

### SCHEDULE OF QUANTITY

**NAME OF WORK :- Providing LWSS Harizan Basti Mandhara in GP Kando Kansar in tehsil Paonta Sahib Distt. Sirmour (HP)**  
**(SH: Supply & erection of centrifugal Pumping Machinery with allied accessories & Rising Main.)**

**Estimated Cost:Rs. 199561/-**  
**Earnest Money: Rs. 4000/-**  
**Time: Three months.**

Sr. No.	DESCRIPTION	QTY	RATE	UNIT	AMOUNT
<b>1</b>	Supply, erection, testing & commissioning of Horizontal spindle, Horizontal split casing, radial split single/multistages centrifugal pumps of standard make such as KSB/Kirloskar/BS confirming to relevant BIS 1520-1980 with upto date amendments read with BIS 9137-1978 or latest edition to handle clear water having turbidity upto 50ppm with impellers casing ring priming funnels & 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 of cast steel to BHEL/Kirloskar/NGEF /Crompton/ Siemen/Jyoti/GECmake slip ring/squirrel cage screen protected drip proof induction electric motor suitable for operation on the date given below including the cost of all accessories in all leads, lifts and carriage of material at site as per direction of the Engineer-in-charge.	1		Set	Each.
<b>a)</b>	Total Head in mtrs (i/c depth of Column Pipe in case of t/well) :	173.50		Mtr.	
<b>b)</b>	Capacity (in LPS)	1.49		LPS	
<b>c)</b>	Dia of R/Main (in mm)	50		mm	
<b>d)</b>	Dia of Column pipe (in mm)				
<b>A)</b>	<b>SITE CONDITIONS:-</b>	<b>Moderable</b>			
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<b>i)</b>	<b>Location of Site:-</b>	<b>60 Km. from Tehsil Headquarter.</b>			
<b>ii)</b>	<b>The altitude of place in which the motor is intended to work:-</b>				
<b>iii)</b>	<b>Humidity:-</b>	Wheather Generally remains humid during monsoon season			
<b>iv)</b>	<b>Nature of atmosphere:-</b>	As normally encountered in Shivalik Ranges			
<b>v)</b>	<b>Detail of quality of water :-</b>	Clear water			
<b>vi)</b>	<b>Water free from sand or not:-</b>	Free from sand.			
<b>vii)</b>	<b>Water corrosive or not:-</b>	---			
<b>viii)</b>	<b>Turbidity :-</b>	Clear water.			
<b>ix)</b>	<b>Type of well:-</b>				

x)	Inside Dia of Well:-						
xi)	Depth of water during HFL in the pond:-	NA					
xii)	Max. draw down:-						
xiii)	Depth of well:-	----					
xiv)	Any other information or requirement:-	----					
xv)	NPSH available.	Positive suction.					
B)	<b>OPERATING CONDITIONS:-</b>						
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i)	Type of current:-	AC three					
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)	Speed of revolution:-	To be quoted by tenderer.					
vi)	Direction of rotation:-	To be quoted by tenderer.					
vii)	No. of working hours per day:-	8 Hours.					
viii)	The max. Temp. of cooling air & water in the place in which the pumpset is intended to work in ordinary service:-	Generally warm.					
C)	<b>MOTOR:-</b>						
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i)	Ref to BIS code:-	BIS 325-1978 read with BIS 900-1992 or latest with upto date ammendments					
ii)	Type of enclosure of motor:-	As per BIS 4691-1985 or latest with up to date ammendments					

iii)	Type of duty:-	"S1" i.e. Continuous duty type as per IS-12824-1989 or latest with up to date ammendments			
iv)	Mechanical out put in KW:-	Suitable for driving centrifungal 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~			
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 reqd. & 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 & motor. Shunt capacitor is also proposed to be installed for improving the power factor at site.			
(NOTE:- Star delta starter upto 37.5 KW & ATS for 37.5 KW & above)					
ix)	Type of motor:- (Whether squirrel cage or slipring) Note; Squirrel cage upto 65 HP	Squirrel cage.			
x)	Details of shaft extension reqd:-	To work with the pump offered			
xi)	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.			
xii)	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 accelrated & No.of starts during a specified period:-	To work the pump offered			
xiii)	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 times the rated current for two minutes without suffering damages or permanent deformations			

