

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

SUMMARY

Bill No.	Description	Cost (PKR)
1	Diversion and Protection of Works from Floods	
2	Sub-Surface Water Management	
3	Irrigation Channel	
4	On-farm Water Management Works	
5	Solar Pumping System for Haji Lawang kas weir / District Bajaur	
6	Protection Work for Solar Pannels Installation	
7	General Items	
8	EMP Implementation Cost	
Total Project Cost		
Total Project Cost (In Words):		

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.1 - Diversion Arrangements

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
1.1	Diversion and Protection of Works from Floods	Provisional Sum	1			
Total Cost for Bill No.1						

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.2 - Sub-Surface Water Management

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
2.1	Excavation for core trench of Dam Embankment/Spillway/Intake & Outlet Structure and Irrigation System upto a minimum depth of 35 ft in common soil including removing of excavated material by machinery in 1 KM radius	cu.m	171.57			
2.2	Excavation for core trench of Dam Embankment/Spillway/Intake & Outlet Structure and Irrigation System upto a minimum depth of 35 ft in shingle gravel including removing of excavated material by machinery in 1 KM radius	cu.m	686.27			
2.3	Structural backfill using common Material available at site.	cu.m	454.63			
2.4	Sand Aggregate, To be used as filter around lateral pipes.	Cu-m	66.97			
2.5	Crush Aggregate, To be used as filter around lateral pipes.	Cu-m	37.57			
2.6	Making and fixing steel grated doors, complete with locking arrangements & angle iron frame (for room)	Sq-m	1.20			
2.7	Providing and Fixing steel windows with openable glazed panels With 22 SWG wire gauze : Glass pane 3mm	Sq-m	1.45			
2.8	Reinforced cement concrete work as in dams, spillways, weirs, barrages, cross drainage works and other hydrolic structures using crushed stone aggregate(screening & washing) and coarse sand i/c costof all labour and material and all kinds of form works, moulds, shuttering, lifting/pumping, curing, rendering and finishing the exposed surface, cast in situ/precast excluding the cost of steel reinforcement and labour for bending binding also excludig cost of additives which have to be paid separately. Type B G20	Cu.m	11.79			

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

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Bill No.2 - Sub-Surface Water Management

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
2.9	Supply & fabricate M.S. reinforcement for cement concrete (Hot rolled deformed bars Grade 60)	Tonne	1.39			
2.10	Providing and Laying stone pitching/filling, dry hand packed in pitching & aprons	cu.m	73.50			
2.11	HDPE Pipe: dia=12" (SDR-21, Pressure Nominal (PN-8 Bar) (Collector Pipe)	Rm	90.00			
2.12	HDPE Pipe: dia=18" (SDR-21, Pressure Nominal (PN-8 Bar) (Collector Pipe)	Rm	60.00			
2.13	HDPE Pipe: dia=10" (SDR-21, Pressure Nominal (PN-8 Bar) (Delivery Pipe)	Rm	190.00			
2.14	Providing and installing PVC strainer, in tubewell borehole comp. BSS Class 'C' working pressure : 12" i/d	Rm	90.00			
Total Cost for Bill No.2						

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.3 - Irrigation Channels

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
3.1	Excavation for core trench of Dam Embankment/Spillway/Intake & Outlet Structure and Irrigation System upto a minimum depth of 35 ft in common soil including removing of excavated material by machinery in 1 KM radius	cu.m	270.29			
3.2	Excavation for core trench of Dam Embankment/Spillway/Intake & Outlet Structure and Irrigation System upto a minimum depth of 35 ft in shingle gravel including removing of excavated material by machinery in 1 KM radius	cu.m	1,081.16			
3.3	Structural backfill using common Material available at site.	cu.m	850.69			
3.4	Supplying clean and screened river or pit sand within 150m including removal of loose earth or overburden.	cu.m	28.56			
3.5	Carriage on Item (03-43) above. (Lead upto 10km)	5 Tonnes/km	10.09			
3.6	Providing and Laying PCC segments in Precast lining (Parabola type) Type C	Rm	1,904.00			
3.7	PCC G10 in mass concrete less formwork using 50% boulders	cu.m	13.83			
3.8	Providing Plain Cement Concrete including placing, compacting, finishing & curing G10 (Beneath RCC)	cu.m	3.91			
3.9	Plain Cement Concrete including placing, compacting, finishing & curing G20	cu.m	23.11			

