.18
	- Form F3	m2	130	18.2	2,366	189.0	24,570	4,159	T4.1.18
	<u>Subtotal of item D6 /03</u>				17,577		137,196	27,591	
/04	Surface treatment								
	- Surface treatment	m2	180	1.1	198	14.3	2,574	386	T5.2.5
	<u>Subtotal of item D6 /04</u>				198		2,574	386	
	<u>Subtotal of item D6</u>				109,473		269,760	129,162	
	<u>TOTAL OF ITEM D</u>				8,590,031		45,703,113	11,926,021	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
E INTAKE									
E1	Earthwork								
/01	Excavation, weathered rock, in open-cut	m3	290	3.5	1,015	15.7	4,553	1,347	T2.4.6
/02	Excavation, rock, in open-cut	m3	610	7.2	4,392	37.2	22,692	6,048	T2.4.6
/03	Anchor bar, 25 mm dia. for sliding	m	630	12.0	7,560	49.2	30,996	9,822	T2.10.5
/04	Chipping of existing concrete	m2	70	0.7	49	10.3	721	102	T2.11
Subtotal of item E1					13,016		58,962	17,319	

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
E2	Concrete Work								
/01	Concrete, class A, in blockout	m3	20	63.1	1,262	294.5	5,890	1,692	T4.1.18
/02	Concrete, class B, facing concrete	m3	220	57.4	12,628	279.4	61,468	17,115	T4.1.18
/03	Concrete, class C, intake structure	m3	3,190	64.2	204,798	262.6	837,694	265,944	T4.1.18
/04	Concrete, class D, inclined step	m3	80	51.0	4,080	226.7	18,136	5,404	T4.1.18
/05	Form, F1 for item /01 and /02	m2	160	11.2	1,792	230.7	36,912	4,486	T4.1.18
/06	Form, F2 for item /02 and /03	m2	3,710	15.1	56,021	157.5	584,325	98,672	T4.1.18
/07	Reinforcing bar	ton	160	816.0	130,560	4,419.9	707,184	182,179	T4.1.18
/08	Waterstop, type "A"	m	70	13.8	966	70.3	4,921	1,325	T4.1.18
/09	Joint filler	m2	340	25.7	8,738	132.6	45,084	12,029	T4.1.18
<u>Subtotal of item E2</u>					420,845		2,301,614	588,846	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
E3	Miscellaneous Metalwork								
/01	Embedded metal work	kg	920	0.8	736	17.2	15,824	1,891	T9.6.2
/02	200ø steel air vent pipe	m	150	23.3	3,495	201.8	30,270	5,704	T9.6.4
					4,231		46,094	7,595	
					438,092		2,406,670	613,761	

Subtotal of item E3

TOTAL OF ITEM E

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
F RIVER OUTLET WORKS									
F1	Earthwork								
/01	Excavation, underground in valve chamber access shaft	m3	420	50.2	21,084	256.1	107,562	28,935	T2.4.6
/02	Demolishing concrete lining of diversion tunnel	m3	10	37.5	375	712.6	7,126	895	T2.11
/03	Permanent steel support	ton	1	814.5	815	10,343.1	10,343	1,570	T2.5.6
	<u>Subtotal of item F1</u>				22,274		125,031	31,400	
F2	Grouting								
/01	Contact grouting between lining and plug concrete	L.S.	-		8,000		115,000	16,394	T3.12.7
/02	Backfill grouting	m3	3	57.7	173	400.1	1,200	261	T3.12.8
	<u>Subtotal of item F2</u>				8,173		116,200	16,655	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
F3	Concrete Work								
/01	Concrete, class C, for lining of access shaft and valve chamber	m3	260	60.3	15,678	350.5	91,130	22,330	T4.1.18
/02	Concrete, class D, for plug concrete around steel pipe	m3	3,400	54.5	185,300	480.6	1,634,040	304,573	T4.1.18
/03	Form, F1 for item /01 and /02	m2	900	11.2	10,080	266.5	239,850	27,587	T4.1.18
/04	Form, F2 for item /01 and /02	m2	190	15.1	2,869	229.2	43,548	6,048	T4.1.18
/05	Reinforcing bar	ton	27	816.0	22,032	6,346.4	171,353	34,540	T4.1.18
/06	Cooling system and cooling operation for plug concrete including 40 mm ϕ thermometer, 200 ϕ drain pipe and drilling ϕ 46mm x 250mm depth hole (6 pieces)	L.S.			25,000		171,000	37,482	T4.3.3
	<u>Subtotal of item F3</u>				260,959		2,350,921	432,560	
F4	Miscellaneous Metalwork								
/01	Embedded metal work	kg	790	0.8	632	25.4	20,066	2,097	T9.6.2
/02	Stairway and handrail	kg	9,740	0.8	7,792	36.2	352,588	33,528	T9.6.2
	<u>Subtotal of item F4</u>				8,424		372,654	35,625	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
F5	Miscellaneous Work								
/01	Steel door for valve chamber (1,000 x 1,800)	m2	1.8	119.9	216	786.0	1,415	319	T6.13.5
/02	Steel door for valve chamber (1,800 x 800)	m2	1.5	119.9	180	786.0	1,179	266	T6.13.5
/03	Drain holes with perforated P.V.C. pipes downstream of plug portion in the diversion tunnel								
	- Drilling (hole diameter; 60 mm)	m	510	13.9	7,089	130.2	66,402	11,936	T3.13.2
	- Perforated P.V.C. pipe (d=48mm length = 4m)	m	510	9.2	4,692	18.8	9,588	5,392	T2.9.3
	<u>Subtotal of item F5</u>				12,177		78,584	17,913	
	TOTAL OF ITEM F				312,007		3,043,390	534,153	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-Clause
				Unit Price	Amount	Unit Price	Amount		
G HYDRO-MECHANICAL WORKS									
G1	Intake Gates and Hoists								
/01	Gate leaves	L.S.		89,490		166,420	101,637		T7.14.4
/02	Guide frames	L.S.		97,200		165,240	109,261		T7.14.5
/03	Hoists and controls	L.S.		74,800		65,960	79,615		T7.14.6
/04	Spare parts	L.S.		7,850		11,930	8,721		T7.8
	<u>Subtotal of item G1</u>			269,340		409,550	299,234		
G2	Intake Trash Racks								
/01	Front trash racks	L.S.		19,440		29,700	21,608		T7.15.4
/02	Top trash racks	L.S.		8,640		13,200	9,604		T7.15.4
	<u>Subtotal of item G2</u>			28,080		42,900	31,212		
G3	Water Supply Facilities								
/01	Steel conduit	L.S.		333,000		508,750	370,135		T7.16.4
/02	Discharge valve	L.S.		108,000		164,340	119,996		T7.16.6
/03	Guard valve	L.S.		36,000		54,900	40,007		T7.16.7
/04	Spare parts	L.S.		14,310		21,840	15,904		T7.8
	<u>Subtotal of item G3</u>			491,310		749,830	546,042		

