

Government of West Bengal  
Irrigation & Waterways Directorate  
Office of the Superintending Engineer  
Mechanical & Electrical Circle  
"Jalasampad Bhavan" (6<sup>th</sup> floor)  
Salt Lake City, Kolkata - 700 091.  
Ph No 03323218430 e-Mail semeciwd2017@gmail.com

NOTICE INVITING EXPRESSION OF INTERESTS (EoI)  
(for Budgetary purpose)

Expression of interest for obtaining competitive budgetary quotes at competitive market prices is being invited from reliable reputed resourceful Manufacturer/Distributor/Stockiest in connection with the determination of estimated cost for the work "Supply installation testing commissioning of 33KV/6.6KV and 33KV/0.415 KV sub-station complete of both H.T & L.T components in the sub-station & pump house as per enclosed schedule of work for the proposed 2<sup>nd</sup> Additional Uttarbhag Pumping Station at Uttarbhag, P.O. Brindakhali, P.S. Baruipur, Dist South 24 Parganas of West Bengal under Irrigation, & Waterways Department, Govt. of West Bengal" by the Superintending Engineer, Mechanical & Electrical Circle, Irrigation & Waterways Directorate on behalf of the Governor of West Bengal.

**Issue of EoI documents :**

The EoI documents can be obtained from the departmental website [www.wbiwd.gov.in](http://www.wbiwd.gov.in) as well as from the office of the Superintending Engineer, Mechanical & Electrical Circle during office hours on working days till 06.09.2017.

**Submission of EoI :**

The intending agencies should submit their most competitive budgetary quotes, as per current market price as per the BOQ FORMAT in a sealed envelope super scribing on the top EOI for the budgetary quotes for the work "**Supply installation testing commissioning of 33KV/6.6KV and 33KV/0.415 KV sub-station complete of both H.T & L.T components in the sub-station & pumphouseas per enclosed schedule of work, detailed specification for the proposed 2<sup>nd</sup> Additional Uttarbhag Pumping Station**" in the tender box to be available at the following offices:

1. Office of the Superintending Engineer, Mechanical & Electrical Circle, Jalasampad Bhavan (6<sup>th</sup> floor), Bidhannagar, Kolkata - 700091.  
Or
2. Office of the Executive Engineer, Metropolitan Drainage Mechanical Division, Jalasampad Bhavan, (4<sup>th</sup> floor), Bidhannagar, Kolkata - 700091.

The intending agencies should submit their most competitive budgetary quotes as per enclosed schedule of work (BOQ) conforming to detailed specifications with reputed manufacturers name. Rate and amount to be quoted should be legible and both in words and figure.

The budgetary quotes rates should be inclusive of GST & all other statutory taxes/duties applicable in the State of West Bengal.

GA Drawing, Electrical Single line diagram (S.L.D) of sub-station and pump house and lay out of sub-station is enclosed for ready reference of the EOI. In this connection it may be stated that the values as shown in S.L.D. may vary.

Intending agencies or their authorized representatives may remain present while opening of the sealed covers containing EoIs.

The Superintending Engineer, Mechanical & Electrical Circle., I & W Dte. reserves the right to accept or reject any or all EoI's without assigning any reason thereof.

Since, the Notice Inviting Expression of Interests (EoIs) is being made to assess the value of the work, no work order will be issued in favour of any agency against the EoIs.

**Pre-Qualification / Credential :**

The intending agencies should possess the following and self-attested copies of the same are to be submitted with the EoI.

- i) At least one work any where in any Govt. Sector in India for procurement, supply & installation of similar work.
- ii) Suitable document determining financial strength of the bidder & authorization of reputed manufacturer in India.

**Inspection of site and its premises before submission of EoIs :**

Before submitting EoI's, the intending agencies should make themselves acquainted thoroughly with the exact requirement of works and details of existing civil installation/structures accompanied with the official/representative of the Executive Engineer, Metropolitan Drainage Mechanical Division, having its office at the 4<sup>th</sup> floor of Jalasampad Bhawan, Bidhannagar, Kolkata - 700091 (Mobile Nos. 9476155032) during any working day between 11.30 hours and 17.00 hours prior to the date of submission of proposal.

**Pre Bid Meeting :**

Pre bid meeting will be held at the office chamber of the Superintending Engineer, Mechanical & Electrical Circle on the following dates and interested agencies may attend the meeting for technical discussions.

EoIs so received in sealed covers will be opened in the chamber of the Superintending Engineer, Mechanical & Electrical Circle in presence of the intending agencies those who will be present at that time.

**Schedule of Dates for EoIs :**

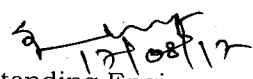
Sl No.	Activity	Date & Time	Remarks
1	Publishing Date	18.08.2017	
2	Pre Bid Meeting	23.08.2017 at 12.00 Hrs	
3	Pre Bid Meeting	04.09.2017 at 12.00 Hrs	
4	E.o.I submission end date	07.09.2017 at 15.00 Hrs	
5	Date of E.o.I opening	07.09.2017 at 15.30 Hrs	

**Memo No: 1318(10)/1T-6**

**Dated: 17.08.2017**

Copy submitted for favours of kind information to ;-

- 1) The Secretary to the Govt of West Bengal, I. & W. Directorate.
- 2) The Chief Engineer (South), I. & W. Directorate. Govt. of West Bengal
- 3) The Joint Secretary (Works) to the Govt of West Bengal, I. & W. Department
- 4) The Dy Secretary (Works) to the Govt of West Bengal, I. & W. Department
- 5) The Superintending Engineer, Metropolitan Drainage Circle, I&W Dte.
- 6) The Superintending Engineer, Eastern Circle, I&W Dte.
- 7) The Superintending Engineer, Western Circle-I, I&W Dte.
- 8) The Superintending Engineer, Greater Calcutta Drainage Circle, I&W Dte
- 9) The Superintending Engineer, Western Circle-II, I&W Dte
- 10) The Financial Advisor, I & W Deptt.

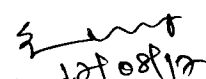
  
17/08/17  
Superintending Engineer  
Mechanical & Electrical Circle

Memo No: 1318/1(4)/1T-6

Dated: 17.08.2017

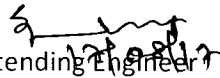
Copy Forwarded for favours of kind information to ;-

- 1) The Executive Engineer, Metropolitan Drainage Mechanical Division for wide circulation.
- 2) The Executive Engineer & T.A to Superintending Engineer Mechanical & Electrical Circle for wide circulation.
- 3) The Director of information, department of Information & cultural Affairs, NABANNA (9<sup>th</sup> Floor) 325, Sarat Chatterjee Road, Howrah - 711102 for wide circulation.
- 4) The Notice Board of Mechanical & Electrical Circle.

