

**Schedule of quantity**

Estimated cost Rs. 1,35,000/-  
Earnest money Rs.2700/-  
Time:- Three months

**Name of Work :- Providing LWSS to village Panjolth in GP Batwara Tehsil Sundernagar Distt. Mandi (HP)(SH:- Supply and erection of pumping machinery with allied accessories).**

Sr.No	Items of work	Quantity	Rate	Units	Amount.
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**1st stage**

1	Supply of horizontal spindle, horizontal split casing single/Multistage centrifugal pumps of standard make such as KSB/Mather and Platt/Jyoti /Kirloskar/Lubbi/Grundfos conforming to BIS 5120-1980/ appropriate IS code (latest with upto date ammendments) read with BIS 9137-1978 or latest to handle clear water having turbidity <50 ppm. with LG-2 grade impelleres, casing ring and 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 /Marathon slip ring/squirrel cage screen protected drip proof induction electric motor suitable for operation on the data given below:-	2 sets		Per set	
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**A) SITE CONDITIONS**

(I) Location of site	Village Panjolth
(ii) The altidue of place which the motor is intended to work in ordinary service if it exceeds 1000 mt.	900 mtrs.
(iii) Humidity	Whether generally remains humid during monsoon season
(iv) Nature atmosphere	As normally encountered in Shivalik Range
(v) Detail of quality of water	Clear cold water
(vi) Water free from sand or not	Yes
(vii) water corosive or not	Yes
(viii) Turbidity (if any)	Upto 50 PPM
(ix) NPSH available	Positive suction
x) Any other information or requirement	

**(B) OPERATING CONDITIONS**

(I) Type of current	AC 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 ammenmdments
(v) No. of working hours per day	<b>8 Hours</b>
(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 motor is intended to work in ordinary service	35 Degree Centigrade

**C MOTOR**

(I) Ref to BIS code	BIS 325-1978 read with BIS 900-1992(latest) with upto date ammendments.
(ii) Type of enclosure of motor	SPDP(As per BIS 4691-1985 (latest)

Sr.No	Items of work	Quantity	Rate	Units	Amount.
(iii) Type of duty	Continuous				
(iv) Mechanical out put in KW	Suitable for driving centrifugal/ reciprocating 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 primer mover				
(v) Class of insulation	Class- B/Class "F"				
(vi) Max. permissible temp. rise of motor reqd. if different from given in B (viii) above.	-				
(vii) Particulars of test reqd. & where they are to be conducted	As per terms and conditions.				
(viii) Particulars as to whether voltage limiting device will be employed.	ATS/Star delta starter /Stator Rotor starter oil immersed, fully automatic to be installed between bus bar chamber and motor shunt capacitor is also proposed to be installed for improving the power factor at site. <b>Note:-</b> Star delta starter upto 37.5 KW ATS between 37.5KW to 50 KW & Stator rotor starter with slip ring motor beyond 50 KW				
(ix) Motor whether squirrel cage or splirring	Squirrel cage/slipring				
(x) Details of shaft extension reqd.	Just sufficient to provide direct drive by flexible coupling to pump.				
(xi) Type of slip ring gear whether continously rated or for starting purposoes only & whether to be fitted with brush lifting or short circuiting arrangements or both if interlocks are required.	Continuously rated for Squirrel cage/Slipring 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.				

