Job No.1

schedule of quantity											
Name of Work :-Replacement of Pumping machinery of LWSS Mallian Sadhrian phase 3rd in Tehsil Bhoranj Distt..Hamirpur								Estimated Cost			468000.00
								Earnest Money			9360.00
	(SH: - Supply & erection of 2 Nos centrifugal pumping machinery of 60 H.P. each alongwith allied accessories)							Time		2	Months
S.No.	**Description of Items**					**Qty.**		**Rate in Fig**	**Rate in Words.**	**Unit**	**Amount**
1	Providing horizontal spindle horizontal split casing/end suctions (back pull out arrangement) single/double multistage centrifugal pump or combination of pump in series of recommended make such as Mather and Platt/ KSB/ Kirloskar as per **BIS-1520-1980** with up to date amendments, read with IS: 9137-1978 or latest edition suitable for lifting **clear** water for under mentioned characteristics with Bronze impellers/priming funnels, casing ring and shaft sleeves of bronze, shaft of steel grade EN-8 with cast iron casing coupled directly through a flexible coupling on a MS/Cast steel base plate (base plate to be from the manufacturers of the pumping unit only) to Squrrel cage induction motor of standard make such as Kirloskar/Crompton/ NGEF/KSB ABB/ HEL/ GEC/ Seimens/Jyoti and suitable for operation on **400 (+)/-) 10%** volts, 50 cycles/second, 3 phase AC electric supply. The power of electric motor should be at least 10% in excess of the maximum power required by the pump in the operation range of **(+) 10% and (-) 15%** of the duty point head. The motor should be as per IS: 325-1978 with up to date amendments read with IS: 900-1972. It shold include the cost of bearing nuts, bolts and painting etc and should meet the following requirement.				**(a) pumps**: Specifications (i) Make (ii) Model (iii) No's of Stages (iv) Material (manufacures certificate to be appended) Performances (i) Head (H) in meter (ii) Discharge (Q)in lps/m3/hr (iii) BHP absorbed (iv) Efficiency (n) (v) NPSH (K)	**2 Nos.** pumping sets				Per set	
					(b) Motors: (Specification)						
	Discahrge (Q) : -	For each pump	**11.06**	LPS	(i) Make.	**2**	**Nos.**				
		Or	39.82	Cum/Hour							
	Total dynamic head :		*231.47*	Mtr.	(ii) Model						
	(a) LWL in sump well (h) :		*441.00*	Mtr.	(iii) Motor rating (KW)						
	(b) Shaft level :		*441.50*	Mtr.	(iv) Speed :						
	(c) Level at discahrge point :		*631.00*	Mtr.	(v) Insulation						
	(d) Suction lift :		*Postive*	mtrs							
	(e) Residual head :		***3.00***	Mtr.							
	(f) Static head :		192.50	Mtr.							
	(i) Rising Main :										
	(a) Length		***2670***	Mtr.	(c) Coupling:	**2**	**Nos.**				
	(b) Dia. :		***125***	mm	(d) Base plate.	**2**	**Nos.**				
	(iv) Pumping Hours :		***8***	Hours							
	(v) Altitude of installation above MSL :		***420.60***								
	(vi) Characteristics of water :		clear water								
	(a) Temperature :			^{0} C							
	(b) Ambient temperature			^{0} C							
	(c) Turbidity	< than	*50 ppm*	NTU							
	(d) Alkalinity			Mg/C_a Co_3							
	(e) Size of the solids			mm							
	(f) Other										
2	Providing side handle operated Change over switch of L & T/ Crompton/ Standard/ Havells make Operational rating as per **IS: 4064 (Part-II) -1978** with up to date amendments immediately after the power meter of HPSEB .				**Change over Switches** :- (i) Make (ii) Model (iii) Capacity : suitable	**1**	**No.**			Each	

3	Providing M.S. sheet, steel fabricated floor mounted closed (Almirah type) switch board including angle iron post of suitable height and size ISA 40x40x6mm, duly painted, with steel sheet of **16** gauge comprising, capable of mounting the following accessories with all internal connections:-	**Panel/Switch Board:** (i) Drawing. (ii) Layout plan.	**1**	**No**			Each	
(i)	**MCB. Havells / MEI / Jyoti** make of suitable capacity on incoming feeder with or without initial oil filling as the case may be with neutral linked under voltage releases as per **IS: 2516(Part-II) -1985** with up to date amendments .	**M.C.B.** (i) Make. (ii) Type (iii) Range: suitable	1	**No.**			Each	
(ii)	**ELR** of **Havell/Inditec/ MDS/Standard** make as per **IS: 2516(Part-II)-1985** with upto date amendment 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 tape etc. It should also be lifted with earth fault for tripping of breaker on occurrence of earth fault on off breaker load side end.	**E.LR** (i) Make (ii) Type (iii) Range : suitable .	**1**	**No.**			Each.	
(iii)	The voltage monitor relay of **L & T/AE/ Diplomat** make three phase with all protection and usual indicator and electric siren against single phasing low voltage, high voltage, reverse phasing, over loading and phase voltage difference as per **IS: 3842** (Latest edition).	**Voltage relay monitor** (i) Make (ii) Type (iii) Range 3suitable	**1**	**No.**			Each.	
iv)	**100mm square type** A.C. supply voltmeter of **AE/ L& T** make with selector switches as per **IS: 4064-1978** with up to date amendments.	**Voltmeter**. (i) Type. (ii) Make (iii) Range 0-500 V	1	**No.**			Each	
v)	Power factor meter of **AE/ L& T** make square type as per relevant IS codes with up to date amendments of suitable rating.	**Power factor meter**. (i) Type. (ii) Make	1	**No.**			Each	
vi)	Frequency meter of **AE/ L& T make square type** as per relevant IS: Codes with up to date amendments of suitable rating.	**Frequency meter.** (i) Type. (ii) Make. (iii)Range : Suitable rating	1	**No.**			Each	
vii)	Bus bar chamber with three copper strips having three bars of suitable rating for full length equal to the width of the board for three live phases and suitable for induced current, one copper bar of half the rating of full length for neutral phase as per **IS: 8084-1976** and **IS: 11353-1985** read with **BIS 5578-1985** with up to date amendments suitable	**Bus Bar chamber.** (i) Type (ii) Make. (iii) Rating : suitable	1	set			Each	
viii)	ICTP switches with HRC fuses of L & T/ Crompton/ Standard/ **Havells** make of suitable capacity as per IS: 4064-1978 with up to date amendments.suitable	**ICTP Switches** (i) Type. (ii) Make. (iii)Range : suitable	2	**Nos.**			Each	
ix)	Three phase indicator lamps complete with toggle switches for individual motors as per IS: 3452 (P-I&II) with up to date amendments. 15 Watt	**Three phase indicator**: (i) Type (ii) Make. (iii) Range : suitable	1	set			Each set.	
x)	100mm Square type AC supply Ammeter of **AE/ L& T/Rishab** make with selector switches and CTS operated as per IS:1248 (P-II) 1983 with up to date amendments.	**Ammeter.** (i) Type. (ii) Make. (iii) Range. Suitable	2	**Nos.**			Each	

