

No. 2

**ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE AND COOPERATIVES
KINGDOM OF THAILAND**

THE BANG PAKONG DIVERSION DAM PROJECT

BIDDING DOCUMENTS

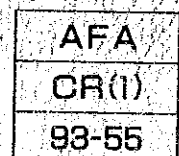
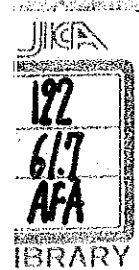
VOLUME V : BILL OF QUANTITIES

(Part-1 Main Works)

NOVEMBER 1993

Prepared by :

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SANYU CONSULTANTS INC.**



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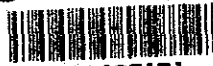
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BIDDING DOCUMENTS - VOLUME V:
BILL OF QUANTITIES (Part - 1 Main Works)
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PREAMBLE

References

1. This Bill of Quantities shall be read in conjunction with the Instructions to Bidders, the Conditions of Contract, the Specifications and the Drawings.

Description of Works and Materials

2. General directions and description of works and materials as stated in the Specifications and the Conditions of Contract are not necessarily repeated in the Bill of Quantities.

Quantities in the Bill of Quantities

3. The quantities of works and materials in the Bill of Quantities are an estimate only and shall not be considered as limiting or extending the work to be done and the materials to be supplied by the Contractor. All the work done and materials supplied by the Contractor will be measured according to the procedures laid down in the Specifications and paid for at the unit prices quoted in the Bill of Quantities.

Unit Prices and Prices entered in the Bill of Quantities

4. Unless expressly stated otherwise, all unit prices and prices entered in the Bill of Quantities shall be deemed to have included the followings:-
 - (i) Labor and all costs in connection with the execution of the work.
 - (ii) The supply of materials, goods, storage and all costs in connection therewith including waste and delivery to Site.
 - (iii) Plant, equipment and all costs in connection therewith.
 - (iv) All temporary works. (except temporary works separately itemized or expressly included in other items in the Bill of Quantities).
 - (v) All the requirement of the Conditions of Contract and the Specifications which are not specifically priced elsewhere.
 - (vi) All general obligations, liabilities and risks involved in the execution of the Works set forth or reasonably implied in the documents on which the bid is based.

Lump Sum
(L.S.)

5. Unless expressly indicated in the Specifications, payment against the item of a lump sum (L.S.) unit in the Bill of Quantities will be made by equal monthly installments commencing from the time the work, service or obligation included in the item has started, and spread over the remainder of time for the completion of the Works or any extended time.

If the Contractor is involved in expenses greater than the aggregated monthly payments on any date the Employer may authorize payment of such additional expenses provided that the aggregated payments in respect of the item do not exceed the sum in the Bill of Quantities and that any resulting payments outstanding after payment of the aforementioned expenses will be spread over the remainder of time for completion of the Works or any extended time.

Contingencies

6. The sum provided in the Bill of Quantities for contingencies is provisional only and will be used in whole or in part, as required, to meet the cost of any Additional/Extra Works as may be ordered from time to time by the Employer.

Unpriced
Items

7. The Contractor shall fulfill all the requirements and obligations or all clauses of the Conditions of Contract and Specifications. An unit price or price shall be inserted against each item in the Bill of Quantities. Items against which no unit price or price has been inserted shall be deemed to be covered by other unit prices or prices in the Bill of Quantities, the cost of such requirements or obligations shall be deemed to be included in other items in the Bill of Quantities. Unit prices entered in the Bill of Quantities shall further be deemed to include for everything necessary to complete and finish the work to the full extent of the Contract and all works shall be completed and made ready for use to the entire satisfaction of the Employer without extra payment.

Minimum Unit of
Measurement for
Payment

8. Quantities for each item in the Bill of Quantities shall be measured to the nearest unit or fraction of a unit shown in the following table.