Sr.No	Items of work	Quantity	Rate	Units	Amount.
	(xiii) Nature of load & any information regarding the driven machine which has a bearing upon the torque reqd. 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 2.5 time the rated current for two minutes without suffering damages or permanent deformations.
<b>D</b>	<b>PUMP BIS 1520-1980) Read with BIS 9137-1978 both latest with upto date ammendments</b>				
	(a) Nos. of pumps required				2 Nos. pumps One will act as stand bye.
	(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
<b>E</b>	<b>PUMP OPERATING CONDITIONS</b>				
(I)	Capacity				1.41 LPS each
(ii)	Total head in Mts. If total head is not known then following details be provided				273.94 mtrs.
	(I) Static head				250.00 mtrs.
	(ii) Minimum depth of water				Positive suction
	(iii) Variation in water level				
	(iv) Ground level to max. water level				
	(v) Ground level to delivery point				
	(vi) Pressure in the suction tank				_____ kg/cm2
	(vii) Pressure in the delivery tank				_____ kg/cm2
(iii)	Length of R/Main				800 Rmt
iv)	Dia of rising main				50 mm
(v)	Drive arrangement				Direct through flexible coupling on a common base plate.
(vi)	Drive type				Electric driven
(vii)	NPSH reqd.				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 teneederer.
(x)	Efficiency of pump at				To be specified by the teneederer.

Sr.No	Items of work	Quantity	Rate	Units	Amount.
	(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 star delta starter/ATS/Staror rotor starter of standard make such as MEI/Kilburn/Jyoti/Siemens conforming to BIS-8544-1979 latest with upto date ammendments for squirrel cage/slipping 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 to be fitted in existing panel.	2 Nos.		Each	
	<b>Note:-</b> Star delta starter upto 37.5 KW, ATS between 37.5 KW to 50 KW and starter rotor starter with slipping motor beyond 50 KW.				
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.	1 No.		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.	2 Nos.		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 latest with upto date ammendments.	1 No.		Each	
	(c) ICTP switches with HRC fuses Kilburn/Larsen & Turbo/Standard/Siemens 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	2 sets		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.	1 No.		Each	
	(e) MCB/Oil circuit breaker of suitable capacity of Kilburn/LT/LK/MEI/Standard make on in common feeder for motors offered by the tendere conforming to BIS 2516-1985 latest with upto date ammendments with neutral linked under voltage release.	1 No.		Each	
	(f) 3 phase indicating lamps complete with toggle switches for individual motors conforming to BIS-3452 part-I & II latest with upto date ammendments.	2 Nos.		Each	
	(g) Earth leakage circuit breaker of recommended (Kilburn/L&T/MET/GEC as per BIS- 2516-1977 with upto date ammendments and of suitable range which should have control box, operating handle and trip/reset bush button on/off indicators, re-indicating off spring condition of the circuit breaker for over current protection. The circuit should be equipped with magnet thermal release with metallic tap CTS. It should also be fitted earth fault for tripping of breaker on occurance of earth fault on/off breaker load side.	1 No.		Each	

