Project: *Gopalpur Palm Resort –*

Swosti Group

Request for Proposal:

Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam,

on

Item Rate Contract Basis

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INTRODUCTION

Background

Swosti Premium Ltd., a leading hospitality group in Odisha, the owner and developer of a hospitality project titled Gopalpur Palm Resort located at Gopalpur, Odisha(hereafter referred to as "The Client") is undertaking the development of a world-class hospitality destination under the brand **"Gopalpur Palm Resort"** at Gopalpur-on-Sea, District Ganjam, Odisha. The project envisions a premium coastal resort comprising a luxury hotel of B+G+9 storied building with 124+ keys, banquet and MICE facilities, restaurants, landscaped areas, spa & wellness, swimming pools, and associated amenities.

In pursuit of delivering a high-standard facility within a fixed timeframe, Swosti Premium Ltd. intends to select a reputed Original Equipment Manufacturer(OEM) for Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, on a **lumpsum Contract** Basis.-

Project Summary

Bid. No.	Name of Work	Estimated Cost	Construction Period	Maintenance Period
09	Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam,	₹110 Lakhs*	6(Six) Months	1 Year (DLP)+ 5 (Five) Years Paid

*Estimated Cost is exclusive of GST and based on current project planning and scope.

Scope of Work

The selected Bidder (hereafter referred to as the **"Contractor"**) shall be responsible for the following deliverables as per the terms of the Item Rate Basis contract:

- **Supply, Execution, Testing & Commissioning** based on issued GFC drawings
- **Procurement & Execution** of materials, manpower, equipment, and tools
- **MEP related facilitation with Civil Contractor in Coordination** with PMC as per client-appointed agencie's requirement.

PREAMBLE

1 The work shall be carried out strictly in compliance with this tender and design requirement. The onus of demonstrating satisfactory performance of entire system shall be sole responsibility of the contractor and supplied material shall be as per specifications and approved shop drawings. Relevant Indian Standards shall be adhered. It is to be understood that all liabilities and risks arising out of the stated conditions of contract shall be covered by contractor and Owner/Consultant shall be indemnified.

2 The unit rate for all items in the BOQ shall be quoted in Indian Rupees (INR) and include cost of equipment, wastage, accessories, tools, appliances, labour, installation, testing & commissioning upto satisfactory handover.

3 The contractor shall ensure that unit price of each item includes cost of Equipment, materials, fixing accessories, appliances, tools, plants, transport, labour and incidentals required in preparation for and in the full and entire execution, testing, balancing, commissioning and completion of work called for in the item and as per Specifications and Drawings.

4 The contractor to ensure that all waste and debris is collected and satisfactorily disposed off from site.

5 The contractor shall ensure that unit price of each item includes loading, transporting, unloading, handling/double handling, hoisting to all levels, setting, fixing in position and insurance upto satisfactory handover including security.

6 The specifications and drawings shall be read in conjunction to the Bill of Quantities. In case of conflict between Bill of Quantities and other documents including the specifications, the most stringent shall apply. The interpretation of the Architect / Consultant /Project Manager shall be final and binding

7 The quantities mentioned in the BOQ are for contractor guidance only.The actual procurement of material shall be done only after written approval of shop drawings & technical submittals. This shall also apply to the Contractor's requisition for Owner supplied materials. The contractor shall be solely responsible for material supplied at site.

9 The contractor shall ensure work is carried out in conformity with the approved shop drawings and taking cognizance of latest architectural and other displine drawings. The execution at site should be based on coordinated shop drawings or after obtaiing written approval of Project Manager/Architect/Consultant.

10 The progress of work shall be in accordance with approved pert chart which will be prepared by Contractor at the time of award of work and duly revised from time to time.

11 All shop drawings will be made on Autocad or Revit as per Project Manager requirement. Coloured prints shall be provided for site work. The shop drawings will clearly indicate requirement of hangars, supports, quantities and instructions for installation.

12 The information contained in this bid document, or any other information subsequently provided to Bidders—whether verbally, in documentary form, or by any other means—by or on behalf of the Client or any of its employees or advisers, is provided to the Bidders on the terms and conditions set out in this bid and such other terms and conditions subject to which such information is provided.

13 This bid document is not an agreement, nor is it an offer or invitation by the Client to any prospective Bidder or any other person. The purpose of this bid is to provide interested Bidders with information that may be useful in formulating their Proposals pursuant to this bid process.• This document includes statements that reflect various assumptions and assessments made by the Client in relation to the Services. Such assumptions, assessments, and statements do not purport to contain all the information that each Bidder may require. This bid may not be appropriate for all persons, and it is not possible for the Client, its employees, or advisers to consider the objectives, technical expertise, and particular needs of each party who reads or uses this bid.

14 The assumptions, assessments, statements, and information contained in this document may not be complete, accurate, adequate, or correct. Each Bidder should therefore conduct its own investigations, analysis, and due diligenG.M(B D),Swosti Premium Ltd and should check the accuracy, adequacy, correctness, reliability, and completeness of the information contained in this

bid and obtain independent advice from appropriate sources. Information provided in this bid to Bidders covers a wide range of matters, some of which depend on interpretations of law. The information provided is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Client accepts no responsibility for the accuracy or otherwise of any interpretation or opinion on the law expressed herein.

15 The Client, its employees, and advisers make no representation or warranty and shall have no liability to any person, including any Bidder, under any law, statute, rule or regulation, or under the principles of tort, restitution, or unjust enrichment, for any loss, damage, cost, or expense which may arise from or be incurred or suffered on account of anything contained in this bid or otherwise, including the accuracy, adequacy, correctness, reliability, or completeness of this document, or any assumption, statement, or information contained in or deemed to form part of this bid, or arising in any way in this selection process.

16 The issuance of this bid document does not imply that the Client is bound to select any Bidder for the provision of the Services, and the Client reserves the right to reject all or any of the Proposals without assigning any reasons whatsoever. •The Client may, in its absolute discretion—but without being under any obligation to do so—update, amend, or supplement the information, assessment, or assumptions contained in this bid.

17 The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal, including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the Client, or any other costs incurred in connection with or relating to its Proposal. All such costs and expenses shall remain with the Bidder, and the Client shall not be liable in any manner whatsoever for the same or for any other costs or expenses incurred by a Bidder in the preparation or submission of the Proposal, regardless of the conduct or outcome of the selection process.

Swosti Hotels
(A Unit of Swosti Premium Ltd.)
Corporate Office: Swosti Premium,
Jaydev Vihar, Bhubaneswar – 751013, Odisha
Email: info@swostihotels.com
Website: www.swostihotels.com

File No.: PMC/SPL/GPR/2025/01
Letter No.: 002 / Gopalpur, Date: 10th March 2026

LETTER OF INVITATION

Swosti Premium Ltd, on behalf of Gopalpur Palm Resort (A Unit of Swosti Premium Ltd), invites sealed bids for the Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, on a Lumpsum Contract Basis for selection of a qualified agency to whom the project may be awarded.

The bid documents will be made available from 10.04.2026 10.00 am IST to 01.05.2026 5 pm IST at designated link or upon request physically from Swosti Corporate Office, Bhubaneswar or through official mail ID .Bid document can be downloaded from the website - https://www.swostihotels.com/tenders.html

The completed proposals shall be submitted in hard copy (physical submission) at the address specified in the bid document no later than 3:00 PM on 02.05.2026.

Three days before the scheduled Pre-Bid Meeting the intending bidders are requested to visit the site for accessing bid document and submit their queries in written form via their official mail ids or through registered postal service addressed to Swosti corporate office.

The Pre-Bid Meeting will be held on 20.04.2025 at 12.00 AM via Zoom/Physical mode. Meeting link/Venue shall be shared subsequently.

All received proposals will be opened at 5:00 PM on 02.05.2026 in the presence of authorized representatives of the bidders (not mandatory), at the venue communicated via email.

Swosti Premium Ltd reserves the right to reject any or all bids without assigning any reason thereto and shall not be liable for any costs incurred by bidders in the preparation or submission of proposals.

All subsequent corrigenda, clarifications, or updates (if any) will be circulated through official communication only via:

gm.communications@swostihotels.com

pmc.swosti@arkitechno.com

Gopalpur Palm Resort

(A Unit of Swosti Hotels)

gm.communications@swostihotels.com

Swosti Premium Ltd. Gopalpur Palm Resort Project,Gopalpur,Ganjam

DATED: 10.04.2026

DETAILED TENDER NOTICE

1. Last Date & Time of issue of tender documents from 10.04.2026 to 01.05.2026
2. Last Date & Time of receipt of tender 02.05.2026 upto 3.00 p.m.

G.M(B D),SWOSTI PREMIUM LTD Swosti Premium Ltd ,Bhubaneswar on behalf of Swosti Premium Ltd invites sealed item rate tenders from eligible contractors for similar works.

Name of work: **Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam**

Estimated cost of work put to tender : Rs. 110 Lacs
Time of completion : 6 Months

Earnest Money Deposit: **Rs. 1,10,000/- (Rupees One Lacs Ten Thousand only)** is to be submitted with tender document as earnest money. The above payment shall be made in the shape of deposit at pay order/demand draft of a scheduled bank issued in favour of **Swosti Premium Ltd payable** at New Delhi.

Works to be completed in coordination with the main Civil & MEP Interior works contractor. No extra for non-availability of fronts or coordination with main agency shall be payable on account of the same.

Tender documents can be downloaded from SWOSTI PREMIUM LTD website (www.Swosti Premium Ltd .ac.in) and submitted with non-refundable DD of **Rs. 11800/-** in favour of **Swosti Premium Ltd** as cost of tender.

1) The tenders shall be placed in sealed envelopes with a name of work and due date written on the envelope and addressed to the G.M(B D),SWOSTI PREMIUM LTD SWOSTI PREMIUM LTD. Complete tender documents shall be submitted by the approved contractors in **two envelopes**. **1st envelope** shall contain the earnest money in the shape of Demand Draft / Pay Order of a scheduled Bank requisite shape as per condition & eligibility criteria and cost of tender as stated above along with "Technical Bid " and supporting documents . The 2nd sealed envelop shall contain the "Financial Bid" . Both the sealed envelops shall be contained in another envelop , sealed and super scribed with the "Name of the Work", the name and detailed address of the bidder as well as contact phone number & e-mail id. This sealed envelop has to be submitted at designated place as indicated in the bid document.

2) The eligible contractors who have carried out similar works in Reputed Private Hotel Chain/Govt Deptts/PSU/Reputed Pvt sector /MNCs are to

submit the experience certificates for the works and registration certificates with Govt. Depts. if any. The said certificates along with the EMD be enclosed in Envelope-1.

3) Experience of having successfully completed similar works during last seven years ending on the 31.12.2025. **The Similar works shall mean works of Minimum 600 TR capacity Water/Air cooled screw chiller.** The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum calculated from date of completion to last date of receipt of tenders.

Three similar works not less than 40 % of est.cost	Rs 50.00 lacs each Or
Two similar works not less than 60 % of est cost	Rs 70.00 lacs each Or
One similar work not less than 90 % of est cost	Rs 1 0 0 lacs each

The work of similar nature should have been executed under Central/State/Autonomous/Central PSU/State PSU/local authority/Reputed Hotelier Group formed under any Act in Central/State .

4) **The bidder should be Original Equipment Manufacturer or authorized dealers of OEM and certificate/corroborative documentary evidences are required be submitted along with the bid.**

5) The applications not supported with requisite experience certificates, GST registration certificate and ITCC in Envelope-1 shall not be entertained

6) Solvency certificate for Rs. 50 lacs from any nationalized /scheduled bank. The applicant shall submit the solvency certificate, not older than six months prior to 30th September 2025, issued by any scheduled bank, in original.

7) Average Annual Turnover over related works should be at least Rs 200 lacs during immediate last 3 consecutive financial years ending 31st Mar 2025.

8) Should not have incurred any loss in the more than two years in the last five years ending 31st Mar 2025.

9) Company should not have been barred / blacklisted for taking up similar work in any organization- A certification to this effect on the letter head of the bidder.

10) Performance certificates issued by past employers must be submitted by the

vendors for the works, in support of their experience.

11) Bidder shall furnish list of the supervisory persons and other technical persons he wishes to deploy in this job along with their experience details.

12) Letter of Authority for signing and negotiation of bid.

13) The 2**nd envelope** shall contain the financial bids including Priced Schedule of Quantities sealed,

14) The 1st envelop should contain Form of Tender, Conditions of Tender, Articles of Agreement, Brief Specifications, Condition of contract, Drawings all duly signed by the authorized signatory of the firms.

1st and 2nd envelopes are to be put in a single envelope duly super-scribed the name of work, and addressed to G.M(B D),SWOSTI PREMIUM LTD and with their address. Incase the tenderer does not fulfill the laid down eligibility criteria or fails to deposit the earnest money in prescribed form, financial bid shall not be opened.

Tenderers shall seal the tender after affixing their initials and put stamp on each and every page of tender document before submission. The tender of the contractor, who submits in-complete tender document or submits more than one tender for one work, shall not be considered at all.

Tenders will be received by the **G.M(B D),SWOSTI PREMIUM LTD up to 3.00 P.M on 02.05.2026** and will be opened by him or his authorized representative in the office of Registrar, SWOSTI PREMIUM LTD on the same day at **5.00 P.M.**

First the Technical Bids will be opened and screened. The bids shall be examined whether the EMD is in order and the bidder meets the minimum eligibility criteria specified above. . Those bidders whose EMD is in order, meets the minimum eligibility criteria, has submitted all the required documents and meet the technical requirements shall be considered for opening of financial bid. Conditional tenders would not be accepted. Financial bids in respect of contractors who do not fulfill above criterion shall not be opened.

15) No Xerox / certified copies of tenders shall be accepted, if submitted these tenders shall be rejected.

16) **Pre- bid meeting** - A pre bid meeting will be held as on **20th April 2026** at 12.00 Noon - Any doubts or queries of the potential bidders will be addressed during the hybrid meeting. Venue: Hotel SWOSTI PREMIUM LTD /Zoom Link.

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SECTION-1 INSTRUCTION TO BIDDERS (ITB)

1. The time allowed for carrying out the construction work will be 6 months from the 7th day after the date of written orders to commence the work.

2. The site for the work is available.

3. During execution of works, because of some unforeseen circumstances to enable him to complete the work as per terms of the contract, shall not relieve the contractor from any liability or obligations under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor, his agents or workmen as fully as if they were the acts, defaults or neglects of the contractor, his agents or workmen.

4. The Contractor shall be required to deposit an amount equal to 3% of the tendered value of the work as performance guarantee in the form of an irrevocable bank guarantee bond of any scheduled bank or State Bank of India in accordance with the form prescribed or in the form of fixed deposit receipt etc. within 15 days of the issue of letter of acceptance. The performance guarantee shall have the validity up to 31st Jan 2027.

5. Tenderers are advised to inspect and examine the site and its surrounding at their own cost and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risk, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at own cost all materials, tools and plants, water, electricity, access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contact documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specification of the work to be done, local condition and other factors having a bearing on the execution of the work.

6. The Accepting Authority -SWOSTI PREMIUM LTD does not bind himself to accept the lowest or any other tender and reserves to him/herself the authority to reject in whole or part, any or all of the tenders received without the assignment of any reason. All tenders in which any of the prescribed conditions are not fulfilled or for any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

7. Canvassing, whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractor who resort to canvassing will be liable to rejection.

8. The Accepting Authority reserves to himself the right of accepting the whole or any part of the tender and the tender shall be bound to perform the same at the rates quoted.

9. Tenders shall remain open for acceptance for a period of 60 days from the date of opening of the tenders. If any tenderer withdraws his tender before the said period for issue of letter of acceptance, whichever is earlier or makes any modification in the terms and condition of the tender which are not acceptable to the SWOSTI PREMIUM LTD , then SWOSTI PREMIUM LTD shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely besides black listing of the tenderer.

10. The notice-inviting tender shall form a part of the contract document. The successful tenderer/contractor shall, sign the necessary contract documents consisting of the notice inviting tender, all the documents including additional conditions, specification and drawings, if any forming the tender as issued at the time of invitation of tender and acceptance thereof with any correspondence leading thereto within the time specified in the letter communicating the acceptance of the tender. In case of delay, the earnest money may be forfeited and the tender cancelled or the contract enforced as per the terms of the tender and the invitation to tender and the tenderer shall thus be bound by the condition of contract even though the formal agreement has not been executed and signed within the specified time by the tenderer.

11. The work shall be carried out as per general of conditions of contract (Tender Contract) and form part of the agreement/document.

12. Contract is liable to be terminated by the SWOSTI PREMIUM LTD without payment of any compensation, if subsequent to the acceptance of tender the contractor is black- listed by, or enters into partnership of any black listed contractor of the SWOSTI PREMIUM LTD or any other department, or Govt. or its, undertakings.

13. Cost of Bidding

    13.1 The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

14. Clarification of Bidding Documents

    14.1 A prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing/mail at the Employer's address indicated in the invitation to bid not later than 7 days before the Date of Submission of Tenders. Email- **admin-project@Swosti Premium Ltd .ac.in**

15. Currencies of Bid and Payment

15.1 The unit rates and the prices shall be quoted by the bidder entirely in Indian Rupees. All payments will be invariably made in Indian Currency (Indian Rupees.)

16. PROTECTION OF ENVIRONMENT AND OTHER LAWS:

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and other local Acts/ Laws/ rules made there under, regulations, notifications and bye-laws of local authorities or any other law, bye-laws, regulations that may be passed or notification that may be issued in this respect in future by the State/ Local authority.

17. Evaluation of Bids Received : Detailed at following section

For and on behalf of the
Swosti Group of Hotels, Resorts, Travels & Educations
GM Corporate Communications.
Cell- 9938244538
Email: gm.communications@swostihotels.com

Bid Data Sheet

Bid Identification No.: SWOSTI/GPR/TENDER/CCW/09/2026-27

The Swosti Premium Ltd., invites sealed, offline bids from reputed and experienced civil construction firms for the following work on lumpsum basis contract. Project details are as under:

Tender Summary

Sl. No.	Particulars	Details
1	Name of Work	**Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, a on a Item Rate Contract Basis**
2	Project Location	Plot No. 182/552/617 & 184/618, Khata No. 102 (AJA), Gopalpur-on-Sea, Ganjam District, Odisha
3	Nature of Contract	Item Rate Contract
4	Estimated Project Cost	₹110 Lalhs (One Hundred Ten Thousand Only)
5	Time for Completion	06(Six) Calendar Months from date of LOA
6	Number of Packages	01 (One)
7	Eligibility	Reputed private sector entities having successfully completed similar scale works. **Relevant Project Experience must include**: •IT/Office Buildings •Commercial or Hospitality Projects
8	Cost of Tender Document	₹11,800/- (Including GST)(Non-refundable, to be paid via Demand Draft(DD) in favor of "Swosti Premium Ltd.")- Including GST
9	Availability of Tender Documents	From 10.05.2025 to 01.05.2025 up to 5.00 PM –. a) From the Swosti Hotels website - https://www.swostihotels.com/tenders.html
10	Seeking Queries on RFP Document(Through email/Letter)	20.04.2025 upto 3:00 PM a) E-mail id. manoj@arkitechno.com b) Address : Swosti Hotels Corporate Office: Swosti Premium, Jaydev Vihar, Bhubaneswar – 751013, Odisha
11	Pre-Bid Meeting	20.04.2025 at 12:00 Noon at Swosti Corporate Office, Bhubaneswar/Zoom Link in virtual mode
12	Last Date of Submission of Bids	02.05.2025 up to 3:00 PM (Sealed Envelopes at Swosti Corporate)

Sl. No.	Particulars	Details
13	Opening of Technical Bids	02.05.2025 at 5:00 PM in presence of PMC & Client
14	Technical Presentation (By technically qualified bidders)	Not Applicable
15	Opening of Financial Bids	Exact date and time shall be informed to qualified bidders atleast 48 hours of date of opening.
16	Mode of Tender	Offline, Physical Submission – Two Envelope System (Technical + Financial)
17	Bid Validity	90 Days from Last Date of Submission of Bids
18	Communication Email	manoj@arkitechno.com pmc.swosti@arkitechno.com

The bids must be submitted in hard copy (manual mode) in two separate sealed envelopes contained in another sealed envelope, marked clearly as “Technical Bid” and “Financial Bid”, mentioning the name and address of bidder, superscribed with title of work put to bids, along with all documents as prescribed in the bid document hereunder.

The client reserves the right to cancel the bidding process and/or reject any or all bids without assigning any reason there to. Corrigendum to bidding process/bid document if issued, subsequent to pre-bid meeting, shall be shared directly with bidders seeking clarification on or before pre-bid meeting/ participating in pre-bid meeting via email provided by them.

Authorized Signatory
Mr. Nihar Ranjan Sahoo, GM Corporate Communications.

Swosti Group of Hotels, Resorts, Travels & Educations

Cell- 9938244538

Email: gm.communications@swostihotels.com

Gopalpur Palm Resort Project
On behalf of Swosti Premium Ltd.

Evaluation Criteria

(Clause 1.1 of Instructions to Bidders – Gopalpur Palm Resort Project)

INTRODUCTION

- This Evaluation Criteria outlines the method by which bidders for the bids received will be evaluated based on their technical and financial qualifications, experience, project-specific understanding, organizational setup, and resource readiness.
- The evaluation will be conducted in accordance with the Instructions to Bidders (ITB) and is applicable to **Cover-I: Technical Bid**. Only those bidders who qualify under the technical evaluation will be considered for the opening and evaluation of their **Cover-II: Financial Bid**.

EVALUATION OF TECHNICAL BID (COVER-I)

The Technical Bid will be evaluated based on the following five main criteria:

Sl. No	Evaluation Criteria	Maximum Marks
a	Financial Strength	25
b	Experience in Similar Nature of Work	25
c	Working Methodology and execution of similar nature of work(DBR)	25
d	Key Personnel	25
	Total	**100**

Criteria/Sub-Criteria of TECHNICAL EVALUATION

Financial Strength – 25 Marks

Component	Max. Marks	Evaluation Basis
(i) Annual Financial Turnover (as per Bid Data Sheet)	20	70% marks for minimum eligibility criteria; 100% for twice the minimum. In between – on pro-rata basis.
(ii) Liquid Assets (as per Clause of Bid Data Sheet)	5	70% marks for minimum eligibility criteria; 100% for twice the minimum. In between – on pro-rata basis.

Experience in Similar Nature of Work – 25 Marks

Description	Max. Marks	Evaluation Basis
Completion of Similar Projects of Bid Data Sheet)	25	70% marks for minimum eligibility; 100% for twice the minimum. In between – on pro-rata basis.

Methodology and Work Program – 25 Marks

Bidder shall submit a detailed Design Basis Report covering approach to execution of civil works.

Assessment will be based on content, specificity, and alignment to project needs.

Component	Marks
Technical Specifications for Materials & Workmanship	10
Project Execution Schedule / Work Programme	10
Approach & Methodology (project-specific)	5
Total	**25**

Key Personnel – 25 Marks

The following key personnel must be proposed and CVs submitted:

Position	Qualifications & Experience	Max. Marks	Evaluation Basis
Project Manager(1 No)	B.E./B.Tech Mech/Elect with 10+ years	15	Graduation (5), Experience (Exp. 10 yrs-7 , Higher - 10)
Site Engineer-HVAC (1 No)	B.E. with 3 yrs/Diploma with 7+ years in Mech	5	Graduation (2),Dip- (1), Experience (Exp. 7 yrs-2 , Higher - 3)
Site Engineer-Elect (1 No)	B.E. with 3 yrs/Diploma with 7+ years in Elect	5	Graduation (2),Dip- (1), Experience (Exp. 7 yrs-2 , Higher - 3)

GENERAL NOTES

- Bidders must furnish all necessary supporting documentation for substantiating the information.
- Only those bidders who score **70 marks or more (out of 100)** in Technical Evaluation shall be considered for opening of their “Financial Proposal”

Enhancement Factors for Past Financial Years (for Turnover/Experience Updating):

Year Before	Enhancement Factor
One	1.10
Two	1.21
Three	1.33
Four	1.46
Five	1.61

SECTION-2-FORMS & FORMATS

DOCUMENTS TO BE FURNISHED BY BIDDER

1. Documents as specified in Section 1, must be submitted by the Bidder in the Formats mentioned in Section 2 along with the BID.