MINIMUM UNIT OF MEASUREMENT FOR PAYMENT

Description of Work or Pay Item No.	Minimum Unit or Fraction
Employer's & Consultant's offices & residences (Pay item Nos. 1301 & 1302)	0.1 month
Field Laboratory (Pay item No. 1303)	0.1 month
Provision, operation & maintenance of vehicles	0.1 vehicle-month
Provision, operation & maintenance of motor launch	0.1 boat-month
Stripping	1 m ³
Excavation	1 m ³
Fill & backfill, Embankment of earthfill zone	1 m ³
Sand & gravel bedding, Gravel pavement	1 m ³
Sand bedding, Gravel bedding, Sand	1 m ³
Riprap, Embankment of rockfill zone	1 m ³
Concrete block river bed protection	0.1 m ²
Sodding	1 m ²
Sub base of road	1 m ³
Base course of road	0.1 m ³
Asphalt concrete surface of road	1 m ²
Concrete, all classes	0.1 m ³
Reinforcing bar, Sheet pile	0.01 ton
Form work	0.1 m ²
S.P. pile, P.C. pile, R.C. pile, Sand compaction pile	0.1 m
Steel pipe, R.C. pipe, PVC pipe	0.1 m
Miscellaneous metal	1 kg
Expansion joint, Contraction joint	0.1 m ²
Waterstop, Barbed wire fence	0.1 m

Abbreviations

9. The following abbreviations are used in the Bill of Quantities.

mm	:	Millimeter
cm	:	Centimeter
m	:	Metre
m ²	:	Square metre
m ³	:	Cubic metre
kg	:	Kilogramme
ton	:	Metric ton
No.	:	Number
∅	:	Diameter
t	:	Thickness
H	:	Height
L	:	Length
W	:	Width
KV	:	Kilovolt (s)
KVA	:	Kilovolt ampere
Kw	:	Kilowatt
PS	:	French horsepower
R.C.	:	Reinforced Concrete
P.C.	:	Precast Concrete
PVC	:	Polyvinyl Chloride
L.S.	:	Lump Sum
P.S.	:	Provisional Sum
S.P.	:	Steel Pipe
ITV	:	Industrial Television System

Pay Item
Coverage

10. The description of work given in the Bill of Quantities shall not be considered as limiting the work included in each item in the Bill of Quantities. The item coverage of all items in the Bill of Quantities shall be as stated in the Specifications. All unit prices and prices shall be deemed to include for complying with the requirements specified in the Specifications.

Pay Item
Application

11. Unless expressly indicated in the Specifications, the application of pay items in the Bill of Quantities to the work done by the Contractor for payment shall be as follows:

- Payments for general requirement, common temporary works and Employer's & Consultant's facilities will be made under the respective pay items in Division-1 of the Bill of Quantities (Part - 1 Main Works).
- Payment for the construction works of BANG PAKONG DIVERSION DAM & DIVERSION CANAL will be made under the respective pay items in Division-2 of the Bill of Quantities (Part - 1).
- Payment for the construction works of CLOSURE DAM will be made under the respective pay items in Division-3 of the Bill of Quantities (Part - 1).
- Payment for the construction works of ROAD & ROAD BRIDGE, including the construction of sub-base, base course and asphalt concrete surface in the sites of Bang Pakong diversion dam, diversion canal and closure dam, will be made under the respective pay items in Division-4 of the Bill of Quantities (Part - 1). But, payment for the earth works for the Road & Road Bridge construction carried out in the site between STA.2+ 590 and STA. 2+ 950 on the alignment of the road will be made under the respective pay items in Divisions 2 and 4 of the Bill of Quantities (Part - 1), as specified in table A.
- Payment for the construction works of PUMPING STATION will be made under the respective pay items in Division-5 of the Bill of Quantities (Part - 1).
- Payment for the construction works of CONTROL SYSTEM & ELECTRICAL FACILITIES will be made under the respective pay items in Division-6 of the Bill of Quantities (Part - 1).
- Payment for the construction works of BUILDING will be made under the respective pay items in the Bill of Quantities (Part - 2 Building Works). But, payment for pump house, hoist houses, observation houses, electric house and control house will be made under the respective pay items in the Bill of Quantities (Part - 1).

- The application of pay items to the earth works done for Main Works shall be as indicated in the following table.