xi)	Capacitor of **L & T/ Bajaj/ Assian/ Crompton** make as per **IS:2834-1986** with up to date amendments to raise the power factor at site to 0.95 for direct connections to induction motor individually of suitable capacity to HP offered including cables as per relevant ISI code (of Siemens/Glocter/IEC make) from bus bar chamber to capacitor and also including ICTP switches of appropriate range as per IS: 4064-1978 with upto date amendments .	**Capacitor**: (i) Type (ii) Make (iii) Range : suitable	2	**Nos.**			Each	
xii)	Providing and fixing SOFT STARTER of Siemen./ L&T make conforming to relevant BIS for heavy duty application rate from 15 to 500 Amps.Consent current Torque control starting for comprehensive motor protection with large LCD key pad mounted on panel board and bilt in real time clock complete in all respect s and most suitable for squrel cage electric induction 3 phase 415 volts operated for suitable motor	**Starter:** (i) Type .**starter roter** (ii) Make.	2	**Nos.**			Each	
		Single Phase Preventor. (i) Type. (ii) Make.	2	**Nos.**			Each	
xiii)	Providing Hour run meter of recommended make of suitable capacity as per **IS: 722 (Latest edition)** 0-9999 hours .	**Hour Rrun meter :** (i) Type. (ii) Make. (iii) Range.	2	**Nos.**			Each	
4	Providing double flanged **Cast iron** sluice valve of **Kirloskar/ Leader** make of 125 mm dia higher than pump for the suction pipe and capable of with standing the normal seat pressure and as per **780-1984 (Part-I) Class PN 1.0 with upto date ammendments .**	**Sluice valve.** (i) Make. (ii) Class P.N. 1 (iii)Seat Pressure 10.20 **Kg/cm^2** (iv) Material. C.I.	2	Nos.			Each	
5	Providing double flanged **Cast steel** sluice valve of **Kirloskar/ Leader** make one dia higher than pump for the delivery line of the pump and capable of with standing the normal seat pressure and as per relevant **IS 1414 API 600 (Class ASA- 300)** with up to date amendments.	**Sluice valve.** (i) Make. (ii) Class ASA-300 (iii)Seat Pressure 52.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
6	Providing double flanged (Swing type) **Cast steel** reflux valve of **Kirloskar/ Leader** make one dia higher than pump having bye pass arrangement on the delivery line of pump and capable of with standing normal seat pressure as **1868 API 600 (Class ASA- 300)** with up to date amendments **.**	**Reflux valve valve.** (i) Make. (ii) Class ASA-300 (iii)Seat Pressure 52.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
7	Providing double flanged **Cast steel non return valve** of **Kirloskar/ Leader** make and of 1**25** mm dia having bye pass arrangement for rising main and capable of with sta30**0)** up to date amendments **.**	**Non return valve.** (i) Make. (ii) Class ASA-300 (iii)Seat Pressure 52.00 Kg Cm2 (iv) Material. CS.	1	No.			Each	
8	Providing **100mm dia.** circular dial pressure gauge of Fiebig make complete with all accessories such as stop cock, copper tubing etc. as per **IS: 3624-1987** with up to date amendments range 0.52Kg/cm2	**(Pressure gauge)** (i) Make. (ii) Range :0.52Kg/cm^2	2	Nos.			Each	
9	Installation of all the items appearing at Serial No. **1 to 8** as per the systematic drawing attached with the tender documents		1	Job			Job.	

10	Providing and fixing double flanged GMS piping work layout to be approved by the Engineer-in-Charge for suction and delivery pipes suitable to pump(s) offered and common header as per the rising main respectively complete with all specials such as bends ,tees reducers/ increasers with companion flanges matching with the relevant specifications of the accessories as indicated in the drawing No.2 including rubber/asbestos gasket of minimum 3mm thickness as per IS 2712-1979 and required number of nuts and volts as per IS: 1364-1983. The pipes shall be as per relevant IS Code and to withstand 1.5 times total head stipulated under item No.1.	**Suction pipe.** (i) Make (ii) Grade (iii) Thickness (iv) Flange table	**GMS pipe 125 mm dia (Medium class) flanged with M.S. flanges of Table -5**				Job.	
	The size of the various components to be as under:-	**Delivery pipe.** (i) Make (ii) Grade (iii) Thickness (iv) Flange table	**GI pipe 100 mm dia (Medium class) flanged with M.S. flanges of Table -28**					
	(i) Suction pipe 125 mm dia Min. length = 10 mtr.							
	(ii) Delivery pipe 100 mm dia -do- = 5 mtr.							
	(iii) Common Header **125** mm dia -do- = 10 mtr.							
	And will extend up to 5 meters from the outer wall of the pump house in the direction to be jointed.	**Common header** (i) Make (ii) Grade (iii) Thickness	**GI pipe 125 mm dia (Medium class) flanged with M.S. flanges of Table - 28**					
11	Providing and laying copper PVC insulated armoured power cable (one cable carrying all the three phases) of suitable size and capacity to and all other electrical equipments as per IS: 1554 (P-I)1988 or latest with upto date amendments of Siemens/ IEC/ICC/GICO/Grandly/National make including all other accessories such as thimbles, flexible, pipes solder, nuts and bolts, cable glands etc. laid in pipes or trenches under floor.		1	Job			Job.	
	Motor side: suitable size Min length = 20 mtrs.							
	Supply side: suitable size Min. length = 10 mtrs.							
12	Providing and fixing double loop earthing and **G.I. plate 600mmx600mmx3mm** thick electrode complete with material such as thimbles, nuts and bolts, charcoal and common salt, 25mmx3mm **G.I.** strips & **G.I.** wire as per **IS: 3043-1987** with up to date amendments for motors and other electrical equipments and digging of pits etc. complete in all respect.		1	Job			Job.	
							TOTAL Rs.	