  
17/08/17  
Superintending Engineer  
Mechanical & Electrical Circle

## ACCEPTABLE MAKES

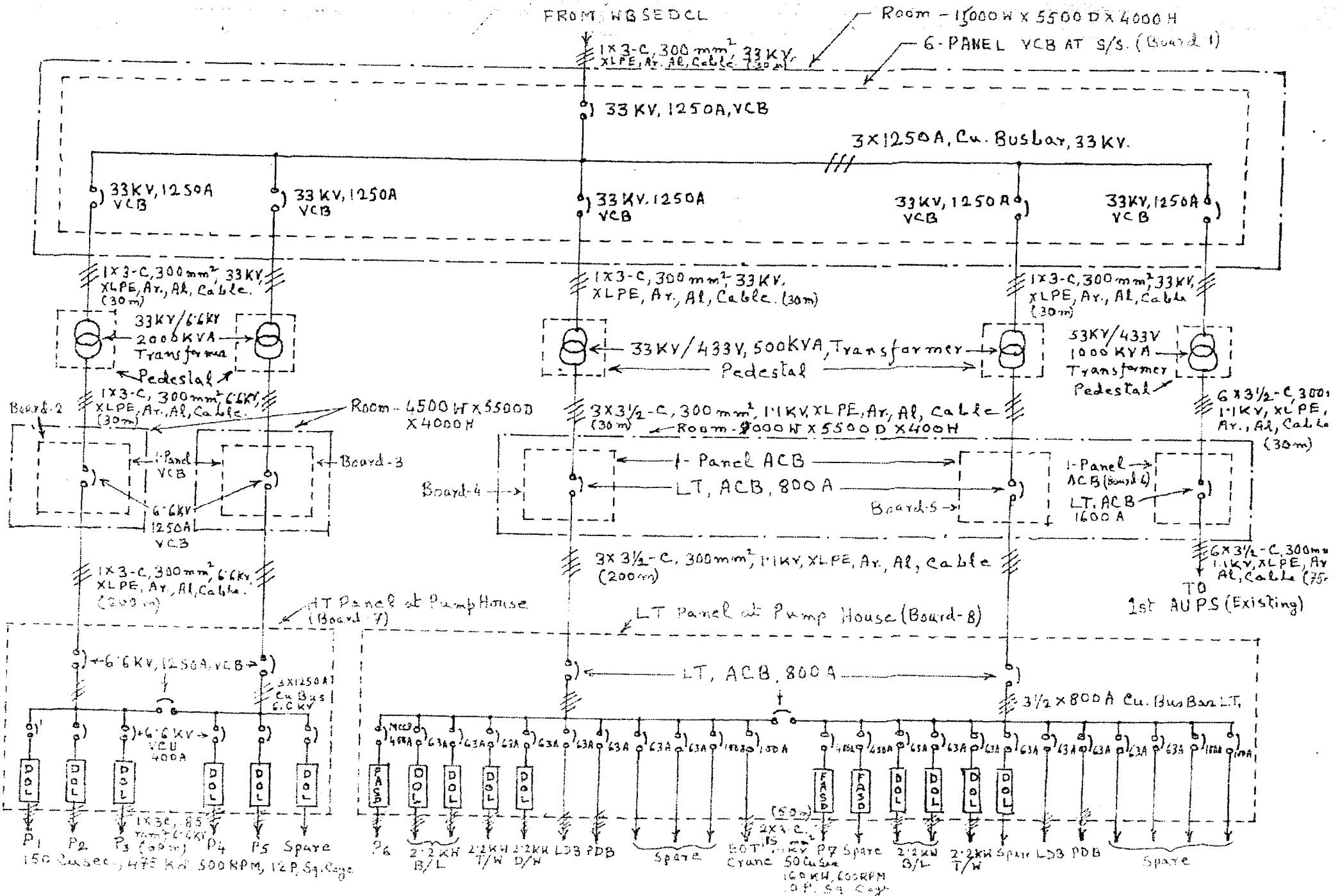
SI. NO.	PARTICULARS	ACCEPTABLE MAKES
1	<b>H.T Panel</b>	
1.1	Panel	In house production of Original Equipment Manufacturer
1.2	V.C.B and V.C.U/V.C.P	Siemens/ABB/Schneider
1.3	Relays (Digital & others)	Siemens/ABB/Areva (MICOM)
1.4	C.T.s & P.T.s	Jyoti/A.E/Kappa
1.5	DOL Starter	Siemens/ABB/Schneider
2	<b>Transformer</b>	BHEL/Kirloskar Electric/Siemens
3	<b>L.T panel</b>	
3.1	Panel	Techno Commece/Hindustan Control (Should be authorised panel manufacture, recommended by OEM)
3.2	ACB & MCCB	Siemens/Jyoti/ABB/L & T
3.3	C.Ts & P.T.s	Jyoti/A.E/Kappa
3.4	FASD Starter	Siemens/ABB/L & T
3.5	Relays (Digital & others)	L & T/Siemens/ABB/Areva (MICOM)
4	<b>H.T Cable</b>	NICCO/GLOSTER/UNIVERSAL
5	<b>L.T Cable</b>	NICCO/GLOSTER/UNIVERSAL
6	<b>Capacitor Bank (Both H.T &amp; L.T)</b>	EPCOS/MADHAV/UNIVERSAL
7	<b>Submersible Pump</b>	KSB/Kirloskar/C.R.I
8	<b>Lead Acid Batteries</b>	Exide
9	<b>Battery Charger</b>	A.E/Electronics System
10	<b>Cable wires &amp; Accsories</b>	Finolex/Mescab/KEI
11	<b>Spares &amp; Tools</b>	Original Equipment Manufacturer.

  
 Superintending Engineer

Mechanical & Electrical Circle  
 I & W Dte.



SINGLE LINE DIAGRAM FOR PROPOSED 2ND ADDL. PUMP HOUSE AT THE OUTFALL OF SAMD PART-1 AT UTTAR BHAG



## PART -B (Electrical Works)

Supply, Installation, Testing and Commissioning of 33KV/6.6 KV and 33 KV/0.415 KV sub-station complete of both H.T & L.T components in the sub-station & pump house as per enclosed schedule of work, detailed specification for the proposed 2nd Additional Uttarbhadg Pumping Station at Uttarbhadg, P.O - Brindakhali, P.S - Baruipur, Dist- South 24 Parganas of West Bengal under Irrigation & Waterways Department, Govt. of West Bengal.

### Bill of Quantities

SI No	Description	Proposed Modification of Specification, if any to commensurate the scope of work	Unit	Qty	Rate in Figure (Rs.)	Amount(Rs.)
	<b>SECTION-I, SUB-STATION EQUIPMENTS</b>					
1.0	<b>CONSUMER 6-PANEL VACUUM CIRCUIT BREAKER AT SUB-STATION</b>					
	Supply,delivery, storing at site,erection testing & commissioning of indoor, floor mounted metal clad totally enclosed horizontal cubicle fully compartmentalized,extensible on either side motor operated spring charged, electrically/manually operated fully draw-out type 33KV Vacuum Circuit Breaker(VCB) Board having rupturing capacity of 750MVA at 33KV with suitable digital breaker protection relay etc. conforming to specification etc and detail shown in single line diagram and as described below Including supplying necessary mounting channels and all other mounting accessories complete.					
	<b>(A) Incomer</b>					
	(i) 1-No 1250A TP,33 KV, 26.2 KA, electrically operated, motorised springcharged, drawout type Vacuum Circuit Breaker (VCB).					
	(ii)1-set (3 Nos) 15VA,250/5A,CL-1 for metering and 5P10 for protection CTs, 13.12 KA/sec					
	(iii)1-set flush mounting digital type trivector meter with accuracy class 0.5 with maximum demand indicator at 30 minute interval					
	(iv)1-set cable termination box suitable for 3C x 300 sqmm.33KV, XLPE /A, AL cable					

	(v)1-set microprocessor based Numerical type relay with two elements for O/C and one element for E/F protection with time and current setting,(70%- 100%for current and 0.3-1.0 for time settings), RS 485 and 232 port for SCADA integration and data up and down loading etc.
	(vi)1-set 0-250A AC flush mounting digital ammeter with selector switch.
	(vii) 1-set-IDMTL type over voltage & under voltage relay having settings 90% to 110% in equal steps.
	(viii) 1-set Draw out type 33KV/ 110V, 100VA star/star dry type potential transformer with primary (3A) and secondary (4A) HRC fuse protections.
	(ix) 1set -0-33KV flush mounted digital voltmeter and selector switch
	(x) 1-set high speed master trip relay.
	(xi) 1 set-Continuous trip circuit supervision with relay
	(xii) 1 set-ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons
	(xiii) 1-set (2 Nos.)-110V,DC shunt trip coil for tripping with power pack unit
	(xiv) 1 set (2 Nos.)- Aux. contactors with necessary fittings
	(xv) Earth bus-bar and all other accessories complete
	(xvi) Annunciator unit. 8W
	(xvii) Hooter
	(xviii) 1-set R/Y/B phase indication lamps
	<b>(B) Bus-Bars</b>
	1-Set TP, 33KV, 1250A, 750 MVA continuous rated copper bus-bar with insulating sleeves
	<b>(C ) Outgoing</b>
	(i) 5 Nos - 1250A, TP, 33 KV, 26.2 KA,Vacuum Circuit Breaker (VCB) (2 nos for 2 MVA transformer feeder , 2 nos for 0.5 MVA transformer feeder & 1 no. for 1 MVA Transformer feeder)
	(ii)2set (3 Nos. in each set) 15VA,150/5A,CL-1 for metering and 5P10 for protection CTs, 13.12 KA/sec, for 2 MVA transformer feeder.
	(iii)2set (3 Nos. in each set) 15VA,50/5A,CL-1 for metering and 5P10 for protection CTs, 13.12 KA/sec, for 0.5 MVA transformer feeder.
	(iv)1 set (3 Nos. in each set) 15VA,100/5A,CL-1 for metering and 5P10 for protection CTs, 13.12 KA/sec, for 1 MVA transformer feeder.





