SECTION 4, CONTRACT DATA

The following Conditions shall supplement the General Conditions in Section III. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions and Additional Conditions. Items marked _NA' shall not apply

Category	Description	Particular Conditions	Clause references with respect to Section 3
A. GENERAL			
General information	Name of Contract/Work	**Augmentation of Greater Mamit Water Supply Scheme – Part – II (Clear Water and Distribution System)**	
	Bid No:	1/2022-23/E-in-C/PHED dated 29th July 2022	
Definition	The Employer is:	PHE Department, Mizoram represented by Engineer-in-Chief, PHE Department, Government of Mizoram.	Clause 1.1(15)
	Engineer-in-Charge:	The Executive Engineer, PHED MAMIT WATSAN Division,	Clause 1.1(16)
Interpretation	Sectional Completion applies to the following items of Work:	For details, please refer **Program** under **B. Time Control** below: 1. NA	Clause 2.2
	The following documents also forms part of the Contract:	1. NA 2. NA	Clause2.3(9)
Language and Law	The law which apply to the contract :	The Law of Union of India	Clause 3.1
	The language of the contract document :	English	Clause 3.1
Other Contractors	The Schedule of Other Contractors:	NA	
Key Personnel	The Scheduled of Key Personnel	As per Annexure – II of Section – I(ITB)	Clause 9.1
Insurance	The minimum insurance cover for physical property, injury and death is:	Rs 5 Lakh per occurrence with the number of occurrences limited to four. After each occurrence, Contractor will pay additional premium necessary to make insurance valid for four occurrence always.	Clause 13.1
Site Investigation Report	Site Investigation Report	Available and enclosed at Drawing No 1	Clause 14.1
Possession of Site	The site is located at:	**Phaizau and Mamit** and is indicated in the Drawing No. 2	Clause 21.1
B. Program	The Start Date shall be:	**15 days** from the date of issue of the notice to proceed with the work.	Clause 27.1
	The Intended Completion Date for the whole of the work is:	24 months after the Start Date	Clause 27.2
	Mile stones are:		Clause 27.2

	1. Milestone 1 ie _____	NA_____ Months after Start Date	
	2. Milestone 2 ie. _____	___NA_____ Months after Start Date	
	3. Milestone 3 ie. _____	_____NA____ Months after Start Date	
	The period for submission of program for approval of Engineer-in-charge;	**21 days** from the issue of letter of acceptance.	Clause 27.3
	Period between program updates	90 days	Clause 27.5
	The amount to be withheld for late submission of an updated program;	Rs. 2% of the Contract price	Clause 27.5
C. QUALITYCONTROL			
Correction of defects, Guarantees and Liabilities	The Defect Liability Period is:	365 (three hundred and sixty five days) days from the date of Completion of the Facilities or one year from the date of Operational Acceptance of the Facilities, whichever first occurs subject to further extension as long as the defect remains to be corrected.	Clause 35.2
COST CONTROL			
Change in Quantities	Competent authority to approve variation of quantities beyond 10% of the Contract Price	Engineer-in-Chief	Clause 38.2
Compensation Events	The following events shall also be Compensation Events:	Substantially adverse ground conditions encountered during the course of execution of work not provided for in the bidding documents : i) Removal of underground utilities detected subsequently ii) Significant change in classification of soil requiring additional mobilization by the contractor, e.g ordinary soil to rock excavation. iii) Removal of unsuitable material like marsh, debris dumps, etc not caused by the contractor iv) Artesian conditions v) Seepage, erosion, landslide vi) River training requiring protection of permanent work vii) Presence of historical, archeologist or religious structures, monuments interfering with the works viii) Restriction of access to ground imposed by civil, judicial, or military authority.	Clause 44.1(xii)