Terms & Conditions of Pumping machinery

1 The firm shall forward a copy of supply order/indent placed by it for the supply of pumps and motors on the manufacturers/authorized dealers of the pumps and motors to the consignee within 30 days after issue of the letter of intent/award by the Engineer-in-charge.The copy of supply order/ Indent to the consignee should also accompany the dealership certificate of the dealer for the pumping machinery in case the pumps and motors are arranged from the authorised dealer.

2 The firm shall arrange dispatch of offered pumps and motors to the consignee direct from the manufacturers/ their authorised dealer of the pumping machinery for which supply order/ indent has been placed by the firm. The packing slip should indicate the details of materials in the package and material of construction of pumps and motors.

3 The shop test for the pumps and motors shall be carried out at manufacturers works in the presence of representative of the department as per IS: 325-1978. The test performance certificate of the pumping machinery shall be arranged by the firm from the manufacturers and get it approved from the Engineer-in-charge before actual dispatch of the pumping machinery.

4 The firm shall supply the recommended list of spares and quantities required for normal working of pumping machinery (2 years) from the manufacturers of the aforesaid equipment at the time of quoting rates and shall quote item rates for the same also.

5 The firm shall supply the manufacturers manuals for the operation and maintenance of the pumping equipment.

6 The firm shall arrange operation and maintenance training to the operating staff for the pumping machinery without extra cost for a period of 7 days i.e. during the testing period.

7 The **characteristic curves** of the pumping equipment shall be supplied with the offer other wise the tender shall be rejected.

8 The firm shall supply layout drawing in respect of various components, such as suction pipes, valves, cable, trenches, control panel etc. from the foot valve location to the common header, which shall extend upto 5 metre from the outer wall of the pump house towards rising main. The details of foundations required for various components shall also be supplied by the firm within 30 days of the letter of intent/award.

9 The installation of pumping machinery above 40 HP shall be inspected by the technical representative of the manufacturers of rank not less than that of a services engineer, at the work site and inspection certificate shall be supplied to the Engineer-in-charge. This inspection shall be in addition to the test report and nothing extra shall be paid on this account.

10 All the civil work shall be constructed by the contractor

11 The wiring and installation of electric equipment shall be as per HPSEB rules and regulations & subjected to the approval of the Chief Electrical Inspector and or his authorized officer. Any defect pointed out shall be rectified by the firm without any extra cost. The wiring and installation of all electric equipment shall be done by a licensed contractor of approved class of HPSEB and test report shall be got accepted from the HPSEBL authorities on their approved format (form D) for release of power connection by the firm without extra cost.

12 The temporary electrical connection, if required during installation shall be arranged by the firm at its own cost and energy charges shall also be paid directly by the firm to the HPSEBL.

13 Prices of all the items shall be FOR site of work inclusive of all leads and lifts and shall be inclusive of all charges of transportation, insurance, packing, taxes and duties such as GST including all taxes.

14 The rates shall be quoted only on the format of schedule of quantities which is attached with the tender document giving all specified data so desired there in.

15 The rates offered for the specified makes in the schedule of quantities only shall be considered. Rates quoted for part and or non-specified makes shall lead to rejection of the tender.

16 The site of work is located at __Km on road _____ km from nearest raod _____ & head load is involved. The site is located _____ km from the nearest railhead Una. The rates quoted by the firm shall be inclusive of all mechanical and manual transport within all leads and lifts.

17 All the equipment material shall conform to the relevant BIS specifications wherever applicable and in its absence to any accepted / National/International standards.

18 The general specifications of work shall conform to HPIPH specifications as per direction of the Engineer-in-charge.

19 The validity of the tender shall be not less than 120 days other-wise the tender shall be summarily rejected.

20 All the equipments shall be guaranteed against any manufacturing defect including metallurgy and its performance for a period of 12 (twelve) months from the date of commissioning/ 15 (fifteen) months from the date of supply which ever is earlier. Any defect, if noticed within the stipulated period shall be rectified by the firm at its own cost within 15 days of bringing the same to its notice..

21 The installed pumping machinery and other allied accessories shall be tested daily for stipulated pumping hours in the NIT for a period of seven days without extra cost. However the cost of electricity and water shall be borne by the department.

22 During the guarantee period efficiency of the pumping and the electric equipment should not vary beyond the range of (+/-) 2.5% If during guarantee period, the efficiency falls beyond 2.5% to a maximum of 5%, 1% cost of the pump set for 1% fall of the efficiency shall be deducted in case of fall of efficiency beyond 5% the pump set shall be rejected and cost of the effected pump set recovered from the pledged Bank guarantee & or from the security deposit as the case may be.

23 60%(Sixty percent) payment of the cost of pumping machinery and equipment less 10% security and other statutory recovery shall be made after receipt of complete pumping machinery i.e. pump and motor received together at site of work in good condition. The balance 40% cost after deduction of the security and other recoveries shall be released after successful and satisfactory installation, testing of the entire equipment. Ten percent security deposit shall be released as stipulated in the agreement.

24 **The Rates are inclusive of all taxex including GST**

25 Only such contractor can participate in the tender who was the authorised deler of the manufacturer of Pumping Machinery

26 Those contractor/ firms who have more than two incomplete works in hand in this Division can not participate in the tendering process.

27 List of complete as well as incomplete works with stauts should be submitted by the contractor

Executive Engineer,
I&PH Division, Barsar.