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
G4 Operation and Controls									
/01	Control cabins	L.S.			50,000		36,000	52,628	T7.17.2
/02	Oil pressure unit	L.S.			100,000		72,000	105,255	T7.17.3
/04	Spare parts	L.S.			4,500		3,240	4,736	T7.8
	<u>Subtotal of item G4</u>				154,500		111,240	162,619	
G5 Inlet Bulkhead Gate									
/01	Gate leaf	L.S.			8,550		15,900	9,711	T7.18.4
/02	Guide frames	L.S.			21,700		32,860	24,099	T7.18.5
/03	Spare parts	L.S.			910		1,460	1,017	T7.8
	<u>Subtotal of item G5</u>				31,160		50,220	34,827	
G6 River Outlet Trash Racks									
/01	Trash racks	L.S.			20,160		30,800	22,408	T7.19.4
	<u>Subtotal of item G6</u>				20,160		30,800	22,408	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
G7	River Outlet Facilities								
/01	Steel conduit	L.S.		88,200		134,750		98,036	T7.20.4
/02	Discharge valve	L.S.		499,800		747,600		554,369	T7.20.6
/03	Guard valve	L.S.		80,640		123,840		89,679	T7.20.7
/04	Spare parts	L.S.		20,060		30,190		22,264	T7.8
	<u>Subtotal of item G7</u>			688,700		1,036,380		764,348	
G8	Maintenance Equipment and Tools								
/01	Maintenance equipment and tools	L.S.		38,000		0		38,000	T7.9
	<u>Subtotal of item G8</u>			38,000		0		38,000	
G9	Instructions to Project Staff								
/01	Instructions to project staff	L.S.		38,000		0		38,000	T7.1.3
	<u>Subtotal of item G9</u>			38,000		0		38,000	
	TOTAL OF ITEM G			1,759,250		2,430,920		1,936,690	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H ELECTRICAL WORKS									
H1	Dam Control House								
(1)	Lighting and receptacles								
/01	Lighting fixture type A FL-40Wx2	set	5	100.0	500	140.0	700	551	T8.11
/02	- do - type A FL-40Wx1	set	3	60.0	180	80.0	240	198	T8.11
/03	- do - type A FL-40Wx1 WP	set	1	80.0	80	110.0	110	88	T8.11
/04	- do - type B FL-40Wx1	set	1	70.0	70	100.0	100	77	T8.11
/05	- do - type C FL-40W x2	set	5	120.0	600	160.0	800	658	T8.11
/06	- do - type C FL-40Wx1	set	2	90.0	180	120.0	240	198	T8.11
/07	- do - type D FL-40Wx2	set	12	160.0	1,920	220.0	2,640	2,113	T8.11
/08	- do - type E IL-20Wx1	set	1	380.0	380	520.0	520	418	T8.11
/09	- do - type E IL-40Wx1	set	6	420.0	2,520	580.0	3,480	2,774	T8.11
/10	Electric wire, PVC 600V, 2 sq.mm	m	3,000	1.0	3,000	1.0	3,000	3,219	T8.11
/11	- do - 3.5 sq.mm	m	1,000	1.0	1,000	1.0	1,000	1,073	T8.11
/12	Cable, 600V XLPE, 4c - 22 sq.mm	m	100	7.0	700	10.0	1,000	773	T8.11
/13	Cable, 600V XLPE, 4c - 38 sq.mm	m	100	9.0	900	10.0	1,000	973	T8.11
/14	Conduit, rigid galvanized steel ø16	m	500	7.0	3,500	10.0	5,000	3,865	T8.11
/15	Conduit, rigid galvanized steel ø22	m	200	10.0	2,000	20.0	4,000	2,292	T8.11
/16	Conduit, rigid galvanized steel ø36	m	100	15.0	1,500	20.0	2,000	1,646	T8.11
/17	Conduit, rigid galvanized steel ø54	m	100	25.0	2,500	30.0	3,000	2,719	T8.11

Item No.	Work	Unit	Quantity		Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
			Unit Price	Amount	Unit Price	Amount				
/18	Tumbler switch, 1P, 15A 300V, simplex	set	15	6.0	90	10.0	150	101	T8.11	
/19	- do - , duplex	set	2	10.0	20	20.0	40	23	T8.11	
/20	Receptacle, ø1.2P, 15A 250V, simplex	set	3	10.0	30	10.0	30	32	T8.11	
/21	Receptacle, ø1.2P, 15A 250V, duplex	set	13	10.0	130	20.0	260	149	T8.11	
/22	Receptacle, ø3.4P, 20A 600V, simplex	set	3	20.0	60	30.0	90	67	T8.11	
/23	Outlet box, 100x100x50mm	set	36	5.0	180	10.0	360	206	T8.11	
/24	Pull box, 100mm x100mm x100 mm	set	10	10.0	100	10.0	100	107	T8.11	
/25	Pull box, 150mm x150mm x100 mm	set	5	14.0	70	20.0	100	77	T8.11	
/26	Pull box, 200mm x200mm x100 mm	set	2	20.0	40	30.0	60	44	T8.11	
/27	Panelboard for lighting and receptacles, type L-A	set	1	6,000.0	6,000	8,200.0	8,200	6,599	T8.11	
/28	Panelboard for lighting and receptacles, type L-B	set	1	5,000.0	5,000	6,900.0	6,900	5,504	T8.11	
/29	Telephone cable, indoor use	m	100	1.0	100	2.0	200	115	T8.11	
/30	Miscellaneous materials	L.S.			3,430		4,200	3,737	T8.11	
Subtotal of item HI					36,780		49,520	40,396		