xix)	Type of slipping gear whether continuously rated or for starting purpose only and whether to be fitted with brush lifting or short circuit arrangements or both if interlocks are required:-	Continuously rated for squirrel cage.					
D)	<b>PUMPS:-</b>						
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i)	<b>Nos of pumps reqd.:-</b>	2 No. Pumps (One will run and one will acts as standby.					
ii)	<b>Spare parts required:-</b>	For two years normal maintenance as recommended by manufacturer.					
iii)	<b>Type of drive:-</b>						
iv)	<b>Optional fittings reqd.:-</b>	-----					
E)	<b>PUMP OPERATING CONDITIONS:-</b>		<b>As per condition attached</b>				
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i)	<b>Capacity of each pump (in lps) :-</b>	1.49 LPS					
ii)	<b>Total head (in Mts.) :-</b>	173.50 Mtr.					
	<b>If total head is not known then following details be provided:-</b>						
i)	<b>Static head (in mtrs):-</b>	155.00 Mtr.					
ii)	<b>Minimum depth of water (in mtrs) :-</b>						
iii)	<b>Seasonal Variation in water level (in mtrs):-</b>						
iv)	<b>Ground level to max. water level (in mtrs) :-</b>						
v)	<b>Ground level to delivery point (in mtrs):-</b>						
vi)	<b>Pressure in the suction tank (in kg/cm<sup>2</sup>)-</b>						
vii)	<b>Pressure in the delivery tank (in kg/cm<sup>2</sup>) :-</b>						
iii)	<b>Length of R/Main (in mtrs):-</b>	460 Rmt.					
iv)	<b>Dia of R/Main (in mm):-</b>	50 mm					
v)	<b>Length of Column pipe (in mtrs):-</b>						
vi)	<b>Dia of Column pipe (in mtrs)</b>	----					
vii)	<b>Turbidity of water (in ppm):-</b>	---ppm					

viii)	<b>Drive type and Drive arrangement:-</b>	Electric driven					
		Drive arrangement :Direct through flexible coupling on a common base plate.					
ix)	<b>Limits of total head in which the pump is reqd. to operate:-</b>	(-) 15% to (+) 10% of total head.					
x)	<b>Suction/delivery size of pump:-</b>	To be specified by the tenderer					
xi)	<b>Efficiency of pump at</b>	To be specified by the tenderer					
	<b>a) duty head as mentioned in item 1(a)</b>	<b>173.50 Mtrs.</b>					
	<b>b) (+) 10 % of head -do-</b>	190.85 Mtrs.					
	<b>c) (-) 15 % of head -do-</b>	147.475 Mtrs.					
xii)	<b>Material of construction:-</b>	To be specified by the tenderer (manufacturers certificate to be appended)					

2	Supply & fixing at site of suitable direct on line/oil immersed star delta /ATS/stator rotor starter of standard make such as MEI/Kilburn/Jyoti/ Siemens/Larson & Tubro conforming to BIS-8544-1979 latest with up to date ammendments for squirrel cage/slip-ring 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 .	2	No.		Each.	
	<b>Note:- Star - delta - starter upto 37.5 KW , ATS between 37.5 KW to 50 KW and stater rotor starter with slipring motor beyond 50 KW.</b>					
3	Providing & fixing at site M.S. 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 including the cost of Providing and fixing these 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,100 mm dia circular dial Auto electric/AE/IMP/Havells make of suitable range for above motor with selector switches conforming to BIS 1248-(P-II)1983 latest with up to date ammendments.	2	Nos.		EACH	
b)	Voltmeter AC supply,100 mm dia circular dial Auto electric/AE/IMP/Havells make of suitable range for above motor with selector switches conforming to BIS 4064-1978 with up to date ammendments.	1	No.		EACH	
c)	ICTP switches with HRC fuses of Kilburn/Larsen & Tubro/Standard/Siemen/Havells make and having capacity 30% extra of the operational rating of motor as per BIS 4064-1978 with upto date ammendments immediatly after the power meter of HPSEB.	2	Set		P/Set	
d)	Busbar chamber having three copper bars of suitable rating for full length equal to width of board of three 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.			