SCHEDULE OF QUANTITY											
Name of Work :-Replacement of Pumping machinery of LWSS Jahu Phase 1st (Houd) in Tehsil Bhoranj Distt..Hamirpur									Estimated Cost		337500.00
									Earnest Money		6750.00
	(SH: - Supply & erection of 2 Nos centrifugal pumping machinery of 25 H.P. each alongwith allied accessories .)								Time	2	Months
S.No.	**Description of Items**					**Qty.**		**Rate in**		**Unit**	**Amount**
								Fig	**Words.**		
1	Providing horizontal spindle horizontal split casing/end suctions (back pull out arrangement) single/double multistage centrifugal pump or combination of pump in series of recommended make such as Mather and Platt/ KSB/ Kirloskar as per **BIS-1520-1980** with up to date amendments, read with IS: 9137-1978 or latest edition suitable for lifting **clear** water for under mentioned characteristics with Bronze impellers/priming funnels, casing ring and shaft sleeves of bronze, shaft of steel grade EN-8 with cast iron casing coupled directly through a flexible coupling on a MS/Cast steel base plate (base plate to be from the manufacturers of the pumping unit only) to Squrrel cage induction motor of standard make such as Kirloskar/Crompton/ NGEF/KSB ABB/ HEL/GEC/Seimens/Jyoti and suitable for operation on **400 (+)/-) 10%** volts, 50 cycles/second, 3 phase AC electric supply. The power of electric motor should be at least 10% in excess of the maximum power required by the pump in the operation range of **(+) 10% and (-) 15%** of the duty point head. The motor should be as per IS: 325-1978 with up to date amendments read with IS: 900-1972. It shold include the cost of bearing nuts, bolts and painting etc and should meet the following requirement.				**(a) pumps**: Specifications (i) Make (ii) Model (iii) No's of Stages (iv) Material (manufacures certificate to be appended) Performances (i) Head (H) in meter (ii) Discharge (Q)in lps/m3/hr (iii) BHP absorbed (iv) Efficiency (n) (v) NPSH (K)	**2 Nos.** pumping sets				Per set	0.00
					(b) Motors: (Specification)						
	Discahrge (Q) : -	For each pump	***10.72***	LPS	(i) Make.	**1**	**Nos.**				
		Or	38.59	Cum/Hour							
	Total dynamic head :		*90.09*	Mtr.	(ii) Model						
	(a) LWL in sump well (h) :		*746.30*	Mtr.	(iii) Motor rating (KW)						
	(b) Shaft level :		*750.00*	Mtr.	(iv) Speed :						
	(c) Level at discahrge point :		*814.00*	Mtr.	(v) Insulation						
	(d) Suction lift :		*3.70*	mtrs							
	(e) Residual head :		***3.00***	Mtr.							
	(f) Static head :		64.00	Mtr.							
	(i) Rising Main :										
	(a) Length		***1500***	Mtr.	(c) Coupling**:**	**1**	**Nos.**				
	(b) Dia. :		***125***	mm	(d) Base plate.	**1**	**Nos.**				
	(iv) Pumping Hours :		***8***	Hours							
	(v) Altitude of installation above MSL :		***420.60***								
	(vi) Characteristics of water :		clear water								
	(a) Temperature :			^{0} C							
	(b) Ambient temperature			^{0} C							
	(c) Turbidity	< than	*50 ppm*	NTU							
	(d) Alkalinity			$Mg/C_a\ Co_3$							
	(e) Size of the solids			mm							
	(f) Other										
2	Providing side handled operated L & T/ Crompton/ Standard/ Havells make Operational rating as per **IS: 4064 (Part-II) -1978** with up to date amendments immediately after the power meter of HPSEB				**ICTPSwitches** :- (i) Make (ii) Model (iii) Capacity : Amps	**1**	**No.**			Each	

3	Providing M.S. sheet, steel fabricated floor mounted closed (Almirah type) switch board including angle iron post of suitable height and size ISA 40x40x6mm, duly painted, with steel sheet of **16** gauge comprising, capable of mounting the following accessories with all internal connections:-	**Panel/Switch Board:** (i) Drawing. (ii) Layout plan.	**1**	**No**			Each	
(i)	**M.C.B. Havells** make of suitable capacity on incoming feeder with or without initial oil filling as the case may be with neutral linked under voltage releases as per **IS: 2516(Part-II) -1985** with up to date amendments.	**M.C.B.** (i) Make. (ii) Type (iii) Range: suitable	1	**No.**			Each	
(ii)	E.L.C.B**.** of **Havell/Inditec/ MDS/Standard** make as per **IS: 2516(Part-II)-1985** with upto date amendment 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 tape etc. It should also be lifted with earth fault for tripping of breaker on occurrence of earth fault on off breaker load side end.	**ELCB** (i) Make (ii) Type (iii) Range : suitable .	**1**	**No.**			Each.	
(iii)	The voltage monitor relay of **L & T/AE/ Diplomat** make three phase with all protection and usual indicator and electric siren against single phasing low voltage, high voltage, reverse phasing, over loading and phase voltage difference as per **IS: 3842** (Latest edition).	**Voltage relay monitor** (i) Make (ii) Type (iii) Range suitable . volts.	**1**	**No.**			Each.	
iv)	**100mm square type** A.C. supply voltmeter of **AE/ L& T/Rishab** make with selector switches as per **IS: 4064-1978** with up to date amendments.	**Voltmeter**. (i) Type. (ii) Make (iii) Range suitable .	1	**No.**			Each	
v)	Power factor meter of **AE/ L& T/Rishab** make square type as per relevant IS codes with up to date amendments of suitable rating.	**Power factor meter**. (i) Type. (ii) Make	1	**No.**			Each	
vi)	Frequency meter of **AE/ L& T/Rishab make square type** as per relevant IS: Codes with up to date amendments of suitable rating.	**Frequency meter.** (i) Type. (ii) Make. (iii)Range : Suitable rating	1	**No.**			Each	
vii)	Bus bar chamber with three copper strips having three bars of suitable rating for full length equal to the width of the board for three live phases and suitable for induced current, one copper bar of half the rating of full length for neutral phase as per **IS: 8084-1976** and **IS: 11353-1985** read with **BIS 5578-1985** with up to date amendments suitable .	**Bus Bar chamber.** (i) Type (ii) Make. (iii) Rating : 100 Amp .	1	set			Each	
viii)	ICTP switches with HRC fuses of L & T/ Crompton/ Standard/ **Havells** make of suitable capacity as per IS: 4064-1978 with up to date amendments.suitable .	**ICTP Switches** (i) Type. (ii) Make. (iii)Range : suitable .	2	**Nos.**			Each	
ix)	Three phase indicator lamps complete with toggle switches for individual motors as per IS: 3452 (P-I&II) with up to date amendments.	**Three phase indicator**: (i) Type (ii) Make. (iii) Range : suitable	1	set			Each set.	
x)	100mm Square type AC supply Ammeter of **AE/ L& T/Rishab** make with selector switches and CTS operated as per IS:1248 (P-II) 1983 with up to date amendments.	**Ammeter.** (i) Type. (ii) Make. (iii) Range. suitable .	2	**Nos.**			Each	