2. Any other document, if asked by Employer for clarification during evaluation, shall be submitted by the bidder.

CHECKLIST OF DOCUMENTS TO BE SUBMITTED IN TECHNICAL BID

	Criteria	**Document to be submitted**	**Submitted (Yes/No)**
1	Cost Of Bid Document	DD/BC	
2	EMD/ Bid Security -	In the form of BG/Bid Security fee deposit details.	
3	Written power of attorney of the signatory of the Bid to commit the Bidder(If any)	Copy of power of attorney	
4	Whether Indian firms (Y/N)	Certificate of Incorporation	
5	OEM firms with proven track record of execution of similar HVAC Projects in IT buildings, commercial complexes, hospitality projects, or high-rise structures (G+9 or above).	Relevant Certificate	
6	Constitution or legal status of Bidder	Incorporation Certificate, Partnership Deed, Trade License, MoA, AoA	
7	Place of registration	Qualification Information	
8	Principal place of business	Qualification Information	
9	Major items of construction equipment proposed to carry out the Contract	Invoices of equipment / Lease agreement/Letter of Commitment	
10	Qualifications and experience of key site management and technical personnel proposed for the Contract	Detailed CV	
11	Reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past five financial years	CA Certificate along with Audited Financial report for the relevant Financial Years	
12	Evidence of adequacy of working capital for this contract [access to line (s) of credit and availability of other financial resources]; Liquid assets and / or availability of credit facilities	Banker's certificate	
13	Authority to seek references from the Bidder's bankers	Bankers Details	

14	Information regarding any litigation or arbitration resulting from contracts executed by the bidder in the last five years or currently under execution	List of Litigation, if any	
15	Methodology & Programme.	To be submitted	
16	Bids from Joint venture - Bids from Joint ventures / Consortiums / Association of Parties are not acceptable	NA	
17	Annual minimum turnover	Turnover from HVAC Construction works certified by chartered Accountant	
18	The Firm should demonstrate making profit	CA/ Statutory auditor certificate	
19	Should have valid PAN and GSTIN	Scan copy of valid PAN and GSTIN	
20	Experience of successful completion of works / substantial completion of works (90% of the value of the contract to be considered as substantial completion) as referred in Bid Data Sheet C l.2.3).	Completion Certificate from Competent Authority mentioning all the details as per Bid Data Sheet/TDS Certificate for Pvt Sector Project	
21	Bid Validity Undertaking	Undertaking	
22	Affidavit	Affidavit by the bidder duly signed by the Notary Public and as specified in Section 2,	
23	Design Basis Report	NA	
24	Certificate of No Relationships	As per format given in Section-2 of the tender document	
25	Information Regarding Any Conflicting Activities and Declaration Thereof	As per format given in Section-2 of the tender document	
26	Proposal for Sub-Contract	To be mentioned	

Undertaking by Tenderer

I/We have read and examined and understood the notice inviting tender, schedules, Specifications applicable, drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions, & all other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I / We hereby tender for the execution of the work specified for the SWOSTI PREMIUM LTD within the time specified in schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in General Rules and Directions and Conditions of contract and with such materials as are provided for, by, and in respect in accordance with, such conditions so far as applicable.
We agree to keep the tender open for Ninety (90) days from the due date of its opening and not to make any modifications in its terms and condition.
A sum of Rs.....……Rupees…… ……..)
has been deposited in demand draft of a scheduled bank issued by a scheduled bank as earnest money. If I / we, fail to furnish the prescribed performance guarantee within prescribed period, l / we agree that the said G.M.(BD), SWOSTI PREMIUM LTD or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if l / we fail to commence work as specified, I / we agree that Director, SWOSTI PREMIUM LTD or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the 25 percentage and those in excess of that limit at the rates to be determined in accordance with the terms of contract. Further, I / We agree that in case of forfeiture of earnest money or both Earnest Money & Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

I / We hereby declare that I / we shall treat the tender documents drawings and other records connected with the work as secret / confidential documents and shall no communicate information / derived there from to any person other than a person to whom I / we am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated. . . . .
Witness: Signatures of Contractor
Address: Postal Address
Occupation:

LETTER OF SUBMISSION

The GM Corporate Communications.
Swosti Group of Hotels, Resorts, Travels & Educations
Cell- 9938244538
Email: gm.communications@swostihotels.com
Gopalpur Palm Resort Project
On behalf of Swosti Premium Ltd

Sir,

.I/We, the undersigned, have read and examined in detail, the HVAC specifications and all bidding documents and hereby declare that:

Price and Validity

1. All the rates quoted in our proposal are in accordance with the terms and conditions as specified in the bid document. All the prices and other terms and conditions of this proposal are valid for a period of 90 calendar days from the date of opening of bid.
2. We do hereby confirm that our bid prices include all taxes/levies. GST indicated separately.
3. We hereby declare that if any tax law is altered, we shall pay the same.
4. The quoted rates are inclusive of ESI , PF and Green Tax no extra on such heads would be payable on such account.

Earnest Money

We have enclosed EMD in the form of demand draft no…..... , dated……..favoring Swosti Premium Ltd. payable at Bhubaneswar issued / drawn on … Bank for Rs.__/- (Rupees ___Thousand only), as desired.

Deviations

We declare that all the works shall be performed strictly in accordance with the technical specifications and other tender conditions with no deviations.

Qualifying Data

We confirm that all information/data have been submitted as required in tender document.

We hereby declare that our proposal is made in good faith, without collusion for fraud and the information contained in the proposal is true and correct to the best of our knowledge and belief. I/We agree that in case any information is found to be incorrect the tender is liable to be rejected at any point of tendering process.

Bid submitted by us is properly sealed and prepared so as to prevent any subsequent alteration and replacement.

We understand that you are not bound to accept the lowest or any bid you may receive.

Thanking you,
Yours faithfully,
(Signature and seal of Tenderer with name, designation and contact no.)

NON-BLACK LISTING DECLARATION

FORMAT OF UNDERTAKING, TO BE FURNISHED ON COMPANY LETTER HEAD WITH REGARD TO BLACKLISTING/ NON- DEBARMENT, BY ORGANISATION

UNDERTAKING REGARDING BLACKLISTING / NON – DEBARMENT

To,
SWOSTI
PREMIUM LTD
Bhubaneswar

We hereby confirm and declare that we, M/s ----------, is not blacklisted/ De-registered/ debarred by any Government department/ Public Sector Undertaking/ Private Sector/ or any other agency for which we have Executed/ Undertaken the works/ Services during the last 5 years.

Signature of Contractor

With stamp

.

GENERAL INSTRUCTIONS FOR SITE *VISIT*

I, , aged years, son/daughter of , presently residing at and authorized by (name of tenderer) ("Tenderer") to solemn this affidavit on behalf of the Tenderer, solemnly affirm on oath as hereunder:

The Tenderer confirms that the Tenderer has duly undertaken the visit of the proposed project site of SWOSTI PREMIUM LTD located at Gopalpur ,Ganjam

The Tenderer has inspected and examined its surroundings and has satisfied itself about the site conditions and site logistics. The Tenderer confirms that it is aware of the ground conditions and nature of the site, means of access to the site and the accommodation area required for establishing the labour camp. The Tenderer agrees and confirms it shall be solely responsible for arranging and maintaining the afore- mentioned at its own cost including all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for executing the Work unless otherwise specifically provided for in the contract documents.

The Tenderer confirms and agrees that the submission of the tender implies that the requisite site visit has already been undertaken and that the Tenderer has acquainted itself with the local conditions and other factors having a bearing on the execution of the Work.

DEPONENT VERIFICATION

I, , aged years, son/daughter of , presently residing at and authorized by Tenderer verify that the information mentioned above is true and correct to the best of my knowledge and belief.

DEPONE

LETTER OF ACCEPTANCE

(To be issued to the successful bidder on the letterhead of Swosti Premium Ltd.)

[Date: _____]

To,
[Name and Address of the Contractor]

Subject: Letter of Acceptance for Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam, on a Item Rate Contract Basis)

Dear Sir(s),

This is to notify you that your Bid dated _____ for execution of the following work on a Lumpsum basis:

Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam,, on a Item Rate Contract Basis)"

for the Contract Price of Rs. _____ (Rupees _____ only), as corrected and modified[1] in accordance with the Instructions to Bidders, is hereby accepted by Swosti Premium Ltd.

We note that as per your bid,
☐ You do not intend to subcontract any component of work
or
☐ You propose to employ [Insert Name of Sub-Contractor] as sub-contractor for executing [Insert Work Component]
(*Delete whichever is not applicable*)

You are hereby requested to furnish a detailed Work Programme along with milestone-wise activity chart and cash flow forecast (S-curve) as per the Bid Data Sheet within 14 (fourteen) days from the issue of this Letter of Acceptance (LoA).

Further, you are required to furnish the Performance Security as specified in the Bidding Documents for an amount of Rs. _____, in the form prescribed, within 21 (twenty-one) days of receipt of this Letter of Acceptance.

Failure to comply with the above conditions may result in actions as specified in Clause 23 and 24 of the Bid Data Sheet.

We look forward to the successful execution of the project.

Yours faithfully,

_____
Authorized Signatory
Swosti Premium Ltd.
Bhubaneswar

NOTICE TO PROCEED WITH THE WORK

(To be issued on Letterhead of Swosti Premium Ltd.)

[Date: _____]

To,
[Name and Address of the Contractor]

Subject: Notice to Proceed – Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam,, on a Item Rate Contract Basis)

Dear Sir(s),

Pursuant to your furnishing of the required Performance Security in accordance with Clause of Bid Data Sheet, and the execution of the Contract Agreement for the work titled:

"Supply, Installation, Testing & Commissioning of Supply, Installation, Testing & Commissioning of Hot Water System and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd.,Gopalpur, Ganjam,, on a Item Rate Contract Basis"

at a Bid Price of Rs. _____ (Rupees _____ only), you are hereby instructed to proceed with the execution of the said works effective immediately, in strict accordance with the terms and conditions of the contract documents.

We trust that you will mobilize your resources promptly and commence the work at site without delay as per the agreed programme and milestones.

Wishing you a successful execution.

Yours faithfully,

_____
Authorized Signatory
Swosti Premium Ltd.
Bhubaneswar

PERFORMANCE BANK GUARANTEE

To
_____[name of Client]
_____[address of Client]

WHEREAS_____[name and address of Contractor] (hereafter called "the Contractor") has undertaken, in pursuance of Contract No.___ dated _____to execute _____[name of Contract and brief description of Works] (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;
AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:
NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of___ [amount of guarantee]*_____(in words), such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of_[amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.
We hereby waive the necessity of your demanding the said debt from the contractor before presenting us with the demand.
We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between your and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.
This guarantee shall also be operatable at our Branch at Bhubaneswar, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.

The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of Odisha Bridge & Construction Corporation Ltd details of which is as under:

Sl No.	Particulars	Details
1	Name of Beneficiary	Swosti Premium Ltd
2	Name of Bank	Union Bank Of India
3	Account No	128713100000061
4	IFSC Code	UBIN0578827

This guarantee shall be valid until 28 days from the date of expiry of the Defect Liability Period. Signature and Seal of the guarantor
Name of Bank _____ Address_____ Date _____

* An amount shall be inserted by the Guarantor, representing the percentage the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

BID SECURITY– Cover-IV

Bid Security (EMD): 8,50,000.00 INR

Affidavit (on Non-Judicial Stamp, attested by Notary Public)

Declaring authenticity of all submitted information and non-involvement in any corrupt or fraudulent practice.

Authorized Signature: _____
Name & Title: _____
Name of the Bidder: _____
Company Stamp/Seal

BANK CERTIFICATE

(To be issued by the Bidder's Bank on official letterhead and submitted by the Bidder in Cover-IV)

TO WHOMSOEVER IT MAY CONCERN

This is to certify that M/s. [Insert Name of Bidder] is a reputed company with good financial standing and banking conduct.

If the contract for the work, namely:

"Construction of Gopalpur Palm Resort – Core Civil Works (Lumpsum Package)"

is awarded to the above-mentioned firm, we confirm that we shall be in a position to provide overdraft / cash credit / fund-based credit facilities to the extent of:

₹ [Insert Amount in Figures and Words]

to meet their working capital requirements for executing the said contract.

Sl No.	Particulars	Details
1	Name of Beneficiary	Swosti Premium Ltd
2	Name of Bank	Union Bank Of India
3	Account No	128713100000061
4	IFSC Code	UBIN0578827

INFORMATION REGARDING ANY CONFLICTING ACTIVITIES AND DECLARATION THEREOF

(To be submitted on Bidder's Letterhead)

To,
The G M (B.D)

Swosti Premium Ltd.
Bhubaneswar

Subject: Declaration Regarding Conflicting Activities

Dear Sir,

I, the undersigned, hereby declare that our firm/company is not engaged in any activities that can be termed as conflicting in nature with respect to this tender for the project titled:

"Supply, Installation, Testing & Commissioning of Water Cooled Screw Chillers and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd., Gopalpur, Ganjam, on a Lump sum Contract Basis)"

I also acknowledge that in case of any misrepresentation or concealment of facts related to this declaration, our proposal and/or contract shall be liable for rejection/termination by the Client, and the decision shall be binding upon us without any claim whatsoever.

Authorized Signatory: _____
Name & Designation: _____
Name of the Bidder: _____
Stamp/Seal: _____
Date: _____
Communication Address: _____

Note:
Conflicting activities refer to any potential conflict of interest arising from prior, current, or proposed agreements, engagements, or affiliations with the Client that may impair the bidder's objectivity, integrity, or impartiality in the execution of the project.

AFFIDAVIT

[To be submitted by the bidder in a non-judicial stamp paper duly signed by the Notary Public]

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.

2. The undersigned also hereby certifies that neither our firm M/s…….. … .....have abandoned any work on building in India nor any contract awarded to us by the State of Odisha for such works have been rescinded, during last five years prior to the date of this bid.

3. The undersigned hereby authorize(s) and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.

4. The undersigned understand and agrees that further qualifying information may be requested and agrees to furnish any such information at the request of the Department/ project implementing agency.

_____

Authorized Signature: Name & Title of Signatory:
Name of Bidder :

SECTION-3
BOQ,SPECIFICATIONS& TENDER DRAWINGS :

These Particular are to be read in conjunction with other documents issued along with tender. In case of any discrepancy between Design drawings, General conditions or Bill of quantity, Following order of preference shall be applicable.

- BOQ
- Specification
- Tender drawings

The contractor shall refer the tender drawings attached at end of this section.

The contractor shall refer the following annexure while bidding and will read them in conjunction with specifications as well as bill of quantity

Annexure - I : Design Criterion
Annexure -II : List of approved makes
Annexure -III : Codes and Standards
Annexure -IV : Technical Specifications
Annexure -V : Technical Data Sheets

ANNEXURE-I

DESIGN CRITERION

1.0 DESIGN CRITERION

Following shall be basis for developing the design:

Site Location	:	Gopalpur, Odisha
Geographical Data	:	20°15’ N, 85°49’ E
Altitude	:	46 m above the sea level

1.1 Outdoor Design Temperatures

The recommended outdoor design conditions for Bhubaneswar, (which is approximately 170 km from Gopalpur) mentioned in ISHRAE Weather Data Book-2022 has been selected

S. No.	Season	Outdoor Temperatures	
		DBT	WBT
1.	Summer	38.9 °C (102.02°F)	27.0 °C (80.6 °F)
2.	Monsoon	35.0 °C (95.0 °F)	30.1 °C (86.18 °F)
3.	Winter	14.1 °C (57.38 °F)	-

The outdoor temperatures are based on 0.4 % cumulative frequency of occurrence.

1.2 Envelope Details

Based on recommendations from ECBC for Warm-Humid zone, the minimum performance requirements are given below:

S No.	Description	Recommendation (Btu/Hr.Sqft °F)
1.	Exposed Masonry Wall	0.11
2.	Exposed Roof	0.05
3.	Window to Wall Ratio	As per design
4.	Glazing U-Value	0.50
5.	Glazing SHGC	0.27
6.	Spandrel	0.06

1. GENERAL

EPC Contracting Work of Hot Water System for proposed JW Marriot, Sohna road, Gurugram.

The materials, design and workmanship shall satisfy the specifications and codes referred to. In the absence of any Standard / Specifications covering any part of the work covered in this tender document, the instructions / directions of engineer-in-charge will be binding on the contractor.

All Hot Water System installations shall be of high quality, complete and dully operational including all necessary items and accessories whether or not specified herein. All Hot water system work shall be completed in accordance with the regulations and standard to the satisfaction of the Engineer-in-charge.

IGBC minimum Gold rated as per Green Building rating System in India shall be achieved. The EPC Contractor shall provide complete details & documents as required by the IGBC Consultant for certification & shall work in consultation with IGBC Consultant.

For all energy efficiency, ECBC 2017 shall be followed & ECBC Plus Building category shall be referred in ECBC 2017.

The design specifications indicated are minimum guidelines to enable the contractor to carry out engineering and execute entire Hot water system works to meet the indicative design / employer’s functional requirement.

The contractor shall provide detailed Hot water system DBR based on relevant codes referred in document along with all the calculation, drawings etc as required by the client.

All given capacity and numbers in each section of DBR is indicative and for reference only & which is the minimum requirements and during detailed designing, if required and found necessary, the capacity / rating / numbers of the tank, equipment, associated items, materials etc shall be upgraded / revised in higher / stringent side with the approval of Engineer-In-Charge / Main EPC Consultant.

2. PROPOSED BUILDING

The tender drawings are just for reference. The actual & final Hot water system drawings shall be prepared by the successful Contractor after due co-ordination with other services & shall be approved by Engineer-in-Charge / Consultant / Architect before commencement of site work. The EPC Contractor has to ensure that their proposal will meet with all the current rules & regulations pertaining to the relevant local / national statutory.

3. WORK DESCRIPTION

The work shall be strictly carried out as per the scope listed in this document and in accordance with the specifications. The equipment & material supplied at site will also be selected out of the list of approved makes. Bill of quantity provided with the document is for contractor guidance. It is expected that after award of work, contractor shall prepare shop drawings for approval by the Consultant & Client representative and also submit Technical documentation duly identifying shortlisted make of material/equipment along with its data sheets. Actual ordering shall be based on approved shop drawings & documents.

The work at site shall comply with the approved shop drawings and will meet the satisfaction of Client representative. The contractor shall be required to demonstrate satisfactory operation of entire system (including client supplied equipment installed by contractor) and furnish the required labour, material & tools to install & commission the system.

The broad scope of work for proposed plumbing system covered under this contract shall include supply, installation, testing & commissioning of the following:

- Heat Pumps and Control Equipment.
- Feed water tanks, Transfer pumps, valves, pressure reducing station, pressure /temperature gauges and sensors etc.
- Other Miscellaneous Items.

Besides above, contractor shall also be required to undertake following:

- Obtain approval from Local Authorities prior & post installation for operation of system.
- Minor civil works which include making openings in walls & slabs and making good of the same.
- Commissioning of the plant including test reports to demonstrate satisfactory working prior to handing over.
- Provide as-built drawings and handing over document Test reports, list of recommended spares, operation & maintenance manual for the entire plumbing system.

4. SITE MANAGEMENT

The Contractor shall be required to provide following staffing for the project:

a. Design Engineer who will work with Consultant for getting shop drawings, technical submittal and variation in quantity statement approved.

b. Procurement team.

c. Full time dedicated Engineer & one supervisor posted at site.

The contractor shall submit organization chart and CV prior to starting work at site.

The Contractor shall have required stores, tools & plant, security and facility to transport materials to place of installation for speedy execution of work.

5. REGULATIONS & PERMITS

Prior to starting work at site, the contractor shall obtain required permits/ licenses required for satisfactory execution and operation of the installation. All reciepted amounts shall be reimbursed by Client on production of proof of payment by the contractor.

The executed work shall strictly confirm to applicable laws, regulations and Indian Standards which become applicable. In case the specifications and drawings contained in this document call for higher standard than those required by prevailing regulations, then these specifications & drawings shall become applicable. However, in case of

any conflict or violation between the document/drawings and prevailing laws, then the applicable laws & regulations shall be governing & binding.

6. SHOP DRAWINGS

A set of design drawings listed in this document are available at Consultant office and may be issued with the tender document. These design drawings are for reference of the contractor and indicate proposed arrangement and the extent of work covered in the contract. The data given in the drawings and specifications is as exact as could be procured, but its accuracy is not guaranteed. The contractor cannot execute work or scale these drawings for reference.

Following shall be the procedure followed by contractor while preparation of shop drawings:

- The contractor shall refer the design drawings for understanding the scope and proposed routes to be followed during execution.

- Collate latest architectural backgrounds from the Client representative / Architect / Consultant.

- Within one week of award of work, the Contractor shall prepare a list of shop drawing along with submission schedule for approval of Client representative/Consultant. The list of drawings must include layouts for Plant room, Pump room, Typical drawings showing exact location of supports, flanges, bends, tee connections, reducers, detailed piping drawings showing exact location and type of supports, valves, fittings etc; electrical panels inside/outside views, power and control wiring schematics, cable trays, supports and terminations.
Maximum headroom shall be maintained at all points and in case the same is inadequate, then written approval from Client representative must be obtained prior to execution at site.
These shop drawings shall depict information required to complete the Project as per specifications and as required by the Consultant/Client representative. These Drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all measurable items of equipment/materials/works and progressive cumulative totals from other related drawings to arrive at a variation-in-quantity statement at the completion of all shop drawings.
Where the work under this contract is proposed to be installed in close proximity or is interfering with other trades, then based on client representative/consultant directions, the contractor shall prepare all services coordinated working drawings and sections at a suitable scale (not less than 1:50), clearly showing proposed installed in relation to the work of other trades.
- The contractor shall thereafter furnish six sets of detailed shop drawings to Client representative/Consultant for obtaining comments/approval. The Contractor will make unlimited number of re-submissions of shop drawings unless Client representative/Consultant/Architect approval is obtained.
- The Contractor will thereafter submit six sets of final shop drawings to the Client representative for their exclusive use and all other agencies.
- No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/installation.
- In case installation is carried out without following above process or obtaining a waiver to follow the procedure from Client representative, the work shall be rejected and contractor shall rectify the same at their own cost.
- Shop drawings shall be submitted for approval minimum four weeks in advance of planned delivery and installation of any material to allow Client representative/ Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

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

7. TECHNICAL DOCUMENTATION

The contractor prior to supplying material at site, will submit the following documentation to Consultant/Client representative for approval:

- Manufacturers drawings, catalogues, pamphlets and other documents in triplicate. Each item shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.

- Samples of all materials shall be submitted to the Client's site representative prior to procurement. These will be submitted in two sets for approval and retention by Client's representative and shall be kept in their site office for reference and verification till the completion of the Project. Wherever directed, a mockup or sample installation shall be carried out for approval before proceeding for further installation.

- Where the contractor proposes to use an alternate make or model of equipment other than that specified, all new drawings and detailing required thereafter shall be prepared by the contractor at his own expense including any re-design required for other discipline/trade. Any delay on such account shall also be at the cost of and consequence of the Contractor.

Contractor to refer Annexure –I for list of approved makes & materials for this project.

8. VARIATION IN QUANTITY STATEMENT

After approval of major & relevant shop drawings, the contractor shall submit four copies of a comprehensive variation in quantity statement. This statement must be submitted prior to completing ordering of equipment and should identify imported/local materials in this contract as well as proposed spares/tools. The Consultant shall provide recommendation to Client representative for acceptance of anticipated variation in contract amounts and also advise Client to initiate action for procurement of spare parts and tools at the completion of project.

9. QUALITY ASSURANCE

The contractor to ensure that all materials and equipment supplied shall be new and of best available quality conforming to the relevant Indian Standard Specifications and to these specifications. Makes shall be strictly in conformity with list of approved manufacturers as per Annexure - I. Owners reserve the right to reject any item which in their assessment is second hand

Any deviations from above shall be clearly highlighted prior to supply and shall be brought to the notice of the Client representative/Consultant for further instructions in the matter.

Prior to starting execution work at site, the Contractor shall verify the sufficiency of the size of the shaft openings, clearances and ceiling spaces for proper installation. Failure to communicate insufficiency of any of the above, shall constitute Contractor acceptance of the same. The Contractor shall locate all equipment in fully accessible locations which can be easily serviced, operated or maintained. Valve or other devices requiring attendance shall be finalized and communicated in sufficient time. Failing this, the Contractor shall make all the necessary repairs and changes at own expense. Access panel shall be marked.

10. WORKS NOT COVERED UNDER THIS CONTRACT

Following works are excluded from the scope under this contract. These shall be executed by respective contractor in accordance with approved shop drawings where these details must be highlighted. However, contractor shall be responsible for providing details and thereafter supervision to ensure satisfactory & timely execution of these associated items as they have a bearing on this contract.

11. INTEGRATION WITH BUILDING AUTOMATION SYSTEM

The scope of Plumbing and Firefighting Contractor shall include the following for the interface to Building

Automation System and no additional cost shall be paid for providing the interface feasibility.

