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Chapter-I: General Intent of Specifications

1. INTENT OF THE SPECIFICATION

1.1. Various activities required for Supply and Installation of Solar RTS systems have been identified by BHEL. All the activities required for providing services related to BHEL supplied items, dismantling of existing system and Installation of COMPLETE Solar Rooftop systems at site have been identified and listed. Supply of Civil foundation, other minor items, fittings etc. as per list have also been identified as separate line items. Apart from the items generally required for completion of a basic system – other items for supply, installation have also been identified which are required on cases to case basis against various specific requirements of our customer/end user.

1.2. BHEL will place the order with the lowest bidder for full scope of work. Works order is to be awarded to bidder who meet pre-qualification requirement, and techno-commercially qualified and quotes "lowest landed cost to BHEL" for complete specification and scope defined in tender enquiry

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Chapter - II: Delivery Period

1. DELIVERY PERIOD

Total Time period is 45 days from the date of award of order.





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Chapter - III: Obligations of Contractor

1. CONSUMABLES & OTHER ITEMS

The contractor shall provide within finally accepted price / rates, all Minor accessories, fitting items, sealing compounds etc for ensuring proper finish and completeness of the work. Other erection consumables such as tapes, jointing compound, M-seal, Araldite, CTC / other cleaning agents are to be provided by the contractor. Steel, packers, shims, wooden planks, scaffolding materials hardware items etc required for temporary works such as scaffoldings are to be arranged by the contractor. Sealing compounds, gaskets, gland packing, wooden sleepers, for temporary work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by the contractor.

2. TOOLS AND PLANTS / MONITORING AND MEASURING EQUIPMENT (MMEs)

T&Ps and MMEs to be provided by Contractor

- 2.1. All T&Ps and MMEs except those that are in BHEL scope are to be provided by the Contractor. Contractor has to make his own arrangement at his cost for completing the formalities, for bringing their materials, plants and equipment's at site for the execution of work under this contract.
- 2.2. Timely deployment of adequate T&Ps is the responsibility of the contractor. The contractor shall be prepared to augment the T&P at short notice to match the planned programme and to achieve the milestones.
- 2.3. In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material or non-availability of the same owing to breakdown, BHEL will make alternative arrangement at the risk and cost of the contractor. Decision of BHEL shall be final and binding on the contractor.
- 2.4. The T&P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. Their movements, should be such that no damage / breakage occurs to foundations, other equipment, material, property and men. All arrangements for the movement of the T&P etc shall be the contractor's responsibility.

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2.5. Contractor shall ensure deployment of reliable and calibrated MMEs (Inspection measuring and Monitoring equipment). The MMEs shall have test / calibration certificates from authorized / Government approved / accredited agencies traceable to National / International standards. Each MME shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.

2.6. The contractor shall engage trained and experienced operators for the operation of T&Ps.

3. EPF/ESIC

For the persons deputed at site – Bidder should ensure EPF/ESIC registration and payment towards PF of employee as per applicable rules prevailing in the state/UT of work. Workmen compensation policy has to be taken by the Bidder and should be submitted to BHEL before start of work. Indemnity bond to this effect shall be submitted by vendor for release of payment.



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**Chapter – IV : Responsibilities of Contractor in respect of Labour,
Supervisory Staff, etc.**

1. RESPONSIBILITIES OF CONTRACTOR IN RESPECT OF LABOUR, SUPERVISORY STAFF, ETC.

- 1.1. Refer relevant clauses of General Conditions of Contract (GCC) also in this regard
- 1.2. The contractor shall deploy all the necessary skilled/semiskilled/ unskilled labour including highly skilled workmen etc. These workmen should have previous experience on similar job. They shall hold valid certificates wherever necessary. BHEL reserves the right to insist on removal of any employee of the contractor at any time if he is found to be unsuitable and the contractor shall forthwith remove him.
- 1.3. Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.
- 1.4. It is the responsibility of the contractor to engage his workmen in shifts and or on overtime basis for achieving the targets set by BHEL. This target may be set to suit BHEL's commitments to its customer or to advance date of completion of events or due to other reasons. The decision of BHEL in regard to setting the erection and commissioning targets will be final and binding on the contractor.
- 1.5. The Contractor shall obtain Independent license under the Contract labour (Regulation and Abolition) Act 1970 from the concerned authorities based on Form-V issued by the Principal Employer/Customer. In order to issue Form-V by Customer, Contractor shall fulfill all Statutory requirements like Insurance Policy, PF Code/PF Account number etc as per the requirement of BHEL/Customer.
- 1.6. Contractor shall deduct the necessary amount towards Provident Fund and contribute equal amount as per Government of India laws. This amount will be deposited regularly to the provident Fund Commissioner. BHEL/Customer may insist for submission of the account code duly certified by PF Commissioner
- 1.7. Contractor may also be required to comply with provisions of ESI Act in vogue if applicable and submit evidence to BHEL.