xi)	Capacitor of **L & T/ Bajaj/ Assian/ Crompton** make as per **IS:2834-1986** with up to date amendments to raise the power factor at site to 0.95 for direct connections to induction motor individually of suitable capacity to HP offered including cables as per relevant ISI code (of Siemens/Glocter/IEC make) from bus bar chamber to capacitor and also including ICTP switches of appropriate range as per IS: 4064-1978 with upto date amendments .	**Capacitor**: 13 KVAR (i) Type (ii) Make (iii) Range : suitable .	2	**Nos.**			Each	
xii)	Providing and fixing SOFT STARTER of Siemen./ L&T make conforming to relevant BIS for heavy duty application rate from 15 to 500 Amps.Consent current Torque control starting for comprehensive motor protection with large LCD key pad mounted on panel board and bilt in real time clock complete in all respect s and most suitable for squrel cage electric induction 3 phase 415 volts operated for suitable motor	**Starter:** (i) Type .**starter roter** (ii) Make.	2	**Nos.**			Each	
		Single Phase Preventor. (i) Type. (ii) Make.	2	**Nos.**			Each	
xiii)	Providing Hour run meter of recommended make of suitable capacity as per **IS: 722 (Latest edition)** 0-9999 hours .	**Hour Rrun meter :** (i) Type. (ii) Make. (iii) Range. suitable .	2	**Nos.**			Each	
4	Providing double flanged **Cast iron** foot valve of 125mm dia of **Kirloskar/ Leader** make for the suction pipe and capable of with standing the normal seat pressure and as per **4038-1986 (Part-I) Class PN 1.0 with upto date ammendments .**	**foot valve.** (i) Make. (ii) Class P.N. 1 (iii)Seat Pressure **Kg/cm^2** (iv) Material. C.I.	2	Nos.			Each	
5	Providing double flanged **Cast steel** sluice valve of **Kirloskar/ Leader** make one dia higher than delivery of pump for the delivery line of the pump and capable of with standing the normal seat pressure and as per relevant **IS 1414 API 600 (Class ASA- 150)** with up to date amendments.	**sluice valve valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
6	Providing double flanged **Cast steel reflux valve** of **Kirloskar/ Leader** make one dia higher than delivery of pump having bye pass arrangement for rising main and capable of with standing normal seat pressure as per **1868 API 600 (Class ASA- 150)** up to date amendments **.**	**reflux valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
7	Providing double flanged **Cast steel non return valve** of **Kirloskar/ Leader** make and of **125** mm dia having bye pass arrangement for rising main and capable of with standing normal seat pressure as per **1868 API 600 (Class ASA- 150)** up to date amendments **.**	**Non return valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	1	No.			Each	
8	Providing **100mm dia.** circular dial pressure gauge of Fiebig make complete with all accessories such as stop cock, copper tubing etc. as per **IS: 3624-1987** with up to date amendments range 0.21Kg/cm2	(**Pressure gauge)** (i) Make. (ii) Range :0.21 Kg/cm^2	1	Nos.			Each	
9	Installation of all the items appearing at Serial No. **1 to 9** as per the systematic drawing attached with the tender documents		1	Job			Job.	

10	Providing and fixing double flanged GMS piping work layout to be approved by the Engineer-in-Charge for suction and delivery pipes suitable to pump(s) offered and common header as per the rising main respectively complete with all specials such as bends ,tees reducers/ increasers with companion flanges matching with the relevant specifications of the accessories as indicated in the drawing No.2 including rubber/asbestos gasket of minimum 3mm thickness as per IS 2712-1979 and required number of nuts and volts as per IS: 1364-1983. The pipes shall be as per relevant IS Code and to withstand 1.5 times total head stipulated under item No.1.	**Suction pipe.** (i) Make (ii) Grade (iii) Thickness (iv) Flange table	**GMS pipe 125 mm dia (Medium class) flanged with M.S. flanges of Table -5**				Job.	
	The size of the various components to be as under:-	**Delivery pipe.** (i) Make (ii) Grade (iii) Thickness (iv) Flange table	**GI pipe 100 mm dia (Medium class) flanged with M.S. flanges of Table -17**					
	(i) Suction pipe 125 mm dia Min. length = 10 mtr.							
	(ii) Delivery pipe 100 mm dia -do- = 5 mtr.							
	(iii) Common Header **125** mm dia -do- = 10 mtr.							
	And will extend up to 5 meters from the outer wall of the pump house in the direction to be jointed.	**Common header** (i) Make (ii) Grade (iii) Thickness	**GI pipe 125 mm dia (Medium class) flanged with M.S. flanges of Table - 17**					
11	Providing and laying copper PVC insulated armoured power cable (one cable carrying all the three phases) of suitable size and capacity to and all other electrical equipments as per IS: 1554 (P-I)1988 or latest with upto date amendments of Siemens/ IEC/ICC/GICO/Grandly/National make including all other accessories such as thimbles, flexible, pipes solder, nuts and bolts, cable glands etc. laid in pipes or trenches under floor.		1	Job			Job.	
	Motor side: 4MM2 Min length = 20 mtrs.	**20 Rmt**						
	Supply side: 10MM2 Min. length = 10 mtrs.	**10 Rmt**						
12	Providing and fixing double loop earthing and **G.I. plate 600mmx600mmx3mm** thick electrode complete with material such as thimbles, nuts and bolts, charcoal and common salt, 25mmx3mm **G.I.** strips & **G.I.** wire as per **IS: 3043-1987** with up to date amendments for motors and other electrical equipments and digging of pits etc. complete in all respect.		1	Job			Job.	
							TOTAL Rs.	

