

**OFFICE OF THE EXECUTIVE ENGINEER (MECHANICAL)
SEWA HYDEL PROJECT, BASOHLI,
J&K STATE POWER DEVELOPMENT CORPORATION JAMMU**

NOTICE INVITING TENDER

No: SHP /MECH/417-20

Dated 6-2-2010

NIT NO: 13 of 2009-10

DATED: 6-02-2010

DUE ON: 16-02-2010

Competition Time: 33 days from the date mentioned in the Notice to Proceed/ Date of issue of LOI.

1. For and on behalf of Managing Director J&KSPDC, sealed Tenders affixed with Rs.5/- revenue stamps accompanied with earnest money in the shape of FDR/ CDR of any Nationalized Bank for an amount equal to the amount mentioned against each work here in under and pledged in favour of Executive Engineer, Mechanical, Sewa Hydel Project, Basohli, J&K State Power Development Corporation, are invited from reputed manufacturers or their authorized dealers/ Business Associates/ Channel Partners only for the below detailed works required for SEVER ROOM/ IT CENTER of J&KSPDC at Ashok Nagar, Satwari, Jammu

SNO	DESCRIPTION/ NAME OF WORK	EARNEST MONEY(IN RUPEES)
WORK NO 1	Design, supply, installation, testing and commissioning of Air- cooled Precision air conditioning system complete with all allied works	15, 000.00
WORK NO 2	Fire detection, fire alarm and fire fighting equipment based on gas with all associated works.	3,000.00
WORK NO 3	Video surveillance system complete with cameras, digital video recorders, monitors, digital door locks and associated works.	8,000.00

2. The tenders addressed to the **CHIEF ENGINEER, CI&D WING JAMMU, J&KSPDC, 18 C/C, GANDHI NAGAR, JAMMU** should reach his office up to 1530 Hrs on or before 16-02-2010.
3. Bidding Process shall follow ONE DROP THREE COVER SYSTEM.
 - **First Cover** (Envelope) sealed and super scribed with words "**EARNEST MONEY**" shall contain only the Earnest Money for the work/ works.
 - **Second Cover** (Envelope), sealed and super scribed with words, "**TECHNICAL BID**" shall contain all other documents, as are to be supplied/ furnished by the Bidder to establish the technical qualification/ prove technical credentials of the bidder and other technical/ design details/ schematic layout of machines, accessories, panels etc. for the equipment to be supplied in response to tender specifications and other commercial terms such as warranties/ guarantees.

- **Third cover** (Envelope), sealed and super scribed with words, “**PRICE BID**” shall contain only the Price Bid. It shall contain no other document.
 - All the three covers, described herein above shall be placed inside a sealed envelope super scribed with the name of the Work under Bid, NIT Number, due date, complete address and telephone number of the Bidder.
4. The tenders as received by due date and time shall be opened on the same day or any subsequent working day convenient to the tender opening authority in presence of Bidders who may like to be present in the Office of the Chief Engineer, C I & D Wing, J&KSPDC, Jammu , 18 C-C, Gandhi Nagar, Jammu-180004.
 5. In the first instance only the first cover super scribed “**EARNEST MONEY**” shall be opened.
 6. Bids received without Earnest Money in the manner and for the amount prescribed herein above shall be summarily rejected.
 7. Cover 2 super scribed “**TECHNICAL BID**” submitted by only those Bidders who are found to have submitted the Earnest Money in the manner and for the amount prescribed herein above shall be opened and considered valid for technical evaluation.
 8. Cover 3 super scribed “**PRICE BID**” only of those bidders who are found to be technically responsive to the requirements laid in the bid document shall be opened and considered valid for evaluation.
 9. Detailed tender documents along with others terms and condition of the contract can be had from the office of the undersigned on any working day up to 15-02-2010,(1530 Hours) against payment of Rs.1000/ through a non refundable Demand Draft in favour of General Manager,(Accounts) in the Office of Managing Director, J&KSPDC, Ashok Nagar, Satwari, Jammu along with an application for issue of tender documents accompanied with the following documents:
 - i. Authentic proof of being original manufacturer/ dealer/ associate of the manufacturer and
 - ii. Sales Tax Registration Certificate from the Sales Tax Department with TIN for items/ equipment under the scope of the proposed contract.
 10. The Department reserves the right to accept or reject any/all tenders without assigning any reason whatsoever.

**EXECUTIVE ENGINEER
MECHANICAL DIVISION
SEWA HYDEL PROJECT STAGE-III,
BASOHLI
J&KSPDC, JAMMU**

Copy to:

1. The Managing Director, J&KSPDC, Jammu for information.
2. The Chief Engineer, CI & D, Wing, J&KSPDC, for information. This is as per his directions given vide his letter no CI & D/477-VI/5072-73
3. The Joint Director Information Department, Jammu for favour of publishing of the Gist of NIT in at least two local dailies well before the due date
4. The Director NIC, Civil Secretariat, Jammu for favour of uploading of the document in official website of JKSPDC.
5. Notice Board.

TECHNICAL SPECIFICATIONS FOR DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF AIR- COOLED PRECISION AIR CONDITIONING SYSTEM WITH ASSOCIATED COMFORT AC SYSTEM FOR ADJACENT AREAS COMPLETE WITH ALL ALLIED WORKS

BASIS OF DESIGN

The Bidders shall base their design on the following parameters area wise:

OUTSIDE DESIGN CONDITIONS

1.	<u>SUMMER</u>	43 C/113 F, 30% RH
	Inside design conditions	
	Summer	22+1 C, 50-55% RH
	Occupancy	
	Server Room	1 person
	Battery Room	2 persons
	Data Entry Room	6-7 persons
	Supervisor Room	2-3 persons
	Light Load for all areas:	2 Watt/ Square feet
	Equipment Load	3200 Watts in Server Room
	Ventilation/ infiltration	10 Cfm/person or 1 AC/Hr
	Size of Hall/ Rooms	As per drawings enclosed
	Areas to be Air conditioned	
	• Server Room of size	11.75' x 16.75'
	• Room SA & DBA	8' x 12.25'
	• Room office	14' x 13.5'
	• Room	7'-10" x 10'

SCOPE OF WORK:

The Scope of work shall be designing, supplying, installing, testing, commissioning and handing over precision air-conditioning system on turn key basis for the Server Room and comfort air conditioning system for three adjacent rooms of Data Centre of J&K SPDC situated in the heart of Jammu city at Ashok Nagar, Satwari.