<b>2.0</b>	<b><u>TRANSFORMER</u></b>					
<b>2.1</b>	Supply, delivery, storing at site,erection, testing & commissioning of 2 MVA 33KV / 6.6KV, 3 phase, 50HZ Δ/λ, Dyn 11 outdoor ONAN type transformer in IP 55 enclosure with copper windings, OFF load tap changing arrangement in equal steps of 2.5 % per step from + 12.5% to -7.5%, having HT cable end boxes with cable gland plate suitable for terminating 33KV ,3C x 300 sqmm XLPE/ ARMD, AL cables for primary side and 6.6 KV, 3C x 300 sqmm. XLPE/ARMD, AL cables on the secondary side, three channel temperature scanner for continuous monitoring of the windings & oil, with supply of all associated materials and accessories like oil conservator, silica gel breather, mounting channels bolts ,nuts washers, screw, clamps, painting, earthing etc.and confirming to IS 2026 (I to J) and as per specification as laid down in the contract complete in all respect as required at site including construction of required size CC pedestal.		Set	2		
<b>2.2</b>	Supply, delivery, storing at site,erection, testing & commissioning of 0.5 MVA 33KV / 433V, 3 phase, 50HZ Δ/λ, Dyn 11 outdoor ONAN type transformer in IP 55 enclosure with copper windings, OFF load tap changing arrangement in equal steps of 2.5% per step from +12.5% to -7.5% having HT cable box and LT cable box with cable gland plate suitable for terminating of 33KV ,3C x 300 sqmm XLPE/ ARMD, AL cables for primary side and 3 nos. 1.1 KV grade, 3¼C x 300 sqmm. XLPE/ARMD, AL cables on the secondary side, three channel temperature scanner for continuous monitoring of the windings & oil, with supply of all associated materials and accessories like oil conservator, silica gel breather, mounting channels bolts ,nuts washers, screw, clamps, painting, earthing etc.and confirming to IS 2026 (I to J) and as per specification as laid down in the contract including construction of required size CC pedestal.		Set	2		

<p><b>2.3</b></p>	<p>Supply, delivery, storing at site,erection, testing &amp; commissioning of 1 MVA 33KV / 433V, 3 phase, 50HZ Δ/λ, Dyn 11 outdoor ONAN type transformer in IP 55 enclosure with copper windings, OFF load tap changing arrangement in steps of +12.5 &amp; -7.5 having HT cable boxe and LT cable box with cable gland plate suitable for terminating of 33KV ,3C x 300 sqmm XLPE/ ARMD, AL cables for primary side and 6 nos. 1.1 KV grade, 3½C x 300 sqmm. XLPE/ARMD, AL cables on the secondary side, three channel temperature scanner for continuous monitoring of the windings &amp; oil, with supply of all associated materials and accessories like oil conservator, silica gel breather, mounting channels bolts ,nuts washers, screw, clamps, painting, earthing etc.and confirming to IS 2026 (I to J) and as per specification as laid down in the contract including construction of required size CC pedestal.</p>		<p>Set</p>	<p>1</p>		
<p><b>3.0</b></p>	<p><b>CONSUMER 1-PANEL VACUUM CIRCUIT BREAKER AT SUB-STATION</b></p>					
	<p>Supply,delivery, storing at site,erection testing &amp; commissioning of indoor, floor mounted metal clad totally enclosed horizontal cubicle fully compartmentalized,extensible on either side motor operated spring charged, electrically/manually operated fully draw-out type 6.6KV Vacuum Circuit Breaker(VCB) Board having rupturing capacity of 180MVA at 6.6KV with suitable digital breaker protection relay etc conforming to specification etc and detail shown in single line diagram and as described below Including supplying necessary mounting channels and all other mounting accessories complete.</p>					
	<p>Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before manufacturing the same.</p>					
	<p><b>(A) Incomer/ Outgoing</b></p>					
	<p>(i) 1-No. 1250A TP,6.6 KV, 16 KA,Vacuum Circuit Breaker (VCB)</p>					
	<p>(ii)1-set (3 Nos in each set) 15VA,250/5A,CL-1 for metering and 5P10 for protection CTs, 16 KA/sec</p>					
	<p>(iii)2-set cable termination box suitable for 3C x 300 sqmm.6.6KV, XLPE /A, AL cable</p>					

	(iv)1-set microprocessor based Numerical type relay with two elements for O/C and one element for E/F protection with time and current setting,(70%- 100%for current and 0.3-1.0 for time settings), RS 485 and 232 port for SCADA integration and data up and down loading etc.					
	(v)1-set 0-250A AC flush mounting digital ammeter with selector switch.					
	(vi)1-set Draw out type 6.6KV/ 110V, 100VA star/star dry type potential transformer with primary (3A) and secondary (4A) HRC fuse protections.					
	(vii) 1-set 0-8KV flush mounted digital voltmeter and selector switch					
	(viii) 1-set High speed master trip relay.					
	(ix) 1-set Continuous trip circuit supervision with relay					
	(x) 1-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons					
	(xi) 1-set (2 Nos. in each set) 30V, DC shunt trip coil for tripping with power pack unit					
	(xii) 1- set (2 Nos. in each set) Aux. contactors with necessary fittings					
	(xiii) 1-set Digital KWH & PF meter					
	(xiv) Earth bus-bar and all other accessories complete					
	(xv) 1-set R/Y/B phase indication lamps					
			set	2		
<b>4.0</b>	<b>CONSUMER 1-PANEL AIR CIRCUIT BREAKER AT SUB-STATION</b>					
	Supply,delivery, storing at site,erection testing & commissioning of indoor, floor mounted metal clad totally enclosed horizontal cubicle fully compartmentalized,extensible on either side motor operated spring charged, electrically/manually operated fully draw-out type 433V microprocessor based Air Circuit Breaker(ACB) Board having rupturing capacity of 35MVA at 433V conforming to specification etc and detail shown in single line diagram and as described below Including supplying necessary mounting channels and all other mounting accessories complete.LT panel shall be suitable for 433V AC 50HZ,3 phase and neutral system.					
	Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before manufacturing the same.					