Terms & Conditions of Pumping machinery

1 The firm shall forward a copy of supply order/indent placed by it for the supply of pumps and motors on the manufacturers/authorized dealers of the pumps and motors to the consignee within 30 days after issue of the letter of intent/award by the Engineer-in-charge.The copy of supply order/ Indent to the consignee should also accompany the dealership certificate of the dealer for the pumping machinery in case the pumps and motors are arranged from the authorised dealer.

2 The firm shall arrange dispatch of offered pumps and motors to the consignee direct from the manufacturers/ their authorised dealer of the pumping machinery for which supply order/ indent has been placed by the firm. The packing slip should indicate the details of materials in the package and material of construction of pumps and motors.

3 The shop test for the pumps and motors shall be carried out at manufacturers works in the presence of representative of the department as per IS: 325-1978. The test performance certificate of the pumping machinery shall be arranged by the firm from the manufacturers and get it approved from the Engineer-in-charge before actual dispatch of the pumping machinery.

4 The firm shall supply the recommended list of spares and quantities required for normal working of pumping machinery (2 years) from the manufacturers of the aforesaid equipment at the time of quoting rates and shall quote item rates for the same also.

5 The firm shall supply the manufacturers manuals for the operation and maintenance of the pumping equipment.

6 The firm shall arrange operation and maintenance training to the operating staff for the pumping machinery without extra cost for a period of 7 days i.e. during the testing period.

7 The **characteristic curves** of the pumping equipment shall be supplied with the offer other wise the tender shall be rejected.

8 The firm shall supply layout drawing in respect of various components, such as suction pipes, valves, cable, trenches, control panel etc. from the foot valve location to the common header, which shall extend upto 5 metre from the outer wall of the pump house towards rising main. The details of foundations required for various components shall also be supplied by the firm within 30 days of the letter of intent/award.

9 The installation of pumping machinery above 40 HP shall be inspected by the technical representative of the manufacturers of rank not less than that of a services engineer, at the work site and inspection certificate shall be supplied to the Engineer-in-charge. This inspection shall be in addition to the test report and nothing extra shall be paid on this account.

10 All the civil work shall be constructed by the contractor

11 The wiring and installation of electric equipment shall be as per HPSEB rules and regulations & subjected to the approval of the Chief Electrical Inspector and or his authorized officer. Any defect pointed out shall be rectified by the firm without any extra cost. The wiring and installation of all electric equipment shall be done by a licensed contractor of approved class of HPSEB and test report shall be got accepted from the HPSEBL authorities on their approved format (form D) for release of power connection by the firm without extra cost.

12 The temporary electrical connection, if required during installation shall be arranged by the firm at its own cost and energy charges shall also be paid directly by the firm to the HPSEBL.

13 Prices of all the items shall be FOR site of work inclusive of all leads and lifts and shall be inclusive of all charges of transportation, insurance, packing, taxes and duties such as GST including all taxes.

14 The rates shall be quoted only on the format of schedule of quantities which is attached with the tender document giving all specified data so desired there in.

15 The rates offered for the specified makes in the schedule of quantities only shall be considered. Rates quoted for part and or non-specified makes shall lead to rejection of the tender.

16 The site of work is located at __Km on road _____ km from nearest raod _____ & head load is involved. The site is located _____ km from the nearest railhead Una. The rates quoted by the firm shall be inclusive of all mechanical and manual transport within all leads and lifts.

17 All the equipment material shall conform to the relevant BIS specifications wherever applicable and in its absence to any accepted / National/International standards.

18 The general specifications of work shall conform to HPIPH specifications as per direction of the Engineer-in-charge.

19 The validity of the tender shall be not less than 120 days other-wise the tender shall be summarily rejected.

20 All the equipments shall be guaranteed against any manufacturing defect including metallurgy and its performance for a period of 12 (twelve) months from the date of commissioning/ 15 (fifteen) months from the date of supply which ever is earlier. Any defect, if noticed within the stipulated period shall be rectified by the firm at its own cost within 15 days of bringing the same to its notice..

21 The installed pumping machinery and other allied accessories shall be tested daily for stipulated pumping hours in the NIT for a period of seven days without extra cost. However the cost of electricity and water shall be borne by the department.

22 During the guarantee period efficiency of the pumping and the electric equipment should not vary beyond the range of (+/-) 2.5% If during guarantee period, the efficiency falls beyond 2.5% to a maximum of 5%, 1% cost of the pump set for 1% fall of the efficiency shall be deducted in case of fall of efficiency beyond 5% the pump set shall be rejected and cost of the effected pump set recovered from the pledged Bank guarantee & or from the security deposit as the case may be.

23 60%(Sixty percent) payment of the cost of pumping machinery and equipment less 10% security and other statutory recovery shall be made after receipt of complete pumping machinery i.e. pump and motor received together at site of work in good condition. The balance 40% cost after deduction of the security and other recoveries shall be released after successful and satisfactory installation, testing of the entire equipment. Ten percent security deposit shall be released as stipulated in the agreement.

24 **The Rates are inclusive of all taxex including GST**

25 Only such contractor can participate in the tender who was the authorised deler of the manufacturer of Pumping Machinery

26 Those contractor/ firms who have more than two incomplete works in hand in this Division can not participate in the tendering process.

27 List of complete as well as incomplete works with stauts should be submitted by the contractor

Executive Engineer,
I&PH Division, Barsar.