The total cooling load calculations for the month of peak summer have to be calculated by the Bidders and details submitted along with the tender and the design shall be based on these heat load calculations only.

The Air Conditioning System for the Server Room shall be designed with high precision type air conditioner. Notwithstanding any thing contained in this, the Bidder is to offer a proven and tested equipment to meet the requirements of this specification.

AIR-COOLED PRECISION AIR CONDITIONERS DIRECT EXPANSION MODEL

OUTDOOR UNIT/CONDENSING UNIT:

The outdoor condenser unit shall be air cooled type with ambient design temperature of 43 deg C with 100% output rating ensuring both power saving and reliability. Electric motor for the condenser should meet IP-54 standards for protection from the environment. The condenser fan should be having a variable speed drive which will ensure periodic modulation based on the required level of operating pressures as per the

ambient temperature demands thus saving power. The condensing units should be built to withstand extreme weather conditions and should be polyester powder coated to prevent corrosion. The units should have side throw condenser fan and motor fitted with maintenance free bearings, condensing coil housed in polyester powder coated enclosure should be blue fin coated with hydrophobic aluminum fins. The condenser coil should be inner grooved copper to enhance efficiency. The outdoor condensing unit shall be fitted with a separate isolator with weather proof enclosure for site repair and maintenance.

Each condensing unit will have to be placed on MS frames of sufficient strength, duly primer coated and synthetic enameled as per standard practice of air conditioner installation.

COMPRESSOR: The compressor used in the unit shall be highly efficient having highest energy efficiency ratio (EER). Only hermetically sealed scroll compressors will be accepted with built-in internal thermal protector, internal pressure relief valve.

2. **INDOOR UNIT:**

The indoor unit should be capable of controlled cooling and 24x7 operations. The minimum required features shall be:

The indoor unit should be equipped with high performance woven media EU-4 filters located in the air inlet face of the cooling coil and should be capable of ensuring filtration down to 10 microns and have 90% retention capacity. The filters should be washable making them easy to maintain and made of synthetic material ensuring long life.

The machine shall be equipped with precision electrode steam generator to control humidity levels within the conditioned space for varied humidification demands and should be complete with drain pump and water valve to deliver precise drainage and feed enabling steam supply to constantly keep pace with the demand ensuring accurate conductivity control.

The cooling coil shall be designed with sufficient number of rows enabling quick dehumidification at optimal evaporating temperature resulting in precise humidity control and energy savings.

The PAC shall be fitted with an advance microprocessor based controller fully compliant with EEC directives for electromagnetic compatibility (EMC) enabling continuous real time and precise control over all design conditions. It shall be password protected for authorized access only. It shall be equipped with potential free contact facility for external fire alarm interlock to stop the unit in case of fire or smoke. the controller shall allow adjustment of temperature and humidity set points, range of control, alarm set points, remote alarm transmission ability

The package unit shall be of up flow configuration. The blower outlet will be connected to the GP sheet ducting of 24 gauge fully insulated with 12mm thick XLPE insulation. Conditioned air would be distributed through three diffusers in supply air duct and thrown towards the floor. Return hot air will be taken back directly by the front of the unit through a grill.

3. **COPPER PIPING:**

The copper piping between indoor and outdoor units shall be only hard drawn copper of required diameter and of at least 19 gauge. The copper piping shall be properly fixed on

walls/ceiling with steel clips with proper pitching towards compressors as per usual standards followed in refrigeration piping.

The entire refrigeration piping shall be tested to Nitrogen pressure after installation to a pressure of 1.5 times the working pressure, and the pressure shall hold for 8 hours. After pressure testing, the piping system shall be vacuumised to a vacuum of 500 microns and held for 2 hours before gas charging.

4. **CONDENSATE DRAIN PIPING:**

The scope of this section consists of providing condensate drain piping at indoor unit for smooth and uninterrupted removal of cooling coil condensate to a suitable drain point .Proper water locking loops to be provided in drain pipe so that no outside air or any foreign material is sucked by the cooling coil blower. The subject piping shall be carried with Plumbing PVC Pipes of at least 25mm Dia (nominal) and fittings of suitable pressure ratings.

5. **ELECTRIC WORKS:**

The scope of this section consists of

a. providing and fixing of 40KVA capacity 3 phase balanced load and balanced input voltage type servomotor controlled voltage corrector copper wound with input voltage range of 145-260 volts phase to neutral and output voltage of $230 \pm 1\%$ as per relevant IS specifications for the complete AC and other equipment load for all areas. The corrector should be fitted with protection devices like over current protection, under/over voltage protection, Auto/manual voltage raise/lower provision and other standard meters like voltmeter and ampere meter.

b. Wall mounted distribution panel fabricated of MS sheets 16 gauge with 1 coat of primer paint and 2 coats of enamel paint for precision AC, split ACs, Fire panel, CCTV system, Servers, line printers and other equipment with incomer MCCB of 100 amps 1 No
Aluminum colour coded bus bar for 3 phase and neutral 1 Set
Outgoing MCB of 32Amp TPN for Precision AC 1 No
Outgoing MCB of 25 Amps SPN for split ACs 3 Nos
Outgoing MCB of 25 Amps SPN for Server 1&2 2 Nos
Outgoing MCB of 16 Amps SPN for other equipment 4 Nos

c. Main electric cabling between voltage corrector to distribution panels and from distribution panel up to Precision AC, each split AC indoor/outdoor depending upon the design of individual manufacturer along with MCB/isolators, and earthing of all air-conditioning equipment components and accessories. All power wiring shall be carried with 650/1100 volts grade PVC insulated, multistranded copper conductor cables laid in PVC Pipes .The cables shall be sized for starting current and by applying proper derating factors .All control wiring shall be done with 650/1100 volts grade PVC insulated multistranded copper cable of at least 1.5 sq.mm.

6. **ASSOCIATED CIVIL WORKS:**

All associated minor civil works like making openings in walls/floor for taking piping, recesses in walls for embedding copper piping/drain piping or electrical conduits wherever directed etc.and repairing of the same after work is completed shall be in the contractor's scope.

AIR-COOLED HIGH WALL MOUNTED SPLIT AIR CONDITIONERS

1. OUTDOOR UNIT/CONDENSING UNIT.

The outdoor unit for IT centre shall be fitted with 1 phase rotary Compressor, controls, electric switch gear, condenser fan and motor fitted with maintenance free bearings, condensing coil housed in polyester powder coated enclosure operable on 220 V \pm 10%, single phase and neutral,50 HZ power supply

COMPRESSOR: The compressor used in the unit shall be highly efficient having highest energy efficiency ratio (EER).Only hermitically sealed rotary compressors will be accepted with built-in internal thermal protector, internal pressure relief valve.

