

SCHEDULE OF QUANTITY

Estimated Cost:- Rs.270000 / only

Name of Work:- Providing LWSS to PC habitation of census village Mandal sub- village Tikkari in GP Mandal in Tehsil Sadar District Mandi (HP).

Earnest Money:- Rs. 5400 /only

(SH:- Supplying & Errection of Pumping Machinery)

Time:- Six months

S.NO.	DESCRIPTION	Quantity	RATE		UNIT	AMOUNT
			IN FIG	IN WORDS		
1	Supply of horizontal spindle horizontal/ vertical split casing Single/Multistage centrifugal pumps of standard make such as KSB/Mather & Platt/Jyoti/Kirloskar/ Best & Crompton/BE conforming to BIS 5120-1980 (latest with upto date ammendments) read with BIS 9137-1978 or latest to handle clear water having turbidity up to 50 PPM, with impellers,casing ring & shaft sleeves of bronze, shaft of steel with cast iron casing of suitable capacity coupled directly through a flexible coupling on a common base plate to kirloskar /NGEF/ Crompton/Siemen /Jyoti /ABB/Marathan Squirrel cage screen protected drip proof induction electric motor suitable for operation on the data given below.	2 Sets			Per Set	
A) SITE CONDITIONS						
i.	Location of site					About 1.5 Km. from Nerchowk towards Mandi and Nil km By head load.
ii	Thre altitude of place in which the motor is intended to work in ordinary service if it exceeds 1000mtrs					Altitude of place is 790m above MSL.
iii.	Humidity					Weather generally remains humid during monsoon season.
iv	Nature of atmosphere					As normally encountered in Shivalik Ranges.
v.	Detail of quality of water					Clear cold water.
vi	Water free from sand or not					Yes
vii	Water corrosive or not					No
viii	Turbidity					(if any) Clear cold water.
ix	NPSH available					N.A.
x.	Any other information or requirement					-
B OPERATING CONDITIONS						
I.	Type of current					A.C Three/Single phase.
ii.	Operating frequency					50 HZ
iii.	Rated voltage					400(+ / -) 10% volts.
iv.	System of earthing if any to be adopted					Double loop earthing as per BIS-3043-1987 latest with upto date ammendments.
v.	No. of working hours per day					4 Hours.
vi	Speed of revolution in RPM					To be quoted by tenderer.
vii	Direction of rotation					To be quoted by tenderer.
viii	The max. Temp. of cooling air & water in the place in which the pumpset is intended to work in ordinary service.					35 degree centigrade.
C MOTOR						
i.	Ref. to BIS code					BIS 325-1978 raed with BIS 900-1992 (latest) with upto date ammendments.
ii	Type of enclosure of motor					SPDP (As per BIS 4691-1985, Latest).
iii.	Type of duty					Continuous.
iv.	Mechanical out put in KW					Suitable for driving submersible pumps required for duties specified against pumps. To avoid overloading of motor a margin of about 15-20% may be kept in the rated out put of prime mover.
v.	Class of insulation					Class-B/F