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- 1.8. BHEL / customer may insist for witnessing the regular payment to the labour which is to be done compulsorily through e-payment mode. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL/ Customer.
- 1.9. Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.
- 1.10. The contractor's supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by BHEL engineer from time to time.
- 1.11. The supervisory staff employed by the contractor shall ensure proper outturn of work and discipline on the part of the labour put on the job by the contractor. Also in general they should see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL or BHEL's client.
- 1.12. It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer / BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours.
- 1.13. The actual deployment will of Labour and Engineer/supervision staff shall be so as to satisfy the erection and commissioning targets set by BHEL. If at any time, it is found that the contractor is not in a position to deploy the required engineers/supervisors/workmen due to any reason, BHEL shall have the option to make alternate arrangements at the contractor's risk and cost. The expenditure incurred along with BHEL overheads thereon shall be recovered from the contractor
- 1.14. Contractor shall not deploy women labour at night.



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Chapter – V: Drawings and documents

1. DRAWINGS

- 1.1. On award of work, for complete works, bidders shall arrange site visit and confirm feasibility as per drawings and rating provided by BHEL to the bidder.
- 1.2. The detailed drawings, specifications available with BHEL engineers will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings / documents at work place
- 1.3. Necessary drawings to carry out the erection work will be furnished to the contractor by BHEL on loan, which shall be returned to BHEL Engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents.
- 1.4. The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL Engineer. Contractor shall ensure use of pertinent drawings / data / documents and removal of obsolete ones from work place and returning to BHEL.
- 1.5. The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such project work. The contractors quoted rates shall be inclusive of the above factor
- 1.6. Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor.
- 1.7. Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of BHEL.

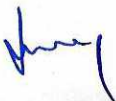
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2. DOCUMENTS

Below mentioned timeframe is an essential condition of contract

The Contractor shall furnish the following documents on Award/Intent and obtain approval

- 2.1. Confirmation of site mobilization date and list of persons to be deputed to site. (to be submitted with 03 days of award of work. (Site to be mobilised within 07days of award of work and civil foundation work to be lined up first).
- 2.2. PERT CHART – listing activities with start & finish date as per contract.
(to be submitted within 07 days of award of work)
- 2.3. General arrangement (location of ACDB, DCDB, Inverter, LT Panel etc.)
(within 07 days from order) – CONSIDERING 03 DAYS FOR SITE VISIT.



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Chapter – VI: Inspection and Quality

1. Inspection, Quality Assurance, Quality Control

- 1.1. Preparation of quality assurance log sheets and protocols with customer/ consultants/statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work/specification. These records shall be submitted to BHEL/customer for approval from time to time.
- 1.2. The protocols between contractor and customer/ BHEL shall be made prior to installation for correctness of foundations, materials, procedures, at each stage of installation, generally as per the requirement of customer/ BHEL. This is necessary to ensure elimination of errors or keeping them within tolerable limits and to avoid accumulation and multiplication of errors.
- 1.3. The protocols between contractor and customer/ BHEL shall be made prior to installation for correctness of foundations, materials, procedures, at each stage of installation, generally as per the requirement of customer/ BHEL. This is necessary to ensure elimination of errors or keeping them within tolerable limits and to avoid accumulation and multiplication of errors.
- 1.4. Contractor shall provide all the Measuring Monitoring Equipments (MMEs) required for completion of the work satisfactorily. These MMEs shall be of brand, quality and accuracy specified by BHEL Engineer and should have necessary calibration and other certificates as per the requirement of BHEL Engineer. Decision of BHEL Engineer regarding acceptance or otherwise of the measuring instruments/gauges/tools for the work under this specification, is final and binding on the contractor. BHEL may give an indicative list of MMEs required for this work and to be made available by the contractor. The list will be reviewed by BHEL and the contractor shall meet any augmentation needed wherever required.
- 1.5. Any re-laying or re-termination of cables/re-erection of instruments/ recalibration of instruments etc. required due to contractor's mistake or design requirement and found at any stage inspection, shall be carried out by the contractor at no extra cost.