Each Condensing unit will have to be placed on MS frames of sufficient strength, duly primer coated and synthetic enameled as per standard practice of air conditioner installation

2. INDOOR UNIT/COOLING COIL:

Indoor unit shall be constructed of galvanized steel sheet with aesthetically good looking front curved grilles of high quality polypropylene .It will be complete with cooling coil. There should be perfect refrigerant control with a capillary restrictor for optimal refrigerant control for extended compressor life and reduced power consumption. It shall also be fitted with a centrifugal type blower fan operable on 230v, 1 ph, 50 Hz power supply. The microprocessor based controller shall be fixed in the indoor unit only and connected with a cordless type remote control through infra red eye.

3. COPPER PIPING:

The copper piping between indoor and outdoor used shall be only soft drawn copper of required diameter and of at least 22 gauge bright finished of nominal size pipes respectively with allowed tolerances. The copper piping shall be properly fixed on walls/ceiling with steel clips with proper pitching towards compressors as per usual standards followed in refrigeration piping. All the copper piping shall be insulated with tubular insulation of required thickness of Nitrile rubber foam with UV resistant material. The entire refrigeration piping shall be tested to Nitrogen pressure after installation to a pressure of 1.5 times the working pressure, and the pressure shall hold for 8 hours. After pressure testing, the piping system shall be vacuumised to a vacuum of 25" and held for 2 hours before gas charging.

4. CONDENSATE DRAIN PIPING:

The scope of this section consists of providing condensate drain piping at each indoor unit for smooth and uninterrupted removal of cooling coil condensate to a suitable drain point .Proper water locking loops to be provided in each drain pipe so that no outside air or any foreign material is sucked by the cooling coil blower. The subject piping shall be carried with Plumbing PVC Pipes of at least 20mm Dia (nominal) and fitting of suitable pressure ratings.

TECHNICAL DETAILS TO BE SUBMITTED BY THE TENDERER FOR EVALUATION

S No	Description of item	Offered	Any deviations from the tender specs
1	Precision AC make and model		
	Tons offered (Nominal)		
	Tons@43 deg C ambient		
	Sensible Heat ratio		
	Evaporator air flow cfm		
	Air Filtration Quality		
	Compressor type		
	Humidifier Output		
	Heater Output		
	Physical Dimensions (Indoor unit)		
	Physical Dimensions(Outdoor unit)		
2	Servo motor controlled voltage corrector		
	KVA (Nominal)		
	KVA @ Full load and 43 deg C ambient		
	Air/oil cooled type		
	Correction rate		
	Hi-Lo voltage cut protection		
	Current overload protection		
	Input voltage range		
	Balanced/unbalanced type		
	Physical Dimensions		
3	Hi Wall split ACs Make and Model		
	Tons offered (Nominal)		
	Tons@43 deg C ambient		
	Star rating		
	EER/COP		

TECHNICAL SPECIFICATIONS FOR FIRE DETECTION, FIRE ALARM AND FIRE FIGHTING EQUIPMENT BASED ON GAS WITH ALL ELECTRICAL ASSOCIATED WORKS

PHOTO ELECTRIC SMOKE DETECTOR & IONISATION SMOKE DETECTORS

DESIGN & SELECTION:

- a. Ionization & Optical smoke detectors shall be provided in the areas which are normally free from smoke. One heat detector be also provided in the corridor area. The area to be protected by smoke detectors shall be generally in accordance with the Standards laid down below. Additional detectors if any shall be provided as per user's requirement.
 - i. Each detector shall cover an area not exceeding 25sqmtr in case of air conditioning areas and 40sqmtr in case of non air conditioning areas.
 - ii. Each detector shall cover an area not exceeding 10sqmtr when provided above false ceiling or below false flooring or over fully covered cable network.
 - iii. Ionization and photoelectric detectors shall be provided in the ratio of 1:1 for mixed monitoring purpose.
- b. Signals from detectors which are normally not visible shall be extended in shape of response indicator to a suitable location which is easily accessible.
- c. Each detector shall be numbered zone wise such as Z04/N-10 ; wherein Z04 indicates zone number 4 & N-10 indicates number 10 in that zone.

TECHNICAL SPECIFICATION:

The entire system shall conform to I.S. 2189 as amended up to date. Where standard is not available the BS 5839 standards shall be followed. The wiring work shall be carried out conforming to C.P.W.D. specifications for Electrical works (Internal) as amended up to date.

DRAWINGS:

The contractor shall furnish the drawing within three days for the approval of the Employer before the start of work:-

1. Plans showing location of detectors, main control panel, and manual call points, hooters, response indicators etc.
2. Plan showing zone wise connectivity of detectors and accessories.

OPERATION PRINCIPLE:

A. PHOTO ELECTRIC SMOKE DETECTORS:

The operation of detector is based on light scattering principle under normal conditions. Light pulses are separated at such a rate that photo diode is not able to detect them because of its position being outside the light path. When the smoke enters the chamber, the light would be scattered off by the smoke and sufficient quantity of light would be detected by the diode result in activating an alarm on counting of six consecutive pluses on account of continued existence of smoke within the sensing chamber. External LED also glows in alarm activation.

B IONISATION SMOKE DETECTORS:

The Ionisation smoke detector shall consist of two Ionisation chamber i.e. inner and outer, both containing a sealed radiation source. The air inside the chamber is ionised by the radio rays omitted from the radiation source. The two chambers are connected in series.

At the time of fire the smoke would enter into the outer chamber and due to the smoke, the current in the Ionisation chamber is reduced. This effect is taken a note of by the control panel and signals are given accordingly. External LED also glows on alarm activation.

C HEAT DETECTORS:

The detector function with a dual action using two distinct method of the detection i.e. rate of rise and fixed temperature. The rate of rise element consists of fan air chamber, a flexible metal diaphragm a moisture proof trouble free vent which is carefully calibrated at the factory. Air expands as it is heated and contracts as it is cooled. For normal day to day fluctuations the expansion and contraction of the air within the chamber is automatically compensated by the breathing action of vent. However, when fire occurs air temperature is raised very rapidly and the air in the chamber expands faster than it can be vented. This creates a pressure, which distorts the diaphragm and closes the electrical contacts. The rate of rise action is not related to any fixed temperature level but responds to the utmost promptness when the rate of temperature rise is very fast. If the heat is subsequently removed, the air within the chamber contracts relieving the pressure and the detector automatically restores itself to the normal open circuit's position.