	<b>(A) Incomer/ Outgoing</b>				
	(i) 1-Nos 800A FP,433V, 50 KA,Air Circuit Breaker (ACB)				
	(ii)1-set (3 Nos in each set) 15VA,800/5A,CL-1 for metering CTs				
	(iii)2-set cable termination box suitable for 3 nosx 3½ -C x 300 sqmm.1.1KV, XLPE /A, AL cable				
	(iv)1-set 0-800/2000A AC flush mounting digital ammeter with selector switch.				
	(v) 1-set 0-500V flush mounted digital voltmeter with selector switch				
	(vi) 1-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons				
	(vii) 1-set R/Y/B phase indication lamps				
	(viii) 1-set TRIP/NEUTRAL/CLOSE selector switch				
	(ix) Earth bus-bar and all other accessories complete				
	(x) 1-set Multi Function Meter				
	<b>Complete set as stated above.</b>	set	2		
<b>5.0</b>	<b>CONSUMER 1-PANEL AIR CIRCUIT BREAKER AT SUB-STATION</b>				
	Supply,delivery, storing at site,erection testing & commissioning of indoor, floor mounted metal clad totally enclosed horizontal cubicle fully compartmentalized,extensible on either side motor operated spring charged, electrically/manually operated fully draw-out type 433V Air Circuit Breaker(ACB) Board having rupturing capacity of 35MVA at 433V microprocessor based conforming to specification etc and detail shown in single line diagram and as described below Including supplying necessary mounting channels and all other mounting accessories complete.LT panel shall be suitable for 433V AC 50HZ,3 phase and neutral system.				
	Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before manufacturing the same.				
	<b>(A) Incomer/ Outgoing</b>				
	(i) 1-Nos 1600A FP,433V, 50 KA,Air Circuit Breaker (ACB)				
	(ii)1-set (3 Nos in each set) 15VA,1600/5A,CL-1 for metering CTs				
	(iii)2-set cable termination box suitable for 6 nosx 3½ -C x 300 sqmm.1.1KV, XLPE /A, AL cable				

	(iv)1-set 0-1600/3000A AC flush mounting digital ammeter with selector switch.				
	(v) 1-set 0-500V flush mounted digital voltmeter with selector switch				
	(vi) 1-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons				
	(vii) 1-set R/Y/B phase indication lamps				
	(viii) 1-set TRIP/NEUTRAL/CLOSE selector switch				
	(ix) Earth bus-bar and all other accessories complete				
	(x) 1-set Multi Function Meter				
		set	1		
<b>6.0</b>	<b>HT PANEL AT PUMP HOUSE</b>				
	Supply, delivery, storing at site,erection, testing & commissioning of 6.6KV T.P VCB having rupturing capacity 180 MVA at 6.6 KV with suitable digital breaker protection relay floor mounting free standing HTpanel made of 14SWG CRCA sheet steel extensible on either side totally enclosed,dust and vermin proof, self supported,free standing unit with base channel,multi tier, compartmentalised cubicle,front access type construction with details of feeders as given below .HT panel shall be suitable for 6.6KV AC 50HZ,3 phase system.Panels shall be treated with seven tanks process before painting with two coats of epoxy paint over two coats of epoxy primer all of approved shade complete with front operated incoming and outgoing switchgears,cablealleys,provision for cable entries from top and bottom, necessary meters, internal wiring with1.1KV,copper wire (2.5 sq.mm) protection HRC fuse etc terminal blocks, selector switches, inter connection with insulated(1.1KVgrade) colour coded copper conductor cable,gland plates, earth bus of copper, lifting bolts, level inscriptions, earth connections etc and supply of all necessary accessories all complete and mending good the damages as required.				
	Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before manufacturing the same.				
	<b>(A) Incomer</b>				
	(i) 2-No 1250A TP,6.6 KV, 16 KA,Vacuum Circuit Breaker (VCB)				

	(ii)2-set (3 Nos in each set) 15VA,250/5A,CL-1 for metering and 5P10 for protection CTs, 16 KA/sec
	(iii)2-set cable termination box suitable for 3C x 300 sqmm.6.6KV, XLPE /A, AL cable
	(iv)2-set microprocessor based Numerical type relay with two elements for O/C and one element for E/F protection with time and current setting,(70%- 100%for current and 0.3-1.0 for time settings), RS 485 and 232 port for SCADA integration and data up and down loading etc.
	(v)2set-0-250A flush mounting digital ammeter with selector switch
	(vi) 2-set Draw out type 6.6KV/ 110V, 100VA star/star dry type potential transformer with primary (3A) and secondary (4A) HRC fuse protections.
	(vii) 2-set 0-8KV flush mounted digital voltmeter and selector switch
	(viii) 2-set high speed master trip relay.
	(ix) 2 set-Continuous trip circuit supervision with relay
	(x) 2 set-ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons
	(xi) 2- set (2 Nos. in each set) - 30V, DC shunt trip coil for tripping with power pack unit
	(xii) 2- set (2 Nos. in each set)- Aux. contactors with necessary fittings
	(xiii) 2-set Digital KWH & PF meter
	(xiv) Earth bus-bar and all other accessories complete
	(xv) 2-set R/Y/B phase indication lamps
	<b>(B) Bus-Bars</b>
	2-Set TP, 6.6KV, 1250A, 180 MVA continuous rated copper bus-bar with insulating sleeves
	<b>(C) Bus Coupler</b>
	(i) 1-No 1250A TP,6.6 KV, 16 KA,Vacuum Circuit Breaker (VCB)
	(ii)1-set (3 Nos) 15VA,250/5A,CL-1 for metering and 5P10 for protection CTs, 16 KA/sec
	(iii)1-set microprocessor based Numerical type relay with two elements for O/C and one element for E/F protection with time and current setting,(70%- 100%for current and 0.3-1.0 for time settings), RS 485 and 232 port for SCADA integration and data up and down loading etc.
	(iv)1set-0-250A flush mounting digital ammeter with selector switch

(v) 1-set high speed master trip relay.					
(vi) 1set-Continuous trip circuit supervision with relay					
(vii) 1 set-ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons					
(viii) 1- set (2 Nos.)- Aux. contactors with necessary fittings					
(ix) Earth bus-bar and all other accessories complete					
(x) Annunciator unit. 8W					
(xi) 1-set R/Y/B phase indication lamps					
<b>(D) Outgoing</b>					
(i) 6-set 6.6KV, drawout type electrically operated vacuum contactor unit/vacuum contactor panel, 400A, 16KA, with HRC fuse, 100A (5 nos for 150 cusec, 475 KW, VT pump & 1 no spare)					
(ii) 6-set (3 Nos in each set) 15VA,65/5A,CL-1 for metering and 5P10 for protection CTs, 16 KA/sec					
(iii)6-set cable termination box suitable for 3C x 185 sqmm.6.6KV, XLPE /A, AL cable					
(iv)6-set microprocessor based Numerical type relay with two elements for O/C and one element for E/F protection with time and current setting,(70%- 100%for current and 0.3-1.0 for time settings), RS 485 and 232 port for SCADA integration and data up and down loading etc.					
(v)6-set 0-65/390A AC flush mounting digital ammeter with selector switch.					
(vi) 6-set high speed master trip relay.					
(vii) 6-set-ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons					
(viii) 6-set - Aux. contactors with necessary fittings					
(ix) Annunciator unit. 8W					
(x) Hooter					
(xi) 6-set R/Y/B phase indication lamps					
(xii) 6-set Temperature Scanner.					
(xiii) 6-set digital relay for full motor protection.			per set	1	



7.0	<b>LT PANEL AT PUMP HOUSE</b>					
	<p>Supply, delivery, storing at site,erection, testing &amp; commissioning of 415V (35MVA) TPN floor mounting free standing LTpanel made of 14SWG CRCA sheet steel extensible on either side totally enclosed,dust and vermin proof, self supported,free standing unit with base channel,multi tier, compartmentalised cubicle,front access type construction with details of feeders as given below .LT panel shall be suitable for 500/415VAC 50HZ,3 phase and neutral system.Panels shall be treated with seven tanks process before painting with two coats of epoxy paint over two coats of epoxy primer all of approved shade complete with front operated incomingandoutgoing switchgears,cablealleys,provision for cable entries from top and bottom, necessary meters, internal wiring with1.1KV,copperwire (2.5 sq.mm) protection HRC fuse etc terminal blocks, selector switches, inter connection with insulated(1.1KVgrade) colour coded copper conductor cable,gland plates, earth bus of copper, lifting bolts, level inscriptions, earth connections etc and supply of all necessary accessories all complete and mending good the damages as required.</p>					
	<p>Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before manufacturing the same.</p>					
	<b>(A) Incomer</b>					
	(i) 2-Nos 800A FP,433V, 50 KA,Air Circuit Breaker (ACB)					
	(ii)2-set (3 Nos in each set) 15VA,800/5A,CL-1 for metering CTs					
	(iii)2-set cable termination box suitable for 3 nosx 3 1/2-C x 300 sqmm.1.1KV, XLPE /A, AL cable					
	(iv)2-set 0-800/2000A AC flush mounting digital ammeter with selector switch.					
	(v) 2-set 0-500V flush mounted digital voltmeter with selector switch					
	(vi) 2-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons					
	(vii) 2-set R/Y/B phase indication lamps					
	(viii) 2-set TRIP/NEUTRAL/CLOSE selector switch					
	(ix) Earth bus-bar and all other accessories complete					