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H2	Inspection Gallery								
(1)	Electrical installation								
/01	Cable, XLPE 600V, 2c-8 sq.mm	m	500	2.0	1,000	3.0	1,500	1,109	T8.11
/02	Cable, XLPE 600V, 2c-14 sq.mm	m	1,200	3.0	3,600	4.0	4,800	3,950	T8.11
/03	Conduit, exposed, ø28mm	m	1,700	12.0	20,400	16.0	27,200	22,385	T8.11
/04	Lighting fixture FL-40Wx1 water proof type	set	80	80.0	6,400	110.0	8,800	7,042	T8.11
/05	Distribution panel including MCCBs	set	1	2,880.0	2,880	3,950.0	3,950	3,168	T8.11
/06	Receptacle, ø1,2P, 15A 250V, duplex	set	5	6.0	30	8.0	40	33	T8.11
/07	Outlet box, exposed	set	10	5.0	50	8.0	80	56	T8.11
/08	Miscellaneous materials	L.S.			3,640		4,630	3,978	T8.11
	Subtotal of item H2				38,000		51,000	41,721	

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H3	Gate Control House								
(1)	Lighting and receptacles								
/01	Lighting fixture type A FL-40Wx2	set	2	100.0	200	140.0	280	220	T8.11
/02	- do - type A FL-40Wx1	set	0	0.0	0	0.0	0	0	T8.11
/03	- do - type A FL-40Wx1 WP	set	0	0.0	0	0.0	0	0	T8.11
/04	- do - type B FL-40Wx1	set	0	0.0	0	0.0	0	0	T8.11
/05	- do - type C FL-40Wx2	set	0	0.0	0	0.0	0	0	T8.11
/06	- do - type C FL-40Wx1	set	0	0.0	0	0.0	0	0	T8.11
/07	- do - type D FL-40Wx2	set	0	0.0	0	0.0	0	0	T8.11
/08	- do - type E IL-20Wx1	set	0	0.0	0	0.0	0	0	T8.11
/09	- do - type E IL-40Wx1	set	0	0.0	0	0.0	0	0	T8.11
/10	Electric wire, PVC 600V, 2 sq.mm	m	200	1.0	200	1.0	200	215	T8.11
/11	- do - 3.5 sq.mm	m	50	1.0	50	1.0	50	54	T8.11
/12	Cable, 600V XLPE, 4c - 22 sq.mm	m	200	7.0	1,400	10.0	2,000	1,546	T8.11
/13	Cable, 600V XLPE, 4c - 38 sq.mm	m	0	0.0	0	0.0	0	0	T8.11
/14	Conduit, rigid galvanized steel ø16	m	50	7.0	350	10.0	500	386	T8.11
/15	Conduit, rigid galvanized steel ø22	m	20	10.0	200	15.0	300	222	T8.11
/16	Conduit, rigid galvanized steel ø36	m	200	15.0	3,000	20.0	4,000	3,292	T8.11
/17	Conduit, rigid galvanized steel ø54	m	0	0.0	0	0.0	0	0	T8.11

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/18	Tumbler switch, 1P, 15A 300V, simplex	set	1	10.0	10	10.0	10	11	T8.11
/19	- do - , duplex	set	0	0.0	0	0.0	0	0	T8.11
/20	Receptacle, ø1,2P,15A 250V, simplex	set	0	0.0	0	0.0	0	0	T8.11
/21	Receptacle, ø1,2P,15A 250V, duplex	set	2	10.0	20	15.0	30	22	T8.11
/22	Receptacle, ø3,4P,20A 600V, simplex	set	0	0.0	0	0.0	0	0	T8.11
/23	Outlet box, 100x100x50mm	set	3	10.0	30	10.0	30	32	T8.11
/24	Pull box, 100mm x100mm x100 mm	set	2	10.0	20	10.0	20	21	T8.11
/25	Pull box, 150mm x150mm x100 mm	set	0	0.0	0	0.0	0	0	T8.11
/26	Pull box, 200mm x200mm x100 mm	set	0	0.0	0	0.0	0	0	T8.11
/27	Panelboard for lighting and receptacles, type L-A	set	1	1,150.0	1,150	1,600.0	1,600	1,267	T8.11
/28	Panelboard for lighting and receptacles, type L-B	set	0	0.0	0	0.0	0	0	T8.11
/29	Telephone cable, indoor use	m	50	1.0	50	2.0	100	57	T8.11
/30	Miscellaneous materials	L.S.			620		880	684	T8.11
Subtotal of item H3					7,300		10,000	8,029	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H4	Valve Chamber including Access Shaft								
(1)	Power supply lighting and receptacle outlet facilities								
/01	Panel type, A	set	1	1,150.0	1,150	1,600.0	1,600	1,267	T8.11
/02	Lighting fixture, water proofed type, FL-40W x 1	set	10	80.0	800	110.0	1,100	880	T8.11
/03	Lighting fixture, water proofed type, FL-20W x 1	set	10	60.0	600	80.0	800	658	T8.11
/04	Wire, PVC 600V, 2 sq.mm	m	150	1.0	150	1.0	150	161	T8.11
/05	Wire, PVC 600V, 3.5 sq.mm	m	150	1.0	150	1.0	150	161	T8.11
/06	Cable, 600V XLPE, 2c-14 sq.mm	m	50	4.0	200	4.0	200	215	T8.11
/07	Conduit rigid galvanized steel, ø 16 mm	m	50	7.0	350	10.0	500	386	T8.11
/08	Conduit rigid galvanized steel, ø 28 mm	m	50	12.0	600	16.0	800	658	T8.11
/09	Pull box, galvanized metal sheet, 150 mm x 150 mm x 100 mm	set	10	13.0	130	20.0	200	145	T8.11
/10	Tumbler switch w/ plate, 1P-15A-300V x 1	set	2	5.0	10	10.0	20	11	T8.11