In the instance of a very slow smoldering fire where the temperature does not increase rapidly enough to operate the rate of raise element the fusible solder melts at a predetermined temperature and release the spring, which closes the electrical contacts.

1. The heat detectors shall operate as on open circuit device and designed to close an electric circuit on being activated upon.
2. The fixed temperature sensing features shall be entirely independent of rate of temperature rise sending features.
3. The detectors shall have phosphor bronze spring held under tension by fusible soldered link in order to achieve fixed temperature sensing features.

GENERAL FEATURES:

1. The detectors shall be plug in type to facilitate easy removability and installation of detectors while base is permanently installed.
2. The detectors shall operate at 24 v (max) D.C. and shall be of low voltage type.
3. The detectors shall be cent percent solid-state using field effects transistors, integrated circuits, and transistor technology.
4. The detectors shall have LED indicators for quick identification of location of fire / smoke.
5. The detectors shall have provision for connecting remote response Indicator.
6. The detectors shall be protected against reverse polarity of incoming supply.

MAIN CONTROL PANEL:

1. Microprocessor based Confirming to IS 2189
2. 1.6 mm thick cabinet
3. User-friendly operations.
4. Compatible with all types of conventional detectors.
5. Battery backup with in built changing.
6. Automatic switch over to battery in case of AC main failure.

7. Signal Silence to acknowledge Fire / Fault condition.
8. Active fire zones in case of isolating of other zones.
9. Separate twin LED indication for fire for each zone.
10. Zone wise Fault (open / short circuit) indications.
11. Fire / Fault status in unambiguous colored indications.
12. Ac fail / Low battery indication.
13. Charger ON / Charger fail indication.
14. Fuse blown indication for AC and DC fuses.
15. Earth Fault indications.
16. Hooter cut Detection with audio visual warning.
17. Individual hooter outputs for each zone & a common hooter output.
18. Relay outputs for actuators like , AHU shutdown, fire extinguishing system.
19. Selectable activation of relays either at alarm condition or at trouble condition.
20. One man walk test facility.
21. Lamp test facility.
22. Drill switch to activate alarm sounders manually.
23. Ease of maintenance with auxiliary isolate feature.
24. Zone isolation facility.
25. Primary Power – 150V to 270V, 50 Hz.
26. Secondary Power- 24V DC (12V , 7AH batter-02 nos)
27. Current Consumption – 100mA.
28. Loop Response – approx. 500ms.
29. Auxiliary contact rating – 3A @ 230V AC.
30. Zone input – 2 wire loop.

HOOTER AND MANUAL CALL POINT:

HOOTER:

1. The Hooter shall be totally electronic solid state type speaker
2. The Hooter output shall be approximately 4 watts.
3. The Hooter shall be suitable for signal / dual tone audible alarm and public address.
4. The Hooter shall be suitable for wall mounting incorporating hooter card and speaker inside a metallic box. and shall be mounted 2.4 mtr. above floor level.
5. The control panel shall actuate the Hooter control.

MANUAL CALL POINT OR PILL BOX:

1. Manual call point box shall be aluminium/ MS/ die casted construction painted with fire Red paint.
2. The box shall incorporate single pole change over switch with test facility by inserting a key.
3. The box shall be provided with plastic coated inner plate, glass, and gasket to make it completely vermin and dust proof A/W hammer and chain.
4. The glass front cover shall have write up 'BREAK GLASS IN CASE OF FIRE
5. The box shall be suitable for wall mounting and shall mounted at 1.25 meters above floor level.

CABLES AND THEIR INSTALLATION:

The cable should confirm to the following :-

- a. PVC insulated copper conductor armoured cable conforming to IS:694-1977 having minimum 1.5 mm. sq . cross-sections area .
- b. PVC insulated single solid core copper wire conforming to IS:694-1977 having minimum 1.5 mm. sq . cross-sections area .

RESPONSE INDICATOR:

Response Indicator with suitable 16 gauge MS/aluminum box with cover of acrylic sheet minimum 2mm thick & LED as req.

ABC /CO2 TYPE FIRE EXTINGUISHERS 4.5/5 KG CAP:

ABC /CO2 type fire extinguishers 4.5/5 Kg cap. Complete with discharge arrangement, high-pressure hose pipe complete as required in conformity to IS 13849-1993 best suitable for control and extinguishing of electrical/electronic equipment fires.

TEST AT SITE:

After physical completion of the installation functional tests on the following items shall be conducted as follows:-

TESTING OF DETECTORS:-

- a. **OPEN CIRCUIT TEST:-** All smoke detectors of a zone are looped and are terminated on PCB card in control card in control panel. Remove one terminal of detector to make open circuit in the detectors loop, a corresponding fault indication of the open circuit will be displayed on the panel. Open circuit condition is created at the last detector of individual zone.
- b. **SHORT CIRCUIT TEST:-** Short the terminals of detectors one by one in last detector of each zone to create a short circuit in detector circuit and same will be displayed on the panel.
- c. **CLOSED CIRCUIT TEST:-** By putting a cigarette smoke or allowing smoke of four incense stick in the chamber of detector just about a distant feel apart, the detector will sense the smoke within 10 – 15 sec and a red LED on the body of the detector glows permanently giving a audio visual alarm on the control panel and distant hooters also gives audio signal.
- d. Open and short signalling line circuits and verify that the trouble signal actuates.
- e. Open and short notification appliance circuits and verify that trouble signal actuates.
- f. Ground all circuits and verify response of trouble signals.
- g. Check presence and audibility of tone at all alarm notification devices.
- h. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
- i. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points

All other tests pertaining to response indicator, manual call points, hooter / alarms, fault signals; main panel etc shall also be conducted at the time of testing and commissioning.

BATTERIES

The standby power supply should be capable of maintaining the system in normal operation for a period of not less than 48 hours after the failure of normal main supply after which sufficient

capacity would remain to provide full load operation for at least 30 minutes. The full load would be defined as that caused by the operation of all the alarm sounders operating simultaneously, operation of detectors in at least 25 percent of zones (with a minimum of two zones) and the operation of the fault indicator. The operation of trigger devices in further zones should not result in cancellation of fire alarms existing at least at that time.