	(x) Annunciator unit. 8W					
	(xi) 2-set Multi Function Meter					
	<b>(B) Bus-Bars</b>					
	2-Set TPN, 500/415V, 800A, 50Hz, 35 MVA continuous rated copper bus-bar with insulating sleeves					
	<b>(C) Bus Coupler</b>					
	(i) 1-No 800A FP,433V, 50 KA,Air Circuit Breaker (ACB)					
	(ii)1-set (3 Nos) 15VA,800/5A,CL-1 for metering CTs					
	(iii)1-set 0-800/2000A AC flush mounting digital ammeter with selector switch.					
	(iv) 1-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push buttons					
	(v) 1-set R/Y/B phase indication lamps					
	(vi) 1-set TRIP/NEUTRAL/CLOSE selector switch					
	(vii) Earth bus-bar and all other accessories complete					
	(viii) Annunciator unit. 8W					
	<b>(D) Outgoing</b>					
	(i) 3Nos-400A TPN 500/415V, AC 50KA breaking capacity MCCB with motor protection digital relay , microprocessor based O/L,E/F and S/C releases having independent time and current settings (time settings 0.3sec to 1.0sec and current settings 80% to 100%) with all other accessories complete including 415V,Fully Automatic StarDelta Starter (FASD) for operation of 180KW pump motor having 3nos.300A,415V,TP AC 3 contactors and timer 0-30 sec CT operated thermal O/L relay having suitable setting range with single phase preventor,ON/OFF/TRIP lamps, START/STOP push buttons, 0-500A, CT operated digital ammeter with 500/5A class-1 CTS and selector switch, local/remote selector switch, temperature scanner (Masibus make),completely wired up to the terminals (2 nos for 50 cusec, 160 KW, VT pump &1 no spare)					

	(ii) 8Nos-63A TPN 500/415V, AC 50KA breaking capacity MCCB with motor protection relay MICOM brand (Schneider/ Siemens/ L&T), microprocessor based O/L,E/F and S/C releases having independent time and current settings (time settings 0.3sec to 1.0sec and current settings 80% to 100%) with all other accessories complete including 415V, DOL starter for operation of 2.2KW bearing lubrication & cooling/drinking water lifting pump motor having 1 no contactor 32A, CT operated thermal O/L relay having setting range 4-6.3A with, single phase preventor, ON/OFF/TRIP lamps, START/STOP push buttons, 0-500A, CT operated digital ammeter with 500/5A class-1 CTS and selector switch, local/remote selector switch, completely wired up to the terminals (4 nos. for 2.2 KW bearing lubrication & cooling pump motor ,1 no. for 2.2KW drinking water lifting pump motor, 2 nos. for 2.2 KW submercible pump motor & 1 no. spare)				
	(iii) 8Nos- 63A TPN 500/415V MCCB with breaking capacity of 50 KA including 0-63A CL-1 digital ammeter with 60/5A class-1 CTS and selector switch and ON/OFF/TRIP indication light complete (2 nos for LDB, 2 nos for PDB, 2 nos for control panel of tubewell-1&2, 2 nos spare).				
	(iv) 4Nos- 100A TPN 500/415V MCCB with breaking capacity of 50 KA including 0-100A CL-1 digital ammeter with 60/5A class-1 CTS and selector switch and ON/OFF/TRIP indication light complete ( 1 no for EOT crane, 3 nos spare).				
	<b>(E) Earth bus-bar</b>				
	Continuous earth bus bar of 50 x 6mm G.I. flat running continuous through out the length of the switch board with earthing terminals.				
	<b>Complete set as stated above</b>	Set	1		
<b>8.0</b>	Local / Remote Push Button Station including all accessories and wiring complete for 5 nos, 6.6 KV, 475 KW, motors and 2 nos 415 V, 160 KW motors.	Set	7		

<b>9.0</b>	<b>Capacitor Bank</b>				
<b>9.1</b>	Supply, delivery and storing at site, erection, testing & commissioning of capacitor bank of 290KVAR or suitable rating to reach improve power factor near to 1, delta connected double dielectric heavy duty Metalised poly propylene -Heavy duty (MPP-H) power factor correction capacitor 6.6KV AC,3ph,50Hz, as per IS:13340 & IEC specification to be connected directly in parallel with the 475 KW motor terminals. Including supply and installation of Reactor/ Inductor coil against each module.Including supply of 16G well ventilated,Powder coated MS enclosure of appropriate size and duly painted Note:Capacitor should be able to with stand a 110% of rated voltage and 130% of rated current.		Set	5	
<b>9.2</b>	Providing and fixing inductance coil, contactor, auxliary contacts, auxiliary bus and auto manual switch I/C wiring complete with material and labour for capacitor bank.		Set	5	
<b>9.3</b>	Supply, delivery and storing at site, erection, testing & commissioning of capacitor bank of 100KVAR or suitable rating to reach improve power factor near to 1, delta connected double dielectric heavy duty Metalised poly propylene -Heavy duty (MPP-H) power factor correction capacitor 415V AC,3ph,50Hz, as per IS:13340 & IEC specification to be connected directly in parallel with the 160 KW motor terminals. Including supply and installation of Reactor/ Inductor coil against each module.Including supply of 16G well ventilated,Powder coated MS enclosure of appropriate size and duly painted Note:Capacitor should be able to with stand a 110% of rated voltage and 130% of rated current.		Set	2	
<b>9.4</b>	Providing and fixing inductance coil, contactor, auxliary contacts, auxiliary bus and auto manual switch I/C wiring complete with material and labour for capacitor bank.		Set	2	
<b>10.0</b>	<b>HT CABLING</b>				
<b>10.1</b>	Supplying and laying of following size HT cables in excavated cable trench, erected cable tray,pipes and masonry trench, through under ground as and where necessary as per I E Rule/PWD Schedule. 33 KV grade 3 core 300 Sq. mm XLPE armoured Aluminum cable.		RM	180	