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| vi. | Max. permissible temp. rise of motor reqd. if different from that given in B (viii) above. | To be specified by the tenderer. |
| vii. | Particulars of test required & where they are to be conducted. | As per terms & conditions attached. |
| viii. | Particulars as to whether voltage limiting device will be employed | ATS/Star Delta starter oil immersed, fully automatic to be installed between bus bar chamber & motor. Shunt capacitor is also proposed to be installed for improving the power factor at site.
NOTE:- Start delta starter upto 37.5KW & ATS for 37.5 KW to 50KW & stator rotor starter with slip ring motor beyond 50 KW. |
| ix | Motor whether squirrel cage or slipring | Squirrel cage:- Note:- Squirrel cage upto 65HP & slipring above 65HP |
| x. | Details of shaft extension required. | Just sufficient to provide direct drive by flexible coupling to pump. |
| xi. | Type of slipring gear whether continuously rated or for starting purposes only and whether to be fitted with brush lifting or short circuiting arrangements or both if interlocks are required. | Continuously rated for squirrel cage motor. |
| xii. | Breakway torque in terms of rated load torque & the corresponding breakway starting current which may be taken from the supply with the starting apparatus in circuit. | Breakway torque to be given by the tenderer but the starting current should not exceed 2.5 times of the full load current. |
| xiii. | Nature of load & any information regarding the driven machine which has a bearing upon the torque required during the accelerated period. The kinetic energy of the moving parts to be accelerated & No. of starts during a specified period. | To work the pump offered. |
| xiv. | Where possible fault capacity of the system to which the motor is connected. | The motor should be able to withstand initial current of 2.5times the rated current for two minutes without suffering damages of permanent deformations. |
| D | PUMPS:BIS 1520-1980,READ WITH BIS 9137-1978 BOTH LATEST WITH UPTO DATE AMMENDMENTS. | |
| a | Nos of pumps reqd. | 2 No. pumps (one will act as stand by). |
| b | Spare parts required | For Two years normal maintenance as recommended by manufacturer. |
| c. | Optional fittings reqd. | Air cock for exhausting air from each stage. |
| C | <u>Pump operating conditions.</u> | |
| i. | Capacity | 2.24 LPS (EACH SET) |
| ii. | Total head in Mts.
(If total head in not known then following details be provided): | 349.84 Mtrs. |
| i. | Static Head | -----Mtrs. |
| ii. | Minimum depth of water |Mtrs. |
| iii. | Variation in water level. |Mtrs. |
| iv. | Ground level to max. water level |Mtrs. |
| v. | Ground level to delivery point |Mtrs. |
| vi. | Pressure in the suction tank |Kg/cm ² |
| vii | Pressure in the delivery tank |Kg/cm ² |
| iii. | Length of R/main | 3000 mtrs. |
| iv. | Dia of R/main | 65 mm Dia |
| v. | Drive arrangement | Direct through flexible coupling on a common base plate. |
| vi. | Drive type | Electric driven |
| vii. | NPSH required: | To be quoted by tenderer. |

viii.	Limits of total head in which the pump is reqd. to operate.	(-)15% to (+) 10% of total head.		
ix	Suction/delivery size of pump	To be specified by the tenderer.		
x.	Efficiency of pump at	To be specified by the tenderer.		
	a. duty head.			
	b.(+) 10% head			
	c. (-)15% head.			
xi.	Material of construction	To be specified by the tenderer(Manufacturers certificate to be appended).		
2	Supply of suitable oil immersed Star delta starter/ATS/stator rotor starter of standarad make such as MEI/Kilburn/Jyoti/Siemens conforming to BIS-8544-1979 latest with upto date ammendments for squirrel cage/ slipring motor (Make to be specified by the tenderers) mounted on panel board with magnetic type over load release & dashpot, time lag under voltage release with initial oil filling. Note:- Star delta starter upto 37.5KW, ATS between 37.5 KW to 50 KW and stator rotor starter with slipring motor beyond 50KW.		2Nos	Each
3	Providing MS sheet 16 SWG steel fabricated floor mounted closed almirah type switch board including angle iron post of suitable height and size ISA 40x40x6mm duly painted comprising and capable of mounting the following accessories with all internal electric connections. The drawing of panel board shall be subject to approval of Engineer-in-charge.		1No	Each
a.	Ammeter AC supply,100mm circular dial Auto electric/AE/IMP/Havells make of suitable range for above motor with selector switches conforming to BIS 1248-1983 latest with upto date ammendments.		2Nos	Each
b.	Voltmeter AC supply,100mm circular dial Auto electric/AE/IMP/Havells make of suitable range for above motor with selector switches conforming to BIS 4064-1978 with upto date ammendments.		1No	Each
c.	ICTP switches with HRC fuses Kilburn/Larsen & turbo/Standard/Siemen make and having capacity 30% extra of the operational rating of motor as per BIS 4064-1978 with upto date ammendments immediately after the power meter of HPSEB.		2Sets	Per Set
d.	Busbar chamber having 3 copper bars of suitable rating for full length equal to width of board of 3 live phases and one copper bar of half rating of full length for neutral conforming to BIS 8084-1976 and 11353-1985 read with 5578-1985 all latest with upto date ammendments.		1No	Each
e.	MCB / Oil Circuit breaker of suitable capacity of Kilburn/LT/LK/MEI/Standard make on in coming feeder for motors offered by the tenderer conforming to BIS 2516-1985 lates with upto date ammendments with neutral linked under voltage release.		1No	Each
f.	3 Phase indicating lamps complete with toggle switches for individual motors conforming to BIS 3452 Part 1 & II latest with up to date ammendments.		2Nos	Each
g.	Earth leakage circuit breaker of recommended (Kilburn/L&T/MEI/GEC as per BIS-2516-1977 with upto date ammendments and of suitable range with which should have control box , operating handle and trip/reset bush button on/off indicators, re-indicating off spring condition of the circut breaker for over current protection. The circuit should be equipped with magnet thermal release with metallic tap CTS. It should also be fitted with earth fault for tripping of breaker on occurance of earth fault on/off breaker load side.		1No	Each
h.	Hour run meter of reputed make of four digit capacity conforming to BIS-722 (Latest edition) recommendations.		2Nos	Each
i.	Suitable three phase voltage monitor relay with all protections & usual indicators with electrical sirens against single phasing.no voltage, high voltage & overloading & phase voltage difference.		1No	Each