- Stop/Manual/ Auto switches along with potential free contacts for monitoring the manual operation status, to be provided for those equipment whose start / stop is controlled by Building Automation System.
- Potential free 'NO' contacts for monitoring 'Run' status of equipment wherever required.
- Necessary contactor with potential free contacts and Stop/Manual/ Auto switches to be provided for all equipment wherever the starter is not provided and which requires starting / stopping through Building Automation System.
- Sockets /Nipples including shut-off valve for mounting sensors/transmitters on pipe lines.
- The space provision in all the equipment panel (MCC) for mounting Current/ Potential transformers & transducers and power supply to the transducer shall be provided by the Plumbing and Firefighting contractor. Separate current transformers shall be provided by Plumbing and Firefighting contractor for monitoring current / KWH (wherever required) through BAS.
- The installation of current transformer & Transducer along with wiring between Current Transformer & Transducer up to the terminal block shall be provided by the Plumbing and Firefighting contractor. All transducers shall be supplied by BAS contractor.
- The low voltage BAS Cables shall be brought upto the electric panel by BAS contractor and all terminations into the electrical panels shall be made by Plumbing and Firefighting contractor after satisfying himself of the wiring system. It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements, of the Plumbing and Firefighting system, lies solely with the contractor.
- All necessary Hardware/ Software shall be made available by the Plumbing and Firefighting Contractor on the Microprocessor based panel for the integration of such panel to Building Automation System for remote monitoring / controlling of marking / equipment thru BAS.

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12. TESTING, ADJUSTING AND BALANCING

Balancing of all water systems and all tests as called for the Specifications shall be carried out by the contractor through a specialist group, in accordance with the Specifications and ASPE / ASHRAE Guide lines and Standards. Performance test shall consist of three days of 10 hour each operation of system for each season. Cost of performance witness test of major equipment such as pumps, equipment, panels etc. at factory with two personnel from Owners / Consultant shall be included.

The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Owner's site representative. All tests shall be carried out in the presence of the representatives of the Architect / Consultant and Owner's site representative.

13. COMPLETION CERTIFICATE

On completion of the installation, a certificate shall be furnished by the contractor, counter signed by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority.

The contractor shall be responsible for getting the entire installation duly approved by the local authorities concerned, and shall bear expenses if any, in connection with the same.

14. AS-BUILT DRAWINGS

Contractor shall submit following as-built drawings as and when work is completed:

- Six set of hard copies of all as-built drawings duly corrected and incorporating any modifications during execution.
- Two set of pen drive containing the drawings.

- Runs of all water lines with diameters on all floors and vertical risers / drops.

- Runs of all soil, waste, vent & rain water piping with diameters on all floors and vertical stacks.

- Position and sizes of all type of control valves and all other plant and equipment.

- Position of cleaning eye / access doors and opening panels in soil/waste disposal system.

- Original installation and Maintenance manual of all types of equipment.

- Location of all mechanical equipment with layout and piping connections.

15. MAINTENANCE MANUAL

Upon completion and commissioning of works, the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Client's site representative and two for Clients Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment.

The manuals shall include:

i. Description of the work carried out / installed.
ii. Operating instructions.
iii. Maintenance instructions including procedures for preventive maintenance.
iv. Manufacturers catalogues.
v. Spare parts list.
vi. Trouble shooting charts.
vii. Drawings
viii. Type and routine test certificates of major items.

Details of all the bought out item should be part of this maintenance manual.

16. ON SITE TRAINING

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labor and helpers for operating the entire installation for such periods so as to enable the Client's staff to get acquainted with the operation of the system. During this period, the contractor shall train the Client's personnel in the operation, adjustment and maintenance of all equipment installed.

17. DEFECTS LIABILITY PERIOD

Complaints

The Contractor shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

Repairs

All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defects liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the Client.

18. UPTIME GUARANTEE

The contractor shall guarantee for the installed system an uptime of 98%. In case of shortfall in any month during the defects liability period, the Defects Liability period shall get extended by a month for every month having shortfall and no reimbursement shall be made for the extended period.

19. OPERATION & MAINTENACE CONTRACT

Contractor may be required to carry out the operation of the installation during and after the defects liability period. Further, it may also be required to carry out all inclusive maintenance of the entire system for a period of four years beyond the defects liability period.

Operation Contract:

It will involve round the clock operation for24 hours a day wherein work will include but not limited to operation of installation, maintaining log books, complain register and summary of operation.

The terms of payment shall be monthly at the end of each month on pro-rata basis.

All Inclusive Maintenance Contract:

The work will involve routine preventive maintenance with monthly status report. Entire installation shall be painted every two years. 98% uptime of all systems is expected under this contract wherein up time shall be assessed every month and in case of shortfall during any month the contract shall be extended by a month. No reimbursement shall be payable for the extended period.

Adequate number of persons to the satisfaction of the Client representative shall be provided including relievers wherein statutory compliances such as of EPF, ESIC and other applicable labour legislations shall be to contractor account. No overtime shall be payable. Routine shut downs shall be permitted with prior permission of the Owner.

Payment shall be Quarterly at the beginning of each quarter on pro-rata basis.

ANNEXURE – I
List of Approved Makes for HWS

S.NO.	DESCRIPTION	MANUFACTURER'S NAME
1	MS ‘C’ class pipes	Hisar/Jindal
2	Re- Circulation Pump	Wilo / Grundfos / Armstrong/Xylem/Lubi
3	Heat Pump	Trane/ Climaveneta /Klima / Kristherm / khemes/Saffron Energy/Blue box
4	Plate heat exchanger	Kelvion/ Alfalaval/ Denfoss
5	Temperature Sensor	Forbes marshall / Danfoss /PT-10
6	Pressure Reducing Station & PRV	J N Marshall / Thermax/ Zoloto / Sant/ Castle
7	Globe valves / Butterfly Valve / NRV / Strainer / Ball Valve	Castle/ Kartar/ Audco / Zoloto / Advance / Honeywell

8	Vent Valve	Spirax / Thermax
9	Insulation Lloyd / Rockwool / UP Twiga / Armacell	
10	Level Controller	Minilec/ Krone Marshall / Technika / Cirrus
11	Pressure Gauges / Dial Thermometers H Guru / Feibig / Forbes Marshal	
12	Motor	Siemens / Bharat Bijlee / ABB / Kirloskar
13	Mixing Tank	As per Vendor
14	Any Other Items	On Approval Of Architect / Consultant Or Engineer-In-Charge

Note :- The choice of the Final makes shall be made by the owner / consultant

List of Approved Makes of Medium Voltage Equipment

S.No	Details of Material/ Equipment's	Manufacture Name
1	Power/aux, contractors/overload relays with built in single phase preventer Siemens / Schneider/ L&T / ABB	
2	Switchgears Siemens / Schneider/ L&T / ABB	(ACB's. MCB, MCCB)
3	Current Transformer Automatic Electric / Precise / Pragati / Matrix	(Epoxy cast Resin)
4	LED type Indicating Lamps, Technik / Vaishno Electricals / RASS / ESBEE	Push Buttons
5	LT Panel Fabricator	Adlec / Advance / Lotus / Power Gear
6	Bus bar Hindalco	
7	Electronics Digital meter Networkable Siemens / Schneider / L&T	(A/V/PF / HZ/KW/KWH)
8	PVC insulted XPLE aluminum / copper conductor armoured MV cable upto 1100 V grade Polycab/KEI/RPG Cables	
9	LT Joining Kit / Termination 3M/Raychem	
10	Cable Glands Double Compression with earthing Links Dowells/Comet	
11	Bimetallic/ copper /Al. cables lug Dowells / Comet /Cosmos	
12	PVC insulted copper conductor stranded flexible FRLS wire (pre twisted) Polycab / Bonton, Lapp / Finolex / Batra Henlay	
13	Metallic conduit (ISI Approved) AKG / BEC	
14	Cable tray (perforated/ Ladder type) /raceway prefabricated RICCO / MEM / Profab / MK	
15	Selector Switch, Toggle Switch Kaycess / Slazer / Technik	
16	MCCB	ABB / L&T / Schneider / Siemens / Nagar
17	Relays / Contactors	L&T / ABB / Siemens / Schneider / Automatic Electric

18 Current Transformer Kappa / Pragati / AE / Gilbert & Maxwell

S.No Details of Material/ Equipment's Manufacture Name

19 Ammeter / Voltmeter / Metering Equipment's L&T / Siemens / Neptune / Enercon / Automatic Electric

20 Selector Switches Kaycee / Salzer / L&T / ABB
21 LED Lamps L&T / Vaishno / Siemens
22 XLPE / PVC Insulated Aluminum Conductor Armoured Cables. Universal (Satna) / CCI / Nicco / Finolex / Polycab / Skytone / RR

23 Copper Conductor Armoured Control Cables. Finolex / Polycab / Skytone / RR / Batra Henlay

24 Voltage Transformer Kappa / AE / Gilbert & Maxwell / Vishal
25 Cable Tray Indeana / Bharti / Slotco / Steelways / Profab / Rico / Dynamic / MICO / RMCOM

26 Protection Relay

A Numeric type
ABB / Siemens / Wood word
B Electromagnetic Type
Siemens / Schneider
27 Electric Control Panel Tricolite / Advance / Ambit / Adlec / RST / Elegant / Vidyut Control / Conqrent / Dynamic / ASES

Note: The choice of the Final makes shall be made by the owner / consultant / as specified in electrical tender

ANNEXURE – II

PART LIST OF CODES & STANDARDS
LIST OF BUREAU OF INDIAN STANDARDS AND OTHER
INTERNATIONAL CODES

All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practices given below. All equipment and material being supplied by the contractor shall meet the requirements of IS and other specified.

Tarrif advisory committee's regulation (fire insurance), electrical inspectorate and Indian Electricity rules and other Codes / Publications as given below:

1. Pipes and Fittings
IS : 458 Specification for precast concrete pipes (with and without reinforcement)
IS : 651 Salat glazed stone ware pipes and fittins.
IS : 1239 (Part 1) Mild steel, tubes, tubulars and other wrought steel fittings : Part 1 Mild Steel tubes.
IS : 1239 (Part 2) Mild Steel tubes, tubulars and other wrought steel fittings : Part 2 Mild Steel tubulars and other wrought steel pipe fittings.
IS : 1536 Centrifugally cast (spun) iron pressure pipes for water, gas and sewage.
IS : 1537 Vertically cast iron pressure pipes for water, gas and sewage.
IS : 1538 Cast Iron fittings for pressure pipes for water, gas and sewage.
IS : 1729 Sand Cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
IS : 1879 Malleable cast iron pipe fittings.
IS : 1978 Line pipe
IS : 1979 High test line pipe.

IS : 2501 Copper tubes for general engineering purposes

IS : 2643 (Part 1) Dimensions for pipe threads for fasterning purposes : Part 1 Basic profile and dimensions.

IS : 2643 (Part 2) Dimensions for pipe threads for fastening purposes : Part 2 Tolerances.

IS : 2643 (Part 3) Dimensions for pipe threads for fastening purposes : Part 3 Limits of sizes.

IS : 3468 Pipe nuts.

IS : 3589 Seamless or electrically welded steel pipes for water, gas and sewage (168.3 mm to 2032 mm outside diameter).

IS : 3989 Centrifugally cast (sun) iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.

IS : 4346 Specifications for washers for use with fittings for water services.

IS : 4711 Methods for sampling steel pipes, tubes and fittings.

IS : 6392 Steel pipe flanges

IS : 6418 Cast iron and malleable cast iron flanges for general engineering purposes.

IS : 7181 Specification for horizontally cast iron double flanged pipe for water, gas and sewage.

IS:782 Specification for caulking lead (3rd rev.)

IS:6163 Cast Iron Low Pressure Pipes

IS:13592 PVC Pipes

IS:4989 HDPE Pipes for Potable water supply, Sewage and Ind. Effluent

I.S:985 UPVC Pipes for Potable water supply

IS:110221 Code of Practice for coating and wrapping of U.G M.S Pipelines

IS:3114 Code of Practice for laying C.I Pipes (2nd rev.) (Amendment 2)

2. Valves

IS : 778 Specification for copper alloy gage, globe and check valves for water works purposes.

IS : 780 Specification for sluice valves for water works purposes (50 mm to 300 mm size).

IS : 1703 Specification copper alloy float valves (horizontal plunger type) for water supply fittings.

IS : 2906 Specification for sluice valves for water works purposes (350 mm to 1200 mm size)

IS : 3950 Specification for surface boxes for sluice valves.

IS : 5312 (Part 1) Specification for swing check type reflux (non return) valves : part 2 Multi door pattern.

IS : 5312 (Part 2) Specification for swing check type reflux (non return) valves : part 2 Multi door pattern.

IS : 12992 (Part 1) Safety relief valves, spring loaded : Design

IS : 13095 Butterfly valves for general purposes.

4 Water Quality Tolerance

IS : 3025 (Parts 1 to 44) Method of sampling and test (physical and chemical) for water and waste water.

IS : 4764 Tolerance limits for sewage effluents discharged into inland surface waters.

IS : 10500 Drinking Water

5. Pumps & Vessels

IS : 1520 Specification for horizontal centrifugal pumps for clear cold fresh water.

IS : 2002 Steel plates for pressure vessels for intermediate and high temperature service includng boilers.

IS : 2825 Code for unfired pressure vessels.

IS : 4648 (Part 1) Code of practice for lining of vessels and equipment for chemical processes Part 1 : Rubber lining.

IS : 5600 Specification for sewage and drainage pumps

IS : 8034 Specification for submersible pump sets for clear, cold, fresh water.

IS : 8418 Specification for horizontal centrifugal self priming pumps.

6. General

National Building Code of India 2005 Part IV and Part IX

Uniform Plumbing Code of India 2008

SP : 6 (1) Structural Steel Sections
IS : 325 Three Phase Induction Motors
IS: 456 Code of practice for plain and reinforced concrete (3rd rev.) (Amendment 2)
IS : 554 Dimensions for pipe threads where pressure tight joints are required on the threads.
IS : 694 PVC insulated cables for working voltages upto & including 1100 V.
IS : 779 Specification for water meters (domestic type).
IS : 782 Specification for caulking load.
IS : 800 Code of practice for general construction in steel
IS : 1068 Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium.
IS : 1172 Code of Basic requirements for water supply drainage and sanitation
IS : 1367 (Part 1) Technical supply conditions for threaded steel fasteners : Part 1 introduction and general information.
IS : 1367 (Part 2) Technical supply conditions for threaded steel fasteners : Part 2 product grades and tolerances.
IS : 1554 (Part 1) PVC insulated (heavy duty) electric cables : Part 1 for working voltages upto and including 1100 V.
IS : 1554 (Part 2) PVC insulated (heavy duty) electric cables : Part 2 for working voltages from 3.3 KV upto and including 11 KV.
IS : 1726 Specification for cast iron manhole covers and frames.
IS : 1742 Code of practice for building drainage.
IS : 2064 Selection, installation and maintenance of sanitary appliance code of practice.
IS : 2065 Code of practice for water supply in buildings.
IS : 2104 Specification for water meter for boxes (domestic type)
IS : 2373 Specification for eater meter (bulk type)
IS : 2379 Colour code for identification of pipe lines.
IS : 2527 Code of practice for fixing rainwater gutters and down pipes for roof drainage.
IS : 2629 Recommended practice for hot dip galvanizing on iron and Steel.
IS : 3114 Code of practice for laying of cast iron pipes
IS : 4111 (Part 1) Code of practice for ancillary structures in sewerage system : Part 1 manholes.
IS : 4127 Code of practice for laying glazed stoneware pipes.
IS : 4853 Recommended practice for radiographic inspection of fusion welded butt joints in steel pipes.
IS : 5329 Code of practice for sanitary pipe work above ground for buildings.
IS : 5455 Cast iron steps for manholes.
IS : 6159 Recommended practice for design and fabrication of material, prior to galvanizing.
IS : 7558 Code of practice for domestic hot water installations.
IS : 8321 Glossary of terms applicable to plumbing work.
IS : 8419 (Part 1) Requirements for water filtration equipment : Part 1 Filteration medium sand and gravel.
IS : 8419 (Part 2) Requirements for water filtration equipment : Part 2 under drainage system.
IS : 9668 Code of practice for provision and maintenance of water supplies and fire fighting.
IS : 9842 Preformed fibrous pipe insulation.
IS : 9912 Coal tar based coating materials and suitable primers for protecting iron and steel pipe lines.
IS : 10221 Code of practice for coating and wrapping of underground mild steel pipelines.
IS : 10446 Glossary of terms relating to water supply and sanitation.
IS : 11149 Rubber Gaskets
IS : 11790 Code of practice for preparation of butt-welding ends for pipes, valves, flanges and fittings..
IS : 12183 (Part 1) Code of practice for plumbing in multistoried buildings : Part 1 water supply.
IS : 12251 Code of practice for drainage of building basements.
IS : 5572 Code of practice for sanitary pipe work.
BS : 6700 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages.
BS : 8301 Code of practice for building drainage.
BSEN : 274 Sanitary tap were, waste fittings for basins, bidets and baths. General technical specifications.

TECHNICAL SPECIFICATIONS

A) AIR-TO-WATER HEAT PUMP (Scroll Type)

1. AIR-to-WATER HEAT PUMP:

Each heat pump Unit shall be standard model and shall comprise of:

1.1 Multiple Hermetic Scroll compressors.

1.2 Condenser with accessories and supports.

1.3 Steel structure as required for assembling/mounting the above.

1.4 Microprocessor based control panel with automatic controls and display module.

1.5 Accessories as specified/required.

1.6 Interconnecting refrigerant piping.

1.7 To provide liquid level sight glass and relief device of (bursting type) to pervert excessive built of pressure.

1.8 Full charge of R 407c / R 410a refrigerant and oil.

1.9 Starter for the motor shall be DOL.

1.10 The Unit shall be capable of continuous stable compressor operation even at part load condition.

1.11 The Heat Pump should be capable of operating up to 63°C condenser outlet temperatures.

1.12 Guarantee of heat pump to be specified in no. of years and guarantee period will be 24 months after commissioning and handing over of whole system.

1.13 In case of Imported Machine your prices will be CIF Site with break-up of FOB (SPECIFYING PORT OF DESPATCH. FOB price to include all charges including Packing , inland freight, port charges etc incurred up to port of dispatch) Insurance and ocean freight up to Site.

1.14 In event of import the supplier will handle all logistics including customs clearance and safe delivery of the heat pump at site .Client will hand over the EPCG license to the India counterpart to arrange clearance of the heat pump from customs and onward delivery to the site.

1.15 Ex-stock availability of all spare parts in India is required for zero downtime.

1.16 Your proposal must mention total electric load of the machine with break up.

1.17 To include training of operating staff and providing in triplicate documentations i.e. operation, installation and spare part manuals and all electrical control circuit diagram, relevant for the machine and field hook up (in elec. Circuits).

The Heat Pump System should be capable of operation on ambient air to water basis. The Heat Pump when operating air to water mode should be capable of generating required hot water upto -20 Deg C.
The Heat Pump System should be based on a closed circuit primary hot water flow of 63 °C out of the unit with 58 °C return for normal operation pattern.
The system shall contain Scroll Compressor, Braze-welded stainless steel AISI 316 plates insulated by a shell of closed-cell foam material Recovery Heat Exchanger (for hot water production up to 63 °C), Air Cooler Type Heat

Exchanger, Microprocessor control panel and Electronic Expansion Valve (EEV) all of which shall be contained within the cabinet of the unit.

2. UNIT FRAME

Galvanized sheet steel painted using polyester powder at 180 °C, which confers high resistance to atmospheric agents. The structure should be load bearing, with removable panels lined with sound absorbing expandable polyurethane matting.

3. COMPRESSOR

Unit should have hermetic scroll compressor with vapor injection connected in tandem, complete with thermal overload protection included in the electric motor windings, sump heater and rubber anti-vibration supports. The compressor has a connection for the application of the vapour injection in order to reach higher temperatures than standard compressors. Thermodynamically, the injection also allows to reach higher energy efficiency levels. Each Compressor to have Crank case heater

4. REFRIGERENT

Multi-Functional Units of higher efficiency with widest capacity based on latest environ-friendly R410a

5. SOURCE SIDE HEAT EXCHANGER

Coil should be made up from a battery with copper pipes and aluminum gills with large exchange surface. A sub cooler is inserted to the base of the battery to ensure complete defrosting; an anti-freeze resistance ensures the runoff of condensate water towards the drain. A metal grid is present to protect the gill pack.

6. FANS

Helicoidal fans directly coupled to the 6-pole external rotor electric motors, IP 54 protection level. Each fan is housed in shaped nozzles and includes the accident-prevention grill in compliance with UNI EN 294.

7. USER SIDE HEAT EXCHANGER

Braze-welded plate in AISI 316 stainless steel insulated by a cladding in closed cell expansive material. The heat exchanger has a temperature probe for anti-freeze protection and a mechanical flow switch supplied as standard.

8. REFRIGERANT CIRCUIT

Main Components Includes: charge connection on liquid and suction line, sight glass, dryer filter, Electronic expansion valves with external pressure equalization, 4-way reversing valve, liquid receiver, non-return valves, liquid line solenoid valve, pressure transducer, high and low pressure gauges and safety valve. A refrigerant/refrigerant heat exchanger is also present for the production of vapour in order to cool the compressor. It should also have a dedicated anti ice circuit with solenoid valve.

9. DEFROSTING

Defrosting is the system used to avoid the accumulation of frost on the evaporator coil and the removal of any that has formed, when operating in only domestic hot water or only hot water for heating mode. This is done by reverse cycle with the fans off for external air temperatures of less than 15°C; with external temperatures above 15°C defrosting is done by air with the compressors off. This reduces the number of defrosting cycles by up to 65% and increases thermal performance by up to 10%.

10. CONDENSATION AND EVAPORATION PRESSURE CONTROL

This function allows the machine to effectively satisfy the various demands of the system throughout the whole year, and is assured by the modulating adjustment (cut-off device) of the fan speed depending on the pressure measured by the transducers, to extend the operating limits.

11. AUTOMATIC HOT WATER DELIVERY COMPENSATION CONTROL

Fitted as standard on all machines: this function compensates the temperature of the hot water delivery (automatically changing the set-point of the heat pump operation), as the external air temperature drops (climate curve); ideal for very low external air temperatures where the production of hot water is in any case guaranteed.

12. ELECTRONIC EXPANSION VALVE

Energy savings, precision and comfort all delivered as standard, with the electronic Expansion valve that continuously

adjusts the power delivery and it also offers the following advantages:

- Fast, high precision adjustment of refrigerant flow;
- Fast arrival of the unit at steady-state conditions;
- Superheating value remains constant in variable thermal load conditions;
- Efficient operating conditions of the compressor, especially in the presence of low room temperatures;
- Wide working range with consequent extension of the unit's operating limits.These properties result in enhanced performance of the unit and make it possible to obtain very significant energy savings.

13. ELECTRIC CONTROL BOARD

With main isolating device, power and auxiliary circuits protection, compressors remote control. Microprocessor management of the unit with main function display. The electric control board is made up from:

- Main isolating switch and fuse protection of the auxiliary and power circuits);
- Compressor remote control;
- Fan rev. regulator for condensation control;
- Main alarm on/off contacts;
- Phase monitor
- External air temperature probe

Microprocessor , for the control of the following functions:

- Regulation of the water temperature with inlet control;
- Anti-freeze protection;
- Compressor timing;
- High pressure pre-alarm management (to prevent unit block in many cases);
- Enabling of summer/winter changeover;
- Automatic defrosting;
- Alarm signals;
- Alarms reset;
- Self-adaptable regulation to allow optimal functioning in the case of low water content in the plant;
- Digital input for external ON-OFF;
- Digital input for summer/winter remote changeover.

Display for:

- Outlet water temperature;
- Condensation temperature;
- Set temperature and differentials set;
- Description of the alarms;
- Compressor and pump functioning timer;

14. CONTROLS AND SAFETY DEVICES

- Utility water temperature control probe (situated at entry of heat exchanger);
- Anti-freeze probe that activates the anti-freeze alarm (with automatic re-arm at limited intervals);
- High pressure gauge (with manual re-arm);
- Low pressure gauge (with automatic re-arm at limited interventions);
- Mechanical flow switch supplied as standard;
- Condensation pressure control by means of rev. regulator for functioning with low external temperatures.
- High pressure safety valve;
- Compressor internal over-temperature protection.
- Compressor external over-temperature protection
- It should have ethernet serial port with modbus protocol and integrated web server preloaded web page.

15. INSPECTION

The units are inspected in the factory and are supplied complete with oil and refrigerant.