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1.6. Total Quality is the watchword of the work and Contractor shall strive to achieve the Quality Standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and Quality Standards.

2. Stage Inspection By FES/QA Engineers

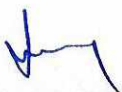
Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of equipments under erection and commissioning at various stages shall also be conducted by teams of Engineers from Field Engineering Services of BHEL's Manufacturing Units, Quality Assurance teams from Field Quality Assurance, Unit/Factory Quality Assurance and Commissioning Engineers from Technical Services etc. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost

3. Statutory Inspection of Work

The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations. The work related statutory inspections, though not limited to, are as under: 1) Inspectorate of Steam Boilers and Smoke Nuisance 2) Electrical Inspector 3) Factory Inspector, Labour Commissioner, PF Commissioner and other authority connected to this project work The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for the pressure parts to be offered for inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority.

4. Field Quality Assurance

4.1. Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) as revised from time to time. Total quality shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide the services of quality assurance engineer as per the relevant clauses



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- 4.2. Contractor has to fulfil quality requirement as per this chapter. In case of any gap in fulfilling these requirements by the contractor, financial penalty shall be imposed on the contractor with the rate mentioned in the "MEMO for penalty imposition against non-compliance in Quality area" enclosed as Annexure-IV.

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Chapter VII: HSE & OHSAS – SAFETY ARRANGEMENT & PRECAUTIONS

1. OCCUPATIONAL HEALTH, SAFETY & ENVIRONMENT MANAGEMENT/ QUALITY ASSURANCE PROGRAMME :

BHEL, Rudrapur has HSE certification (ISO14001& OHSAS18001) and accordingly, Contractor has to organize/ plan/ perform all their activities to meet with the applicable requirements of these standards.

BHEL, Rudrapur is certified for ISO 9001. Quality of work to customer's satisfaction and fulfillment of system requirements are the essence of ISO 9001 certification.

HSE (Health, safety & Environment):

Requirements of BHEL HSE compliance in brief is given below :-

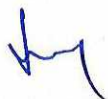
- 1.1. Contractor will nominate only qualified and experienced employees. The site incharge nominated by contractor will be responsible for all HSE related issues of contractor's work area. In case contractor feels that the site incharge needs training regarding the HSE guidelines – he may request in writing to BHEL in this regard. All details shall be explained in detail to the person identified by contractor at BHEL Rudrapur unit.

The Site Incharge will have authority to stop any activity, in case he observes that the activity is not being carried out in safe manner. He will conduct surprise inspection as well as periodic inspection/drill (at least once in a month). He will conduct periodic meetings with different working groups and explain HSE issues and use of PPEs to them. Contractor will develop suitable work procedures based upon HSE guidelines and OCPs and implement it. Such work procedures will consist of Area of work, T&P Details, Work Procedure, PPE requirements etc.

No extra charges shall be payable to contractor towards compliance of the safety requirements as per BHEL HSE guidelines.

- 1.2. Requirement of all personnel protective equipments (PPEs), in adequate numbers shall be assessed by the site incharge and will be made available at site for their regular use by all concerned. This will be ensured by site incharge.

List of such PPEs shall be recorded in the site register and issue records to individuals with signature will be maintained.