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/11	Grounding clamp, ø 16	set	20	1.0	20	1.0	20	21	T8.11
/12	Grounding clamp, ø 28	set	20	1.0	20	1.0	20	21	T8.11
/13	Miscellaneous materials	L.S.			420		440	452	T8.11
Subtotal of item H4					4,600		6,000	5,036	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H5	Grouting Tunnel								
(1)	Lighting and receptacle outlet facilities								
/01	Distribution panel type B including MCCB	set	1	1,150.0	1,150	1,600.0	1,600	1,267	T8.11
/02	Lighting fixture, FL-40W x 1, water-proofed type	set	20	80.0	1,600	110.0	2,200	1,761	T8.11
/03	Cable, 600V XLPE, 2c-22 sq.mm	m	500	6.0	3,000	8.0	4,000	3,292	T8.11
/04	Conduit, rigid galvanized steel, exposed, ϕ 36 mm	m	500	15.0	7,500	20.0	10,000	8,230	T8.11
/05	Pull box, galvanized metal sheet, 150 mm x 150 mm x 100 mm	no.	10	13.0	130	20.0	200	145	T8.11
/06	Miscellaneous materials	L.S.			1,320		2,000	1,466	T8.11
Subtotal of item H5					14,700		20,000	16,161	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H6	Outdoor Lighting (dam, spillway, access road including surrounding of gate control house)								
/01	Lighting fixture, NH-220W x 1 waterproof type with steel pole	set	20	2,000.0	40,000	2,740.0	54,800	44,000	T8.11
/02	Lighting fixture, FL-20W x 1 waterproof type	set	23	310.0	7,130	430.0	9,890	7,852	T8.11
/03	Cable, 600V XLPE, 2c-22 sq.mm	m	600	6.0	3,600	10.0	6,000	4,038	T8.11
/04	Cable, 600V XLPE, 2c-14 sq.mm	m	60	3.0	180	5.0	300	202	T8.11
/05	Wire, 600V OW, 14 sq.mm	m	1,200	1.0	1,200	1.0	1,200	1,288	T8.11
/06	Conduit, rigid galvanized steel, ø 28 mm	m	200	13.0	2,600	20.0	4,000	2,892	T8.11
/07	Conduit, rigid galvanized steel, ø 36 mm	m	200	15.0	3,000	20.0	4,000	3,292	T8.11
/08	Steel tubler pole, 7.8 m height	no.	25	1,200.0	30,000	1,640.0	41,000	32,993	T8.11
/09	Handhole, 900 mm x 900 mm x 1, 300 mm	set	2	20.0	40	30.0	60	44	T8.11
/10	Distribution panel A including MCCB, MGS & photo switch	set	1	2,300.0	2,300	3,200.0	3,200	2,534	T8.11
/11	Lighting pole foundation for dam crest	L.S.			200		270	220	T8.11
/12	Lighting pole foundation for access road	L.S.			230		320	253	T8.11

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/13	Pull box, galvanized metal sheet 150 mm x 150 mm x 100 mm	no.	50	13.0	650	20.0	1,000	723	T8.11
/14	Miscellaneous materials	L.S.			8,870		11,960	9,743	T8.11
Subtotal of item H6					100,000		138,000	110,074	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H7	Grounding System (intake, dam and spillway)								
/01	Grounding conductor, 100 mm ²	m	500	6.0	3,000	8.0	4,000	3,292	T8.11
/02	Grounding conductor, 38 mm ²	m	100	2.0	200	3.0	300	222	T8.11
/03	Grounding rod, ø 25 mm x 2 m	no.	200	30.0	6,000	40.0	8,000	6,584	T8.11
/04	Compression type connector	no.	1,000	4.0	4,000	5.0	5,000	4,365	T8.11
/05	Grounding plate, 1m x 1m	no.	2	250.0	500	350.0	700	551	T8.11
/06	Miscellaneous materials	L.S.	-	-	700	-	1,000	773	T8.11
<u>Subtotal of item H7</u>					14,400		19,000	15,787	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H8	Power Receiving and Distribution System								
(1)	20 kV distribution line materials								
/01	Conductor, ACSR, 58 mm2, including midspan joint for each drum	km	1	990.0	990	1,400.0	1,400	1,092	T8.11
/02	Connector, ACSR, 95 mm2 - 58 mm2	no.	6	15.0	90	20.0	120	99	T8.11
/03	Ditto, 58 mm2 - 58 mm2	no.	12	10.0	120	10.0	120	129	T8.11
/04	22 kV line post insulator, complete with fittings	no.	30	92.0	2,760	130.0	3,900	3,045	T8.11
/05	22 kV tension insulator string, complete with fittings	set	12	40.0	480	60.0	720	533	T8.11
/06	Low-voltage spool type insulator, complete with fittings	no.	12	5.0	60	5.0	60	64	T8.11
/07	Cross arms, with complete set of fittings for 20 kV, Type-A pole use	set	3	990.0	2,970	1,350.0	4,050	3,266	T8.11
/08	Ditto, Type-B pole	set	1	1,040.0	1,040	1,400.0	1,400	1,142	T8.11
/09	Ditto, Type-C pole	set	1	1,040.0	1,040	1,430.0	1,430	1,144	T8.11
/10	Ditto, Type-D pole	set	1	1,040.0	1,040	1,430.0	1,430	1,144	T8.11

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/11	Cross arms, with complete set of fittings for 22 kV, Type-H poles	set	1	1,090.0	1,090	1,500.0	1,500	1,199	T8.11
/12	Ditto, for low-voltage, Type-A pole	set	1	680.0	680	1,000.0	1,000	753	T8.11
/13	Ditto, Type-C pole	set	1	680.0	680	1,000.0	1,000	753	T8.11
/14	Ditto, Type-D pole	set	1	680.0	680	1,000.0	1,000	753	T8.11
/15	Stay guy assembly, complete with anchor	set	12	150.0	1,800	200.0	2,400	1,975	T8.11
/16	Grounding rod with lead wire	set	10	38.0	380	60.0	600	424	T8.11
/17	22 kV power cable, XLPE, 3c (triplex), 60 sq.mm(Al)	m	300	140.0	42,000	200.0	60,000	46,380	T8.11
/18	22 kV cable head and accessories	L.S.			1,500		2,100	1,653	T8.11
/19	Miscellaneous materials	L.S.			2,900		3,770	3,175	T8.11
	Subtotal of item H8/(1)				62,300		88,000	68,723	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
(2)	Power receiving station facilities								
/01	22 kV incoming cubicles and accessories for dam control house	set	1	24,000.0	24,000	32,880.0	32,880	26,400	T8.11
/02	22 kV transformer (75 kVA) cubicle including switchgear and accessories for dam control house	set	1	40,000.0	40,000	54,800.0	54,800	44,000	T8.11
/03	22 kV lightning arresters with accessories	set	3	390.0	1,170	530.0	1,590	1,286	T8.11
/04	Cables, wires, grounding materials and other materials to complete cubicle type receiving station	L.S.			3,260		4,470	3,586	T8.11
/05	Transformer, three-phase, 50 kVA, 22 kV/400-230V with accessories for gate control house	no.	1	5,000.0	5,000	6,850.0	6,850	5,500	T8.11
/06	22 kV outdoor switchgear including complete with fittings	L.S.			7,500		10,300	8,252	T8.11
/07	Low-voltage switchgear including complete with fittings	L.S.			500		700	551	T8.11