TABLE A. PAY ITEM APPLICATION TO EARTH WORKS FOR MAIN WORKS

Description of Work Construction Work	Stripping	Excavation (Open Cut)	Fill & Backfill	Fill & Backfill with Selected Material	Sodding	Sand and Gravel Bedding for Structure
Bang Pakong * Diversion Dam & Road Bridge	2201	2202	2204	2205	2206	2208
Diversion Canal	2201	2203**	2204	2205	2206	2208
Closure Dam	3201	3201**	-	-	-	-
Road	4201	4202	-	4203	4204	4210
Pumping Station	5201	5202**	-	5203	5206	5204

* including the construction works of the road carried out in the site between STA. 2 + 590 and STA. 2 + 950 on the alignment of the road.

** including payment for dredging excavation.

Description of Work Construction Work	Riprap	Embankment of Earth-fill Zone	Embankment of Rock-fill Zone	Sand and Gravel Bedding for Riprap	Sand Mat	Sub-base
Bang Pakong * Diversion Dam & Road Bridge	2209	-	-	-	-	4205
Diversion Canal	2209	-	-	-	-	4205
Closure Dam	3204	3202	3203	3205	3206	4205
Road	-	-	-	-	-	4205
Pumping Station	5205	-	-	-	-	-

Description of Work Construction Work	Base Course	Asphalt Concrete Surface t = 5 cm	Asphalt Concrete Surface t = 3 cm	Sand Bedding	Gravel Pavement
Bang Pakong * Diversion Dam & Road Bridge	4206	4207	4208	-	2207
Diversion Canal	4206	4207	4208	-	2207
Closure Dam	4206	4207	4208	-	-
Road	4206	4207	4208	4216	-
Pumping Station	5228	5227	-	5231	5229

Application of Escalation Formula 12. The application of the escalation formula to the Pay Items in the Bill of Quantities (Part - 1 Main Works) shall be as indicated in the following table.

Column A : Pay Item No. in the Bidding Documents Volume V :
Bill of Quantities (Part - 1 Main Works)

Column B : No. of Applicable Escalation Formula
(For the escalation formulae, see the Bidding Documents
Volume II : I. Supplementary Conditions of Contract.)

A	B	A	B	A	B
Pay Item No.	Escalation Formula	Pay Item No.	Escalation Formula	Pay Item No.	Escalation Formula
1101	-	2222	-	3209	(2)
1201	-	2223	-	3210	-
1301	-	2224	-		
1302	-	2225	-	4101	-
1303	-	2226	-	4201	(2)
1304	-	2227	-	4202	(2)
1305	-	2228	-	4203	(2)
1306	-	2229	-	4204	(2)
1307	-	2230	-	4205	(2)
1308	-	2231	-	4206	(2)
		2232	(10)	4207	(7)
2101	-	2233	-	4208	(7)
2201	(2)	2234	-	4209	-
2202	(2)	2235	-	4210	(2)
2203	(2)	2236	(1)	4211	(10)
2204	(2)	2237	(1)	4212	(10)
2205	(2)	2238	(1)	4213	-
2206	(2)	2239	-	4214	-
2207	(2)	2301	-	4215	-
2208	(2)	2302	-	4216	(2)
2209	(3)	2303	-	4217	(16)
2210	(16)	2304	-	4218	(16)
2211	(16)	2305	-	4219	(15)
2212	(16)			4220	-
2213	(16)	3101	-	4221	-
2214	(16)	3201	(2)	4222	-
2215	(15)	3202	(2)	4223	-
2216	-	3203	(3)	4224	-
2217	-	3204	(3)	4225	-
2218	-	3205	(2)	4226	-
2219	-	3206	(2)	4227	-
2220	(15)	3207	-	4228	(10)
2221	-	3208	-		

A	B	A	B	A	B
Pay Item	Escalation	Pay Item	Escalation	Pay Item	Escalation
No.	Formula	No.	Formula	No.	Formula
5101	-	5308	-		
5201	(2)	5309	-		
5202	(2)	5310	-		
5203	(2)	5311	-		
5204	(2)	5312	-		
5205	(3)				
5206	(2)	5401	-		
5207	(16)	5402	-		
5208	(16)	5403	-		
5209	(16)	5404	-		
5210	(16)	5405	-		
5211	(15)	5406	-		
5212	-	5407	-		
5213	-	5408	-		
5214	-	5409	-		
5215	-	5410	-		
5216	-	5411	-		
5217	-	5412	-		
5218	-	5413	-		
5219	-	5414	-		
5220	-				
5221	-	6101	-		
5222	-	6201	-		
5223	(21)	6202	-		
5224	-	6203	-		
5225	(9)	6204	-		
5226	(9)	6205	-		
5227	(7)	6206	-		
5228	(2)	6207	-		
5229	(2)	6208	-		
5230	-	6301	-		
5231	(2)	6302	-		
5232	-	6401	-		
5233	-	6501	-		
5234	-	6601	-		
5235	-	6602	-		
5236	-	6603	-		
5237	-	6604	-		
5238	(14)	6605	-		
5239	(1)	6606	-		
		6701	-		
5301	-	6801	-		
5302	-	7001	-		
5303	-	7002	-		
5304	-	7003	-		
5305	-				
5306	-				
5307	-				