16. Field Quality Control

Manufacturer's Field Service: Provide services of a factory-authorized service representative to supervise the field assembly of components and installation of heat pumps, including piping and electrical connections, and to report results in writing.

17. Calorifier and Hot Water Mixing Tank :

hot water mixing tank shall be fabricated from SS-plates suitable for minimum 6 bar working pressure for Low Zone and 9 Bar for High zone. Necessary inlet, outlet and drain connections shall be provided along with water level gauge tube, low level water alarm, dial type thermometer, 75mm dia. vent connection and an access manhole not less than 450mm dia. Calorifier tank shall have cold water connection from the hydropneumatics system.

Hot water mixing tank shall have hot water connection from the Calorifier tank and hot water secondary heating connection shall be connected to the mixing tank through the heat pump circulating pumps. Hot water supply from the mixing tank to the user points shall be maintained at continuous 600C temperature by means of thermostat controlling the hot water generation and flow into the mixing tank.

Tank shall be insulated as given below in section `INSULATION'.

TECHNICAL DATA:
Contractor should furnish technical data as mentioned below, of the equipment and accessories offered by him as per scheme given in tender document.

S.No.	Description	Unit	Condition of Services
1.0			
HEAT PUMP (SCREW TYPE)			
1.1	Heating Capacity at Design	Kcal/Hr (kW)	
1.2	Cooling Capacity at Design	TR	
1.3	Evaporator Water Flow	LPM/GPM	
1.4	Evaporator Water IN Temp.	o C/ o F	
1.5	Evaporator water OUT Temp	o C/ o F	
1.6	Evaporating Temp	o C/ o F	
1.7	Hot Water Flow	LPM/GPM	
1.8	Condenser Hot Water IN Temp	o C/ o F	
1.9	Condenser Hot Water OUT Temp	o C/ o F	
1.10	Condensing Temp	o C/ o F	
1.11	Input Power Requirement	(Max.)	

	at Design Conditions	IKW
2.0	Compressor	
2.1	Make	
2.2	Model	
2.3	Compressor Type	
2.4	Speed (Operating)	RPM
2.5	Speed (Maximum)	RPM
2.6	Capacity at 2OC Suction and 55OC Condensing and Operating Speed	K.Cal/KW
2.7	Design Suction Temp	O C/ O F
2.8	Design Discharge Temp	O C/ O F
2.9	Capacity at Design Temperature	K.Cal/KW
2.10	KW Consumed at Design Temperature	KW
2.11	Refrigerant Used	R
2.12	Type and Make of Capacity Control	
2.13	Quantity of Compressor/Nos. per Chilling Unit	
2.14	Type and Make of Safety Controls	
3.0	Condenser:	
3.1	Manufacturer	Name
3.2	Dia of Condenser Shell	mm
3.3	Length of Tubes	m
3.4	No. of Tubes	Nos.
3.5	Material of Tubes	
3.6	Dia of Tubes	
3.7	No. of Integral Fins/cm	Nos.
3.8	No. of Passes	Nos.
3.9	Water Velocity	M/S
3.10	Pressure Drop	m
3.11	Type/Thickness of insulating material	
3.12	Quantity	Nos.
3.13	Fouling Factor	(FPS)
4.0	Compressor Motor:	
4.1	Manufacturer	Name
4.2	Type of Motor	Type
4.3	Rated Output	KW
4.4	Current Characteristics	

B) WATER-TO-WATER HEAT PUMP

1.0 General:

The scope of work under this section comprises the supply, testing and site supervision during the erection, testing and commissioning of Heat Pump confirming to these specifications and in accordance with the requirement as per tender document, drawings and as per site conditions.

2.0 WATER-to-WATER Heat Pump:

Each heat pump Unit shall be standard model and shall comprise of:

2.1 Scroll compressor, along with multiple hermetic type motor, and flexible coupling with open type compressor.

2.2 Condenser with accessories and supports.

2.3 Steel structure as required for assembling/mounting the above.

2.4 Microprocessor based control panel with automatic controls and display module.

2.5 Accessories as specified/required.

2.6 Interconnecting refrigerant piping.

2.7 To provide liquid level sight glass and relief device of (bursting type) to pervert excessive built of pressure.

2.8 Full charge of R-134a/R-410a refrigerant and oil.

2.9 Starter for the motor.

2.10 The Unit shall be capable of continuous stable compressor operation even at part load condition.

2.11 Pressure Drop at design Conditions shall not exceed 50 kPa through the condenser and 50 kPa through the evaporator for the non-refrigerant side.

2.12 The Heat Pump should be capable of operating upto 60°C condenser outlet temperatures when evaporator outlet temperature is 6.67°C.

2.13 Guarantee of heat pump to be specified in no. of years and guarantee period will be 24 months after commissioning and handing over of whole system.

2.14 In case of Imported Machine your prices will be CIF Site with break-up of FOB (SPECIFYING PORT OF DESPATCH. FOB price to include all charges including Packing , inland freight, port charges etc incurred up to port of dispatch) Insurance and ocean freight up to Site.

2.15 In event of import the supplier will handle all logistics including customs clearance and safe delivery of the heat pump at site .Client will hand over the EPCG license to the India counterpart to arrange clearance of the heat pump from customs and onward delivery to the site.

2.16 Ex-stock availability of all spare parts in India is required for zero downtime.

2.17 Your proposal must mention total electric load of the machine with break up.

2.18 To include training of operating staff and providing in triplicate documentations i.e. operation, installation and spare part manuals and all electrical control circuit diagram, relevant for the machine and field hook up (in elec. Circuits).

2.19 For performance at various loads you will enclose performance parameter curve indicating IKW/KW of heating at various loads i.e. 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% & 100%.

2.20 MICROCOMPUTER CONTROL CENTRE

Each unit shall be furnished with microcomputer control centre in a locked enclosure, factory mounted, wired and tested. The control center shall include a 40-character alphanumeric display showing all system parameters in English language with numeric data in English (FPS) units.

Digital programming of essential setpoints through a colour coded, tactile-feel keypad shall include: entering and leaving chilled water temperature and condensing water temperature; percent loading: pull down demand limiting; seven-day time clock for starting and stopping heat pump (complete with local holiday schedule); and remote reset temperature range.

All safety and cycling shutdowns shall be annunciated through the alphanumeric display and consist of day, time, cause of shutdown, and type of restart required. Safety shutdowns shall include: high oil pressure, high compressor discharge temperature:low evaporator pressure: motor controller fault: and sensor malfunction. Cycling shutdowns shall include: low water temperature; low oil temperature, heat pump/condenser water flow interruption; power fault; internal time clock; and entire cycle.

System operating information shall include: return/leaving chilled water temperatures; return/leaving condenser water temperatures; evaporator/condenser refrigerant pressure; differential oil pressure; percent motor current; evaporator/condenser saturation temperatures; operating hours (Hours Run) and number of compressor starts.

Security access shall be provided to prevent unauthorized change of set points to allow local or remote control of the heat pump, and to allow manual operation of the preprotation vanes and oil pump.

BACNet/Modbus communication card shall be provided.

The heat pump shall be provided with an RS-232 port to output all system operating data, shutdown/cycling messages and a record of the last four cycling or safety shutdowns to a remote printer or Building Automation System (BAS). The control center shall be programmable to provide data logs to the BAS/printer at a set time interval.

Microprocessor to have software stored in non-volatile memory (EPROM) to eliminate heat pump failure due to AC power failure. Programme set point retained in Lithium back RTC memory for minimum 5 years.

Control center shall be able to interface with the Building Automation System (BAS) to provide remote heat pump start/stop reset of chilled water temperature reset of current limit; and status messages indicating heat pump is ready to start, heat pump is operating, heat pump is shut down on a safety requiring reset, and heat pump is shut down on a recycling safety.

2.21 INTERFACE WITH BUILDING AUTOMATION SYSTEM

All necessary hardwires / softwares to integrate the heat pump panel to BAS system shall be provided free of cost by heat pump manufacturer / supplier.

3.0 COMPRESSOR:

Each unit shall have a Rotary Screw semi-hermetic/open type compressor.

3.1 The Compressor shall be manufactured from forged steel, with profiles which are as symmetrical. The profile of Screws shall permit safe operation upto a speed of 2900 RPM for 50 Hz operation.

3.2 The compressor housing shall be of high grade cast iron, machined with precision, to provide a very close tolerance between the impeller and the housing.

3.3 The Pure Rotary Motion of the compressor shall ensure uniform flow of gas, even torque and positive displacement. The intake and Discharge Cycle shall overlap.

3.4 The load of each rotor shall be evenly distributed through the use of Anti-Friction Ball Bearings.

3. 5 Each Compressor shall include an integral Oil Separation system, Oil Sump and Oil filter. The oil temperature shall be controlled during operation throughout the lubrication system. Oil flow switch shall be provided to protect the compressor.

3.6 Each Compressor shall have a suction check valve, suction filter, suction service valve and discharge check valve. Isolation valves shall be provided on all connection to the compressor to allow condenser to be used as a pump down receiver.

3.7 The units shall be complete with stepless capacity control mechanism, to permit modulation between 20% to 100% of capacity range.

3.8 There shall be built in oil reservoir to ensure full supply of lubricants to all bearings and a check valve to prevent back spin during shut down.

3.9 There shall be oil pump or other means of forced lubrication of all parts during startup, running and coasting for shut down. An oil header shall be provided in the casing.

3.10 There compressor shall be guaranteed for a minimum period of 5 years from the date of handover and achievement of performance parameters. Failure of any compressor shall require complete replacement of the compressor at no extra cost.

4.0 Compressor Motor:

4.1 The driving motor shall be squirrel cage type or suitable hermetic/open type as required, protected against damage by means of built in protection devices.

4.2 The compressor motor shall be suction water cooled.

4.3 The compressors and Motors shall be fully protected against abnormal operating conditions by high and low pressure switches , thermal relays ,overload relays and safety controls and Phase failure protection.

4.4 The compressors shall be fitted with gauge connections for reading oil, suction and discharge pressure, and shall be fitted with sight glass, internal motor protection.

4.5 The motor windings shall have solid state protection to prevent the motor from operating at unsafe operating temperatures.

4.6 Tender to specify time frame from date of release of the order till the delivery to the site and installation time separately from the date of arrival of equipment at site. Any delay in the time frame agreed shall be subjected to penalty as per the terms and conditions agreed during the discussions.

5.0 Condenser:

5.1 Each unit shall have single/ multiple horizontal shell and tube, water cooled, single/multiple pass condenser, fitted with safety.

5.2 Valve, purge valve, and other safety devices.

5.3 The shell shall be of welded steel construction fitted with machined steel tube sheets on either ends. The tubes shall be 12/19mm O.D. of seamless copper with integral fins. The tubes shall be supported in the shell to avoid noise and vibrations and the ends shell be properly expanded in the tube sheets to prevent leakage of refrigerant gas.

5.4 The water heads shall be of fabricated steel, easy to remove, with suitable baffles for multipass water flow, in and out connections and gasket to prevent water leakage.

5.5 The condenser shall be tested against leaks, with a pressure of 24.5 kg/sq. Cm (350 psig) on both the shell side and the water side.

5.6 The condenser shall be insulated with 25 mm thick rubber based closed cell polyurethane factory installed insulation.

5.7 The condenser shall be complete in all respects and shall also include:

- Support for mounting
- Refrigerant in and out connections.
- Water in, out and drain connections.

6.0 Evaporator:

6.1 Each unit shall have (1) one horizontal shell and tube, Dry Expansion/ flooded type cooler complete with accessories.

6.2 The shell shall be of welded steel construction fitted with machined steel tube sheets on either ends.

6.3 The evaporator shall either have integrally finned copper tubes or tubes with other means for increasing heat transfer surface. The tube shall be supported in the shell by adequate, stiff supports to eliminate vibration and noise. The tube ends shall be mechanically bonded to the tube sheets to prevent leakage of refrigerant gas.

6.4 The water heads shall be made of fabricated steel and the faces ground to a close tolerance to prevent leakage and permit single/multiple pass operation.

6.5 The evaporator shall be tested against leaks with a pressure of 24.5 kg/sq. cm (350 PSIG) both on the shell and the water side.

6.6 The evaporator shall be insulated with 25 mm thick rubber based close cell polyurethane factory installed insulation.

6.7 The evaporator shall be complete in all respects and also include:-

- Supports for mounting

- In and out connections both for the refrigerant and the water circuit and drain connections.
- Relief valve.

7.0 Control console:

7.1 The unit shall be complete with a microprocessor based control console mounted directly on the unit and prewired with all operating and safety controls.

7.2 Adapter box provision for incoming armoured aluminium cable termination of heat pump motor is in contractor's scope.

7.3 The control console shall have the following extended capabilities:

Remote indication of:
Heat pump operating status
- Shutdown codes
- Key operating parameters
- Self-diagnostics

Programming capabilities of:

Leaving hot water temperature
Reset of hot water temperature from:

- Return hot water temperature (to maintain constant return hot water temperature)
- EMS, building management system;
- Remote temperature
- Load on heat pump.
- Power demand limit

Reset of power demand limit from:

- Stepped position contact closure (80/60/40% selectable)
- EMS, building management system ;

Lead-lag operation and control.

7.4 The control console should include but not be limited to the items listed below:

- Start/stop switch and micro processor module for capacity control system with overload limit control point adjustment, purge unit controls etc.

- Indicating lights.

- Suction and discharge pressure indications.

- Safety cutouts for low chilled water temperature, high oil temperature, low oil pressure and low refrigerant pressures with reset buttons.

- Necessary motor protection devices.

- Other time delays, relays etc. As required.

8.0 Painting:

Scroll heat pump shall be finished with durable enamel paint. Shop coats of paint that have become marred during shipment or erection, shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with enamel paint to match the finish over the adjoining shop-painted surfaces.

9.0 Performance Rating:

The unit shall be selected for the lowest operating noise level. Capacity ratings, and power consumption with operating points clearly indicated, shall be submitted and verified at the time of testing and commissioning of the installation. Capacity shall be ascertained by measurements of hot water flow rate and temperature of hot water in and out of the heat pump.

Power consumption shall be computed from measurements of incoming voltage & input current to the machine.

10.0 Capacity Control:

10.1 The unit shall be equipped with suitable inlet guide vanes or other devices for providing capacity control.

10.2 The device should be capable of permitting Continuous Modulating capacity control in the range of 20% to 100% of rated capacity.

11.0 Refrigerant Piping:

11.1 Necessary Copper refrigerant pipe lines of heavy class shall be provided for the flow of suction and hot gases and liquid refrigerant.

11.2 The pipe lines shall be insulated, as required.

12.0 Lubrication system:

12.1 The lubrication system shall be complete with accessories such as oil circulating pump, oil heater with 2 steps thermostatic control, oil strainer, Pressure regulating cum relief valve etc.

12.2 Necessary pipe lines for lubricants and cooling system with valves, shall be included.

13.0 Accessories:

13.1 Each unit shall include the following as part of unit price.

- Ribbed rubber isolation pads to eliminate transmission of vibrations upto 90%.
- Full charge of refrigerant gas and required quantity of lubrication oil.
- Other valves as required for cleaning of evaporator/condenser and draining of water.

14.0 Miscellaneous:

14.1 Each unit shall have the following items.

- Water flow switches at the outlet of the condenser and the evaporator.
- Stem type thermometers and dial type water pressure gauges at the inlet and outlet of the condenser and the evaporator.

- Suitable size butterfly valves at the inlet of the condenser and evaporator.

- Suitable size balancing valve at the outlet of condenser and evaporator.

14.2 Each unit shall include, but not be limited to, all the items listed in the foregoing paragraphs or in the 'schedule of equipment' and drawings for this project. In addition all such items, as may be required, shall be included whether specifically mentioned or not, if considered or found necessary to fulfill the intent and meaning for the purpose of maintaining design rations under all extreme weather conditions.

15.0 Starter for Compressor Motor :

Factory mounted close transition type Star Delta Starter with NEMA- 1 enclosure suitable for pad mounting. A 14 gauge (minimum) steel terminal box with gasketed front access cover will be provided for connecting PVC armoured aluminium cables for field connections. Overload/over current protection shall be provided by the heat pump micro-center control panel. The starting current of the motor should not exceed 2 times the FLA of the motor.

16.0 Type of Refrigerant:

16.1 In view of Montreal convention on CFC, units using R-410A/R134a shall be offered.

17.0 Limitations:

The water velocity in the condenser and the evaporator shall not exceed 3 m per sec. (10 FPS)

18.0 Packaging

Apart from standard packaging being provided by the manufacturer for protection against ingress of water and moisture, protection against damages and scratches. The complete equipment to be protected and packed in wooden crates packaging. The woods used for the same shall comply with the provisions for imported woods mentioned under destructive Insects and Pests Act, 1914. The woods shall be properly treated and marked as per ISPM – 15 or is accompanied by a phytosanitary certificate with the treatment endorsed.

19.0 Field Quality Control

Manufacturer's Field Service: Provide services of a factory authorized service representative to supervise the field assembly of components and installation of heat pumps, including piping and electrical connections, and to report results in writing.

20.0 Calorifier and Hot Water Mixing Tank :

20.1 Calorifier and hot water mixing tank shall be fabricated from SS304 plates using 6mm thick plates for shell and 8 mm thick plates for dish ends. Necessary inlet, outlet and drain connections shall be provided along with water level gauge tube, low level water alarm, dial type thermometer, 75mm dia. vent connection and an access manhole not less than 450mm dia. Calorifier tank shall have cold water connection from the hydropneumatic system.

20.2 Hot water mixing tank shall have hot water connection from the Calorifier tank and hot water secondary heating connection shall be connected to the mixing tank through the heat pump circulating pumps. Hot water supply from the mixing tank to the user points shall be maintained at continuous 600C temperature by means of thermostat controlling the hot water generation and flow into the mixing tank.

20.3 Tank shall be insulated as given below in section `INSULATION'.

TECHNICAL DATA:
Contractor should furnish technical data as mentioned below, of the equipment and accessories offered by him as per scheme given in tender document.

S.No.	Description	Unit	Condition of Services
1.0			
HEAT PUMP (SCREW TYPE)			
1.1	Heating Capacity at Design	Kcal/Hr (kW)	
1.2	Cooling Capacity at Design	TR	
1.3	Evaporator Water Flow	LPM/GPM	
1.4	Evaporator Water IN Temp.	o C/ o F	
1.5	Evaporator water OUT Temp	o C/ o F	
1.6	Evaporating Temp	o C/ o F	
1.7	Hot Water Flow	LPM/GPM	
1.8	Condenser Hot Water IN Temp	o C/ o F	
1.9	Condenser Hot Water OUT Temp	o C/ o F	
1.10	Condensing Temp	o C/ o F	
1.11	Input Power Requirement at Design Conditions	(Max.) IKW	
2.0	Compressor		
2.1	Make		
2.2	Model		
2.3	Compressor Type		
2.4	Speed (Operating)	RPM	
2.5	Speed (Maximum)	RPM	
2.6	Capacity at 2OC Suction and 55OC Condensing and Operating Speed	K.Cal/KW	
2.7	Design Suction Temp	O C/ O F	
2.8	Design Discharge Temp	O C/ O F	
2.9	Capacity at Design Temperature	K.Cal/KW	
2.10	KW Consumed at Design Temperature	KW	
2.11	Refrigerant Used	R	
2.12	Type and Make of Capacity Control		
2.13	Quantity of Compressor/Nos. per Chilling Unit		
2.14	Type and Make of Safety Controls		
3.0	Condenser:		
3.1	Manufacturer	Name	

3.2 Dia of Condenser Shell mm
3.3 Length of Tubes m
3.4 No. of Tubes Nos.
3.5 Material of Tubes
3.6 Dia of Tubes
3.7 No. of Integral Fins/cm Nos.
3.8 No. of Passes Nos.
3.9 Water Velocity M/S
3.10 Pressure Drop m
3.11 Type/Thickness of insulating material
3.12 Quantity Nos.
3.13 Fouling Factor (FPS)
4.0 Compressor Motor:
4.1 Manufacturer Name
4.2 Type of Motor Type
4.3 Rated Output KW
4.4 Current Characteristics

21.0 TECHNICAL DATA:

Contractor should furnish technical data as mentioned below, of the equipment and accessories offered by him as per scheme given in tender document.

S.No. Description Unit Condition of Services

1.0 HEAT PUMP (SCROLL TYPE)

1.1 Heating Capacity at Design Kcal/Hr (kW)

1.2 Cooling Capacity at Design TR

1.3 Evaporator Water Flow LPM/GPM

1.4 Evaporator Water IN Temp. o C/ o F

1.5 Evaporator water OUT Temp o C/ o F

1.6 Evaporating Temp o C/ o F

1.7 Hot Water FlowLPM/GPM

1.8 Condenser Hot Water IN Temp o C/ o F

1.9 Condenser Hot Water OUT Temp o C/ o F

1.10 Condensing Temp o C/ o F

1.11 Input Power Requirement (Max.)
at Design Conditions IKW

2.0 Compressor

2.1 Make

2.2 Model

2.3 Compressor Type

2.4 Speed (Operating) RPM

2.5 Speed (Maximum) RPM

2.6 Capacity at 2OC Suction and 55OC Condensing and Operating Speed K.Cal/KW

2.7 Design Suction Temp O C/ O F

2.8 Design Discharge Temp O C/ O F

2.9 Capacity at Design Temperature K.Cal/KW

2.10 KW Consumed at Design Temperature KW

2.11 Refrigerant Used R

2.12 Type and Make of Capacity Control

S.No. Description Unit Condition of Services

2.13 Quantity of Compressor/Nos. per Chilling Unit

2.14 Type and Make of Safety Controls

3.0 Condenser:

3.1 Manufacturer Name

3.2 Dia of Condenser Shell mm

3.3 Length of Tubes m

3.4 No. of Tubes Nos.

3.5 Material of Tubes

3.6 Dia of Tubes

3.7 No. of Integral Fins/cm Nos.

3.8 No. of Passes Nos.

3.9 Water Velocity M/S

3.10 Pressure Drop m

3.11 Type/Thickness of insulating material

3.12 Quantity Nos.

3.13 Fouling Factor (FPS)

4.0 Compressor Motor:

4.1 Manufacturer Name

4.2 Type of Motor Type

4.3 Rated Output KW

4.4 Current Characteristics

C) PUMPS:

1.0 GENERAL SPECIFICATION:

a. All Pumps shall be selected for use with speed not exceeding 2900 RPM unless otherwise specified.

b. Pumps offered shall be selected for minimum vibrations and noise level during operation. Should these be excessive and not within normally acceptable standards. The contractor shall be responsible for provision of further acoustical and anti-vibration treatment necessary at no extra cost.

c. Pumps shall be selected for maximum efficiency and minimum power consumption.

d. Pumps shall have relatively non-overloading characteristics. Special attention should be given to selection of NPSH to eliminate occurrence of cavitations.

e. Horizontal pumps shall be mounted on common C.I. bed plate directly coupled to totally enclosed fan cooled squirrel cage motor.

f. Vertical pumps shall be given by “in-line” TEFC squirrel cage motor. Motor shall be properly fitted to the pump casing and permanently aligned.

g. Pump base shall be driven machine finished, accurately aligned and bolted on to heavy concrete plinth or boiler frame with anti-vibration mounting as specified.

Pump shall be installed as per manufactures recommendations. Pump set shall be mounted on foundation which in turn shall be mounted on cushy foot mountings or any other equivalent vibration isolation fittings.

Pumps sets shall preferably be factory aligned. Whenever necessary, site alignment shall be done by competent persons. Bedplate levels and alignment results shall be submitted to the project manager

h. All pumps supplied shall be constructed to meet the maximum required working condition water temperature and test pressure as required for the system operation & working condition.

i. Adequate pump guards shall be provided at pump couplings.

j. Provided with the following accessories:-

1. Vent Cock.

2. Gland drain connected to nearest floor drain for pump with gland packing.
3. Pressure gauge on suction and discharge with isolation valve.
4. Temperature gauge on discharge.

2.0 HOT WATER RETURN / CIRCULATION PUMPS:

Hot Water Pumps shall be :-

a) Vertical Centrifugal type, electrically driven by TEFC motor.

b) Pump shall be constructed of:-

1.	Casing/Impeller/Shaft	:	Stainless Steel
2.	Base	:	Cast Iron (Epoxy Coated)
3.	Packing	:	Mechanical Seal

c) Specially designed for Hot Water Application.

d) Coupling shall be direct via resilient coupling.

e) Capable of withstanding the service temperature up to 90oC.

f) After complete Installation and Testing , pumps accessories and fittings shall be given two coats, three.

