

1987

JAPAN INTERNATIONAL COOPERATION AGENCY

CENTRO DE REHABILITACION DE MANABI (CRM)
THE REPUBLIC OF ECUADOR

THE DETAILED DESIGN STUDY
ON
THE WATER TRANSBASIN SCHEMES
FOR
CHONE - PORTOVIEJO RIVER BASINS

FINAL REPORT
VOLUME IX
COST ESTIMATE

MARCH 1986

NIPPON KOEI CO., LTD.
Tokyo, Japan

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ESTIMATE OF PROJECT COST

Price Level : August 1994

Currency Exchange Rate : US\$1 = S/. 2,250 = Yen 100

FINAL REPORT

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COST ESTIMATE

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Mancha Grande Transbasins.

ABBREVIATION

Ecuadorian Institutions

CEDEGE	:	Committee for Guayas River Basin Development
CETUR	:	Ecuadorian Corporation for Tourism
CLIRSEN	:	Integrated Center for Remote Sensing Survey
CONADE	:	National Development Council
CPC	:	Chamber of Shrimp Producer
CRM	:	Manabi Rehabilitation Center
DIGMER	:	Directorate General of Merchant Marine
DINAC	:	National Directorate of Valuation and Cadastre
DINAF	:	National Directorate of Forestry
DITURIS	:	Directorate of Tourism
EMAPAM	:	Municipal Enterprise of Potable Water and Sewerage of Manta
ESPOL	:	Polytechnic Littoral College
GOE	:	Government of Ecuador
IEOS	:	Ecuadorian Institute of Sanitary Works
IERAC	:	Ecuadorian Institute for Agrarian Reform
IGM	:	Geographic Military Institute
INAMHI	:	National Institute of Meteorology and Hydrology
INEC	:	National Institute of Statistics and Census
INECEL	:	Ecuadorian Institute for Electrification
INEFAN	:	Ecuadorian Institute of Forestry and Natural Areas
INEN	:	Ecuadorian Institute of Standards
INERHI	:	Ecuadorian Institute of Water Resources
INIAP	:	Institute of Agricultural Investigations
INOCAR	:	Military Oceanographic Institute
JRH	:	Jipijapa and Pajan Board of Water Resources
MAG	:	Ministry of Agriculture and Livestock
MICIP	:	Ministry of Industry, Commerce, Integration and Fishery
MOP	:	Ministry of Public Works and Communications
PFI	:	Institutional Reinforcement Planning Unit of CRM

- PHIMA : Integrated Water Resources Development Plan of Manabi
 PMRC : Management Program of Coastal Resources

International or Foreign Institutions

- ACI : American Concrete Institute
 ASCE : American Society of Civil Engineers
 ASTM : American Society for Testing and Materials
 CAF : Corporación Andina de Fomento
 CEPIS : Panamerican Center for Sanitary Engineering and the Environment
 CIDIAT : Interamerican Center for Integrated Development of Water and Land
 FAO : Food and Agriculture Organization of the United Nations
 IDB/BID : Interamerican Development Bank
 IEC : International Electrotechnical Commission
 JEC : Japanese Electrotechnical Committee
 JICA : Japan International Cooperation Agency
 JIS : Japanese Industrial Standards
 OAS/OEA : Organization of American States
 OECF : Overseas Economic Cooperation Fund of Japan
 SCS : Soil Conservation Service of USDA
 UNDP : United Nations Development Program
 USA : United States of America
 USAID : United States Agency for International Development
 USDA : United States Department of Agriculture
 WHO : World Health Organization of the United Nations

Technical Terms

- A.C. : Alternating Current
 ACSR : Aluminum Cable Steel Reinforced
 BOD : Biochemical Oxygen Demand
 COD : Chemical Oxygen Demand

D.C.	:	Direct Current
DO	:	Dissolved Oxygen
EC/CE	:	Electrical Conductivity
EIA	:	Environmental Impact Assessment
EMMP	:	Environmental Management and Monitoring Plan
FEM	:	Finite Element Method
F.M.	:	Finess Modulus
F/S	:	Feasibility Study
FWL	:	Flood Water Level
GPS	:	Global Positioning System
H	:	Horizontal
HWL	:	High Water Level
IEE	:	Initial Environmental Examination
IPM	:	Integrated Pest Management
LACAT	:	Program for Warm Tropical Lakes
LWL	:	Low Water Level
MOL	:	Minimum Operating Level
NATM	:	New Austrian Tunneling Method
PLC	:	Power Line Carrier
RWL	:	Reservoir Water Level
SPT	:	Standard Penetration Test
ST	:	Station
T-N	:	Total Nitrogen
T-P	:	Total Phosphorus
TRMS	:	Transbasin and Reservoir Management System
TSS	:	Total Suspended Solid
V	:	Vertical
ZEM	:	Special Zone for Management

Economic Terms and Others

CIF	:	Cost Insurance and Freight
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EIRR : **Economic Internal Rate of Return**
FC : **Foreign Currency**
FIRR : **Financial Internal Rate of Return**
FOB : **Free on Board**
GDP : **Gross Domestic Product**
GRP : **Gross Regional Product**
IVA : **Sales Tax or Value Added Tax**
LC : **Local Currency**
NGO/ONG : **Non Governmental Organization**

ABBREVIATION OF MEASURES

Length

mm	=	millimetre
cm	=	centimetre
m	=	metre
km	=	kilometre
masl	=	metre above sea level
EL.	=	elevation

Area

ha	=	hectare
m ²	=	square metre
km ²	=	square kilometre

Volume

l, lit	=	litre
Kl, Klit	=	kilolitre
l/s	=	litre per second
m ³	=	cubic metre
m ³ /s, cms	=	cubic metre per second
m ³ /min	=	cubic metre per minute
m ³ /hr	=	cubic metre per hour
MCM, mcm	=	million cubic metre
m ³ /d, cmd	=	cubic metre per day

Weight

mg	=	milligram
mg/l	=	milligram per litre
meq/l	=	milli-equivalent per litre
g	=	gram
kg	=	kilogram
t, ton	=	ton
ty	=	ton per year
MT	=	metric ton

Time

sec	=	second
min	=	minute
hr, HR	=	hour
d	=	day
yr	=	year

Money

S/.	=	Ecuadorian Suces
¥	=	Japanese Yen
US\$	=	U. S. Dollars

Energy

Kcal	=	Kilocalorie
KW, Kw	=	kilowatt
MW, Mw	=	megawatt
KWh, Kwh	=	kilowatt-hour
GWh, Gwh	=	gigawatt-hour
V	=	volt
KV	=	kilovolt
KVA	=	kilovolt ampere
MVA	=	megavolt ampere
Hz	=	Hertz

Others

%	=	percent
°	=	degree
'	=	minute
"	=	second
°C	=	degree Celsius
MD, md	=	man-day
mil.	=	million
NO. Nos	=	number
pers.	=	person
Umho	=	micromho
ppt	=	parts per thousand
ppm	=	parts per million
ppb	=	parts per billion
l/h/d	=	litre per person per day
g/c/d	=	gram per capita per day
LS	=	lump sum
MPN	=	most probable numbers
O&M	=	Operation and Maintenance
p.a.	=	per annum
rpm	=	revolutions per minutes

1. GENERAL

This report presents the construction cost for the implementation of the Water Transbasin Project for Chone-Portoviejo River Basin. The Project is divided into three international tender packages.

The construction cost of the project is estimated on the basis of the detailed design and the proposed construction plan and schedule. In order to attain an accurate cost estimate, a unit price estimate method is mainly applied for each work. Furthermore, the estimate procedures and the breakdown are applied taking into account of a recent tender 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 labor, material cost and equipment cost, and the cost data referring to the recent tender prices on the similar project.

2. BASIC CONDITIONS

The basic conditions and assumptions applied for the cost estimate are presented below:

- The unit prices and rates are based on the current prices for labor, material and equipment as of August 1994.
- The estimated cost is composed of a foreign currency portion expressed in US Dollar and a local currency portion of Ecuadorian Sucre. The total amount is converted into Ecuadorian Sucre and US Dollar as an equivalent price.
- The exchange rate is employed in consideration of the prevailing exchange rate in August 1994. The exchange rate used in this cost estimate is as follows:

$$\text{US \$ 1.0} = \text{Yen 100} = \text{S/2,250} \quad (1 \text{ Yen} = \text{S/22.5})$$

- The work quantities are calculated from the detailed design drawings and the technical specifications of the tender documents. The work quantities are shown in APPENDIX.
- The construction works will be carried out by contractors selected through an international competitive bidding in accordance with a guideline of the financial source.

3. CONSTITUTION OF CONSTRUCTION COST

The construction cost consist of a direct 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 labor cost, material cost, equipment cost and contractor's indirect cost such as overhead and profit. The direct construction cost is estimated in the breakdown of cost estimate as shown in APPENDIX.

(1) Direct Construction Cost

- Package 1: Civil Works for Daule-Peripa ~ La Esperanza Transbasin

General items, Daule-Peripa~La Esperanza diversion tunnel, Conguillo work adit, El Guasmo work adit, Membrillo work adit, Conguillo access road, El Guasmo access road and Membrillo outlet access road.

- Package 2: Civil Works for La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin.

General items, Severino pumping station, Severino penstock, Severino head tank, Severino substation, Severino open channel, La Esperanza~Poza Honda diversion tunnel, Poza Honda~Mancha Grande diversion tunnel, La Seca work adit, Los Cuyuyes work adit, Poza Honda work adit, Severino access road, Caña Dulce access road, La Seca access road, Los Cuyuyes access road, Poza Honda inlet access road and Daule-Peripa 138 kV switchgear yard.

- Package 3: Electrical and Mechanical Works for Daule-Peripa ~ La Esperanza, La Esperanza ~ Poza Honda and Poza Honda ~ Mancha Grande Transbasins.

Section 1: Severino pumping station, Severino penstock, Severino substation and Daule-Peripa~Severino transmission line.

Section 2: Conguillo inlet

Section 3: Poza Honda inlet

(2) Indirect Cost

Indirect cost is comprised of as follows:

- Land acquisition and compensation
- Administration expenses
- Engineering services
- Physical contingency
- Price escalation

4. DIRECT CONSTRUCTION COST

4.1 Civil Works

4.1.1 General Items

The cost for general items include the cost for temporary buildings, water supply system, power supply system, telecommunication system, construction road and maintenance, laboratory equipment, exploratory borings, monument and memorial, camps for CRM and Supervision, office furnitures for CRM, first aid facilities, and vehicles for CRM and Supervision.

The cost for general items is estimated at lump sum and provisional sum costs based on the Specifications and the proposed construction plan. The breakdown of general items is shown in APPENDIX.

4.1.2 Cost Component of Direct Construction Cost

The direct construction cost of civil works is estimated by adopting unit prices and lump sum, based on labor cost and the cost of materials, construction equipment and plants. The contractor's indirect cost consisting of overhead expenses and profit is included in the unit price of each work item. The main components of the cost are described as follows:

(1) Labor Cost

All the labors required for the construction are assumed to be local labors. However, some foreign technicians such as foreman, mechanics and specialist are considered for the special works. The direct daily wages in 8-hour shift of labor applied to the cost estimate are based on the wages obtained in Guayaquil and Portoviejo. The labor cost is shown in Table 4.1.

(2) Material Cost

Most of the construction materials are to be supplied by contractors mainly from local market. Major local materials employed in the cost estimated are cement, fuel, gasoline, reinforcement bar, asphalt bitumen, structural steel, explosives, timber, plywood, concrete aggregate, and so on. The local material prices are assumed to be purchased price at site including inland transportation expenses from the market. The local material prices are divided into foreign and local portions, and the local material prices include the IVA (Sales tax).

While, imported material costs for H shape steel rib, consumable goods of drilling, grouting and concrete works, etc. are estimated referring to the prevailing prices in Japan. The cost is estimated on the basis of CIF price at Guayaquil, including freight and insurance premium. The CIF price is estimated in foreign currency. The cost of handling charge at port and inland transportation expenses from Guayaquil to the site are included in the material price and estimated in local currency. The imported materials are exempted from import duties and IVA (Sales tax). The material cost is shown in Table 4.2.

(3) Equipment Cost

The construction equipment and plant will be provided by a contractor. The prices of equipment are prevailing prices in Japan on August 1994. The equipment cost is estimated based on the CIF price at Guayaquil. The import duties and taxes for equipment is excluded in this cost estimate according to the re-export conditions after the completion of the project. The equipment cost is divided into foreign and local portion. The foreign currency portion includes mainly depreciation cost, spare parts and consumable cost, while the local portion includes the cost of mechanic labour cost for the repair and maintenance and administration expenses. The equipment cost is listed in Table 4.3.

(4) 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, stationery 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 25% of direct unit cost comprising labor cost, material cost and equipment cost.

(5) Direct Construction Cost

The unit price for various work items in the bill of quantity are estimated in accordance with the above conditions. The unit price for civil works are as shown in APPENDIX.

4.2 Electrical and Mechanical Works

The prices for main pumps, valves, motors, transformers, switchgears, 13.8 kV distribution lines, 138 kV transmission lines, trashracks, gates, discharge penstocks, etc. in the Package 3 are estimated on the basis of the recent international contract prices of similar equipment units. The cost of imported equipment and materials is estimated at CIF price at Guayaquil in foreign currency portion. The import duties and taxes are not included in the cost estimate. The cost for supply and delivery of imported items, ocean freight and insurance are included in the foreign currency portion. The cost for unloading and other charges at port and inland transportation expenses are estimated in the local currency portion. The installation costs are portionally shared by the foreign and local portions.

5. INDIRECT COST

5.1 Land Acquisition and Compensation

All required land acquisition and compensation shall be carried out by the CRM along the project implementation schedule. Those costs include the costs required for the acquisition of construction areas, transmission line routes, road alignment and the temporary land area, as shown in Table 5.1.

5.2 Administration Expenses

The administration expenses of CRM for project implementation are estimated to be 2% of the direct construction cost and allocated to the local currency portion.

5.3 Engineering Services

The cost for engineering services is estimated based on the assumed man-month of foreign and local consultants to be employed during the implementation of the project. The assumed man-month is to be 323 M/M for foreign and 405 M/M for local.

5.4 Contingencies

Contingencies are provided to cope with unforeseen physical condition (physical contingency) and inflation (price contingency). The physical contingency is taken to be 10% of a sum of the Package 1 and Package 2 construction costs, land acquisition and compensation. The rate of 5% for administration expenses and engineering services is applied. As for the Package 3 work, 3% is to be applied for the physical contingency. The price contingency is estimated applying annual inflation rate of 3% for foreign currency portion. For local currency portion, the actual annual inflation rate in recent years is more than 40% and it is almost impossible to predict future inflation rate of Ecuadorian Sucre. Therefore, the price contingency for the local currency portion is estimated by converting the local currency portion into US Dollars and applying the same inflation rate of 3% per annum in terms of US Dollars.

6. CONSTRUCTION COST

The construction cost is summarized in Table 6.1.

The Breakdown of construction cost is shown in Table 6.2 to Table 6.3. The Priced Bill of Quantities (Detailed Construction Cost) is shown in APPENDIX A (Package 1), APPENDIX B (Package 2) and APPENDIX C (Package 3).