The voltage of the batteries should be monitored and low voltage indicated on C & I equipments.

CABLES AND THEIR INSTALLATION:

The cable should conform to the following:-

- a. PVC insulated copper conductor cable conforming to IS:694-1977 having minimum 1.5 mm. sq . Cross-sections area.

TECHNICAL SPECIFICATIONS OF VIDEO SURVEILLANCE SYSTEM COMPLETE WITH CAMERAS, DIGITAL VIDEO RECORDERS, MONITORS AND DIGITAL DOOR LOCK.

CCTV SURVEILLANCE SYSTEM SPECIFICATIONS

GENERAL

A CCTV system shall be supplied to enable centralized surveillance of various selected areas and to generate a record for post event analysis. All components of the system shall be designed for continuous duty and shall be proven in previous installations. This section shall be read in conjunction with the drawings identifying camera types and their locations, data sheets and the schedule of prices.

1. Following authorizations shall be made available from the CCTV manufacturer:
 - Authorization for participating in the tender.
 - Certificate from Manufacturer that the items quoted by the Bidder are in regular Production Line and would be serviceable for at-least 5 years from the date of tender. No obsolete products should be quoted.
2. The bidder must have fully established office in India with service setup in Jammu and response time of maximum 24 hours . The bidder must have completed work of similar nature (CCTV-Wired or Wireless) of at least 30.0 lac. Certificate in this regard must be furnished.
3. This product shall be manufactured by a firm whose quality system is in compliance with the ISO 9001/2000 Quality system.
4. The supplier shall be ISO 9001/2000 and 14001 certified.
5. Bidder is required to submit technical datasheets of all products and installation manuals of all products, technical bids without these documents shall be considered incomplete and will be rejected.

SCOPE OF WORK

The scope shall include the complete design, engineering, manufacture, supply, delivery, and storage at site, installation, testing and commissioning of a fully functional and complete CCTV system. All accessories and fitting hardware such as brackets together with associated masonry work are included in the scope of work.

The system shall comprise of the following sub-systems:

- Fixed Dome day and night Camera.
- Monitoring, Recording and control equipment including Monitors, Digital Video Recorder.
- The scope is deemed to include all components, accessories and equipment required to implement a fully functional CCTV system regardless of whether they are explicitly mentioned or not.
- Documentation to be submitted shall include but not be limited to schematic drawings of the CCTV system with all the components shown, data sheets and catalogues of equipment offered, and operation and maintenance manuals.

- The bidder shall furnish warranty for the entire system for a defect liability period of twelve (12) months after installation and final official hand over. This period shall include maintenance, replacement of parts, and regular periodic visit by qualified personnel of the Contractor and attending to emergency calls at short notice.

FIXED DOME VIDEO CAMERA

- ◆ The CCTV video camera should be a COLOUR camera

TECHNICAL SPECIFICATION :

Pick up Device	1/3" Super-HAD IT CCD
Viewing Angle	71 deg H and 53 deg V
Color Resolution	600 TV Lines or better for sharp image HOIZONTAL
Minimum Color Illumination	0.0006 Lux or better – Color@ F2.0
AGC facility	To be Present
Video Output	1 V pp
White Balance with Multi Colour Temperature technology.	To be Present
Back light Compensation	To be Present
S/N Ratio	≥ 52 db
PIP	Off/On
Internal Synchronization	To be Present
Built-in fixed lens	F=3.8 mm ,Aperture ratio f=2.0 f
Mounting ceiling/wall as required	To be Present
Operating Temperature	-10°C to +50°C
Electronic Shutter Control	Built-in
Humidity	<90%
Electronic Shutter	1/50 to 1/10,000 Sec

STAND-ALONE DIGITAL VIDEO RECORDER

- ◆ The DVR must support multi casting features.
- ◆ The DVR must support simultaneous dual connectivity (TCP/IP as well as dial-up connections)
- ◆ The DVR should support video transmission up to 120/100fos on LAN
- ◆ The DVR must support both static and dynamic IP
- ◆ The DVR should support sophisticated system arm. disarm.
- ◆ Live, Network, Recording and Playback shall be performed simultaneously such that it does not affect the recording
- ◆ The DVR MUST support various recording modes like manual, schedule or event recording
- ◆ The DVR must automatically manage free disk space by deleting recordings older than the specified number of days or when a minimum disk space threshold is met
- ◆ The DVR must support video footage extraction through CD.
- ◆ The DVR should have compliance with BS 8418:2003
- ◆ The DVR must have unlimited video storage expansion.
- ◆ The DVR should support event log function with tamper and power failure interruption detection.
- ◆ The DVR should have independent Web server with Independent remote viewers.
- ◆ The DVR should support Triplex operation simultaneous monitoring , recording and play.
- ◆ The DVR should support two different login modes: basic and advanced. The basic login mode should have user and admin passwords. When DVR is configured in advanced login

mode, it should support up to 20 user accounts including system administrator. Each user account comes with individual username and password. The system administrator can determine the authority when setting up individual user accounts. Besides system settings, playback, video extraction and event handling, etc., the system administrator can hide up some cameras to prohibit the access from some user accounts.

- ◆ The DVR should support sophisticated event management and system disarm/arm.
- ◆ Compression technique: SMAC-M

TECHNICAL SPECIFICATION:

Video Input	4 Independent Video Inputs
Video Out	Spot((1EA),VGA(upto 1280x1024)
Compression	SMAC-M
Video Display	Full screen, quad screen, 3 X 3 Screen, hex screen
Disk Full Detection	To be present
Video Loss Detection	To be present
Motion Detection	To be present
Recording Rate	Half D1 120(NTSC)/100(PAL) ips
Play back Resolution	CIF: 120(NTC)/100(PAL) ips
Frame Rate	D1: 90(NTSC)/75(PAL) ips
Operating Temperature	5°C to +40°C
Audio IN/OUT	4/1
User Interface	Menu Driven
Play back speed	X 2,4,8,16,32
Backup device	DVD,USB
Simultaneous network connection	Live monitoring 4/search 4 persons
	Live monitoring 4/search 4 persons

LIQUID CRYSTAL DISPLAY:

- ◆ The Monitor should be a LCD
- ◆ The Monitor should be High Resolution LCD at 600 TV lines or Better
- ◆ The Monitor should be 32" or bigger monitor
- ◆ The Monitor should have built –in Audio 2RCA
- ◆ The Monitor should have external controls in Contrast, Brightness, Colour, Sharpness, volume

