PQD

Expression of Interest [EOI] Document for Pre-Qualification of Supply and Services Companies/ Firms/ AoPs/ Sole Proprietors/ Joint Venture(s) of Solar Systems to Operate High Efficiency Irrigation Systems (HEISs)

Under ADP-Funded Project

"Transformation of Agriculture in Thal"

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DISCLAIMER

This Expression of Interest (EOI) Document is provided to the recipient solely for use in preparing and submitting applications for pre-qualification of Supply and Services Companies/ Firms/ AoPs/ Sole Proprietors/ Joint Venture(s) for installation of Solar Systems to operate High efficiency Irrigation Systems (HEISs) under the ADP-funded Project titled **"Transformation of Agriculture in Thal"** and to carry out the Assignment as further detailed in this EOI Document. This EOI Document is being issued by the Director General Agriculture (Water Management) Punjab, Lahore (hereinafter referred as the "Agriculture Department" where relevant the term includes its employees, personnel, affiliated entities, consultants, advisors, agents and contractors etc.), solely for the use of the Applicant(s) interested in the Assignments enumerated hereunder. Unless expressly specified otherwise, all capitalized terms used herein shall bear the meaning as ascribed in this EOI Document.

This EOI is not an agreement and is neither an offer nor invitation by the Agriculture Department to the prospective Applicant(s) or any other person. The purpose of this EOI is to provide interested parties with information that may be useful to them in the formulation of their application for qualification pursuant to this EOI (the "Application"). This EOI includes statements, which reflect various assumptions and assessments arrived at by the Agriculture Department in relation to the said Project. Such assumptions, assessments and statements do not purport to contain all the information that each Applicant(s) may require. This EOI may not be appropriate for all persons, and it is not possible for the Agriculture Department, its employees or advisors to consider the investment objectives, financial situation and particular needs of each party who reads or uses this EOI. The assumptions, assessments, statements and information contained in this EOI may not be complete, accurate, adequate or correct. Each Applicant should therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this EOI and obtain independent advice from appropriate sources.

Information provided in this EOI to the Applicant(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Agriculture Department accepts no responsibility of the accuracy or otherwise for any interpretation or opinion on law expressed herein.

The evaluation criteria have been laid down for the purpose of short-listing of the Applicant(s). The Agriculture Department or its affiliated entities including its consultants, advisors, employees, personnel, agents, make no representation or warranty and shall have no liability to any person, including any Applicant, under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this EOI or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the EOI or in any other Document made available to a person in connection with the tendering process for the Assignment(s) or for any other written or oral communication transmitted to the recipient in the course of the recipient's evaluation and any assessment, assumption, statement or information contained therein or deemed to form part of this EOI or arising in any way with pre-qualification of Applicant(s) for participation in the further process.

The EOI submitted by any Applicant shall be upon the full understanding and agreement of any and all terms of this EOI Document and such submission shall be deemed as an acceptance to all the terms and conditions stated in this EOI Document. Any EOI submitted by any Applicant shall be construed based on the understanding that the Applicant has done a complete and careful examination of this EOI Document and has independently verified all the information received from the Agriculture Department.

This EOI Document shall neither constitute a solicitation to invest, or otherwise participate, in the Assignment, nor shall it constitute a guarantee or commitment of any manner on the part of The Agriculture Department that the Assignment will be awarded. The Agriculture Department reserves its right, in its full discretion, to modify the EOI Document and/or the Assignment at any stage during the process to the fullest extent permitted by law, and shall not be liable to reimburse or compensate the applicant for any costs, taxes, expenses or damages incurred by the Applicant in such an event. Similarly, the Agriculture Department reserves the right, in its full discretion, to cancel the EOI Document and/or Assignment at any stage of the procurement process and shall not be liable to reimburse or compensate the Applicant for any costs, taxes, expenses or damages incurred by the Applicant(s) in such an event.

SECTION-I

INTRODUCTION

DEFINITIONS

In this document, the following terms shall be interpreted as defined bellow:

Procuring Agency:	Water Management Wing of the Agriculture Department, Government of the Punjab, Lahore.
Applicant:	Means any Firm/ AoP/ Sole Proprietor/ Supply Company/ Joint Venture that is eligible, has the expertise and ability to undertake the Assignment as per the requirements of this PQD Document and has not been blacklisted/ debarred by any public sector organization or department anywhere.
Assignment/Scope of Work:	Means the work to be undertaken and services to be provided by the Applicant in accordance with this PQD Document upon being selected as a successful applicant after the pre-qualification process, to be conducted post-shortlisting.
Due Date:	The date mentioned in advertisement as deadline for submission of EOI application.
EOI:	Expression of Interest to be submitted by the Applicants through **Punjab e-Procurement System (eP) only** containing the information as set out and required under this PQD Document.
Power of Attorney:	The Power of Attorney to be provided by the Applicant(s) in the form appended to this PQD Document.
RFP:	Request for Proposals
Signatory of Application:	Means the Applicant or any person duly authorized by the Applicant through Power of Attorney placed at **Annexure-III** to sign the application for EOI on his behalf.

1. PROJECT BRIEF

The project titled “Transformation of Agriculture in Thal” has been approved by the PDWP at a total cost of PKR 7,986.385 million for its implementation for three years (2026-27 to 2028-29) in Thal region including Bhakkar, Layyah, Mianwali, Jhang, Muzaffargarh and Kot Addu districts. The project is completely in line with the Punjab Government’s overall policy of agricultural transformation, water conservation, crop diversification, rural development, private sector engagement, and job creation in rural areas.

2. OBJECTIVES

The key objective of the proposed project is “to bring uncultivated area under irrigated agriculture through land and water resources development and promotion of high value agriculture in Thal”.

The main objectives of the project are given hereunder:

i) To enhance agricultural productivity in the Thal region through modern farming techniques, and promotion of high-value crops suited to arid conditions.

ii) To improve water availability and efficiency through adoption of efficient irrigation technologies.

iii) To increase gram productivity in the Thal region through provision of subsidized farm machinery and improved cultivation practices.

iv) To enhance farmers' income and livelihoods through diversification into high-value agriculture, value addition, and improved market linkages.

3. KEY COMPONENTS (Water Management Wing)

The project envisages:

i) Development of 500 Irrigation Schemes

ii) Installation of Solar Coupled Drip Irrigation Systems on 10,000 acres

iii) Installation of Solar Powered Sprinkler Irrigation Systems on 1,000 acres

iv) Construction of 500 Water Storage Ponds

v) Provision of Citrus/ Lemon Plants on 10,000 acres

4. SCOPE OF WORK FOR HEISs

The project envisages installation of HEIS on **11,000 acres** in Thal region i.e., **Solar coupled Drip Irrigation Systems on 10,000 acres and Solar Powered Sprinkler Irrigation Systems on 1,000 acres**.

5. PROJECT LOCATION

The project will be implemented in Thal region including Bhakkar, Layyah, Mianwali, Jhang, Muzaffargarh and Kot Addu districts.

6. GESTATION PERIOD

Three years (2026-27 to 2028-29)

7. IMPLEMENTATION MODALITIES

The modernization of farm operations has taken place in every agricultural operation all over the World, and Pakistan can remain no exception. The farmers are using traditional irrigation practices for so many years due to non-availability of modern irrigation technologies, lack of knowledge, and necessary services. Drip, bubbler, sprinkler, impact sprinkler, portable/semi-portable sprinklers, rain-gun, center pivot etc. are together called as high efficiency irrigation systems (HEISs) are reformatory technologies introduced in Punjab at farmers' fields to bring a paradigm shift in crop production. In drip or trickle irrigation, water is provided directly to individual plants by means of small emitters in the form of droplets. Similarly, bubbler irrigation is very similar to trickle irrigation except that the water is delivered to the plants through a

bubbler mounted on small spikes. In rain-gun irrigation systems, water is pumped at high pressure through a piped system and sprayed over the entire cultivated field.

7.1 Drip Irrigation System

Among all high efficiency irrigation systems, drip irrigation (also called as trickle/micro irrigation) is the most efficient technology that makes highly effective use of water, fertilizers, and nutrients. Its main principle is to apply water and other inputs slowly, regularly, and frequently as close to the plant roots as possible according to plants requirement through emitters installed on plastic pipes laid out in the field. Regular and timely availability of nutrients throughout the plant growth period as per exact requirements and maintenance of favorable soil moisture conditions to maximize crop productivity. It enables right air, water, and nutrients mix in the plant root zone. Drip irrigation technology is best suited for orchards and high value row crops such as cotton, maize, sugarcane, vegetables, etc. It has become the most valued innovation, which optimizes use of water and fertilizers by enhancing irrigation efficiency as much as 95% as compared to other irrigation methods.

7.2 Sprinkler Irrigation System

The sprinkler system is the overhead irrigation whereby water is sprayed on the soil/crop somewhat like rain. A typical sprinkling unit comprises of an electric or diesel pumping unit, a portable or buried main pipeline with hydrants at predetermined intervals, and one or more sprinkler units attached to hydrants or hoses. Sprinkler systems are classified into various types on the basis of their spray pattern and mobility/portability (a) Raingun (b) Reel System.

7.3 Implementation Procedure for Installation of Solar Systems for Operating HEISs

i. The eligible applicants will be advised to approach the pre-qualified SSC of solar systems of their own choice for survey, design, and cost estimation for the solar system for operating drip/ sprinkler irrigation system;
ii. The concerned DDA (OFWM)/Consultants shall ensure that the drip/ sprinkler irrigation system has already been installed, or is under installation, or has been properly designed for operation through the proposed solar system before processing the case for installation of the solar system;
iii. The selected SSC will survey the site, prepare design, bill of quantity (BOQ), and cost estimates as per approved standards & specifications and the rates approved by the Pre-Qualification Committee (PQC) or any other designated

committee under other OFWM development projects. The same will be offered to the concerned DDA (OFWM/ Project Consultants for review and approval;

iv. The farmer, after approval of design & cost estimates, will be advised by the concerned DDA (OFWM) to deposit his/her entire share in the form of pay order/bank draft in favour of selected SSC/ in-kind material and afterwards, DGA(WM) Punjab/ DDA (OFWM) will issue the work order;

v. The concerned SSC will be bound to deliver the solar equipment alongwith other accessories as per BOQs at site within the prescribed timeframe mentioned in the Tri-partite Agreement or work order. Late delivery charges will be imposed on SSCs for the delay in delivery of equipment or installation of site. The SSC may, however, request for an extension in solar installation period based on sound justification and farmer readiness. The DGA(WM) Punjab/ DDA (OFWM) would be competent/ authorized to accord extension in the material dispatch/ completion period;

vi. The delivered equipment will be inspected against approved specifications & BOQs by the project consultants as third-party validation;

vii. After inspection of the delivered equipment and confirmation/ inspection by the Consultants' Field Engineer that the solar equipment/ material has been shifted to the site, 50% of the total system cost will be paid by DGA(WM) Punjab/ DDA (OFWM) as 1st instalment on recommendation by concerned DDA/ ADA (OFWM);

viii. The SSCs will complete the installation of solar system within prescribed time period mentioned in the work order after delivery/inspection of equipment. The installed system will be verified by the Consultants for its performance as per approved design and specifications;

ix. The Consultants will ensure that coupling of solar system with drip/ sprinkler irrigation system is according to the approved design, guidelines, compatibility, and successful in operation of the drip/ sprinkler system;

x. The performance of installed solar system will be evaluated in terms of design and operation, etc. and solar system will be handed over by the SSC to the beneficiary farmers in the presence of the Consultants and departmental representatives. At the time of commissioning/ handing over the system, the SSCs would ensure that;

    a) farmer has been trained in operation & maintenance of the solar system;
    b) logbook has been provided to the farmer;

c) O&M manual in Urdu has been provided to the farmer; and

d) Warranty card of the equipment has been handed over to the farmer.

xi. On the recommendation of the Consultants, DGA(WM) Punjab/ DDA (OFWM), will make 45% payment to the SSC on commissioning/ handing over of the solar system to farmer (2nd instalment) by keeping 5% as retention money/ performance guaranty, which will be released after two years on provision of satisfactory post-installation services for successful system operation;

xii. The SSCs will be bound to provide the post-installation services for at least two years;

xiii. The DGA(WM) Punjab/ DDA (OFWM) concerned will pay remaining 5% cost (3rd instalment) or against the Bank guarantee of equal amount, which will be released after two years on provision of satisfactory follow up support services by the SSCs during two years, which will be verified by the concerned DDA (OFWM) and the Consultants or any other designated committee for the purpose.

xiv. If deemed necessary, the PSC may make necessary modifications in implementation arrangements of this component for smooth execution.

8. Cost Sharing

It is planned to demonstrate solar-coupled High Efficiency Irrigation Systems (HEIS) in the project area to promote the cultivation of high-value crops, including orchards, vegetables, and other cash crops, based on site-specific requirements. Keeping in view the socio-economic conditions and financial capacity of the farming community, a 70:30 cost-sharing mechanism will be adopted, whereby the government will provide 70% of the total system cost, while the farmer will contribute the remaining 30%. This cost-sharing mechanism will apply to both components of the system, i.e., the drip irrigation system and the solar system.

9. Expression of Interest for Prequalification of Supply and Services company for the installation of Solar Systems for Operating HEISs:

i. Firm/ AoP/ Sole Proprietor/ Supply Company/ Join Venture has a registered office in Punjab/ Pakistan and a dedicated website for the purpose.

ii. Registration of Firm/ AoP/ Sole Proprietor/ Supply Company/ Join Venture as a legal entity with relevant authority/ forum (Registrar of firms, SECP, etc.)

iii. Enlistment/ registration in the name of Firm/ AoP/ Supply Company/ Sole Proprietor/ Join Venture as supplier/manufacturer/ importer with concerned agencies (Valid/ active NTN, STN, PRA registration or enlistment certificate).

iv. Must not be involved in any type of Tax Evasion (Income Tax & GST Returns of the last three years must be provided).

v. Must be in business for the last three years with a minimum average turnover of Rs. 25 million per year.

vi. Must have experience of completing similar assignments on at least 150 acres of Solar Powered HEISs during the last three (03) years by the date of EOI closing, with an average of 50 acres/ year. (Attach list of projects with location, type of system installed and cost incurred and furnish any additional documents to support relevant experience of firm(s).

vii. Must have available inventory of Solar equipment (panels) of at least 50 KW as per standards & specifications approved by the Punjab Agriculture Department to install the solar systems for operating HEISs.

viii. Willing to hire a mix of professional staff including minimum two Electrical Engineers, two Agricultural Engineers and five Solar Technicians (Affidavit will be submitted).

ix. Must agree to supply a compatible complete unit including PV panels and essential accessories and complete specifications of PV panels and required accessories along with origin certificate of equipment, brochure, etc.

x. Must provide an affidavit confirming that: (a) Firm/ AoP/ Sole Proprietor/ Supply Company/ Join Venture have never been blacklisted by any government local or foreign department (if ever blacklisted, then provide the case history and current status of the firm regarding this decision; (b) All the information provided by the applicant firm is correct; (c) the firm will provide compatible Solar equipment as per approved standards & specifications along with import documents; (d) the Firm/ AoP/ Sole Proprietor/ Supply Company/ JV will deploy staff as per project requirements/ directions of the Client and avail relevant staff for mandatory training organized by Agriculture Department on standards and procedures within three months of the pre-qualification and before getting any contract. The pre-qualification will be nullified in case of non-compliance.

xi. The Firm/ AoP/ Sole Proprietor/ Supply Company/ JV undertake to performing Performance Assessment Tests for commissioning of the solar equipment/ system provided/ installed. The test will be performed by the SSC under the oversight of the consultants/project team and of the beneficiary as per departmental standards/requirements.

xii. The Firm/ AoP/ Sole Proprietor/ Supply Company/ JV will undertake to comply with the Environmental and Social Management Framework (ESMF) of the project available at https://ofwm.agripunjab.gov.pk/system/files/priat ESMF.pdf.

xiii. EOI security amounting to Rs. 500,000/- (refundable) in the form of CDR/ Demand Draft.

xiv. In case of incomplete information/ non-verification of information, application will be rejected.

xv. Interested supply Firms/ AoPs/ Sole Proprietors/ Supply Companies registered on Punjab e-Procurement System (eP) meeting the above mentioned criteria mentioned in Pre-Qualification Document (PQD) as a prerequisite may download the PQD from websites https://ofwm-agripunjab.punjab.gov.pk/, www.ppra.punjab.gov.pk and Punjab e-Procurement System (eP) portal https://ep.punjab.gov.pk/auth/login free of cost.

xvi. The Expression of Interest, prepared in accordance with instructions in the Prequalification Document (PQD), must be submitted through Punjab e-Procurement System (eP) only on or before 16-11-2026 at 03:00 PM. EOIs received later than the specified time and date shall not be entertained for any reason(s) whatsoever.

xvii. The EOIs will be publicly opened by the Pre-qualification Committee (PQC) in the Committee Room of Agriculture Department, 2nd Floor, New P&D Tower, 2 - Bank Road, Lahore on the same date at 03:30 PM online through the Punjab e-Procurement System (eP).

xviii. Firms/ AoPs/ Sole Proprietors/ Supply Companies already prequalified with Water Management wing of the Agriculture Department must need to apply afresh for prequalification under this project.