e)	ACB/MCB/Oil circuit breaker of suitable capacity of Kilburn/L &T/MEI/GEC/Standard make on incoming feeder for motors offered by the tenderer conforming to BIS 2516-1985 latest with upto date ammendments with initial oil filling whenever required & neutral linked under voltage release.	1	No.		EACH	
f)	Three phase indicating lamps complete with toggle switches for individual motors conforming to BIS 3452 part I & II latest with up to date ammendments.	2	Set		P/Set	
g)	Earth leakage circuit breaker/relay of recommended make such as Kilburn/L&T/MET/GEC conforming to BIS-2516-1977 with upto date ammendments and of suitable range which should have control box, oprating handel and trip/reset push 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 earth fault for tripping of breaker on occurance of earth fault on/ of breaker load side.	1	No.		EACH	
h)	Hour run meter of reputed make of four digit capacity conforming to BIS-722 (latest edition)/recommendations.	2	Nos.		EACH	
i)	Suitable three phase voltage monitor relay with all protections & usual indicators with electric sirens against single phasing, low voltage, high voltage & overloading & phase voltage difference as per IS-3842 with up to date ammendments.	1	No.		EACH	
j)	Change over Switch of reputed make & suitable capacity	1	No.		EACH	
k)	Single phase preventor of reputed make & suitable capacity conforming to IS:1248 (P-V)-1983 with up to date ammendments	1	No.		EACH	
4 (a)	Supply & fixing at site of work of Kirloskar /Kilburn /IVC /Fouress /Gled /BHEL/ Leader/ KSB make of suitable size cast steel double flanged sluice valve having size one size larger than the nominal dia of delivery of the pump or equal to dia of column pipe (in case of t/well) and capable of withstanding nominal seat pressure as mentioned in item No.1-(a) surge pressure conforming to /API standards with up to date ammendments for delivery line of pump (The class of value shall be Cast steel ASA 300 ).	2	Nos.		EACH	
(b)	Supply & fixing at site of work of Kirloskar /Kilburn /IVC /Fouress /Gled /BHEL/ Leader/ KSB make of suitable size cast steel double flanged swing check type reflux valve confirming to API standards with upto date ammendments for Rising main as mentioned in item No.1-(a) surge pressure conforming to /API standards with up to date ammendments for delivery line of pump (The class of value shall be Cast steel ASA 300 ).	1	No.		EACH	
(c)	Supply & fixing at site of work of Kirloskar/Kilburn/IVC/Fouress/Gled/BHEL/Leader /KSB make of suitable size Cast Steel double flanged swing check type reflux valve having bye pass arrangement & size equal to dia of R/main as mentioned in item No.1(c) capable of withstanding nominal seat pressure as indicated in item 1(a) surge pressure . The size of Reflux valve shall be equakll to size of Rising main .The shame shall be provided with suitable bye pass arrangement .The class of valve shall be cast steel ASA 300 and shall be of 50mm diameters. ASA-150 .	1	No.		EACH	
4(d)	Prov. & fixing at site of Kirloskar/Kilburn/IVC/Fouress/GLED /BHEL/Leader make Cast Iron doubl;e flanged sluice valve (in case suction is positive) for suction pipe having size one or two size larger than suction size of pump such that velocity of flow is not more than 3.00 mtr./sec and capable of withstanding nominal seat pressure as mentioned in Item No. 1 (a and confirming to BIS standards with upto date ammendments.The class of valve shall be Cast Iron PN 1.60					