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- 1.3. Contractor will provide appropriate First Aid facilities for prompt treatment of injuries and illness at work place. Arranging training to contractor workmen/ employees for giving first aid.
- 1.4. All the following details shall be displayed properly for emergency reference. Information regarding the same shall also be provided to all workmen during HSE briefing.
 - a) Arranging ambulance in case of any emergency situation.
 - b) Identification of nearest hospital for health check-up of workmen/employees.
 - c) Identification of nearest fire station and display contact telephone nos./ person's name around work places for cases of emergencies.
- 1.5. Contractor will make arrangement for proper drinking water at work place.
- 1.6. Contractor will ensure that safety requirements at all power tapping points are fulfilled.
- 1.7. Red & White caution tape of proper width(1.5 to 2 inch) to be used for cordoning unsafe area such as open trench, excavation area etc.
- 1.8. Providing contractors company logo on cloths /uniform/ proper identity cards with photographs, for correct identification of people working at project site.
- 1.9. All scaffolding/ platforms should be made from materials of appropriate quality/grade so that these are safe for use. It should be certified/declared safe for use by an experienced contractor person, before any scaffolding/platform is used. Please refer IS:3696 part 1&2 and 4014 part 1 & 2 for further details.
- 1.10. Ensure that the regulatory requirement of excessive weight limits (to carry/ lift/ move weights beyond prescribed limits) for male and female workers are complied with.
- 1.11. Safety slogan, Safety/ Caution boards, wherever required to be displayed in consultation with BHEL.
- 1.12. Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. Ensure proper cleanliness of work place, housekeeping and waste management (including proper waste disposal) on daily basis.

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1.13. The Contractor is required to provide proper safety net systems (IS-11057) where ever the hazard of fall from height is present. The safety nets shall be fire resistant, duly tested and shall be of ISI Mark and the nets shall be located as per site requirements to arrest or to reduce the consequences of a possible fall of persons working at different heights.

1.14. Different risk areas shall be identified by the site incharge and accordingly, all applicable OCPs (Operational control procedures) will be followed. Based on identified safety risks at site – the contractor may submit request to BHEL in writing for required assistance in making of suitable OCPs in case the same is not available with them. The OCPs are also available in BHEL website in downloadable format. Complete responsibility for identification of risk areas and displaying the OCPs prominently at site, explaining the procedure to each workmen in the area, lies with the contractor.

2. SUBMISSION OF SAFETY PLAN:

The contractor shall take all necessary safety precautions and arrange for appropriate appliances to prevent loss of human lives, injuries, to personnel engaged and damage to property. Before commencing the work, the contractor shall submit a "Safety Plan" to the above authorized BHEL official and obtain approval on the same. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety of men, equipment, materials and environment during execution of the work. Area wise Electrical safety inspection is to be carried out and the report is to be submitted. This will also include an organization structure, role and responsibilities of the concerned key personnel, the safety practices that will be followed, PPEs deployed, plan for handling critical activities and emergencies.

3. During the course of construction, alternation or repairs, scrap with protruding nail, sharp edge etc and all other debris shall be kept clean from working areas, passage, ways and stairs in and around site.
4. Rigging equipment for materials handling shall be inspected prior to use in each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment will be removed from service.



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5. All workmen of the contractor working on construction area shall wear safety shoes, hand gloves, safety helmets and safety belt as applicable.
6. The contractor shall insure his workmen against all accidents and the policy shall be presented to BHEL Engineer on demand. In case of a fatal or disabling injury accident to any person at construction site due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary BHEL shall have the right to impose appropriate financial penalty on contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependence before imposing any such penalty. Appropriate enquiry shall be held by BHEL giving opportunity to the contractor for presenting his case. Above safety conditions are not exhaustive but gives an idea for the contractor and contractor shall adhere to all safety precaution given by the Engineer at site.

The Contractor shall take all measures at the sites of the work to protect all persons from accidents and shall be bound to bear the expenses of defense of every suit, action or other proceeding at law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the Contractor be paid to compromise any claim by any such person should such claim proceeding be filed against BHEL, the Contractor hereby agrees to indemnify BHEL against the same

7. The contractor shall arrange at his cost adequate lighting facilities e.g. flood lighting, hand lamps, area lighting etc. at various levels for safe and proper working operations during night hours at the work spot as well as at the pre-assembly area.
8. The contractor shall be responsible for provision of all the safety notices and safety equipment as enjoined on him by the application of relevant statutory regulation / provisions and/or as called upon by BHEL from time to time. He shall be held responsible for any violation of statutory regulations (local, state or central) and BHEL instruction that may endanger safety of men, equipment and material.
9. The contractor shall provide temporary fencing wherever required as a safety measure against accident and damage to properties. Suitable caution notices shall be displayed where access to any part is found to be unsafe and hazardous.