SUMMARY OF BILL OF QUANTITIES

		<u>Amount</u>
BILL OF QUANTITIES (Part-1 Main Works)	₱	
BILL OF QUANTITIES (Part-2 Building Works)	₱	
<hr/>		
Sub - total	₱	
Sum for Contingencies	₱	150,000,000
<hr/>		
Total Bid Price	₱	<u> </u>

BILL OF QUANTITIES (Part - 1 Main Works)

SUMMARY

			<u>Amount</u>
DIVISION-1	General	Baht	
DIVISION-2	Bang Pakong Diversion Dam & Diversion Canal	Baht	
DIVISION-3	Closure Dam	Baht	
DIVISION-4	Road & Road Bridge	Baht	
DIVISION-5	Pumping Station	Baht	
DIVISION-6	Control System & Electrical Facilities	Baht	
DIVISION-7	Provisional Sum	Baht	35,000,000
<hr/>			
	Total	Baht	<u> </u>

DIVISION-1 GENERAL

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 1.1 General Requirement</u>					
1101	General requirement	L.S.			
<u>Section 1.2 Common Temporary Works</u>					
1201	Common temporary works	L.S.			
<u>Section 1.3 Employer's & Consultant's Facilities</u>					
1301	Provision & maintenance of Employer's & Consultant's offices	month	42		
1302	Provision & maintenance of Employer's & Consultant's residences	month	42		
1303	Provision, operation & maintenance of field laboratory	L.S.			
1304	Provision, operation & maintenance of four wheel drive car (2.8 liter)	vehicle. month	84		
1305	Provision, operation & maintenance of sedan car (1.8 liter)	vehicle. month	126		
1306	Provision, operation & maintenance of micro-bus (2.0 liter)	vehicle. month	126		
1307	Provision, operation & maintenance of pick-up car (1.6 liter)	vehicle. month	210		
1308	Provision, operation & maintenance of motor launch, for not less than 10 passengers	boat. month	42		
Total for Section 1.3					
Total for Division-1					

DIVISION-2 BANG PAKONG DIVERSION DAM & DIVERSION CANAL (1/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 2.1 Temporary Works</u>					
2101	Temporary works	L.S.			
<u>Section 2.2 Civil Works</u>					
2201	Stripping	m ³	200,000		
2202	Excavation for Bang Pakong diversion dam & road bridge construction, all classes	m ³	1,060,000		
2203	Excavation for diversion canal construction, all classes	m ³	2,300,000		
2204	Fill & backfill	m ³	30,000		
2205	Fill & backfill with selected material	m ³	180,000		
2206	Sodding	m ³	50,000		
2207	Gravel pavement	m ³	2,500		
2208	Sand & gravel bedding for structure	m ³	1,000		
2209	Riprap	m ³	55,000		
2210	Concrete block river bed protection	m ²	18,000		
2211	Concrete, class C	m ³	36,000		
2212	Concrete, class D	m ³	680		
2213	Concrete, class E	m ³	560		
2214	Concrete, class F	m ³	1,300		
2215	Reinforcing bar	ton	2,200		
2216	Formwork	m ²	32,000		
2217	Expansion joint filler, t=20mm	m ²	1,200		
2218	Contraction joint	m ²	1,300		