Applicants supply Firms/ AoPs/ Sole Proprietors/ Supply Companies/ JV(s) registered on Punjab e-Procurement System (eP) are requested to provide only relevant and complete information specific to the proposed assignment and avoid submitting generic promotional literature. Any misinformation, false and forged statements will lead to disqualification and any other action as per applicable laws. The department reserves the right to withdraw this EoI at any time and interested Firms/ AoPs/ Sole Proprietors/ Supply Companies/ JV(s) are responsible for all costs incurred arising from or in relation to this request.

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SECTION-II

INSTRUCTIONS TO APPLICANTS

Instructions to applicant

Fraud & Corruption

i. The prequalification agency requires that the applicant observes the highest standard of ethics in relation to submission of EOI for short listing and further document required thereafter.
ii. The prequalification agency will reject the proposal for short listing if it determines that the applicant has directly through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question and will declare the applicant ineligible, either indefinitely or for a stated period of time.
iii. Any misinformation, forged/ fake documents/ statements etc. will lead to disqualification at short listing stage in addition to any other action as per law.

Eligibility

Undertaking on judicial paper that the firm/ company is not insolvent, not blacklisted and not involved in litigation or arbitration with any provisional or federal Government Department in Pakistan, any agency of United Nations, world Bank, Asian Development Bank etc. In case the Firm/ Company were involved in any litigation or arbitration process, proof of dispute resolution along with history for last three years in accordance with **Annexure-I** would be required.

The Applicant or any of its Members firm, declared Insolvent/ blacklisted/ declared by any public sector organization or department in Pakistan shall be ineligible for short listing.

Language

Language of EOI and subsequent document of all processes and correspondence shall be English.

EOI Advertisement

The EOI advertisement shall form an integral part of the EOI document.

Clarification in relation to EOI Document

i. An applicant requiring any clarification in relation to the EOI document shall contact the prequalification agency in writing at the address indicated in this EOI document.
ii. The prequalification agency will respond in writing to any request for clarification provided that such request is received no later than five (05) days prior to the deadline / due date for submission of EOI.

Amendments in EOI documents

i. At any time prior to the deadline for submission of EOI, the prequalification agency may amend the EOI document by issuing an addendum.
ii. Any addendum issued shall be part of EOI document
iii. To give applicant reasonable time to take an addendum into account in preparing their applications, the prequalification agency may, at its discretion, extend the deadline for the submission of applications.
iv. No objection shall be entertained regarding the terms & conditions of EOI document after deadline for submission of EOI.

Change in information provided to Pre-qualification agency

The Applicant shall immediately report to the Pre-Qualification Agency in writing any change in the information provided in its EOI. The determination of whether the change is material shall be in Pre-Qualification Agency's sole and exclusive discretion and any material change could also lead to disqualification of such Applicant. Any failure to report change by the Applicant shall constitute grounds for disqualification.

Cost of Application

i. The Applicant shall bear all costs associated with the preparation and submission of EOI. The Pre-Qualification Agency will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the short-listing process.
ii. The Pre-Qualification Agency will not be responsible for any costs or expenses incurred by the Applicant in connection with visits to any office or site for the preparation or delivery of proposals.
iii. The Pre-Qualification Agency shall be under no obligation to return any EOI or supporting materials submitted by the Applicant.

Documents Establishing the Eligibility of Applicant

To establish its eligibility, the Applicants shall fulfil all eligibility requirements set out in this document supported by verifiable documentary evidences. Applications without complete supporting documentary evidence, as required under this EOI, shall be considered non-responsive and shall be rejected.

Documents Establishing the Qualifications of Applicant

To establish its qualifications, the Applicant shall provide the information requested in the corresponding sheets, evaluation criteria etc. in the form of verifiable documentary evidence.

Signing the Applicant

1. The Applicant shall prepare and submit the EOI as described in this document. The EOI shall be signed by a person duly authorized on behalf of the Applicant through Power of Attorney.
2. Original written Power of Attorney authorizing the signatory of the Application to act for and on behalf of the Applicant shall be attached with the application according to the Annexure-III.
3. Every page and every form of EOI shall be signed and stamped by the Signatory of the Application.

Sealing and Identification of application

The Applicant shall enclose ONE Original and ONE COPY of its EOI in a sealed envelope that shall:

i. Bear the name and address of the Applicant.

ii. Be addressed to the Director General Agriculture (WM) Punjab, Lahore for "Transformation of Agriculture in Thal", Installation of HEIS. Agriculture House, 1st Floor, 21-Davis Road, Lahore. Pakistan.
iii. Bear the specific identification of this short-listing process indicated in the EOI Document and shall be clearly marked.
iv. Each EOI shall be in English language accompanied by all the supporting documents in same language.
v. If any original supporting document is not in English, a certified translation of the same in English shall be provided by the Applicant.
vi. Applicants are also required to state, in their proposals, the name, title, phone & fax numbers, e-mails, and addresses of their Primary Contact and Secondary Contact, through whom all communications shall be directed until the procurement process has been completed or terminated.
vii. The Pre-Qualification Agency will accept no responsibility for not processing any envelope that was not identified as required.

Opening of Application

The Pre-Qualification Agency shall open (all) application(s) on the time & date indicated in EOI advertisement.

Confidentiality

Information relating to the evaluation of Applications, and recommendation for short-listing, shall not be disclosed to the Applicants or any other person not officially concerned with such process until the notification of short-listing is made to all Applicants.

Clarification of Applicants

i. To assist in the evaluation of applications, The Pre-Qualification Agency may, at its discretion, ask any Applicant for a clarification of its application which shall be submitted within a stated reasonable period of time.
ii. Any request for clarification and all clarifications shall be in writing.
iii. If an Applicant does not provide clarifications of the information requested by the deadline, the application shall be evaluated based on the information and documents available at the time of evaluation of the application. Failing to provide requisite information may lead to rejection / disqualification of application.

Responsiveness of Applicant

All applications not responsive to the requirements of the EOI Documents shall be rejected.

Notification of Short-Listing

The purpose of this EOI Document / Advertisement is to pre-qualify firms. The Pre-Qualification Agency shall promptly notify each Applicant about its short listing or otherwise after completing the process / procedure of short-listing.

Interpretation & Final Determination

The interpretation and final determination of any matter relating to the EOI Document, all enclosed documents, sections, compliance documents etc. as well as any additional or supplementary information required by the Pre-Qualification Agency will be at Pre-Qualification Agency's sole discretion which shall be final and binding on the Applicants.

Use of Information

Permission for disclosure of information submitted by an Applicant as part of the EOI would not be required by the Pre-Qualification Agency, its governing bodies/departments, its consultants, advisors and personnel for the purpose of evaluation of application and short-listing.

Conflict of Interest

The Pre-Qualification Agency may confirm the status of the Applicant for the sake of conflict of interest before completion of the short-listing process. For this purpose, the Applicant shall be required to provide this information in specific terms and any misrepresentation shall be made a ground for rejection. Applicants shall note that in case of their selection, any such links, if detected during the course of their contract, would be reported by the Pre-Qualification Agency to PPRA / other relevant authority for cancellation of its registration/license leading to their blacklisting.

Governing

The governing laws for the scheme and the contract thereto shall be laws of Pakistan (where Federal laws are applicable) and laws of Punjab (where provincial laws are applicable). The Rules may be downloaded from the Punjab Procurement Regulatory Authority ("PPRA") website www.ppra.punjab.gov.pk Moreover, the entire EOI Document shall be construed in the light of these Rules.

SECTION-III

EVALUATION CRITERIA FOR SELECTION / PREQUALIFICATION OF FIRMS/ AOPs/ SOLE PROPRIETORS/ SUPPLY COMPANIES/ JV(s) FOR SUPPLY AND SERVICES OF SOLAR SYSTEMS TO OPERATE HEISs FOR FARMERS

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
1.	Firm/ AoP/ Sole Proprietor/ Supply Company/ JV has a registered office in Punjab/ Pakistan and a dedicated website for the purpose	Rental Deed Agreement / Fard Malkiyat and Website Link/ Address.	
2.	Registration of Firm/ AoP/ Sole Proprietor/ Supply Company/JV as a legal entity with relevant authority/ forum as applicable (Registrar of firms, SECP, etc.).	**For Companies:** i. Copies of certificate of registration with SECP, ii. Form 28 and 29 for companies **For Firms/AoPs:** i. Certificate of registration with Registrar of firms/ Form C **For Sole proprietors:** i. Evidence of registration with FBR **Note:** In case of JV, above mentioned documents for each JV partner (i.e. company/firm/Sole proprietor) will be provided. JV agreement would require to be registered with FBR/Registrar of Firm/SECP/Relevant Legal forum and must be submitted with EOI.	
3.	Enlistment/ registration in the name of Firm/ AoP/ Supply Company/ Sole Proprietor/ JV as supplier/ manufacturer/ importer with concerned agencies (Valid/ active NTN, STN, PRA registration or enlistment certificate).	Valid/ active NTN, STN, PRA registration in the name of Firm/ AoP/ Sole Proprietor/ Supply Company/ JV. **Note:** In case of JV, above	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
		mentioned documents for each JV partner (i.e. company/firm/Sole proprietor) will be provided.	
4.	Must not be involved in any type of Tax Evasion (Income Tax & GST Returns of the last three years must be provided).	Complete Returns of Income Tax (last 3 Years) & GST for the last 03 years (36 Months) (F.Y. 2022-23, 2023-24 & 2024-25)	
5.	Must be in business for the last three years with a minimum average turnover of Rs. 25 Million per year.	Annual Turnover reports of last three years (F.Y. 2022-23, 2023-24 & 2024-25)	
6.	Must have experience of completing similar assignments on at least 150 acres of Solar Powered HEISs during the last three (03) years by the date of EOI closing, with an average of 50 acres/ year.	• List of completed projects with client name, address, Location (Latitude; Longitude), system type, size/ scope, cost, period, year of installation components, and share/role, workorder/ contracts etc (specimen attached) • Any additional documents to support relevant experience.	
7.	Must have available inventory of Solar equipment (panels) of at least 50 KW as per standards & specifications approved by the Punjab Agriculture Department to install the solar systems for operating HEISs.	Physical Verification/Proof/ Documents with pictorial evidence.	
8.	Willing to hire a mix of professional staff including minimum two Electrical Engineers, two Agricultural	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
	Engineers and five Solar Technicians.	Proprietor/ Supply Company/ JV	
9.	Must agree to supply a compatible complete unit including PV panels and essential accessories and complete specifications of PV panels and required accessories along with origin certificate of equipment, brochure, etc.	• Brochures having Specifications. • Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	
10.	Must provide an affidavit confirming that: (a) Firm/ AoP/ Sole Proprietor/ Supply Company/ JV have never been blacklisted by any government local or foreign department. (if ever blacklisted, then provide the case history and current status of the firm regarding this decision) (b) All the information provided by the applicant firm is correct; (c) the firm will provide compatible Solar equipment as per approved standards & specifications along with import documents; (d) the Firm/ AoP/ Sole Proprietor/ Supply Company/JV will deploy staff as per project requirements/ directions of the Client and avail relevant staff for mandatory training organized by Agriculture Department on standards and procedures within three months of the pre-qualification and before getting any contract. The	Stamp Paper/ Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
	pre-qualification will be nullified in case of non-compliance.		
11.	The Firm/ AoP/ Sole Proprietor/ Supply Company/JV undertake to performing performance assessment tests for commissioning of solar equipment/system provided/ installed. The test will be performed by the SSC under the oversight of the consultants/ project team and of the beneficiary as per departmental standards/requirements.	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	
12.	The Firm/ AoP/ Sole Proprietor/ Supply Company/JV undertake to comply with the Environmental and Social Management Framework (ESMF) of the project available at https://ofwm.agripunjab.gov.pk/system/files/priat ESMF.pdf	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/JV	
13.	EOI security amounting to Rs. 500,000/- (refundable) in the form of CDR/ Demand Draft.	CDR/Bank Draft	

Note: In case of Joint Venture all correspondence and financial transactions will be made to Lead Firm.