10.2	Supplying and laying of following size HT cables in excavated cable trench, erected cable tray, pipes and masonry trench, through under ground as and where necessary as per I E Rule/PWD Schedule. 6.6 KV grade 3 core 300 Sq. mm XLPE armoured Aluminum cable.		RM	460		
10.3	Supplying and laying of following size HT cables in excavated cable trench, erected cable tray, pipes and masonry trench, through under ground as and where necessary as per I E Rule/PWD Schedule. 6.6 KV grade 3 core 185 Sq. mm XLPE (UE) armoured Aluminum cable.		RM	300		
10.4	Supply and fixing 33KV HT end termination joints (heat shrinkable type) for 3C x 300sqmm cable including supplying all jointing materials, compound end socket etc.		Set	12		
10.5	Supply and fixing 6.6KV HT end termination joints (heat shrinkable type) for 3C x 300sqmm cable including supplying all jointing materials, compound end socket etc.		Set	8		
10.6	Supply and fixing 6.6KV HT end termination joints (heat shrinkable type) for 3C x 185sqmm cable including supplying all jointing materials, compound end socket etc.		Set	10		
11.0	<b>LT CABLING</b>					
11.1	Supplying and laying of following sizes of 1.1KV grade XLPE insulated armored aluminum cable in excavated trenches, erected cable tray, pipes and masonry trench, through under ground etc. as and where required as follows:					
11.1.1	3 ½ C 300 Sqmm XLPE/A Al Cable.		RM	2000		
11.1.2	3 C 185Sqmm XLPE/A Al Cable.		RM	200		
11.1.3	3 ½ C 50 Sqmm XLPE/A AL Cable.		RM	100		
11.1.4	4 C 25 Sqmm XLPE/A AL Cable.		RM	35		
11.1.5	4C X 16 Sqmm XLPE/A AL Cable.		RM	100		
11.1.6	3C X 10 Sqmm XLPE/A AL Cable.		RM	300		
11.1.7	2C X 16 Sqmm XLPE/A AL Cable.		RM	400		
11.1.8	7C X 2.5 Sqmm XLPE/A Cu Cable.		RM	350		
11.1.9	14C X 2.5 Sqmm XLPE/A Cu Cable.		RM	700		
11.1.10	2C x 10 Sqmm XLPE/A AL Cable.		RM	600		
11.2	Supply of following gauge <b>GI earth wire and laying</b> in proper places as per specification.					
11.2.1	6 G		RM	120		
11.2.2	8 G		RM	120		

11.2.3	12 G		RM	150		
11.3	Supplying and fixing of compression type brass cable gland and <b>finishing the cable</b> ends of XLPE/A aluminum cable by crimping with cable sockets, including tapes etc including supplying copper cable sockets all joints materials and making connection including earthing as per approved practice as follows (As per PWD schedule of electrical works)					
11.3.1	3 ½ C 300 Sqmm XLPE/A Al Cable.		Set	48		
11.3.2	3 C 185 Sqmm XLPE/A Al Cable.		Set	16		
11.3.3	3 ½ C 50 Sqmm XLPE/A AL Cable.		Set	8		
11.3.4	4 C 25 Sqmm XLPE/A AL Cable.		Set	4		
11.3.5	4C X 16 Sqmm XLPE/A AL Cable.		Set	8		
11.3.6	3C X 10 Sqmm XLPE/A AL Cable.		Set	20		
11.3.7	2C X 16 Sqmm XLPE/A AL Cable.		Set	32		
11.3.8	3C X 2.5 Sqmm XLPE/A Cu Cable.		Set	30		
11.3.9	14C X 2.5 Sqmm XLPE/A Cu Cable.		Set	24		
11.3.10	2C x 10 Sqmm XLPE/A AL Cable.		Set	48		
12.0	Supplying and installation of GI pipe (medium class) protection for cable to be laid underground /embedding in wall/ floor /entry to the building etc. including all accessories all complete.					
12.1	100 mm NB G.I pipe		RM	100		
12.2	80 mm NB G.I pipe		RM	100		
12.3	50mm NB G.I pipe		RM	100		
13.0	<b>Cable tray</b>					
13.1	Supplying and installation at site perforated Galvanised Iron Cable tray of following sizes.					
13.1.1	375 mm x 2.0 mm x 50 mm		RM	70		
13.1.2	150 mm x 1.6 mm x 50 mm		RM	80		
13.1.3	100 mm x 1.6 mm x 50 mm		RM	120		
13.2	Supply installation, delivery & storing at site fabricated ladder type cable tray made from 50 x 50 x 6mm M.S.angle and 25 x 6mm M.S.flat at 300mm intervals with drilled holes with necessary supports,clamps,bolts,nuts, washers, screws, and all other accessories painting earthing complete.					
13.2.1	300 mm wide		RM	50		

13.2.2	450 mm wide		RM	50		
13.2.3	600 mm wide		RM	100		
13.3	Supply and installation of arm bracket made from G.I pipe.					
13.3.1	40 mm dia.		Each	18		
13.3.2	50 mm dia.		Each	9		
14.0	<b><u>Earthing station and accessories</u></b>					
14.1	Supplying and installation of all materials necessary for Boring earthing pits 300mm dia and supply and fixing of pipe earth electrode with 80mm dia G.I (M) pipe(IS-1239) 3.0 M long having 12mm dia holes on its length driven to an average depth of 3.65M below the ground level including supply and fixing 1no.65 mm x 8 mm G.I.steel tape 4M long 25mm dia x 150mm long galvanised double bolts double nuts and washer including s/f 80mm dia GI pipe protection of 3.0M length to be filled with bitumen partly underground level and partly above ground level including S/F of G.I.reducer,bolts,double nuts,double washers & restoring the surface duly rammed.Also providing necessary masonry inspection pit on the top of the earth electrode having overall size 550 X 550 X 475mm deep below GL complete with CBW (1:6)of 125cm width duly plastered with cement mortar (1:6) (inside), S/F CI hinged inspection cover of size 300 X 300 mm (approx) in cement concrete of depth 100 mm and treating the soil of the earth pit with salt & charcoal or coke.		Set	20		
14.2	Do-as above with G.I. plate of 610 × 610 × 10mm size & others as per IS-3043 etc. for Transformer. Neutral connection.		Set	10		

14.3	Supplying and fixing of hot dipped <b>GI strip</b> of following sizes, for connecting the neutral of transformer / earth bus bars to earth electrode including supply and fixing 50 mm x 6 mm galvanised steel tapes as per IS with 3 mm thick GI space bar saddle at an interval of 500 mm on wall having clearance of 25 mm from wall as necessary for earth connection complete with GI bolts, nuts, washer etc as required for tapping, where required, floor chipping embedding the strip and mending good the damages with cement concrete (1:2:4)-1/4" down stone chips to be used and neat cement finish, for body earthing of sub- station equipment. For under ground portion the GI tape shall be painted with anti-corrosive bituminous paint and the rate shall include excavation, refilling and ramming of earth. Depth of the trench minimum 300 mm.					
14.3.1	(i) 65 x 8 mm		RM	400		
14.3.2	(ii) 50 x 6 mm		RM	350		
14.3.3	(iii) 40 x 6 mm		RM	150		
14.3.4	(iv) 25 x 6 mm		RM	250		
15.0	Supplying and fixing of 5.0 kg capacity <b>fire extinguishers</b> (Dry chemical type) to be fitted in wall with suitable bracket including cutting, chipping and mending good the damages.		Each	16		
16.0	Supplying and fixing 9 lts. Capacity MS fire bucket coloured red.		Each	16		
17.0	Supplying and fixing of <b>shock treatment chart</b> duly framed with glass on wall with necessary screws.		Each	4		
18.0	Supplying and fixing of 250 mm x 250 mm x 2 mm thick <b>danger boards</b> with screws.		Each	10		
19.0	Supplying and fixing of 2000 x 1000 x 12 mm thick <b>rubber insulating mat</b> , tested up to 33 KV of approved make.		Each	12		
20.0	Supplying and fixing of <b>First Aid Box</b> with all items as required by rule on MS Bracket including mending good the damages.		Set	2		



	<b>SECTION-II INTERNAL ELECTRICAL WORK</b>					
<b>21.0</b>	<b>DISTRIBUTION BOARDS</b>					
<b>21.1</b>	Supplying and installation off 500V 8 way <b>TPN MCB</b> double door type Distribution board with incoming isolator and outgoing MCBs including separate TPN copper busbars,earth busbar setc.suitable for single and multiple pole MCBs complete with all inter connection in manufacturers MS (IP 44) enclosure suitable for flushed fitted in wall,danger board and all other accessories including supplying of all accessories, earthing, painting etc.and comprising the following: Note: MCBs shall be 10 KA short circuit rating (min).					
	8 way -TPN Distribution Board					
	1No - Incoming 125A 4 Pole MCB					
	9 Nos - 32 A SP MCBs					
	3 Nos.-16 A SP MCBs					
	<b>Complete set as stated above</b>		Set	4		
<b>21.2</b>	Supplying and installation of 250 V <b>SPN MCB</b> double door type Distribution board with incoming isolator and outgoing MCBs including separateTPN copper bus bars earth bus bars etc. suitable for single pole MCBs complete with all inter connection in manufacturers MS (IP44) enclosure suitable for flushed fitted in wall,danger board and all other accessories including supplying of all accessories earthing and painting etc. and comprising the following: Note: MCBs shall be 10 KA short circuit rating (min).					
	12-way SPN Distribution Board with					
	1No.- incoming 63A DP, 30 mA, RCCB					
	6 Nos.-16 A SP MCBs					
	6 Nos.-6 A SP MCBs					
	<b>Complete set as stated above</b>		Set	6		
<b>21.3</b>	Supply of junction box of size 150 X 150 X 50 mm made from 1.6 mm thick MS sheet with terminal.		Set	30		