Sr.No	Items of work	Quantity	Rate	Units	Amount.
	(h) Hour run meter of reputed make of four digit capacity conforming to BIS-722 (latest edition) recommendations.	2 Nos.		Each	
	(l) Suitable three phase voltage monitor relay with all protections & usual indicators with electrical sirens against single phasing no voltage, high voltage & over loading & phase voltage difference.	1 No.		Each	
	(j) Change over switch of reputed make and suitable capacity	1 No.		Each	
	(k) Single phase preventor of reputed make & suitable capacity	1 No.		Each	
4(a)	Supply of Kirloskar/Kilburn/IVC/Fouress/Gled/BHEL/Leader/KSB/Pelican of reputed make of suitable size cast steel Class ASA-300 double flanged sluice valve one step higher to delivery of pump and capable of withstanding nominal seat pressure of 52kg/cm <sup>2</sup> conforming to BS 1414 (API 600) latest with upto date ammendments)  <b>Note:- The sluice valve shall conform to BIS 780-1984 latest with upto date ammendments. However if the seat pressure exceeds the limits prescribed in BIS 780 then the sluice valves shall be of cast steel conforming to class 150 ASA (Seat pressure 21kg/cm<sup>2</sup>) or class 300 ASA (Seat pressure 52 kg/cm<sup>2</sup>)as per BS 1414 (API 600) class 600 ASA (Seat pressure 120kg/cm<sup>2</sup>) Kartar make is only for Cast Iron valves)</b>	2 Nos.		Each	
(b)	Supply of Kirloskar/Kilburn/IVC/Fourcess/Gled/BHEL/Leader/KSB/Pelican of suitable size cast steel class ASA-300 double flanged swing check type reflux valve having bye pass arrangement & one step higher to delivery of pump for withstanding nominal seat pressure 52 kg./cm <sup>2</sup> conforming to BS 1868 (API 600) latest with upto date ammendments.  <b>Note:- The Reflux valve shall conform to BIS 5312-1984 latest with upto date ammendments. However if the seat pressure exceeds the limits prescribed in BIS 5312 then the sluice valves shall be of cast steel conforming to class 150 ASA (Seat pressure 21kg/cm<sup>2</sup>) or class 300 ASA (Seat pressure 52 kg/cm<sup>2</sup>) or class 600 ASA (Seat pressure 104 kg/cm<sup>2</sup>) as per BS 1868 (API 600)</b>	2 Nos.		Each	
(c)	Supply of Kirloskar/Kilburn/IVC/Fouress/Gled/BHEL/Leader/Kartar of reputed make of suitable size cast Iron Class PN-1 double flanged sluice valve having size equal to suction of pump and capable of withstanding nominal seat pressure of 10kg/cm <sup>2</sup>  <b>Note:- The sluice valve shall conform to BIS 780-1984 latest with upto date ammendments. However if the seat pressure exceeds the limits prescribed in BIS 780 then the sluice valves shall be of cast steel conforming to class 150 ASA (Seat pressure 21kg/cm<sup>2</sup>) or class 300 ASA (Seat pressure 52 kg/cm<sup>2</sup>)as per BS 1414 (API 600) class 600 ASA (Seat pressure 120kg/cm<sup>2</sup>) Kartar make is only for Cast Iron valves)</b>	2 Nos.		Each	

Sr.No	Items of work	Quantity	Rate	Units	Amount.
5(a)	P/L 10mm <sup>2</sup> copper PVC insulated armoured power 3.5 core cable conforming to BIS 1554 (part I) 1988 or latest with upto date ammendments Havells /Gloster/Finolex/Standard 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 and 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.	1 Job		Per Job	
(b)	Providing and laying three core flat water proof cable as per BIS 694-1990(latest with upto date ammendments) suitable for the pump set offered from OCB to motor, motor to starter including all other electirical equipments such as Thimbles, flexible pipes, solder, nuts & bolts cable glands etc. laid in pipes or trenches. 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.	2 Jobs		Per Job	
(c)	Supply & erection of floor/wall mounted power factor shunt capacitor conforming to BIS 2834- 1986 latest with upto date ammendments BHEL/GEC/Machneil/Mager/Bajaj make to raise the prevailing power factor at site to 0.95 for direct connection to inductiion motor individually of required KVAR according to HP of motor offered including cable 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.	2 Nos.		Each	
6	Supply of standard make 100mm dia circular dial pressure gauge of suitable range Fiebeg/Bourden/Precision make with all accessories such as stop cock, copper tubing etc. conforming to BIS-3624-1987 latest with upto date ammendments	2 Nos.		Each	
7	P/L Suction, delivery pipe considering site requirements, NPSH required and available & common header having area equal to two times the area of delivery branch of pump including tappers, flanges, rubber gaskets, 3mm thick as per BIS-2712-1978 nuts and bolts as per 1364-1983 & special upto 5 mtrs. away from the outer wall of pump house as per layour drawings approved by the Engineer-in-charge. The pipes shall be capable of withstanding 1.5 times the total pressure indicated in item No. 1 e(ii)	1 Job.		L.S	
	<b>Note:-</b> Actual laying to be done as per final drawings to be approved by the Engineer-in-charge.				
8	Errection of all equipments from Sr. No.1 to 4, 6 & 7 including cost of tees, bends, tapers & any other fittings required as per site conditions & as per direction of Engineer-in-charge.	1 Job		L.S.	
				<b>Total</b>	

**Terms and condition attached separately**

Executive Engineer  
I&PH Division  
Sundernagar