10. MAJOR ROLE OF SUPPLY AND SERVICE COMPANIES (SSCs)

i) Carry out field surveys using the latest tools
ii) Prepare designs in accordance with accepted Standards & Specifications
iii) Prepare cost estimates/ bill of quantities
iv) Install Solar Systems to operate HEISs at farmers' fields

v) Provide post-installation engineering and agronomic backup support services for at least two years

INFORMATION FORM

Name of Applicant:_____ Firm/Company:_____

Applicant as Supply and Service Company _____

a. **Address:**

b. **Telephone No(s):**

c. **Fax Number:**

d. **E-mail Address:**

e. **Preferred mode of correspondence: Mobile No.:**

Information Form

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
1.	Firm/ AoP/ Sole Proprietor/ Supply Company/ JV has a registered office in Punjab/ Pakistan and a dedicated website for the purpose	Rental Deed Agreement / Fard Malkiyat and Website Link/ Address.	
2.	Registration of Firm/ AoP/ Sole Proprietor/ Supply Company/JV as a legal entity with relevant authority/ forum as applicable (Registrar of firms, SECP, etc.).	**For Companies:** iii. Copies of certificate of registration with SECP, iv. Form 28 and 29 for companies **For Firms/AoPs:** ii. Certificate of registration with Registrar of firms/ Form C **For Sole proprietors:** ii. Evidence of registration with FBR **Note:** In case of JV, above mentioned documents for each JV partner (i.e. company/firm/Sole proprietor) will be	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
		provided. JV agreement would require to be registered with FBR/Registrar of Firm/SECP/Relevant Legal forum and must be submitted with EOI.	
3.	Enlistment/ registration in the name of Firm/ AoP/ Supply Company/ Sole Proprietor/ JV as supplier/ manufacturer/ importer with concerned agencies (Valid/ active NTN, STN, PRA registration or enlistment certificate).	Valid/ active NTN, STN, PRA registration in the name of Firm/ AoP/ Sole Proprietor/ Supply Company/ JV. **Note:** In case of JV, above mentioned documents for each JV partner (i.e. company/firm/Sole proprietor) will be provided.	
4.	Must not be involved in any type of Tax Evasion (Income Tax & GST Returns of the last three years must be provided).	Complete Returns of Income Tax (last 3 Years) & GST for the last 03 years (36 Months) (F.Y. 2022-23, 2023-24 & 2024-25)	
5.	Must be in business for the last three years with a minimum average turnover of Rs. 25 Million per year.	Annual Turnover reports of last three years (F.Y. 2022-23, 2023-24 & 2024-25)	
6.	Must have experience of completing similar assignments on at least 150 acres of Solar Powered HEISs during the last three (03) years by the date of EOI closing, with an average of 50 acres/ year.	• List of completed projects with client name, address, Location (Latitude; Longitude), system type, size/ scope, cost, period, year of installation components, and share/role, workorder/ contracts etc (specimen attached)	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
		• Any additional documents to support relevant experience.	
7.	Must have available inventory of Solar equipment (panels) of at least 50 KW as per standards & specifications approved by the Punjab Agriculture Department to install the solar systems for operating HEISs.	Physical Verification/Proof/ Documents with pictorial evidence.	
8.	Willing to hire a mix of professional staff including minimum two Electrical Engineers, two Agricultural Engineers and five Solar Technicians.	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	
9.	Must agree to supply a compatible complete unit including PV panels and essential accessories and complete specifications of PV panels and required accessories along with origin certificate of equipment, brochure, etc.	• Brochures having Specifications. • Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	
10.	Must provide an affidavit confirming that: (a) Firm/ AoP/ Sole Proprietor/ Supply Company/ JV have never been blacklisted by any government local or foreign department. (if ever blacklisted, then provide the case history and current status of the firm regarding this decision) (b) All the information provided by the applicant firm is correct; (c) the firm will provide compatible Solar equipment as per approved standards	Stamp Paper/ Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
	& specifications along with import documents; (d) the Firm/ AoP/ Sole Proprietor/ Supply Company/JV will deploy staff as per project requirements/ directions of the Client and avail relevant staff for mandatory training organized by Agriculture Department on standards and procedures within three months of the pre-qualification and before getting any contract. The pre-qualification will be nullified in case of non-compliance.		
11.	The Firm/ AoP/ Sole Proprietor/ Supply Company/JV undertake to performing performance assessment tests for commissioning of solar equipment/system provided/ installed. The test will be performed by the SSC under the oversight of the consultants/ project team and of the beneficiary as per departmental standards/requirements.	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/ JV	
12.	The Firm/ AoP/ Sole Proprietor/ Supply Company/JV undertake to comply with the Environmental and Social Management Framework (ESMF) of the project available at https://ofwm.agripunjab.g	Stamp Paper /Affidavit duly signed and stamped by Firm/AoP/Sole Proprietor/ Supply Company/JV	

Sr. No.	Description/ EOI Clause	Source of Verification/ Mandatory Documents	Specify detail of the relevant document and attach Evidence duly signed & stamped.
	ov.pk/system/files/priat ESMF.pdf		
13.	EOI security amounting to Rs. 500,000/- (refundable) in the form of CDR/ Demand Draft.	CDR/Bank Draft	

Directorate General Agriculture (Water Management) Punjab
21-Agha Khan Soyyum (Davis) Road, Lahore, Pakistan
Tel: +92-42-99200703 Fax: +92-42-99200702
Email: pipipwm@gmail.com

EXPRESSION OF INTEREST (EOI)

FOR

PREQUALIFICATION FOR SUPPLY & SERVICES OF SOLAR SYSTEMS TO OPERATE HIGH EFFICIENCY IRRIGATION SYSTEMS (HEISS)

UNDER

"TRANSFORMATION OF AGRICULTURE IN THAL"

To

Director General Agriculture (WM) Punjab,
Agriculture House, Davis Road, Lahore.

Subject: **EXPRESSION OF INTEREST (EOI) FOR SUPPLY AND SERVICES COMPANY OF SOLAR SYSTEMS TO OPERATE HEISs TO THE FARMERS**

Dear Sir,

This is in response to your EOI advertisement published in the daily newspaper _____ on [_____/____/ 2026] inviting expression of interest for Pre-qualifying Supply and Services Companies/ Firms/ AoPs/ Sole Proprietors/ JV(s) for Installation of Solar Systems to operate HEISs under the Project titled "**Transformation of Agriculture in Thal"**. We hereby submit our expression of interest to supply HEIS systems.

We have attached all the requisite information according to the given formats. The information furnished by us in this expression of interest is correct to the best of our knowledge and belief. We understand that you will evaluate our application to decide whether or not we are eligible and shortlisted to proceed further in the process.

We shall remain obliged.

Dated: / /2026

Sincerely yours,

…….

To be attached:

i. Power of Attorney (for signatory of Application)
ii. Affidavit for Correctness of Information
iii. History of Litigation
iv. Affidavit for Experience/ Hiring of Staff/ Compatibility of Solar Equipment/ Depolyment and Training of Staff.
v. Compliance with Environmental Guidelines/ Framework of Environmental Protection Agency.

ANNEXURE-I

[To be printed on a PKR 1200/- stamp paper]

LITIGATION HISTORY

NAME: *( )*

Year	Award FOR or AGAINST Applicant	Name of Client, Cause of litigation and matter in dispute	Disputed amount (Current value in Pakistani Rs.)

Note:

i. Attach Affidavit on non-judicial stamp paper that non-performance of a contract did not occur within the last ten years based on information on all settled disputes or litigation.

ii. Applicants should provide information on any history of litigation or arbitration resulting from contracts executed in the last 03 years or currently under execution.

ANNEXURE-II

AFFIDAVIT FOR CORRECTNESS OF INFORMATION

[To be printed on a PKR 1200/- stamp paper]

Name: *( )*

I. I, the undersigned, do hereby certify that all the statements made in the EOI and in the supporting documents are true, correct and valid to the best of my knowledge and belief and may be verified by Pre-Qualification Agency for provision/ installation of Solar Systems to operate HEISs to the farmers in all project districts under the Transformation of Agriculture in Thal, at any time, if deems it necessary.

II. The undersigned hereby authorize and request the bank, person, firm or corporation to furnish any additional information requested by the Pre-Qualification Agency deemed necessary to verify this statement regarding my (our) competence and general reputation. Firm is not insolvent, not blacklisted and not involved in litigation or arbitration with any of provincial or Federal Government Department of Pakistan, any Agency of United nations, World Bank and Asian Development Bank.

III. The undersigned understands and agrees that further qualifying information may be requested and agrees to furnish any such information at the request of the Pre- Qualification Agency.

Signed by an authorized representative

Title of Officer:

Name of Firm:

Date:

POWER OF ATTORNEY

(For Signatory of Application)

[To be printed on a PKR 1200/- stamp paper]

KNOW ALL MEN BY THESE PRESENTS THAT by this Power of Attorney (**"Power of Attorney"**), (**M/S** _____) having its registered office at [_____], do hereby nominate, appoint and authorize (Mr._____), having CNIC No (_____) hereinafter referred to as the **"Signatory of Application"**, to do in our name and on our behalf the following:

Sign and submit to Project Director or its authorized nominee, the EOI of pre-qualification for provisions of Solar Systems to operate HEISs to successful farmers under the Transformation of Agriculture in Thal, in response to the EOI advertisement dated [ ] issued by the Pre-Qualification Agency and all other documents and instruments required to submit the EOI.

i. Execute all such contracts, deeds, documents and instruments as may be considered necessary and expedient in relation to the foregoing.
ii. Do and carry out all other actions as may be required by the Pre-Qualification Agency in connection with the EOI process as a whole.
iii. To immediately notify the Pre-Qualification Agency in writing of any impending or actual revocation as well as any change in the terms of this Power of Attorney**.**
iv. To do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our EOI in response to the above referred tenders including signing and submission of all documents, instruments and deeds (including correcting any deficiencies or mistakes therein), attending any meetings called by the Pre-Qualification Agency and providing information/responses to the Pre-Qualification Agency in all matters in connection with our EOI.

We, *[.],* do hereby ratify and confirm whatsoever the Signatory of Application shall do by virtue of these presents and further agree that whatever the Signatory of Application shall do or cause to be done pursuant to this Power of Attorney shall be binding on us.

Furthermore, each provision of this Power of Attorney is severable and distinct from the others. The invalidity, illegality or unenforceability of any one or more provisions of this Power of Attorney at any time shall not in any way affect or impair the validity, legality and enforceability of the remaining provisions hereof.

IN WITNESS WHEREOF, we have executed this **POWER OF ATTORNEY** as of [_____]

FOR: [INSERT NAME OF APPLICANT FIRM] FOR SIGNATORY OF THE APPLICATION (Attorney)

Signature: _____	Signature: _____
Name: _____	Name: _____
Title: _____	Title: _____
CNIC: _____	CNIC: _____

WITNESSES:

1……..	2……
NAME:……	**NAME**:……
ADDRESS:	ADDRESS:
CNIC:	CNIC:

Notes:

a) Single Applicant Firm; To be executed by:
i. Partners in case of a Partnership Firm; or
ii. Chairman Board of Directors in case of a Company.

b) In the case of a Pakistani Executor or Attorney, a copy of his/her Computerized National Identity Card ("CNIC") should be attached with the Power of Attorney. In the case of a non-Pakistani Executor or Attorney, a copy of his/her passport should be attached.

c) The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the Applicable Law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

d) Also, wherever required, the applicant should submit for verification the extract of the charter documents and documents such as a resolution/power of attorney in favor of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the applicant.

e) For a Power of Attorney executed and issued overseas, the document will also have to be legalized by the Pakistani Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. Once the original Power of Attorney has been brought into Pakistan, adhesive stamps are to be affixed on the same.

…….

AS NOTARIZED BY THE NOTARY PUBLIC

ANNEXURE-IV

AFFIDAVIT FOR COMPLIANCE WITH ENVIRONMENTAL GUIDELINES/ FRAMEWORK OF ENVIRONMENTAL PROTECTION AGENCY

[To be printed on a PKR 1200/- stamp paper]

Name: *( )*

I, the undersigned, do hereby certify that I am/ my firm/ Company/ JV is in Solar Business, and I am/my firm/ Company undertakes to comply with Environmental Guidelines/ Framework of Environmental Protection Agency (EPA) and compliance to environmental standards.

Signed by an authorized representative

Title of Officer:

Name of Firm:

Date:

ANNEXURE-V

AFFIDAVIT FOR EXPERIENCE/ HIRING OF STAFF/ COMPATIBILITY OF SOLAR EQUIPMENT/ DEPOLYMENT AND TRAINING OF STAFF

[To be printed on a PKR 1200/- stamp paper]

Name: *( )*

1. I, the undersigned, do hereby certify that I am/ my Firm/ AoP/ Sole Proprietor/ Supply Company/ JV is providing/Installing Solar systems to the farmers since last ____ years and I fulfill all the eligibility criteria mentioned in the EOI.
2. I, the undersigned, do hereby certify that I am/ my Firm/ AoP/ Sole Proprietor/ Supply Company/ JV will ensure hiring of a mix professional staff including minimum two Electrical Engineers, two Agricultural Engineers and five Solar Technicians as mentioned in eligibility criteria of the EOI.
3. I, the undersigned, do hereby certify that I am/ my Firm/ AoP/ Sole Proprietor/ Supply Company/ JV will provide compatible Solar equipment/ material as per approved departmental standards & specifications along with import documents.
4. I, the undersigned, do hereby certify that I am/ my Firm/ AoP/ Sole Proprietor/ Supply Company/ JV will deploy staff as per project requirements/ directions of the client and avail relevant staff for mandatory training organized by the department on standards and procedures (if required).

Signed by an authorized representative

Title of Officer:

Name of Firm:

Date:

ANNEXURE-VI

SPECIMEN OF EXPERIENCE LIST

[To be printed on Letter Head]

Sr. No.	Name of Project/ Client/ Farmer	Address/ Location with Latitude & Longitude	CNIC #	Contact # & Email	System Type and Size (KW)	Scope/ Cost	Period (Year of Installation)	Remarks (Workorder/ Contract to be attached)

- *Any additional documents to support relevant experience*

Signed by an authorized representative

Title of Officer:

Name of Firm:

Date:

STANDARD AND SPECIFICATIONS OF SOLAR SYSTEM

(Annex-XXXII)

Standards & Specification of Equipment and Material of Solar
Technical Specification of Solar Photovoltaic Module

Sr. No.	Item/Feature	Specification		
1	Application	To absorb the sunlight as a source of energy to generate electricity.		
2	Nominal Power (Watt)	≥550		
3	Solar Cell	Monocrystalline Silicon	Polycrystalline Silicon	Mono Perc
4	Module Efficiency (%)	≥18	≥17.2	≥20
5	Power Tolerance	Positive Tolerance Only		
6	Operating Temperature	-20°C to +80°C		
7	International Standards Compliance	IEC 61215, IEC 61730 (Class-II)		
8	Identification	Barcode		
9	Labeling and Import Data	Name of manufacturer, Unique Model Number and Serial Number, Maximum Performance Pmax, Maximum Power Voltage Vmp, Maximum Power Current lump, Open Circuit Voltage Voc, Short Circuit Current Isc, Month and Year Of Manufacturing (the age of the module must not be more than one year at the time of installation)		
10	Junction Box	PVC		
11	Junction Box Standard	IP67 and above		
12	Performance Warranty	25 Years i.e. Insurance backed warranty (Manufacturer warranty on letter head), global irrevocable and immediate insurance-backed with 3rd party policy rights of operation. Performance warranty will be linear.		
13	Materials and Workmanship Warranty	Free: 12 Years or above		
14	Power Output Warranty	Power output within 10 years shall not fall below 90% Power output within 25 years shall not fall below 80%		
15	Degradation	Anti-Potential Induced Degradation (PID)/PID Resistant.		
16	Origin	Imported Tier-I with CoC and PSI reports also complying SRO 604		
17	Temperature Co-efficient of Maximum Power (Pmax)	≤ -0.43% / °C		
18	Minimum Efficiency at 200W/m2 (25°C, AM 1.5)	Equal to or more than 95% of the module efficiency at STC.		
19	Connector	MC4 Equivalent connectors.		