Currency	The Currency of the Contract shall be:		In Indian Rupees	Clause 46.1
Price Adjustment	Whether Price adjustment shall be applicable or not.		**NO**	Clause 47.1
Retention (Security Deposit)	Rate of retention from each of the Contractor‘s Bill		6% of the gross amount of Bill from each Bill subject to 5% of the Final Contract Price.	Clause 48.1
Liquidated Damage	The liquidated damages for the whole of the works are:		0.25% of the Contract Price per week of delay to be computed on per day basis	Clause 49.2
	The maximum amount of cumulative Liquidated Damage shall be:		10% of the Contract Price	Clause 49.2
Bonus	Whether payment of Incentive/Bonus for early completion shall/Bonus for early completion shall be applicable		NO	Clause 50.1
Advance payments	Conditions and mode of payment of Advances shall be			
	a)	**Mobilization Advance**	10% of the Contract price	Clause 51.1
			Condition:	
			1. 12% Simple Interest per annum	
			2. on submission of unconditional Bank Guarantee, valid for full Contract period.	
			3. To be released in Two equal installments: 1st Installment after mobilization starts, and 2nd Installment after utilization of the previous installment	
	b)	**Equipment Advance (Plant& Machinery)**	5% of the Contract price, limited to 90% of assessed cost of equipment.	
			Condition: 1. After equipment is brought to site (provided the Engineer-in-Charge is satisfied that the equipment is required for performance of Contract) and on submission of unconditional Bank Guarantee for the amount of advance. 2. 12% simple interest per annum.	
	c)	**Secured Advance for non-perishable**	75% of Invoice value on conditions that:	Clause 51.4

		materials brought to site.	a.	The materials are in accordance with the specifications for works.	
			b.	Such materials have been delivered to site and are properly stored and protected against damage or deterioration to the satisfaction of the Engineer-in- Charge. The Contractor shall store the bulk materials in measurable stacks;	
			c.	The Contractor‘s record receipt and use of materials are kept in a form approved by the Engineer-in-Charge and such records shall be available for inspection by the Engineer-in-Charge	
			d.	The contractor has submitted with his monthly statement the estimated value of the materials on site together with such documents as may be required by the Engineer-in- such documents as may be required by the Engineer-in- Charge or his nominee for the purpose of valuation of the materials and providing evidence of ownership and payment thereof;	
			e.	Ownership of such materials shall be deemed to vest in the Employer for which the Contractor has submitted an Indemnity Bond in an acceptable format; and	
			f.	The quantity of materials is not excessive and shall be used within a reasonable time as determined by the Nodal Officer or his nominee.	
		Repayment of advance payment for mobilization and equipment:	The advance loan shall be repaid with percentage deductions from the interim payments certified by the Engineer-in- Charge under the Contract. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all such payments to the Contractor has reached not less than 20 percent of the Contract Price or 6(six) months from the date of payment of 1st Installment of advance, whichever period concludes earlier and shall be made at the rate of 20% of the amount of all interim payment certificates until such time as the loan has been repaid, always provided that the loan shall be completely repaid by the time prior to the expiry of the original time for		

	Repayment of secured advance:	The advance shall be repaid from each succeeding monthly payment to the extent materials [for which advance was previously paid pursuant to Clause 51.4 of G.C.C.	
Securities:			Clause 34.1
Performance Security	Performance Security shall be delivered to the Engineer-in- Charge	Within 15 days after issue of Letter of Acceptance.	
	The amount of Performance Security shall be	5% of the Contract Price plus Rs ___/- (to be decided after evaluation of the Bid) as additional security in terms of ITB Clause 29.5	
E. FINISHING THE CONTRACT			
O & M Manual	The date by which Operation and Maintenance manuals are required:	28 days after issue of completion of Facilities	Clause 58.1
As Built Drawings	The date by which as built drawings are required:	28 days of issue of Certificate of Completion of whole or section of the work, as the case may be	Clause 58.1
	The amount to be withheld for failing to supply drawings and/or operating and maintenance manuals by the date required is:	2.5% of the Contract Price with maximum amount of 35 lakhs	Clause 58.2
Termination	The following events shall also be fundamental breach of contract:		Clause 59
	The percentage to apply to the value of the work not completed representing th additional cost for completing the Works shall be:	5% of the Contract Price	Clause 60