Job No.-3

SCHEDULE OF QUANTITY												
Name of Work :-Replacement of Pumping machinery of LWSS Jahu Phase 2 nd(Talai) in Tehsil Bhoranj Distt..Hamirpur									Estimated Cost		202500.00	
									Earnest Money		4050.00	
	(SH: - Supply & erection of 2 Nos centrifugal pumping machinery of 15 H.P. each alongwith allied accessories)								Time	2	Months	
S.No.	**Description of Items**					**Qty.**		**Rate in**		**Unit**	**Amount**	
								Fig	**Words.**			
1	Providing horizontal spindle horizontal split casing/end suctions (back pull out arrangement) single/double multistage centrifugal pump or combination of pump in series of recommended make such as Mather and Platt/ KSB/ Kirloskar as per **BIS-1520-1980** with up to date amendments, read with IS: 9137-1978 or latest edition suitable for lifting **clear** water for under mentioned characteristics with Bronze impellers/priming funnels, casing ring and shaft sleeves of bronze, shaft of steel grade EN-8 with cast iron casing coupled directly through a flexible coupling on a MS/Cast steel base plate (base plate to be from the manufacturers of the pumping unit only) to Squrrel cage induction motor of standard make such as Kirloskar/Crompton/ NGEF/KSB ABB/ HEL/GEC/Seimens/Jyoti and suitable for operation on **400 (+)/-) 10%** volts, 50 cycles/second, 3 phase AC electric supply. The power of electric motor should be at least 10% in excess of the maximum power required by the pump in the operation range of **(+) 10% and (-) 15%** of the duty point head. The motor should be as per IS: 325-1978 with up to date amendments read with IS: 900-1972. It shold include the cost of bearing nuts, bolts and painting etc and should meet the following requirement.				**(a) pumps**: Specifications (i) Make (ii) Model (iii) No's of Stages (iv) Material (manufacures certificate to be appended) Performances (i) Head (H) in meter (ii) Discharge (Q)in lps/m3/hr (iii) BHP absorbed (iv) Efficiency (n) (v) NPSH (K)	**2 Nos.** pumping sets				Per set	
					(b) Motors: (Specification)							
	Discahrge (Q) : -	For each pump	**4.71**	LPS	(i) Make.	**1**	**Nos.**					
		Or	16.96	Cum/Hour								
	Total dynamic head :		*129.74*	Mtr.	(ii) Model							
	(a) LWL in sump well (h) :		*736.30*	Mtr.	(iii) Motor rating (KW)							
	(b) Shaft level :		*740.00*	Mtr.	(iv) Speed :							
	(c) Level at discahrge point :		*814.00*	Mtr.	(v) Insulation							
	(d) Suction lift :		*3.70*	mtrs								
	(e) Residual head :		***3.00***	Mtr.								
	(f) Static head :		74.00	Mtr.								
	(i) Rising Main :											
	(a) Length		***2010***	Mtr.	(c) Coupling:	**1**	**Nos.**					
	(b) Dia. :		***80***	mm	(d) Base plate.	**1**	**Nos.**					
	(iv) Pumping Hours :		***8***	Hours								
	(v) Altitude of installation above MSL :		***426.60***									
	(vi) Characteristics of water :		clear water									
	(a) Temperature :			^{0} C								
	(b) Ambient temperature			^{0} C								
	(c) Turbidity	< than	*50 ppm*	NTU								
	(d) Alkalinity			Mg/C_a Co_3								
	(e) Size of the solids			mm								
	(f) Other											
2	Providing side handled operated L & T/ Crompton/ Standard/ Havells make Operational rating as per **IS: 4064 (Part-II) -1978** with up to date amendments immediately after the power meter of HPSEB				**ICTPSwitches** :- (i) Make (ii) Model (iii) Capacity : Amps	**1**	**No.**			Each		

3	Providing M.S. sheet, steel fabricated floor mounted closed (Almirah type) switch board including angle iron post of suitable height and size ISA 40x40x6mm, duly painted, with steel sheet of **16** gauge comprising, capable of mounting the following accessories with all internal connections:-	**Panel/Switch Board:** (i) Drawing. (ii) Layout plan.	**1**	**No**			Each	
(i)	**M.C.B. Havells** make of suitable capacity on incoming feeder with or without initial oil filling as the case may be with neutral linked under voltage releases as per **IS: 2516(Part-II) -1985** with up to date amendments.	**M.C.B.** (i) Make. (ii) Type (iii) Range: suitable	1	**No.**			Each	
(ii)	E.L.C.B**.** of **Havell/Inditec/ MDS/Standard** make as per **IS: 2516(Part-II)-1985** with upto date amendment 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 tape etc. It should also be lifted with earth fault for tripping of breaker on occurrence of earth fault on off breaker load side end.	**ELCB** (i) Make (ii) Type (iii) Range : suitable .	**1**	**No.**			Each.	
(iii)	The voltage monitor relay of **L & T/AE/ Diplomat** make three phase with all protection and usual indicator and electric siren against single phasing low voltage, high voltage, reverse phasing, over loading and phase voltage difference as per **IS: 3842** (Latest edition).	**Voltage relay monitor** (i) Make (ii) Type (iii) Range suitable . volts.	**1**	**No.**			Each.	
iv)	**100mm square type** A.C. supply voltmeter of **AE/ L& T/Rishab** make with selector switches as per **IS: 4064-1978** with up to date amendments.	**Voltmeter**. (i) Type. (ii) Make (iii) Range suitable .	1	**No.**			Each	
v)	Power factor meter of **AE/ L& T/Rishab** make square type as per relevant IS codes with up to date amendments of suitable rating.	**Power factor meter**. (i) Type. (ii) Make	1	**No.**			Each	
vi)	Frequency meter of **AE/ L& T/Rishab make square type** as per relevant IS: Codes with up to date amendments of suitable rating.	**Frequency meter.** (i) Type. (ii) Make. (iii)Range : Suitable rating	1	**No.**			Each	
vii)	Bus bar chamber with three copper strips having three bars of suitable rating for full length equal to the width of the board for three live phases and suitable for induced current, one copper bar of half the rating of full length for neutral phase as per **IS: 8084-1976** and **IS: 11353-1985** read with **BIS 5578-1985** with up to date amendments suitable .	**Bus Bar chamber.** (i) Type (ii) Make. (iii) Rating : 100 Amp .	1	set			Each	
viii)	ICTP switches with HRC fuses of L & T/ Crompton/ Standard/ **Havells** make of suitable capacity as per IS: 4064-1978 with up to date amendments.suitable .	**ICTP Switches** (i) Type. (ii) Make. (iii)Range : suitable .	2	**Nos.**			Each	
ix)	Three phase indicator lamps complete with toggle switches for individual motors as per IS: 3452 (P-I&II) with up to date amendments.	**Three phase indicator**: (i) Type (ii) Make. (iii) Range : suitable	1	set			Each set.	
x)	100mm Square type AC supply Ammeter of **AE/ L& T/Rishab** make with selector switches and CTS operated as per IS:1248 (P-II) 1983 with up to date amendments.	**Ammeter.** (i) Type. (ii) Make. (iii) Range. suitable .	2	**Nos.**			Each	