Standards & Specification of Equipment and Material of Solar

(Frequency Device (VFD) –IP65)

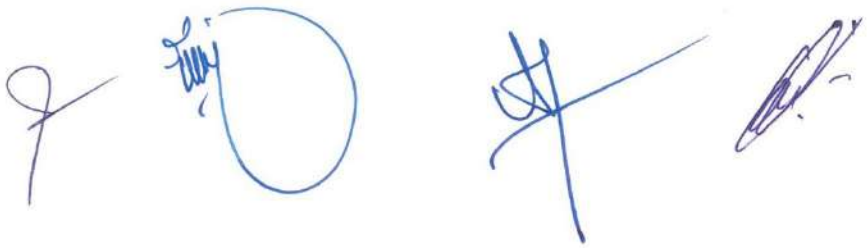
Sr. No.	Item/Feature	Specification
1	Application	Converts D.C voltage to A.C voltage and regulates the functions of the pump
2	Standard Compliance	IP65 and above and VFDs complying IEC/EN 62109-1:2010, IEC/EN 62109-2:2011.
3	Efficiency	>95%
4	Type	Wall mounted
5	Free warranty period	02 years from the date of certification including replacement and O&M service or more as provided by manufacturer.
6	Built-in-functions	Variable frequency Drive. Automatic Start and Stop with any input power (solar, Grid and Generator). Self-diagnostic and self-Protection. Dry run protection detection. MPPT (Maximum Power Tracking). Hybrid operation with solar at high priority.
7	Controls	Digital controls with complete protective functions. Instantaneous output status display (Speed/Power/Amps) etc. Intelligent Power module (IPM) with LED displays, external display or smart phone for operating system. Data logging (Optional). Ground fault monitoring. AC short circuit protection. Under/Over Voltage & Over Current protection. Low Voltage Disconnect (LVD). Overcharge Protection Reverse Current Blocking.
8	Temperature range	-10 to +60 degree Celsius
9	Rated output voltage	A.C and D.C rated voltage (single/three phase)/rated voltage.
10	Origin	Imported with CoC and PSI reports and complying SRO 604

(Annex-XXXV)

Standards & Specification of Equipment and Material of Solar

Technical Specification of Connectors and Power Disconnect

Sr. No.	Item/Feature	Specification
1	Application	To connect and disconnect the power and enclose them in proper housing.
2	Ingress Protection	IP54 or higher for breaker box
3	Voltage	Have voltage ratings greater than the maximum circuit voltage
4	Current	Have current ratings between 125% and 150% of the maximum design current for the circuit
5	Display	All power disconnect should include a clear visual indication of their state (ON/OFF or I/O)
6	Alternate Source switch over	There must be a switch over to power the pumping system with grid or generator on request of farmer
7	Origin	Imported / Local



Standards & Specification of Equipment and Material of Solar

(Solar Array Wiring)

Sr. No.	Item/Feature	Specification
1	Application	To carry current
2	Type	Single conductor type, 99.99% Copper, Cross-sectional area of 4 mm^2 or higher, 1000 V/Class II (according to protection class II /1000V, single core cable, Tinned copper conductor, XLPE/XPLO insulation, PVC-PVC/ double EVA jacket (resistant to heat and cold, resistant to heat and cold, resistant to ozone, UV, oil and chemicals), Temperature range:-40 to 90°C (temperature peak allowable:120 °C), Halogen free, DC cable shall be suitable for the environment conditions at the Project site, including UV protection and rodent protection.
3	Color Coding	Positive: Red or Brown Negative: Black or Blue
4	Calbe Losses	Ohmic losses less than 1% for DC cables and 0.5% for AC Cables
5	Cable binders	Cable, cable binders clamps and other fixing material must also be UV-resistant, make of polyethylene
6	Standard	ISO 9001: 2015
7	Origin	Import / Local

Standards & Specification of Equipment and Material of Solar

(Structure – L2)

Roof Mounted Structure:	
Description	**Requirements**
Tentative outlines design will be site dependent and may varies	
Roof Structure	Galvanized Iron (GI), min 20 Micron or Hot Dip Galvanized (min 80 Micron or ASTMI compliant) or Aluminum Frame of min 2.3 mm (1.2) with more than 20 years of proven life
Theft Protection	The mounting structure must come with an anti-theft protection to hinder demounting of modules
Material Gauge	SWG 14 or better / as per design or 2.3 mm for aluminum \(1.2). Fasteners, Nut, Bolts, Clamps must be of stainless steel / aluminum
Wind loading	Mounting structure to support the module must be made of durable material, resistant ot sandstorms, high wind speeds (up to 40 m/s), corrosion (passing the salt spray test IEC 61701, material must be compatible with the module frame material so as to avoid any adverse electrolytic / galvanic effects
Civil Work	• Structure should support the existing roof top / ground mounting • 1:2:4 concrete block with size minimum 1 x 1x1 for 1.2 type structure. • The stability of the supporting structure after installation shall be guaranteed by the bidder. • To avoid the drilling in roofs, use appropriate arrangements for strengthen the structure without damage the roofs. • Pointed dead-loads on rooftop surface must be avoided. • Additional bears can be casted to avoid drilling on roofs • Water drainage must not be considered; separate water channels must be maintained for water drainage. • The supporting structure must be grounded for short- circuit and lightning protection through in depended earthling

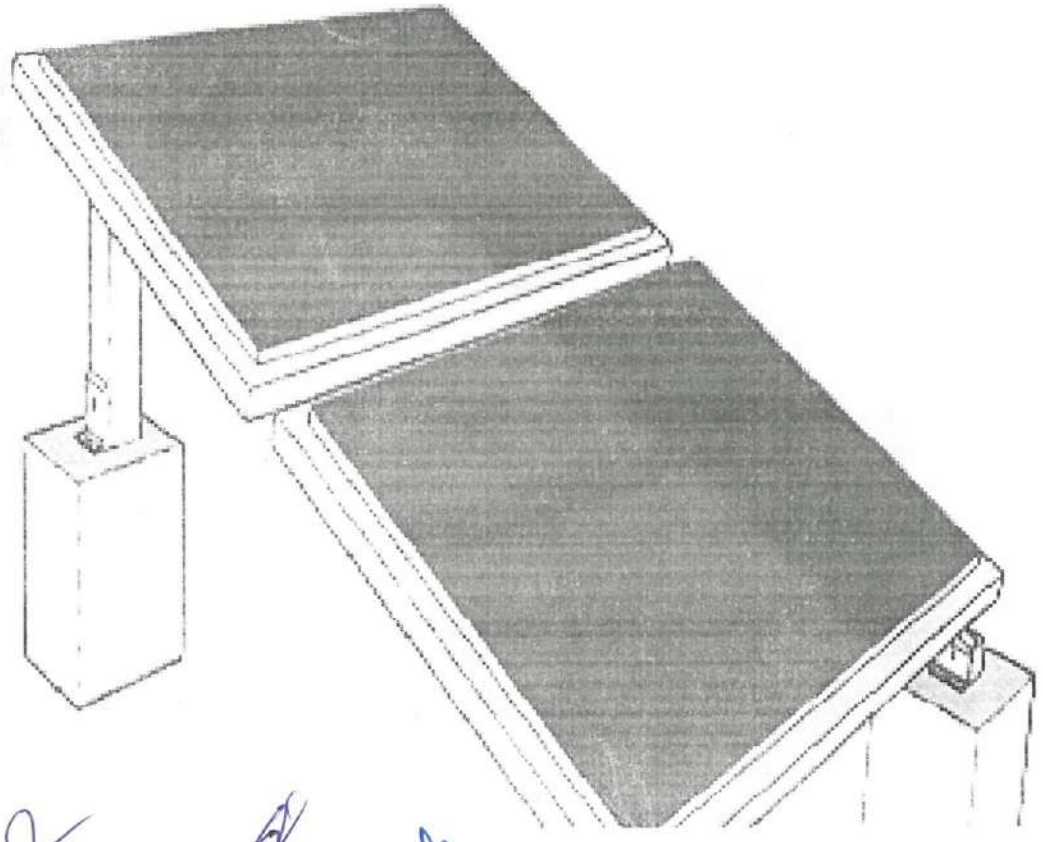
PANEL GROUND MOUNTING STRUCTURE:

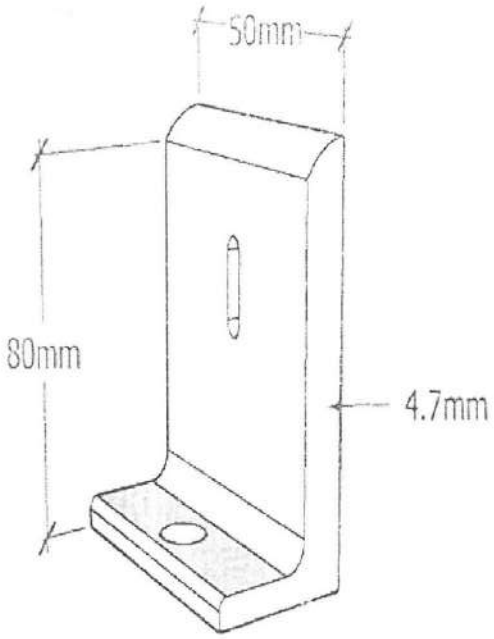
a. Ground should be straight and hard enough to hold the load of PV modules, Proper slop should be maintained to endure water drainage.

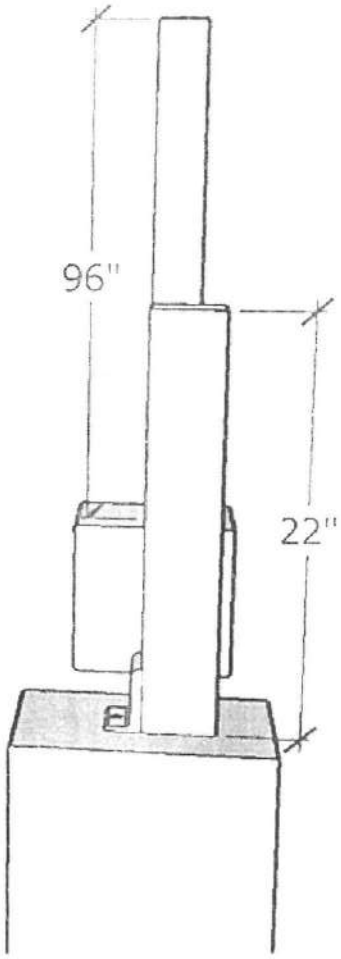
b. The panel mounting and structure should be made of Galvanized Iron (GI), min 20 Micron or hot dipped galvanized (80 microns Average/as per ASTM standards) galvanized steel of minimum thickness of 14 SWG/2 mm Channel / Pipe or 12 SWG/2.642mm Angle (Profile of

channel and Sketch Attached for Reference Annex 1) or Aluminum Panel mounting and structure of minimum thickness of 2 mm.

c. A sketch of the mounting frame (As per Actual Site Requirements) showing dimensions of the frame parts should be provided at the time of supply.
d. To avoid Shading, Distance between two rows of PV panels and from walls should be maintained at a minimum of 1.6 times the height of structure/walls.
e. The pit size for concrete (PCC) works should be minimum 1x1x2.5 feet for each individual leg or 1x2x2.5 feet for double leg and the concrete should be extended at least 1 foot above the ground. The concrete ratio should be 1:2:4.
f. The Surface azimuth angle of PV Module 180° and the Tilt angle (slope) of PV Module should be 18 to 30° or as per site requirement.
g. The PV modules will be mounted on structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour.
h. Array fasteners (nut/bolts/washers) between PV Module and Structure shall be stainless steel. Washers should be installed on both sides of Module frame.
i. The minimum space between two PV Modules should be 2.54 cm (1 inch), to avoid air push over PV Modules.
j. For Ground mounting structure, Module clearance should be not less than 1.5 Feet.



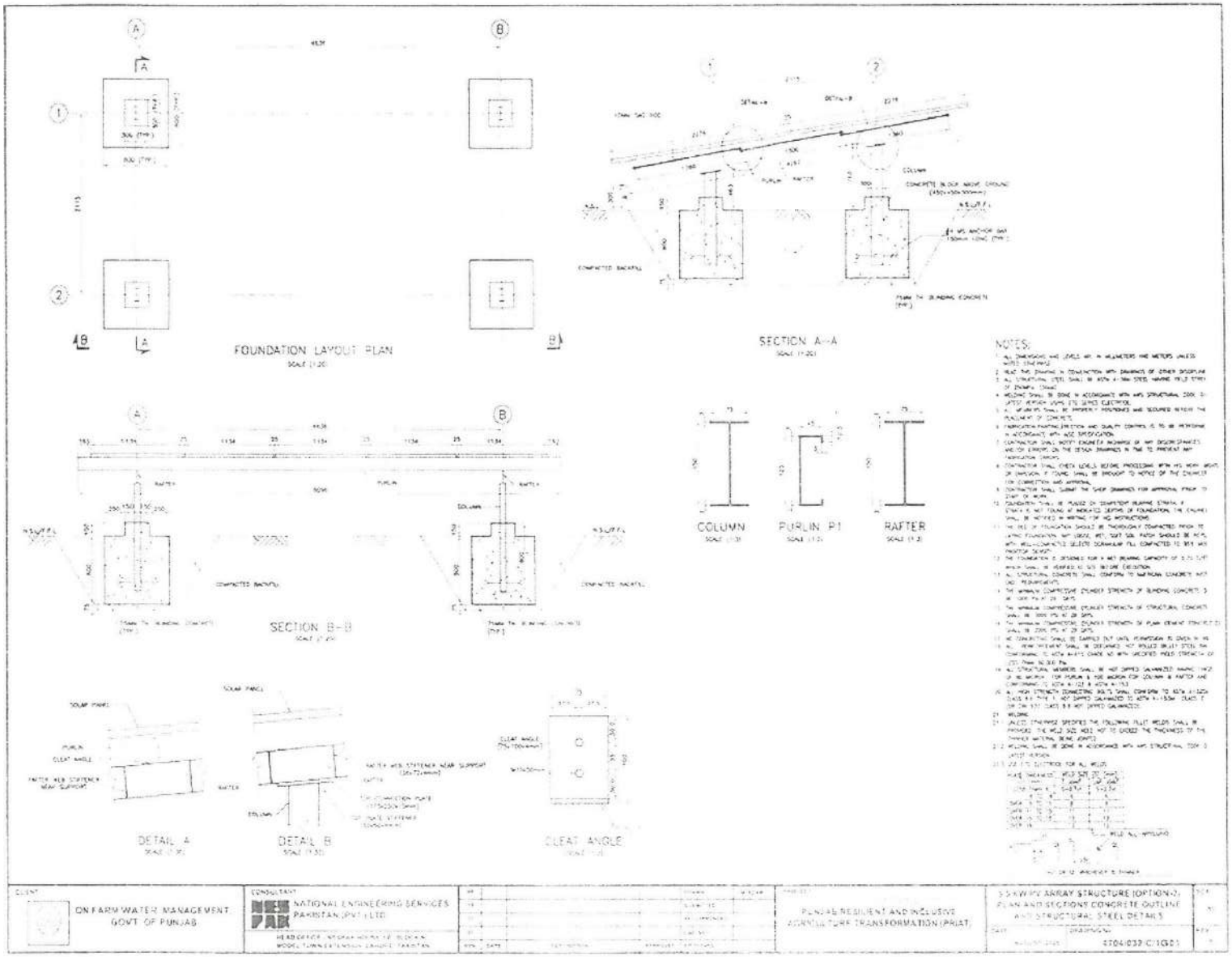

50mm
80mm
4.7mm


96"
22"