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/08	Cables, wires, grounding materials and other materials to complete pole assembly type receiving station	L.S.			770		1,410	873	T8.11
	<u>Subtotal of item H8/(2)</u>				82,200		113,000	90,448	
	<u>Subtotal of item H8</u>				144,500		201,000	159,171	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H9	Emergency Power Supply System								
/01	Diesel engine generator set, 75 kVA (60 kW) 3ø 400/230V, 1,500 rpm with accessories	set	1	100,000.0	100,000	137,000.0	137,000	110,000	T8.11
/02	DC power panel including battery and charger and accessories	set	1	20,000.0	20,000	27,400.0	27,400	22,000	T8.11
/03	Automatic starting panel including transfer switch and accessories	set	1	12,000.0	12,000	16,500.0	16,500	13,204	T8.11
/04	Cable, 600V XLPE, 1c-100 sq.mm	m	60	10.0	600	10.0	600	644	T8.11
/05	Cable, 600V XLPE, 1c-50 sq.mm	m	20	5.0	100	10.0	200	115	T8.11
/06	Cable, 600V XLPE, 3c-38 sq.mm	m	200	10.0	2,000	15.0	3,000	2,219	T8.11
/07	Cable, 600V XLPE, 1c-14 sq.mm	m	200	2.0	400	2.0	400	429	T8.11
/08	Cable, 600V XLPE, 3c-22 sq.mm	m	50	8.0	400	10.0	500	436	T8.11
/09	Conduit rigid galvanized steel, ø36mm	m	50	16.0	800	20.0	1,000	873	T8.11
/10	Conduit rigid galvanized steel, ø70mm	m	200	36.0	7,200	50.0	10,000	7,930	T8.11

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/11	Pull box, galvanized metal sheet, 300 mm x 300 mm x 250 mm	set	10	37.0	370	50.0	500	406	T8.11
/12	Grounding clamp, 70ø	set	80	3.0	240	5.0	400	269	T8.11
/13	Grounding clamp, 36ø	set	50	2.0	100	3.0	150	111	T8.11
/14	Spare parts	L.S.			2,800		3,550	3,059	T8.11
/15	Miscellaneous materials	L.S.			6,990		9,800	7,705	T8.11
	<u>Subtotal of item H9</u>				154,000		211,000	169,400	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause	
				Unit Price	Amount	Unit Price	Amount			
H10 Dam Leakage Water Drainage System										
/01	Submersible type drainage pumps	set	4	3,850.0	15,400	5,300.0	21,200	16,947	T8.11	
/02	Pump discharge pipework and valves with support	m	310	40.0	12,400	60.0	18,600	13,758	T8.11	
/03	Pump handling equipment	set	1	800.0	800	1,100.0	1,100	880	T8.11	
/04	Submersible mixer	set	1	2,700.0	2,700	3,800.0	3,800	2,977	T8.11	
/05	Control panel	set	1	20,000.0	20,000	27,500.0	27,500	22,007	T8.11	
/06	Power and control cables	m	500	18.0	9,000	26.0	13,000	9,949	T8.11	
<u>Subtotal of item H10</u>								85,200	66,518	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
H11	Inspection Shaft Entrance House								
1	Indoor lighting								
/01	Lighting panel (A)	set	1	1,040.0	1,040	6,820.0	6,820	1,538	T8.11
/02	Lighting fixture including lamp ballast and fitting FL-40W x 1 (B401WP) waterproof type	set	4	93.0	372	610.0	2,440	550	T8.11
/03	Tumbler switch with outlet box IP-15A-300V x 1 (3 way) water proof type	set	2	19.0	38	1,240.0	2,480	219	T.8.11
/04	Electric conduit including couplings, bushings, junction boxes and accessories 16 mm dia.	m	8	6.0	48	40.0	320	71	T.8.11
/05	- do - 22 mm dia.	m	17	8.0	136	55.0	935	204	T8.11
/06	Electric wire, P.V.C. insulated, 600 V with terminals, 2.0 mm	m	72	1.0	72	6.0	432	104	T8.11
	Subtotal of item H11				1,706		13,427	2,686	
	TOTAL OF ITEM H				576,286		804,147	634,979	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
I BUILDING WORKS									
II Dam Control House									
/01 Building works									
1) Earthwork									
	- Excavation	m3	63	8.6	542	44.6	2,810	747	T6.2
	- Backfill	m3	40	3.1	124	22.2	888	189	T6.2
	- Disposal	m3	23	3.1	71	22.2	511	108	T6.2
	- Gravel bedding	m3	23	14.5	334	202.0	4,646	673	T6.2
2) Concrete work									
	- Concrete, Class A for structure	m3	113	75.7	8,554	353.4	39,934	11,469	T6.3
	- Concrete, Class F	m3	3	54.0	162	258.2	775	219	T6.3
	- Form F1	m2	601	13.4	8,053	276.8	166,357	20,196	T6.3
	- Form F3	m2	158	18.1	2,860	189.0	29,862	5,040	T6.3
	- Reinforcing bar	kg	14,800	0.8	11,840	5.3	78,440	17,566	T6.3
3) Masonry work									
	- Concrete block wall, 100 mm thick including filling cement mortar and with wire lath	m2	167	31.2	5,210	204.3	34,118	7,700	T6.4.2
	- Concrete block wall, 200 mm thick including filling cement mortar and with wire lath	m2	172	54.2	9,322	355.3	61,112	13,783	T6.4.2

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
4) Bituminous waterproofing work									
	- 3 ply built-up asphalt roofing	m2	194	17.3	3,356	113.2	21,961	4,959	T6.5.5
	- 2 ply built-up asphalt roofing	m2	24	15.8	379	104.0	2,496	561	T6.5.5
5) Terrazzo work									
	- Terrazzo block on floor including base cement mortar	m2	123	129.4	15,916	849.2	104,452	23,540	T6.6.3
	- Terrazzo block door sill, W=100mm including base cement mortar	m	1	86.3	86	566.1	566	127	T6.6.3
	- Terrazzo block shelf, W=150mm including base cement mortar	m	2	71.1	142	471.2	942	211	T6.6.3
6) Tile work									
	- Porcelain tile to interior floor including base cement mortar	m2	11	51.1	562	355.0	3,905	847	T6.7.3
	- Ceramic tile to interior wall including base cement mortar	m2	48	54.7	2,626	358.0	17,184	3,880	T6.7.3
	- Porcelain tile to exterior wall including base cement mortar	m2	159	67.1	10,669	440.1	69,976	15,777	T6.7.3
7) Plastering work									
	- Cement mortar plaster on floor	m2	94	8.6	808	56.6	5,320	1,196	T6.8.5
	- Base cement mortar plaster 20mm thick for bituminous waterproofing	m2	194	6.7	1,300	44.4	8,614	1,929	T6.8.5
	- Cement mortar plaster to interior skirting, H=100mm	m	138	7.7	1,063	50.5	6,969	1,572	T6.8.5
	- Cement mortar plaster to interior wall	m2	516	17.7	9,133	116.3	60,011	13,513	T6.8.5