<b>22.0</b>	<b>Distribution wiring</b> for lighting including circuit wiring and point wiring in single core ISI marked stranded 2 X 2.5 Sqmm (1.1 KV grade) PVC insulated copper wire and 1 no 1.5 sqmm. PVC insulated copper earth wire in 25 mm dia MSBE conduit (as per specification) surface on wall / ceiling for lights including supplying MSBE conduit, bar saddles, circular box, ceiling rose etc where necessary, galvanised ms switch board properly flushed in wall with 6A piano key type switch and white hylam cover 3 mm thick and earthing the boxes painting all complete. Av run 8 mtr.  NB :point wiring should inclusive of continuous wire length up to the connection block of light fitting/fan etc.					
<b>22.1</b>	light Points		Pt.	100		
<b>22.2</b>	Ceiling Fan points		Pt.	10		
<b>22.3</b>	Exhaust Fan points		Pt.	20		
<b>23.0</b>	DO--DO- for three pin 6 A socket outlets on same lighting switch board including supplying and fixing piano key type switch socket on hylam cover switch board.Av run 1.5 mtr. (a) On switch Board.		Pt.	20		
<b>24.0</b>	Supplying and installation of Power point wiring in single core stranded 1.1 KV grade PVC insulated copper wire in 20 mm dia MSBE conduit including earth wire surface on wall/ ceiling etc. including supplying MSBE conduit, bar saddles, circular boxes, ceiling rose, M.S boxes with white hylam cover (3 mm thick) where necessary from SPN DBs to power plug points and making connection as follows : Av run 8 mtr.					
<b>24.1</b>	With 2 x 2.5 sqmm + 1 x 1.5 sqmm single core Stranded 1.1KV grade PVC insulated copper wire ( for 6 pin and 6/16 A plug points).		Pt.	20		
<b>24.2</b>	With 2 x 6 sqmm +4 sqmm single core Stranded 1.1 KV grade PVC insulated copper wire (for 2 pin and scraping earth 20A plug points).		Pt.	20		
<b>25.0</b>	Supplying and installation of flush mounting <b>switch socket and plug units</b> of following rating with controlling piano type / SPMCB of same rating in MS enclosure flushed in wall including supplying plug top and all other installation accessories.					
<b>25.1</b>	16 A SPN Switch socket outlet with fuse (piano type)		Each	20		
<b>25.2</b>	20A 2P+E with 20 A SPN MCB (industrial type)		Each	20		

<b>26.0</b>	<b>Fluorescent tube Light</b>				
<b>26.1</b>	Supplying and installation of corrosion resistant surface mounted type batten suitable for <b>1 x 40w fluorescent fitting</b> MSCRCA sheet steel, powder coated, grey gear tray withMS CRCA powder coated white cover Plate containing all accessories such as electronics chokes, click fix type lamp holder, capacitors etc. including supply of 1nos .40w fluorescent lamps etc all complete and completely wired upto terminal and ready fo rconnection with 240V, 50 Hz AC supply.		Set	24	
<b>26.2</b>	Supplying and installation of corrosion resistant surface mounted type batten suitable for <b>2x40w fluorescent fitting</b> MSCRCA sheet steel, powder coated, grey gear tray withMS CRCA powder coated white cover Plate containing all accessories such as electronics chokes, click fix type lamp holder,capacitors etc. including supply of 2nos.40w fluorescent lamps etc all complete and completely wired upto terminal and ready for connection with 240V, 50 Hz AC supply.		Set	12	
<b>27.0</b>	Supplying and fixing of <b>HPSV street lighting luminaries</b> of following rating with single piece deep drawn aluminium housing (IP-54) powder coated outside,pot optics reflector and uv stabilised acrylic cover complete with all accessories such as energy efficient copper ballast,Electronics ignitor, Power factor improvement capacitor etc. prewired to a terminal block and mounted easily detachable gear plate suitable for 70 / 150 / 250 W HPSV lamp for street lighting installation with necessary connection suitable to run smoothly from 1ph, 230 V, 50 Hz supply.				
27.1	70 w		Set	6	
27.2	150 w		Set	20	
27.3	250 w		Set	10	
27.4	Fixing out door type flurocent /SV/ NV light fittings on pole including S & F 40 mm dia X 1.68 mts. long GI pipe (ISI-medium) bracket with 40 mm. X 10 mm. thick, MS clamp etc. and providing wiring with 2X 1/1.40 PVC insulated and sheathed wire (Single core) from loop box at the base of pole to light fitting through pole and bracket ( without control switch) including making connections and painting.		Set	20	

28.0	Supply and fixing of MS <b>fan hook box</b> of dimension 200 mm (dia) x 50 mm (depth) with ms rod of 12mm dia and 300mm length properly curved to suspend ceiling fan form RC ceiling as per specification and direction of engineer.		Each	10		
29.0	Supply and fixing of 230/250V,50 cycles,AC1400 mm sweep <b>ceiling fan</b> of approved shade complete with down rod,canopies,blades, rubber bush, forks, locking pins, and regulator etc all complete.		Each	10		
30.0	Supplying and fixing of 1500 RPM (approx.) 230 volt AC ring mounted,sound less,centrifugal through exhaust fan of following sweep including supply of louver guard etc.all complete. 450 mm dia.		Each	20		
31.0	Supplying and installation of <b>high /medium bay luminaries</b> for use with high pressure Metal Halide upto 250 W including anodised aluminium canopy with MS eye bolt for suspension and agrommet suitable for entry of incoming cable. Spacer accommodating a specially designed lamp holder prewired upto the terminal bock,wide beam reflector made of high purity aluminium sheet electro chemically brighten and anodised flat toughened glass cover fixed to the reflector by toggles,safety chain is provided for captive retention black butyle rubber gasket all complete to run smoothly from1ph,230V,50 Hz supply. ( For pump house)		Each	20		
32.0	Supplying and erection of street light pole					
32.1	Supplying and erection of single steel tubelar pole of length as given below with / without sole plate & cap etc. in CC foundation ( proportion and dimension indicated below ), having 600 x 600 x 150 mm thick CC ( 4:2:1 )base block below sole plate / pole with hard jhama metal including CC ( 6:3:1 )muffing 0.30 mts. dia and 0.30 mts. above ground level including 3 mm thick neat cemented finish and GI earth bolt after making drilled holes etc. on pole & carriage of pole upto 1.6 Km from store to work-site including filling up the excavated earth pit with shifted soil and ramming properly (a) UPto 9.0 mtr. Size 0.6 x0.6 x1.70 mts.		Each	20		