F. ADDITIONAL CONDITIONS OF CONTRACT					
Design and Engineering	General Arrangement Drawings, Engineering Drawings with design calculations should be submitted within	45 (forty five) days after date of signing Contract		ACC	Clause 3.2
Guarantee Test	Guarantee test to be conducted within ;	30 (Thirty) days after date of completion of facilities		ACC	Clause 9.2
Functional Guarantee	Functional Guarantee shall be applicable for the following Machineries and the value shall be as stated in the Annexure to Contract Data.	1.	Electric Motors	ACC	Clause 13.1
		2.	Diesel Engines		
		3.	Pumps		
		4.	Power Transformers		

Description of Works and Milestones

[Ref. Sub-Clause 16.3 of GCC and ACC]

Detailed description of Work:

It is intended to execute Augmentation of Mamit Water Supply Scheme at Mamit which is about 100 kms from Aizawl. The proposed Augmentation Scheme, with the existing Water Supply System together is expected to supply potable water @ 2.97 mld which shall in turn supply water to an ultimate population of 20,000 @ 135 lpcd. However, all the data provided by the Department may be used for reference only and all the actual survey and data collection will be done by the successful bidder in consultation with the engineer-in-charge and those will be used for final data for submission for approval. Various components of the work in this Augmentation Water Supply Scheme are to be incorporated in the existing Water Supply Infrastructure and the following items of works are expected to involve in this contract:

PART – A: CLEAR WATER PUMPING SYSTEM

1. **Clear Water Pump House:** The Clear water Pump House of RCC Framed Structure with brick walling shall have to be constructed as per per annexure at the proposed location. The Pump House is to house three nos of Clear Water Pumps of 470 KW where two nos shall be electric motor driven while one pumpset shall be diesel engine driven. Sufficient spaces for piping system, between the walls and the pumping machineries, in between the machineries and sufficient space for Control Panels and working spaces shall have to be provided to an ultimate population of 20,000.

   The pump house shall also have the HOT Crane of 10 MT capacity with Horizontal Girder and Longitudinal Rails of sufficient strength installed at sufficient height for facilitating lifting and shifting of pumping machineries. For sufficient air circulation, ventilations and windows of sufficient opening area shall also have to be provided.

   Clear Water Sump constructed under Part – I shall be connected with three nos suction outlet pipe which are already installed and new pipeline shall be provided and fitted upto proposed clear water pump house.

2. **Clear Water Rising Main:** The entire length of Rising Main is approximately 5000 RM 219.10 mm (OD) diameter, MS ERW pipe of API 5L, Grade 52 shall be used for the rising main. The total rising main consists of two sections; the first section is a high pressure zone which comprises of 2000 RM immediately from the Clear Water Pump House where the Rising Main Pipe thickness shall be 5.6mm thick. The second section comprises of 3000RM starting from the end of high pressure zone where the rising main pipe thickness can be reduced to 4.8mm.

   The rising main pipes shall, as far as possible have to laid at a minimum depth of 1.0m. All rising main pipes, before laying to the underground, must be must be painted with the liquid epoxy paint at the inner side and the outer side have to be wrapped with Coal Tar Tape of 2mm thick.

   No part of the unburied portion of the pipe shall be left unsupported in excess of 3M for which sufficiently strong RCC Pillar must be provided and the pipe must be securely clamped to the RCC support pillar.

   At any change of direction (bends of more than 30 degree in horizontal/vertical direction) RCC thrust Block of appropriate design must be provided.

   RCC anchor block of sufficient strength must also be provided at an interval of 250 m.

   All Valves and Pipe appurtenances fitted to the rising main must be housed with RCC Chamber of sufficient size and depth with steel cover with locking arrangement.

The successful bidder shall carry out and submit to the Engineer-in-Charge, the surge pressure analysis data for the pumping main and ensure that appropriate control and safety devices (non-return valve, air valve, sluice valve, zero-velocity valve etc) are placed at required locations along the alignment for the proposed pumping main.