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
	- Cement mortar plaster to exterior wall	m2	372	18.7	6,956	122.4	45,533	10,280	T6.8.5
	- Waterproof cement mortar plaster to roof gutter	m2	16	28.8	461	188.2	3,011	681	T6.8.5
	- Concrete trowel finish	m2	33	2.9	96	18.9	624	142	T6.8.5
8)	Painting work								
	- Oil paint to metal surface	m2	50	7.2	360	47.4	2,370	533	T6.9.3
	- Oil paint to wooden surface	m2	39	8.1	316	53.6	2,090	469	T6.9.3
	- Vinyl emulsion paint on cement mortar	m2	953	6.2	5,909	41.3	39,359	8,782	T6.9.3
	- Vinyl emulsion paint on asbestos cement sheet surface	m2	75	6.7	503	44.4	3,330	746	T6.9.3
9)	Carpentry and joinery work								
	- Wooden blind box, W200mm x H150mm x T25mm including required accessories	m	10	36.9	369	241.7	2,417	545	T6.10.2
10)	Finishing work								
	- Rockwool tile including suspension system and accessories	m2	111	25.9	2,875	170.0	18,870	4,252	T6.11.3
	- Asbestos cement sheet including suspension system and accessories	m2	75	24.9	1,868	163.7	12,278	2,764	T6.11.3
	- Vinyl floor tile including base cement mortar	m2	54	19.4	1,048	127.3	6,874	1,550	T6.11.3
	- Vinyl strip base, H=100mm including base cement mortar	m2	28	2.3	64	14.8	414	94	T6.11.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
11)	Doors and window								
	- Wooden door leaves and frames including louvers, hardware and accessories	m2	15	134.3	2,015	879.8	13,197	2,978	T6.12.2
	- Steel door leaves and frames including hardware, accessories and calking to outside perimeter	m2	16	119.9	1,918	786.0	12,576	2,836	T6.13.5
	- Aluminium doors and frames including hardware, accessories and calking to outside perimeter	m2	4	383.5	1,534	2,515.3	10,061	2,268	T6.14.3
	- Aluminium windows and frames including hardware, accessories and calking to outside perimeter	m2	35	287.7	10,070	1,886.5	66,028	14,890	T6.14.3
	- Jalousie windows and frames including hardware, accessories and calking to outside perimeter	m2	12	287.7	3,452	1,886.5	22,638	5,104	T6.14.3
	- Steel window and frames including hardware, accessories	m2	5	230.2	1,151	1,509.2	7,546	1,702	T6.13.5
12)	Glazing work								
	- Plate glass 3mm thick including glazing bead	m2	41	16.9	693	109.4	4,485	1,020	T6.15.3
	- Plate glass 5mm thick including glazing bead	m2	5	28.8	144	188.2	941	213	T6.15.3
	- Plate wire glass 6.8mm thick including glazing bead	m2	9	39.0	351	255.9	2,303	519	T6.15.3
	- Figured glass 4mm thick including glazing bead	m2	4	19.2	77	125.5	502	114	T6.15.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
13)	Miscellaneous metal work								
	- Roof drain, cast iron made, 100mm dia.	no	8	36.0	288	235.6	1,885	426	T6.16.3
	- Steel pipe handrail, 50mm dia. including balusters	m	8	57.5	460	377.9	3,023	681	T6.16.3
	- Stainless steel nosing w/non-slip rubber	m	14	13.4	188	88.7	1,242	279	T6.16.3
	- Metal coping	m	59	36.0	2,124	235.8	13,912	3,139	T6.16.3
14)	Miscellaneous work								
	- PVC downspout, 100mm dia. including accessories	m	30	18.2	546	119.3	3,579	807	T6.17.3
	- Kitchen sink unit in kitchen	no	1	287.7	288	1,886.5	1,887	426	T6.17.3
	- Cupboard unit in kitchen	no	1	95.9	96	628.8	629	142	T6.17.3
	- Vinyl curtain for lavatory including accessories	no	1	33.5	34	220.3	220	50	T6.17.3
	- Wood bench	no	1	23.9	24	157.6	158	36	T6.17.3
Subtotal of item /01					139,390		1,025,831	214,270	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
/02	Building service works								
1)	Plumbing works								
i)	Water supply								
	- Galvanized steel pipe ø50	m	700	28.2	19,740	185.2	129,640	29,203	T6.21.2
	- Galvanized steel pipe ø25	m	13	15.7	204	102.8	1,336	302	T6.21.2
	- Galvanized steel pipe ø20	m	52	12.3	640	80.8	4,202	947	T6.21.2
	- Gate valve ø50	ea	1	58.4	58	382.9	383	86	T6.21.2
	- Gate valve ø25	ea	1	22.7	23	148.7	149	34	T6.21.2
	- Gate valve ø20	ea	1	17.7	18	116.0	116	26	T6.21.2
	- Valve casing	ea	2	86.3	173	565.9	1,132	256	T6.21.2
	- Insulation for pipe ø25	m	8	11.5	92	75.5	604	136	T6.21.2
	- Insulation for pipe ø20	m	26	11.0	286	72.3	1,880	423	T6.21.2
	- Anticorrosive tape for pipe ø50	m	700	12.5	8,750	81.7	57,190	12,924	T6.21.2
	- Anticorrosive tape for pipe ø25	m	5	8.2	41	53.4	267	60	T6.21.2
	- Anticorrosive tape for pipe ø20	m	28	7.4	207	48.7	1,364	307	T6.21.2
	- Painting to exposed pipe ø25	m	8	5.0	40	33.0	264	59	T6.21.2
	- Painting to exposed pipe ø20	m	26	4.7	122	30.5	793	180	T6.21.2
ii)	Drainage and sewerage								
	- P.V.C. pipe ø100	m	31	33.7	1,045	220.7	6,842	1,544	T6.21.2
	- P.V.C. pipe ø75	m	25	25.1	628	164.7	4,118	929	T6.21.2
	- P.V.C. pipe ø65	m	23	20.2	465	132.4	3,045	687	T6.21.2
	- P.V.C. pipe ø50	m	18	15.7	283	102.8	1,850	418	T6.21.2
	- P.V.C. pipe ø40	m	4	12.1	48	79.2	317	71	T6.21.2
	- P.V.C. pipe ø20	m	3	7.0	21	46.2	139	31	T6.21.2
	- Floor drain ø50	ea	2	60.7	121	398.3	797	179	T6.21.2
	- Pipe cleanout ø100	ea	1	65.7	66	430.7	431	97	T6.21.2
	- Pipe cleanout ø80	ea	1	61.4	61	402.4	402	90	T6.21.2