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10. It will be the responsibility of the contractor to ensure safe lifting of the equipment, taking due precaution to avoid any accident and damage to other equipment and personnel. All requisite tests and inspection of handling equipment, tools & tackle shall be periodically done by the contractor by engaging only the COMPETENT PERSONS as per law. Defective equipment or uncertified shall be removed from service. Any equipment shall not be loaded in excess of its recommended safe working load.
11. The contractor should conduct periodical first –aid classes to keep his supervisor and Engineers properly trained for attending to any emergency.
12. The contractor shall arrange induction safety training for all employees before assigning work. In addition, awareness programme, mock drill at regular intervals and daily tool box meetings shall be arranged.
13. All portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed. Only electricians licensed by appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works. Details of earth resource and their test date to be given to BHEL safety officer as per the prescribed formats of BHEL
14. The contractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical areas.
15. The contractor shall use only properly insulated and armored cables which conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site. BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the cost of the contractor. All electrical appliances used in the work shall be in good working condition and shall be properly earthed. No maintenance work shall be carried out on live equipment. The contractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.
16. Suitable scaffolds shall be provided for workman for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration of work which can be done safely from ladders. When a ladder is used, it shall be of rigid construction made of steel. The steps shall have a minimum width of 45 cm and a maximum rise of 30 cm. Suitable handholds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than ¼ horizontal and 1 vertical.



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17. Scaffolding or staging more than 3.6 m above the ground floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced or otherwise secured, at least 90 cm above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from savor, from swaying, from the building or structure.
18. Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform gangways provided is more than 3.6 m above ground level or floor level, they shall be closely boarded and shall have adequate width which shall not be less than 750 mm and be suitably fenced as described above.
19. Every opening in the floor or a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.
20. Wherever there are open excavation in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.
21. Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m in the length while the width between side rails in rung ladder shall in no case be less than app. 29.2 cm for ladder upto and including 3 m in length. For longer ladders this width shall be increased at least ¼" for each additional foot of length.
22. Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.
23. Electric wiring and other dangerous paPump of hoisting appliances should be provided with efficient safe guards. When workers employed on electrical installations which are already energized, insulting mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductor of electricity.
Hoisting appliance should be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.



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24. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent, place at work spot. The persons responsible for compliance of the safety code shall be named therein by the Contractor
25. Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the contractor. Such cleanings has to be done by contractor within quoted rate, on daily basis by an identified group.

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Chapter VIII: Payment

1. PAYMENTS

Bills shall be raised by Contractor on Quarterly basis only after completion of recording and verification of work measurement as per Chapter-7 (Page 17-18) of GCC attached in this NIT. Any bill without Verified Measurement Sheet and duly filled and signed Format WAM6/WAM7 shall not be entertained by BHEL. Payments to Contractors shall be made as follows:

1.1. Running Account Bills (RA Bills)

- a) These are for interim payments when the contract is in progress. The bills for such interim payments are to be prepared by Contractor in prescribed formats (RA Bill forms – WAM6).
- b) Payments shall be made according to the extent of work done as per measurements taken up to the end of the calendar month and in line with the terms of payments described in the Tender documents.
- c) The payment for running bills will normally be released within 45 days of submission of execution of work subject to acceptance and submission of running bill complete in all respects with all supporting documents like verified measurement sheet and format WAM6. It is the responsibility of the contractor to make his own arrangements for making timely payments towards labour wages, statutory payments, outstanding dues etc and other dues in the meanwhile. Following documents shall be submitted by bidder:
 - Invoice - 01 original for buyer + 03 extra.
 - Duly filled and stamped RA bill format WAM 6.
 - Monthly Operation & Maintenance report duly signed and stamped.
 - List of all tools and tackles with calibration certificates.
 - Details of payment of PF and ESI of labours.
 - Copy of Maintenance Register for the period duly signed by authorized representative of user. This will be treated as verified measurement for processing of bills.
 - In case of any discrepancy in material supplied or service rendered or work executed by contractor, BHEL shall indicate the discrepancy, and payment shall be made within 45 days from the day of removal of such discrepancy.
 - Recoveries on account of electricity, water, Liquidated Damages, all applicable statutory deductions like TDS under Income Tax, GST TDS etc. shall be made as per terms of contract.
- d) Full rates for the work done shall be allowed only if the quantum of work has been done as per the specifications stipulated in the contract. If the work is not executed as per the