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Bill of Quantities

Bill No.3 - Irrigation Channels

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
3.10	Erecting & removing formwork to concrete in any shape / position (Vertical)	sq.m	336.07			
3.11	Reinforced cement concrete work as in dams, spillways, weirs, barrages, culverts, cross drainage works and other hydrolic structures using crushed stone aggregate (screening & washing) and coarse sand i/c cost of all labour and material and all kinds of form works, moulds, shuttering, lifting /pumping, curing, rendering and finishing the exposed surface, cast in situ/precast excluding the cost of steel reinforcement and labour for bending binding also excludig cost of additives which have to be paid separately. Type B G20	Cu.m	29.08			
3.12	Supply & fabricate M.S. reinforcement for cement concrete (Hot rolled deformed bars Grade 60)	Tonne	3.42			
3.13	Providing and Laying stone pitching/filling, dry hand packed in pitching & aprons	cu.m	3.08			
Total Cost for Bill No.3						

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.4) On-Farm Water Management Works

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures
LINING OF 1734 R/M WATERCOURSE USING PRECAST PARABOLIC SEGMENTS					
4.1	Earth excavation in irrigation channels/drains & disposal upto 25m. & dressing : in Ordinary Soil	cu.m	104.04		
4.2	Earth excavation in irrigation channels/drains & disposal upto 25m. & dressing : in Shingle/Gravel	cu.m	104.04		
4.3	Embankment formation in ordinary soil and compaction by mechanical means at optimum content to 90% max. modified AASHTO dry density (borrow area).	cu.m	677.65		
4.4	Supplying clean and screened river or pit sand within 150m including removal of loose earth or overburden	cu.m	29.48		
4.5	Providing and Laying pre-cast segments in PCC lining (parabola type) type E	Rm	1,734.00		
3 FIELD BOX CULVERTS (0.70M x 0.50M) IN THE COMMAND					
4.6	RCC in roof slabs, beam, column and other structural members, in situ or precast. Type B G20	cu.m	2.784		
4.7	Supply and fabricate M.S reinforcement for cement concrete (Hot rolled deformed bars Grade 40)	tonnes	0.194		

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Bill of Quantities

Bill No.4) On-Farm Water Management Works

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures
4.8	Plain Cement Concrete including placing, compacting, finishing and curing. G20	cu.m	5.136		
4.9	Providing & laying RCC pipe sewer complete As per ASTM C-76-79, Class II: 12" i/d. Wall B	Rm	10.00		
4.10	Providing & laying RCC pipe sewer complete As per ASTM C-76-79, Class II: 24" i/d. Wall B	Rm	20.00		

2 NUMBER WASHING PADS NEAR HOUSES OF FARMING COMMUNITY IN THE COMMAND

4.11	Plain Cement Concrete including placing, compacting, finishing and curing G20	cu.m	2.37		
4.12	Supply and fabricate M.S reinforcement for cement concrete (Hot rolled deformed bars Grade 40)	tonne	0.015		

INSTALLATION OF 96 NACCA PANELS

4.13	Standard Nacca Panels (0.31m)	No	96.00		
4.14	4" thick PCC lining using washed screened and graded crushed stone aggregate On slope, G20 (on sides of Naccas)	cu.m	23.04		

Total Cost for Bill No.4

Amount (Rs) in Words

Amount (Rs) in Words

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Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Technical Proposal for Solar Pumping System

Description of Work

Supply & Installation of Solar Energy based Pump (ISO – 9906 Certified) Coupled with Electric Motor Rewind-able, Water Cool capable of giving required Discharge (M³/Hour) at Given Total dynamic Head (Meter) and pump Setting (Meter) along-with Solar Panel (A-Grade Mono-crystalline), Fix Structure, Controller /Inverter, Motor Cable, Riser Pipe, Top Set (Sluice Valves, Reflux Valve, Bend, Suspension Clamps, Bore Cover Plate, Cable Ties, Nut Bolts & Rubber Gaskets etc.), and dry run protection complete in all respect with **three (3) years** comprehensive warranty for complete system as per attached specification