7. ANNUAL DISBURSEMENT SCHEDULE

The annual disbursement is estimated according to the construction schedule and summarized as follows. The disbursement schedule of the construction cost is tabulated in Table 7.1.

	(1,000 US\$)		
	Foreign Currency	Local Currency	Total
1996	0.00	144.02	144.02
1997	27,435.56	14,474.41	41,909.97
1998	35,586.76	15,298.65	50,885.41
1999	30,268.42	14,127.30	44,395.72
2000	39,663.03	12,468.09	52,131.12
2001	10,592.30	4,752.40	15,344.70
Total	143,546.07	61,264.87	204,810.94

Table 4.1 Labor Cost (Basic Wage Rate)

Description	Unit	Foreign Currency		Local Currency
		J.Yen	Equiv.US\$	
Foreman, foreign	M.D.	30,000	300	-
Technician, foreign	M.D.	20,000	200	-
Foreman, tunnel	M.D.	-	-	24,700
Foreman	M.D.	-	-	20,600
Mechanic	M.D.	-	-	25,700
Electrician	M.D.	-	-	25,700
Operator, heavy	M.D.	-	-	25,600
Operator, light	M.D.	-	-	20,500
Assistant operator	M.D.	-	-	17,900
Plant operator	M.D.	-	-	22,900
Driver, dump truck	M.D.	-	-	18,100
Driver, ordinary	M.D.	-	-	17,600
Rigger	M.D.	-	-	19,000
Carpenter	M.D.	-	-	19,000
Formworker	M.D.	-	-	19,000
Concrete worker	M.D.	-	-	19,000
Driller	M.D.	-	-	17,300
Tunnel, worker	M.D.	-	-	20,200
Pipe fitter	M.D.	-	-	19,000
Brick worker	M.D.	-	-	13,000
Mason	M.D.	-	-	19,000
Plumber	M.D.	-	-	19,000
Painter	M.D.	-	-	19,000
Welder	M.D.	-	-	19,000
Plasterer	M.D.	-	-	19,000
Powderman	M.D.	-	-	17,300
Reinforcing worker	M.D.	-	-	19,000
Boring worker	M.D.	-	-	20,200
Grout worker	M.D.	-	-	20,200
Pavement worker	M.D.	-	-	19,000
Skilled worker	M.D.	-	-	20,900
Semi skilled worker	M.D.	-	-	19,000
Common labor	M.D.	-	-	17,300

Table 4.2 Construction Material Cost

Description	Unit	Foreign Currency		Local Total	Currency LC	(S/) Tax
		J.Yen	Equiv.US\$			
Gasoline	litre	6	0.06	582	581	1
Light oil	litre	4	0.04	354	353	1
Lubricant	litre	44	0.44	4,650	4,150	500
Grease	kg	58	0.58	6,045	5,396	650
Portland cement	ton	4,969	49.69	82,560	65,360	17,200
Bitumen 80/100	kg	1	0.01	147	131	16
Bitumen MC30	litre	1	0.01	147	131	16
Emulsion, K170	litre	1	0.01	147	131	16
Reinforcement, deformed	ton	24,556	245.56	408,000	323,000	85,000
Annealed iron wire	kg	58	0.58	960	760	200
Channel steel	ton	35,533	355.33	590,400	467,400	123,000
Angle steel	ton	35,533	355.33	590,400	467,400	123,000
Nail	kg	58	0.58	960	760	200
Dynamite, open	kg	0	0.00	9,153	8,343	810
Dynamite, tunnel	kg	0	0.00	9,153	8,343	810
ANFO	kg	0	0.00	2,034	1,854	180
Detonator, delay, open	No	0	0.00	4,407	4,017	390
Detonator, relay, tunnel	No	0	0.00	4,238	3,863	375
Lead wire	m	0	0.00	904	824	80
Timber, square	m3	1,244	12.44	130,200	116,200	14,000
Timber, plant	m3	2,089	20.89	218,550	195,050	23,500
Timber, log	m3	1,067	10.67	111,600	99,600	12,000
Plywood	m3	23,333	233.33	661,500	556,500	105,000
(Poza Honda~Mancha Grande)						
Gravel, cobble	m3	610	6.10	7,846	5,884	1,962
Subbase	m3	851	8.51	10,940	8,205	2,735
Base	m3	904	9.04	11,620	8,715	2,905
Concrete aggregate	ton	734	7.34	9,439	7,079	2,360
Boulder, riprap, mason	m3	930	9.30	11,960	8,970	2,990
Sand	ton	745	7.45	9,576	7,182	2,394
Hot asphalt	ton	416	4.16	42,136	37,454	4,682
(Pumping station, open channel)						
Gravel, cobble	m3	797	7.97	10,246	7,684	2,562
Subbase	m3	1,038	10.38	13,340	10,005	3,335
Base	m3	1,090	10.90	14,020	10,515	3,505
Concrete aggregate	ton	872	8.72	11,216	8,412	2,804
Boulder, riprap, mason	m3	1,117	11.17	14,360	10,770	3,590
Sand	ton	786	7.86	10,101	7,576	2,525
Hot asphalt	ton	440	4.40	44,591	39,636	4,955
(La Esperanza~Poza Honda)						
Gravel, cobble	m3	704	7.04	9,046	6,784	2,262
Subbase	m3	944	9.44	12,140	9,105	3,035
Base	m3	997	9.97	12,820	9,615	3,205
Concrete aggregate	ton	803	8.03	10,327	7,745	2,582
Boulder, riprap, mason	m3	1,024	10.24	13,160	9,870	3,290
Sand	ton	797	7.97	10,251	7,688	2,563
Hot asphalt	ton	428	4.28	43,364	38,546	4,818

Table 4.2 Construction Material Cost (Cont'd)

Description	Unit	Foreign Currency		Local Total	Currency LC	(S/.) Tax
		J.Yen	Equiv.US\$			
(Daule-Peripa-La Esperanza)						
Gravel, cobble	m3	984	9.84	12,646	9,484	3,162
Subbase	m3	1,224	12.24	15,740	11,805	3,935
Base	m3	1,277	12.77	16,420	12,315	4,105
Concrete aggregate	ton	1,011	10.11	12,994	9,745	3,249
Boulder, riprap; mason	m3	1,304	13.04	16,760	12,570	4,190
Sand	ton	903	9.03	11,614	8,710	2,904
Hot asphalt	ton	465	4.65	47,045	41,818	5,227
Lead wire	m	7	0.07	8	8	0
H-shape steel	ton	42,800	428.00	48,150	48,150	0
Channel steel	ton	58,850	588.50	66,206	66,206	0
Steel plate	ton	53,500	535.00	60,188	60,188	0
Bit, 65 mm	No	43,442	434.42	48,872	48,872	0
Bit, 75 mm	No	52,109	521.09	58,623	58,623	0
Rod, 38 mm, 3 m	No	52,430	524.30	58,984	58,984	0
Shank, for 38 mm	No	39,590	395.90	44,539	44,539	0
Sleeve, for 38 mm	No	10,593	105.93	11,917	11,917	0
Bit, 32 mm	No	7,062	70.62	7,945	7,945	0
Bit, 36 mm	No	7,383	73.83	8,306	8,306	0
Bit, 38 mm	No	7,651	76.51	8,607	8,607	0
Bit, 48 mm	No	11,342	113.42	12,760	12,760	0
Taper rod, 2 m	No	9,737	97.37	10,954	10,954	0
Taper rod, 1.5 m	No	8,731	87.31	9,822	9,822	0
Insert bit, 36 mm, 1.7 m	No	14,017	140.17	15,769	15,769	0
Air entrain agent	kg	257	2.57	289	289	0
Water reduced agent	kg	342	3.42	385	385	0
Agent, quick set	kg	214	2.14	241	241	0
Agent, air bubble	kg	535	5.35	602	602	0
Metal form, 200*1500	No	2,782	27.82	3,130	3,130	0
Bolt and nut	No	27	0.27	30	30	0
Clamp	No	300	3.00	338	338	0
Crip	No	37	0.37	42	42	0
Anchor bolt, 22 mm, 0.4 m	No	171	1.71	192	192	0
Metal form, 200*1500	No	2,782	27.82	3,130	3,130	0
Cone	No	19	0.19	21	21	0
Separator, 8-10 mm	m	71	0.71	80	80	0
Form oil	litre	321	3.21	361	361	0
Metal form, 150*1500	No	2,087	20.87	2,348	2,348	0
Metal form, 100*1500	No	1,980	19.80	2,228	2,228	0
Hunch form, 200*1500	No	3,906	39.06	4,394	4,394	0
Pipe support	m	3,210	32.10	3,611	3,611	0
Portal frame	No	4,173	41.73	4,695	4,695	0
Boring rod, 40 mm, 1.5 m	No	12,412	124.12	13,964	13,964	0
Boring rod, 40 mm, 3.0 m	No	17,762	177.62	19,982	19,982	0
Tube core barrel, 45 mm	No	15,943	159.43	17,936	17,936	0
Cross bit, 45 mm	No	11,021	110.21	12,399	12,399	0
Taper rod, 25 mm, 2 m	No.	15,622	156.22	17,575	17,575	0
Gas pipe, 40 mm	m	396	3.96	446	446	0
Gas pipe, 50 mm	m	546	5.46	614	614	0
Gas pipe, 65 mm	m	760	7.60	855	855	0
Scaffolding pipe	m	278	2.78	313	313	0

Table 4.2 Construction Material Cost (Cont'd)

Description	Unit	Foreign Currency		Local Total	Currency LC	(S/.) Tax
		J.Yen	Equiv.US\$			
Metal crown, 46 mm	No	3,692	36.92	4,154	4,154	0
Metal crown, 56 mm	No	4,023	40.23	4,526	4,526	0
Metal crown, 66 mm	No	4,280	42.80	4,815	4,815	0
Core tube, single, 46 mm	No	15,943	159.43	17,936	17,936	0
Core tube, single, 56 mm	No	19,153	191.53	21,547	21,547	0
Core tube, single, 66 mm	No	22,363	223.63	25,158	25,158	0
Air bubble agent	kg	535	5.35	602	602	0
PVC pipe, 40 mm	m	235	2.35	264	264	0
Lozenge shape net	m2	696	6.96	783	783	0
Galvanized pipe, 150 mm	m	3,724	37.24	4,190	4,190	0
Galvanized pipe, 100 mm	m	2,119	21.19	2,384	2,384	0
Gabion, 0.4*1.2 m, 3.2 mm	m	2,033	20.33	2,287	2,287	0
Waterstop, 150 mm, 6 mm	m	1,059	10.59	1,191	1,191	0
Waterstop, 200 mm, 6 mm	m	1,338	13.38	1,505	1,505	0
Waterstop, 300 mm, 9 mm	m	2,611	26.11	2,937	2,937	0
Joint filler, 10 mm	m2	899	8.99	1,011	1,011	0
Joint filler, 20 mm	m2	1,798	17.98	2,023	2,023	0
PVC pipe, 25 mm	m	161	1.61	181	181	0
PVC pipe, 50 mm	m	321	3.21	361	361	0
PVC pipe, 75 mm	m	631	6.31	710	710	0
PVC pipe, 100 mm	m	931	9.31	1,047	1,047	0
Cooling pipe, 25 mm	m	407	4.07	458	458	0
Grout pipe, 40 mm	m	621	6.21	699	699	0
Riser pipe, 20 mm	m	289	2.89	325	325	0
Steel pipe, 200 mm	m	4,355	43.55	4,899	4,899	0
Steel pipe, 75 mm	m	1,231	12.31	1,385	1,385	0
Steel pipe, 60 mm	m	1,049	10.49	1,180	1,180	0
Steel pipe, 35 mm	m	546	5.46	614	614	0
Steel pipe, 800 mm	m	21,400	214.00	24,075	24,075	0
Guardrail, 3.2 mm	m	5,564	55.64	6,260	6,260	0
Cast iron pipe, 300 mm	m	5,757	57.57	6,477	6,477	0
Cast iron pipe, 75 mm	m	899	8.99	1,011	1,011	0
Cast iron pipe, 100 mm	m	1,241	12.41	1,396	1,396	0
Cast iron pipe, 150 mm	m	2,151	21.51	2,420	2,420	0
Cast iron pipe, 200 mm	m	3,274	32.74	3,683	3,683	0
PVC pipe, 150 mm	m	1,787	17.87	2,010	2,010	0
PVC pipe, 200 mm	m	2,686	26.86	3,022	3,022	0
Adhesive agent	kg	556	5.56	626	626	0
Gas pipe, 20 mm	m	268	2.68	302	302	0
Gas pipe, 40 mm	m	396	3.96	446	446	0
Gas pipe, 85 mm	m	760	7.60	855	855	0
Galvanized pipe, 100 mm	m	2,119	21.19	2,384	2,384	0
Galvanized pipe, 150 mm	m	3,724	37.24	4,190	4,190	0
Ventilation pipe, 500 mm	m	1,391	13.91	1,565	1,565	0
Ventilation pipe, 600 mm	m	1,605	16.05	1,806	1,806	0
Wire mesh, 3.2 mm, 50*50	m2	337	3.37	379	379	0
Wire mesh, 3.2 mm, 100*100	m2	166	1.66	187	187	0
SN dry mortar	kg	64	0.64	72	72	0
Topac capsle, 25*500	No	621	6.21	699	699	0
Wire net, fence	m2	642	6.42	722	722	0

Table 4.3 Equipment Cost

Description	HP-KW	Unit	Foreign Currency		Local Currency
			J.Yen	Equiv.US\$	
Bulldozer, 21 t	207	H	4,510	45.10	21,440
Bulldozer, 11 t	100	H	2,050	20.05	9,745
Bulldozer w/ripper, 32 t	318	H	7,400	74.00	36,550
Backhoe, 0.6 m3	126	H	2,890	28.90	13,736
Backhoe, 0.2 m3	51	H	1,479	14.79	6,735
Tractor shovel, 2.2 m3	205	H	3,578	35.78	17,010
Tractor shovel, 1.2 m3	93	H	1,985	19.85	9,037
Dump truck, 11 t	335	H	1,616	16.16	6,816
Dump truck, 8 t	244	H	1,210	12.10	5,507
Truck crane, 20 t	232	H	3,804	38.04	15,102
Truck crane, 30 t	274	H	5,705	57.05	22,654
Crawler drill, 7 m3/min, 30 kg		H	1,482	14.82	6,074
Crawler drill, 10 m3/min, 150 kg		H	2,007	20.07	8,223
Jack hammer, 20 kg		D	1,000	10.00	2,063
Leg hammer, 30 kg		D	1,308	13.08	2,699
Pick hammer, 7 kg		D	181	1.81	373
Motor grader, 3.7 m	151	H	2,644	26.44	12,040
Macadam rollere, 10-12 t	69	H	1,882	18.82	7,471
Tire roller, 8-20 t	96	H	1,647	16.47	6,538
Tamping self, 20 t	213	H	9,825	98.25	43,684
Vibrat roller, hand 0.5 t	6	H	475	4.75	1,758
Vibrat roller, 0.8-1.1 t	8	H	602	6.02	2,226
Vibrat roller, 3-5 t	29	H	1,368	13.68	6,081
Vibrat roller, 8-10 t	132	H	3,916	39.16	17,412
Rammer, 60-100 kg	4	D	846	8.46	2,738
Compactor, 90 kg	5	D	744	7.44	2,410
Concrete plant, 0.75 m3*2	85	H	12,070	120.70	49,455
Agitat, truck, 3.0-3.2 m3	220	H	1,517	15.17	6,906
Conc.pump, 40-45 m3/hr	140	H	4,923	49.23	22,414
Asphalt sprayer, 200 lit	3.5	D	712	7.12	1,923
Air compressor, 10.5-11 m3	106	D	11,379	113.79	45,183
Air compressor, 14.3 m3/min	145	D	13,143	131.43	52,186
Air compressor, 17 m3/min	157	D	13,343	133.43	52,979
Water pump, 80 mm, 20 m	4.2	D	548	5.48	2,756
Water pump, 100 mm, 20 m	7.5	D	974	9.74	4,896
Water pump, 150 mm, 20 m	13	D	1,316	13.16	6,615
Water pump, 200 mm, 20 m	18.8	D	1,961	19.61	9,857
Diesel generator, 150 KAV	188	D	5,549	55.49	19,712
Diesel generator, 200 KAV	259	D	7,264	72.64	25,805
Diesel generator, 250 KAV	319	D	9,352	93.52	33,223
Diesel generator, 300 KAV	401	D	10,806	108.06	38,391
Concrete bucket, 1.0 m3		D	2,115	21.15	7,822
Concrete vibrator, 45 mm	0.88	D	493	4.93	1,331
Concrete vibrator, 60 mm	1.09	D	656	6.56	1,772
Form vibrator, 0.2 kw	0.20	D	184	1.84	497
Conc.spray gun, 6 m3/hr	30	H	1,674	16.74	6,426
Sprinkler, 5.5-6.5 kl*	180	H	1,062	10.62	4,833