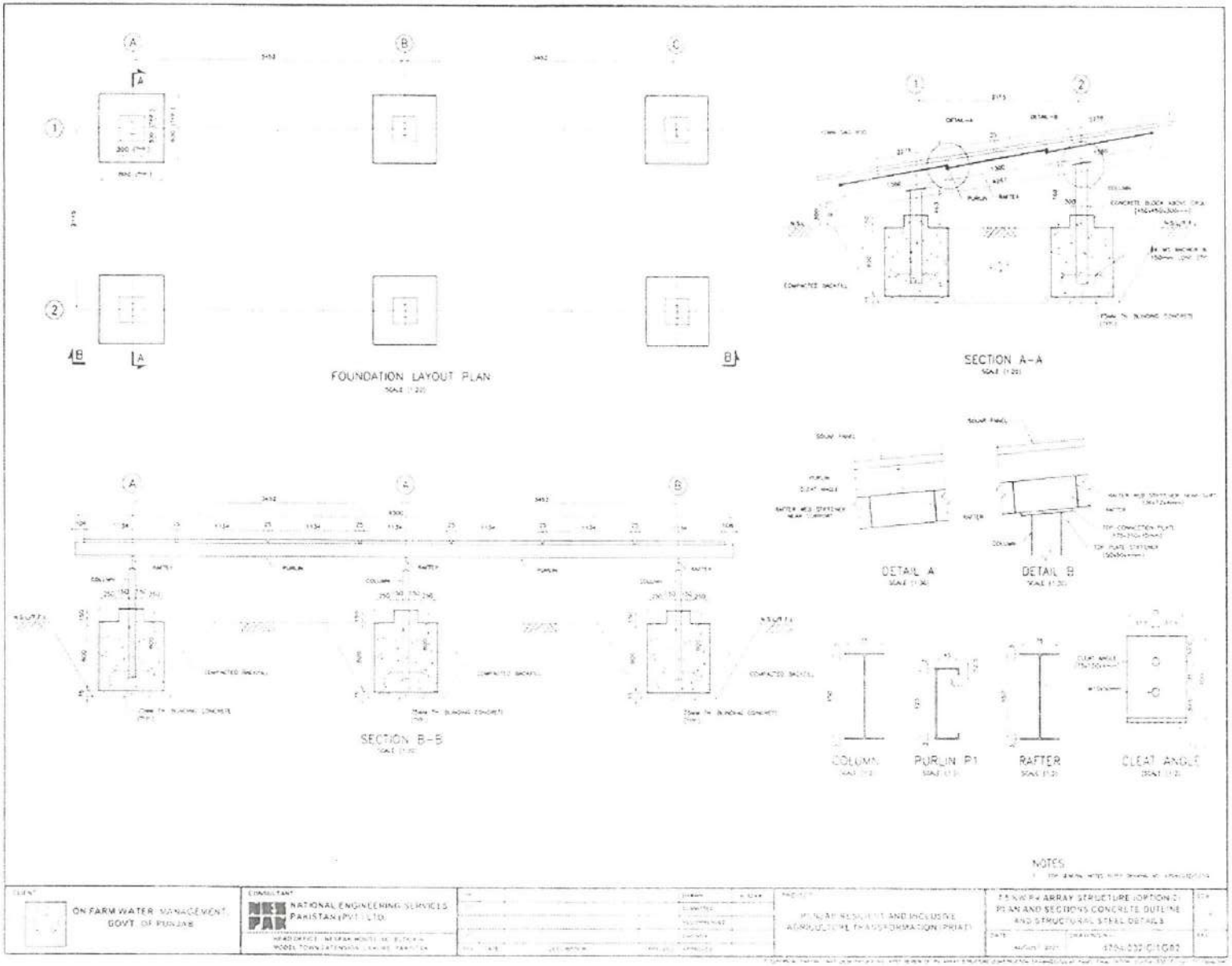
(Annex-XXXVIII)

Standards & Specification of Equipment and Material of Solar Foot Mounted Solar Array Structure

Sr. No.	Item/Feature	Specification
1	Application	The structure carries solar modules straight to sunlight
2	Type	Ground mounted (Frame) with No tracking, Tilt angle may be adjusted as per site conditions
3	Material	• For hot rolled use ASTM A-36M, yield strength of 250 MPa. • For Cold Formed use ASTM A-653M SS, Grade 340.
4	Galvanization OR Paint	100 microns Hot dipped Galvanization for mounting structure including Rafter & Column and 80 Microns for Purlin/corrosion-resistant painted. All nuts and bolts installed to the whole structure must be of stainless steel or galvanized. No drilling or cutting is allowed at site.
5	Quality Standard	ISO 9001
6	Wind bearing velocity	150 km/hr
7	Tracking options	No
8	Civil Wok	1:2:4 Concrete mixture for foundations as follows • $\geq 112 ft^3$ for four foundations, with upto 10 panels • $>168 ft^3$ for six foundations, with upto 14 panels • $>224 ft^3$ for eight foundations, with upto 20 panels Base 900x900x900 (mm), Concrete block above ground 450x450x300 (mm). Shuttering of bricks/metallic for base and concrete block with 300 mm above the ground level.
9	Top Structure	Rafter with I-section 150x75x3mm is used as main horizontal member. C Purlin 125x45x512.5x3 mm is used to support the solar panels. The purlins are connected by 10mm sag rod at mid-length in each span. The purlins are connected with the rafter through cleat angle. The length of purlins can be adjusted/changed depending upon the size of panel/array size, as per site requirement.
10	Main Column	Column with I-section 150x75x3mm is used as main vertical member. The rafter is welded with column through connection plate. The column is embedded in foundation block, the total embedment depth is 800mm. All nuts, bolts and other accessories to be rust resistant and are hot dipped galvanized.
11	Warranty period	10 Years free
12	Anti-theft provision	The mounting structure equipped with anti-theft screws/ clamps to prevent removal of any equipment.



CLIENT: ON FARM WATER MANAGEMENT GOVT. OF PUNJAB	CONSULTANT: NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LTD.	PROJECT: PUNJAB RESILIENT AND INCLUSIVE AGRICULTURE TRANSFORMATION (PRIAT)	5.5 KW PV ARRAY STRUCTURE (OPTION-2) PLAN AND SECTIONS CONCRETE OUTLINE AND STRUCTURAL STEEL DETAILS


FOUNDATION LAYOUT PLAN
SECTION A-A
SECTION B-B
DETAIL A
DETAIL B
COLUMN
PURLIN P1
RAFTER
CLEAT ANGLE
NOTES
ON FARM WATER MANAGEMENT
GOVT. OF PUNJAB
NATIONAL ENGINEERING SERVICES
PAKISTAN (PVT.) LTD.
PUNJAB RESILIENT AND INCLUSIVE AGRICULTURE TRANSFORMATION (PRIAT)
3.5 kW P-V ARRAY STRUCTURE (OPTION 2)
PLAN AND SECTIONS CONCRETE OUTLINE
AND STRUCTURAL STEEL DETAILS
STRUCTURE/01/G02

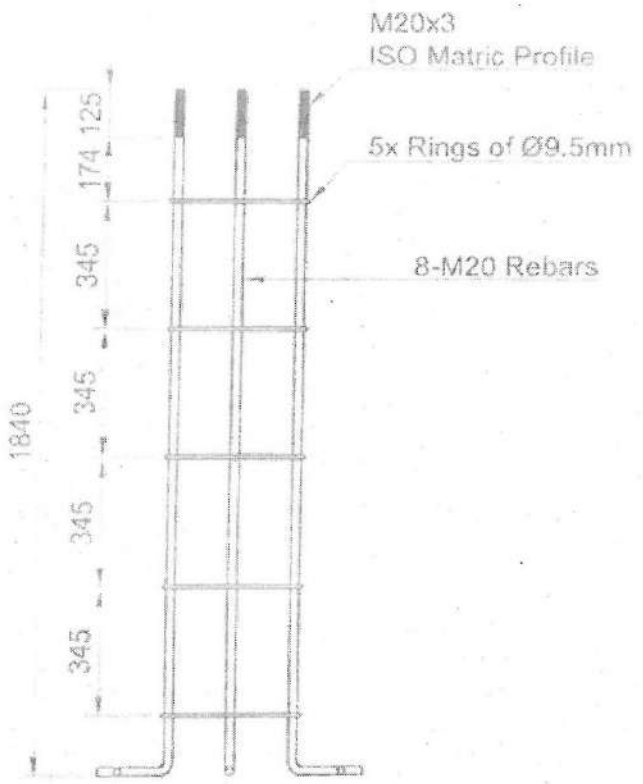
FOUNDATION LAYOUT PLAN
SECTION B-B
NOTES
SHEET (1 / 2)

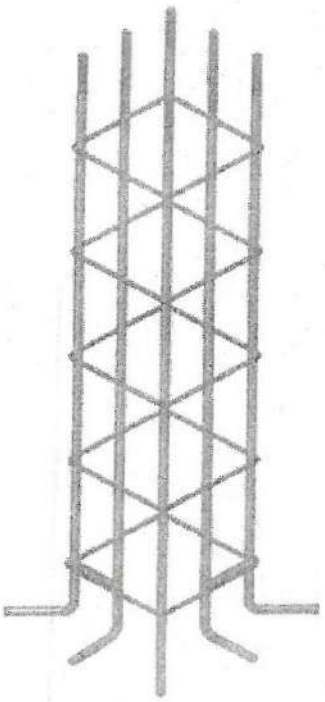
SECTION A-A
COLUMN
PURLIN
RAFTER
CLEAT ANGLE
DETAIL A
DETAIL B
NOTES

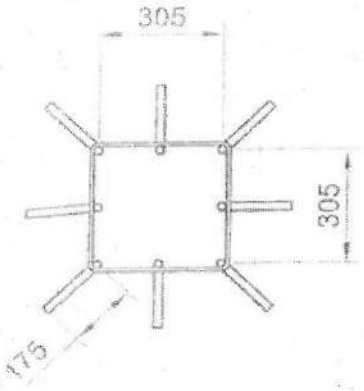
(Annex-XXXIX)

Standards & Specification of Equipment and Material of Solar
(Solar Array Panel Structure)

Sr. No.	Item/Feature	Specification
1	Application	The structure carries solar modules straight to sunlight and provides manual tracking, 2 axis
2	Type	Ground mounted (Pole) with manual tracking
	Material	Grade 60 Steel
	Galvanization/Corrosion-resistant painted.	100 microns Hot dipped Galvanization for mounting structure/ corrosion-resistant painted. All nuts and bolts installed to the whole structure must be of stainless steel or galvanized/ corrosion-resistant painted.. No drilling or cutting in allowed at site.
	Quality Standard	ISO 9001:2015
	Wind bearing velocity	150 km/hr
	Tracking options	Seasonal and daily variations
	Civil Work	1:2:4 Concrete mixture (270 cubic.ft for single pole, Maximum 10 panels on a pole). Base 5 x 5 x 1', Concrete block 3 x 3 x 5. Shuttering of bricks metallic for base and concrete block.
	Top Structure	T-frame/middle pipe Min diameter 4", Min wall thickness 3mm, 78 & 82 length with 2 angle adjuster of 3 holes. Side arms 2"x 2"x 5mm 13 feet (length depends upon panels) or with horizontal pipe beams. Angle for PV adjustment 2"x2"x5mm, length depends upon panels or cam shaft provision for seasonal variations The dimensions of top structure can be adjusted/changed depending upon the size of panel array size, as per site requirement.
	Base Plate	Base plate 15"x15", 16mm thickness with 4-arrays of 12"x4"x6mm thickness.
	Main Pole	Main pipe diameter 5.5"(OD), 6mm thickness flange at 4 feet. 5-feet height. Flange with groove of 8mm with eight holes, with cap having 3mm thickness flange with 2 holes, with angle adjusters and pipe clips. Tracking of solar panels through grove surface (8 mm balts, 72 nos, minimum in groove). All nuts, bolts and other accessories to be rust resistant. A piece of base plate equal to outer diameter of main pole will be removed and 360 degree welding of main pole to base plate will be done after fully inserting the main pole in the base plate.
	Reinforcement Cage in civil work	4-J-bolts, 7/8"rod thickness, height 72", bend 06", 5 rings of 3/8"thickness, 12"x12"cente to center
	Warranty Period	10 Years free
	Grounding and Earthing	The PV System and the entire structure shall be properly grounded according to Electric Act of Pakistan. This is to ensure the requisite ohmic resistance and safety of the PV System along with connected electric appliances,



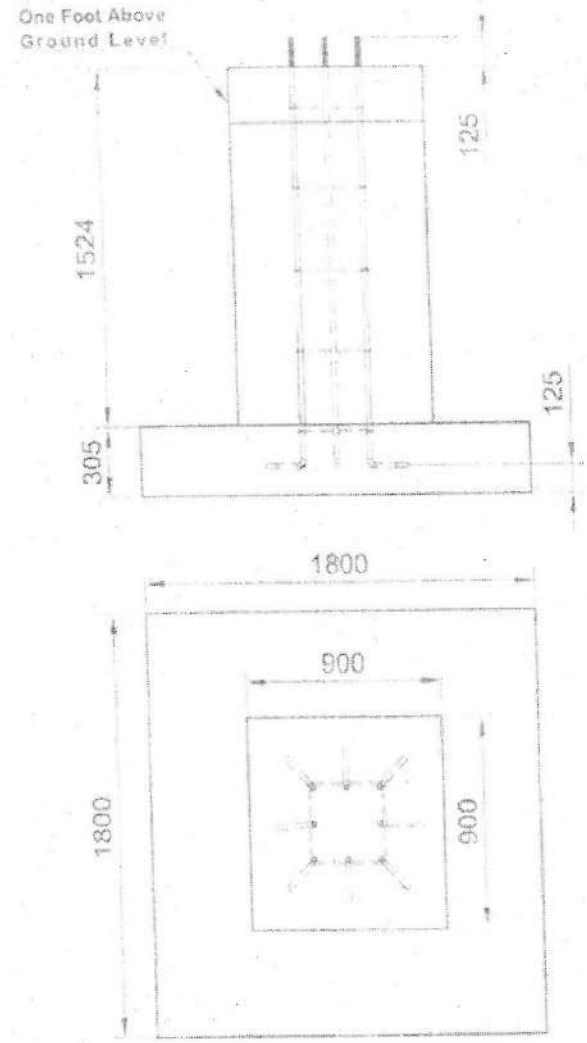


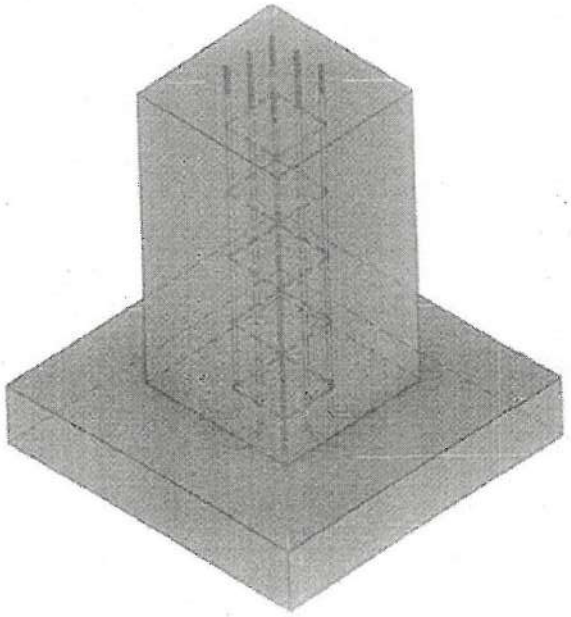


1-J Bolt Cage

PV Array Structure
4.0kW and 5.5kW

Note:
All measurements are in 'mm'