DIVISION-2 BANG PAKONG DIVERSION DAM & DIVERSION CANAL (2/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
2219	Waterstop, w = 300 mm	m	1,600		
2220	Dowel bar	No.	1,000		
2221	Steel sheet pile, type II	ton	190		
2222	Supply of R.C.pile, 260 mm × 260 mm	m	100		
2223	Driving of R.C. pile supplied under Pay Item No. 2222	m	100		
2224	Supply P.C. pile, ø 300 mm	m	15,000		
2225	Driving of P.C. pile supplied under Pay Item No. 2224	m	15,000		
2226	Supply of P.C. pile, ø 600 mm	m	2,200		
2227	Driving of P.C. pile supplied under Pay Item No. 2226	m	2,200		
2228	Supply of S.P. pile, ø 800 mm, t = 9 mm	m	3,200		
2229	Driving of S.P. pile supplied under Pay Item No. 2228	m	3,200		
2230	Supply of S.P. pile, ø 800 mm, t = 12 mm	m	4,600		
2231	Driving S.P. pile supplied under Pay Item No. 2230	m	4,600		
2232	O/M bridge, W = 6.6 m, L = 170 m	L.S.			
2233	Barbed wire fence, H = 24 m	m	120		
2234	Entrance gate, Type-B (W = 4 m)	No.	1		
2235	Log boom	L.S.			
2236	Hoist house, including staircase	No.	6		
2237	Control house	L.S.			
2238	Electric house	L.S.			
2239	Miscellaneous metalwork	Kg	10,000		
	Total for Section 2.2				

DIVISION-2 BANG PAKONG DIVERSION DAM & DIVERSION CANAL (3/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 2.3 Mechanical Equipment</u>					
2301	Supply of flood gates of three (3) units, H = 10 m, L = 30 m	L.S.	.....	.....	.....
2302	Supply of regulating gates of two (2) units, H = 10 m, L = 30 m	L.S.	.....	.....	.....
2303	Installation of all equipment supplied under Pay Item Nos. 2301 & 2302	L.S.	.....	.....	.....
2304	Supply of stop log, including operation test	L.S.	.....	.....	.....
2305	Staff training	L.S.	.....	.....	.....
Total for Section 2.3					.....
Total for Division 2					.....

DIVISION-3 CLOSURE DAM

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 3.1 Temporary Works</u>					
3101	Temporary works	L.S.			
<u>Section 3.2 Civil Works</u>					
3201	Excavation, all classes, including stripping	m ³	190,000		
3202	Embankment of earthfill zone	m ³	230,000		
3203	Embankment of rockfill zone	m ³	43,000		
3204	Riprap	m ³	20,000		
3205	Sand & gravel bedding for riprap	m ³	10,000		
3206	Sand mat	m ³	10,000		
3207	Penetration of casing pipe of 400 mm dia. and installation of sand drain	m	43,000		
3208	Installation of ϕ 700 mm sand compaction pile	m	17,000		
3209	Sand material for sand compaction pile and sand drain	m ³	14,000		
3210	Jetty construction	No.	2		
<i>Total for Section 3.2</i>					
<i>Total for Division 3</i>					

DIVISION-4 ROAD & ROAD BRIDGE (1/2)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 4.1 Temporary Works</u>					
4101	Temporary works	L.S.			
<u>Section 4.2 Civil Works</u>					
4201	Stripping	m ³	16,000		
4202	Excavation, all classes	m ³	2,200		
4203	Fill & backfill with selected material	m ³	78,000		
4204	Sodding	m ²	12,000		
4205	Sub base of road	m ³	18,000		
4206	Base course of road	m ³	7,000		
4207	Asphalt concrete surface of road, t = 5 cm	m ²	25,000		
4208	Asphalt concrete surface of road, t = 3 cm	m ²	11,000		
4209	Guardrail	m	1,300		
4210	Sand and gravel bedding for structure	m ³	200		
4211	Curb, type A	m	850		
4212	Curb, type B	m	300		
4213	R.C. pipe, ø1,000 mm	m	300		
4214	R.C. pipe, ø800 mm	m	30		
4215	R.C. pipe, ø600 mm	m	30		
4216	Sand bedding	m ³	500		
4217	Concrete, class C	m ³	1,300		
4218	Concrete, class F	m ³	40		
4219	Reinforcing bar	ton	140		
4220	Formwork	m ²	3,100		
4221	Supply of P.C. pile, ø500 mm	m	1,400		
4222	Driving of P.C. pile supplied under Pay Item No. 4221	m	1,400		