3. **Clear Water Pumping Machineries:** There shall be two sets of Clear water Pumping Machineries; one set shall be of Diesel engine driven and the other of 2nos of sets will be electric motor driven. Both the Clear Water Pump Sets shall be capable of discharging 110 m3/Hr of water against the total dynamic head of 847m including Control Panel, Cables, Earthing, Base plate, flange, etc necessary others all complete. The Pumping Machineries shall have to be laid on a properly designed Machine foundation capable of absorbing eventual vibrations of the Pumping Machineries.
4. **Electro Chlorinator System:** The Electro Chlorinator capable of producing **12Kg** of active chlorine per day in the form of neutral sodium hypo-chloride solution. The Electro Chlorinator is to be installed at the space already decided by the Department near the Water Treatment Plant site along with all standard accessories like, Generator module, DC Power Supply Unit, Power Cables from control panel, Hypo-chloride storage tank, dosing pump, pipe lines, etc. Laying of floor and wall tiles needs to be done on the floor and wall of the Chlorinator house.
5. **Buildings**: Construction of Buildings at appropriate location shall be required in this contract:
   a) Construction of Structurally Designed single storey RCC Framed Structure with brick walling and aluminum windows and ventilations for Control Room of 56.65 sqm including suitable toilet provisions and all essential service connections and internal electric wiring and plumbing as per relevant Government Guidelines and as per direction of Engineer-in-Charge.

   b) Construction of Structurally Designed two storey RCC Framed Structure with brick walling and aluminum windows and ventilations for Billing Counter-cum-Site Office of 42 sqm for Ground floor and 45.15 sqm for First Floor including suitable toilet provisions and all essential service connections and internal electric wiring and plumbing as per relevant Government Guidelines and as per direction of Engineer-in-Charge.

   c) Construction of single storey Assam Type Building for housing DG Set for Raw Water Pump of 60.24 sqm as per direction of Engineer-in-Charge
6. **Power Supply:** The Power Supply Components includes, 1) Construction of 1.5KM long 11KV transmission lines including erection of Steel Poles, fitting transmission cables of suitable size, etc with all required accessories, 2) Supply and Installation of 2x1000 KVA Power Transformer and 3) 1x250KVA Power Transformer including inside Pump House wiring, lighting including compound lightings.
7. **Restoration of damaged paved road due to laying of pipelines:** The Distribution pipes and Feeder pipes are to be laid along PWD Roads where some portion of paved roads shall be damaged which shall need to be repaired. The intending Bidders are advised to assess the approximate length of paved roads likely to be damaged due to laying of pipelines.
8. **Security Fencing:** The Pump House complex is to be provided with fencing for an average height of 1.8m with poly steel Goat Proof fencing fixed with nails and wire, etc., on a 2.4m long Angle Iron Post 50x50x6mm size placed 2.00m apart embedded in cement concrete block 1:3:6 of size 25x25x60cm. The approximate length of the fence wall is 270 RM.
9. **Renovation / Improvement of Existing Water Supply System:** The Contract also includes renovation/improvement of the following components in the existing water supply system:
   i) Construction of Intake Weir at Lahmun Lui and Kurung Lui sources including construction of footpath for laying of Raw Water Gravity Main pipelines
   ii) Laying and Jointing of Raw water gravity main including construction of RCC Support

Pillar:

a. Gravity main from Kurung Lui: 80mm – 3500m length (2500RM laid underground and 1000RM laid over ground).
b. Gravity main from Lahmun Lui: 80mm – 2500m length (1500RM laid underground and 1000RM laid overground)

iii) SITC of Raw water submersible pump set of 80 m3/hr including suitable control panel; similar to existing raw water submersible pump.

iv) SITC of DG Set, 380 KVA with necessary materials like Base plate, coupling, etc all complete including transportation, installation, commission and testing inside the existing clear water pump house.

v) SITC of DG Set, 200 KVA with necessary materials like Base plate, coupling, etc all complete including transportation, installation, commission and testing for driving raw water submersible pump.

vi) Construction of Stone masonry retaining wall to support existing clear water pump house and proposed clear water pump house etc.

vii) **Approach Road**: Construction of PCC paved road 4m road width of 0.12m thickness from existing pump house to Raw Water Pump House near Tut Weir and approach to Clear Water Pump House. The approximate length of approach road to Raw Water Pump House is 550 m and approach road to Clear Water Pump House is 50 m. However, the successful Bidders are advised to assess the exact length by themselves.