2-Civil Structure

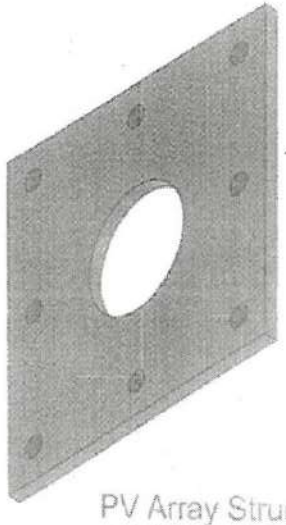
PV Array Structure
4.0kW and 5.5kW

Note:
All measurements are in 'mm'

40



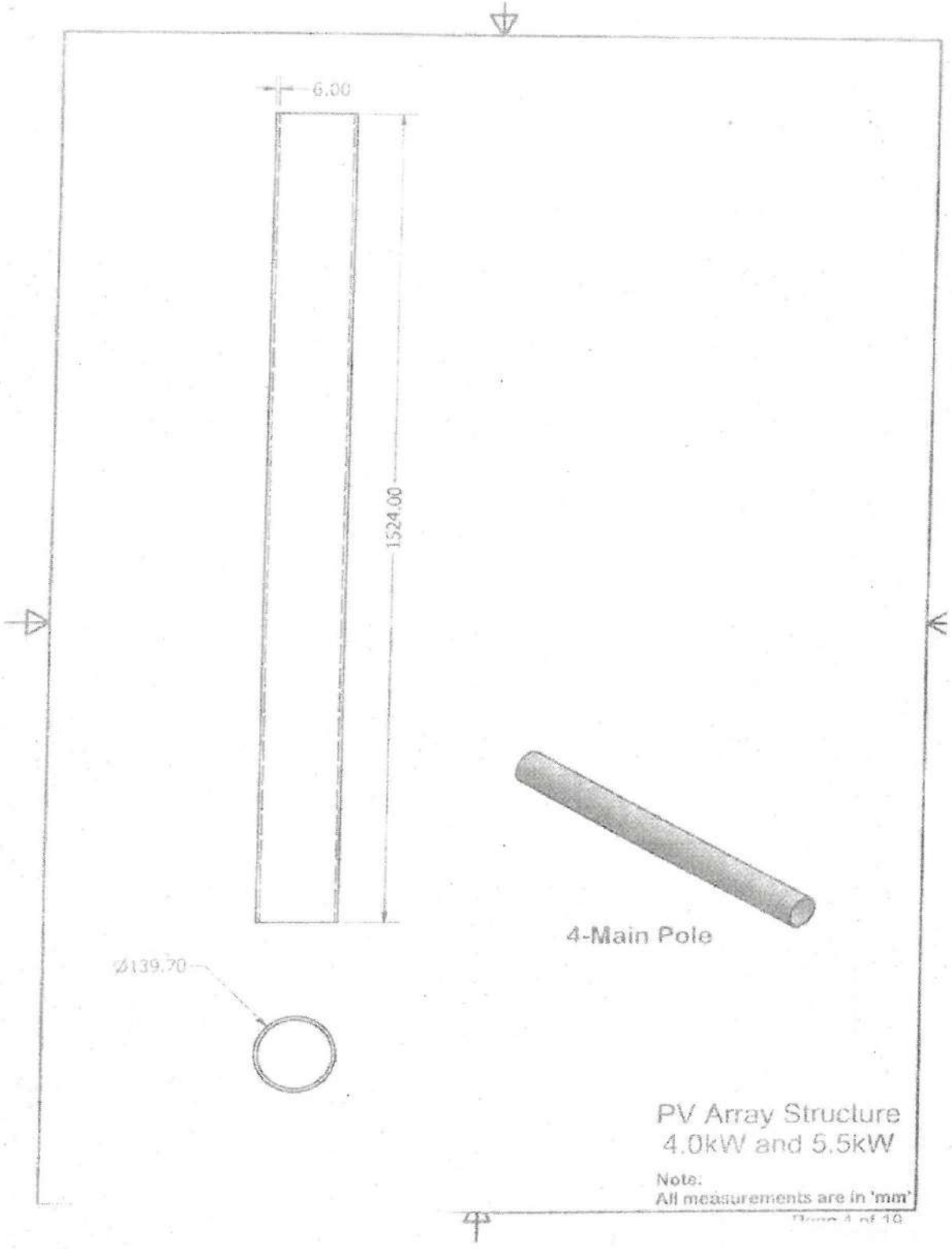
3-Base Plate

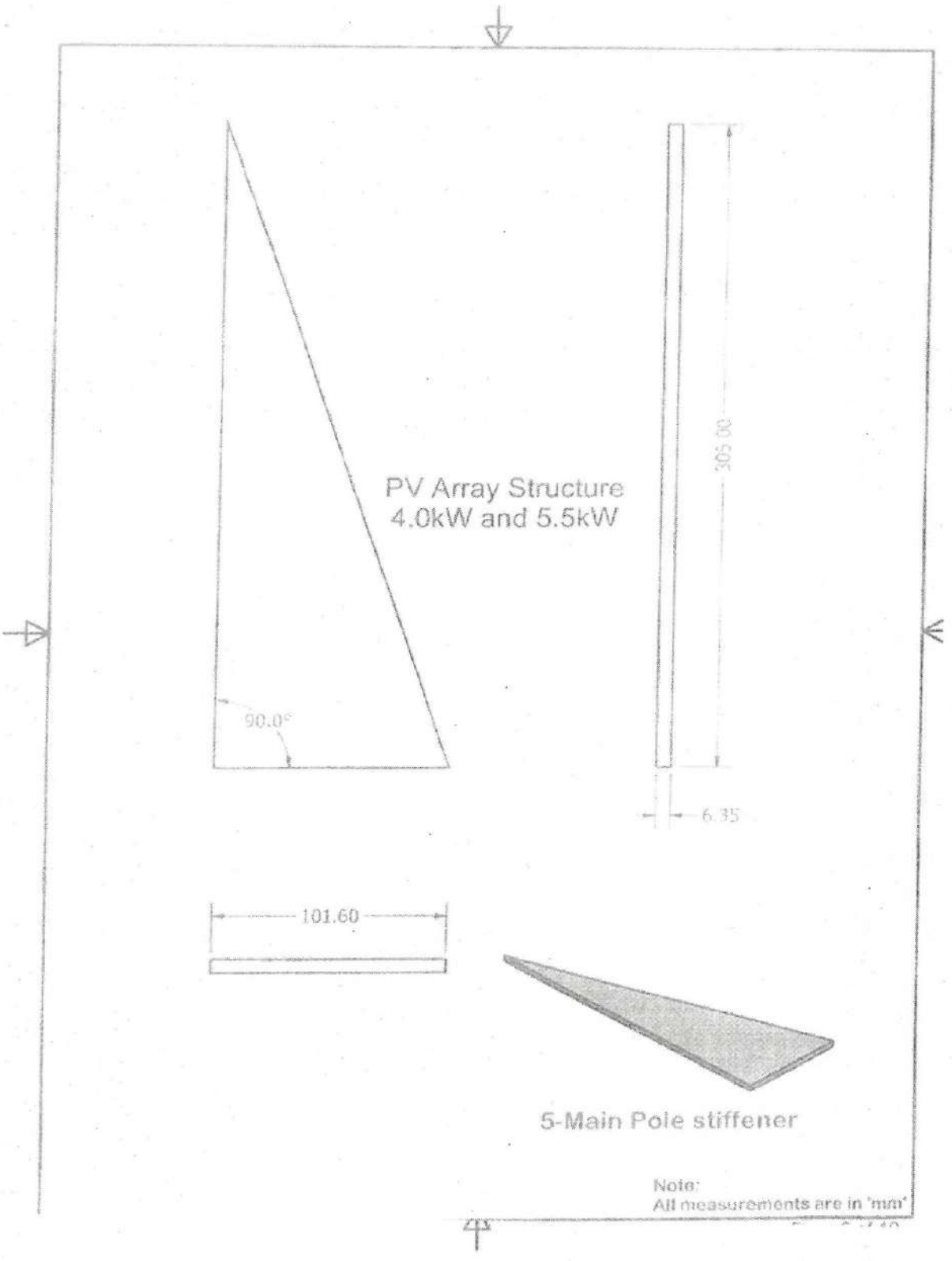


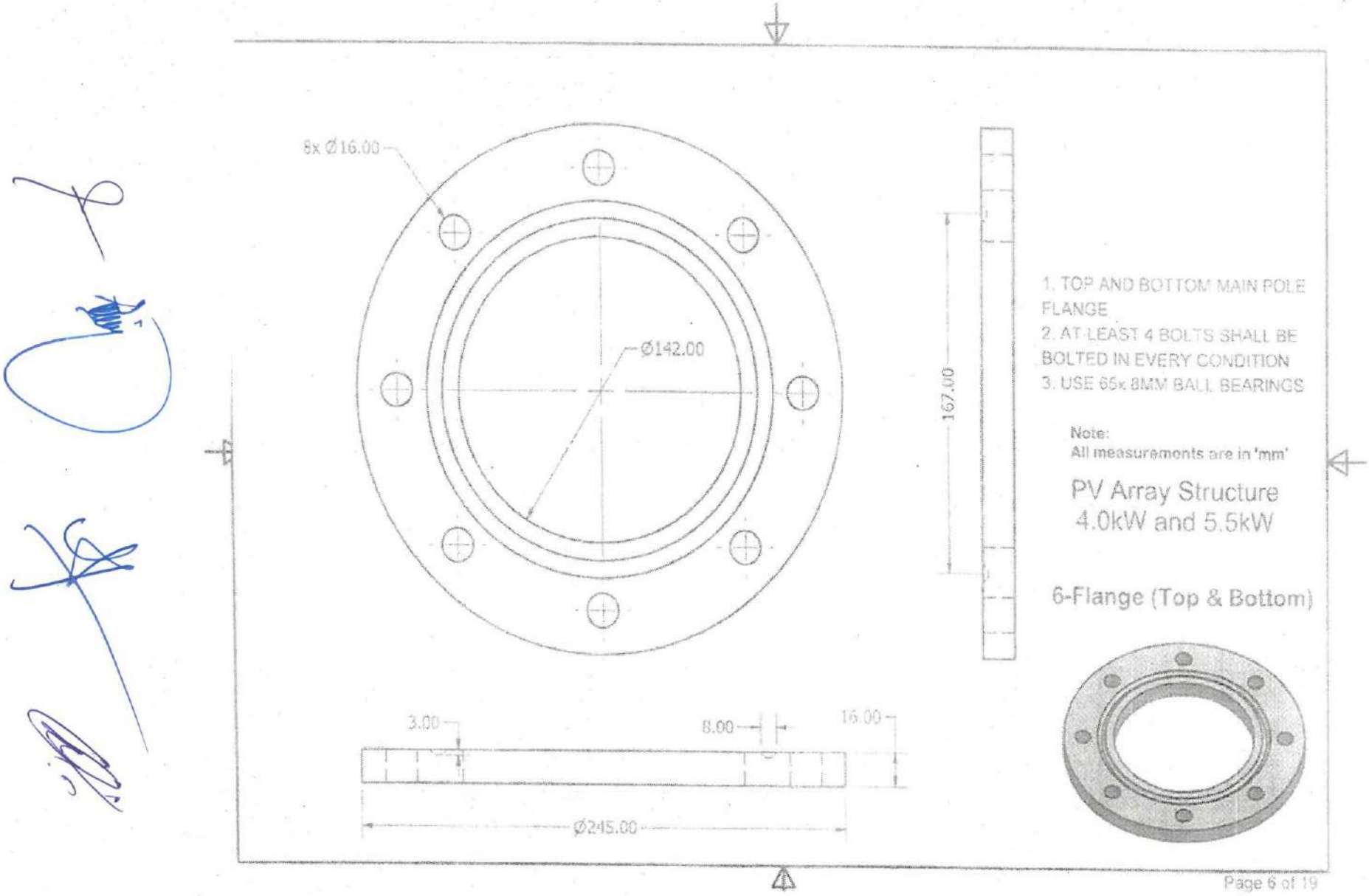
PV Array Structure
4.0kW and 5.5kW

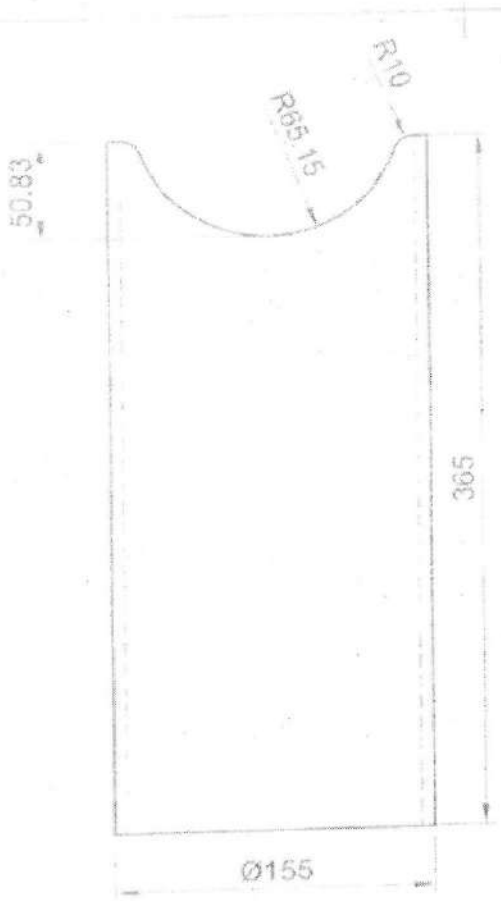
Note:
All measurements are in 'mm'

41

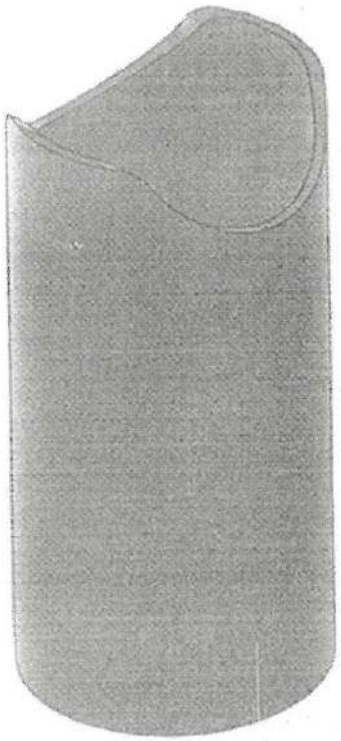

6.00
1524.00
4-Main Pole
Ø139.70
PV Array Structure
4.0kW and 5.5kW
Note:
All measurements are in 'mm'