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stipulated specifications, BHEL may ask the contractor to re do the work according to the required specifications, without any extra cost. However, where this is not considered necessary 'OR' where the part work is done due to factors like non-availability of material to be supplied by BHEL 'OR' non availability of fronts 'OR' non availability of drawings, fraction payment against full rate, as is considered reasonable, may be allowed with due regard for the work remaining to be done. BHEL decision in this regard will be final and binding on the contractor.

- e) All preconditions noted in the NIT for release of payment shall be necessarily complied with by the contractor while submitting the claim for payment.

1.2. Final Bill

Final Bill' is used for final payment on closing of Running Account for works or for single payment after completion of works. 'Final Bill' shall be submitted as per prescribed format WAM7 after completion of works as per scope and upon material reconciliation, along with the following.

- Duly Filled and verified Final Bill Format WAM7
- 'No Claim Certificate' by contractor
- Clearance certificates wherever applicable viz Clearance Certificates from Customer, various Statutory Authorities like Labour department, PF Authorities, Commercial Tax Department, etc

BHEL shall settle the final bills after deducting all liabilities of Contractor to BHEL.

Refund of Retention Amount shall be along with 'Final Bill'. No interest shall be applicable on retention amount.

- 1.3. BHEL shall release payment through Electronic Fund Transfer (EFT)/RTGS. In order to implement this system, Contractor to furnish details pertaining to his Bank Accounts where proceeds will be transferred through BHEL's banker, as per prescribed formats.



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Chapter IX: PRICE VARIATION COMPENSATION

PRICE VARIATION COMPENSATION

1.1. This clause shall NOT be applicable for normal duration of contract as specified in the Special Conditions of Contract.

1.2. This clause shall be applicable ONLY WHEN the duration of contract has exceeded the Specified delivery period due to reasons that are NOT attributable to the contractor.

The price variation clause shall be as under:

- a) Price Variation: In order to take care of variation in the cost of execution of work, on either side, due to variation in the index of labour in the work, the following price variation formula shall be applicable.
- b) 50% Component of Contract Value shall be permitted to be adjusted for variation in various relevant Indices during execution of work. The remaining 50% shall be treated as fixed component.
- c) The Basis for calculation of price variation under each category, their component, base index/price and base date of accounting of index/price shall be as under :-

1	2	3	4	5
Sl. No.	Category	Component(k)	Base index/price	Base date
A)	Labour of all Categories	50%	Consumer price Index for industrial workers(general),applicable to "All India" as published by labour bureau,shimla	Base date shall be calendar month previous to the month of price bid opening.

- d) Payment/recovery due to variation in the index/prices shall be determines on the basis of the following notional formula without any initial absorption, in respect of the identified components viz. Labour.

$$A = K \times R \times \frac{(X_n - X_o)}{X_o}$$

Where

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A = Amount to be paid/recovered due to variation in the index for labour prices.

K = Percentage component of labour as indicated in column no.3 above.

R = Value of work done for the billing month

Xn = Revised index number for labour on the date subsequent to the base date as indicated in the column no.5 of the above table (i.e. for the work bill month under consideration)

Xo = Index no. for labour as on the base date indicated in the column no.5 of the above table

- e) PVC shall not be payable for Supplementary/Additional Items, Extra works.
- f) The Contractor shall produce necessary "monthly bulletins" issued by Labour Bureau, Shimla and RBI bulletins for all commodities for application of price variation as required in the national formula mentioned above.
- g) The contractor will be required to raise the bills for price variation along with the running bills raised as Per the terms of payment clause mentioned in Condition of contract of floated tender Irrespective of the fact whether any increase/decrease in the consumer price index for labour. In case if there is delay in publication of bulletins (final figure), the provisional value as published can be considered for payment/recovery on account of variation and the arrears shall be paid / recovered on getting the final values.
- h) A site register is to be maintained for capturing the start and end of erection, testing and commissioning Work dates as per the availability of fronts at site. This register will be maintained by contractor. Photocopy of the register of concerned pages is Required to be attached with the PVC bills.
- i) PVC shall be applicable for the entire original contract period plus the extended period. However the Total Quantum of Price Variation amount payable/recoverable shall be regulated as follows:
 - For the portion of backlog attributable to the contractor, the PVC will not be applicable.
 - For the period of Force Majeure, the PVC will be limited to the indices applicable at the beginning of the force majeure period.
 - For the portion of backlog attributable to BHEL, the PVC will be as per the indices applicable for the respective months.
 - The total amount of PVC shall not exceed 20% of the cumulatively executed contract value. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/ Additional Items and Extra works.