32.2	Extra on item no 32.2 above, for providing CC ( 6:3:1 ) base block ( around the pole ) dimension 0.6 x 0.6 x 0.76mt. Above ground level, neatly cemented finish ( 3 mm thick ) at the base of pole ( in lieu of CC muffing ) suitable for alkathene / polythene pipe entry as directed for street light wiring incl. S & F 250 x 250 x 100 mm GI loop box, 16 SWG & incl. drilled hole in pole.		Each	20		
	<b>Section-III Installation of Lightning Conductor.</b>					
33.1	Supply and installation of lightning conductor Air-terminals made of 15 mm dia 1500 mm long Class-BG .I pipe (ISI approved) having five prongs of No. 4 SWGG.I. wire at top with 85 mm dia 6 mm thick G.I. base plate at bottom including necessary holes etc. for grouting on the parapet etc in C.C mortar (4:2:1).		Each	14		
33.2	Supply and fixing of 25 x 6 mm G.I flat on parapet / roof/ plinth/ surface of wall for lightning conductor as required (for horizontal runs) with 40 mm long G.I staples .		Each	300		
33.3	Supplying and fixing of 25 x 6 mm G.I flat for vertical run with G.I saddles .		Mtr	150		
33.4	Supply and providing for making soldered joints between conductor/ down pipes/other metallic objects with 25x 6mm G.I flat including supply of jointing materials and painting with two coats bituminous paint		Mtr	50		
33.5	Supplying and providing testing line joints by 25 x 6mm thick G.I strip 125 mm long grouted on wall having clearance of 6mm from wall for making connection with thimbles at the end of 25 x 6G.I flat and 4-SWGG.I.wire of vertical conductor and conductor from earth electrode complete with S&F thimbles, G.I bolts, nuts, check nuts, spring washers etc required		Mtr	14		
33.6	Cutting cornices /steps etc including cutting recess in building setc and supply and fixing of 15 mm bore (class-B) G.I.pipe protection as below and making god damages to the building worksLength up to 0.5 Mtr		Each	14		
33.7	Earth pits as per IS-3043 and connection as per specification of Contract using 50 mm dia G.I. pipe Electrode.		Set	14		

	<b>Section-IV Installation of Instrumentation.</b>					
<b>34.0</b>	<b>Instrumentation System</b>					
<b>34.1</b>	Installation, testing and commissioning of following terms with supply of all accessories and equipment, erection hardware and all power and control cables, laying arrangement, etc. as required as per specifications - all inclusive.					
	(i) 6 nos Ultrasound type level transmitter with probes.					
	(ii) 1 no Rain gauge (Manual)					
	(iii)Power,control & signal cables and accessories as may be required-all inclusive.					
			Set	1		
<b>34.2</b>	Installation, testing and commissioning of instruments control panel with following instruments ,control equipment and associate direction hardware as well asaccessories, push buttons,indicating lamps,etc and all other accessories, power and control cabling, earthing complete as per specification.					
	(a) Upstream Panel with following items of work :					
	(i) 1set-Microprocessor based Alarm Audio visual type annunciator with hooters as per specification					
	(ii) 1set-Instrument control panel with digital type level indicator as per specification.					
	(iii)Power & Control cables and accessories as are required.					
			Set	1		
	<b>Section-V, BATTERIES, BATTERY CHARGER &amp; D.C.D.B.</b>					
<b>35.1</b>	Supplying , installation, testing and commissioning batteries , Battery Charger and D.C. Distribution Board ( D.C.D.B) complete unit , comprising of following and as per detailed specification . (1) Batteries with 55 cells , 2 Volts each , total 110V D.C. 200 Amp-Hr Capacity alongwith all accessories . (2) Charger will be float cun boost for rating 20 Amps . (3) D.C.D.B. would have 12 nos. of feeder .(4) D.C.D.B. comprising of two incoming double pole miniature circuit breaker ( M.C.B.) 50 Amps and 12 nos. of 10 Amps outgoing feeder with M.C.B. or switch fuse unit, complete with accessories etc. conforming to specification .					
			set	1		

	<b>Section-VI, TRIAL RUN &amp; OPERATION</b>					
36.1	Trial run operation minimum of 72 Hrs on continuation basis or 200 Hrs. intermittent of each pump , free of cost including cleaning .					
36.2	Operation, maintenance and cleaning of pump house after completion of trial run not less than 100 operational days or 12 month s whichever is later as per detailed scope of work and specification.		Job	1		
	<b>Total amount of Electrical works</b>					

sd/-  
 Superintending Engineer  
 Mechanical & Electrical Circle  
 Irrigation & Waterways Dte.

Sd/- M. K. KAMAKAR DRAUGHTSMAN	Sd/- S. A. HAKIM ASSISTANT DIRECTOR CENTRAL DESIGN OFFICE	Sd/- AMIYA BERA DEPUTY DIRECTOR CENTRAL DESIGN OFFICE	Sd/- M. P. GHOSH DIRECTOR CENTRAL DESIGN OFFICE
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REFERENCE:-  
1. MEMO NO. 3F-2 / 1791 DT. 30.09.15 S.E. METROPOLITAN CIRCLE.  
2. MEMO NO. 5M-21 / 661 DT. 18.04.16 S.E. METROPOLITAN CIRCLE.

REVISION DRG. NO. - PH-74/1/10/(R-1)/16 DATE : 18.07.16

REVISION MADE	SIGNATURE
FILE DA HAS BEEN CHANGED FROM 600MM TO 750MM & PILE CAP HAS BEEN MODIFIED.	
DRAUGHTSMAN C.D.O.	ASSISTANT DIRECTOR C.D.O.
DEPUTY DIRECTOR C.D.O.	DIRECTOR C.D.O.

- NOTES :
- ALL DIMENSIONS ARE IN MM AND ALL LEVELS ARE IN METRE EXCEPT OTHERWISE SPECIFIED.
  - DO NOT SCALE ANY DIMENSION ; ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN. IN CASE OF OMISSION OR DISCREPANCY REFER TO THE DESIGN OFFICE.
  - ALL P.C.C. WORKS SHALL BE OF 1:2:4 CONCRETE UNLESS OTHERWISE MENTIONED.
  - (a) CONCRETE USED FOR R.C.C. WORKS EXCEPT PILES SHALL BE OF M - 25 (DESIGN MIX) CONFORMING TO IS - 456 - 2000.  
(b) PILES ARE OF M-35 GRADE CONCRETE.
  - MAXIMUM SIZE OF COURSE AGGREGATES USED SHALL BE 20 mm BOTH FOR P.C.C. & R.C.C. WORKS.
  - MINIMUM COVER TO MAIN REINFORCEMENT  
(a) PILE & PILE CAP 50mm.  
(b) OTHER R.C.C. WORKS 50 mm.
  - 200 mm LDPE FILM SHALL BE PROVIDED UNDER P.C.C. TO PREVENT WATER PERCOLATING IN TO THE SOIL.
  - 50 MINIMUM DIA PIPE SHALL BE EMBEDDED IN THE WALL ( ABUTMENT WALL / RETAINING WALL ) AS WEEP HOLES. ITS HORIZONTAL ROWS OF WEEP HOLES SHALL BE PROVIDED AS PER SUITABILITY AND SITE CONDITION. HORIZONTAL & VERTICAL SPACING BETWEEN ROWS SHALL BE 1000 mm. INVERTED FILTER IS TO BE PROVIDED AT THE BACK OF THE WALL IN TWO LAYERS EACH OF 300 mm THICK.
  - ISIS Z' TYPE SHEET PILE SHALL BE USED AS SHOWN.
  - GRADE FOR SECONDARY CONCRETE SHALL BE LEFT WHERE GUIDE CHANNEL, SILL BEAM ETC. ARE TO BE EMBEDDED.
  - REINFORCING STEEL BARS USED SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF Fe-415 GRADE CONFORMING TO IS - 1786 - 1985.
  - SPACING IN REINFORCEMENT BARS MAY BE ALLOWED IN STAGGERED POSITION AND DEVELOPMENT LENGTH OF BARS IN SPlicing SHALL BE 50 TIMES THE DIA OF BAR.

- 5 NOS. OF BAY @ 3.80M. CLEAR, FOR EACH 150 CUSEC PUMP.
- 2 NOS. OF BAY @ 2.20M. CLEAR, FOR EACH 50 CUSEC PUMP.