3.0 TECHNICAL DATA SHEETS:

Contractor shall fill in detailed technical data sheets for each equipment.

a) HOT WATER RETURN PUMP/RECIRCULATION PUMP:

DESCRIPTION:

PUMP:

Make :

Model :

No. of Stages :

Head/Stage :

Power Requirement :

Efficiency :

Discharge in L.P.S. :

Total Head :

Suction end I.D. :

Delivery end I.D. :

MATERIAL:

a) Body :

b) Impeller :

c) Shaft :

Type of impeller :

MOTOR:

Make :

Model :

R.PM :

Rating :

Over Load Capacity :

Class of Insulation :

Details of Additional protection in winding :

Motor Efficiency

C) M.S. PIPES & FITTINGS:

1.0 M/.S. PIPES:

All pipes for Hot water supply secondary circuit, make up for calorifier, feed water tank shall be Mild steel tubes conforming to IS:1239 – Part I (for medium grade).

2.0 M.S. FITTINGS:

All fittings shall be conforming to IS:1879 (Part I to X) (or as revised). All fittings shall have manufacturer's trade mark stamped and ISI stamped on it. Fittings in M.S.. pipe lines shall include elbows, tees, bends, reducers, nipples, union, M.S.. Clamps / Steel structural supports of approved design, nuts, bolts, washers, etc. All fittings shall be tested at manufacturer's works. Contractors may be required to produce certificate to this effect from the manufacturers.

3.0 CUTTING AND THREADING:

Where the pipes have to be cut or rethreaded, the ends shall be carefully filed out so that no obstruction to bore is offered. The end of the pipes shall then be carefully threaded conforming to the requirements of IS:554-1964 with pipe dies and taps in such a manner that will not result in slackness of joints when the two pieces are screwed together. The screw threads of pipes and fittings shall be protected from damage until they are fitted.

4.0 JOINTING:

The pipes shall be cleaned and cleared of all foreign matter before being laid. In jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over with material suitable to food grade and a few turns of spun yarn wrapped around the screwed end of the pipes. The end shall then be screwed in the socket, tee etc

with the pipe wrench. Care shall be taken than all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust and dirt during fixing. Burr from the joints shall be removed after screwing. After laying, the ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter.

5.0 PAINTING:

The buried pipes shall be cleaned and coated with zinc chromate primer and bitumen paint, then wrapped with bitumen faced hesian.

6.0 TESTING OF JOINTS:

After laying and jointing, the pipes and fittings shall be inspected under working condition of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 1.5 times the working pressure or at 7.5 Kg / Sqcm whichever is higher. The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock of water hammer. The draw of taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recaliberated before the test. The test pump having been stopped, the test pressure should be maintained without loss for at least 24 hours. The pipes and fittings shall be tested in sections as the work of laying proceeds, having the joints exposed for inspection during the testing.

The treated water shall be left in the pipe line for a period as directed but not exceeding 24 hours. Chlorine residual tests shall be taken at various points along the pipe line. The sterilization process shall be repeated until the samples of water taken from the pipeline are declared fit for human consumption by a recognized laboratory.

D) EQUIPMENT:

1.0 STRAINERS:

Strainers shall be installed in all pump suctions, PRVs and tanks. The strainers shall be of pipeline “Y” type and suitable for use in the appropriate system.

The perforated screen shall have □ 0.75 mm hole sizes, and be stainless steel. The following area should be at least 4 times the cross sectional area of the pipe.

40mm and smaller strainer shall have bronze bodies with screwed connections while 50mm strainers and larger shall have cast iron bodies and flanged connections. The cap of the strainer shall be provided with a □ 20 drain plug.

1.1 PRESSURE GAUGES:

Pressure gauges shall be of the bourdon type, stainless steel casing, round type of 100mm dia and scale range of approximate 150 percent of the normal operation (accuracy 1%). Pressure reading shall be in dual scale with psi and kg/sq.cm.

The needle valve and stainless steel siphon with working pressure corresponding with the piping system shall be provided for each pressure gauge.

Pressure gauges, subjected to corrosive liquid, shall be of the chemical type with diaphragm liquid separator.

1.2 DGV -- AUTOMATIC DEGASSING VALVE:

Vents trace amounts of gas continuously, as they occur and accumulate in the valve. Recommended for applications prone to out gassing, ozone processes, etc. This is a normally open valve vents in or out increasing liquid pressure

forces air/gas out. Rising liquid lifts a natural polypropylene float, which acts on an armature and seal to close the valve bubble tight. When, the float drops and the valve reopens. Liquid pressure forces the gas to be expelled, and then re-closes the valve. The process repeats over and over, automatically, as gas accumulates.

FEATURES / BENEFITS:

1. SAFETY: Allows safe expulsion of unwanted air in piping systems.

2. DEPENDABILITY: Patent-pending float mechanism assures minimal emission of system liquid prior to sealing.

3. MINIMAL CLOSING PRESSURE: Closes at 0 PSI, as long as liquid is present.

4. COST EFFICIENT: Designed to improve system performance and competitively priced.

5. SUPERIOR DESIGN: Valve opens and closes automatically, over and over and over.

6. CORROSION RESISTANT: Top quality thermoplastics and elastomers resist chemical attack and protect system purity. No metal components in Series DGV.

a) HOW IT WORKS:

When sufficient water has accumulated, the float drops. The valve now opens, and liquid pressure forces the water through the vent. Once the gas is expelled, the float rises and again closes the valve. This process can repeat over and over, as often as gas occurs.

1.3 VALVES

a) Ball valves

Valves 40 mm dia and below shall be screwed type ball valves with chrome plated balls, spindle, Teflon seating and gland packing tested to a hydraulic pressure of 16 kg/sq.cm. and accompanying couplings and steel handles to B.S. 5351.

b) Butterfly Valves

Valves 50 mm dia and above shall be cast iron butterfly valve to be used for isolation and/or flow regulation. The valves shall be bubble tight, neoprene/EPDM body lining stainless steel upper stem, PTFE bush, suitable for flow in either direction and seal in both direction. Valves shall be provided with matching flanges with neoprene insertion gasket 3 mm thick

c) Non Return Valve

Where specified non return valve (swing check type) shall be provided through which flow can occur in one direction only. It shall be single door swing check type of best quality conforming to IS: 5312.

Each butterfly and slim type swing check valves shall be provided with a pair of flanges screwed to the main line by providing fittings with metal inserts and having the required number of galvanized nuts, bolts and washers of correct length.

2.0 INSULATION OF HOT WATER PIPES:

Specification for closed cell chemically cross linked polyethylene thermal insulation material for Hot water pipes in Shaft/Plant Room above False Ceiling.

MATERIAL

Thermal conductivity of material shall not exceed 0.0328 W/MdegreeK at an average temperature of 23OC. The material should have a minimum density 33 kg/m3. The material shall conform to BS476 Part7 ‘Class1’ water permeability,μ factor shall be greater than11000

Thickness of the insulation shall be as specified for the individual application. Each lot of insulation material delivered at site shall be accompanied with manufacturer test certificate for thermal conductivity values. Samples of insulation material from each lot delivered at site may be selected by project manager for thermal conductivity and density test at contractor’s cost. All joints shall be sealed properly with adhesive, which shall provide vapour barrier as the original insulating material.

i) PIPING INSULATION:

All hot water piping shall be insulated in the manner specified herein. Before applying insulation, all pipe shall be brushed and cleaned. Thermal insulation shall be applied as follows or as specified in drawings or schedule of quantity.

Thickness of Insulation :

Pipe size (mm)	Thickness of Insulation
15 mm to 20 mm	9 mm thick
25 mm	13 mm thick
32 mm to 100 mm	25 mm thick

Insulating material in tube form shall be sleeved on the pipes. On existing piping – opened tube from insulating material shall be placed over the pipe and adhesive (as recommended by the manufacturer) shall be applied as suggested by the manufacturer. Adhesive must be allowed to tack dry and then press surface firmly together starting from butt end and working towards centre

Wherever flat sheets shall be used it shall be cut out in correct dimension. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The insulation shall be continuous over the entire run of piping, fittings and valve. All valves, fittings, joints, strainers etc. in hot water piping shall be insulted to the same thickness as specified for the main run of piping and application shall be same as above. Valves bonnet, yokes and spindles shall be insulated in such a manner as not to cause damage to insulation when the valve is used or serviced.

All the exposed insulation shall be properly protected from ultraviolet damage by providing required uv protection treatment and 24 gauge aluminum sheet cladding to protect the insulation from physical damage

3.0 MEASUREMENT AND RATES:

3.1 GI PIPES / M.S. PIPE / S.S. PIPE:

GI / M.S./S.S. Pipes above ground shall be measured per linear metre (to the nearest cm) along the centre line of the pipe and shall be inclusive of all fittings e.g. couplings, tees, bends, elbows, unions, flanges, etc. Deduction for valves shall be made. Rates quoted shall be inclusive of all fittings, clamps, cutting holes chases and making good the same and all other items mentioned in the specifications and Schedule of Quantities.

3.2 VALVES, STRAINERS, MOISTURE SEPARATORS :

Valves shall be measured by numbers. However, wherein these items are included as integral part of an assembly and described as such in the B.O.Q., these will not be prescribed and paid for separately.

3.3 FLANGES FOR NOZZLES:

Flanges for nozzles shall be measured by numbers and the quoted rate shall include welding of the flanges to the pipe nozzles.

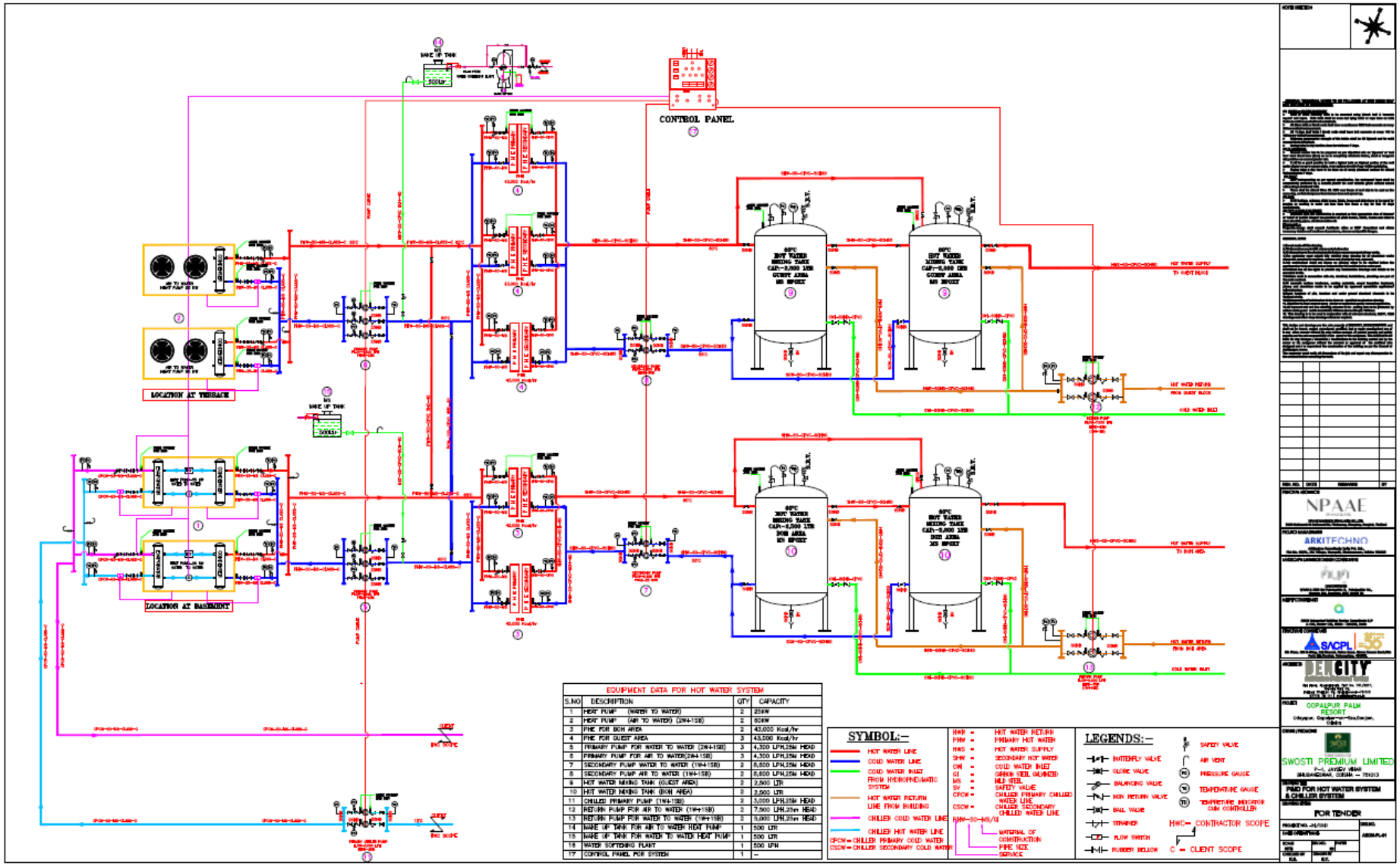
3.4 PIPING / PIPE PROTECTION / INSULATION:

Unless otherwise specified painting / Pipe protection / Insulation for pipes shall be measured and paid for separately. These shall be measured per linear meter along the centre line of the pipe over the finished surface and shall include all valves and fittings for which no special rates shall be applicable.

DRAWINGS

The contractor shall refer the tender drawings attached in this section.

Sr. No.	Drawing Title (GFCs)	Drawing No.
1	LOWER GROUND FLOOR LAYOUT	AEON/AC/T-01
2	TERRACE FLOOR LAYOUT	AEON/AC/T-09



EQUIPMENT DATA FOR HOT WATER SYSTEM			
S.NO	DESCRIPTION	QTY	CAPACITY
1	HEAT PUMP (WATER TO WATER)	2	23kW
2	HEAT PUMP (AIR TO WATER) (2W+1SB)	2	90kW
3	PHE FOR DOM AREA	2	43,000 Kcal/hr
4	PHE FOR GUEST AREA	3	43,000 Kcal/hr
5	PRIMARY PUMP FOR WATER TO WATER (2W+1SB)	3	4,300 LPH,25m HEAD
6	PRIMARY PUMP FOR AIR TO WATER(2W+1SB)	3	4,300 LPH,25m HEAD
7	SECONDARY PUMP WATER TO WATER (1W+1SB)	2	8,600 LPH,25m HEAD
8	SECONDARY PUMP AIR TO WATER (1W+1SB)	2	8,600 LPH,25m HEAD
9	HOT WATER MIXING TANK (GUEST AREA)	2	2,500 LTR
10	HOT WATER MIXING TANK (DOM AREA)	2	2,500 LTR
11	CHILLED PRIMARY PUMP (1W+1SB)	2	3,000 LPH,25m HEAD
12	RETURN PUMP FOR AIR TO WATER (1W+1SB)	2	7,500 LPH,25m HEAD
13	RETURN PUMP FOR WATER TO WATER (1W+1SB)	2	5,000 LPH,25m HEAD
14	MAKE UP TANK FOR AIR TO WATER HEAT PUMP	1	500 LTR
15	MAKE UP TANK FOR WATER TO WATER HEAT PUMP	1	500 LTR
16	WATER SOFTENING PLANT	1	500 LPH
17	CONTROL PANEL FOR SYSTEM	1	--

SYMBOL:-

- HOT WATER LINE
- COLD WATER LINE
- COLD WATER INLET FROM HYDROPNEUMATIC SYSTEM
- HOT WATER RETURN LINE FROM BUILDING
- CHILLER COLD WATER LINE
- CHILLER HOT WATER LINE
- CPOW = CHILLER PRIMARY COLD WATER
- CSOW = CHILLER SECONDARY COLD WATER

HWR = HOT WATER RETURN
HPW = PRIMARY HOT WATER
HWS = HOT WATER SUPPLY
SHW = SECONDARY HOT WATER
CW = COLD WATER INLET
GI = GARVIN STEEL GALVINIZED
MS = MILD STEEL
SV = SAFETY VALVE
CPCW = CHILLER PRIMARY CHILLED WATER LINE
CSCW = CHILLER SECONDARY CHILLED WATER LINE

HWR-50-MS/G
- MATERIAL OF CONSTRUCTION
- PIPE SIZE
- SERVICE

LEGENDS:-

- BUTTERFLY VALVE
- GLOBE VALVE
- BALANCING VALVE
- NON RETURN VALVE
- BALL VALVE
- STRAINER
- FLOW SWITCH
- RUBBER BELLOW
- SAFETY VALVE
- AIR VENT
- PG — PRESSURE GAUGE
- TG — TEMPERATURE GAUGE
- TD — TEMPERATURE INDICATOR CUM CONTROLLER

HWC — CONTRACTOR SCOPE
C — CLIENT SCOPE

NPAAE
ARKITECHNO
SACPL
JEN CITY
PROJECT: GOPALPUR PALM RESORT
SWOSTI PREMIUM LIMITED
P&ID FOR HOT WATER SYSTEM & CHILLER SYSTEM
FOR TENDER

SECTION-4

FINANCIAL PROPOSAL SUBMISSION FORM

(To be submitted in separate sealed Envelop)

(In Company's Letterhead)
{Location, Date}

To

The General Manager (Communications)
Swosti Premium Ltd.
Gopalpur Palm Resort Project
Email: gm.communications@swostihotels.com ear Sirs:

We, the undersigned, offer to provide the construction services for "Supply, Installation, Testing & Commissioning of Water Heater and Allied Works at Gopalpur Palm Resort for Swosti Premium Ltd., Gopalpur, Ganjam, on a Item Rate Contract Basis", in accordance with your Request for Proposal dated and our Technical Proposal.

"We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery. We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act, 1988 (as updated from time to time)."

Our attached Financial Proposal is for the amount of {Indicate the corresponding to the amount(s) currency(ies)}{Insert amount(s) in words and figures}, *"excluding" of all indirect local taxes as in the Data Sheet.* The estimated amount of local indirect taxes is {Insert currency} {Insert amount in words and figures} which shall be confirmed or adjusted, if needed, during negotiations. {Please note that all amounts shall be the same as indicated above.

Our Financial Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal, i.e. before the date indicated in the Data Sheet.

We understand you are not bound to accept any Proposal you receive.

We remain,

Yours sincerely,

Authorized Signature {In full and initials}: _____ Name and Title of Signatory: _____

In the capacity of: _____
Address: _____

E-mail:

BOQ FOR SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF WATER HEATER AND ALLIED WORKS

Sr.No	Description	Unit	Qty	Rate	Amount
A).	**DOMESTIC HOT WATER SYSTEM EQUIPMENT**				
1	**WATER TO WATER HEAT PUMP**				
	Supply, installation, testing & commissioning of Micro Processor Controlled Non-reversible water cooled semi hermetic screw compressor Heat pump, delivering actual capacity as per the following parameters duly installed at site. Electronic Expansion Valve, MS Shell and copper tubes heat exchanger for both evaporator and condenser side, antivibration rubber mounts with factory assembled with Electrical panel mounted on the heat pump including the disconnect switch suitable for 50 Hz, 3 phase 415 volts,ac supply. The vibration isolators shall be shipped along with heat pump from your works. Heat Pump should be capable of generating Hot Water upto 65ºC.Refrigerant circuit to include necessary controls for higher temperature application, liquid line solenoid valve, drier filter with replaceable solid cartridge, liquid line sight glass, electronic expansion valve, high pressure safety valve, high & lower pressure transducers, High pressure safety in addition to high / low pressure switch, high and low-pressure switches, liquid receiver etc. The heat pump shall be suitable for operation on Environment friendly refrigerant R134a/ 410A and shall come factory charged with refrigerant.				
	Heating capacity = 25 kW Actual at below mentioned conditions				
	Hot water inlet temp.= 60Deg C				
	Hot water outlet temp.= 65 Deg C				
	Refrigerant : R-134A / 410A				
	Anti Corrosion coating confirming ASTM B117 passing Salt Spray test of 7000 hours				
	(The system shall be complete in all respects viz Drive, lubrication system, evaporator, condenser coil, refrigerant system, controller, communication port for BMS).	Nos.	2		-
1.1	**FITTINGS FOR WATER TO WATER HEAT PUMP**				
	Supply, installation, testing & commissioning of following Valvs & Fittings as per Specifications				
1.1.1	Ball Valve - 25 mm dia	Nos.	8		-
1.1.2	Ball Valve - 15 mm dia	Nos.	4		-
1.1.3	NRV Valve, Dual Plate ,CI - 25 mm dia	Nos.	4		-
1.1.4	Rubber bellow -25 mm dia	Nos.	8		-
1.1.5	Balancing valve -25 mm dia	Nos.	4		-
1.1.6	Flow switch,65mm dial , Honeywell	Nos	4		-
1.1.7	Pressure Gauge (Gylecrine filled)	Nos.	8		-
1.1.8	Temp. Gauge	Nos	8		-
1.1.9	Air Release Valve - 15 mm dia	Nos.	4		-
1.1.10	Ball Valve - 15 mm dia for air release valve	Nos.	4		-
1.1.11	MS Socket for BMS	Nos.	8		-
2	**AIR TO WATER HEAT PUMP**				

	Supply, installation, testing and commissioning of Air Cooled Heat Pump Unit (for outdoor installation) for Hot Water generation up to 60ºC. Heat Pump shall include dual circuit scroll compressor suitable for R 410 refrigerant driven by suitable size squirrel cage induction motor rated for 415± 10% volts, 3 phase , 50 Hz AC supply complete Heat pump shall have the following features:				
	The compressor and heat exchangers shall be housed in a suitably insulated enclosure to limit vibration and noise.				
	Heat - efficiency Copper Tube in Tube , Double wall Condenser .				