Table 4.3 Equipment Cost (Cont'd)

Description	HP-KW	Unit	Foreign Currency		Local Currency
			J.Yen	Equiv.US\$	
Tractor shovel, 0.4 m ³	40	H	1,488	14.88	5,711
Deposit bucket, 3 m ³		D	1,506	15.06	4,875
Boring mashine, 5.5 kw	5.8	D	4,778	47.78	18,873
Grout pump, 200, 11 kw	11.2	D	4,657	46.57	19,083
Grout mixer, 200*2, 2.2 kw	2.3	D	1,948	19.48	7,980
Leg hammer, 30 kg		D	1,308	13.08	2,699
Leg hammer, 40 kg		D	1,475	14.75	3,044
Pick hammer, 7.5 kg		D	181	1.81	373
Much loader, nail, 0.35 m ³		H	4,887	48.87	20,618
Train loader, 200 t/hr		D	9,810	98.10	42,525
Muck car, 6 m ³		D	3,388	33.88	14,685
Muck car, 4.5 m ³		D	2,747	27.47	11,907
Muck car, 3 m ³		D	2,405	24.05	10,423
Battery locomotive, 8 t, 15 kw.2		H	5,666	56.66	32,585
Battery locomotive, 6 t, 12 kw.2		H	4,625	46.25	26,600
Rail, 100 m, 30 kg/m		D	181	1.81	489
Rail, 100 m, 22 kg/m		D	125	1.25	338
Guide shell, 30 kg, 2 m		D	2,572	25.72	5,307
Vent fan, 100 m ³ /min	2.2	D	259	2.59	879
Winch, 150 kw		D	52,442	524.42	280,385
Winch, 100 kw		D	36,904	369.04	197,308
Vent fan, 300 m ³ /min, 30 kw	30	D	3,378	33.78	11,434
Spray, 5-10 m ³ /hr, dry	7.5	H	4,977	49.77	20,392
Concrete placer, 4.5 m ³	11	H	5,413	54.13	20,022
Concrete placer, 6 m ³	22	H	5,461	54.61	20,199
Agitator car, 3 m ³	11	H	2,989	29.89	11,057
Agitator car, 4 m ³	22	H	3,751	37.51	13,875
Dust collector, 150 m ³ /min	11	H	5,366	53.66	19,846
Stopper drill, 2.7 m ³ /min		D	1,660	16.60	3,426
Huck loader, incline, 0.2 m ³		H	4,735	47.35	19,974
Tunnel machine, 110 kw		H	30,233	302.33	97,896

Table 5.1 Land Acquisition and Compensation

Description	Acquired Area (ha)	Amount (S/.)
A. Land acquisition		
1. Package 1		
Civil works for Daule Peripa-La Esperanza Transbasin		
1. General (Preparatory works)	Office, camp, plant, storage, motor pool, etc.	1.4
2. Conguillo inlet	Construction area	0.4
	Temp. area, storage, etc.	0.3
3. Diversion tunnel	Spoil area (Conguillo)	2.4
	Spoil area (El Guasmo)	1.4
	Spoil area (Membrillo)	1.6
4. Membrillo outlet	Construction area	0.4
	Temp. area, storage, etc.	0.7
5. Conguillo work adit	Temp. area, portal	0.3
6. El Guasmo work adit	Construction area, portal	0.3
	Temp. area, storage, etc.	0.3
7. Membrillo work adit	Construction area, portal	0.3
8. Conguillo access road	Road reserve	75.0
9. Guasmo access road	Road reserve	4.0
10. Membrillo outlet access road	Road reserve	3.0
11. Others (10%)		9.2
Total (Package 1)		101.0
		126,250,000
2. Package 2		
Civil works for La Esperanza-Poza Honda Transbasin and Poza Honda-Mancha Grande Transbasin		
1. General (Preparatory works)	Office, camp, plant, storage, motor pool, etc.	3.2
2. Severino pumping station, penstock, head tank, sub-station	Construction area	3.2
	Temp. area, storage, etc.	1.2
3. Severino open channel	Construction area	20.1
	Temp. area, storage, etc.	0.5
	Spoil area (Severino site)	13.1
4. Cana Dulce inlet	Construction area	0.3
	Temp. area, storage, etc.	0.2
5. Diversion tunnel, Esperanza-Poza Honda	Spoil area (Cana Dulce)	2.0
	Spoil area (La Seca)	1.6
	Spoil area (Los cuyuyes)	1.9
6. Los Cuyuyes outlet	Construction area	0.2
	Temp. area, storage, etc.	0.2

Table 5.1 Land Acquisition and Compensation

Description		Acquired Area (ha)	Amount (S/.)
7. Poza Honda inlet	Construction area	0.3	
	Temp. area, storage, etc.	0.3	
8. Diversion tunnel, Poza Honda-Mancha Grande	Spoil area (Poza Honda)	1.5	
	Spoil area (Mancha Grande)	2.3	
9. Mancha Grande outlet	Construction area	0.9	
	Temp. area, storage, etc.	0.2	
10. La Seca work adit	Construction area, portal	0.2	
	Temp. area, storage, etc.	0.4	
11. Los Cuyuyes work adit	Construction area, portal	0.2	
	Temp. area, storage, etc.	0.3	
12. Poza Honda work adit	Construction area, portal	0.3	
13. Severino access road	Road reserve	19.0	
14. Cana Dulce access road	Road reserve	8.0	
15. La Seca access road	Road reserve	10.0	
16. Los Cuyuyes access road	Road reserve	26.0	
17. Poza Honda access road	Road reserve	10.0	
18. Others (10%)		12.8	
Total (Package 2)		140.4	175,500,000
3. Package 3			
Electrical and mechanical works	Area is included in the above.		
Power transmission line	T/L route, access road, etc.	66.0	82,500,000
Total (Package 3)			82,500,000
Total A			384,250,000
B. Compensation (Housing)	57 nos. x 3,000,000 S/.		171,000,000
Total (A and B)			555,250,000

Table 6.1 Summary of Construction Cost of the Transbasin Project

Description	Foreign Currency (1000 US\$)	Local Currency (1000 S/.)	Total (1000 S/.)	Total (Equivalent 1000 US\$)
1. Package 1 Civil Works for Daule Peripa-La Esperanza Transbasin	29,035.57	31,956,625	97,286,658	43,238.51
2. Package 2 Civil Works for La Esperanza-Poza Honda Transbasin and Poza honda-Mancha Grande Transbasin	52,299.84	61,809,803	179,484,443	79,770.86
3. Package 3 Electrical and Mechanical Works for Daule Peripa-La Esperanza, La Esperanza-Poza Honda and Poza Honda-Mancha Grande Transbasins	25,045.55	5,941,627	62,294,115	27,656.27
Total(1 to 3)	106,380.96	99,708,055	339,065,215	150,695.65
4. Land aquisition and compensation	0.00	555,250	555,250	246.78
5. Administration expenses	0.00	6,781,304	6,781,304	3,013.91
6. Engineering services	10,012.00	3,429,000	25,956,000	11,536.00
Total(1 to 6)	116,392.96	110,473,609	372,357,769	165,492.34
7. Physical contingency	9,385.51	10,120,932	31,238,330	13,883.70
Total(1 to 7)	125,778.47	120,594,541	403,596,099	179,376.04
8. Price escalation	25,434.90	0	57,228,525	25,434.90
Grand total	151,213.37	120,594,541	460,824,624	204,810.94
Price escalation				
Total 22,537.56 x 1000(US\$)	FC	17,767.60 x 1000		
	LC	7,667.30 x 1000		
Contribution : 2.5% of direct construction cost, LC		8,476,631 x 1000		
including contingency, 10%		9,324,294 x 1000		

Table 6.1 Summary of Construction Cost of
the Transbasin Project

Description	Foreign Currency (1000 US\$)	Local Currency (1000 US\$)	Total (1000 US\$)
1. Package 1 Civil Works for Daule Peripa- La Esperanza Transbasin	29,035.57	14,202.94	43,238.51
2. Package 2 Civil Works for La Esperanza- Poza Honda Transbasin and Poza honda-Mancha Grande Transbasin	52,299.84	27,471.02	79,770.86
3. Package 3 Electrical and Mechanical Works for Daule Peripa-La Esperanza, La Esperanza-Poza Honda and Poza Honda -Mancha Grande Transbasins	25,045.55	2,640.72	27,686.27
Total(1 to 3)	106,380.96	44,314.69	150,695.65
4. Land aquisition and compensation	0.00	246.78	246.78
5. Administration expenses	0.00	3,013.91	3,013.91
6. Engineering services	10,012.00	1,524.00	11,536.00
Total(1 to 6)	116,392.96	49,099.38	165,492.34
7. Physical contingency	9,385.51	4,498.19	13,883.70
Total(1 to 7)	125,778.47	53,597.57	179,376.04
8. Price escalation	17,767.60	7,667.30	25,434.90
Grand total	143,546.07	61,264.87	204,810.94

Table 6.2 Detailed Construction Cost (1)

Description	Foreign Currency (1000 US\$)	Local Currency (1000 S/.)	Total (1000 S/.)	Total (Equivalent 1000 US\$)
1. Package 1				
Civil Works for Daule Peripa-La Esperanza Transbasin				
1. General Items	1,681.13	2,570,932	6,353,475	2,823.77
2. Daule Peripa-La Esperanza Diversion Tunnel	18,638.17	17,110,829	59,046,712	26,242.98
3. Conguillo Work Adit	306.39	477,057	1,166,435	518.42
4. El Guasao Work Adit	503.84	805,154	1,938,794	861.69
5. Membrillo Work Adit	225.50	353,478	860,853	382.60
6. Conguillo Access Road	7,250.67	9,959,821	26,273,829	11,677.26
7. El Guasao Access Road	262.33	450,839	1,041,082	462.70
8. Membrillo Outlet Access Road	167.54	228,515	605,480	269.10
Total(Package 1)	29,035.57	31,956,625	97,286,658	43,238.51
2. Package 2				
Civil Works for La Esperanza-Poza Honda Transbasin and Poza Honda-Mancha Grande Transbasin				
1. General Items	6,077.56	7,712,217	21,336,727	9,505.21
2. Severino Pumping Station	5,027.65	8,529,714	19,841,927	8,818.63
3. Severino Penstock	212.00	328,297	805,297	357.91
4. Severino Head Tank	398.80	622,487	1,519,787	675.46
5. Severino Substation	106.20	170,943	409,893	182.17
6. Severino Open Channel	4,900.38	6,297,659	17,323,514	7,699.34
7. La Esperanza-Poza Honda Diversion Tunnel	22,571.53	21,131,014	71,916,957	31,963.09
8. Poza Honda-Mancha Grande Diversion Tunnel	7,441.46	7,241,169	23,984,454	10,659.76
9. La Seca Work Adit	691.08	1,118,446	2,673,376	1,188.17
10. Los Cuyuyes Work Adit	228.41	357,001	870,924	387.08
11. Poza Honda Work Adit	277.50	442,121	1,066,496	474.00
12. Severino Access Road	1,603.46	2,412,555	6,020,340	2,675.71
13. Cana Dulce Access Road	355.80	599,137	1,399,687	622.08
14. La Seca Access road	311.39	632,418	1,333,046	592.46
15. Los Cuyuyes Access Road	1,951.65	3,995,673	8,386,886	3,727.50
16. Poza Honda Inlet Access Road	135.06	202,152	506,037	224.91
17. Daule Peripa 138 kV	9.91	16,800	39,098	17.38
Total(Package 2)	52,299.84	61,809,803	179,484,443	79,770.86

Table 6.2 Detailed Construction Cost (1)

Description	Foreign Currency (1000 US\$)	Local Currency (1000 S/.)	Total (1000 S/.)	Total (Equivalent 1000 US\$)
3. Package 3				
Electrical and Mechanical Works for Daule Peripa-La Esperanza, La Esperanza-Poza Honda and Poza Honda -Mancha Grande Transbasins				
Section-1, Severino pumping station	22,321.58	5,718,551	55,942,106	24,863.16
Section-2, Conguillo Inlet	1,672.27	150,864	3,913,472	1,739.32
Section-3, Poza honda Inlet	691.98	65,668	1,622,623	721.17
Others, maintenance tools, shop inspection, instruction to staff, etc	359.72	6,544	815,914	362.63
Subtotal (Package 3)	25,045.55	5,941,627	62,294,115	27,686.27
Total(1 to 3)	106,380.96	99,708,055	339,065,215	150,695.65
4. Land aquisition and compensation	0.00	555,250	555,250	246.78
5. Administration expenses	0.00	6,781,304	6,781,304	3,013.91
6. Engineering services	10,012.00	3,429,000	25,956,000	11,536.00
Total(1 to 6)	116,392.96	110,473,609	372,357,769	165,492.34
7. Physical contingency	9,385.51	10,120,932	31,238,330	13,883.70
Total(1 to 7)	125,778.47	120,594,541	403,596,099	179,376.04
8. Price escalation	25,434.90	0	57,228,525	25,434.90
Grand total	151,213.37	120,594,541	460,824,624	204,810.94

Price escalation
 Total 22,537.56 x 1000(US\$) FC 17,767.60 x 1000
 LC 7,667.30 x 1000

Contribution : 2.5% of direct
 construction cost, LC 8,476,631 x 1000
 including contingency, 10% 9,324,294 x 1000

Table 6.3 Detailed construction Cost (2)