DIVISION-4 ROAD & ROAD BRIDGE (2/2)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
4223	Supply of S.P. pile, ϕ 450 mm t = 9 mm	m	1,400		
4224	Driving of S.P. pile supplied under Pay Item No. 4223	m	1,400		
4225	Traffic sign	No.	5		
4226	Road marking	m ²	800		
4227	Lighting post, H = 10 m	No.	120		
4228	Road Bridge, W = 13 m, L = 227 m	L.S.			
	Total for Section 4.2				
	Total for Division 4				

DIVISION-5 PUMPING STATION (1/4)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 5.1 Temporary Works</u>					
5101	Temporary works	L.S.			
<u>Section 5.2 Civil Works</u>					
5201	Stripping	m ³	4,000		
5202	Excavation, all classes	m ³	28,000		
5203	Fill & backfill with selected materials	m ³	25,000		
5204	Sand & gravel bedding for structure	m ³	2,500		
5205	Riprap	m ³	1,900		
5206	Sodding	m ²	2,100		
5207	Concrete, Class C	m ³	3,200		
5208	Concrete, class D	m ³	20		
5209	Concrete, class E	m ³	80		
5210	Concrete, class F	m ³	180		
5211	Reinforcing bar	ton	220		
5212	Formwork	m ²	5,900		
5213	Expansion joint filler, t = 20 mm	m ²	100		
5214	Contraction joint	m ²	40		
5215	Waterstop, W = 200 mm	m	140		
5216	Steel sheet pile, type II	ton	7		
5217	Supply of P.C. pile, ø300 mm	m	2,300		
5218	Driving of P.C. pile supplied under Pay Item No. 5217	m	2,300		
5219	Supply of P.C. pile, ø500 mm	m	900		
5220	Driving of P.C. pile supplied under Pay Item No. 5219	m	900		

DIVISION-5 PUMPING STATION (2/4)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
5221	Supply of P.C. pile, ϕ 600 mm	m	700		
5222	Driving of P.C. pile supplied under Pay Item No. 5221	m	700		
5223	PVC pipe, ϕ 100 mm	m	10		
5224	Miscellaneous metalwork	Kg	5,000		
5225	Manhole cover, 600 mm \times 600 mm	No.	4		
5226	Manhole cover, 1,000 mm \times 800 mm	No.	2		
5227	Asphalt concrete pavement, t = 5 cm	m ²	1,500		
5228	Base course	m ³	300		
5229	Gravel pavement	m ³	300		
5230	R.C. pipe, ϕ 300 mm	m	50		
5231	Sand bedding	m ³	10		
5232	Barbed wire fence, H = 2.4 m	m	240		
5233	Entrance gate, Type-C (W = 3 m)	No.	1		
5234	Entrance gate, Type-B (W = 4 m)	No.	3		
5235	Entrance gate, Type-A (W = 6 m)	No.	1		
5236	Lighting post, H = 8 m	No.	10		
5237	Log boom	L.S.			
5238	Trashrack	L.S.			
5239	Pump house	L.S.			
Total for Section 5.2					

DIVISION-5 PUMPING STATION (3/4)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 5.3 Mechanical Equipment</u>					
5301	Supply of main pump, ϕ 1,350 mm	unit	4		
5302	Supply of speed reduction gear	unit	4		
5303	Supply of prime mover, 350 kw motor	unit	3		
5304	Supply of prime mover, 500 PS diesel engine, including starting system, fuel oil supply system, cooling water system, exhaust sytem ,etc.	unit	1		
5305	Supply of electrically operated butterfly valve, ϕ 1,350 mm	set	4		
5306	Supply of expansion joint, ϕ 1,350 mm rubber type	set	4		
5307	Supply of non-return valve, ϕ 1,650 mm	set	4		
5308	Supply of discharge pipes and loose flange, ϕ 1,350~1,650 mm	set	4		
5309	Supply of overhead traveling crane, 20 ton	L.S.			
5310	Supply of in-plant drainage pump equipment	set	2		
5311	Installation of all equipment supplied under Pay Item Nos. 5301 - 5310	L.S.			
5312	Staff training	L.S.			
Total for Section 5.3					