j.	Change over switch of reputed make & suitable capacity.	1No	Each
k.	Single phase preventor of reputed make & suitable capacity.	1No	Each
4 (a)	Supply of Kirloskar/Kilburn/IVC/Fouress./Gled/Bhel/Leader/Pelican/KSB make of suitable size cast steel double flanged sluice valve having size one step higher to delivery of pump and capable of withstanding nominal seat pressure as per BIS. Note:- The sluice valve shall confirm to IS:780-1984 latest with upto date amendments . However, If the seat pressure exceeds the limits prescribed in BIS 780 then the sluice valve shall be of cast steel confirming to class 150 ASA (Seat pressure 21 Kg/cm²) or class 300 ASA (seat pressure 52 Kg/cm²) or class 600 ASA(Seat pressure 104Kg/cm²) as per BIS 1414 (API 600).	2Nos	Each
4 (b)	Supply of Kirloskar/Kilburn/IVC/Fouress/Gled/BHEL/Leader cast steel double flanged swing check type reflux valve having bye pass arrangement & size one step higher than the delivery of pump for withstanding nominal seat pressure as per BIS. NOTE:- The reflux valve shall conform to BIS 5312-1984(Part-1) latest with upto date ammendments . However if the seat pressure exceeds the limits prescribed in BIS 5312 then the reflux valves shall be of cast steel conforming to class 150ASA (Seat pressure 21Kg/cm²) or class 300ASA(Seat pressure 52 Kg/cm²) as per BS 1414(API 600).	2Nos	Each
4 (c)	Supply of Kirloskar/Kilburn/ IVC/Fouress/Gled/Bhel/Leader/ Kartar make of suitable size cast steel double flanged swing check type reflux valve having bye pass arrangement & size equal to dia of rising main for withstanding nominal seat pressure as per BIS. Note:- The reflux valve shall conform to BIS 5312-1984(Part-I) latest with up to date ammendments. However if the seat pressure exceeds the limits prescribed in BIS 5312 then the reflux valves shall be of cast steel conforming to class 150ASA (Seat pressure 21Kg/cm²) or class 300 ASA (Seat pressure 52 Kg/cm²) as per BIS414 (API 600).	1No	Each
4 (d)	Supply of Kirloskar/Jyoti/Standard /Kilburn make cast iron flanged strainer of dia equal to dia of suction pipe conforming to BIS 4038-1986 latest withupto date ammendments.	2No	Each
4 (e)	Supply of Kirloskar/Kilburn/IVC/Fouress./Gled/Bhel/Leader/ Kartar make of suitable size cast iron double flanged sluice valve having size equal to dia of suction pipe and capable of withstanding nominal seat pressure as per BIS. Note:- The sluice valve shall confirm to IS:780-1984 latest with upto date amendments . However, If the seat pressure exceeds the limits prescribed in BIS 780 then the sluice valve shall be of cast steel confirming to class 150 ASA (Seat pressure 21 Kg/cm²) or class 300 ASA (seat pressure 52 Kg/cm²) or class 600 ASA(Seat pressure 104Kg/cm²) as per BIS 1414 (API 600).	2Nos	Each
5 (a)	P/L suitable size copper PVC insulated armoured power 3. 1/2 core cable confirming to BIS 1554(Part-I)-1988 latest with upto date ammendments of Siemen/Gloster/ICC make from meter of HPSEB to OCB & from OCB to Busbar switch & starter (One cable carrying all three Phases) including all other electrical equipment/accessories such as thimbles flexible pipe , solder, nuts & bolts, cable glands etc. laid in pipes or trenches under floor. The type, size & make will be subject to approval of HPSEB authorities.In case of non acceptance by HPSEB authorities it shall have to be replaced by the tenderer free of cost.	10 Rmt	Per Rmt
5 (b)	P/L suitable size copper PVC insulated armoured power three core cable confirming to BIS 1554(Part-I)-1988 or latest with upto date ammendments Siemen/Gloster/ICC make from switch to starter & starter to motor (One cable for carrying all three phases) including all other electrical equipment/accesories such as thimbles, flexible pipes, solder, nuts & Bolts, cable glands etc. laid in pipes or trenches under floor. The type size & make will be subject to approval of HPSEB authorities . In case of non acceptance by HPSEB authorities it shall have to be replaced by the tenderer free of cost.	20 Rmt	Per Rmt
5(C)	Supply & erection of floor/wall mounted power factor shunt capacitor conforming to BIS 2834-1986 latest with upto date ammendments of BHEL /GEC /Machneil / Mager / Bajaj make to raise the prevailing power factor at site to 0.95 for direct connection to iduction motor individually of required KVAR according to HP of motor offered including cable of siemens/ Gloster/ICC make from busbar chamber to capacitor & also including LT/LK/Kilburn make ICTP switches conforming to BIS-4064-1978 or latest with HRC fuses (Range to be specified by the tenderer).	2Nos	Each