PV Array Structure
4.0kW and 5.5kW
90.0°
305.00
6.35
101.60
5-Main Pole stiffener
Note:
All measurements are in 'mm'


5x Ø16.00
Ø142.00
167.00
3.00
8.00
16.00
Ø245.00
1. TOP AND BOTTOM MAIN POLE FLANGE
2. AT LEAST 4 BOLTS SHALL BE BOLTED IN EVERY CONDITION
3. USE 6Sx 8MM BALL BEARINGS
Note:
All measurements are in 'mm'
PV Array Structure
4.0kW and 5.5kW
6-Flange (Top & Bottom)



7-T-Cap Pole



PV Array Structure
4.0kW and 5.5kW

Note:
All measurements are in 'mm'

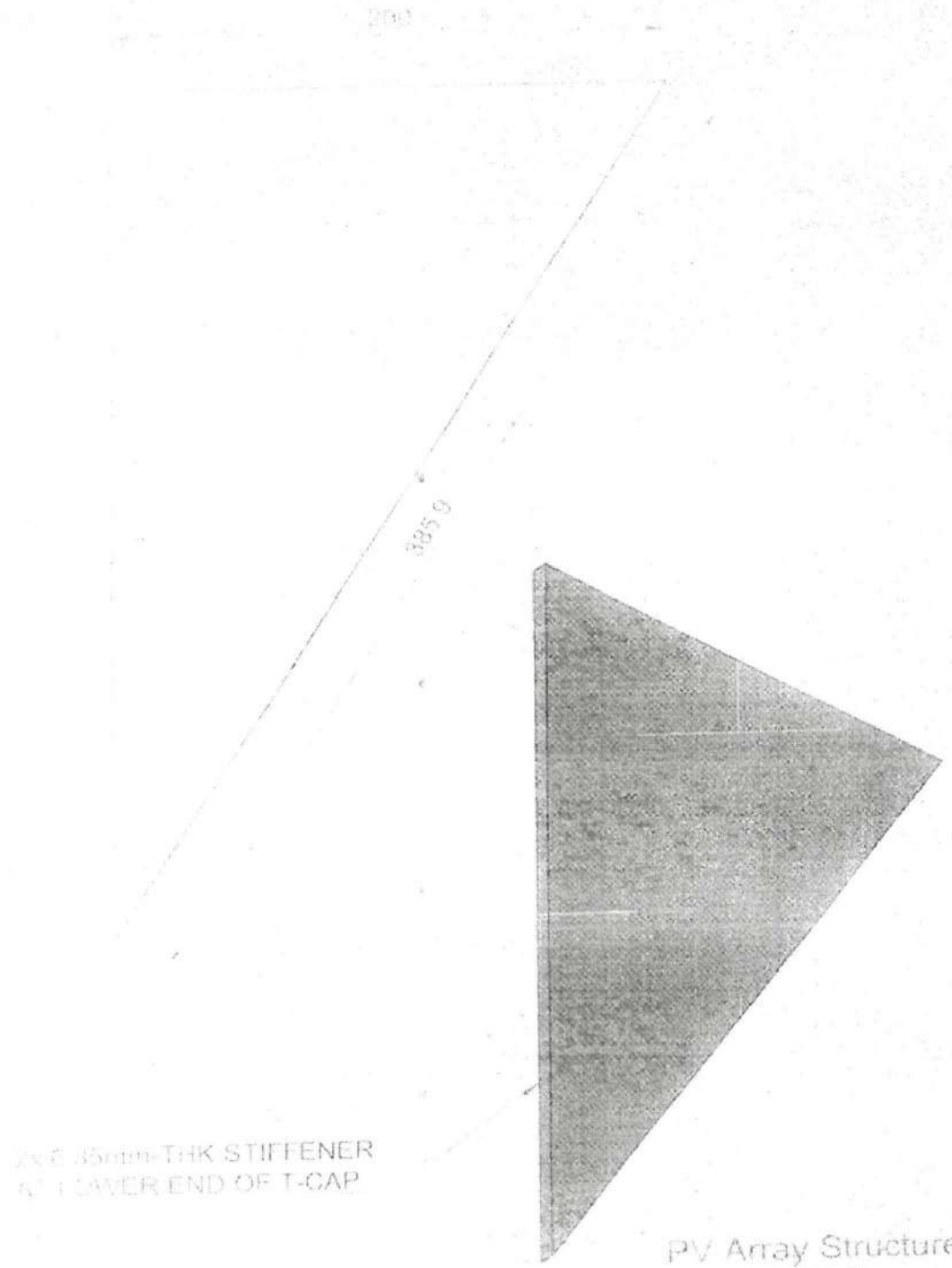
PV Array Structure
4.0kW

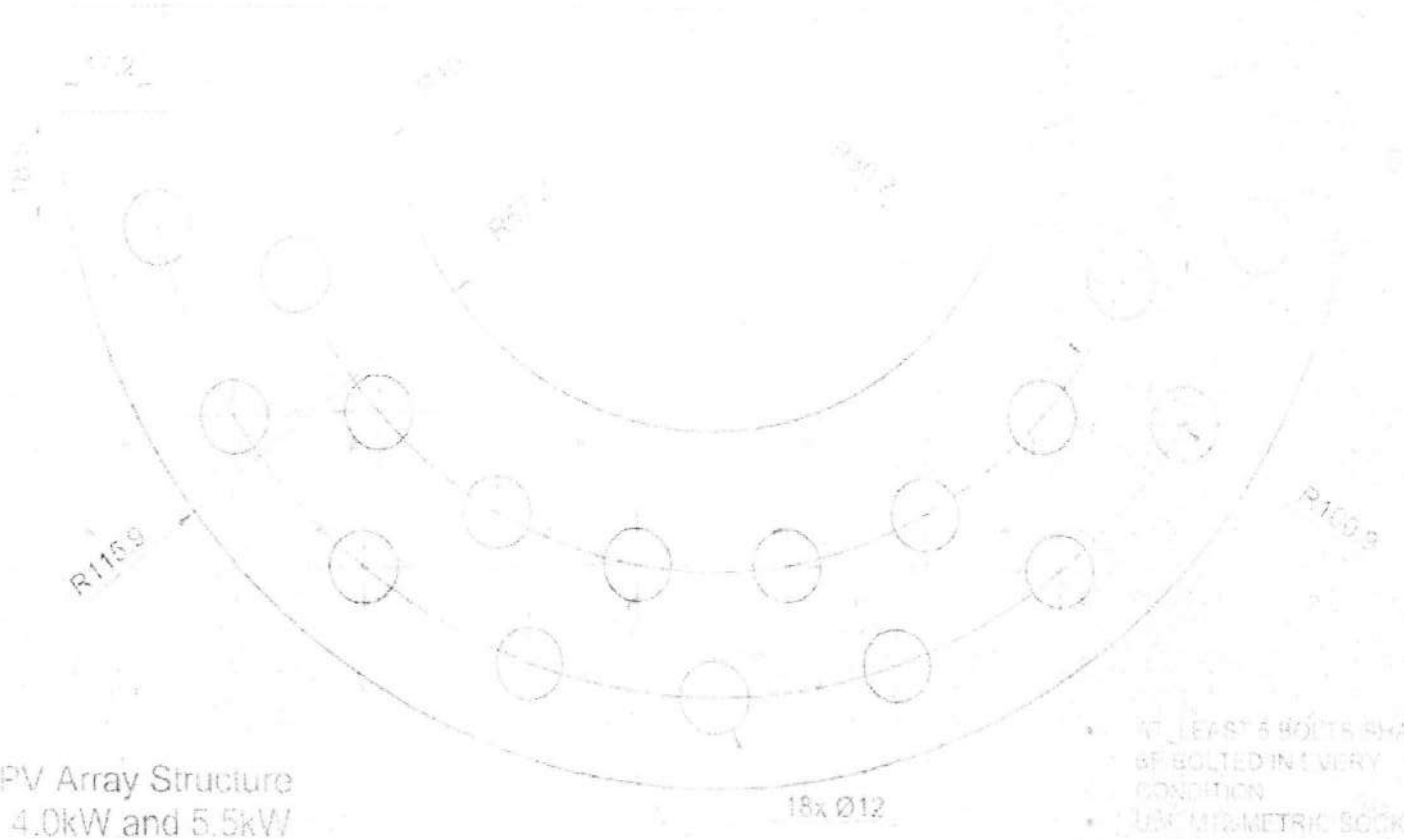
8mm THK-Bottom T-Cap
5mm THK-Top T-Cap

8-T-Cap (Top & Bottom)

Note:
All measurements are in mm

R10
R10
12mm-THK BOTTOM T-CAP
5mm -THK TOP T-CAP
PV Array Structure
5.5KW
8-T-Cap (Top & Bottom)


385 @
PV Array Structure
5.5kW



PV Array Structure
4.0kW and 5.5kW



9-Joining Plate (T-Cap & T-Pipe)

- AT LEAST 6 BOLTS SHALL BE BOLTED IN EVERY CONDITION
- USE M12 METRIC SOCKET HEAD CAP BOLT

Note:
All measurements are in 'mm'

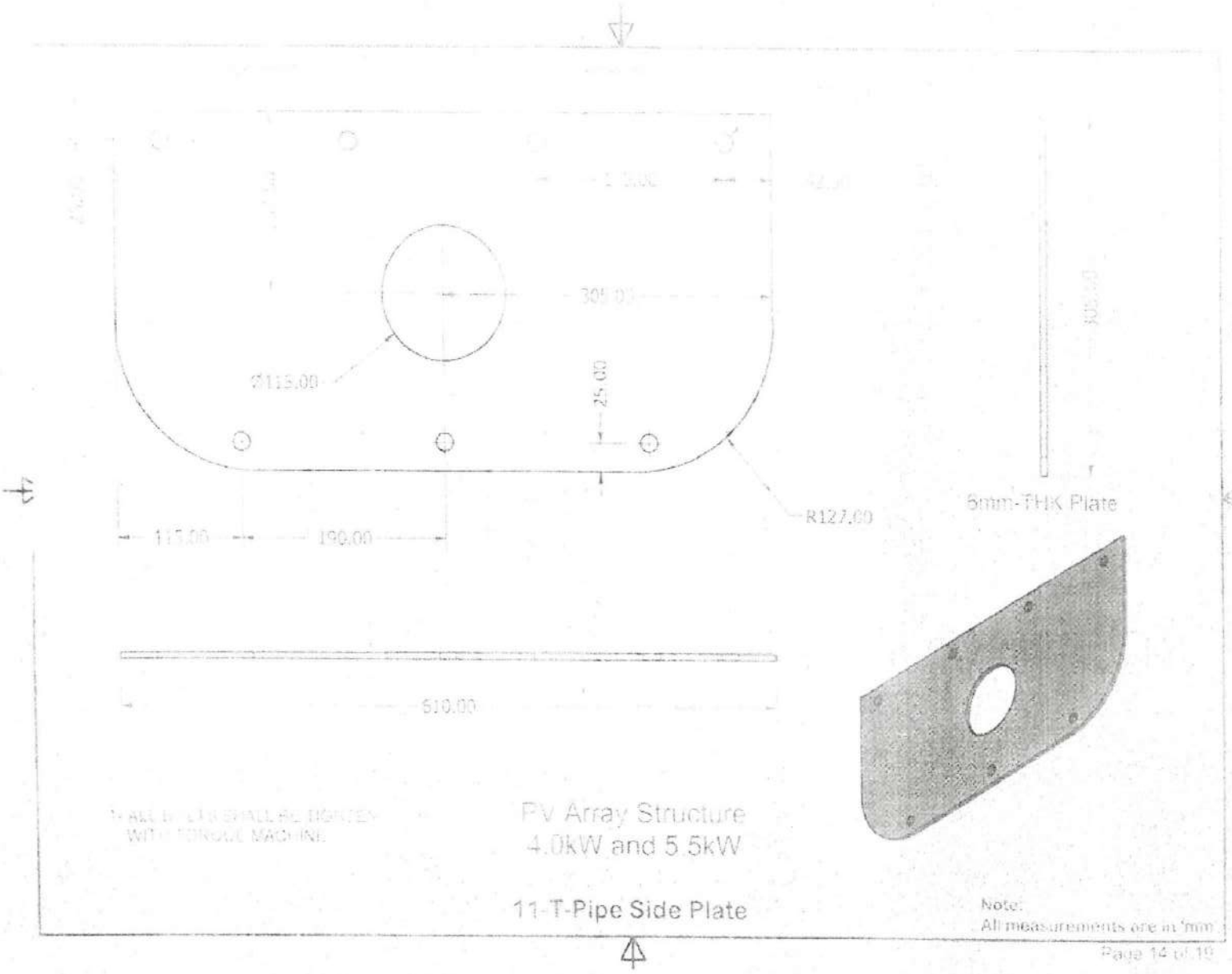
PV Array Structure
4.0kW

Note:
All measurements are in mm

10(A)-T-Pipe Structure

T-Pipe
Ø140mm
5mm THK

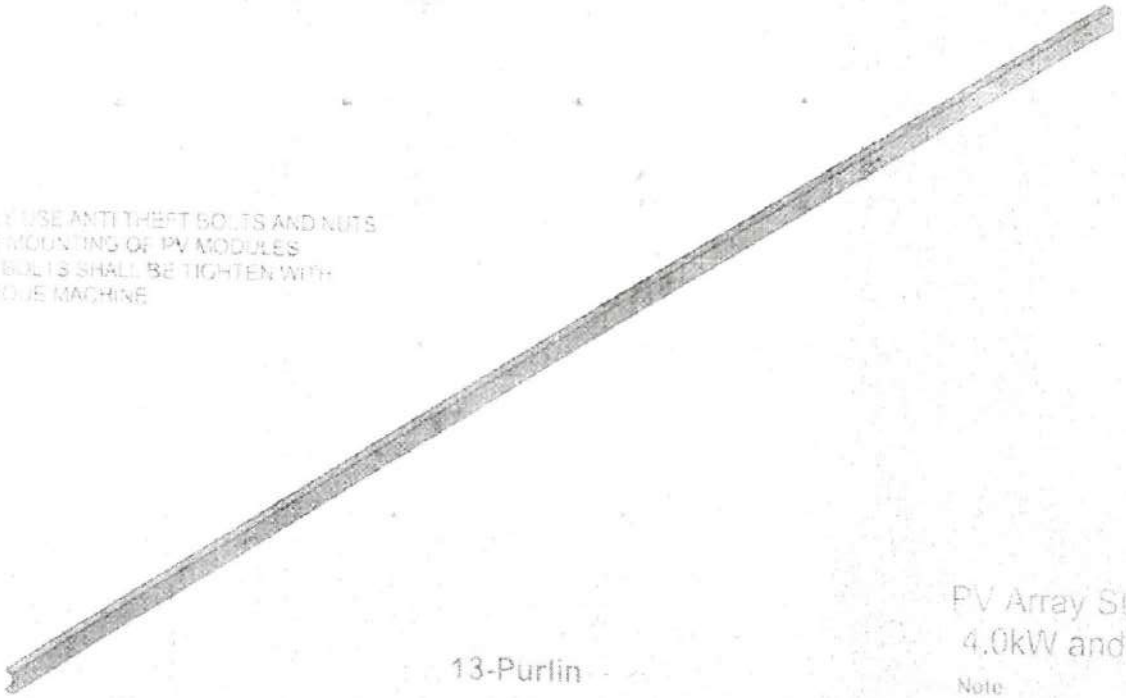
P.V Array Structure
5.5kW
10(B)-T-Pipe Structure
Note :
All measurements are in mm