PART – B: **DISTRIBUTION SYSTEM**

1. **Feeding Mains**: Construction of Feeding Main includes providing, fitting, fixing GI Pipes complete with GI Fittings and laying to a minimum depth of 1m below ground in all types of soil as per design and direction of the Engineer-in-Charge, including construction of Valve Chambers at the following locations:
   a. Mizo veng Reservoir to Luangpawl Reservoir: 100mm diameter, 4085RM
   b. Mizoveng reservoir to Hospital : 100mm diameter, 2585RM
   c. Mizoveng to College veng via Hmunsam: 100mm diameter, 2698RM
   d. Mizo veng to Dinthar : 100mm diameter, 3000RM
   e. Mizo veng to DC Complex : 100mm diameter, 1459RM

2. **Distribution Mains from Zonal Reservoirs:** Construction of Distribution Main includes providing, fitting, fixing GI Pipes complete with GI Fittings and laying to a minimum depth of 1m below ground in all types of soil as per design and direction of the Engineer-in-Charge, including construction of Valve Chambers at the following locations:
   a. From Luangpawl Zonal Tank to IR reservoir: 80mm diameter, 1000RM
   b. From Luangpawl Zonal Tank to JNV Reservoir: 80mm diameter, 3500RM
   c. From Luangpawl Zonal Tank to DIET: 80mm diameter, 1700RM

3. **Main Reservoir:** Design and Construction of elevated RCC Over-head Main Reservoir with staging columns, bracing beams, combined footing foundation, inspection ladders, fitting and fixing inlet and outlet pipe arrangement at the following locations:
   a. Mizo Veng: 3,00,000 litres capacity including acquisition of land
4. **Zonal Reservoirs:** Design and Construction of elevated RCC Over-head Main Reservoir with staging columns, bracing beams, combined footing foundation, inspection ladders, fitting and fixing inlet and outlet pipe arrangement at the following locations:
   a. Gov't Mamit College 1,00,000 litres capacity
   b. JNV Complex 1,00,000 litres capacity
   c. Luangpawl 2,00,000 litres capacity
   d. Hospital Complex 2,00,000 litres capacity

e. **Design and Construction of RCC Reservoir resting on ground** with all inlet and outlet arrangement, inspection ladder, etc at following locations
   i. Dinthar Tlang: 2,00,000 litres capacity
   ii. 4th IR Complex: 1,00,000 litres capacity

5. Distribution network: Construction of Distribution network includes providing, fitting, fixing GI Pipes complete with GI Fittings and laying to a minimum depth of 1m below ground in all types of soil as per design and direction of the Engineer-in-Charge, including construction of Valve Chambers at the following locations:

Luangpawn Zonal Area (Zone 1)

40	mm	dia	2130	Rm
50	mm	dia	1740	Rm
65	mm	dia	2460	Rm
80	mm	dia	2750	Rm
100	mm	dia	2550	Rm

Hospital Zonal Area (Zone 2)

40	mm	dia	2200	Rm
50	mm	dia	4040	Rm
65	mm	dia	3760	Rm
80	mm	dia	1550	Rm
100	mm	dia	1660	Rm

Hmunsam Zonal Area (Zone 3)

40	mm	dia	1850	Rm
50	mm	dia	2950	Rm
65	mm	dia	4170	Rm
80	mm	dia	1770	Rm
100	mm	dia	1680	Rm

Mizo Veng Zonal Area (Zone 4)

40	mm	dia	2230	Rm
50	mm	dia	1320	Rm
65	mm	dia	7131	Rm
80	mm	dia	1600	Rm
100	mm	dia	1650	Rm

DC/LAD Zonal Area (Zone 5)

40	mm	dia	1950	Rm
50	mm	dia	2290	Rm
65	mm	dia	2800	Rm
80	mm	dia	1500	Rm
100	mm	dia	1450	Rm

Dinthar Zonal Area (Zone 6)

40	mm	dia	1900	Rm
50	mm	dia	2290	Rm
65	mm	dia	3697	Rm
80	mm	dia	1250	Rm
100	mm	dia	1510	Rm

Major Plants and Machineries:

Of the works described above, the following Major Plants and Machineries to be installed in this Contract require Design, Supply, Installation and Commissioning:

1. Submersible Raw water pump: The Submersible Raw water pump shall be able to deliver raw water at the rate of 80 m3/hr in single operation and 160 m3/hr in dual operation at the static head of 80 m to the existing pump house.