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
	- Pipe cleanout ø65	ea	1	47.2	47	309.4	309	70	T6.21.2
	- Vent cap. ø50	ea	1	35.5	36	232.6	233	53	T6.21.2
	- Catch basin 450 x 450 w/concrete cover	set	4	239.7	959	1,571.9	6,288	1,418	T6.21.2
	- Cesspool 450 x 450 w/iron cover	set	2	335.6	671	2,200.7	4,401	992	T6.21.2
iii) Plumbing fixture									
	- Water closet w/cistern tank	set	1	551.8	552	3,618.6	3,619	816	T6.21.2
	- Urinal, wall hung w/flush valve	set	1	421.4	421	2,763.4	2,763	623	T6.21.2
	- Lavatory sink, wall hung w/faucet, stop valve and mirror	set	1	238.8	239	1,565.6	1,566	353	T6.21.2
	- Service sink, floor mounted w/faucet	set	1	451.6	452	2,961.5	2,962	668	T6.21.2
	- shower set w/wall mounted head and stop valve	set	1	92.8	93	608.3	608	137	T6.21.2
	- Swing faucet	ea	1	23.5	24	154.0	154	35	T6.21.2
iv) Septic tank									
	- Factory fabricated septic tank, complete, capacity 16 persons w/blower	set	1	1,917.8	1,918	12,575.3	12,575	2,836	T6.21.2
	- Submerged drain pump 50 l/min., w/controls	set	2	316.4	633	2,074.9	4,150	936	T6.21.2
	- Drain pump pit	ea	1	719.2	719	4,715.8	4,716	1,063	T6.21.2

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
2)	Airconditioning and ventilation systems								
	- Airconditioner, cassette type room unit, 5,690 kcal/hour x 1,080 m ³ /hour w/condensing unit	set	2	2,728.1	5,456	17,888.4	35,777	8,067	T6.21.2
	- Airconditioner, cassette type room unit, 4,460 kcal/hour x 960 m ³ /hour w/condensing unit	set	1	2,483.6	2,484	16,285.0	16,285	3,673	T6.21.2
	- Airconditioner, cassette type room unit, 3,040 kcal/hour x 900 m ³ /hour w/condensing unit	set	1	2,080.8	2,081	13,644.2	13,644	3,077	T6.21.2
	- Exhaust propeller fan, ø250 wall mounted, 900 m ³ /h	set	2	214.3	429	1,405.3	2,811	634	T6.21.2
	- Refrigerant copper tube, ø15.9	m	35	38.4	1,344	251.5	8,803	1,987	T6.21.2
	- Refrigerant copper tube, ø12.7	m	12	29.2	350	191.8	2,302	518	T6.21.2
	- Refrigerant copper tube, ø6.4	m	47	18.7	879	122.6	5,762	1,300	T6.21.2
	- Condensed water pipe, P.V.C. ø40	m	14	12.1	169	79.2	1,109	250	T6.21.2
	- Condensed water pipe, P.V.C. ø25	m	20	9.6	192	62.9	1,258	284	T6.21.2
	Subtotal of item /02				53,280		349,356	78,779	
	Total of item II				192,670		1,375,187	293,049	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
I2	Gate Control House								
/01	Building works								
1)	Earthwork								
	- Excavation	m3	31	8.6	267	44.6	1,383	368	T6.2
	- Backfill	m3	21	3.1	65	22.2	466	99	T6.2
	- Disposal	m3	10	3.1	31	22.2	222	47	T6.2
	- Gravel bedding	m3	10	14.5	145	202.0	2,020	292	T6.2
2)	Concrete work								
	- Concrete Class A for structure	m3	71	75.7	5,375	353.4	25,091	7,206	T6.3
	- Concrete Class F	m3	1	54.0	54	258.2	258	73	T6.3
	- Form F1	m2	212	13.4	2,841	276.8	58,682	7,124	T6.3
	- Form F3	m2	371	18.1	6,715	189.0	70,119	11,833	T6.3
	- Reinforcing bar	kg	8,520	0.8	6,816	5.3	45,156	10,112	T6.3
3)	Bituminous waterproofing work								
	- 3 ply built-up asphalt roofing	m2	105	17.3	1,817	113.0	11,865	2,683	T6.5.5
4)	Plastering work								
	- Cement mortar plaster on floor	m2	109	8.6	937	56.6	6,169	1,387	T6.8.5
	- Base cement mortar plaster 20mm thick for bituminous waterproofing	m2	105	6.7	704	44.4	4,662	1,044	T6.8.5
	- Cement mortar plaster to interior wall	m2	196	17.7	3,469	116.3	22,795	5,133	T6.8.5