US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
1. Package 1			
Civil Works for Daule Peripa-La Esperanza Transbasin			
1. General Items	1,681,130.00	2,570,932,000	6,353,474,500
2. Daule Peripa-La Esperanza Diversion Tunnel			
2.1 Care of river and control and removal of water	21,338.00	33,293,280	81,303,780
2.2 Earthwork	9,905,582.12	9,200,852,338	31,488,412,108
2.3 Drilling and grouting	143,486.98	168,065,168	490,910,873
2.4 Concrete work	7,822,801.00	7,088,569,385	24,689,871,635
2.5 Miscellaneous metal work	29,729.18	8,792,555	75,683,210
2.6 Convergency measurement	344,823.00	504,906,150	1,280,757,900
2.7 Building work	11,834.78	54,631,425	81,259,680
2.8 Electrical work	16,853.98	8,554,979	46,476,434
2.9 Miscellaneous	341,716.25	43,163,490	812,025,053
Sub total (2)	18,638,165.29	17,110,828,770	59,046,700,673
3. Conguillo Work Adit			
3.1 Earthwork	207,577.47	374,979,892	842,029,200
3.2 Concrete work	98,813.37	102,076,837	324,406,920
Sub total (3)	306,390.84	477,056,729	1,166,436,119
4. El Guasao Work Adit			
4.1 Earthwork	354,997.69	660,354,050	1,459,098,853
4.2 Concrete work	148,846.16	144,799,798	479,703,658
Sub total (4)	503,843.85	805,153,848	1,938,802,511
5. Membrillo Work Adit			
5.1 Earthwork	134,693.12	257,573,805	560,633,325
5.2 Concrete work	90,811.01	95,904,660	300,229,433
Sub total (5)	225,504.13	353,478,465	860,862,758
6. Conguillo Access Road			
6.1 Earthwork	5,574,452.80	6,586,774,040	19,129,292,840
6.2 Excavation and filling for structures	70,006.44	92,639,049	250,153,539

Table 6.3 Detailed construction Cost (2)

US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
6.3 Culverts and drainage works	672,090.86	1,990,798,484	3,503,002,919
6.4 Concrete work	371,203.22	619,510,440	1,454,717,685
6.5 Pavement	526,997.70	655,560,870	1,841,305,695
6.6 Miscellaneous	35,917.02	14,537,900	95,351,195
Sub total (6)	7,250,668.04	9,959,820,783	26,273,823,873
7. El Guasmo Access Road			
7.1 Earthwork	151,714.50	202,612,200	543,969,825
7.2 Excavation and filling for structures	3,206.82	4,873,531	12,088,876
7.3 Culverts and drainage works	60,347.03	167,826,436	303,607,254
7.4 Concrete work	22,080.18	44,799,869	94,480,274
7.5 Pavement	24,163.20	30,079,197	84,446,397
7.6 Miscellaneous	823.08	647,889	2,499,819
Sub total (7)	262,334.81	450,839,122	1,041,092,445
8. Membrillo Outlet Access Road			
8.1 Earthwork	64,720.21	59,351,510	204,971,983
8.2 Excavation and filling for structures	18,393.18	20,713,436	62,098,091
8.3 Culverts and drainage works	7,384.36	19,654,667	36,224,477
8.4 Concrete work	62,257.94	118,192,050	258,272,415
8.5 Pavement	5,102.20	6,413,183	17,893,133
8.6 Miscellaneous	9,699.57	4,190,312	26,014,345
Sub total (8)	167,537.46	228,515,158	605,474,443
Total (Package 1)	29,035,574.42	31,956,624,875	97,286,667,320
2. Package 2			
Civil works for La Esperanza- Poza Honda Transbasin and Poza Honda-Mancha Grande Transbasin			
1. General Items	6,077,560.00	7,712,217,000	21,386,727,000
2. Severino Pumping station			
2.1 Care of river and control and removal of water	19,683.00	48,207,150	92,493,900
2.2 Earthwork	1,491,352.84	1,527,019,860	4,882,563,750
2.3 Concrete work	2,805,179.07	4,882,922,820	11,194,575,728
2.4 Road work	4,311.22	35,834,151	45,534,396
2.5 Miscellaneous metal work	36,766.85	18,694,450	101,419,863
2.6 Building work	321,427.86	1,902,651,370	2,625,864,055

Table 6.3 Detailed construction Cost (2) US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
2.7 Electrical work	241,481.47	90,208,719	633,542,027
2.8 Miscellaneous	107,448.75	24,175,940	265,935,628
Sub total (2)	5,027,651.06	8,529,714,460	19,841,929,345
3. Severino Penstock			
3.1 Earthwork	39,812.34	43,235,758	132,813,523
3.2 Concrete work	172,180.53	285,033,442	672,439,635
3.3 Miscellaneous metal work	8.74	27,265	46,930
Sub total (3)	212,001.61	328,296,465	805,300,088
4. Severino Head Tank			
4.1 Care of river and control and removal of water	4,374.00	10,712,700	20,554,200
4.2 Earthwork	79,546.49	94,572,363	273,551,966
4.3 Concrete work	301,284.58	501,134,847	1,179,025,152
4.4 Drainage	1,534.60	8,776,930	12,229,780
4.5 Road work	1,800.68	2,309,274	6,360,804
4.6 Miscellaneous metal work	10,256.63	4,980,774	28,058,192
Sub total (4)	398,796.93	622,486,886	1,519,780,093
5. Severino Substation			
5.1 Earthwork	41,052.78	52,338,272	144,707,027
5.2 Concrete work	55,894.13	109,686,232	235,448,025
5.3 Road work	247.80	317,790	875,340
5.4 Miscellaneous metal work	9,006.10	8,600,930	28,864,655
Sub total (5)	106,200.81	170,943,224	409,895,047
6. Severino Open Channel			
6.1 Care of river and control and removal of water	22,266.00	47,348,100	97,446,600
6.2 Earthwork	2,083,476.82	2,285,921,944	6,973,744,789
6.3 Concrete work	2,481,963.64	3,686,480,165	9,270,898,355
6.4 Drainage	158,377.20	160,286,456	516,635,156
6.5 Road work	64,552.30	80,698,360	225,941,035
6.6 Miscellaneous metal work	89,743.43	36,924,386	238,847,104
Sub total (6)	4,900,379.39	6,297,659,411	17,323,513,039
7. La Esperanza-Poza Honda Diversion Tunnel			

Table 6.3 Detailed construction Cost (2) US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
7.1 Care of river and control and removal of water	6,494.00	12,711,500	27,323,000
7.2 Earthwork	12,086,932.14	11,705,124,056	38,900,721,371
7.3 Drilling and grouting	188,691.80	227,431,320	651,987,870
7.4 Concrete work	9,815,228.40	8,494,227,495	30,578,491,395
7.5 Convergency measurement	474,182.00	691,519,900	1,758,429,400
Sub total (7)	22,571,528.34	21,131,014,271	71,916,953,036
8. Poza Honda-Mancha Grande Diversion Tunnel			
8.1 Care of river and control and removal of water	5,434.00	11,712,100	23,938,600
8.2 Earthwork	3,770,842.87	3,721,581,443	12,205,977,901
8.3 Drilling and grouting	60,124.46	77,961,524	213,241,559
8.4 Concrete work	3,313,331.18	3,115,630,942	10,570,626,097
8.5 Miscellaneous metal work	18,409.90	5,905,567	47,327,842
8.6 Convergency measurement	157,762.00	228,242,900	583,207,400
8.7 Building work	12,072.49	51,385,696	78,548,799
8.8 Electrical work	14,542.79	7,970,175	40,691,453
8.9 Miscellaneous	88,945.75	20,778,760	220,906,698
Sub total (8)	7,441,465.44	7,241,169,107	23,984,466,347
9. La Seca Work Adit			
9.1 Earthwork	507,011.83	948,725,203	2,089,501,821
9.2 Concrete work	184,064.28	169,720,801	583,865,431
Sub total (9)	691,076.11	1,118,446,004	2,673,367,252
10. Los Cuyuyes Work Adit			
10.1 Earthwork	137,881.37	262,732,949	572,966,032
10.2 Concrete work	90,531.02	94,268,471	297,963,266
Sub total (10)	228,412.39	357,001,420	870,929,298
11. Poza Honda Work Adit			
11.1 Earthwork	167,692.01	329,357,399	706,664,422
11.2 Concrete work	109,807.65	112,763,305	359,830,518
Sub total (11)	277,499.66	442,120,704	1,066,494,939
12. Severino Access Road			
12.1 Earthwork	1,026,998.30	1,214,766,060	3,525,512,235

Table 6.3 Detailed construction Cost (2)

US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
12.2 Excavation and filling for structures	12,700.22	20,486,957	49,062,452
12.3 Culverts and drainage works	262,016.17	772,194,025	1,361,730,408
12.4 Concrete work	113,090.83	180,966,147	435,420,515
12.5 Pavement	179,662.90	220,805,050	625,046,575
12.6 Miscellaneous	8,988.72	3,336,788	23,561,408
Sub total (12)	1,603,457.14	2,412,555,027	6,020,333,592
13. Cana Dulce Access Road			
13.1 Earthwork	217,474.90	299,212,180	788,530,705
13.2 Excavation and filling for structures	4,265.39	6,755,514	16,352,642
13.3 Culverts and drainage works	70,054.62	189,630,660	347,253,555
13.4 Concrete work	27,979.08	59,968,140	122,921,070
13.5 Pavement	34,572.40	42,544,170	120,332,070
13.6 Miscellaneous	1,458.58	1,026,359	4,308,164
Sub total (13)	355,804.97	599,137,023	1,399,698,206
14. La Seca Access Road			
14.1 Earthwork	150,300.40	256,371,380	594,547,280
14.2 Excavation and filling for structures	1,994.80	3,149,848	7,638,148
14.3 Culverts and drainage works	95,573.03	284,094,396	499,133,714
14.4 Concrete work	12,919.87	27,617,828	56,687,536
14.5 Pavement	48,731.90	60,156,570	169,803,345
14.6 Miscellaneous	1,872.90	1,027,785	5,241,810
Sub total (14)	311,392.90	632,417,807	1,333,051,832
15. Los Cuyuyes Access Road			
15.1 Earthwork	871,706.11	1,232,129,650	3,193,468,398
15.2 Excavation and filling for structures	25,801.06	34,608,973	92,661,358
15.3 Culverts and drainage works	625,595.81	2,101,449,761	3,509,040,334
15.4 Concrete work	137,890.46	281,993,024	592,246,559
15.5 Pavement	274,002.50	337,591,120	954,096,745
15.6 Miscellaneous	16,652.00	7,900,191	45,367,191
Sub total (15)	1,951,647.94	3,995,672,719	8,386,880,584
16. Poza Honda Access Road			
16.1 Earthwork	96,746.67	113,577,344	331,257,352

Table 6.3 Detailed construction Cost (2)

US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
16.2 Excavation and filling for structures	0.00	0	0
16.3 Culverts and drainage works	25,148.19	72,716,373	129,299,801
16.4 Concrete work	0.00	0	0
16.5 Pavement	12,682.08	15,641,289	44,175,969
16.6 Miscellaneous	481.52	216,676	1,300,096
Sub total (16)	135,058.46	202,151,682	506,033,217
17. Daule Peripa 138 kV			
17.1 Earthwork	1,559.43	2,118,546	5,627,264
17.2 Concrete work	7,320.94	13,768,392	30,240,507
17.3 Miscellaneous	1,027.81	912,497	3,225,070
Sub total (17)	9,908.18	16,799,435	39,092,840
Total (Package 2)	52,299,841.38	61,809,802,647	179,484,445,752

3. Package 3

Electrical and mechanical works
for Daule Peripa-La Esperanza,
La Esperanza-Poza Honda and
Poza Honda-Mancha Grande Transbasins

3.1 Section-1, Severino pumping station

1. Main pumps and valves	4,799,903.00	414,622,500	11,214,404,250
2. Electric motors	2,645,692.00	561,112,500	6,513,919,500
3. Transformers	616,146.00	130,500,000	1,516,828,500
4. Static condensers	320,375.00	68,062,500	788,906,250
5. Switchgear and control equipment	3,701,108.00	765,000,000	9,092,493,000
6. Ancillary equipment	1,393,039.00	160,553,250	3,294,891,000
7. Miscellaneous materials	798,278.00	169,166,250	1,960,791,750
8. 13.8kV Distribution lines and receiving facilities	182,802.00	38,434,500	449,739,000
9. 138kV Transmission lines	2,534,991.00	2,874,337,935	8,578,057,685
10. Power line carrier equipment	597,228.00	125,685,000	1,469,443,000
11. Intake trashrack and rake	953,250.00	82,591,875	2,227,404,375
12. Intake gates and gantry crane	1,338,425.00	116,246,250	3,127,702,500
13. Discharge penstocks	2,442,346.00	212,238,600	5,707,517,100
Total(3.1)	22,321,583.00	5,718,551,160	55,942,112,910

3.2 Section-2, Conguillo inlet

Outlet facilities	1,672,266.00	150,864,563	3,913,463,063
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Table 6.3 Detailed construction Cost (2)

US\$1=100Yen
=2250S/.

Description	Foreign Currency (US\$)	Local Currency (S/.)	Total (S/.)
3.3 Section-3,Poza Honda inlet			
Outlet facilities	691,976.00	65,667,750	1,622,613,750
3.4 Others			
1.Mandatory maintenance tools	126,222.00	6,543,750	290,543,250
2.Employer's shop inspection	72,000.00	0	162,000,000
3.Instruction to project staff	83,500.00	0	187,875,000
4.Recommended maintenance tools and spare parts	78,000.00	0	175,500,000
Total(3.4)	359,722.00	6,543,750	815,918,250
Total(Package 3)	25,045,547.00	5,941,627,223	62,294,107,973
Total(1 to 3)	106,380,962.80	99,708,054,745	339,065,221,045
4. Land acquisition and compensation	0.00	555,250,000	555,250,000
5. Administration expenses	0.00	6,781,304,000	6,781,304,000
6. Engineering services	10,012,000.00	3,429,000,000	25,956,000,000
Total(1 to 6)	116,392,962.80	110,473,608,745	372,357,775,045
7. Physical contingency	9,385,507.99	10,120,931,769	31,238,324,747
Total(1 to 7)	125,778,470.79	120,594,540,514	403,596,099,792
8. Price escalation	25,434,900.00	0	57,228,525,000
Grand total	151,213,370.79	120,594,540,514	460,824,624,792
Remarks:			
Physical for itea 1,2 and 4,(10%)	8,133,541.58	9,432,167,752	27,732,636,307
Physical for item 3,Package 3,(3%)	751,366.41	178,248,817	1,868,823,240
Physical for item 5 and 6,(5%)	500,600.00	510,515,200	1,636,865,200
Total	9,385,507.99	10,120,931,769	31,238,324,747

Price escalation for Package 3

Upto commencement

During construction: NIL

Price escalation US\$

17,767,600.00

7,667,300.00

(US\$)

Contribution : 2.5% of sum of
direct construction cost, LC

0

8,476,631,000

8,476,631,000

including contingency 10%

0

9,324,294,000

9,324,294,000

Table 7.1 Disbursement Schedule

Philippine Pesos, 1,000 P.