S/No	Description	Unit	Value
1	Discharge	(m ³ /Hour)	282.3
2	No of Units	No	1
3	Discharge per Unit	(m ³ /Hour)	282.3
4	Total Dynamic Head (TDH)	meter	14.84
5	Pump Setting (Meter)	meter	3
6	WHP (Water Horse Power)	HP	
7	Pump Eff (%) at Duty Point	%	
8	Motor Eff (%)	%	
9	Pump Shaft Power (BHP): =WHP / Pump Efficiency	HP	

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Technical Proposal for Solar Pumping System

10	Motor Input Power(Watt): = (Pump shaft Power*746) / Motor Efficiency	Watt	
11	Total PV Power (Wp) (Min Required): = Motor Input Power*1.75	Wp	
12	Total PV Power Quoted (Wp): As per string Arrangements	Wp	
13	Single PV Module Size (Watts)	Watt	
14	No of PV Modules in Series	No.	
15	No of Strings in parallel	No.	
16	String (Vmp)	Vmp	
17	Motor Model,Make & HP		
18	Pump Model, Make		
19	Inverter Model & Make / Rated (kW)=(Motor Rated Power (kW) / η m)	kW	
20	Inverter Rated Current=1.15 Times (Minimum) of Motor FLA Rated Current.	Amp	

Note: Bidder has to provide above mentioned information from Sr. No. 6 to 20

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Technical Proposal for Solar Pumping System

Bill No.5: Solar Pumping System

S No.	Description of Work			Rate of complete unit including Pumping Machinery along-with all accessories. (Rates will be quoted in digits as well as in words)
5.1	Supply & Installation of Solar Energy based Pump (ISO – 9906 Certified) Coupled with Electric Motor Rewind-able, Water Cool capable of giving required Discharge (M³/H) at Given Total dynamic Head (Meter) , along-with Solar Panel (A-Grade Mono-crystalline), Fix Structure, Controller /Inverter, Motor Cable, Riser Pipe, Top Set (Sluice Valves, Reflux Valve, Bend, Suspension Clamps, Bore Cover Plate, Cable Ties, Nut Bolts & Rubber Gaskets etc.), and dry run protection complete in all respect with three years comprehensive warranty for complete system as per attached specification.			Rate of Unit = (Rs)
	Discharge per Unit	Total Dynamic	Pump Setting	
	(m ³ /Hour)	(Meter)	(Meter)	
	282.3	14.84	3	
	Required No of Units	1		
	Pump / Motor (HP) :			
	Inverter Size (kW)			
	Total Solar PV Power (Wp) Quoted			

Note: Rate/Price of the complete unit, and not the per watt rate, shall be considered for bid evaluation.

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.6 - Protection Boundary for Solar Pannels

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures
6.1	Structural Excavation in Common Material	cu.m	74.52		
6.2	Plain Cement Concrete including placing, compacting, finishing & curing G20	cu.m	34.13		
6.3	Pacca brick work in ground floor Cement, sand mortar 1:4	cu.m	35.79		
6.4	RCC in roof slab, beam, column & other structural members, insitu or precast. Type B G20	Cu.m	5.64		
6.5	Supply & fabricate M.S. reinforcement for cement concrete (Hot rolled deformed bars Grade 60)	Tonne	0.64		
6.6	Cement Plaster 1:5, upto 20' height 3/4" thick (for Wall)	Sq-m	33.80		
6.7	Cement plaster 1:5, upto 20' height 1/2" thick (for slabs)	Sq-m	9.00		
6.8	Making and fixing steel grated doors, complete with locking arrangements & angle iron frame (for room)	Sq-m	2.54		
6.9	Making and fixing steel grated door, with 1/16" thick sheeting, including angle iron frame & lock (for Gate)	Sq-m	4.74		
6.10	Providing and Fixing steel windows with openable glazed panels With 22 SWG wire gauze : Glass pane 3mm	Sq-m	3.86		
6.11	Supply and Fixing bracket Fan pak made complete	No	1.00		
Total Cost for Bill No.6					

Amount (Rs) in Words

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Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No. 7) General Items