	Evaporator is of Finned coils made with copper pipes and aluminium fins with large exchange surface area				
	Safety Valve, Pressure & Temperature gauge & Air Vent Valve				
	Structure and base in hot - dip galvanised steel with epoxy powder coating finish				
	Rubber anti vibration mounting kit				
	Heat pump shall be rated for the following capacity:				
	Nominal Heating Capacity -60 KW				
	Anti Corrosion coating confirming ASTM B117 passing Salt Spray test of 7000 hours				
	Ambient Temp;- - 5 deg to 43 deg				
	HW OUT:65deg C				
	HW IN: 60 deg C	Nos.	2		-
2.1	**FITTINGS FOR AIR TO WATER HEAT PUMP**				
	Fittings for Air to Water Supply, installation, testing & commissioning of following Valves & Fittings as per Specifications				
2.1.1	ButterFly Valve, CI, PN 10 - 50 mm dia	Nos.	4		-
2.1.2	NRV Valve, Dual Plate ,CI -50 mm dia	Nos.	2		-
2.1.3	Ball Valve - 25 mm dia	Nos.	2		-
2.1.4	Ball Valve - 15 mm dia	Nos.	4		-
2.1.5	Balancing valve - 50 mm dia	Nos.	2		-
2.1.6	Flow switch50mm dial , Honeywell	Nos.	2		-
2.1.7	Pressure Gauge (Gylecrine filled)	Nos.	4		-
2.1.8	Temp. Gauge	Nos.	4		-
2.1.9	Air Release Valve - 15 mm dia	Nos.	4		-
2.1.10	MS Socket for BMS	Nos	4		-
3	**Water Softening Plant**				
3.1	**water softening plant for Heat pump**				
	Supply, installation, testing & commissioning of water softening plant with pump (FRP) for make-up water for & Hot water System comprisinh pump of multiport valve with brine ejector and plastic piping complete with brine tank with fittings and brine filtering media and complete charge of cation exchange resin as per specification for the capacity of pump and softner as given below :				
	Anti Corrosion coating confirming ASTM B117 passing Salt Spray test of 7000 hours				
	Incoming Hardness : 400 mg / Ltr (Approx.)				
	Working Pressure : 2.5 kg / Sqm				
	Outgoing Hardness : Comm. Zero				
	Water Softening Plant as described above	Nos.	1		-
	Valves and fitting for above Softner;				
3.1.1	Ball valve - 25 mm dia	Nos.	3		-
3.1.2	Y Strainer - 25 mm dia	Nos.	1		-
3.1.3	Pressure Redusing Valve - 25 mm dia(Gylecrine filled)	Nos.	1		-
3.1.4	Pressure Gauge	Nos.	2		-
4	**Hot Water Mixing Tank**				
4.1	**Hot Water Mixing Tank for BOH Area**				

	Supply, installation, testing & commissioning of MS ,IS 2062 PLATES Horizontal / Vertical hot water storage tank (Capacity 2500 Lts) suitable for minimum 4.5.0 Kg /Sq.cm operating pressure. Tank shall be provided with hot water flow meter at inlet from hydropneumatic system (approved by department of weights and measures), inlet / outlet, overflow / drain connection with MH and cover (550 mm ID) pressure relief valve, pressure gauge outlet with isolation cock, thermometer. All the valves & accessories shall be suitable for an operating pressure as mentioned above. Tank shall be mounted on 450 mm high steel structural supports with access ladder painted with 2 coats of red oxide paint. (Inlet temperature to hot water storage tank 55-60 deg C).				
	Tank shall be insulated as per specification, including 24 gauge aluminium cladding. The flanges shall be dimensions confirming to ANSI, B 16.5 No. 150. The nozzles shall be MS ERW pipes. (Tank shall be fabricated as per unfired pressure vessel code IS 2825-1969). The tank shall be provided with following:				
	I**nternal Coating** :-The Tank will Be coated with Food Grade Epoxy from inside ,the thickness of the coat will be as per the manufacturer's recommendation . **External Coatings** :- Primer Zinc Coating , Middle Epoxy Coating and External PU coating for maximum life , guarantee on tanks 5 years .				
	Hot water mixing tank complete with insulation for required operating pressure.	Nos.	2		-
	Valves and fitting for abvoe tank;				
4.1.1	Butterfly Valve - 50 mm dia	Nos.	10		-
4.1.2	Check Valve - 50 mm dia	Nos.	2		-
4.1.3	Ball Valve - 25 mm dia	Nos.	2		-
4.1.4	Air Release Valve - 25 mm dia	Nos.	2		-
4.1.5	Safity Valve - 25 mm dia	Nos.	2		-
4.1.6	Pressure Gauge(Gylecrine filled)	Nos.	2		-
4.1.7	Temp. Gauge	Nos	2		-
4.1.8	Temperature sensor at mixing tank suitable for differential temperature setting shall be made for start / stop of the Heat Pumo and other.	Set	1		-
4.1.9	Hot Insulation of rockwool 100 kg/cum with 50 mm thick to all equipment complete with Insulation & aluminum cladding of 24 Swg.	Set	2		-
4.1.10	SS SOCKET for BMS	Nos.	2		-
4.2	**Hot Water Mixing Tank for Guest Area**				
	Supply, installation, testing & commissioning of MS ,IS 2062 PLATES Horizontal / Vertical hot water storage tank (Capacity 2500 Lts) suitable for minimum 7.5.0 Kg /Sq.cm operating pressure. Tank shall be provided with hot water flow meter at inlet from hydropneumatic system (approved by department of weights and measures), inlet / outlet, overflow / drain connection with MH and cover (550 mm ID) pressure relief valve, pressure gauge outlet with isolation cock, thermometer. All the valves & accessories shall be suitable for an operating pressure as mentioned above. Tank shall be mounted on 450 mm high steel structural supports with access ladder painted with 2 coats of red oxide paint. (Inlet temperature to hot water storage tank 55-60 deg C).				
	Tank shall be insulated as per specification, including 24 gauge aluminium cladding. The flanges shall be dimensions confirming to ANSI, B 16.5 No. 150. The nozzles shall be MS ERW pipes. (Tank shall be fabricated as per unfired pressure vessel code IS 2825-1969). The tank shall be provided with following:				

	Internal Coating :-The Tank will Be coated with Food Grade Epoxy from inside ,the thickness of the coat will be as per the manufacturer's recommendation . **External Coatings** :- Primer Zinc Coating , Middle Epoxy Coating and External PU coating for maximum life , guarantee on tanks 5 years .	Nos.	2		-
	Valves and fitting for abvoe tank;				
4.2.1	Butterfly Valve - 50 mm dia	Nos.	10		-
4.2.2	Check Valve - 50 mm dia	Nos.	2		-
4.2.3	Ball Valve - 25 mm dia	Nos.	2		-
4.2.4	Air Release Valve - 25 mm dia	Nos.	2		-
4.2.5	Safity Valve - 25 mm dia	Nos.	2		-
4.2.6	Pressure Gauge(Gylecrine filled)	Nos.	2		-
4.2.7	Temp. Gauge	Nos	2		-
4.2.8	Temperature sensor at mixing tank suitable for differential temperature setting shall be made for start / stop of the Heat Pumo and other.	Set	1		-
4.2.9	Hot Insulation of rockwool 100 kg/cum with 50 mm thick to all equipment complete with Insulation & aluminum cladding of 24 Swg.	Set	2		-
4.2.10	SS SOCKET for BMS	Nos.	2		-
5	**Make-up Tank For Hot water System (Heat Pumps) .**				
	Supply, installation, testing & commissioning a MS make-up tank of 500 ltrs. capacity complete with inlets/ outlets, inlet and vent connections with flanges including valves, side mounting type glass level indicator alongwith accessories and manhole with bolted cover and with red oxide as per specifications, complete in all respect as given below:				
	MS make-up tank complete for Heat Pumps	Nos	2		-
	Valves and fitting for abvoe tank;				
5.1	Ball valve-25 mm dia.	Nos	6		-
5.2	Check l valve-25 mm dia.	Nos	3		-
5.3	Y' strainer- 25 mm dia	Nos	3		-
5.4	Glass level indicator along with accessories	Nos	3		-
5.5	Float Valve - 25 mm dia	Nos	3		-
5.6	Vent - 25 mm dia	Nos	3		-
6	**Heat Exchangers**				
	Plate Tyep water to water heat exchanger with all accessories as per specifications complete in all respect as given below:				
7.1	**Domestic Hot Water - BOH**				
	For -BOH				
	Plate type heat exchanger.				
	Capacity 43000 Kcal / Hr				
	Hot Water flow in primary circuit 8600 LPH				
	Water Flow in secondary circuit 8600 LPH				
	Temperature primary circuit.				
	Inlet : 65 deg.C				
	Outlet : 60deg.C				
	Temperature secondary circuit				
	Inlet : 55 deg.C				
	Outlet : 60 deg.C	Nos.	2		-
	Valves & Fittings on primary / secondary circuit				
7.1.1	Butterfly Valve - 50mm dia	Nos.	8		-
7.1.2	Dial type thermometer	Nos.	8		-
7.1.3	Pressure Gauge(Gylecrine filled)	Nos.	8		-
7.1.4	Check Valve - 50 mm dia	Nos.	2		-
7.1.5	Balancing Valve - 50 mm dia	Nos.	2		-
7.1.6	MS Socket for BMS	Nos.	8		-
7.2	**Domestic Hot Water GUEST ROOMS**				
	For Guest Floor -GUEST ROOMS				

	Plate type heat exchanger.				
	Capacity 43000 Kcal / Hr				
	Hot Water flow in primary circuit 8600 LPH				
	Water Flow in secondary circuit 8600 LPH				
	Temperature primary circuit.				
	Inlet : 65 deg.C				
	Outlet : 60deg.C				
	Temperature secondary circuit				
	Inlet : 55 deg.C				
	Outlet : 60 deg.C	Nos.	3		-
	Valves & Fittings on primary / secondary circuit				
7.2.1	Butterfly Valve - 50 mm dia	Nos.	12		-
7.2.2	Dial type thermometer	Nos.	12		-
7.2.3	Pressure Gauge(Gylecrine filled)	Nos.	12		-
7.2.4	Check Valve - 50mm dia	Nos.	3		-
7.2.5	Balancing Valve - 50 mm dia	Nos.	3		-
7.2.6	MS Socket for BMS	Nos.	12		-
8	**PUMPS**				
	Providing, installation, testing and commissioning of following insulated pumps suitable for 415 Volts connected with T.E.F.C. induction motor, isolating valve on suction and discharge, non return valve on discharge, pressure gauges with stop cock and dial type thermometer on suction or discharge. The pump shall have mechanical seal. The pump shall be impeller, shaft and CI (Epoxy coated) base (suitable for hot water temperature).				
8.1	**CHILLED WATER SIDE PUMPS- WATER TO WATER**				
	Pump 2 Nos. = (1W + 1SB)				
	Flow - 3000 LPH				
	Head - 25 mtrs	Nos.	2		-
	Valves / Fittings :				
8.1.1	BALL Valve - 25 mm dia	Nos.	4		-
8.1.2	Check Valve - 25 mm dia	Nos.	2		-
8.1.3	Y-Strainer - 25 mm dia	No.	2		-
8.1.4	Dial type pressure gauge (Gylecrine filled)	Nos.	2		-
8.1.5	Dial type thermometer	Nos.	4		-
8.1.6	MS Socket for BMS	Nos.	4		-
8.2	**HOT WATER SIDE PUMPS PRIMARY - WATER TO WATER**				
	Pump 3Nos. = (2W + 1SB)				
	Flow - 4300 LPH				
	Head - 25 mtrs	Nos.	3		-
	Valves / Fittings :				
8.2.1	BALL Valve - 25 mm dia	Nos.	6		-
8.2.2	Check Valve - 25 mm dia	Nos.	3		-
8.2.3	Y-Strainer - 25 mm dia	No.	3		-
8.2.4	Dial type pressure gauge (Gylecrine filled)	Nos.	3		-
8.2.5	Dial type thermometer	Nos.	3		-
8.2.6	MS Socket for BMS	Nos.	4		-
8.3	**Air To Water Heat Pump Primary Pumps , Condenser Side**				
	Pump 3Nos. = (2W + 1SB)				
	Flow - 8600LPH (EACH)				
	Head - 25 mtrs	Nos.	3		-
	Valves / Fittings :				
8.3.1	Butterfly Valve - 50 mm dia	Nos.	6		-
8.3.2	Check Valve -50 mm dia	Nos.	3		-
8.3.3	Y-Strainer - 50mm dia	Nos.	3		-
8.3.4	Dial type pressure gauge (Gylecrine filled)	Nos.	3		-
8.3.5	Dial type thermometer	Nos.	3		-
8.3.5	MS Socket for BMS	Nos.	6		-
					-

8.4	Domestic **Hot Water Secondary Recirculation** Pumps(For Guest Zone)				
	Pump 2 Nos. = (1W + 1SB)				
	Flow - 8600 LPH (EACH)				
	Head - 25 mtrs	Nos.	2		-
	Valves / Fittings :				
8.4.1	Butterfly Valve - 50 mm dia	Nos.	4		-
8.4.2	Check Valve -50 mm dia	Nos.	2		-
8.4.3	Y-Strainer - 50mm dia	Nos.	2		-
8.4.4	Dial type pressure gauge (Gylecrine filled)	Nos.	2		-
8.4.5	Dial type thermometer	Nos.	2		-
8.4.6	MS Socket for BMS	Nos.	4		-
8.5	Domestic **Hot Water Secondary Recirculation** Pumps(For Guest Zone)				
	Pump 2 Nos. = (1W + 1SB)				
	Flow - 8600 LPH (EACH)				
	Head - 25 mtrs	Nos.	2		-
	Valves / Fittings :				
8.5.1	Butterfly Valve - 50 mm dia	Nos.	4		-
8.5.2	Check Valve -50 mm dia	Nos.	2		-
8.5.3	Y-Strainer - 50mm dia	Nos.	2		-
8.5.4	Dial type pressure gauge (Gylecrine filled)	Nos.	2		-
8.5.5	Dial type thermometer	Nos.	2		-
8.5.6	MS Socket for BMS	Nos.	4		-
8.6	Domestic **Hot Water Return Recirculation** Pumps(For Guest Zone)				
	Pump 2 Nos. = (1W + 1SB)				
	Flow - 7500 LPH (EACH)				
	Head - 25 mtrs	Nos.	2		-
	Valves / Fittings :				
8.6.1	Butterfly Valve - 50 mm dia	Nos.	4		-
8.6.2	Check Valve - 50mm dia	Nos.	2		-
8.6.3	Y-Strainer - 50 mm dia	Nos.	2		-
8.6.4	Dial type pressure gauge (Gylecrine filled)	Nos.	2		-
8.6.5	Dial type thermometer	Nos.	2		-
8.6.7	MS Socket for BMS	Nos.	4		-
8.7	Domestic **Hot Water Return Recirculation** Pumps(For BOH Zone)				
	Pump 02 Nos. = (1W + 1SB)				
	Flow - 5000 LPH (EACH)				
	Head - 25 mtrs	Nos.	2		-
	Valves / Fittings :				
8.7.1	Butterfly / Ball Valve - 40 mm dia	Nos.	4		-
8.7.2	Check Valve - 40 mm dia	Nos.	2		-
8.7.3	Y-Strainer - 40 mm dia	Nos.	2		-
8.7.4	Dial type pressure gauge (Gylecrine filled)	Nos.	2		-
8.7.5	Dial type thermometer	Nos.	2		-
8.7.6	MS Socket for BMS	Nos.	4		-
					-
	TOTAL CARRIED TO SUMMARY				**-**

B)	**HOT WATER PIPING**				
1	**Piping -Primary Hot water System & Primary /Secondary - Chilled Side , Upto 150mm**				
	Providing and fixing in position the following **MS class 'C'** IS 1239 pipes cut to required lengths and installed with all welded joints , providing and fixing in position the necessary fittings like elbows, tees and reducers, mating flanges & sockets . The pipe will be Insulated with 19mm Thick NBR Tube , with 24 gauge Aluminium Cladding . NO Header will Be paid Extra .				
1.1	150 mm dia MS pipes	RM	0		-
1.2	125 mm dia MS pipes	RM	0		-
1.3	100 mm dia MS pipes	RM	0		-
1.4	80 mm dia MS pipes	RM	0		-
1.5	65 mm dia MS pipes	RM	0		-
1.6	50 mm dia MS pipes	RM	100		-
1.7	40 mm dia MS pipes	RM	40		-
1.8	32 mm dia MS pipes	RM	40		-
1.9	25 mm dia MS pipes	RM	24		-
1.10	20 mm dia MS pipes	RM	QR		
2	**Piping -Secondary -Sanitation Hot water , CPVC Schedule - 80**				
	Providing, jointing, testing and commissioning of following sizes of CPVC pipe conforming to SDR 11 up to 50 mm dia and SCH 80 for above 50 mm dia with all accessories like all fittings including tees, elbows, reducers, union, flanges, rubber gaskets, washer including MS supporting/fixing the pipe on floor / wall /ceiling with clamps, hangers (using anchor fastners) as per specification. pipe sleeve of suitable higher size shall be provided wherever the pipes are crossing the walls/floors and sealing the sleeves with glass wool in between & fire sealent compound at either end all as per Project Manager's requirements including cutting holes and chases in brick, All hangers, clamps, brackets etc. shall be of MS and floor supports with vertical pipes unless specified otherwire and then supply of the same shall also be included for rates under this head. (Fire sealent shall be provided to the contractor free of cost). Cost shall be inclusive of providing roller / slide support, expansion loops and wooden brackets / blocks for insulated pipes. The pipe will be Insulated with 19mm Thick NBR Tube , with 24 gauge Aluminium Cladding . NO Header will Be paid Extra .				
3.1	25mm	RM	12		-
3.2	40mm	RM	12		-
3.3	50mm	RM	12		-
3.4	65mm	RM	60		-
3.5	80mm	RM	12		-
3.6	100mm	RM	60		-
C.	**STRUCTURAL**				
1	Structural steel works for making platform, pipe supports (Hot water System) & hangers etc duly painted with enamel.	Kgs.	5000		-
	TOTAL CARRIED TO SUMMARY				**-**

D.	**ELECTRICAL INSTALLATION FOR HOT WATER SYSTEM**				
1	**ELECTRICAL PANEL FOR HEAT PUMP AND HOT WATER GENERATION SYSTEM (LOCATION :- BASEMENT)**				
	Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel in form in 3b formation with reinforcement of suitable size angle iron, channel 'T' sections irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Cadmium Plated hardware shall be used in fabrication of panels. Quoted rates shall inclusive of cables (in accordance to specification) with earthing from panel to each motor / equipment.				
	MCC – 1				
	Incoming				
i)	300 amps 4Pole MCCB type Isolator with the following accessories:				
a.	0-500 volts 96 x 96 mm square voltmeter with selector switch shall be protected by 2 amps TP MCB. 1 Set				
b.	300 amps 96 x 96 mm square ammeter with selector switch and 250/5 amps 10 VA CL:1 CTs. 1 Set				
c.	Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets				
ii)	Bus Bar				
	300 amps TPN (50 KA) aluminium bus bar with heat shrinkable insulation sleeves				
	Outgoings				
A	2 Nos 32 amps TPN MCCB outgoing feeders to 25 KW (EACH) **HEAT PUMP WATER TO WATER** both working				
B	2 Nos 63 amps TPN MCCB outgoing feeders to 50 KW (EACH) **HEAT PUMP AIR TO WATER** both working				
C	3 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 1 KW **WATER TO WATER HEAT PUMP CHILLER SIDE PUMP**. Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
D	3 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 1 KW, **WATER TO WATER HEAT PUMP HOT WATER SIDE PUMP**. Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
E	3 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 2.0 KW **AIR TO WATER HEAT PUMP PRIMARY SIDE PUMP** Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				

F	2 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 2.0 KW **SECONDARY SIDE PUMPS GUEST ROOMS** Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
G	2 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 2.0 KW **SECONDARY SIDE PUMPS BOH AREAS** Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
H	2 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 2.0 KW **RETURN SIDE PUMPS GUEST ROOMS** Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
I	2 Nos. 16 amps TP MPCB with direct online starter and outgoing feeder to 2.0 KW **SECONDARY SIDE PUMPS BOH AREA** Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of motor.				
J	Spare 16 amps TP MPCB 2 Nos				
K	Necessary cable alleys, internal wiring, control wiring, interlocking for all equipments shall also be included in cost of the panel.				
	Notes :				
a.	All MCCBs shall be of 50 KA breaking capacity and suitable for motor duty application.				
b.	Provision shall be made for providing potential free contacts to all pumps starters for connection to BAS	No.	1		-

2	**ELECTRICAL PANEL FOR Heater in Mixing (LOCATION :- BASEMENT)**				
	Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel in form in 3b formation with reinforcement of suitable size angle iron, channel 'T' sections irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Cadmium Plated hardware shall be used in fabrication of panels. Quoted rates shall inclusive of cables (in accordance to specification) with earthing from panel to each motor / equipment.				
	MCC – 1				
	Incoming				
i)	125 amps 4Pole MCCB type Isolator with the following accessories:				
a.	0-500 volts 96 x 96 mm square voltmeter with selector switch shall be protected by 2 amps TP MCB. 1 Set				
b.	250 amps 96 x 96 mm square ammeter with selector switch and 250/5 amps 10 VA CL:1 CTs. 1 Set				
c.	Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets				
ii)	Bus Bar				
	150 amps TPN (50 KA) aluminium bus bar with heat shrinkable insulation sleeves				
	Outgoings				
A	5Nos. 25 amps TPN MCB with sutaible relay contractor/realy including all accessories and outgoing feeder to 5.0 KW **HEATER FOR MIXING TANK BOH AREA** . Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of Heaters.				
B	6Nos. 25 amps TPN MCB with sutaible relay contractor/realy including all accessories and outgoing feeder to 6.0 KW **HEATER FOR MIXING TANK BOH AREA** . Each compartment shall contain auto/manual selector switch and an indicating lamp with MCB's for ON/OFF/Trip status of Heaters.				
C	Spare 25 amps TP MPCB 2 Nos				
D	Necessary cable alleys, internal wiring, control wiring, interlocking for all equipment's shall also be included in cost of the panel.				
	Notes :				
a.	All MCCBs shall be of 25 KA breaking capacity and suitable for motor duty application.				
b.	Provision shall be made for providing potential free contacts to all pumps starters for connection to BAS	No.	1		-

4	**CABLES, SUBMAINS & CABLE TRAYS:**				
	Supply, installation, testing and commissioning of following sizes of PVC sheathed PVC/XLPE insulated Aluminium/copper conductor power/control armoured cables of 1100V grade on surface of wall or in existing cable trays/masonry ducts/ hume pipe with fixing hardware etc. as required.				
	Copper Conductor Armoured control Cables:				
a)	3 ½ C – 50 Sq mm XLPE insulated, Al. conductor	RM	250		-
b)	3 C – 2.5 Sq mm XLPE insulated copper cable	RM	150		-
c)	3 C – 4 Sq mm XLPE insulated copper cable	RM	150		-
d)	4 C – 4 Sq mm XLPE insulated copper cable	RM	100		-
e)	3 C – 1.5 Sq mm XLPE insulated copper cable	RM	50		-
5	**Cable Termination**				
	Supply & making end termination with brass compression glands for the following PVC/XLPE insulated PVC sheathed 1100 V grade cable including cost of crimping lugs/ ferrules, compression glands, solder cable sockets, insulation tap etc. complete as required.				
	Armoured cables (double compression type).				
a)	3 ½ C – 50 Sq mm XLPE insulated, Al. conductor	Nos.	4		-
b)	3 C – 2.5 Sq mm XLPE insulated copper cable	Nos.	22		-
c)	3 C – 4 Sq mm XLPE insulated copper cable	Nos.	22		-
d)	4 C – 4 Sq mm XLPE insulated copper cable	Nos.	8		-
6	**Cable Trays :**				
	Supply, installation of ladder type/perforated type cable trays of the following sizes fabricated out of perforated galvanised MS sheets of minimum 2 mm thick to be installed horizontally or vertically. .				
	Perforated Type Cable Tray :				
a)	100 mm x 25 x 25 x 2 mm thick	RM	100		-
b)	150 mm x 25 x 25 x 2 mm thick	RM	20		-
c)	300 mm x 40 x 40 x 2 mm thick	RM	20		-
Note :	The cable & Cable Tray quantities given above are approximate and for scope purposed. The contractor shall measure the cables & Tray quantities at site and procurement order shall be placed accordingly.				
7	**EARTHING :**				
	Supply, installation, testing & commissioning of following sizes of GI strip/wire clamped to wall, cable trays complete as required including inter connection between lengths at joints, all fixing accessories saddles, clamps etc. and other fixing hardware material as required for proper installation.				
a)	8 SWG GI wire	RM	200		-
	TOTAL CARRIED TO SUMMARY				**-**
	Grand Total				**-**
	GST EXTRA AS APPLICABLE				

Summary of Cost			
S. NO.	**DESCRIPTION**	**AMOUNT (Rs.)**	
	HOT WATER SYSTEM		
A.	DOMESTIC HOT WATER SYSTEM EQUIPMENT	RS.	-
B.	HOT WATER PIPING AND INSULATION:	RS.	-
C.	ELECTRICAL INSTALLATION FOR HOT WATER SYSTEM	RS.	-
	GRAND TOTAL	RS.	**-**

OPERATION & MAINTENANCE		
YEAR	**OPERATION**	**MAINTENANCE**
First Year		PART OF DLP
Second Year		
Third Year		
Forth Year		
Fifth Year		

Note:-

1. Above Prices will not be part of Tender Evaluation
2. It will not be binding on SWOSTI PREMIUM LTD for entering into above Comprehensive Annual Maintenance Contract
3. If SWOSTI PREMIUM LTD decides to enter into the above Comprehensive Annual Maintenance Contract, a separate Contract Agreement shall be made, which will not be part of this Contract
4. Tenderers are expected to quote Reasonable Prices.

PAYMENT TERMS:

Mobilization Advance:

- Contractor will be paid any mobilization advance as indicated in contract data.

PAYMENT SCHEDULE

The stage-wise payment to the Contractor shall be released based on the items of work executed as contained in the Bills of Quantities and rates agreed to thereto. Upon completion that item of work. Detail procedure are as below :

Preparation of R/A Bills :

- After satisfactory completion of each item of work, the bill shall be submitted with detailed measurements and invoice.
- Final bill along with no claim certificate should be submitted within 2 months from date of completion of work.
- Upon clearing the site of all debris, materials, temporary structures and machinery.
- Payments for supply/work done will be made in R/A bill based on monthly progress or work, verified with measurement by PMC/Authorised Engineer.
- R/A bills will be certified against final amounts as in contract.

Withholding of Payments:

- Payment may be withheld if contractor fails to meet contractual obligations.
- Failure to pay workers' wages or bills of contractor.

SECURED ADVANCE :

Any request for a secured advance may be requested for by Contractor along with invoice/ original shipping document copy of invoice and duly signed payment invoice. This may be considered by the Employer(Client) upon assessment by PMC/Engineer-in-Charge for items of non-perishable, non-fragile & non-consumable in nature and required for the work and in accordance with contract (Conditions & Technical Specifications), which have been brought to the site in connection with execution (having reference to an item of work in BOQ) and are adequately stored and/or protected against damage by weather or other causes and have not been incorporated in the work earlier. The amount of such advance shall be deducted from next/final payment. However, any secured advance for any material/equipment lying unutilized after 3 months/completion of work shall be recovered fully from the next/final bill.

Note:

Each payment shall be certified by the Engineer based on physical progress at site against the approved GFC drawings.