Description	1996		1997		1998		1999		2000		2001			
	P.C. (US\$)	L.C. (P.)	P.C. (US\$)	L.C. (P.)	P.C. (US\$)	L.C. (P.)	P.C. (US\$)	L.C. (P.)	P.C. (US\$)	L.C. (P.)	P.C. (US\$)	L.C. (P.)		
1. Doble Peripala-La Esperanza Transbasin (Package 1)	29,085.57	31,956,625	0.00	0	7,037.02	8,078,375	5,122.81	6,261,282	8,252.38	9,117,277	6,651.95	6,764,039	1,971.41	1,635,552
2. La Esperanza-Poza Honda, Poza Honda-Mancha Grande Transbasin (Package 2)	52,299.84	61,809,303	0.00	0	13,765.26	16,674,714	14,655.78	17,371,224	11,692.97	13,537,624	8,818.24	10,281,262	3,357.49	3,794,979
3. Electrical and mechanical works (Package 3)	25,045.55	5,941,627	0.00	0	0.00	0	4,962.41	1,188,225	2,154.44	222,811	15,572.11	2,228,110	2,356.59	2,302,381
Total (1 to 3)	106,380.96	99,708,055	0.00	0	20,802.28	24,753,089	24,751.00	25,070,331	22,099.79	22,877,712	31,042.40	19,273,411	7,685.49	7,732,912
4. Land Acquisition and Compensation	0.00	555,250	0.00	277,625	0.00	277,625	0.00	0	0	0	0	0	0	0
5. Administration Expenses	0.00	6,781,304	0.00	0	0.00	1,431,164	0.00	1,615,214	0.00	1,452,045	0.00	1,782,376	0.00	590,505
6. Engineering Services	10,012.00	3,429,000	0.00	0	2,112.99	723,075	2,384.72	816,741	2,143.82	734,234	2,631.52	901,267	738.95	253,083
Total (1 to 6)	116,392.96	110,473,609	0.00	277,625	22,915.27	27,185,553	27,135.72	27,502,846	24,243.61	25,063,991	33,673.92	21,957,054	8,424.44	8,486,500
7. Physical Contingency	9,385.51	10,120,932	0.00	27,763	2,185.88	2,610,813	2,246.97	2,545,500	2,166.36	2,381,488	2,145.77	1,905,555	640.53	649,804
Total (1 to 7)	125,778.47	120,594,541	0.00	305,388	25,101.15	29,796,366	29,382.69	30,048,395	26,409.97	27,445,479	35,819.60	23,862,609	9,064.97	9,136,204
8. Price Escalation	25,434.80	0	8.29	0	3,555.99	0	8,147.88	0	5,787.76	0	5,705.83	0	2,219.15	0
Grand Total	151,213.27	120,594,541	8.29	305,388	28,657.14	29,796,366	37,530.57	30,048,395	32,197.73	27,445,479	41,525.52	23,862,609	11,284.12	9,136,204
7. Physical contingency Package 1,2 and 4,102	8,133.54	9,432,168	0.00	27,763	2,080.23	2,500,071	1,978.86	2,338,261	1,994.54	2,265,490	1,547.03	1,704,530	532.88	543,053
Package 3,32	751.37	178,240	0.00	0	0.00	0	148.87	35,650	64.63	6,684	467.16	66,843	70.21	69,012
Admini./2/5,55	500.60	510,515	0.00	0	105.65	107,742	119.24	121,598	107.19	109,314	131.58	134,182	36.94	37,679
Total	9,385.51	10,120,932	0.00	27,763	2,185.88	2,610,813	2,246.97	2,545,500	2,166.36	2,381,488	2,145.77	1,905,555	640.53	649,804
***** 32, Price w/d 1994			0.0611	0.0611	0.0930	0.0930	0.1258	0.1258	0.1595	0.1595	0.1943	0.1943	0.2301	0.2301
8. Price Escalation To convert to US\$ L.C.(P.) affected due to devaluation.	25,434.80	0	8.29	0	3,555.99	0	8,147.88	0	5,787.76	0	5,705.83	0	2,219.15	0
**Escalation, loss 1,2,4,5,6	14,616.87	7,335.10	0.00	8.29	2,334.41	1,231.58	3,053.34	1,611.61	3,839.45	1,929.31	3,843.34	1,862.49	1,527.33	691.42
**Escalation, loss 3,1999year	3,150.73	332.20	0.00	0.00	0.00	0.00	332.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total**	17,767.60	7,667.30												
**Disbursement(US\$)	140,546.07	61,264.87	0.00	144.02	27,435.56	14,474.41	35,586.76	15,298.65	30,265.42	14,127.30	39,063.03	12,468.09	10,592.30	4,752.40

APPENDIX A

DETAILED CONSTRUCTION COST

**CIVIL WORKS FOR DAULE-PERIPA ~ LA ESPERANZA
TRANSBASIN**

SUMMARY OF BILL OF QUANTITIES

Description of Works	Foreign Currency(US\$)	Local Currency(S/.)	Equivalent Price(S/.)
	Amount	Amount	Amount
1. General Items	1,881,130.00	2,570,932.000	6,353,474,500
2. Puente Peripa-La Esperanza Diversion Tunnel	18,638,165.29	17,110,828.770	59,046,703,877
3. Conguillo Work Adit	306,390.84	477,056,729	1,166,436,119
4. El Guasmo Work Adit	503,843.85	805,153,848	1,938,802,511
5. Membrillo Work Adit	225,504.13	353,478,465	880,862,758
6. Conguillo Access road	7,250,668.04	9,959,820,783	26,273,823,870
7. El Guasmo Access road	262,334.81	450,839,122	1,041,092,445
8. Membrillo Outlet Access Road	167,537.46	228,515,158	605,474,446
Grand Total	29,035,574.42	31,956,624,875	97,286,667,326

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
I GENERAL ITEMS									
/01	Construction,operation,maintenance and subsequent removal of the Contractor's offices,staff quarters,repair shops,stores laboratory buildings,motor pools,labor camps,etc.,including land clearing, drainage and adequate fencing	L.S.		348,670.00		1,034,842.000		1,819,449.500	
/02	Installation,operation,maintenance and subsequent removal of temporary water system for and in the contractor's offices,laboratory,staff quarters,repair shops,motor pools,etc.,and construction site	L.S.		210,220.00		359,234.000		832,223,000	
/03	Installation,operation,maintenance and subsequent removal of temporary electric system to the contractor's offices, laboratory,staff quarters,labor camps, repair shops,motor pools,etc.,and construction site	L.S.		272,010.00		138,863,000		750,885,500	
/04	Installation,operation,maintenance and subsequent removal of temporary telecommunication system from the CRM's and supervision's offices to the contractor's offices,quarters,etc.,including wire telephon line,VHF radio communication system and handy talky	L.S.		164,620.00		37,298,000		407,633,000	

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
			Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/05	Construction, operation, maintenance and subsequent removal of the Contractor's temporary construction roads to the various working areas, maintenance of temporary and permanent access roads, and maintenance of the existing roads including temporary supports to strengthen piers of the existing bridges, etc.	L.S.	341,320.00	400,228,000		1,168,199,000		
/06	Provision and maintenance of the laboratory equipment and furnitures including provision of necessary testing experts and labor to assist the supervision	Prov. Sum	230,000.00	328,475,000		846,975,000		
/07	Exploratory boring and excavation of pits	Prov. Sum	0.00	28,600,000		28,600,000		
/08	Monument and memorial	Prov. Sum	0.00	45,000,000		45,000,000		
/09	Construction, operation, maintenance and subsequent hand over to CRM the supervision office, first aid buildings, including land clearing and development, water supply system, sewage and drainage system, electric power supply system, telecommunication system and adequate fencing	L.S.	50,460.00	145,541,000		259,076,000		
/10	Provision, maintenance and subsequent hand over to CRM the supervision office furnitures such as desks, tables, shelves, etc., office equipment such as computer, printer, etc., and survey equipment	Prov. Sum	63,830.00	51,750,000		195,367,500		

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S./.)		Equivalent Price (S./.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/11	Provision, operation and maintenance of the first aid facilities and medicines including operation of medical services by one doctor, two nurses and one clerk	Nil		0.00		0		0	
/12	Provision, operation and maintenance of vehicles for CRM and the supervision	Nil		0.00		0		0	
Total of item 1				1,681,130.00		2,570,932.000		6,353,474,500	

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
2	DAULE PERIPA-LA ESPERANZA DIVERSION TUNNEL								
2.1	CARE OF RIVER AND CONTROL AND REMOVAL OF WATER								
/01	Construction and removal of temporary coffering	U.S.	7,150	12,590.00		11,867,880		40,195,380	
/02	Care of water during construction in open air construction site	U.S.	10,700	8,748.00		21,425,400		41,108,400	
	Subtotal of item 2.1			21,338.00		33,293,280		81,303,780	
2.2	EARTHWORK								
/01	Clearing the site for Inlet and outlet structures	m2	7,150	0.14	1,001.00	214	1,530,100	529	3,782,350
/02	Open-cut excavation, in common, for inlet and outlet structures, outlet channel and anchor block of trash boom	m3	10,700	2.54	27,178.00	2635	28,194,500	8350	89,245,000
/03	Open-cut excavation, in weathered rock, for inlet and outlet structures, outlet channel and anchor block of trash boom	m3	22,590	3.25	73,125.00	3233	72,742,500	10546	237,273,750
/04	Open-cut excavation, in rock, for inlet and outlet structures, outlet channel and anchor block of trash boom	m3	400	7.60	3,120.00	8006	3,202,400	25556	10,222,400
/05	Underground excavation, all classes, in tunnel and inlet structures	m3	163,650	43.46	7,112,229.00	43544	7,125,975,600	141329	23,128,490,850

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/06	Trench excavation, all classes, for drain ditch, catch basin and foundation of wire net fence	m ³	120	2.76	331.20	2942	353,040	3152	1,098,240
/07	Permanent steel support, H-125x125	ton	158	1223.55	193,320.90	138414	21,869,412	2891402	456,841,437
/08	Permanent steel support in inlet shaft, H-200x300	ton	82	1995.76	163,852.32	228099	18,048,118	2685559	220,215,838
/09	D.25mm rock bolt	m	118,390	20.26	2,398,581.40	16196	1,917,444,440	61781	7,314,252,590
/10	Backfilling for inlet and outlet structures and anchor block of trash boom	m ³	290	2.92	1,138.80	3001	1,170,390	9571	3,732,690
/11	Gravel surfacing for inlet structure	m ³	103	17.92	1,845.76	28526	4,071,178	79846	8,224,138
/12	Gravel bedding for drain ditch and catch basin	m ³	4	17.36	69.44	44520	178,080	93590	334,320
/13	Sod facing for inlet and outlet structures	m ²	890	0.33	293.70	4622	4,113,580	4690	4,173,555
/14	Gabion mattress, t=50mm	m ³	60	52.71	3,162.60	32650	1,959,000	173748	10,424,850
	Subtotal of item 2.2				9,905,582.12		9,200,852,338		31,488,412,108
2.3	DRILLING AND GROUTING WORK								
/01	D.45mm drain holes in tunnel	m	6,310	9.13	57,610.40	20217	127,569,270	40760	257,192,445
/02	Backfill grouting in tunnel and inlet structures	m ³	1,180	66.91	78,953.80	30879	36,457,220	181427	214,083,270
/03	D.50mm steel pipes for backfill grouting in tunnel and inlet structures	kg	3,970	1.32	5,240.40	905	3,596,820	3876	15,387,720
/04	Contact grouting for concrete plug	kg	520	0.43	223.60	354	184,080	1322	687,180
/05	D.40mm steel pipes for contact grouting	kg	566	2.06	1,227.76	386	230,056	5021	2,992,515
/06	D.25mm steel pipes for contact grouting	kg	107	2.16	231.12	446	47,722	5306	567,742
	Subtotal of item 2.3				143,486.98		168,065,168		490,910,873

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/-)		Equivalent Price (S/-)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
2.4 CONCRETE WORK									
/01	Concrete, class A, for blockout concrete of inlet structure	m3	30	69.32	2,079.60	88221	2,646,630	244191	7,325,730
/02	Concrete, class C, for floor slab, beam and stair of inlet structure	m3	284	60.74	17,250.16	75735	21,508,740	212400	60,321,600
/03	Concrete, class D, for inlet structure	m3	2,720	61.41	167,035.20	76718	208,672,960	214891	584,502,160
/04	Concrete, class D, for tunnel lining	m3	50,650	73.82	3,738,983.00	88264	4,470,571,600	254359	12,983,283,350
/05	Concrete, class E, for concrete facing walls of inlet and outlet structures	m3	96	59.17	5,680.32	73502	7,056,192	206635	19,838,912
/06	Concrete, class F, for drain ditch and catch basin	m3	33	61.83	2,040.39	77368	2,553,144	216486	7,144,022
/07	Concrete, class C, for plug and secondary concrete in inlet structure	m3	733	52.81	38,709.73	57590	49,543,470	186413	136,640,363
/08	Concrete, class G, for anchor block of trash boom and foundation concrete of wire net fence	m3	201	52.81	10,614.81	57590	13,585,590	186413	37,468,913
/09	Concrete, class H, for levelling concrete of drain ditch and catch basin	m3	5	53.47	267.35	68829	344,145	189137	945,683
/10	Formwork, F1 finish, for concrete of items /03, /04, /05 and /07	m2	612	3.56	2,178.72	11519	7,049,628	19529	11,951,748
/11	Formwork, F1 finish, for concrete of items /06	m2	212	0.25	53.25	15279	3,254,427	15842	3,374,240
/12	Formwork, F1 finish, for concrete of items /08	m2	83	3.56	295.48	11519	856,077	19529	1,520,907
/13	Formwork, F2 finish, for concrete of items /02, /03, /05 and /07	m2	2,570	3.48	8,968.30	20350	52,299,500	29203	72,480,425
/14	Formwork, F3 finish, for concrete of items /01, /03, /05 and /07	m2	877	4.08	3,578.16	25668	22,510,836	34848	30,561,696
/15	Formwork, F3 finish, for concrete of items /06	m2	132	4.08	742.56	25668	4,671,575	34848	6,342,336