5 (a)	P/L at site of work suitable size copper PVC insulated armoured power three & half core cable conforming to BIS 1554 (Part I) - 1988 or latest with up to date amendments of Siemen/Gloster/ICC/EICO/National /IEC make from meter of HPSEB to circuite breaker & from circuite breaker to bus bar 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.	1	Job		LS	
5(b)	make from switch to starter and starter to motor (one cable carrying all three phases including all other electrical equipments/accessories 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 authporities . In case of non acceptance by HPSEB authorities it shall have to be replaced by the tenderer free of cost.	1	Job		LS	
5 (c)	Prov. Laying at site double loop earthing with copper plate 600x600x3mm thick electrode complete with material such as charcoal, common salt ,GI pipes,thimbles,nuts & bolts,digging of pits,GI wiring & 25x5mm copper strips of required capacity conforming to BIS 3043-1987 latest with up to date ammendments suitable for above motors & other electrical equipments.	1	Job		LS	
5 (d)	Supply & errection at site of floor/wall mounted power factor shunt capacitor conforming to BIS 2834-1986 or latest with upto date ammendments of BHEL/GEC/Machneil/ Mager/Bajaj/L&T make to raise the prevailing power factor at site to 0.95 for direct connection to induction motor individually,of required KVAR according to HP of motor offered including cable Siemens/Gloster/ICC make from busbar chamber to capacitor & also including L&T//Kilburn/Standard/Siemen/Havells 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 & fixing at site of 100mm dia circular dial pressure gauge of suitable range & standard make such as Fiebeg/Bourden/Precision/PREGA with all accessories such as stop cock,copper tubing etc.conforming to BIS 3624-1987 or latest with up to date ammendments.	1	No.		Each	
7	Providing and fixing double flanged suction delivery pipe & common header considering site requirements,NPSH required &					
	NOTE: Actual laying to be done as per final drawings to be approved by the Engineer-in-charge.					
	<i>( in case of source is sumpwell /percolation well)</i>					
	<b>OR</b>					
7	Providing and lowering of GMS/MSERW column pipe assembly of size as indicated in item 1(d) including MS flanges of appropriate table capable to withstand nominal pressure as mentioned in item No 1(a) & confirming to IS :6392 -1971 with up to date amendments including the cost of rubber/asbestos gasket of maximum 3 mm thickness as per IS: 2712 - 1979 and required numbers of nuts and bolts as per IS 1364 -1983. The column pipe should be provided & lowered as per the direction of engineer incharge. The same shall be of suitable thickness & grade specification capable of withstanding 1.5 times the total presure as indicated in item no. 1(a) unless otherwise specified and properly jointed at every three mtr.including all necessary accessories like increaser/ reducer , flanges ,tees, bends etc.including supporting clamps (2Nos ) at the top of assembly and as per the direction of engineer-in charge. MSERW Pipe 4.8mm thick with F.T.5.	1	Job		L.S.	
	<i>( in case of source is sumpwell /percolation well)</i>					

8	Excavation in drains and channels etc. in earth work in all kinds of soil such as Kankar Moorum, shingles, Colglomerate saturated soil decomposed or soft rock and hard rock by blasting by chiselling ( where blasting prohibited) including dressing of sides and beds disposing of excavated earth with all leads lifts disposed earth to be levelled and neatly dressed and then returning the stacked soil into foundation and trenches etc. including ramming and consolidating the same wherever required with all leads lifts and including jungle clearance and as per direction of Engineer-in-charge.	78.98	Cum		P/Cum		
10	Laying , jointing & commissioning at site in trenches following plain ended GMS pipes of 150mm dia of medium grade as under confirming to BIS 1239 (Part-1)- 1990 or latest with upto date ammendments, capable of withstanding required test pressure as prescribed in BIS code in randum lengths of 5.5 to 6.5 mtr. . The pipe's ends shall bevelled suitable for butt weld, including cost of jointing with butt welding confirming to IS 816-1969 or latest as applicable (leak proof) in three layers at site of work with welding rods of standard make & all allied accessories whatever required for welding at site, tail pieces ,tees, bends manufactured from parent pipes etc. and cutting of pipes wherever required as per site requirement including carriage in all leads lifts and as directed by Engineer-in-charge (Earth work shall be measured & paid seperately)						
	<b>RD's</b>	<b>Nominal dia</b>	<b>Length in mtr.</b>				
	0 to 135	150 mm dia( MG)	135 mtr.	(L/Rate)	135	Rmt.	P/Rmt.
11	Providing , welding and fixing M.S. Plate Flanges of various dia (nominal bore) of following Flange Table confirming to IS 6392-1971 or latest with upto date ammendments to MSERW/G.I. Pipes after every 90 metres or as per site requirement including cutting of pipes wherever required , welding in three layers (Leak proof) confirming to specifications as prescribed in relevent IS code i.e. IS 816-1969 or latest as applicable with upto date ammendments with nuts, bolts & washers & specials etc. confirming to IS-1963 of latest with upto date ammendments including packing sheet i.e. asbestos fibre sheet minimum 3mm thick and painting with anticorrosive paints complete in all respect in all leads lifts and carriage of material at site and as directed by Engineer-in-charge.						
	<b>RD's</b>	<b>Nominal dia</b>	<b>Length (in mtr)</b>	<b>F.T</b>			
	0 to 135	150 mm dia	135	5	2	Pair	P/Pair

Total: \_\_\_\_\_

Executive Engineer,  
IPH Division, Paonta Sahib