TECHNICAL SPECIFICATION:

Screen size	32"
Input Signal	<ul style="list-style-type: none"> ▪ Horizontal frequency: 30~81khz ▪ Vertical frequency: 56~85hz ▪ Pixel pitch(mm): 0.511x0.511 (h x v)
Band Width	100 Hz ~ 6.5 Mhz (-3dB) or Better
AC Power	100 ~ 240 V AC,50/60hz
Horizontal Resolution	600 TV lines or Higher
Power Consumption	143w maximum
External controls	Contrast, Brightness, Colour, Sharpness, Tint and Volume
Audio I/O Connectors	RCA Jack
Input Connectors	CVBS-BNC, R.G.B, +H-BNC, Y/C 4 input DIN Jack
Contrast ratio	4000:1
Response time	8 ms

Panel lamp life	>50,000 hrs
Display colour	16.7 M
Speaker output	2x 5W

AUTOMATIC DOOR LOCKING SYSTEM

Method of entry

1. RF card
2. Pin code combination of 5-12 digits
3. mechanical override key
4. anti panic exit system
5. electronic discharge (ESD) prevention

LIST OF ACCEPTABLE MAKES OF EQUIPMENT AND OTHER MATERIAL:

AIR CONDITIONING EQUIPMENT AND ALLIED WORKS

- Precision air conditioners Emerson technologies/Blue Star
- High Wall splits : Blue Star/Voltas/Daikin.
- Distribution Panel: Standard makes.
- FSU : L&T/ Standard.
- Cables (power) : CCI/ Gloster/ Havels/ Finolex.
- Cables (control) : Finolex/ havels/.
- Condensate Drain piping: Supreme
- Copper piping: Totalline/Equivalent
- MCBs Standard/ Havels/ Hagers
- Servo voltage corrector: Logicstat/ Jindal/ /Electric field

FIRE DETECTION/FIRE ALARM/FIRE FIGTING

- Main control panel Agni, Godrej, Electroequip
- Detectors Appolo,system/ sensor, Edward, Honeywel
- Fire extinguishers Minimax, Cease fire, Geetech, ISI marked
- Cables(power) : CCI/ Gloster/ Havels/ Finolex.
- Cables (control) : Finolex/ Havels/.

SURVEILLANCE SYSTEM

- Day night Dome camera Samsung/Sony/Panasonic
- LCD Monitor Samsung/ Sony/Panasonic
- Digital video recorder Samsung/ Sony/Panasonic

GENERAL CONDITIONS OF CONTRACT

1. BYE LAWS AND REGULATIONS

The installation shall be in conformity with the Bye Laws, Regulations and Standards of the local authorities concerned in so far as these become applicable to the installation.

If the Drawings or Specifications require something which violates the Bye Laws and Regulations, then the Bye Laws and Regulations shall govern the requirement of this installation.

2. WORKING PERMITS AND INSURANCE :

The Contractor shall obtain all work permits/ licenses required for the personnel employed at the work site and shall strictly adhere to all the rules & regulations of the purchaser. All statutory rules like PF, minimum wages etc., are to be followed strictly and registers as required by the law are to be maintained at site.

The contractor shall also fully cover the personnel employed and the materials used under comprehensive insurance, valid up to the duration of the contract plus 3 months.

3. DRAWINGS

The Contractor shall submit a complete layout drawing for the split units including indoor and outdoor placements. He shall also locate placement of Servo voltage corrector, Distribution boards, electrical cabling routing, drain piping routing etc followed by drawings in preparation of his shop drawings and for subsequent installation work. He shall check the drawings of other agencies to verify spaces in which his work will be installed. Fire fighting agency will submit complete layout for the detectors, panels cabling etc. Similarly surveillance agency will also submit a detailed drawing depicting all camera positions, DVR placement, monitor placement and the cable routes

Maximum headroom and maintenance shall be maintained at all points. Where headroom appears inadequate, the contractor shall notify the Corporation before proceeding with the installation.

The Contractor shall examine all architectural, structural, plumbing, electrical and other services drawings before starting the work and report to the Department any discrepancies, coordinate installation of this work with other services and agencies.

4. TECHNICAL DATA

The Bidders must submit the technical data for all the items quoted along with quantity with their tenders. Failure to furnish technical data with tender may result in rejection of tenders.

Within three days after the award of the contract, the contractor shall furnish, for the approval of the purchaser, two sets of detailed shop drawings of all equipment and materials including layout, piping and control wiring layouts required to complete the project as per specification and as required by the purchaser. These drawings shall contain details of, size, arrangement, operating clearance, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each item of equipment proposed shall be a standard catalog product of an established manufacturer as per specifications.

After final approval has been obtained from the Corporation, the contractor shall submit further two sets of shop drawings. No material or equipment shall be supplied for installation at the site until the contractor has in his possession, the approved shop drawings for the particular material or equipment.

The shop drawings shall be submitted for approval sufficiently in advance of planned delivery and installation of any materials, to allow the Department ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved programme.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimension. Where drawings are approved, said approval does not mean that drawings have been checked in detail nor does it in any way relieve the contractor of the responsibility or requirement to furnish material or perform work as required by the contract.

Where the work of the contractor has to be installed will interfere with work of other agencies, he shall assist in working out space conditions to make a satisfactory adjustment. If the contractor installs his work before coordinating with other trades, he shall make all the necessary changes without extra cost to the purchaser.

5. QUIET OPERATION AND VIBRATION ISOLATION

All equipment shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Department.

6. ACCESSIBILITY

The contractor shall verify the sufficiency of the size of the shafts and openings, clearance in cavity walls and piping. His failure to communicate insufficiency of any of the above shall constitute his acceptance of sufficiency of the same. The contractor shall locate all equipments which must be serviced, operated or maintained in fully accessible positions. The exact location and size of all access panels, for devices requiring attendance, shall be finalized and communicated in sufficient time, to be provided in the normal course of work, failing which the contractor shall make all the necessary repairs and changes at his own expenses.

7. ELECTRICAL INSTALLATION

It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements, of the electrical installation work for air-conditioning services, lies solely with the contractor.

All statutory approvals for electrical installation under the scope of this tender shall be obtained out by the contractor. The required fees shall be paid by the purchaser but all other incidental expenses in connection with the inspection/ approval etc., shall be borne by the contractor.