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
5)	Painting work								
	- Oil paint to metal surface	m2	10	7.2	72	47.4	474	107	T6.9.3
	- Vinyl emulsion paint on cement mortar	m2	563	6.2	3,491	41.3	23,252	5,188	T6.9.3
6)	Doors and windows								
	- Aluminium windows and frames including hardware, accessories and calking to outside perimeter	m2	9	287.7	2,589	1,886.5	16,979	3,828	T6.14.3
	- Steel windows and frames including hardware, accessories and calking to outside perimeter	m2	2	230.2	460	1,509.2	3,018	680	T6.13.5
7)	Glazing work								
	- Plate glass 3mm thick including glazing bead	m2	10	16.9	169	109.4	1,094	249	T6.15.3
8)	Miscellaneous metal work								
	- Roof drain, cast iron made, 100mm dia.	no	2	36.0	72	235.6	471	106	T6.16.3
	- Metal coping	m	43	36.0	1,548	235.6	10,131	2,287	T6.16.3
	- Suspension hook ø16	no	3	28.8	86	188.2	565	127	T6.16.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
9)	Miscellaneous work - P.V.C. downspout, 100mm dia. including accessories	m	11	18.2	200	119.3	1,312	296	T6.17.3
Subtotal of item /01					37,923		306,184	60,269	
Total of item I2					37,923		306,184	60,269	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
I3	Inspection Shaft Entrance House								
/01	Building work								
1)	Concrete work								
	- Concrete, Class A for structure	m3	7	75.7	530	353.4	2,474	711	T6.3
	- Form F1	m2	47	13.4	630	276.8	13,010	1,580	T6.3
	- Form F3	m2	20	21.8	436	226.8	4,536	767	T6.3
	- Reinforcing bar	kg	950	0.8	760	5.3	5,035	1,128	T6.3
2)	Masonry work								
	- Concrete block wall, 200 mm thick including filling cement mortar and with wire lath	m2	35	54.2	1,897	355.3	12,436	2,805	T6.4.2
3)	Plastering work								
	- Cement mortar plaster to interior wall	m2	43	17.7	761	116.3	5,001	1,126	T6.8.5
	- Waterproof cement plaster on roof	m2	24	28.8	691	188.2	4,517	1,021	T6.8.5
	- Cement mortar plaster to exterior wall	m2	63	18.7	1,178	122.4	7,711	1,741	T6.8.5
	- Waterproof cement plaster to roof parapet	m2	10	28.8	288	188.2	1,882	425	T6.8.5
4)	Painting work								
	- Oil paint to metal surface	m2	274	7.2	1,973	47.4	12,988	2,921	T6.9.3
	- Vinyl emulsion paint on cement mortar	m2	63	6.2	391	41.3	2,602	581	T6.9.3

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
5)	Doors and windows								
	- Steel door leaves and frames including hardware, accessories and calking to outside perimeter	m2	4	119.9	480	786.0	3,144	709	T6.13.5
	- Jalousie windows and frames including hardware, accessories and calking to outside perimeter	m2	3	287.7	863	1,886.5	5,660	1,276	T6.13.5
6)	Glazing work								
	- Plate wire glass 6.8 mm thick including glazing bead	m2	3	39.0	117	255.9	768	173	T6.13.5
7)	Miscellaneous metal work								
	- Steel ladder including steel checkered plate 6 mm thick, base plate, anchor bolt, base mortar and accessories	kg	4,900	1.5	7,350	9.2	45,080	10,641	T6.16.3
8)	Miscellaneous work								
	- Steel pipe handrail, 40 mm dia. including balusters	m	28	46.0	1,288	303.0	8,484	1,907	T6.17.3
	- Suspension hook ø16	no	1	28.8	29	188.2	188	43	T6.17.3
	- P.V.C. downspout, 75 mm dia., L=250 mm	no	2	2.4	5	14.3	29	7	T6.17.3
	Subtotal of item A1				19,667		135,545	29,562	
	Total of item B				19,667		135,545	29,562	

Item No.	Work	Unit	Quantity	Foregin Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
I4	Inspection Gallery including Inspection Tunnel								
/01	Ventilation works								
	- O.A. intake fan, axial flow fan ø700 x 9,720 m3/hour x 45mm Aq x 2.2 kW with concrete base	set	1	2,330.0	2,330	15,260.0	15,260	3,444	T6.21.2
	- Exhaust fan, axial flow fan ø700 x 9,720 m3/hour x 45mm Aq x 2.2 kW	set	1	2,330.0	2,330	15,260.0	15,260	3,444	T6.21.2
	- Air chamber 1,200 x 1,000 x 600 (galvanized steel sheet)	ea	2	260.0	520	1,700.0	3,400	768	T6.21.2
	- O.A. intake louver 1,200 x 1,000	ea	2	583.0	1,166	3,820.0	7,640	1,724	T6.21.2
	- Painting of air chamber	m2	8	15.0	120	95.0	760	175	T6.9.3
	Subtotal of item /01				6,466		42,320	9,555	
	Total of item I4				6,466		42,320	9,555	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
I5	Grout Tunnel								
/01	Ventilation works (No.1 grout tunnel)								
	- O.A. intake fan, axial flow fan	set	1	900.0	900	5,400.0	5,400	1,294	T6.21.2
	ø400 x 2,900m3/hour x 20mm Aq x 0.35 kW								
	- Spiral duct ø400	m	85	43.2	3,672	300.0	25,500	5,533	T6.21.2
	(Galvanized steel sheet)								
	- O.A. intake louver 500 x 600	ea	2	300.0	600	1,910.0	3,820	879	T6.21.2
	- Painting to duct	m2	120	15.0	1,800	95.0	11,400	2,632	T6.9.3
	<u>Subtotal of item /01</u>				6,972		46,120	10,338	
/02	Ventilation works (No.2 grout tunnel)								
	- O.A. intake fan, axial flow fan	set	1	2,300.0	2,300	15,200.0	15,200	3,409	T6.21.2
	ø700 x 8,200m3/hour x 50mm Aq x 2.2 kW w/concrete base								
	- Spiral duct ø700	m	425	75.2	31,960	520.0	221,000	48,091	T6.21.2
	(Galvanized steel sheet)								
	- O.A. intake louver 800 x 1,000	ea	2	390.0	780	2,550.0	5,100	1,152	T6.21.2
	- Painting to duct	m2	950	15.0	14,250	95.0	90,250	20,838	T6.9.3
	<u>Subtotal of item /02</u>				49,290		331,550	73,490	
	<u>Total of item I5</u>				56,262		377,670	83,828	
	TOTAL OF ITEM I				312,988		2,236,906	476,263	

Item No.	Work	Unit	Quantity	Foreign Currency (US\$)		Local Currency (Rs)		Total Equivalent (US\$)	Ref. Clause or Sub-clause
				Unit Price	Amount	Unit Price	Amount		
J REPAIR FOR EXISTING MUNICIPAL DIKE									
/01	Boulder backfilling	m3	570	10.9	6,213	161.7	92,169	12,941	T2.7.6
/02	Providing of concrete blocks	m3	1,400	185.1	259,140	2,519.3	3,527,020	516,587	T4.1.18
/03	Cement grouting	m	960	57.4	55,104	332.3	319,008	78,389	T3.12.9
TOTAL OF ITEM J					320,457		3,938,197	607,917	