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/16	Formwork, 74 finish, for concrete of items /04, tunnel	m ²	74,280	23.36	1,730,196.80	5357	397,810,820	57962	4,304,258,129
/17	Reinforcing bars for concrete work	ton	224.0	357.97	80,185.28	1054028	236,102,272	1859401	416,519,152
/18	Shotcrete in tunnel and inlet structure	m ³	10,120	154.05	1,558,986.00	131410	1,329,889,200	478023	4,837,587,700
/19	Steel wire mesh for item /18	m ²	100,120	3.97	397,476.40	2060	206,247,200	10993	1,100,569,100
/20	Shotcrete with wire mesh for cut slope protection, t=100mm	m ²	3,360	16.05	53,728.80	17417	41,104,120	93530	126,329,620
/21	Shotcrete with wire mesh for cut slope protection, t=50mm	m ²	300	8.02	2,406.00	8709	7,838,100	26754	24,078,600
/22	Anchor bars, D.25mm dia., for concrete facing wall	m	90	13.54	1,218.60	7737	896,330	38202	3,438,180
/23	P.V.C. waterstop, type B, w=200mm	m	72	17.23	1,240.56	7248	521,856	46016	3,313,116
/24	Bituminous coating for contraction joint	m ²	71	0.03	2.13	3986	283,306	4054	287,799
/25	P.V.C. pipe D.50mm dia., for weep hole	m	108	4.17	450.36	1277	137,916	10660	1,151,228
/26	P.V.C. pipe D.75mm dia., for weep hole	m	391	8.16	3,190.56	1726	674,866	20086	7,923,620
/27	P.V.C. pipe D.150mm dia., for weep hole	m	12	23.19	278.28	4932	59,184	57110	686,314
	Subtotal of item 2.4				7,822,801.00		7,088,569,385		24,689,871,635
2.5	MISCELLANEOUS METAL WORK								
/01	Embedded metal	kg	422	0.56	236.32	1198	505,556	2458	1,037,270
/02	Steel pipe handrail in inlet structure	kg	2,100	1.81	3,801.00	1057	2,219,700	5130	10,771,950
/03	Steel ladder with safety cage in inlet structure	kg	113	0.46	51.98	1435	162,155	2470	279,110
/04	Steel steps, round bar, in inlet structure	kg	326	0.65	211.90	415	135,290	1878	612,065
/05	Steel pipes for water level gauge in inlet structure	kg	756	1.48	1,118.88	279	210,924	3609	2,728,404
/06	Grating and hatch cover in inlet structure	kg	6,710	3.61	24,223.10	813	5,555,230	8936	59,957,205

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/07	Fire net fence with gate	kg	100	0.86	86.00	1037	103,700	2972	297,200
	Subtotal of item 2.5				29,729.18		8,792,555		75,683,210
2.6	CONVERGENCY MEASUREMENT								
/01	Measurement of horizontal convergence	nos.	4,680	14.00	65,520.00	11980	56,066,400	43480	203,486,400
/02	Measurement of diagonal convergence	nos.	4,680	14.00	65,520.00	11980	56,066,400	43480	203,486,400
/03	Measurement of roof settlement	nos.	4,680	0.00	0.00	30000	140,400,000	30000	140,400,000
/04	Measurement of invert upheaval	nos.	4,680	0.00	0.00	30000	140,400,000	30000	140,400,000
/05	Stress measurement of rock bolts	nos.	975	28.50	27,787.50	21750	21,206,250	85875	83,728,125
/06	Stress measurement of shotcrete	nos.	975	189.30	184,567.50	91860	89,563,500	517785	504,840,375
/07	Stress measurement of steel support	nos.	60	23.80	1,428.00	20060	1,203,600	73610	4,416,600
	Subtotal of item 2.6				344,823.00		504,906,150		1,280,757,900
2.7	BUILDING WORKS, CONGUILLO INLET SUPERSTRUCTURE								
	(1) Concrete work								
/01	Concret, class C for structure	m3	45	60.74	2,733.30	75735	3,408,075	212400	9,558,000
/02	Concret, class H for covering concrete	m3	5	53.47	267.35	68829	344,145	189137	945,983
/03	Formwork, F1 finish, for concrete of item /01	m2	146	4.67	681.62	42073	6,142,658	52581	7,676,753
/04	Formwork, F3 finish, for concrete of item /01	m2	223	4.67	1,041.41	42073	9,382,279	52581	11,725,452
/05	Reinforcing bars for concrete works	ton	4.6	357.97	1,646.66	1054028	4,848,529	1859401	8,553,518
	(2) Masonry Works								
/06	Hollow concrete masonry to roof parapet	m2	13	0.00	0.00	16205	210,665	16205	210,665

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
	100mm thick including bonding cement mortar								
(3) Bituminous Waterproof Roofing									
/07	3 ply built-up asphalt roofing including asphalt compound joints and required coating	m ²	75	20.00	1,500.00	45000	3,375,000	90000	6,750,000
(4) Plastering Work									
/08	Cement mortar plaster on floor	m ²	40	0.00	0.00	41197	1,647,880	41197	1,647,880
/09	Base cement mortar plaster 20mm thick for built-up roofing	m ²	62	0.00	0.00	4669	289,478	4669	289,478
/10	Cement mortar plaster to interior skirting, H=100mm	m	35	0.00	0.00	467	16,345	467	16,345
/11	Cement mortar plaster to exterior skirting, H=200mm	m	27	0.00	0.00	934	25,218	934	25,218
/12	Cement mortar plaster to interior wall	m ²	146	0.00	0.00	41240	6,021,040	41240	6,021,040
/13	Waterproof cement mortar plaster to parapet including metal wire lath	m ²	31	0.00	0.00	65488	2,030,128	65488	2,030,128
/14	Waterproof cement mortar plaster to roof parapet including metal wire lath	m ²	8	0.00	0.00	271295	2,170,360	271295	2,170,360
(5) Spray Tile Finish									
/15	Spray tile on exposed concrete	m ²	162	0.00	0.00	2419	391,878	2419	391,878
(6) Painting Work									
/16	Oil paint to metal surface	m ²	46	0.00	0.00	3052	140,392	3052	140,392

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
(6) Steel doors									
/17	Steel door leaves and frames including louvers,required hardware,accessories and caulking to outside perimeter	m2	15	0.00	0.00	412266	6,183,390	412266	6,183,990
(7) Aluminium Windows and Louvers									
/18	Aluminium windows and frames including required hardware,accessories & caulking	m2	4	0.00	0.00	104028	416,112	104028	416,112
/19	Aluminium louvers and frames including required hardware,accessories & caulking	m2	2	0.00	0.00	96900	193,800	96900	193,800
(8) Glazing Works									
/20	Glazing clear wire glass,t=6.8mm	m2	4	41.06	164.24	9238	36,952	101623	406,492
(9) Ventilation Work									
/21	Multiblade fan,20160 CHH,35 mmHg,4KW, 220 V,3-phase,60 Hz	no	1	2125.00	2,125.00	239063	239,063	5020313	5,020,313
/22	Intake Louver,1800 X 1500,020160 CHH	no	1	1015.00	1,015.00	114188	114,188	2397938	2,397,938
/23	Ventilating resistors a.UR-VHS,400 X 200,Q=1480 b.UR-VHS,200 X 150,Q=510 c.UR-VHS,200 X 150,Q=180	no	12 4 2	42.50 25.00 25.00	510.00 100.00 50.00	4781 2813 2813	57,372 11,252 5,626	100406 59063 59063	1,204,872 236,252 118,126
/24	Ventilating zinc plated steel a.Cage 22 b.Cage 24	kg	450 616	0.00 0.00	0.00 0.00	6500 6500	2,925,000 4,004,000	6500 6500	2,925,000 4,004,000
			Subtotal of item 2.7	11,834.78		54,631,425		81,259,684	

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total	Unit Price	Total	Unit Price	Total
2.8	ELECTRICAL WORKS								
/01	Lighting panel	set	1	0.00	0.00	241250	241250	241250	241,250
/02	Type A,FL 400 x 2	set	13	401.25	5,216.25	90281	1,173,653	993024	12,910,216
/03	Type B,FL 400 x 1	set	30	267.50	8,025.00	60198	1,805,940	662973	19,862,190
/04	Type F,IL 600 x 1	set	2	200.63	401.26	45142	90,284	496560	993,118
/05	Convenience outlet,20A-127 V	set	7	0.00	0.00	13725	96,075	13735	96,075
/06	Tumbler switch,10A-127 V	set	7	0.00	0.00	11363	79,541	11363	79,541
/07	Three way switch,10A-127V	set	6	0.00	0.00	12286	73,716	12286	73,716
/08	Conduit pipe,16mm dia.(0.1/2")	m	453	2.14	969.42	4815	2,181,195	9630	4,362,390
/09	Conduit pipe,22mm dia.(0.3/4")	m	75	2.70	202.50	6075	455,625	12150	911,250
/10	IV wire,2.0mm2(TW14AG)	m	980	0.00	0.00	1120	1,097,600	1120	1,097,600
/11	IV wire,3.5mm2(TW12AG)	m	230	0.00	0.00	1488	342,240	1488	342,240
/12	CV cable,4c x 3.5mm2(4X12AG)	m	65	2.07	134.55	932	60,580	5590	363,318
/13	Copper conductor,50mm2(1/0 AG)	m	600	2.98	1,788.00	1341	394,500	8046	4,827,600
/14	Copper conductor,38mm2(2 AG)	m	60	1.95	117.00	878	52,680	5268	315,930
	Subtotal of item 2.8				16,853.98		8,554,979		46,476,434
2.9	MISCELLANEOUS								
/01	Trash boom	m	125	684.33	85,541.25	153374	19,246,750	1623717	211,714,563
/02	Dredging of existing inlet channel of Conguillo inlet	m3	3,000	84.36	252,080.00	7508	22,524,000	137319	591,954,000
/03	Staff gauge,3100mm steel pipe,h=20m	L.S.			3,065.00		1,392,740		8,355,490
	Subtotal of item 2.9				341,716.25		43,163,490		812,925,053
	Total of item 2				13,638,165.29		17,110,828,770		59,046,700,677

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
3	CONQUILEO WORK ADIT								
3.1	EARTHWORK								
/01	Clearing the site for adit portal	m2	1,950	0.14	274.40	214	418,440	529	1,026,840
/02	Open-cut excavation, in common, for adit portal	m3	3,070	2.54	7,797.80	2635	8,989,450	8350	25,604,500
/03	Open-cut excavation, in weathered rock, for adit portal	m3	10,800	3.25	35,100.00	3233	34,916,400	10546	113,891,400
/04	Open-cut excavation, in rock, for adit portal	m3	570	7.80	4,446.00	3006	4,563,420	25556	14,566,920
/05	Underground excavation, all classes, in adit	m3	3,560	25.64	91,278.40	78142	278,185,520	135882	483,561,920
/06	Trench excavation, all classes, for drain ditch and catch basin	m3	40	2.76	110.40	2942	117,680	9152	366,080
/07	Permanent steel support, H-125X125	ton	11	1223.55	13,458.05	138414	1,522,554	2891402	31,805,417
/08	D.25mm rock bolt in adit tunnel	m	2,630	20.26	53,283.80	16196	42,695,480	61781	162,484,030
/09	Backfilling for adit portal	m3	140	2.82	408.80	3001	420,140	9571	1,339,240
/10	Backfilling, drain ditch & catch basin	m3	14	2.92	40.88	3001	42,014	9571	132,994
/11	Gravel surfacing	m3	44	17.92	788.48	39526	1,739,144	78846	3,513,224
/12	Gravel bedding for drain ditch and catch basin	m3	1	17.36	17.36	44520	44,520	83580	83,580
/13	Wet rubble masonry	m3	10	56.52	565.20	126107	1,261,070	252277	2,522,770
/14	Sod facing	m2	230	0.03	6.90	4622	1,063,060	4690	1,078,585
	Subtotal of item 3.1				207,577.47		374,979,892		242,029,200
3.2	CONCRETE WORK								
/01	Concrete, class D, for lining of adit tunnel	m3	611	72.41	44,242.51	86715	52,992,865	248638	152,528,512

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equipment Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/02	Concrete, class 2, for concrete facing walls and portal structure	m ³	37	59.17	1,557.59	73502	1,884,554	206835	5,579,132
/03	Concrete, class 2, for drains ditch and catch basin	m ³	10	61.83	618.30	77369	773,689	2,6486	2,164,855
/04	Concrete, class H, for levelling concrete of drain ditch and catch basin	m ³	2	53.47	106.94	68829	127,658	189137	378,273
/05	Formwork, F1 finish, for concrete of item /02	m ²	9	3.56	32.04	11519	103,671	19529	175,761
/06	Formwork, F1 finish, for concrete of item /03	m ²	76	0.25	19.50	15279	1,191,762	15842	1,235,637
/07	Formwork, F2 finish, for concrete of item /02	m ²	105	3.49	359.47	20350	2,096,050	28292	2,904,858
/08	Formwork, F3 finish, for concrete of item /03	m ²	47	4.08	191.76	25663	1,206,396	34848	1,637,356
/09	Formwork, F4 finish, for concrete of item /01, tunnel	m ²	512	14.95	7,654.40	12350	6,323,200	45988	20,545,600
/10	Reinforcing bars for concrete work	ton	1.0	357.97	357.97	1054028	1,654,028	1629461	1,952,461
/11	Shotcrete in adit tunnel	m ³	225	154.05	34,661.25	131410	22,567,250	478923	107,555,963
/12	Steel wire mesh for item /11	m ²	2,120	3.97	8,416.40	2060	4,267,200	10993	27,304,109
/13	Anchor bars, D.25mm for concrete facing wall	m	33	13.54	446.82	7737	255,321	38202	1,269,606
/14	P.V.C. pipe D.50mm for weep hole	m	26	4.17	108.42	1277	33,202	10660	277,147
Subtotal of item 3.2					98,813.37		102,076,837		321,460,826
Total of item 3					306,390.84		477,656,729		1,199,436,113

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
4	EL GUASHO WORK ADIT								
4.1	EARTHWORK								
/01	Clearing the site for adit portal	m2	1,670	0.14	233.80	214	357,380	529	885,430
/02	Open-cut excavation, in common, for adit portal	m3	3,730	2.22	8,280.60	2290	8,541,700	7285	27,173,050
/03	Open-cut excavation, in weathered rock, for adit portal	m3	7,300	2.92	21,316.00	2985	21,060,500	9455	69,021,500
/04	Open-cut excavation, in rock, for adit portal	m3	390	7.42	2,893.80	7607	2,966,730	24302	9,477,780
/05	Underground excavation, all classes, in adit	m3	6,560	27.25	179,416.00	81393	533,938,080	142931	937,624,080
/06	Trench excavation, all classes, for drain ditch and catch basin	m3	40	2.75	110.40	2942	117,680	9152	366,080
/07	Permanent steel support, H-125x125	ton	31	1223.55	37,930.35	138414	4,290,834	2891402	89,633,447
/08	Ø.25mm rock bolt in adit tunnel	m	5,050	20.26	102,313.00	16196	81,789,800	61781	311,994,050
/09	Backfilling for adit portal	m3	140	2.92	408.80	3001	420,140	9571	1,339,940
/10	Backfilling, drain ditch & catch basin	m3	16	2.92	46.72	3001	48,016	9571	153,136
/11	Gravel surfacing	m3	80	17.92	1,433.60	39526	3,162,080	79846	6,387,680
/12	Gravel bedding for drain ditch and catch basin	m3	2	17.36	34.72	44520	89,040	83580	167,160
/13	Net rubble masonry	m3	10	56.52	565.20	126107	1,261,070	253277	2,532,770
/14	Sod facing	m2	500	0.03	15.00	4622	2,311,000	4690	2,344,750
	Subtotal of item 4.1				354,997.69		660,354,050		1,459,098,853
4.2	CONCRETE WORK								
/01	Concrete, class D, for lining of adit tunnel	m3	598	77.13	46,123.74	91881	54,944,838	265424	158,723,253