8. MATERIALS AND EQUIPMENT

All materials and equipment shall conform to the relevant Indian Standards and shall be of the approved make and design. General specifications for the various equipments / works are enclosed. Wherever these are not totally clarified, the construction shall be carried out as per the relevant IS specifications.

9. MANUFACTURER'S INSTRUCTION

Where manufacturers have furnished specific instructions, relating to the material and equipment used in this job, covering points not specifically mentioned in these documents, such instructions shall be followed in all cases.

10. INSPECTION & TESTING

The Corporations authorized representative shall have full powers to inspect any portion of the work, examine the materials, workmanship and getting the materials / equipments tested at the contractor's works or at any other place from where equipments/ materials are procured. These examinations will not relieve the contractor any of his responsibility for meeting the requirements of the specifications and it will be the contractor's responsibility to rectify/ replace such works/ equipments not found in accordance at his cost.

All the testing and measuring instruments and labour required shall be provided by the contractor at his cost. The contractor shall also calibrate the instruments used for testing at reputed calibration centers.

11. REJECTION OF DEFECTIVE PLANTS/EQUIPMENTS:

If the completed works or equipment or any portion there of taken over is found to be defective, or fail to fulfill any specification requirements, the contractor , on receipt of written notice, shall make good the defective works at his cost within a stipulated time frame. The purchaser shall have full powers to carry out such repair works at the risk and cost of the contractor, in case the contractor fails to carry out this within the stipulated time.

The purchaser shall have the right to operate the plant whether or not such equipments have been accepted.

12. BALANCING, TESTING AND COMMISSIONING

Balancing of all air in case of ACs systems and all tests as called for in the specifications shall be carried out by the contractor in accordance with the specifications and relevant local codes.

The results of these testing shall be submitted for scrutiny. Four copies of the certified manufacturer's performance readings for each piece of equipment shall be submitted along with the test results.

The Contractor shall arrange all necessary balancing and testing equipment, instruments, materials, accessories and the requisite labour. Any defects in materials and / or in workmanship detected in the course of testing shall be rectified by the contractor entirely at his own cost, to the satisfaction of the purchaser. The installation shall be tested again after removal of defects and shall be commissioned only after approval of the purchaser. All tests shall be carried out in the presence of Corporations ' representative.

13. GUARANTEE AND DEFECTS LIABILITY PERIOD

The contractor shall guarantee that all equipments shall be free of any defects due to defective materials and bad workmanship and the equipment shall operate satisfactorily with the performance & efficiencies not less than the guaranteed values. The guarantee period shall be valid for a period of twelve (12) months after completion of the works in all respects, or as per manufacturers warranty policy

CONDITIONS OF CONTRACT

1. The tender/s for the Work, as purchased from the Executive Engineer, Mechanical, Sewa Hydel Project Stage-III, Basohli, Camp Office Digiana, Jammu, must be submitted adopting **ONE DROP THREE COVER SYSTEM**.
2. Tenders must be affixed with Rs.5/- revenue stamps and accompanied with earnest money in the shape of FDR/ CDR of any Nationalized Bank for an amount equal to the amount mentioned against each work here in under and pledged in favour of Executive Engineer, Mechanical, Sewa Hydel Project, Basohli, J&K State Power Development Corporation

SNO	DESCRIPTION/ NAME OF WORK	EARNEST MONEY(IN RUPEES)
WORK NO 1	Design, supply, installation, testing and commissioning of Air- cooled Precision air conditioning system complete with all allied works	15, 000.00
WORK NO 2	Fire detection, fire alarm and firefighting equipment based on gas with all associated works.	3,000.00
WORK NO 3	Video surveillance system complete with cameras, digital video recorders, monitors and digital door locks with all associated works..	8,000.00

BID SUBMISSION: SUBMISSION DATE

2. The tenders addressed to the **CHIEF ENGINEER, CI&D WING JAMMU, J&KSPDC, 18 C/C, GANDHI NAGAR, JAMMU** should reach his office through registered post/ speed post/ courier or be delivered against a receipt from the designated official to his office up to **1530 HRS ON OR BEFORE 16-02-2010**.
3. Telegraphic tender or tenders of such Bidders who have not purchased the tender document shall not be entertained. Any request for any kind of modification, addition or alteration after the due date shall not be entertained
4. Bidder before submitting the tender must ensure the tenders are complete in all respects and are being submitted in the manner prescribed for the Bid. Technical specifications and other conditions should be carefully studied before submitting complete and comprehensive tender. Failure to adhere to BID TERMS & CONDITIONS may lead to the rejection of the tender, even if it is a competitive offer.

BIDDING PROCEEDURE: OPENING OF BIDS

5. Bidding shall follow one drop, three cover system.
6. **First Cover** (Envelope) sealed and super scribed with words "**EARNEST MONEY**" shall contain only the Earnest Money for the work/ works.
7. **Second Cover** (Envelope), sealed and super scribed with words, "**TECHNICAL BID**" shall contain all other documents, as are to be supplied/ furnished by the Bidder to establish the technical qualification/ prove technical credentials of the bidder and the other technical/ design details/ schematic layout of machines, accessories, panels etc. for the equipment to be supplied in response to tender specifications and other commercial terms such as warranties/ guarantees.

8. **Third cover** (Envelope), sealed and super scribed with words, “**PRICE BID**” shall contain only the Price Bid. It shall contain no other document.
9. **ALL THE THREE COVERS**, described herein above shall be placed inside a **SEALED ENVELOPE super scribed with the NAME OF THE WORK UNDER BID, REFERENCE TO NOTICE INVITING TENDERS, LAST DATE TIME FOR SUBMISSION AND THE NAME OF THE BIDDER WITH HIS CONTACT NUMBER.**
10. The tenders as received by due date and time only shall be opened on the same day or any subsequent working day convenient to the tender opening authority in presence of Bidders who may like to be present.
11. In the first instance only the first cover super scribed “**EARNEST MONEY**” shall be opened.
12. Bids received without Earnest Money in the manner and for the amount prescribed herein above OR using documents not issued by/ purchased from the Executive Engineer, Mechanical, Sewa Hydrel Project Stage-III, Basohli, Camp Office Digiana, and Jammu OR using documents purchased by a bidder by suppressing information / furnishing false information shall be summarily rejected.
13. **Cover 2** super scribed “**TECHNICAL BID**” containing documents related to:
 - i. technical data, technical brochures related to the equipment to be supplied,
 - ii. air conditioning equipment layout, detailed cooling load calculations based on design parameters prescribed in the bid document,
 - iii. general equipment, electric layout drawings
 - iv. Audited Balance Sheets for 2006-07, 2007-08 & 2008-09 in support of their financial credentials. The bidder should have an annual turnover of not less than 50 lacs during last three financial years.
 - v. Proof of having executed at least one single job of not less than Rupees 15.00 lac during any one of the last 3 years, 2006-07, 2007-08 & 2008-09.
 - vi. Bidder's personnel profile, after sales service facilities available in Jammu etc.
 - vii. Bid Document, all pages, as purchased from the Executive Engineer, Mechanical Division, SHP Stage-III, sealed and signed by the Bidder in token of acceptance of the terms and conditions specified under the Bid.