5(d)	P/L double loop earthing with GI plate 600x600x3mm thick electrode complete with material such as charcoal, common salt, GI pipes, thimbles, nuts & bolts ,digging of pits, GI wiring & 25x5mm GI strips of required capacity conforming to BIS 3043-1987 latest with upto date ammendments for above motors & other electrical equipment.	1Job	Each
6	Supply of standarad make 100mm dia circular dial pressure gauge of suitable range of Fiebeg/Bourden/Precision make with all accessories such as stop cock, copper tubing etc conforming to BIS 3624-1987 latest with upto date ammendments.	2Nos	Each
7	Providing, Laying suction, delivery pipe considering site requirements, NPSH required & available & common header having area equal to two times the area of delivery branch of pump or equal to dia of rising main (which ever is higher) including tapers , flanges, rubber gaskets 3mm thick as per BIS-2712-1978, nuts and bolts as per 1364-1983 & special upto 5mtrs away from the outer wall of pump house as per layout drawings approved by Engineer-in-charge. The pipes shall be capable of withstanding 1.5 times the total pressure indicated in them no 1C(ii) Note:- Actual laying to be done as per final drawings to be approved by the Engineer-in-charge.		
	(i) Suction side	10 Rmt	Per Rmt
	(ii) Delivery side	4 Rmt	Per Rmt
	(iii) Common Header	10 Rmt	Per Rmt
8	Erection of all equipments from S.No. 1 to 4, 6, 7 i/c cost of tee's, bends, tapers & any other fittings required as per site conditions & as per directions of Engineer-in-charge.	1Job	Each

Terms and conditions:-

As per Annexure -A attached.

**Executive Engineer
IPH Division Baggi.**