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/02	Concrete, class E, for concrete facing walls and portal structure	m3	43	63.81	2,743.83	78331	3,368,233	221904	9,541,851
/03	Concrete, class F, for drain ditch and catch basin	m3	13	66.47	864.11	82196	1,068,548	231754	3,012,786
/04	Concrete, class H, for levelling concrete of drain ditch and catch basin	m3	2	58.11	116.22	73657	147,314	204405	408,809
/05	Formwork, F1 finish, for concrete of item /02	m2	3	3.56	10.88	11519	34,557	19529	58,587
/06	Formwork, F1 finish, for concrete of item /03	m2	87	0.25	21.75	15279	1,329,273	15842	1,378,211
/07	Formwork, F2 finish, for concrete of item /02	m2	146	3.48	509.54	28350	2,971,100	28203	4,117,565
/08	Formwork, F3 finish, for concrete of item /03	m2	62	4.08	252.96	25668	1,591,415	34848	2,160,576
/09	Formwork, F4 finish, for concrete of item /01, tunnel	m2	870	14.95	13,006.50	12350	10,744,500	45988	40,009,125
/10	Reinforcing bars for concrete work	ton	2.0	357.97	715.94	1054028	2,108,056	1859461	3,718,921
/11	Shotcrete in adit tunnel	m3	440	154.05	67,782.00	131410	57,820,400	478023	210,329,900
/12	Steel wire mesh for item /11	m2	4,010	3.97	15,919.70	2060	8,260,600	10993	44,079,925
/13	Anchor bars, D.25mm for concrete facing wall	m	48	13.54	649.92	7737	371,376	38202	1,833,696
/14	P.V.C. pipe D.50mm for weep hole	m	31	4.17	129.27	1277	39,587	10660	330,445
	Subtotal of item 4.2				148,846.16		144,799,798		479,703,658
	Total of item 4				503,843.85		805,153,848		1,838,802,511

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
5	MEMBRILLO WORK ADIT								
5.1	EARTHWORK								
/01	Clearing the site for adit portal	m2	1,720	0.14	240.80	214	368,080	529	909,880
/02	Open-cut excavation, in common, for adit portal	m3	2,560	2.54	6,502.40	2635	6,745,600	8350	21,376,000
/03	Open-cut excavation, in weathered rock, for adit portal	m3	4,040	3.25	13,130.00	3233	13,061,320	10546	42,603,820
/04	Open-cut excavation, in rock, for adit portal	m3	210	7.80	1,638.00	8006	1,681,260	25556	5,366,760
/05	Underground excavation, all classes, in adit	m3	2,550	25.64	65,382.00	78142	199,262,100	135832	346,371,600
/06	Trench excavation, all classes, for drain ditch and catch basin	m3	40	2.76	110.40	2942	117,680	9152	366,080
/07	Permanent steel support, H-125x125	ton	8	1223.55	9,788.40	138414	1,107,312	2891402	23,131,212
/08	D.25mm rock bolt in adit tunnel	m	1,750	20.26	35,455.00	16196	28,343,000	61781	108,116,750
/09	Backfilling for adit portal	m3	140	2.92	408.80	3001	420,140	9571	1,339,940
/10	Backfilling, drain ditch & catch basin	m3	15	2.92	43.80	3001	45,015	9571	143,565
/11	Gravel surfacing	m3	78	17.92	1,397.76	39526	3,083,028	79846	6,227,988
/12	Gravel bedding for drain ditch and catch basin	m3	1	17.36	17.36	44520	44,520	83580	83,580
/13	Wet rubble masonry	m3	10	56.52	565.20	126107	1,261,070	253277	2,532,770
/14	Sod facing	m2	440	0.03	13.20	4622	2,033,680	4690	2,063,380
	Subtotal of item 5.1				134,693.12		257,573,805		560,633,325
5.2	CONCRETE WORK								
/01	Concrete, class D, for lining of adit tunnel	m3	611	72.41	44,242.51	86715	52,882,865	249638	152,528,513

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/02	Concrete, class E, for concrete facing walls and portal structure	m3	25	60.11	1,502.75	74484	1,862,100	209732	5,243,288
/03	Concrete, class F, for drain ditch and catch basin	m3	11	62.77	690.47	78349	861,839	219582	2,415,397
/04	Concrete, class H, for levelling concrete of drain ditch and catch basin	m3	2	54.42	108.84	69810	139,620	192255	384,510
/05	Formwork, F1 finish, for concrete of item /02	m2	6	3.56	21.36	11519	69,114	19529	117,174
/06	Formwork, F1 finish, for concrete of item /03	m2	90	0.25	20.00	15279	1,222,320	15842	1,267,320
/07	Formwork, F2 finish, for concrete of item /02	m2	98	3.49	342.02	20350	1,994,300	28203	2,763,845
/08	Formwork, F3 finish, for concrete of item /03	m2	49	4.08	199.92	26668	1,257,732	34848	1,707,552
/09	Formwork, F4 finish, for concrete of item /01, tunnel	m2	894	14.95	13,365.30	12350	11,040,900	45988	41,112,825
/10	Reinforcing bars for concrete work	ton	1.0	357.97	357.97	1054028	1,054,028	1859461	1,859,461
/11	Shotcrete in adit tunnel	m3	153	154.05	23,569.65	131410	20,105,730	478023	73,137,443
/12	Steel wire mesh for item /11	m2	1,480	3.97	5,875.60	2060	3,048,800	10993	16,268,900
/13	Anchor bars, D.25mm for concrete facing wall	m	30	13.54	406.20	7737	232,110	38202	1,148,060
/14	P.V.C. pipe D.50mm for weep hole	m	26	4.17	108.42	1277	33,202	10660	277,147
	Subtotal of item 5.2				90,811.01		95,904,660		300,229,433
	Total of item 5				225,504.13		353,478,465		860,862,758

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
6	CONGUILLO ACCESS ROAD								
6.1	EARTHWORK								
/01	Clearing the site along access road	m2	522,400	0.14	73,136.00	214	111,793,600	529	276,349,600
/02	Open-cut excavation, in common including weathered rock	m3	797,200	3.87	3,085,164.00	3972	3,166,478,400	12680	10,108,097,400
/03	Open-cut excavation, in rock	m3	8,000	8.96	71,680.00	9236	73,868,000	29396	235,168,000
/04	Embankment (Excavated material to embankment portion, incl. transportation upto 500m)	m3	492,200	3.08	1,515,976.00	2764	1,360,440,800	9694	4,771,386,800
/05	Embankment (Excavated material to embankment portion, incl. transportation more than 500m)	m3	233,100	3.23	752,913.00	2926	682,050,600	10194	2,376,104,850
/06	Compaction of original ground	m2	9,460	0.17	1,608.20	164	1,551,440	547	5,169,890
/07	Sod facing	m2	250,100	0.03	7,503.00	4622	1,155,962,200	4690	1,172,843,950
/08	Gabion for slope protection	m3	1,060	62.71	66,472.60	32650	34,609,000	173748	184,172,350
	Subtotal of item 6.1				5,574,452.80		6,586,774,040		19,129,292,840
6.2	EXCAVATION AND FILLING FOR STRUCTURE								
	BRIDGE								
/01	Open-cut excavation, all classes	m3	4,320	2.76	11,923.20	2942	12,709,440	9152	39,536,640
/02	Backfill with selected material	m3	5,460	2.92	15,943.20	3001	16,385,460	9571	52,257,660
/03	Free drainage backfill	m3	123	18.13	2,229.99	30733	3,780,159	71526	8,797,637
/04	Gravel bedding	m3	55	17.36	954.80	44520	2,448,600	83580	4,596,900
	BOX CULVERT								
/05	Open-cut excavation, all classes	m3	593	2.76	1,636.68	2942	1,744,606	9152	5,427,136

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/06	Backfill with selected material	m3	131	2.92	382.52	3001	393.131	9571	1,253,801
/07	Free drainage backfill	m3	210	18.13	3,807.30	30733	6,453,930	71526	15,020,355
/08	Gravel bedding	m3	16	17.36	277.76	44520	712.320	83580	1,337,380
RETAINING WALL									
/09	Open-cut excavation, all classes	m3	4,750	2.76	13,110.00	2942	13,974,500	9152	43,472,000
/10	Backfill with selected material	m3	1,340	2.92	3,912.80	3001	4,021,340	9571	12,825,140
/11	Free drainage backfill	m3	671	18.13	12,165.23	30733	20,621,843	71526	47,993,611
/12	Gravel bedding	m3	211	17.36	3,662.96	44520	9,393,720	83580	17,635,380
Subtotal of item 6.2					70,006.44		92,639,049		250,153,538
6.3 CULVERT AND DRAINAGE WORK									
/01	Open-cut excavation, all classes	m3	6,630	2.76	18,298.80	2942	19,505,460	9152	60,677,760
/02	Backfill with selected material	m3	2,650	2.92	7,738.00	3001	7,952,650	9571	25,363,150
/03	Crushed stone bedding	m3	415	18.13	7,523.95	30733	12,754,195	71526	29,683,083
/04	Reinforced concrete pipe, D.600mm	m	1,810	25.15	45,521.50	129682	234,724,420	186270	337,147,795
/05	Reinforced concrete pipe, D.800mm	m	129	36.31	4,683.99	184213	23,763,477	265911	34,302,455
/06	Reinforced concrete pipe, D.1000mm	m	101	47.58	4,805.58	224410	22,685,410	331465	33,477,965
/07	Perforated drain pipe, D.200mm	m	10,600	9.15	96,990.00	51509	545,395,400	72097	764,222,900
/08	Free drainage material for subdrain	m3	2,210	18.13	40,067.30	30733	67,819,930	71526	158,071,355
/09	Concrete, class E, for pipe culvert and wing walls	m3	1,090	61.03	66,522.70	75434	82,223,060	212752	231,899,135
/10	Concrete, class F, for side ditch and catch basin	m3	3,390	63.69	215,909.10	79299	268,823,610	222602	754,619,085
/11	Concrete, class H, for levelling concrete	m3	35	55.33	1,936.55	70760	2,476,600	195253	5,833,838
/12	Formwork, F1 finish, for concrete of items /09, /10 and /11	m2	3,950	3.56	14,062.00	11519	45,500,050	19529	77,139,550
/13	Formwork, F3 finish, for concrete of items /09 and /10	m2	27,800	3.49	97,022.00	20350	565,730,000	28203	784,029,500

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/14	Reinforcing bars for concrete work	ton	74.0	357.97	26,489.78	1054028	77,998,072	1859461	137,600,077
/15	Gablon mattress,t=500mm	m3	391	62.71	24,519.61	32650	12,766,150	173748	67,935,273
/16	Joint filler,10mm	m2	0	12.15	0.00	4408	0	31746	0
/17	Bituminous coating for contraction joint	m2	0	0.03	0.00	3986	0	4054	0
Subtotal of item 6.3					672,090.86		1,990,798,484		3,503,002,919
6.4	CONCRETE WORK								
/01	Concrete,class A,for bridge slab and girders	m3	311	71.18	22,136.98	90152	28,037,272	250307	77,845,477
/02	Concrete,class E,for bridge abutment and piers	m3	904	61.02	55,171.12	75434	68,192,336	212752	192,327,356
/03	Concrete,class E,for box culvert	m3	361	61.03	22,031.83	75434	27,231,574	212752	76,803,292
/04	Concrete,class H,for leveling concrete	m3	59	55.33	3,264.47	70760	4,174,840	195253	11,519,898
/05	Rubble concrete for retaining wall (concrete class E and rubble/boulder)	m3	4,640	40.29	186,945.60	50287	233,331,680	140940	653,959,280
/06	Formwork,F1 finish,for concrete of items /02,/03,/04 and /05	m2	5,180	3.56	18,440.80	11518	59,563,240	19528	101,155,940
/07	Formwork,F2 finish,for concrete of items /01,/02 and /05	m2	2,850	4.37	12,454.50	15333	43,699,050	25166	71,721,575
/08	Formwork,F3 finish,for concrete of items /02 and /03	m2	644	3.49	2,247.56	20350	13,105,400	28203	18,162,410
/09	Reinforcing bars for concrete work	ton	134.7	357.97	48,218.56	1054026	141,977,572	1859461	250,489,329
/10	Joint filler for culvert,t=10mm	m2	8	12.15	97.20	4403	35,224	31741	253,824
/11	Joint filler for expansion joint of bridge,t=20mm	m2	8	24.31	194.48	5776	46,208	60474	483,788
/12	Bituminous coating for contraction joint	m2	4	0.03	0.12	3886	15,944	4054	16,214
Subtotal of item 6.4					371,203.22		619,510,440		1,454,717,682

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
6.5 PAVEMENT									
/01	Improved subgrade material, not less than corrected CBR 12	m3	18,610	4.72	87,839.20	4991	92,882,510	15611	290,520,710
/02	Graded crushed stone subbase, not less than corrected CBR 60	m3	20,470	21.24	434,782.80	27261	558,032,670	75051	1,536,293,970
/03	Transportation of improved subgrade material	m3	9,310	0.47	4,375.70	499	4,645,680	1557	14,491,015
Subtotal of item 6.5					526,997.70		655,560,870		1,841,305,695
6.6 MISCELLANEOUS									
/01	Guardrail	m	80	73.56	5,884.80	33103	2,648,240	188613	15,889,040
/02	Warning signs	nos	90	120.38	10,834.20	54169	4,875,210	325024	29,252,160
/03	Bearing, fixed type	nos	8	262.42	2,099.36	59044	472,352	649489	5,195,912
/04	Bearing, movable type	nos	8	262.42	2,099.36	59044	472,352	649489	5,195,912
/05	Steel handrails for bridge deck	kg	3,780	1.81	6,859.80	1057	4,006,030	5130	19,440,805
/06	P.V.C. drain pipes, D.100mm	m	7	12.06	84.42	2164	15,148	29299	205,093
/07	P.V.C. pipe, D.75mm for weep hole	m	973	8.16	7,939.68	1726	1,679,398	20086	19,543,678
/08	Dowel bars, D.22mm, round bar	ton	0.2	336.00	67.20	1076250	215,250	1832250	366,450
/09	Anchor rod with steel pipe, D.32mm for bridge shoe	kg	130	0.37	48.10	1184	153,920	2017	262,145
Subtotal of item 6.6					35,917.02		14,537,900		95,351,195
Total of item 6					7,250,668.04		9,959,820,783		26,273,823,870

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
7	EL GUASMO ACCESS ROAD								
7.1	EARTHWORK								
/01	Clearing the site along access road	m2	22,200	0.14	3,248.00	214	4,984,800	529	12,272,800
/02	Open-cut excavation, in common including weathered rock	m3	400	2.57	1,028.00	2586	1,034,400	8369	3,347,400
/03	Open-cut excavation, in rock	m3	100	7.42	742.00	7607	760,700	24302	2,430,200
/04	Embankment (Excavated material to embankment portion, incl. transportation upto 500m)	m3	21,800	3.08	67,144.00	2764	60,255,200	9894	211,329,200
/05	Embankment (Excavated material to embankment portion, incl. transportation more than 500m)	m3	20,700	3.82	79,074.00	3555	73,588,500	12150	251,505,000
/06	Compaction of original ground	m2	450	0.17	76.50	164	73,800	547	245,925
/07	Sod facing	m2	13,400	0.03	402.00	4622	61,934,800	4690	62,839,300
/08	Gabion for slope protection	m3	0	62.71	0.00	32650	0	173748	0
	Subtotal of item 7.1				151,714.50		202,612,200		543,969,825
7.2	EXCAVATION AND FILLING FOR STRUCTURE								
	BRIDGE								
/01	Open-cut excavation, all classes	m3	0	2.76	0.00	2942	0	9152	0
/02	Backfill with selected material	m3	0	2.92	0.00	3001	0	9571	0
/03	Free drainage backfill	m3	0	18.13	0.00	30733	0	71526	0
/04	Gravel bedding	m3	0	17.36	0.00	44520	0	83580	0
	BOX CULVERT								
/05	Open-cut excavation, all classes	m3	316	2.75	872.16	2942	929,672	9152	2,892,032