No advance payment shall be made unless specifically agreed in the contract data or special conditions.

All payments are subject to retention, tax deduction at source, and recoveries as per the contract.

SECTION 5: CONTRACT DATA,CONTRACT FORM

&

CONDITIONS OF CONTRACT

CONTRACT DATA

Clause	Description
1. Name of Work	SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF HOT WATER SYSTEM AND ALLIED WORKS at Gopalpur Palm Resort – (Item Rate Contract)
2. Name of the Client	Swosti Group
3. Client's Representative	Project Management Consultant (PMC) – [Insert PMC Firm Name]
4. PMC Contact Details	Name: Designation: Project Manager – PMC Email: [Insert] Phone: [Insert]
5. Site Location	Gopalpur-on-Sea, Ganjam District, Odisha – 761002
6. Scope of Work	All HVAC-HIGH Side SUPPLY, INSTALLATION, TESTING & COMMISSIONING OFHOT WATER SYSTEM AND ALLIED as per drawings and specifications.
7. Estimated Contract Value	₹ [Insert Amount] (Inclusive of all costs except GST)
8. Tender Type	Item Rate-Fixed Price Contract
9. Contract Type	Item Rate
10. Time for Completion	[Insert duration – e.g., 6 months] from the date of Letter of Acceptance (LoA)
11. Date of Commencement	Within 7 (seven) days from issuance of LoA or handing over of site, whichever is later
12. Defects Liability Period (DLP)	12 months from the date of issuance of Completion Certificate
13. Performance Security	2% of Contract Value in the form of Bank Guarantee to be submitted within 7 days of LoA
14. Retention Money	3% of Running Account Bills; to be released after successful completion of the Defects Liability Period
15. Mobilisation Advance	No
16. Schedule of Payments	Item-based payments linked to actual progress of works (Refer to Section – Payment Terms)
17. Liquidated Damages (LD)	0.2 % **per day** of the value of balance work delayed **beyond the stipulated date of completion**, subject to a **maximum of 10% of Contract Value**
18. Arbitration	In accordance with the Arbitration and Conciliation Act, 1996; sole arbitrator to be mutually appointed
19. Governing Law and Jurisdiction	Laws of India; jurisdiction: Bhubaneswar, Odisha
20. Insurance	Contractor to provide insurance for Works, Workmen Compensation, Equipment, and Third-Party Liability to indemnify the Client from damage/Claims arising out all such items including loss arising out of natural calamity.
21. Taxes and Duties	Quoted price is inclusive of all taxes and duties except GST; GST shall be paid extra as applicable
22. Sub-contracting	Permitted only with prior written approval of the Client / PMC

Clause	Description
23. Safety & Compliance	Contractor to comply with safety regulations, labor laws, and site protocols
24. Force Majeure	As per General Conditions of Contract
25. Advance Payment	10% of Contract Value, against submission of Bank Guarantee of 100% of amount; recoverable in equal instalments from running bills
26.Secured Advance	To be considered on request

AGREEMENT

AN AGREEMENT is made this----------BETWEEN the SWOSTI PREMIUM LTD ,Bhubaneswar, which expression shall include its successor, unless repugnant to or Excluded by the contract here of and assignees of and represented by its ……(the first party (hereinafter called the Authority) and by…… its sole proprietor/partners/Director and having registered office at (which expression shall be including his / its successor's heirs executors, representative and or assignees of the second party (hereinafter called the contractor}.

WHEREAS the Authority has, under tender Notification No. ----------

WHEREAS the contractor has submitted tender for carrying out the work as above as per the tender document page ---- to ----- and has represented that in conformity with his / its obligation contained in the tender as modified by the correction slips and corrigendum contained he / it shall carryout the same truly, faithfully and honestly.

THE SAME has been accepted by both the parties on the terms and conditions, corrections, corrigendum contained in the tender as modified as well as the letter of acceptance , at a total Contract Price of Rs. Crores (Rupees Crores) excluding GST (To be paid extra as applicable) as Issued party No.1 annexed here to as.

The same shall be binding on both the parties.

IN WITNESS WHEREOF, the parties have signed the deed of agreement on the date, month and year referred to above.

Date: At

New Delhi.

Signed by

Party No.1 Party No.2

WITNESS

1. Party No.1

2. Party No.2

Conditions of Contract

Conditions of Contract

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GENERAL

Terms,which are defined in the Contract Data and not defined in the Conditions of Contract shall keep their defined meanings. Capital initials are used to identify defined terms.

Bill of Quantities means the priced and completed Bill of Quantities;

Compensation Events are those defined in Document;

The **Completion Date** is the date of completion of the Works as certified by the Engineer.

The **Contract** is the contract between the Client and the Contractor to execute, complete and maintain the Works.

The **Contract Data** defines the documents and other information, which comprise the Contract;

The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Client [obligations of the Contractor mentioned in the Contract Data].;

The **Contractor's Bid** is the completed Bidding document submitted by the Contractor to the Client and includes Technical and Financial bids;

The **Contract Price** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract;

Days are calendar days; months are calendar months;

A **Defect** is any part of the Works not completed in accordance with the Contract;

The **Defects Liability Period** is the period named in the Contract Data and calculated from the Completion Date;

The **Client** is the party who will employ the Contractor to carry out the Works; [As mentioned in the Contract Data].

The Engineer is the person named in the Contract Data (or any other competent person appointed and notified to the contractor to act in replacement of the Engineer) who is responsible for supervising the Contractor’s work, administering the Contract, certifying payments due to the Contractor, issuing and valuing Variations to the Contract, recommending extensions of time, and valuing the Compensation Events;

Equipment is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works;

Initial Contract Price is the Contract Price listed in the Client's Letter of Acceptance;

Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Client by issuing an extension of time;

Materials are all supplies, including consumables, used by the contractor for incorporation in the Works;

Plant is any integral part of the Works, which is to have a mechanical, electrical, electronic or chemical or biological function;The **Site** is the area defined as such in the Contract Data;

Site Investigation Reports are those, which were included in the Bidding documents and are factual interpretative reports about the surface and sub-surface conditions at the site;

Specification means the Specification of the works included in the Contract and any modification or addition made or approved by the Client;

The **Start Date / Date of Commencement** is given in. the Contract Data. It is the date when the Contractor shall commence execution of the works. It does not necessarily coincide with any of the Site Possession Dates;

A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site;

Temporary Works are works designed, constructed, installed, and removed by the Contractor, which are needed for construction or installation of the Works;

A **Variation or Change in Scope** is an instruction given by the Client, which varies and change the scope of Works;

Works are what the Contract requires the Contractor to construct, install, and turn over to the Client, as defined in the Contract Data;

Year may be understood as financial year;

"Approved Make" means makes of items as specified in the "List of Approved Makes/Approved Manufacturers" in this RFP. However, a higher or equivalent make can be utilized after obtaining prior approval of "Engineer-In-Charge" in writing.

Interpretation

In interpreting the Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their general meaning under the language of the Contract unless specifically defined. The Client will provide instructions clarifying queries about the Conditions of Contract.

If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion date for the whole of the Works).

The documents forming the Contract shall be interpreted in the following order of priority:

(a) Agreement

(b) Letter of Acceptance, notice to proceed with the works

(c) Contractor's Bid

(d) Contract Data

(e) Conditions of Contract including Additional & Special Conditions of Contract

(f) Specifications

(g) Drawings

(h) Bill of quantities (optional) and

(i) Any other document listed in the Contract Data as forming part of the Contract.

Languages and Law

The language of the Contract and the law governing the Contract are stated in the Contract Data.

Engineer's Decisions:

Except where otherwise specifically stated, the Engineer will decide contractual matters between the Client and the Contractor in the role representing the Client as per the provision of the contract.

Delegation:

The Engineer may delegate any of his duties and responsibilities to other people after notifying the Contractor and may cancel any delegation after notifying the Contractor.

Communications:

Communications between parties which are referred to in the conditions are effective only when in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).

Sub-contracting:

The Contractor may sub-contract any portion of work, up to a limit of 10% of contact value, with the approval of the Engineer but may not assign the Contract without the approval of the Client in writing. Sub-contracting does not alter the Contractor's obligations.

Other Contractors:

The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Client between the dates given in the Schedule of other Contractors. The Contractor shall as refer to in the Contract Data, also provide facilities and services for them as described in the Schedule. The Client may modify the schedule of other contractors and shall notify the contractor of any such modification.

Personnel:

The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in the Contract Data besides those as listed to carry out the functions stated in the Schedule or other personnel approved by the Engineer. The Engineer will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating the reasons the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

Client's and Contractor's Risks:

The Client carries the risks which this Contract states are Client's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

Client's Risks:

The Client is responsible for the excepted risks which are in so far as they directly affect the execution of the Works in India, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

Contractor's Risks:

All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

Insurance:

The Contractor shall provide, in the joint names of the Client and the Contractor, insurance cover ***for the period as stated below against the events and*** in the amounts and deductibles stated in the Contract Data for the following events, which are due to the Contractor's risks:

A) From the starting date to the end of defect liability period:

(a) Loss of or damage to the works

B) From the start date till completion of the work as per agreement:

(a) Loss of or damage to plant, materials and equipment,

(b) Loss of or damage of property (except the works, plant, materials and equipment) in connection with the contract, and

(c) Personal injury or death.

If all the items as listed above can be combined / grouped under one insurance cover like Contractor's, All Risks (CAR) Policy **covering all-natural calamities as per local conditions.**

Prior to seven days before the start date, the Contractor shall furnish to the Engineer notarized true copies of the certificates of insurance, copies of insurance policies and premia payment receipts in respect of such insurance for the Client's approval. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

If the contractor does not provide any of the policies and certificates required, the Client may affect the insurance which the contractor should have provided and recover the premiums the Client has paid from payments otherwise due to the contractor or, if no payment is due, the payment of the premiums shall be a debt due.

Alterations to the terms of insurance shall not be made without the approval of the Client.

Both parties shall comply with any conditions of the insurance policies.

Site Investigation Reports:

The Contractor, in preparing the Bid, may rely on any site Investigation Reports referred to in the Contract Data, which are indicative and not exhaustive. The Client shall provide all available details to the Contractor (Bidder) for his information, if requested by him at least one week prior to the bid submission date. The bidder shall be responsible for interpreting all such data. After award of work, the Contractor shall carryout detail survey and investigation for preparation of detail designs as per the scope of work and time period stipulated.

To the extent which was practicable (taking account of cost and time), the Contractor (Bidder) shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor (Bidder) shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

(a) the form and nature of the Site, including sub-surface conditions,

(b) the climatic conditions,

(c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,

(d) the Laws, procedures and labour practices of the Country, and

(e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

(f) availability of required materials

Queries about the Contract Data:

The Client will clarify queries on the Contract Data if any during the Pre-bid references.

Contractor to Construct the Works:

The Contractor shall construct and install the Works in accordance with the approved specification and drawings. All designs, drawings and specifications to be furnished by the contractor shall be approved by the Client before execution.

The Works to be completed by the Intended Completion Date:

The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the programme submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion Date.

Approval by the Engineer:

The Contractor shall be provided Specifications and Drawings showing the proposed Temporary Works by the Engineer.

The Contractor shall be responsible for design of Temporary Works.

The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

The Contractor shall be provided approved design, drawings and specifications of all components of the building and all allied infrastructure works, except those for the temporary works.

Safety:

The Contractor shall be responsible for the safety of all activities on the Site.

Possession of the Site:

The Client shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Contract Data the Client is deemed to have delayed the start of the relevant activities and this will be Compensation Event.

Access to the Site:

The Contractor shall allow the Client and any person authorized by the Client access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being manufactured / fabricated / assembled for the works.

Instructions:

The Contractor shall carry out all instructions of the Engineer pertaining to works, which comply with the applicable laws where the Site is located.

The Contractor shall permit the Client to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Client, if so, required by the Client.

Disputes:

That for the purpose of jurisdiction in the event of disputes if any of the Contract would be deemed to have been entered in to within the State of Odisha and it is agreed that neither party to the Contract will be competent to bring a suit in regard to the matter by this Contract at any place outside the State of Odisha.

Procedure for Settlement of Disputes:

In case of Dispute or difference arising between the Client and the contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled mutually.

TIME CONTROL

Programme:

Within **7 days of issue of letter of award**, the successful bidder shall submit to the Client detail work programme for approval showing the general methods, arrangements, order and timing for all the activities in the Works along with monthly cash flow forecast. The agreed work programme / milestones during such contract negotiation shall form part of the agreement.

An update of the Programme shall be a programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.

The contractor shall submit to the Client, for approval, an updated Programme at intervals no longer than 15days. If the Contractor does not submit an updated Programme within this period, the Engineer may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue programme has been submitted.

The Client's approval of the Programme shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Client again at any time. A revised Programme is to show the effect of Variations and Compensation Events.

Extension of the Intended Completion Date:

The Client shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the intended Completion Date without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost.

The Client shall decide whether and by how much to extend the Intended Completion Date within 15 days of the Contractor asking the Engineer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

The Engineer shall within 7 days of receiving full justification from the contractor for extension of Intended Completion Date refer to the Client his recommendation. The Client shall in not more than 15 days communicate to the Engineer the Client's decision.

Delays Ordered by the Engineer:

The Client may instruct the Contractor to delay the start or progress of any activity within the Works.

Management Meetings:

Either the Engineer or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

The Engineer shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the Client. The responsibility of the parties for actions to be taken is to be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

Early Warning:

The Contractor is to warn the Client/Engineer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the work resulting delay in the execution. The Engineer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Completion Date.

The Contractor shall cooperate with the Engineer in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Engineer.

QUALITY CONTROL

Identifying Defects:

The Engineer shall check the Contractor's work regularly and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for defects and to uncover and test any work that the Engineer considers may have a Defect

Tests:

If the Engineer instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect the test shall be a Compensation Event.

Correction of Defects:

The Engineer shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion and is defined in the Contract Data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

Every time notice of a Defect is given; the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.

Uncorrected Defects:

If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer will assess the cost of having the Defect corrected, and the Contractor will pay this amount.

COST CONTROL

Changes in the Quantities:(OPTIONAL)

Change of Scope (Variations) and Procedure for change of Scope:

The Client may, require the Contractor to make modifications/alterations to the works before the issue of the completion certificate either by giving an instruction or by requesting the contractor to submit a proposal for change of scope involving additional cost or reduction in cost. Any such change of scope shall be made and valued in accordance with the provisions of this contract and the contractor, in that event, will have no further claim on the ground that had it been known / disclosed earlier he would have made such charges in other connected work in their design, construction which would have saved him some cost and given him other consequential benefits.

Change in scope may include;

(a) Change in specifications of any item of works

(b) omission/ deletion of any item of work from the scope of work

(c) any additional work (such as addition of extra plinth area) which are not included in the scope of work including any additional test on completion

In the event of the Client determining that a change of scope is necessary, it shall issue notice to the contractor a notice specifying in reasonable detail the works contemplated there under (“Change in scope notice”)

Upon receipt of change in scope notice, the contractor shall with due diligence, provide to the Client through the Engineer within seven days time such information as is necessary together with documentation in support of;

(a) the impact, of any, which the change in scope is likely to have on the completion of the work

(b) the options for implementing the proposed change of scope and the effect, if any, each on the cost and time thereof including the following details;

i. break down of quantities, unit rates and cost for different items of work

ii. proposed design for the change of scope

iii. proposed modifications, if any, to the construction period with updated work programmes (all

Variations shall be included in updated programmes produced by the Contractor).

Any change in scope shall be calculated on the basis of the following priority:

The total value of all change of scope of work shall not exceed 10% of total contract price for the construction work.

Payments for Change of Scope (Variations):

The Client shall assess the change in scope proposal and Contractor's quotation at the time of bidding in financial form and upon reaching an agreement; the Client shall issue the Change of Scope Order requiring the contractor to proceed with the performance thereof.

If the Contractor's quotation is unreasonable, the Client may order the Variation and make a change to the Contract Price which shall be based on Client's own forecast of the effects of the Variation on the Contractor's costs.

If the Client decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event, subject to condition that such variation shall not exceed 10% of the total contract price for the contract work.

The Contractor shall not be entitled to additional payment for costs, which could have been avoided by giving early warning.

Payment Certificates:

The Contractor shall submit to the Engineer statements of the value of the work completed.

The Engineer shall check the Contractor's statement within 15 days and certify the amount to be paid to the Contractor as per contract payment schedule after taking into account any credit or - debit for the month in question in respect of materials for the works in the relevant amounts and under conditions set forth, including adjustment of advance.

The value of work executed shall be determined by the Engineer.

The value of work executed shall comprise the value of the quantities of the items as per the BoQ and work programme attached to the contract.

The value of work executed shall include the valuation of Change in Scope (Variation) and Compensation Events, if any.

The Engineer may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

Payments:

Payments shall be adjusted for deductions for retention, other recoveries in terms of the contract and taxes at source, as applicable under the law. The Engineer shall pay the Contractor the amounts as per the items of work executed and agreed rates thereto as well as payment schedule attached to the contract.

Tax:

The rates quoted by the Contractor shall be deemed to be exclusive of the GST and inclusive of Royalty, Income Tax, Labour CESS and all other statutory taxes that the Contractor will have to pay for the performance of this Contract. The Client will perform such duties in regard to the deduction of such taxes at source as per applicable law.

Currencies:

All payments shall be made-in Indian Rupees.

Retention:

The Client shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the works or settlement of final payment.

On completion of the whole of the works and issue of the completion certificate the performance security shall be repaid to the contractor. The retention amount shall be paid after the Defects Liability Period has passed and the Engineer has certified that all defects notified by the Engineer to the contractor before the end of the period have been corrected.

Liquidated Damages:

The Contractor shall pay liquidated damages to the Client at the rate as stated in the Contract Data that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestone as stated in the contract data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Client may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not relieve the contractor from his / her / their obligation to complete the works or from any other duties, obligations or responsibilities which he / she / they may have under the contract.

If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate.

Bonus Payment:

Deleted

Advance Payment:

The Client may make advance payment to the Contractor for mobilization and cash flow support of the amounts stated in the Contract Data by the date stated in the Contract Data, only against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a Bank acceptable to the Engineer in amounts and currencies equal to 110% of the advance payment.

The Advance Payment shall not be released until the camp setup, mobilisation of key personnel, equipment and labour at site.

The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. The contractor shall ensure that the Bank Guarantee remain enforceable until the advance payment has been fully repaid and accordingly renew it, from time to time, until the advance payment has been fully repaid.

If the terms of guarantee specify its expiry date, and the advance payment has not been re-paid by the date then 28 days prior to the expiry date, the contractor shall extend the validity of the guarantee until the advance payment has been fully repaid.

The advance payment shall be repaid through percentage deductions from the interim payments as follows:

Securities:

The Performance Security shall be provided to the Client no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employee

The performance security shall be denominated in Indian Rupees. The Performance Security shall remain valid up to the period as defined in the Contract Data.

Cost of Repairs:

Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions including the situation as stipulated in the RFP.

FINISHING THE CONTRACT

Completion:

The Contractor shall request the Engineer to issue a Certificate of Completion of the Works and the Engineer will do so upon deciding that the Work is completed.

Taking Over:

The Client shall take over the Site and the Works within seven days of the Engineer issuing a certificate of Completion.

Final Account:

The Contractor shall supply to the Engineer a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Engineer shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, the Engineer shall issue within 30 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Client shall decide on the amount payable to the Contractor and issue a payment certificate, within 30 days of receiving the Contractor's revised account.

Termination:

The Client may terminate the Contract if the other party causes a fundamental breach of the Contract.

Fundamental breaches of Contract include, but shall not be limited to the following:

(a) the Contractor stops work for 15 days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Engineer;

(b) the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(c) the Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer;

(d) the Contractor does not maintain a security which is required;

(e) the Contractor has delayed the completion of works by the number of days for which the maximum number of liquidated damages can be paid as defined in the Contract data; and

(f) if the Contractor, in the judgment of the Client has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this paragraph: "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition."

When either party to the Contract gives notice of a breach of contract to the Engineer for a cause other than those listed under Sub Clause 54.2 above, the Engineer shall decide whether the breach is fundamental or not.

Notwithstanding the above, the Client may terminate the Contract for convenience.

If the Contract is terminated the Contractor shall stop work immediately, make the Site safe and secure and leave the Site, as soon as reasonably possible.

Payment upon Termination:

If the-Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done fewer advance payments received up to the date of the issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract Data. Additional Liquidated Damages shall not apply. If the total amount due to the Client exceeds any payment due to the Contractor, the difference shall be a debt payable to the Client.

If the Contract is terminated at the Client's convenience, the Engineer shall issue a certificate for the value of the work done, less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law. No extra cost will be paid by the Client for expenditure towards removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works and the Contractor's costs of protecting and securing the Works.

Property:

All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Client, if the Contract is terminated because of a contractor's default.

Release from Performance:

If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Client or the Contractor, the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which commitment was made.

ADDITIONAL CONDITIONS OF CONTRACT

1.WORK DESCRIPTION

The work shall be strictly carried out as per the scope listed in this document and in accordance with the specifications. The equipment & material supplied at site will also be selected out of the list of approved makes. Bill of quantity provided with the document is for contractor guidance. It is expected that after award of work, contractor shall prepare shop drawings for approval by the Consultant & Client representative and also submit Technical documentation duly identifying shortlisted make of material/equipment along with its data sheets. Actual ordering shall be based on approved shop drawings & documents.

The work at site shall comply with the approved shop drawings and will meet the satisfaction of Client representative. The contractor shall be required to demonstrate satisfactory operation of entire system (including client supplied equipment installed by contractor) and furnish the required labour, material & tools to install & commission the system.

The broad scope of work for proposed HVAC system covered under this contract shall include supply, installation, testing & commissioning of the following:

Water cooled chiller (free supply)
Constant primary & Variable secondary Pumping system.
Smart Air handling units (AHU's).
FRP Cooling towers.
VFD's.
Dedicated outdoor air system including heat recovery wheel.
Mechanical ventilation systems.
Chilled, Condenser and Drain piping with associated fittings, valves etc.
Air distribution system.
Associated electrical works.
Kitchen ventilation.
Basement car parking ventilation.
Testing Adjusting & Balancing of the entire HVAC and mechanical ventilation installation.

Besides above, contractor shall also be required to undertake following:

Obtain fire approval from Local Authorities prior & post installation for operation of system by the land owner. Coordination for submission of required documents & demonstration of systems to obtain the Approval by the Contractor.
Minor civil works which include making openings in walls & slabs and making good of the same.
Commissioning of the plant including test reports to demonstrate satisfactory working prior to handing over.
Provide as-built drawings and handing over document comprising of list of recommended spares, catalogues and service schedule for each equipment/material.
Training of Client's staff.
Documents related LEED requirement

2.SITE MANAGEMENT

The Contractor shall be required to provide following staffing for the project:

Design Engineer who will work with Consultant for getting shop drawings, technical submittal and variation in quantity statement approved.

Procurement team.

Full time dedicated 1 manager (minimum 15 year experience) and Engineer (minimum 10 year experience) & one supervisor posted at site.

The contractor shall submit organization chart and CV prior to starting work at site.

The Contractor shall have required stores, tools & plant, security and facility to transport materials to place of installation for speedy execution of work.

3.REGULATIONS & PERMITS

Prior to starting work at site, the contractor shall obtain required permits/ licenses required for satisfactory execution and operation of the installation. All receipted amounts shall be reimbursed by Client on production of proof of payment by the contractor.

The executed work shall strictly confirm to applicable laws, regulations and Indian Standards which become applicable. In case the specifications and drawings contained in this document call for higher standard than those required by prevailing regulations, then these specifications & drawings shall become applicable. However, in case of any conflict or violation between the document/drawings and prevailing laws, then the applicable laws & regulations shall be governing & binding.

4.SHOP DRAWINGS

A set of design drawings listed in this document are available at Consultant office and may be issued with the tender document. These design drawings are for reference of the contractor and indicate proposed arrangement and the extent of work covered in the contract. The data given in the drawings and specifications is as exact as could be procured, but its accuracy is not guaranteed. The contractor cannot execute work or scale these drawings for reference.

Following shall be the procedure followed by contractor while preparation of shop drawings:

The contractor shall refer the design drawings for understanding the scope and proposed routes to be followed during execution.

Collate latest architectural backgrounds from the Client representative / Architect / Consultant.

Examine all related services drawings but not limited to structural, plumbing, electrical, HVAC, Interior, landscape and others including as-built works before starting the work. Any discrepancy must be report to the Client's site representative in writing and obtain approval for go-ahead.