2. Electric Motor attached to Clear water pump: The Electric Motor shall be able to drive the clear water pump to discharge water at the rate of 110 m3/hr at total head of 847 m.

3. Clear Water Pump: The pump shall be of Horizontal Centrifugal Pump which shall be capable of pumping water at the rate of 110 m3/hr against the total head of 847 m for each pump and 220 m3/hr in dual operation.

4. Power Transformer: One no. of Power Transformer 250 KVA, 11 KV / 0.415 V with 15 nos of compound lighting including transportation, inspection fee and load security to provide power supply to Raw Water Submersible Pump

5. Power Transformer: Two nos. of Power Transformer 1 MVA, 11 KV / 0.415 V including transportation, inspection fee and load security to provide power supply to Electric Motors for pumping Clear Water. Each Transformer shall have necessary arrangements to individually provide power supply to both the Electric motors at any given time.

6. DG Set, 380 KVA with necessary materials like Base plate, coupling, etc all complete including transportation, installation, commission and testing inside the existing clear water pump house.

7. DG Set, 200 KVA with necessary materials like Base plate, coupling, etc all complete including transportation, installation, commission and testing for driving raw water submersible pump.

Functional Guarantees
(NOT APPLICABLE FOR THIS WORK)

1. General

This annexure –II to Contract Data sets out;

(a) the functional guarantees referred to in ACC Clause 13.1 (Functional Guarantees)

(b) the preconditions to the validity of the functional guarantees, either in production and/or consumption, set forth below

(c) the minimum level of the functional guarantees

2. Pre-conditions

The Contractor gives the functional guarantees (specified herein) for the facilities, subject to the following preconditions being fully satisfied:

i) Raw Water Pumping System: Shall be able to deliver raw water at _____ Cusecs

ii) Clear water pumping syste: Shall be able to deliver clear water at _____ Cusecs

iii) Power Transformer: Shal be able to deliver power supply at _____ KVA

3. Functional Guarantees

Subject to compliance with the foregoing pre-conditions, the Contractor guarantees as follows:

3.1 Parameters to be achieved

1. <u>Raw Water Pumps</u>

(a) Raw water pump output	-	_____ m^3/sec
(b) Type of water pump	-	VT/Submersible
(c) Prime mover	-	_____ KW
(d) Prime mover (diesel)	-	_____ HP
(e) Power requirement	-	KW

2. <u>Clear Water Pumps</u>

(a) Clear water pump	-	_____ m^3/sec
(b) Type of water pump	-	Centrifugal/ Submersible/
(c) Prime mover	-	_____ KW
(d) Prime mover (diesel)	-	_____ HP
(e) Power requirement	-	_____ KW

3. <u>Water Treatment Plant</u>

(a) Air Compressor	-	_____ KW
(b) Back-wash Pump	-	_____ KW
(c) Flush Mixer	-	_____ KW
(d) Clarifloculator	-	_____KW
(e) PAC/Timer Mixer	-	_____ KW
(f) Electro-chlorinator	-	_____ KW

(g) Power requirement - _____ KW

4. <u>Station Load Details</u>

(a) Lighting for RW Pump house - _____ KW
(b) Lighting for CW Pumphouse - _____ KW
(c) Lighting for WTP - _____ KW
(d) Compound Lighting - _____ KW
(e) Welding etc. - _____ KW
(f) HoT - _____ KW