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/06	Backfill with selected material	m3	69	2.92	201.48	3001	207,069	9571	560,399
/07	Free drainage backfill	m3	110	18.13	1,994.30	30733	3,380,630	71526	7,867,805
/08	Gravel bedding	m3	8	17.36	138.88	44520	356,160	83580	668,640
RETAINING WALL									
/09	Open-cut excavation, all classes	m3	0	2.76	0.00	2942	0	9152	0
/10	Backfill with selected material	m3	0	2.92	0.00	3001	0	9571	0
/11	Free drainage backfill	m3	0	18.13	0.00	30733	0	71526	0
/12	Gravel bedding	m3	0	17.36	0.00	44520	0	83580	0
Subtotal of item 7.2					3,206.82		4,873,531		12,088,876
7.3 CULVERT AND DRAINAGE WORK									
/01	Open-cut excavation, all classes	m3	589	2.76	1,625.64	2942	1,732,838	9152	5,390,528
/02	Backfill with selected material	m3	272	2.92	794.24	3001	816,272	9571	2,603,312
/03	Crushed stone bedding	m3	37	18.13	670.81	30733	1,137,121	71526	2,646,444
/04	Reinforced concrete pipe, D.600mm	m	179	25.15	4,501.85	129682	23,213,078	186270	33,342,241
/05	Reinforced concrete pipe, D.800mm	m	17	36.31	617.27	184213	3,131,621	265911	4,520,479
/06	Reinforced concrete pipe, D.1000mm	m	0	47.58	0.00	224410	0	331465	0
/07	Perforated drain pipe, D.200mm	m	787	9.15	7,201.05	51509	40,537,583	72097	56,739,946
/08	Free drainage material for subdrain	m3	164	18.13	2,973.32	30733	5,040,212	71526	11,730,182
/09	Concrete, class E, for pipe culvert and wing walls	m3	98	61.03	5,980.94	75434	7,392,532	212752	20,849,647
/10	Concrete, class F, for side ditch and catch basin	m3	279	63.69	17,769.51	79299	22,124,421	222602	62,105,819
/11	Concrete, class H, for levelling concrete	m3	7	55.33	387.31	70760	495,320	195253	1,366,768
/12	Formwork, F1 finish, for concrete of items /09, /10 and /11	m2	418	3.56	1,488.08	11519	4,814,942	18529	8,163,122
/13	Formwork, F3 finish, for concrete of items /09 and /10	m2	2,310	3.49	8,061.90	20350	47,008,500	28203	65,147,775

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/14	Reinforcing bars for concrete work	ton	7.0	357.97	2,505.79	1054028	7,378,196	1859461	13,016,224
/15	Gabion mattress, t=500mm	m3	92	52.71	5,769.32	32650	3,003,800	173748	15,984,770
/16	Joint filler, t=10mm	m2	0	12.15	0.00	4408	0	31746	0
/17	Bituminous coating for contraction joint	m2	0	0.03	0.00	3986	0	4054	0
Subtotal of item 7.3					80,347.03		167,826,436		303,607,254
7.4	CONCRETE WORK								
/01	Concrete, class A, for bridge slab and girders	m3	0	71.18	0.00	90152	0	250307	0
/02	Concrete, class E, for bridge abutment and piers	m3	0	61.03	0.00	75434	0	212752	0
/03	Concrete, class E, for box culvert	m3	210	61.03	12,816.30	75434	15,841,140	212752	44,677,815
/04	Concrete, class H, for levelling concrete	m3	16	55.33	885.28	70760	1,132,160	195253	3,124,040
/05	Rubble concrete for retaining wall (concrete class E and rubble/boulder)	m3	0	40.29	0.00	50287	0	140940	0
/06	Formwork, F1 finish, for concrete of items /02, /03, /04 and /05	m2	285	3.56	1,014.60	11518	3,282,630	19528	5,565,480
/07	Formwork, F2 finish, for concrete of items /01, /02 and /05	m2	0	4.37	0.00	15333	0	25166	0
/08	Formwork, F3 finish, for concrete of items /02 and /03	m2	321	3.49	1,120.29	20350	6,532,350	28203	9,053,003
/09	Reinforcing bars for concrete work	ton	17.0	357.97	6,085.49	1054028	17,918,476	1859461	31,610,829
/10	Joint filler for culvert, t=10mm	m2	13	12.15	157.95	4403	57,239	31741	412,627
/11	Joint filler for expansion joint of bridge, t=20mm	m2	0	24.31	0.00	5776	0	60474	0
/12	Bituminous coating for contraction joint	m2	9	0.03	0.27	3986	35,874	4054	36,482
Subtotal of item 7.4					22,080.18		44,799,869		94,480,274

BILL OF QUANTITIES

Item No.	Description of Works	Unit Quantity		Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
		Unit	Quantity	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
7.5 PAVEMENT									
/01	Improved subgrade material, not less than corrected CBR 12	m3	834	4.72	3,936.48	4991	4,162,494	15611	13,019,574
/02	Graded crushed stone subbase, not less than corrected CBR 60	m3	943	21.24	20,029.32	27261	25,707,123	75051	70,773,093
/03	Transportation of improved subgrade material	m3	420	0.47	197.40	499	209,580	1557	653,730
Subtotal of item 7.5					24,163.20		30,079,197		84,446,397
7.6 MISCELLANEOUS									
/01	Guardrail	m	0	73.56	0.00	33103	0	198613	0
/02	Warning signs	nos	6	120.38	722.28	54169	325,014	325024	1,950,144
/03	Bearing, fixed type	nos	0	262.42	0.00	59044	0	649489	0
/04	Bearing, movable type	nos	0	262.42	0.00	59044	0	649489	0
/05	Steel handrails for bridge deck	kg	0	1.81	0.00	1057	0	5130	0
/06	P.V.C. drain pipes, D.100mm	m	0	12.06	0.00	2184	0	29299	0
/07	P.V.C. pipe, D.75mm for weephole	m	0	8.16	0.00	1726	0	20086	0
/08	Dowel bars, D.22mm, round bar	ton	0.3	336.00	100.80	1076250	322,875	1832250	549,675
/09	Anchor rod with steel pipe, D.32mm for bridge shoe	kg	0	0.37	0.00	1184	0	2017	0
Subtotal of item 7.6					823.08		647,889		2,499,819
Total of item 7					262,334.81		450,839,122		1,041,092,445

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/-)		Equivalent Price(S/-)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
8	HEMBRILLO OUTLET ACCESS ROAD								
8.1	EARTHWORK								
/01	Clearing the site along access road	m2	5,400	0.14	756.00	214	1,155,600	529	2,856,600
/02	Open-cut excavation, in common including weathered rock	m3	2,240	2.57	5,756.80	2586	5,792,640	8369	18,745,440
/03	Open-cut excavation, in rock	m3	100	7.42	742.00	7807	760,700	24302	2,430,200
/04	Embankment (Excavated material to embankment portion, incl. transportation upto 500m)	m3	7,200	3.08	22,176.00	2764	19,900,800	9694	69,796,800
/05	Embankment (Excavated material to embankment portion, incl. transportation more than 500m)	m3	0	3.23	0.00	2826	0	10194	0
/06	Compaction of original ground	m2	130	0.17	22.10	164	21,320	547	71,045
/07	Sod facing	m2	2,800	0.03	87.00	4622	13,403,800	4690	13,599,550
/08	Gabion for slope protection	m3	561	62.71	35,180.31	32650	18,316,650	173748	97,472,348
	Subtotal of item 8.1				64,720.21		59,351,510		204,971,983
8.2	EXCAVATION AND FILLING FOR STRUCTURE								
	BRIDGE								
/01	Open-cut excavation, all classes	m3	3,220	2.76	8,887.20	2942	9,473,240	9152	29,469,440
/02	Backfill with selected material	m3	2,710	2.92	7,913.20	3001	8,132,710	9571	25,937,410
/03	Free drainage backfill	m3	62	18.13	1,124.06	30733	1,905,446	71526	4,434,581
/04	Gravel bedding	m3	27	17.36	468.72	44520	1,202,040	83580	2,256,660
	80X CULVERT								
/05	Open-cut excavation, all classes	m3	0	2.76	0.00	2942	0	9152	0

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/06	Backfill with selected material	m3	0	2.92	0.00	3001	0	9571	0
/07	Free drainage backfill	m3	0	18.13	0.00	30733	0	71526	0
/08	Gravel bedding	m3	0	17.36	0.00	44520	0	83580	0
RETAINING WALL									
/09	Open-cut excavation.all classes	m3	0	2.76	0.00	2942	0	9152	0
/10	Backfill with selected material	m3	0	2.92	0.00	3001	0	9571	0
/11	Free drainage backfill	m3	0	18.13	0.00	30733	0	71526	0
/12	Gravel bedding	m3	0	17.36	0.00	44520	0	83580	0
Subtotal of item 8.2				18,393.18			20,713,436		62,098,091
8.3 CULVERT AND DRAINAGE WORK									
/01	Open-cut excavation.all classes	m3	75	2.76	207.00	2942	220,650	9152	686,400
/02	Backfill with selected material	m3	57	2.92	166.44	3001	171,057	9571	545,547
/03	Crushed stone bedding	m3	2	18.13	36.26	30733	61,466	71526	143,051
/04	Reinforced concrete pipe,D.600mm	m	10	25.15	251.50	129682	1,296,820	186270	1,862,695
/05	Reinforced concrete pipe,D.800mm	m	0	36.31	0.00	184213	0	265911	0
/06	Reinforced concrete pipe,D.1000mm	m	0	47.58	0.00	224410	0	331465	0
/07	Perforated drain pipe,D.200mm	m	30	9.15	274.50	51509	1,545,270	72097	2,162,895
/08	Free drainage material for subdrain	m3	7	18.13	126.91	30733	215,131	71526	500,679
/09	Concrete.class E.for pipe culvert and wing walls	m3	4	61.03	244.12	75434	301,736	212752	851,006
/10	Concrete.class f.for side ditch and catch basin	m3	59	63.69	3,757.71	75289	4,678,641	222602	13,133,489
/11	Concrete.class H.for levelling concrete	m3	1	55.33	55.33	70760	70,760	195253	195,253
/12	Formwork.F1 finish,for concrete of items /09,/10 and /11	m2	32	3.56	113.92	11519	368,608	19529	524,928
/13	Formwork.F3 finish,for concrete of items /09 and /10	m2	472	3.49	1,647.28	20350	9,605,200	28203	13,311,580

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency (US\$)		Local Currency (S/.)		Equivalent Price (S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
/14	Reinforcing bars for concrete work	ton	1.0	357.97	357.97	1054028	1,054,028	1859461	1,859,461
/15	Gabion mattress, t=500mm	m3	2	62.71	125.42	32650	65,300	173748	347,495
/16	Joint filler, 10mm	m2	0	12.15	0.00	4408	0	31746	0
/17	Bituminous coating for contraction joint	m2	0	0.03	0.00	3986	0	4054	0
Subtotal of item 8.3					7,364.36		19,854,667		36,224,477
8.4	CONCRETE WORK								
/01	Concrete, class A, for bridge slab and girders	m3	156	71.18	11,104.98	80152	14,063,712	250307	39,047,892
/02	Concrete, class E, for bridge abutment and piers	m3	452	61.03	27,585.56	75434	34,096,168	212752	96,163,678
/03	Concrete, class E, for box culvert	m3	0	61.03	0.00	75434	0	212752	0
/04	Concrete, class H, for levelling concrete	m3	14	55.33	774.62	70760	880,640	195253	2,733,535
/05	Rubble concrete for retaining wall (concrete class E and rubble/boulder)	m3	0	40.29	0.00	50287	0	140940	0
/06	Formwork, F1 finish, for concrete of items /02, /03, /04 and /05	m2	262	3.56	932.72	11518	3,017,716	19528	5,116,336
/07	Formwork, F2 finish, for concrete of items /01, /02 and /05	m2	778	4.37	3,399.86	15333	11,929,074	25166	19,578,759
/08	Formwork, F3 finish, for concrete of items /02 and /03	m2	0	3.49	0.00	20350	0	28203	0
/09	Reinforcing bars for concrete work	ton	51.3	357.97	18,363.86	1054028	54,071,636	1859461	95,390,324
/10	Joint filler for culvert, t=10mm	m2	0	12.15	0.00	4403	0	31741	0
/11	Joint filler for expansion joint of bridge, t=20mm	m2	4	24.31	97.24	5776	23,104	60474	241,894
/12	Bituminous coating for contraction joint	m2	0	0.03	0.00	3986	0	4054	0
Subtotal of item 8.4					62,257.94		118,192,050		258,272,418

BILL OF QUANTITIES

Item No.	Description of Works	Unit	Quantity	Foreign Currency(US\$)		Local Currency(S/.)		Equivalent Price(S/.)	
				Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
8.5 PAVEMENT									
/01	Improved subgrade material, not less than corrected CBR 12	m3	121	4.72	571.12	4991	603,911	15611	1,888,931
/02	Graded crushed stone subbase, not less than corrected CBR 50	m3	212	2.24	4,502.88	27261	5,779,332	75051	15,910,812
/03	Transportation of improved subgrade material	m3	60	0.47	28.20	499	29,940	1557	93,390
Subtotal of item 8.5					5,102.20		6,413,183		17,893,133
8.6 MISCELLANEOUS									
/01	Guardrail	m	40	73.56	2,942.40	33103	1,324,120	198613	7,944,520
/02	Warning signs	nos	2	120.38	240.76	54169	108,338	325024	650,048
/03	Bearing, fixed type	nos	4	262.42	1,049.68	59044	236,176	649489	2,597,956
/04	Bearing, movable type	nos	4	262.42	1,049.68	59044	236,176	649489	2,597,956
/05	Steel handrails for bridge deck	kg	1,900	1.81	3,439.00	1057	2,008,300	5130	9,746,050
/06	P.V.C. drain pipes, D.100mm	m	4	12.06	48.24	2164	8,656	29299	117,196
/07	P.V.C. pipe, D.75mm for weephole	m	111	8.16	905.76	1726	191,536	20086	2,229,546
/08	Dowel bars, D.22mm, round bar	ton	0.0	336.00	0.00	1076250	0	1832250	0
/09	Anchor rod with steel pipe, D.32mm for bridge shoe	kg	65	0.37	24.05	1184	76,960	2017	131,073
Subtotal of item 8.6					9,699.57		4,190,312		26,014,345
Total of item 8					167,537.46		228,515,158		605,474,446
Grand Total of Package 1					29,035,574.42		31,956,624,875		97,286,667,324