Within one week of award of work, the Contractor shall prepare a list of shop drawing along with submission schedule for approval of Client representative/Consultant. The list of drawings must include layouts for Plant room, Pump room, Typical drawings showing exact location of supports, flanges, bends, tee connections, reducers, detailed piping drawings showing exact location and type of supports, valves, fittings etc; electrical panels inside/outside views, power and control wiring schematics, cable trays, supports and terminations.

Maximum headroom shall be maintained at all points and in case the same is inadequate, then written approval from Client representative must be obtained prior to execution at site.

These shop drawings shall depict information required to complete the Project as per specifications and as required by the Consultant/Client representative. These Drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all measurable items of equipment/materials/works and progressive cumulative totals from other related drawings to arrive at a variation-in-quantity statement at the completion of all shop drawings.

Where the work under this contract is proposed to be installed in close proximity or is interfering with other trades, then based on client representative/consultant directions, the contractor shall prepare all services coordinated working drawings and sections at a suitable scale (not less than 1:50), clearly showing proposed installed in relation to the work of other trades.

The contractor shall thereafter furnish 6 sets of detailed shop drawings to Client representative/Consultant for obtaining comments/approval. The Contractor will make unlimited number of re-submissions of shop drawings unless Client representative/Consultant/Architect approval is obtained.

The Contractor will thereafter submit 6 sets of final shop drawings to the Client representative for their exclusive use and all other agencies.

No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/installation.

In case installation is carried out without following above process or obtaining a waiver to follow the procedure from Client representative, the work shall be rejected and contractor shall rectify the same at their own cost.

Shop drawings shall be submitted for approval minimum four weeks in advance of planned

delivery and installation of any material to allow Client representative/Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

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

5.TECHNICAL DOCUMENTATION

The contractor prior to supplying material at site, will submit the following documentation to Consultant/Client representative for approval:

Manufacturers drawings, catalogues, pamphlets and other documents in triplicate. Each item shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.

Samples of all materials shall be submitted to the Client's site representative prior to procurement. These will be submitted in two sets for approval and retention by Client's representative and shall be kept in their site office for reference and verification till the completion of the Project. Wherever directed, a mockup or sample installation shall be carried out for approval before proceeding for further installation.

Where the contractor proposes to use an alternate make or model of equipment other than that specified, all new drawings and detailing required thereafter shall be prepared by the contractor at his own expense including any re-design required for other discipline/trade. Any delay on such account shall also be at the cost of and consequence of the Contractor.

Contractor to refer Annexure –II for list of approved makes & materials for this project.

6.VARIATION IN QUANTITY STATEMENT

After approval of major & relevant shop drawings, the contractor shall submit four copies of a comprehensive variation in quantity statement. This statement must be submitted prior to completing ordering of equipment and should identify imported/local materials in this contract as well as proposed spares/tools. The Consultant shall provide recommendation to Client representative for acceptance of anticipated variation in contract amounts and also advise Client to initiate action for procurement of spare parts and tools at the completion of project.

7. QUALITY ASSURANCE

The contractor to ensure that all materials and equipment supplied shall be new and of best available quality conforming to the relevant Indian Standard Specifications and to these specifications. Makes shall be strictly in conformity with list of approved manufacturers as per Annexure -II. Owners reserve the right to reject any item which in their assessment is second hand

Any deviations from above shall be clearly highlighted prior to supply and shall be brought to the notice of the Client representative/Consultant for further instructions in the matter.

Prior to starting execution work at site, the Contractor shall verify the sufficiency of the size of the shaft openings, clearances and ceiling spaces for proper installation. Failure to communicate insufficiency of any of the above, shall constitute Contractor acceptance of the same. The Contractor shall locate all equipment in fully accessible locations which can be easily serviced, operated or maintained. The exact location and size of access panels, required for each concealed, valve or other devices requiring attendance shall be finalized and communicated in sufficient time.

Failing this, the Contractor shall make all the necessary repairs and changes at own expense. Access panel shall be marked.

8. WORKS NOT COVERED UNDER THIS CONTRACT

Following works are excluded from the scope under this contract. These shall be executed by respective contractor in accordance with approved shop drawings where these details must be highlighted. However, contractor shall be responsible for providing details and thereafter supervision to ensure satisfactory & timely execution of these associated items as they have a bearing on this contract.

9. EXCLUDED FROM SCOPE OF WORK

ASSOCIATED CIVIL WORKS

Following civil works associated with HVAC installation are excluded from the scope of this contract. These shall be executed by other agencies in accordance with approved shop drawings of and under direct supervision of the air conditioning contractor.

i. RCC foundation for water chilling machine's pumps & centrifugal fans with angle iron frame work at the edges to protect these from damage.

ii. RCC basin & supports & MS Joists for cooling towers.

iii. PCC foundation blocks with angle iron frame work edging for all motor control center.

iv. PCC foundation for pot strainers.

v. PCC foundation blocks for all air handling units.

vi. Air-tight fire doors with minimum one hour fire rating for plant room, AHU rooms, fan rooms and other equipment rooms.

vii. Water proofing of floors of AHU rooms, air washer rooms and fan rooms.

viii. Masonry drain channels and sumps with CI gratings in AC plant room including provision for sump pump and disposal.

ix. Supply and fixing of G.I./wooden frame for mounting of grilles in masonary walls.

x. Supply and fixing of GSS frame for mounting of grilles / diffusers in false ceiling / boxing.

xi. Thermal insulation of terraces above air-conditioned areas exposed to sun.

xii. Making of trenches and back filling the same after laying / pressure testing etc. of pipes.

ELECTRICAL SERVICES WORKS

All associated ELECTRICAL WORKS listed below are excluded from the scope of this contract. These shall be installed by other agencies in accordance with approved shop drawings of, and under direct supervision of the air conditioning contractor.

Providing power supply with earthing at the incoming of control panel in A/C plant room.

ii. Providing power supply and earthing at the incoming MCCB in each air handling unit room.

iii. Providing power and earthing at the incoming MCCB in each centrifugal fan panel and pump panel at locations called for on air conditioning Contractor's shop drawings.

iv. Providing 15 amps power outlet within 2 meter reach of each fan coil unit and VAV boxes at locations called for on air conditioning Contractor's shop drawings.

v. Providing 15 amps power outlet within 2 meter reach of each single phase propeller fan/inline fan at locations called for on air conditioning contractor's shop drawings.

vi. Providing wiring and earthing for sump pumps in air conditioning plant room.

PLUMBING SERVICES WORKS

All associated PLUMBING WORKS listed below are excluded from the scope of this contract. These shall be installed by other agencies, in accordance with approved shop drawings of, and under direct supervision, of the air conditioning contractor.

Providing soft water (Commercial hardness 0 ppm and PH 7+1) at air washers, humidifiers and at chilled water expansion tank.

Providing make up water for cooling tower as per RO water quality

iii. Disposal of condensate drain from fan coil units / ceiling suspended units beyond the condensate drain riser.

Providing sump pumps and necessary piping for drainage of air conditioning plant room and other machine rooms located below ground level.

Providing floor drains in cooling tower area and in air handling unit rooms.

Note : Preparation of shop drawings defining the Foundation details to civil contractor will be under HVAC Contractor scope of work.

10. INTEGRATION WITH BUILDING AUTOMATION SYSTEM

The scope shall include providing following for the interface to Building Automation System.

Sockets /Nipples including shut-off valve for mounting sensors/transmitters on pipe lines.
Space in electrical panel for running of LV cables.
CT of 15 VA burden with potential free taps.
Auto/manual changeover switch with potential free contact at manual position.
Installation of motorized control valves with provision of counter flanges
Installation of current transformer & Transducer along with wiring between Current Transformer & Transducer up to the terminal block
Provision for mounting BAS sensors.
15 Amps. Power supply with MCB in all AHU panels and 32 Amps MCB on HVAC plant room panel for power supply to DDC Panel.

It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements lies solely with the contractor.

11. TESTING, ADJUSTING AND BALANCING

Air and water balancing shall be carried out by the contractor through a specialist team (different than erection team) as per Specifications and ASHRAE Guidelines. Performance test shall consist of three days of 10 hour each operation of system for each season. The results for each season shall be submitted to Client representative/Consultant. The submittal shall include operational parameters marked on performance curves for each equipment along with test certificates and safety/control settings.

The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Client's site representative. All tests shall be carried out in the presence of the

representatives of the Construction Manager/Architect /Consultant and Client's site representative. After commissioning, the results shall be submitted for scrutiny in quadruplicate.

All equipment installation shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Client's site representative. In case of rotating machinery sound or vibration noticeable outside the room in which it is installed, or annoyingly noticeable inside its own room, shall be considered objectionable. Such conditions shall be corrected by the Contractor at his own expense. The contractor shall guarantee that the equipment installed shall maintain the specified Noise Control levels.

12. COMPLETION CERTIFICATE

On completion of the installation, a certificate shall be furnished by the contractor, counter signed by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority engineer in-charge.

The contractor shall be responsible for getting the entire installation duly approved by the local authorities Engineer in Charge concerned, and shall bear expenses if any, in connection with the same.

13. AS-BUILT DRAWINGS

Contractor shall submit following as-built drawings as and when work is completed:
6 set of hard copies of all as-built drawings duly corrected and incorporating any modifications during execution.
Two set of pen drive containing the drawings.

The drawings shall provide plant room layouts, piping layouts, location of all concealed accessories/piping, wiring diagram, control diagram, Single line diagram, control schematic with detailed bill of materials, showing makes, types & description of all components & accessories and sequencing of automatic controls and other services.

14. MAINTENANCE MANUAL

Upon completion and commissioning of works, the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Client's site representative and two for Clients Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment. The manuals shall include:

i. Description of the work carried out / installed.
ii. Operating instructions.
iii. Maintenance instructions including procedures for preventive maintenance.
iv. Manufacturers catalogues.
v. Spare parts list.
vi. Trouble shooting charts.
vii. Drawings
viii. Type and routine test certificates of major items.

Details of all the bought out item should be part of this maintenance manual.

15. ON SITE TRAINING

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labor

and helpers for operating the entire installation for such periods so as to enable the Client's staff to get acquainted with the operation of the system. During this period, the contractor shall train the Client's personnel in the operation, adjustment and maintenance of all equipment installed.

16. DEFECTS LIABILITY PERIOD

Complaints

The Contractor shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

Repairs

All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defects liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the Client.

17. UPTIME GUARANTEE

The contractor shall guarantee for the installed system an uptime of 98%. In case of shortfall in any month during the defects liability period, the Defects Liability period shall get extended by a month for every month having shortfall and no reimbursement shall be made for the extended period.

18. OPERATION & MAINTENACE CONTRACT

Contractor may be required to carry out the operation of the installation during and after the defects liability period. Further, it may also be required to carry out all-inclusive maintenance of the entire system for a period of four years beyond the defects liability period.

Operation Contract:

It will involve round the clock operation for 24 hours a day wherein work will include but not limited to operation of installation, maintaining log books, complain register and summary of operation.

The terms of payment shall be monthly at the end of each month on pro-rata basis.

All Inclusive Maintenance Contract:

The work will involve routine preventive maintenance with monthly status report. Entire installation shall be painted every two years. 98% uptime of all systems is expected under this contract wherein up time shall be assessed every month and in case of shortfall during any month the contract shall be extended by a month. No reimbursement shall be payable for the extended period.

Adequate number of persons to the satisfaction of the Client representative shall be provided including relievers wherein statutory compliances such as of EPF, ESIC and other applicable labour legislations shall be to contractor account. No overtime shall be payable. Routine shut downs shall be permitted with prior permission of the Owner.
Payment shall be Quarterly at the beginning of each quarter on pro-rata basis.

19 BIM Implementation

It is expected that Contractor, if required shall prepare all shop drawings in latest version of Revit

only and coordinate with other contractors to provide a clash free model. Thereafter, all shop drawings shall be provided in PDF, 2D CAD plans and critical sections in 3D. The drawings shall be submitted in hard copy in A0/A1 size at 1:100 scale including all annotations, heights, bottom of duct/pipe/tray etc complete in all respect as required.

20. GREEN BUILDING COMPLIANCE

Actions required by Contractor:

Contractor will provide full support in complying to Green Building requirements for the desired level of Green Building Rating in the project.
Contractor shall implement the recommendations provided by Green Building Consultant and provide support during the site inspections.
Contractor shall provide respective documentation including but not limited to specification sheets, manufacturer cutsheets, Test Certificates, Brochures, purchase records, manufacturer declarations, calculations, site photographs, commissioning reports.
Contractor is encouraged to designate an individual in their existing team who will be responsible for regular coordination with respective site people to ensure implementation of required green building measures and ultimately provide the required documentation for aspired Green Building Rating.
In case of any deviations in implementing recommended green building measures and/ or using specified material/ equipment/ system, contractor will have to inform Owners/ Services Consultant/ Green Building Consultant/ Architect as applicable for their formal approval.

In case of any additional requirement to comply with Green Building rating as identified during construction/ installation/ commissioning based on the actual site conditions/ construction activities, Contractor shall implement

21 PERFORMANCE GUARANTEE

The contractor shall carry out the work in accordance with the Approved shop drawings, Specifications, Schedule of Quantities and other documents forming part of the Contract. Contractor shall carry out heat load calculation, Ventilation calculation & Smoke calculation & submit the same for client / consultants approvals. The contractor shall be fully responsible for the performance of the selected equipment (installed by him) at the specified parameters and for the efficiency of the installation to deliver the required end result.

The contractor shall guarantee that the HVAC system as installed shall maintain the inside conditions in the air-conditioned spaces as described under “Basis of Design” in the specifications.

Complete set of architectural drawings is available in the Architect/Consultant’s office and reference may be made to same for any details or information. The contractor shall also guarantee that the performance of various equipment individually, shall not be less than the quoted capacity; also actual power consumption shall not exceed the quoted rating, during testing and commissioning, handing over and guarantee period.

LABOUR:

The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Engineer may require.

COMPLIANCE WITH LABOUR REGULATIONS:

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to the construction industry are given below. The Contractor shall keep the Client indemnified in case any action is taken against the Client by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments. If the Client is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/Client shall have the right to deduct any money due to the Contractor including his amount of performance security. The Client/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Client.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Client at any point of time.

SPECIAL CONDITIONs OF CONTRACT

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

a) Workmen Compensation Act 1923: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) Employees P.F. and Miscellaneous Provision Act 1952: - The Act Provides for monthly contributions by the Client plus workers @ 10% or 8.33%. The benefits payable under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.

(ii) Deposit linked insurance on the death in harness of the worker.

(iii) Payment of P.F. accumulation on retirement/death etc.

d) Maternity Benefit Act 1951: -The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) Contract Labour (Regulation & Abolition) Act 1970: - The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the

Contractor fails to provide, the same are required to be provided, by the Principal Client by Law. The Principal Client is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Client if they employ 20 or more contract labour.

f) The Code on Wages, 2019: This code consolidates the Laws relating to Wages and Bonus and matters connected therewith or incidental thereto.

g) Industrial Disputes Act 1947: - The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

h) Industrial Employment (Standing Orders) Act 1946: - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Client on matters provided in the Act and get the same certified by the designated Authority.

i) Trade Unions Act 1926: - The Act lays down the procedure for registration of trade unions of workmen and Clients. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

j) Child Labour (Prohibition & Regulation) Act 1986: - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

k) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979: - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter- State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home up to the establishment and back, etc.

l) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: - All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Client of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Client to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

m) Factories Act 1948: -The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

SPECIAL CONDITIONS

1.It must be understood that the work has to be completed as per the time provided in the contract and as such time is the essence of the contract.

2.The quantities furnished in the bills of quantities are only probable quantities liable to alternation by omission, deduction or addition, and it would be clearly understood that the contract is not a lump sum contract and the SWOSTI PREMIUM LTD do not, in any way, assure the tenderer or guarantee that the said probable quantities are correct or that the work would correspond thereto. Payments will be regulated on the actual quantities of work authorizedly done and measured at the accepted rates. No claims due to change in quantities (+ or -) will be entertained. The drawings, forming parts of complementary installations work specifications and the bills of quantities, of the contract, are explanatory of and are to one another, representing together the works / to be carried out. If neither the drawings nor the specifications nor the accepted bills of quantities include any part/parts the intention to include which is nevertheless clearly inferred and which are obviously necessary for the proper completion of the works/ installations, all such parts shall be supplied and executed by the contractor at no extra charge. Anything contained in one or another of (a) the drawings, (b) the specifications and (c) the accepted bills of quantities and not found in the others will be equally binding as if it were contained in each of them.

3.No alterations, that might have been made by the tenderer in the drawings, specifications, conditions or probable quantities accompanying this notice will be recognized and if any such alterations are made the tender, will be invalid. Conditional tenders will however be liable for rejection.

4.The tenderer must obtain for himself on his own responsibility and at his own expense all the information necessary, including risks, contingencies and other circumstances to enable him to make a proper tender and to enter into a contract with the SWOSTI PREMIUM LTD . He must examine the drawings, specifications, conditions and so on and must inspect the site of work, examine the nature of the ground and the subsoil (so far as is practicable) and acquaint himself with local conditions, means of access to the work, storage facilities or areas for staff colony, the nature of the work, in fact all matters pertaining thereto before he submits his tender.

5.The tender accepted shall not be entitled to make any claim for increase in the rates quoted and accepted excepting in pursuance of any specific provision in the contract.

6.Only approved agencies/ skilled workers shall be deployed to carry out requisite specialized items of work. The Officer/ Engineer in charge’s decision in consultation with Architect's/ in this regard shall be binding to all the parties concerned.

7. The rates shall be firm and not be subject to any variations in exchange rates, in taxes, duties etc. in railway freight and the like including labour conditions, etc. The rates are not subject to escalation.

8.It will be the sole responsibility of the contractor to procure all the equipments/ materials and other materials required for the work.

9.The SWOSTI PREMIUM LTD further reserves the right to delete or reduce at any time, any section of the bills of quantities with out assigning any reasons whatsoever there for and no claim will be entertained in this regard.

10.The tenderer whose tender is accepted is bound to execute formal agreement with the SWOSTI PREMIUM LTD within one week of the date of intimation of award of work in

accordance with the draft agreement which will include conditions of tender, form of tender (general conditions of contract & Special Condition of Contract), Articles of Agreement, Bills of quantities, Conditions of contract, Special conditions if any, the drawings and specifications, but his liability under the contract shall commence from the date of written order to commence work whether the formal agreement is drawn or not.

The Contractor shall bear all expenses in connection with the execution of the said agreement including fees for stamping and registration of documents as required.

11.The Security Deposit will bear no interest what so ever until the date of release.

12.

(a)The contractor, upon award of work, shall submit a memorandum of procedure giving the outline of his general scheme, programme and time table, in the form of a chart that shall be scrutinized and approved (with modifications as necessary), which shall become the approved programme for execution. The approved programme shall be the basis for assessment of comparative progress under the relevant conditions of contract.

(b). Over and above, the contractor has to supply programme chalked out showing important milestones to be achieved and the progress actually achieved compared with, the target of the same in the programme and shortfall, if any planned for being made up in the programme for next month.

13.The work in general shall conform to the Specifications provided.

(a)In case items not covered by the general specifications referred above, reference shall be made to the appropriate I.S. Code.

(b)Should there be any difference in the particular specifications of individual item of work and the description of item as given in the Schedule of quantity, the latter shall prevail, which will be as per the relevant drawing.

(c)In case of any work for which there is no specification in I.S. specifications or in the specifications forming part of tender documents or in case there is any variation, such work shall be carried out in all respects in accordance with the instructions to be issued by the Engineer in charge.

14.The work of any part of it shall not be transferred, assigned or sublet without the written consent of the SWOSTI PREMIUM LTD .

15.The Contractor shall be required to co-operate and work in co-ordination with and afford reasonable facilities for such other agencies / specialists / interior designers/ consultants as may be employed by the Architects / Project Management Consultant/ Officer in Charge on other works / sub-works in connection with the project/scheme of which this work forms a part.

16.The Contractor shall get the necessary insurance done for their personal employed/ Swosti Premium Ltd third party insurance in name of G.M(B D),Swosti Premium Ltd and for all other risk insurance or any other insurance as required.

17.The Contractor shall make arrangements of carrying water and electricity .

18.The Contractor is required to comply with all Acts of Government relating to labour, safety, environment and other Rules and Regulations made there under from time to time

and to submit at the proper times all particulars and statements required to be furnished to the appropriate Authorities.

19.Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other Contractor or other person or persons employed for completing and finishing or using the materials and plant for the Work. When the Work shall be completed or as soon thereafter as convenient the Architect shall give a notice in writing to the Contractor to remove his surplus materials and plant, and should the Contractor fail to do so within a period of 14 days after receipt thereof by him, Owner shall sell the same, and shall give credit to the Contractor for the amount realized. The Architect shall thereafter ascertain and certify in writing what (if anything) shall be due or payable to or by the Owner for the value of the said plant and materials so taken possession of by the Owner and the expense or loss which the Owner shall have been put to in procuring the works to be completed, and the amount, if any, owing to the Contractor and the amount which shall be so certified shall thereupon be paid by the Owner to the Contractor or by the Contractor to the Owner, as the case may be, and the certificate of the Architect shall be final and conclusive between the parties.

20.If at any time after the commencement of the work the Owner shall for any reason whatsoever not require the whole thereof, as specified in the tender, to be carried out, but need to abridge the Contract, the Owner shall give notice in writing of the fact to the Contractor who shall have no claim to any payment or compensation which he might have derived from the execution of the work in full, but which he did not derive in consequence of the whole amount of the work not having been carried out. The Contractor shall in this case, however, be entitled to payment for the work already executed by him in accordance with the agreed rates. The Owner shall also take over all building materials as might have been ordered for the work, but orders for which cannot be canceled, if delivered within a reasonable time, and shall pay for them at cost price. The Contractor shall also be allowed to remove his tools and plants from the site.

Contractor Responsibility Matrix

Work Element / Activity	Contractor	Client (Swosti)	PMC (You)	Architect / Consultants
1. Mobilisation & Site Establishment	**R**	A	C	-
2. Setting Out and Site Survey	**R**	C	C	C
3. Site Safety & Housekeeping	**R**	C	C	-
4. Approvals from Local Authorities (as applicable)	**C**	A	R	C
5. Scaffolding, Centering, and Shuttering	**R**	I	C	-
6. Quality Control & Testing	**R**	I	C	C
7. Coordination with MEP teams	C	I	C	C
8. Materials Procurement (Cement, Steel, Bricks, etc.)	**R**	I	C	-
9. Submission of Progress Reports & MIS	**R**	I	A	-
10. Adherence to Timeline / Work Schedule	**R**	I	C	-
11. Rectification of Defects During DLP	**R**	A	C	-
11. Final Handover & Completion Report	**R**	A	C	-

Legend:

- **R = Responsible** – Main executor.
- **A = Accountable** – Final decision-maker or owner.
- **C = Consultative** – Provides input and coordination.
- **I = Informed** – Kept in the loop, but not involved in execution.

Management Meetings

- Either the Engineer or the Contractor may call for a management meeting.
- These meetings are held to review progress plans and handle issues flagged under the early warning system.
- The Engineer shall record meeting proceedings and circulate to attendees and the Client.
- Action items shall be assigned and communicated in writing.

Quality Control

- The Engineer shall regularly inspect the Contractor's work and identify any defects. Instructions may be issued to uncover or test work suspected to be defective.
- **Tests** If the Engineer instructs tests not specified in the specifications, and the work is found defective, the Contractor shall bear the cost of tests. If no defect is found, it will be treated as a Compensation Event.

Payments & Liquidated Damages Payments

- Payments shall be adjusted for deductions for retention, other recoveries in terms of the contract and taxes at source, as applicable under the law.
- The Engineer shall pay the Contractor the amounts as per the payment schedule attached to the contract.

Retention

- The performance security obtained at the time of signing of contract shall be retained till successful conclusion of project completion and issue of completion certificate.
- The Client shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the works or settlement of final payment.
- On completion of the whole of the works half the total amount retained is repaid to the contractor and half when the Defects Liability Period has passed, and the Engineer has certified that all defects notified by the Engineer to the contractor before the end of the period have been corrected.

Milestone

Milestone No.	To be Achieved	Timeline
Milestone 1-	**60 % of value of contract**	**Upto 120 Days**
Milestone 2-	**100 % of value of contract**	**Upto 180 Days**

Liquidated Damages

- The Contractor shall pay liquidated damages to the Client at the rate 0.2%/day on the value of balance work beyond stipulated date of completion as per following milestones of execution subject to a maximum of 10% of contract value.
  a) Up to end of 120 days of signing of contract – 60 % of value of contract
  b) Up to end of 180 days of signing of contract –100 % of value of contract