xi)	Capacitor of **L & T/ Bajaj/ Assian/ Crompton** make as per **IS:2834-1986** with up to date amendments to raise the power factor at site to 0.95 for direct connections to induction motor individually of suitable capacity to HP offered including cables as per relevant ISI code (of Siemens/Glocter/IEC make) from bus bar chamber to capacitor and also including ICTP switches of appropriate range as per IS: 4064-1978 with upto date amendments .	**Capacitor**: 13 KVAR (i) Type (ii) Make (iii) Range : suitable .	2	**Nos.**			Each	
xii)	Providing and fixing SOFT STARTER of Siemen./ L&T make conforming to relevant BIS for heavy duty application rate from 15 to 500 Amps.Consent current Torque control starting for comprehensive motor protection with large LCD key pad mounted on panel board and bilt in real time clock complete in all respect s and most suitable for squrel cage electric induction 3 phase 415 volts operated for suitable motor	**Starter:** (i) Type .**starter roter** (ii) Make.	2	**Nos.**			Each	
		Single Phase Preventor. (i) Type. (ii) Make.	2	**Nos.**			Each	
xiii)	Providing Hour run meter of recommended make of suitable capacity as per **IS: 722 (Latest edition)** 0-9999 hours .	**Hour Rrun meter :** (i) Type. (ii) Make. (iii) Range. suitable .	2	**Nos.**			Each	
4	Providing double flanged **Cast iron** foot valve of 125mm dia of **Kirloskar/ Leader** make for the suction pipe and capable of with standing the normal seat pressure and as per **4038-1986 (Part-I) Class PN 1.0 with upto date ammendments .**	**foot valve.** (i) Make. (ii) Class P.N. 1 (iii)Seat Pressure **Kg/cm^2** (iv) Material. C.I.	2	Nos.			Each	
5	Providing double flanged **Cast steel** sluice valve of **Kirloskar/ Leader** make one dia higher than delivery of pump for the delivery line of the pump and capable of with standing the normal seat pressure and as per relevant **IS 1414 API 600 (Class ASA- 150)** with up to date amendments.	**sluice valve valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
6	Providing double flanged **Cast steel reflux valve** of **Kirloskar/ Leader** make one dia higher than delivery of pump having bye pass arrangement for rising main and capable of with standing normal seat pressure as per **1868 API 600 (Class ASA- 150)** up to date amendments **.**	**reflux valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	2	Nos.			Each	
7	Providing double flanged **Cast steel non return valve** of **Kirloskar/ Leader** make and of **125** mm dia having bye pass arrangement for rising main and capable of with standing normal seat pressure as per **1868 API 600 (Class ASA- 150)** up to date amendments **.**	**Non return valve.** (i) Make. (ii) Class ASA-150 (iii)Seat Pressure 21.00 Kg Cm2 (iv) Material. CS.	1	No.			Each	
8	Providing **100mm dia.** circular dial pressure gauge of Fiebig make complete with all accessories such as stop cock, copper tubing etc. as per **IS: 3624-1987** with up to date amendments range 0.21Kg/cm2	**(Pressure gauge)** (i) Make. (ii) Range :0.21 Kg/cm^2	1	Nos.			Each	
9	Installation of all the items appearing at Serial No. **1 to 9** as per the systematic drawing attached with the tender documents		1	Job			Job.	

10	Providing and fixing double flanged GMS piping work layout to be approved by the Engineer-in-Charge for suction and delivery pipes suitable to pump(s) offered and common header as per the rising main respectively complete with all specials such as bends ,tees reducers/ increasers with companion flanges matching with the relevant specifications of the accessories as indicated in the drawing No.2 including rubber/asbestos gasket of minimum 3mm thickness as per IS 2712-1979 and required number of nuts and volts as per IS: 1364-1983. The pipes shall be as per relevant IS Code and to withstand 1.5 times total head stipulated under item No.1.	**Suction pipe.** (i) Make (ii) Grade (iii) Thickness (iv) Flange table	**GMS pipe 80 mm dia (Medium class) flanged with M.S. flanges of Table -5**				Job.	
	The size of the various components to be as under:-	**Delivery pipe.** (i) Make (ii) Grade (iii) Thickness	**GI pipe 65 mm dia (Medium class) flanged with M.S. flanges of Table -17**					
	(i) Suction pipe 80 mm dia Min. length = 10 mtr.							
	(ii) Delivery pipe 65 mm dia -do- = 5 mtr.							
	(iii) Common Header **80** mm dia -do- = 10 mtr.							
	And will extend up to 5 meters from the outer wall of the pump house in the direction to be jointed.	**Common header** (i) Make (ii) Grade (iii) Thickness	**GI pipe 80 mm dia (Medium class) flanged with M.S. flanges of Table - 17**					
11	Providing and laying copper PVC insulated armoured power cable (one cable carrying all the three phases) of suitable size and capacity to and all other electrical equipments as per IS: 1554 (P-I)1988 or latest with upto date amendments of Siemens/ IEC/ICC/GICO/Grandly/National make including all other accessories such as thimbles, flexible, pipes solder, nuts and bolts, cable glands etc. laid in pipes or trenches under floor.		1	Job			Job.	
	Motor side: 4MM2 Min length = 20 mtrs.	**20 Rmt**						
	Supply side: 4MM2 Min. length = 10 mtrs.	**10 Rmt**						
12	Providing and fixing double loop earthing and **G.I. plate 600mmx600mmx3mm** thick electrode complete with material such as thimbles, nuts and bolts, charcoal and common salt, 25mmx3mm **G.I.** strips & **G.I.** wire as per **IS: 3043-1987** with up to date amendments for motors and other electrical equipments and digging of pits etc. complete in all respect.		1	Job			Job.	
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