DIVISION-5 PUMPING STATION (4/4)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 5.4 Electrical Equipment</u>					
5401	Supply of 3 KV incoming panel	unit	1		
5402	Supply of main pump motor panel	unit	3		
5403	Supply of static capacitor feeder panel	unit	1		
5404	Supply of station power transformer panel	unit	1		
5405	Supply of static capacitor panel	unit	4		
5406	Supply of low voltage distribution panel	unit	1		
5407	Supply of motor control center	set	1		
5408	Supply of instrument panel (TM/TC)	unit	1		
5409	Supply of auxiliary relay panel	set	1		
5410	Supply of engine driven pump control panel	unit	1		
5411	Supply of local control panels, including <ul style="list-style-type: none"> · Three (3) sets for three (3) main pumps (motor driven), · One (1) set for two (2) drainage pumps, · One (1) set for two (2) fuel pumps, · One (1) set for two (2) cooling water pumps and · One (1) set for two (2) air compressors 	L.S.			
5412	Supply of battery and battery charger cubicle	unit	1		
5413	Supply of 60 KVA diesel engine generator unit	unit	1		
5414	Installation of all equipment supplied under Pay Item Nos. 5401 - 5413	L.S.			
Total of Section 5.4					
Total of Division 5					

DIVISION-6 CONTROL SYSTEM & ELECTRICAL FACILITIES (1/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 6.1 Temporary Works</u>					
6101	Temporary works	L.S.			
<u>Section 6.2 Telemetering (T/M), Telecontrol (T/C) and Remote Control Systems</u>					
6201	Bang Sang water level gauging station	L.S.			
6202	Nakhon Nayok water level gauging station	L.S.			
6203	T/M and T/C systems of pumping station	L.S.			
6204	Overhead wiring works for T/M and T/C systems of pumping station, between control house and pumping station	L.S.			
6205	Observation systems for diversion dam and pumping station	L.S.			
6206	T/M, T/C and Remote Control systems in control house	L.S.			
6207	Antenna tower and cabling works to control house	L.S.			
6208	Cabling works for T/M, T/C, Remote Control systems, etc. of diversion dam	L.S.			
Total for Section 6.2					
<u>Section 6.3 Monitoring and Paging Systems</u>					
6301	Monitoring system	L.S.			
6302	Paging system	L.S.			
Total for Section 6.3					

DIVISION-6 CONTROL SYSTEM & ELECTRICAL FACILITIES (2/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 6.4 Electrical Facilities for Pumping Station</u>					
6401	Electrical facilities of No. 2 substation & pumping station	L.S.			
<u>Section 6.5 Electrical Facilities for Diversion Dam</u>					
6501	Electrical facilities of No. 1 substation and electric house	L.S.			
<u>Section 6.6 Cabling Works at the Site of Diversion Dam</u>					
6601	Cabling works between electric house and control house	L.S.			
6602	Cabling works between electric house and hoist houses	L.S.			
6603	Cabling works between electric house and gate lighting facilities	L.S.			
6604	Cabling works between electric house and No. 1, No. 3 ITV unit, No. 1, No. 3, No. 4 observation houses	L.S.			
6605	Cabling works between electric house and No. 2, No. 4 ITV unit, No. 2 observation house	L.S.			
6606	Earthing works	L.S.			
Total for Division 6.6					

DIVISION-6 CONTROL SYSTEM & ELECTRICAL FACILITIES (3/3)

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
<u>Section 6.7 Road Lighting Works</u>					
6701	Road lighting works	No.	.....	.....	.....
<u>Section 6.8 Staff Training</u>					
6801	Staff training for control system & electrical facilities	L.S.	.....	.....	.....
Total for Division 6					.....

DIVISION-7 PROVISIONAL SUM

Pay Item No.	Description of Work	Unit	Quantity	Unit Price (Baht)	Amount (Baht)
7001	Incoming electrical works for sites of Bang Pakong Diversion Dam & Pumping Station	P.S.			7,000,000
7002	Supply of office facilities & equipment for Control House & Pumping Station	P.S.			3,000,000
7003	Supply of spare parts for pumps, gates, control system, electrical facilities, etc.	P.S.			25,000,000
Total for Division 7					35,000,000
Percentage of overhead of the Contractor for:					
Pay Item No. 7001					_____ %
Pay Item No. 7002					_____ %
Pay Item No. 7003					_____ %

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