5. <u>Standby Power Supply</u>

(a) Gen- Set - _____ KVA

6. <u>Power Transformer</u> - _____ KW/KVA

7. <u>Electric Motor</u>

(a) Temperature (^oC) - Must meet manufacturer's
(b) Load current (Amp) - - Do -
(c) Operating Voltage (Volt) - - Do –
(d) Vibration (mm/sec) - Must be within (____ to ___)
(e) Speed (RPM) - Must be within (_____ to _____)

8. <u>Diesel Engine /Gen. Set</u>

(a) Lub- Oil Temp (^oC) - Must be within (_____ to _____)
(b) Lub- Oil Pressure (Kg/cm^2) - Must be within (_____ to _____)
(c) Speed (RPM) - must meet manufacturer'
(d) Water temperature (^oC) - Must be within _____
(e) Vibration (mm/sec) - Must not exceed _____
(f) Fuel consumption (Lit/hr) - Manufacturer's specific
(g) Generating voltage (V) - As per manufacturer's s
(h) Frequency (Hz) - As per manufacturer's s

9. <u>Power Transformer</u>

(a) Winding Impedance (Ω) - must be within _____
(b) Breakdown voltage of Oil (2.5mm) – KV
(c) PI value - _____
(d) Voltage Ratio - _____
(e) Secondary Voltage - _____ KV

1
0. <u>Control & Relay Panel</u>

(a) Voltage - _____ KV
(b) Current - _____ Amp
(c) Power factor - within _____
(d) Frequency - _____ Hz

11. <u>Pump</u>

(a) Discharge - _____m^3/sec
(b) Temperature - _____ ^0C
(c) Vibration - _____ mm/sec
(d) Speed - _____ RPM
(e) Pressure (Suction & Delivery) - _____ Kg/cm^2

<u>Note:</u> Parameters like Temperature, Vibration, Speed, Pressure Voltage, Current & Frequency should be monitored and be recorded at 15min interval. All other Parameters may be recorded at 1hr interval.

and/or

3.2 Raw Materials and Utilities Consumption: _____

4. Failure in Guarantees and Liquidated Damages

4.1 Failure to Attain Guaranteed Production Capacity

If the production capacity of the facilities attained in the guarantee test, pursuant to ACC Sub-Clause 13.1, is less than the guaranteed figure specified in para. 3.1 above, but the actual production capacity attained in the guarantee test is not less than the minimum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Employer in lieu of making changes, modifications and/or additions to the Facilities, pursuant to GC Sub-Clause 28.3, then the Contractor shall pay liquidated damages at the rate of _____ for every complete one percent (1%) of the deficiency in the production capacity of the Facilities, or at a proportionately reduced rate for any deficiency, or part thereof, of less than a complete one percent (1%).

4.2 Raw Materials and Utilities Consumption in Excess of Guaranteed Level _____

If the actual measured figure of specified raw materials and utilities consumed per unit (or their average total cost of consumption) exceeds the guaranteed figure specified in para. 3.2 above (or their specified average total cost of consumption), but the actual consumption attained in the guarantee test, pursuant to ACC Sub-Clause 13.1, is not more than the maximum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Employer in lieu of making changes, modifications and/or additions to the Facilities pursuant to ACC Sub-Clause 13.1(8), then the Contractor shall pay liquidated damages at the rate of *[amount in the contract currency]* for every complete one percent (1%) of the excess consumption of the Facilities, or part thereof, of less than a complete one percent (1%).

4.3 Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees (and consumption

guarantees) are not attained by the Contractor, the Contractor shall at its own cost make good any deficiencies until the Facilities reach any of such minimum performance levels, pursuant to GC Sub-Clause 28.2:

(a) production capacity of the Facilities attained in the guarantee test: ninety-five percent (95%) of the guaranteed production capacity (the values offered by the Contractor in its bid for functional guarantees represents 100%).

and/or

(b) average total cost of consumption of all the raw materials and utilities of the Facilities: one hundred and five percent (105%) of the guaranteed figures (the figures offered by the Contractor in its bid for functional guarantees represents 100%).

4.4 Limitation of Liability

Subject to para. 4.3 above, the Contractor's aggregate liability to pay liquidated damages for failure to attain the functional guarantees shall not exceed 10 % (Ten percent) of the Contract price.