as required under the detailed terms and conditions of the Bid and submitted by only those Bidders who are found to have submitted the Earnest Money in the manner and for the amount prescribed herein above shall be opened and considered valid for technical evaluation.
14. **Cover 3** super scribed “**PRICE BID**” only of those bidders who are found to be technically responsive to the requirements laid in the bid document shall be opened and considered valid for evaluation.

CONDITIONAL TENDERS

15. Conditional tenders, even if found to have quoted lowest cost/ price shall be summarily rejected. Conditional tenders such as “subject to market fluctuations shall also attract summary rejection by the Owner.

EARNEST MONEY

16. No Bidder, unless otherwise specified in these specifications, terms and conditions shall be exempted from depositing earnest money.

17. The earnest money of a Bidder shall be forfeited if the Bidder withdraws his tender or seeks to revise the price of their offer within the validity period.
18. The earnest money shall also be forfeited in case the Successful Bidder fails to implement the contract as per the delivery schedule or to deliver the contract placed on them within the validity period of the tender or the Successful Bidder violates any terms and conditions contained herein.
19. The EMD, submitted by the Unsuccessful Bidders shall be released within 14 days with effect from the date of finalization of the tender/ award of contract. EMD furnished by the Successful Bidder shall be released after the furnishing of Contract Performance Guarantee by the Successful Bidder as described herein under.

CONTRACT PERFORMANCE GUARANTEE/ CONTRACT AGREEMENT

20. The Successful Bidder shall be required to furnish unequivocal, unconditional Bank Guarantee for an amount equivalent to 5% of the finalized Contract Price as the Contract Performance Guarantee valid for the completion period plus defect liability period of 365 days plus 28 days within three (3) days from the date of issue of Letter of Award/ Letter of Intent.
21. The Successful Bidder shall be required to enter into formal CONTRACT AGREEMENT with J&KSPDC within seven (07) days from the date of issue Letter of Award/ Letter of Intent for the work.
22. Furnishing of Contract Performance Guarantee (CPG) as described herein above at para 21 shall be pre-requisite for the signing of the agreement between the J&KSPDC and the Successful Bidder.

ELIGIBILITY CONDITIONS:

23. Capital turnover of the Prospective Bidders for the last three years, 2006-07, 2007-08 & 2008-09 must not be less than Rupees 50.00 lac per year. Bidders are required to furnish/ provide the audited balance sheets for 2006-07, 2007-08 & 2008-09 in support of their financial credentials to establish their eligibility under this clause.
24. Prospective Bidder should also have executed at least one single similar job of not less than Rupees 15.00 lac during any one of the last 3 years, 2006-07, 2007-08 & 2008-09. Prospective Bidders are required to furnish/ provide the copy the work order, invoice raised etc
25. Prospective Bidders also must provide the Staff Structure/ Details of the personnel on the regular roll of the Bidder detailing staff qualifications with emphasis on after sales service infrastructure available in Jammu. With every other thing being equal, preference would be given to Bidders who have local service facilities for after sales service.
26. The Owner is/ shall not be bound to accept the lowest or any other tender and reserves to himself the right of accepting the whole or any portion of any tender as it may deem fit without assigning any reason thereof.
27. In their own interest, Bidders are advised to visit the sites where the equipment/s is/ are to be installed before submitting their Bids. However Bidders are deemed to have visited the site and acquainted themselves with the site conditions before submitting the tender
28. Once the tenders are opened, no tenderer shall change the equipment/specifications offered by him or the prices quoted by him unless specifically asked to do so

29. The Department shall accept the equipment and the complete system only after satisfactory testing in all respects in accordance with the contract.
30. The rates offered by the Bidders must include all costs including basic cost, CST, toll taxes, transportation to site, storage at site, erection, testing and commissioning .It shall include all sales tax, excise duty. Work Contract Tax, Income Tax etc. Income Tax and Work Contract Tax shall be deducted from the payments made to Contractor/s.
31. The contractor shall commence the work on site within 7 days from the date of issue of Letter of Award/ Letter of Intent.
32. The contractor shall hand over the complete work to the Department within 33 days of the date of order.

DEFECT LIABILITY

33. All the works and equipment installed by the Contractor shall be warranted for 365 DAYS from the date of handing over. Any defects developed within warranty/defect liability period will have to be rectified by the contractor free of cost. In case of failure to do so the Corporation shall be at liberty to get the defect rectified by some other agency at the cost of the Contractor.

INSURANCE

34. The successful tenderer shall have to take a worker compensation insurance policy and submit it to the Department.

DELAY DAMAGES

35. The entire contract shall have to be completed and handed over in 45 days. Liquidated damages at the rate of 0.5 % of the total contract value per week of delay up to a maximum of 2% of the total value of the contract shall be charged in case of delay.

VALIDITY OF BID

36. The tender must be kept valid for at least 3 months from the date of opening of the tenders

TERMS OF PAYMENT:

37. Seventy percent (70%) of the total contract value shall be paid after all the equipment and material required for the job is supplied at site, twenty-five percent (25%) after installation of all items as specified in BOQ, five percent (5%) after testing and successful commissioning and handing over to the Corporation.

SAFE CUSTODY:

38. All the equipment, material required at site for the execution of the work shall be in the custody of the contractor. Any theft or loss due to any account shall be the Contractors liability. The liability of safe custody will be transferred to the Corporation only after handing over of the complete system in working condition.

VARIATION IN QUANTITIES

39. The Quantities shown in BOQs are the estimated quantities. The contractor with whom order will be placed shall be paid as per the ordered quantities and actual measurements taken after the execution of the complete work as per the approved drawings and measurements authenticated by the Engineer I/C.

**EXECUTIVE ENGINEER
MECHANICAL DIVISION
SEWA HYDEL PROJECT
STAGE-III
CAMP DIGIANA, JAMMU**