Ø115.00
25.00
115.00
190.00
R127.00
6mm-THK Plate
510.00
PV Array Structure
4.0kW and 5.5kW
11-T-Pipe Side Plate
Note:
All measurements are in mm

50
272
774.23
50
581.77
175 175 175
610
3966.24
450
500
190 190
50x50x6mm
Angle Iron

All measurements may vary according to solar panel dimensions

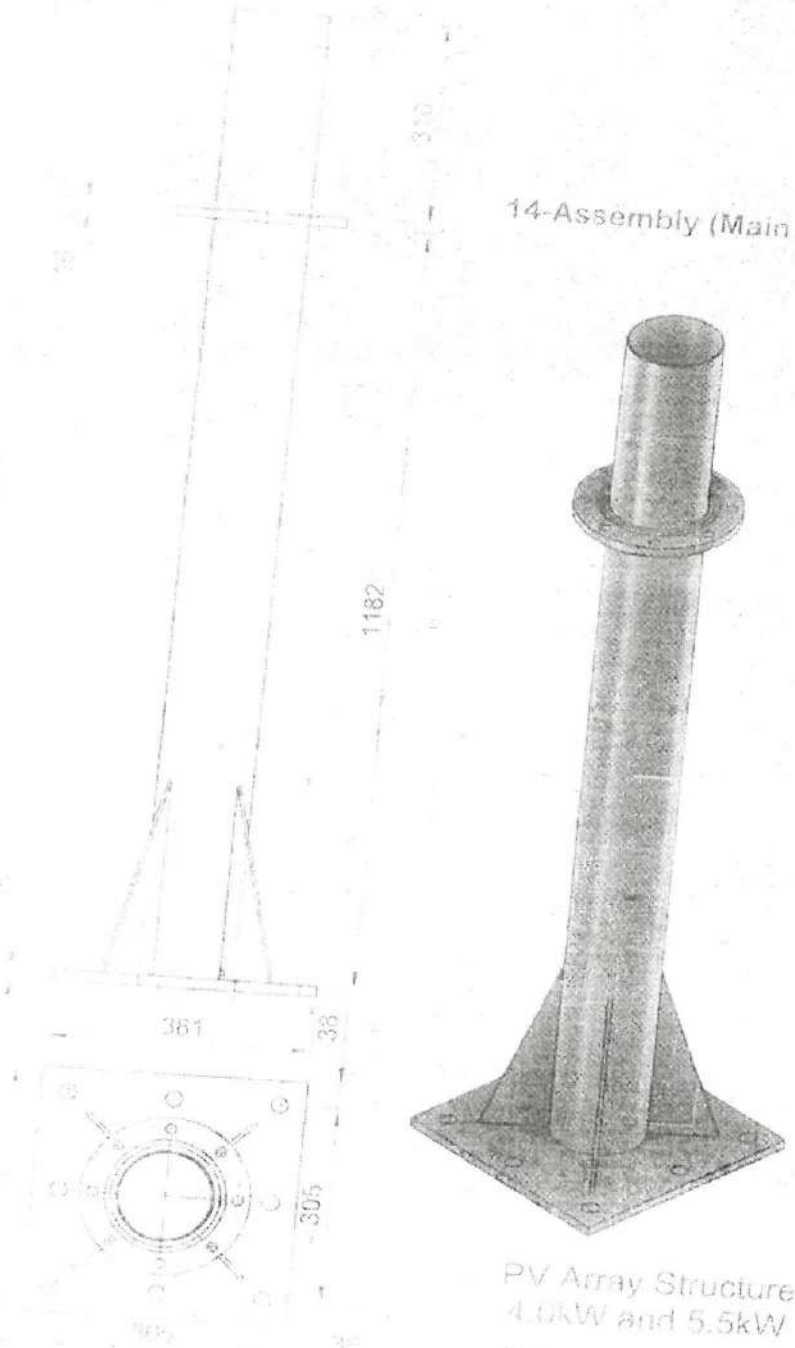
1- ONLY USE ANTI THEFT BOLTS AND NUTS FOR MOUNTING OF PV MODULES
2- ALL BOLTS SHALL BE TIGHTEN WITH TORQUE MACHINE

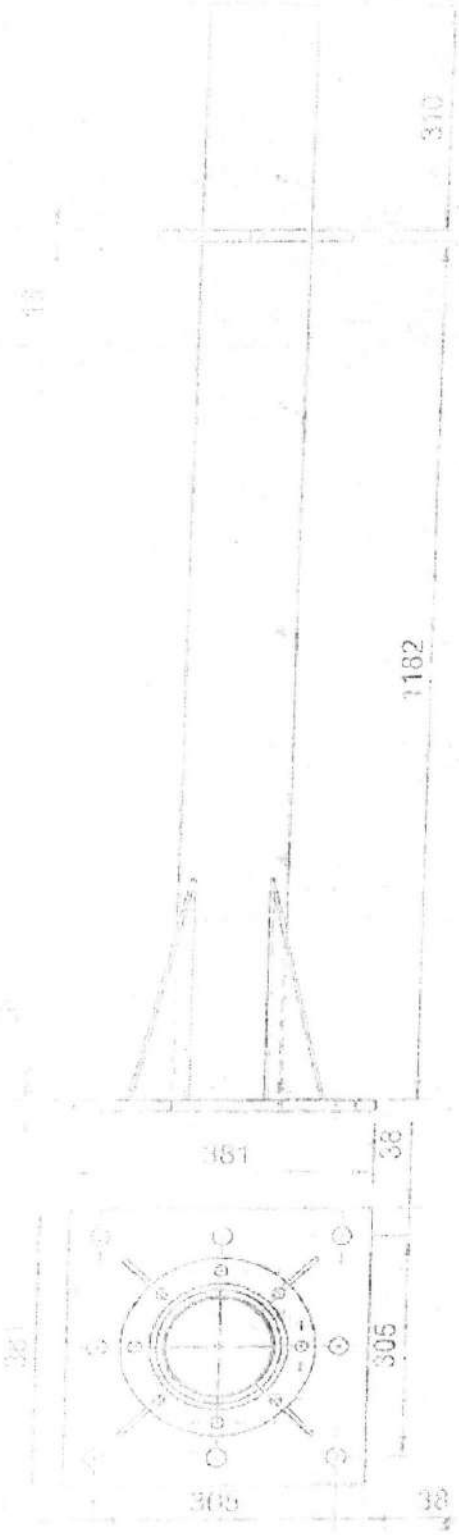


13-Purlin

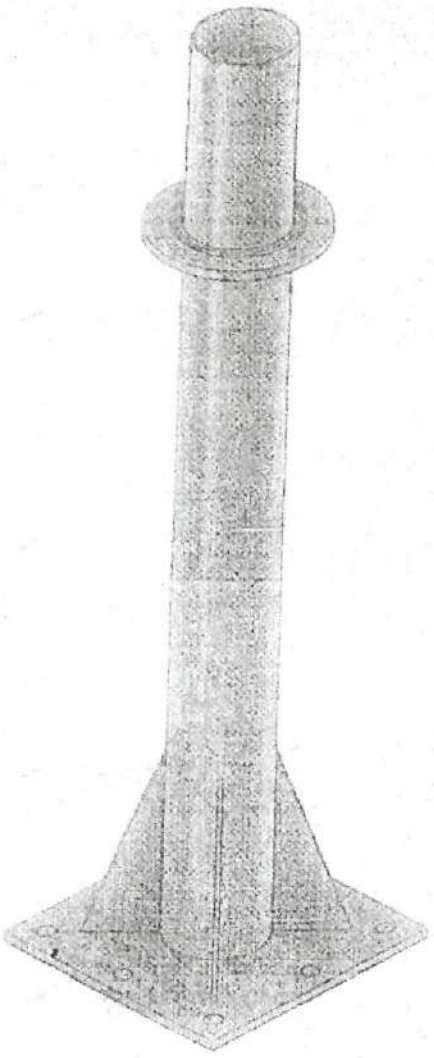
PV Array Structure
4.0kW and 5.5kW

Note
All measurements are in mm


14-Assembly (Main Pole)
1182
381
38
305
PV Array Structure
4.0KW and 5.5kW

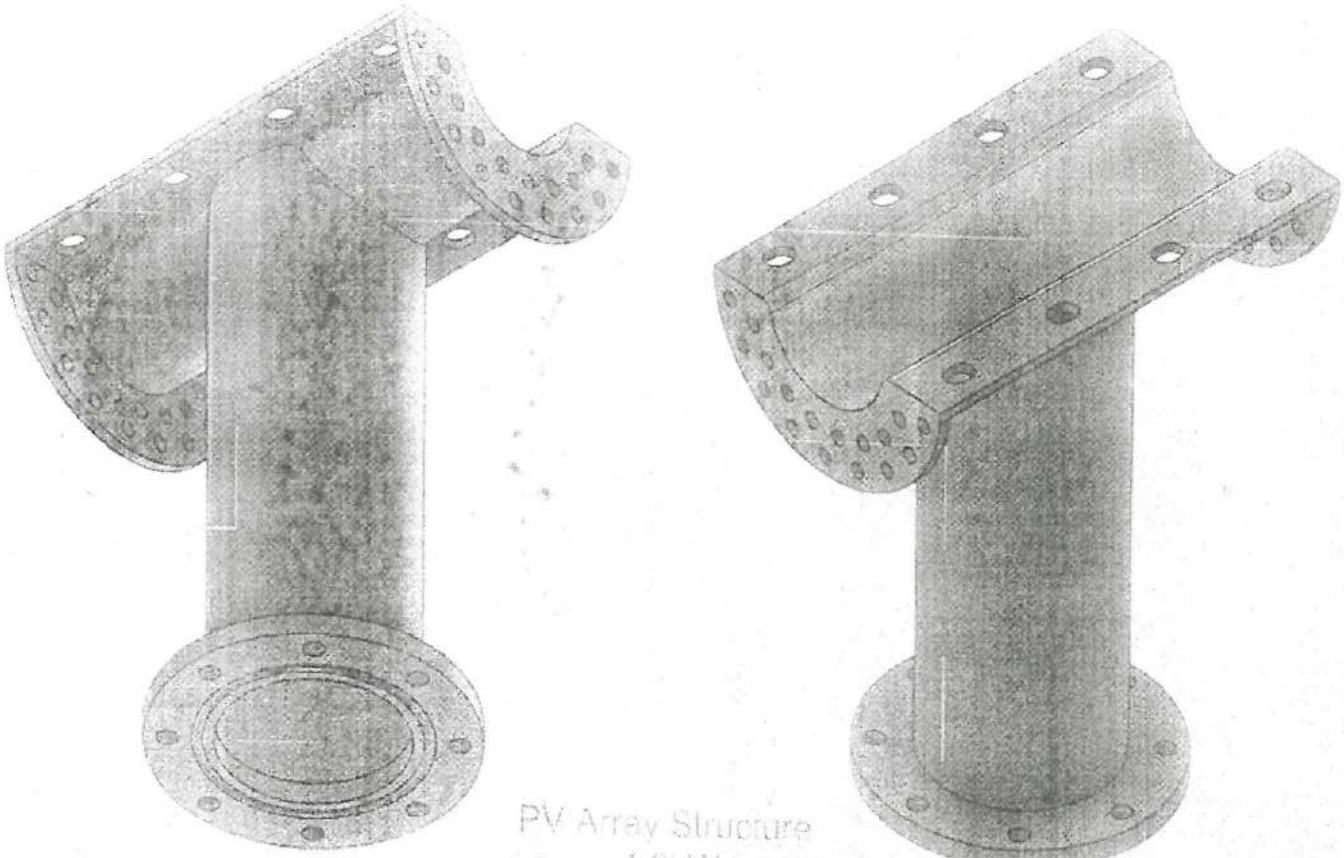


14-Assembly (Main Pole)



PV Array Structure
4.0kW and 5.5kW

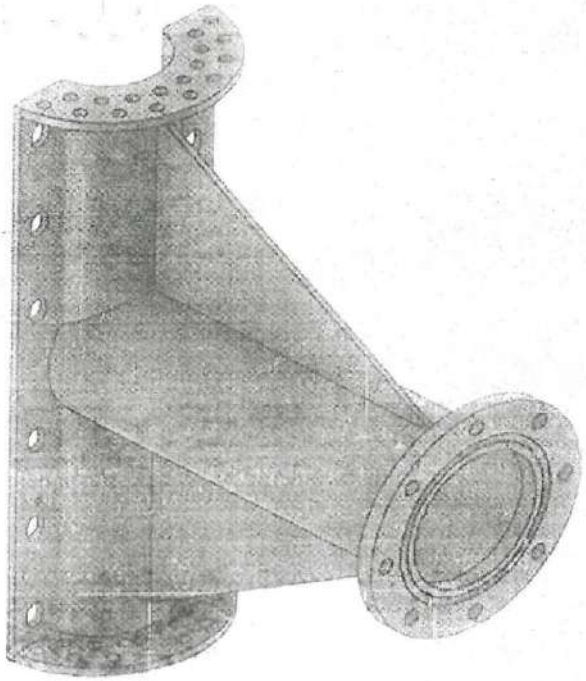
Note:
All measurements are in "mm"

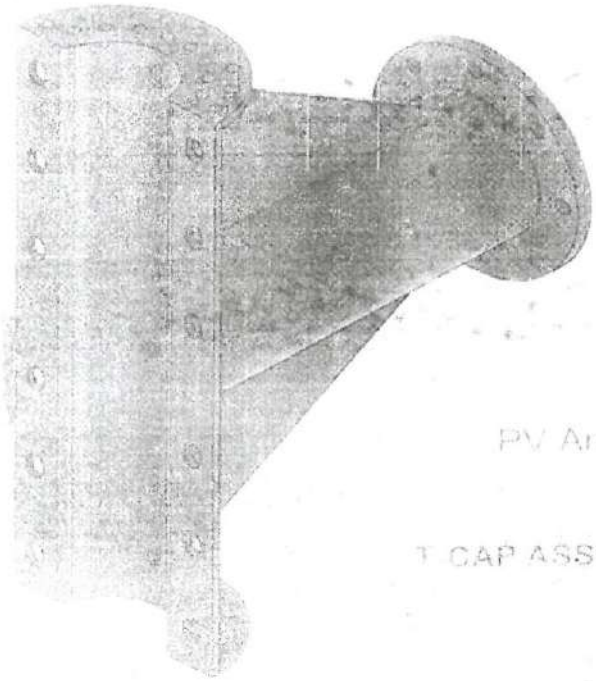


PV Array Structure
4.0kW

15-Assembly (T-CAP Structure)

Note:
All measurements are in 'mm'





PV Array Structure
5.0kW

T CAP ASSEMBLY ASSEMBLY