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
Engineer's Main Office (RE Office)						
	Rental of Vehicles					
7.1	1 No. Rental 4WD Toyota Hilux (model-2012 and above)	Month	6			
	Provisional Sum					
7.2	O & M (PoL, Oil & Service) - Vehicles + Generators	Month	6	40,000.00	240,000.00	(Rupees Two Hundred Forty Thousand Only)
7.3	Monthly rent of the Engineer's Office and laboratory	No	2	35,000.00	70,000.00	(Rupees Seventy Thousand Only)
7.4	Monthly rent of the Engineer's Accommodation	No	2	30,000.00	60,000.00	(Rupees Sixty Thousand Only)
7.5	Repair of Furtinure and Fixture	No	1	13,333.00	13,333.00	(Rupees Thirteen Thousand Three Hundred Thirty Three Only)
7.6	Maintenance and Operations of Office	LS	1	10,000.00	10,000.00	(Rupees Ten Thousand Only)
7.7	Maintenance and Operations of Accommodation	LS	1	10,000.00	10,000.00	(Rupees Ten Thousand Only)
7.8	Maitenance of Laboratoty	LS	1	33,333.00	33,333.00	(Rupees Thirty Three Thousand Three Hundred Thirty Three Only)
Sub-Total:					436,666.00	(Rupees Four Hundred Thirty Six Thousand Six Hundred Sixty Six Only)

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Bill No. 7) General Items

Item	Item Description	Unit	Quantity	Unit Rate (Rs) in Figures	Amount (Rs.) in Figures	Amount (Rs) in Words
Utility Services						
7.9	Office & Accommodation Utility Bills (will be paid to the contractor as per actual)	Month	2	30,000.00	60,000.00	(Rupees Sixty Thousand Only)
7.10	Communications Fax, Landline, DSL, 3G/4G Services, Mobile, courier services etc.	Month	2	20,000.00	40,000.00	(Rupees Forty Thousand Only)
Sub-Total:					100,000.00	(Rupees One Hundred Thousand Only)
Sub-Project Site Office						
Provisional Sum						
7.11	Monthly rent of the site office cum accommodation	Month	12	20,000.00	240,000.00	(Rupees Two Hundred Forty Thousand Only)
7.12	Support Staff	Person-Month	36	16,000.00	576,000.00	(Rupees Five Hundred Seventy Six Thousand Only)
7.13	Maintenance and Operations of Office cum Accommodation	LS	1	20,000.00	20,000.00	(Rupees Twenty Thousand Only)
7.14	Equipment/Furniture and Fixtures etc.	LS	1	213,450.00	213,450.00	(Rupees Two Hundred Thirteen Thousand Four Hundred Fifty Only)
7.15	Office / Accommodation Utility Bills will be paid to the contractor as per actual)	Month	12	15,000.00	180,000.00	(Rupees One Hundred Eighty Thousand Only)
7.16	Communications Fax, Landline, DSL, 3G/4G Services, Mobile, courier services etc.	Month	12	5,000.00	60,000.00	(Rupees Sixty Thousand Only)
Sub-Total:					1,289,450.00	(Rupees One Million Two Hundred Eighty Nine Thousand Four Hundred Fifty Only)
Add 10 % Contractor's Profit on items under provisional sum:						
Total Cost for Bill No.7						

Construction of Haji Lawang Kas Solar Lift Irrigation System, District Bajaur

Bill of Quantities

Bill No.8 - EMP Implementation Cost

Item	Item Description	Unit	Quantity	Rate (Rs)	Rate (Rs)	Amount (Rs)
8.1	<u>Air Testing at site</u> 1. Carbon Monoxide (CO) 2. Sulfur Dioxide (SO ₂) 3. Nitric Oxide(NO) 4. Nitrogen Dioxide(NO ₂) 5. PM10 6. PM2.5	No	4	8,000.00	Eight Thousand	32,000.00
8.2	<u>Noise Testing at site</u> 1. Noise	No	4	1,000.00	One Thousand	4,000.00
8.3	<u>Water Testing in Lab</u> 1. Total Coli form 2. E.coli 3. pH 4. Total Dissolved solids (TDS) 5. Total Hardness as CaCO ₃ 6. Sodium 7. Potassium 8. Sulphate 9. Chloride 10. Alkalinity 11. Color 12. Odor 13. Taste 14. Nitrogen-Nitrates 15. TSS	No	8	11,000.00	Eleven Thousand	88,000.00
Sub-Total Cost						124,000.00
Contingency Cost @ 5%						6,200.00
Total Cost for Bill No.8						130,200.00