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- j) The above PVC will be applicable only for the duration of erection, testing and commissioning activities of Solar Rooftop System & its accessories in each unit of a power project. PVC will not be payable for attending punch points/completion of facilities/contract closure period involving minor works during the applicable period.

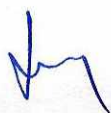


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Chapter X: Performance Monitoring

1. Performance Monitoring

- 1.1. Performance of the contractor is monitored through various reports/reviews and shall be jointly evaluated every month for unit wise identified packages as per prescribed formats. Based on the net weighted scores obtained, Contractors shall be rated 'Good' or 'Satisfactory' or 'Unsatisfactory'
- 1.2. In case of any dispute on performance rating and the contractor refuses to sign on the performance rating given by BHEL package Incharge, the same shall be reviewed by BHEL site Incharge/Construction Manager and his decision shall be final.
- 1.3. Performance of the contractor will be taken into consideration for assessing the capacity of the bidder to execute future jobs under tender, as detailed in the Notice Inviting Tender.
- 1.4. In case of 'Unsatisfactory performance' for a continuous period of three or more months for a package or packages, BHEL has the right to get the balance works executed at the risk and cost of the contractor.
- 1.5. In case of 'Unsatisfactory performance' in a financial year, BHEL reserves the right to put on hold such Contractors for a period of six months for similar package or similar packages



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Chapter XI: Performance Guarantee

1. PERFORMANCE GUARANTEE FOR WORKMANSHIP

1.1. The Contractor will be responsible for the quality of the workmanship of the work undertaken and shall ensure that the systems are in proper working condition for the period of Maintenance Contract as defined in the Conditions of Contract, for good workmanship. In the event of the Contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the Contractor's risk and cost, without prejudice to any other rights and recover the same from the Guarantee money.

1.2. BHEL shall release the Security Deposit subject to the following

- Contractor has submitted 'Final Bill'
- Maintenance period as per contract has expired
- Contractor has furnished 'No Claim Certificate' in specified format
- Contractor has carried out the works required to be carried out by him during the period of Maintenance and all expenses incurred by BHEL on carrying out such works is included for adjustment from the Guarantee money refundable.



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Chapter XII: Make List

SL. No.	Description	Make
1	SPV module	BHEL
2	String inverter	Delta Electronics / KACO / SMA / SAMIL Power / ABB / Ingeteam / Sungrow
3	Accessories/PV Module Connectors	Phoenix Contact / Entrlec / Tyco Solarlok / Huber + Suhner
4	Array Junction Boxes	Hensel / Spelsberg / TTPL / Phoenix Mecanno / Havells / Onexis
5	Surge Protection Device	Phoenix Contact / Schneider / DEHN / JMV / Citel / Havells
6	DC Cables	Havells / Polycab / LAPP / Finolex / RR Kabel / Apar
7	LT Cables PVC / XLPE Insulated	Havells / RR Kabel / Polycab / Finolex / Elektron / Apar
8	Cable Terminations & Joints	Raychem / Mahindra / M-seal / Cabseal
9	DCW-HDPE Pipes	Rex Ployextrusion / ISI marked
10	HDPE Pipes—6 Kg pressure	Finolex / Supreme / AKG or reputed
11	Cable Tray / Under Floor Channels / Trunking Channels	Indeana / AKG / Maheshwari Electricals / Indiatech / KME or reputed
12	MCB / ELCB / Double Door Distribution Board Type-B, Type-C	Legrand / Schneider / L&T / Hager / C&S / Havells / ABB
13	Steel Structure	TATA / Jindal / SAIL / Vizag
14	Lighting Arrestor	SABO / JMV / or reputed make

