STATEMENT OF WORK FOR SUPPLY, COMMISSIONING AND INSTALLATION FOR ONE TO ONE REPLACEMENT OF DATA CENTER IN-ROW COOLING SYSTEM

American Center

US Embassy New Delhi

1.0 INTRODUCTION

Overview: The U.S. Embassy New Delhi, have a requirement for a Contractor to replace and install Data Center IN-ROW Cooling System for Thermal Solutions (Critical Equipment)

Background: To discard and replace existing old IN-ROW Cooling System (Make: APC Schneider) which has lived its life span. The existing server room has space to accommodate new IN-ROW Cooling system and this will be one to one replacement of the existing setup.

TYPE OF CONTRACT

This is a firm fixed price contract. No additional sums will be payable for any escalation in the cost of materials, equipment or labor, or because of the contractor's failure to properly estimate or accurately predict the cost or difficulty of achieving the results required. The contract price will not be adjusted due to fluctuations in currency exchange rates.

2.0 GENERAL REQUIREMENTS

2.1 The contractor shall supply, erect, test and commission all the equipment required for installation. The contractor shall furnish all the materials, labor, tools and equipment for the electrical work. "***The IN-ROW Cooling system to be provided shall be a factory manufactured and tested product. It should not be an assembled or customized product. The unit should be fabricated and fully tested directly from the factory and shall be of a reputed brand and a patent product".***

2.2 The contractor shall be a reputable contractor with at least 5 years of experience in Thermal Solution/IN-ROW Cooling. He should possess skilled and licensed supervisors having necessary permits as per Regulation of Indian Electricity Rules and Local Electrical requirements.

2.3 The installation shall conform in all respects to Indian Standard Code of Practice for Electrical Wiring Installation I.S -732 and National Electric Code. It shall also be in conformity with the current I.E Rules and Regulations and requirements of the local Electric Supply Authority.

2.4 DRAWINGS

The drawings, specifications and bills of quantities shall be considered as a part of this contract and any work or material shown on the drawings and not called for in the specifications or vice versa, shall be executed as if specifically called for in both. The contract drawings indicate the extent and general arrangements of various equipment and their wiring, etc. and are essentially diagrammatic. The drawings indicate the point of termination of conduit runs and broadly suggest the routes to be followed. The work shall be executed as per approved working drawings, subject to any minor changes, if found essential to co-ordinate installation of this work with other trades. All such changes shall be without any additional cost to the embassy. The contractor shall examine all architectural, structural and air-conditioning drawings before starting the work and report to the COR of any discrepancy which in opinion appear on them and get the same clarified.

2.5 SHOP DRAWINGS

The contractor shall prepare and submit for approval detailed all shop drawings within 30 days of signing the contract.

2.6 AS BUILT DRAWINGS

At the completion of the work and before issuance of certificate of virtual completion, the contractor shall submit layout drawings in hard bound manuals with compete operating instructions of the equipment.

2.7 EXECUTION

A. Install system components on concrete housekeeping bases.

B. Maintain minimum workspace at equipment according to manufacturer's written instructions and NFPA 70.

C. Connections: Interconnect system components. Make connections to supply and load circuits according to manufacturer's wiring diagram, unless otherwise indicated.

2.8 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Supervision of unit installation, connections, tests and adjustments by a factory-authorized service representative. Report results in writing.

B. Supervised Adjusting and Pretesting: Under supervision of a factory-authorized service representative, pretest system functions, operations and protective features. Adjust to ensure operation complies with specifications.

2.9 CLEANING

A. On completion of installation, inspect system components. Remove paint splatters and other sports, dirt and debris. Repair scratches and mars of finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

2.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personal as specified below:

1. Train Owner's maintenance personal on procedures and schedulers related to startup and shutdown, troubleshooting, servicing and preventive maintenance.
2. Review data in the operation and maintenance manuals
3. Scheduling training with Owner's maintenance staff and operators with at least 7 working day's advance notice.

3.0 SITE SURVEY

3.1 Before quoting and issuance of the Task Order/Proposal Request, the Contractor shall review government furnished documents and perform one (1) mandatory onsite site survey to gain a complete understanding of the scope of the project.

3.2 The Contractor shall assemble a team to include, at a minimum, the proposed Project Manager and Mechanical and Electrical Engineers to participate in a meeting with the Contracting Officer's Representative (COR).

3.3 The Contractor shall survey the compound area where installation and commissioning will take place and become thoroughly familiar with the existing conditions.

3.4 Sufficient site investigations shall be made by bidders to confirm all existing conditions. Field measurements shall be made to verify all existing dimensions depicted. The Contractor shall obtain additional pertinent information, as needed, from the COR, to ensure the completion of an efficient, comprehensive design/offer.

4.0 CONTRACT ADMINISTRATION

4.1 The Contractor shall not conduct any work that is beyond this SOW unless directed in writing by the CO. Any work done by the Contractor beyond this SOW without direction from the CO will be at the Contractor's own risk and at no cost to the US Government (USG).

4.2 The CO shall provide a NTP (Notice to Proceed) to the Contractor. No work shall be initiated until the CO issues the NTP.

4.3 The CO may designate more than one individual to serve as the COR. The Contractor will be furnished evidence of COR appointments, including explicit authority delegated to each COR and their responsibilities.

4.4 Decisions by the COR regarding construction/installation quality will be final. Construction issues recognized by the COR as requiring actions outside the existing SOW will be separately documented and require a contract modification.

4.5 The Embassy has the right to inspect and test all services called for by the contract, to the extent practicable at all times and places during the term of the contract. The Facility Manager (FM) may oversee all quality control (QC) and quality assurance (QA) inspections and tests during construction to confirm the work is installed according to the Construction Documents.

4.6 The CO has the right to terminate this contract for convenience at any Phase in whole, or from time to time, if the CO determines it is in the best interest of the Embassy.

5.0 RESPONSIBILITIES OF THE CONTRACTOR

5.1 The Contractor shall ensure that the project is executed smoothly, delivered on schedule and within the project budget. The Contractor shall coordinate the efforts of all sub-contractors to ensure successful completion of this project within the schedule and cost.

5.2 Any cost associated with services subcontracted by the Contractor shall be borne by and be the complete responsibility of the Contractor under the fixed price of this contract.

5.3 The Contractor shall be and remain liable to the USG in accordance with the applicable US law for all damages to the Embassy caused by the Contractor's negligent performance of any of the services furnished under this contract. The right and remedies for the USG provided for under this contract are in addition to any other rights and remedies provided by US law.

5.4 At the USG's discretion after award, the Contractor shall make available a representative to meet with the COR on a weekly basis to discuss the Progress Report, or other matters pertaining to the Project.

5.5 Project Management: The Contractor's senior representative shall be responsible for briefing

USG personnel on the status of the Work. The Contractor shall have all the means to communicate with on-site personnel using state-of-the-art technologies for the industry.

5.6 The Contractor shall partner closely with the FM and COR/GTM

6.0 ACCIDENT PREVENTION

The contractor shall take all necessary measures and precautions to avoid interruptions of Government operations and delays. He must provide and maintain work environment and procedures, which will safeguard the public and government personal, property, materials and equipment exposed to his operations and activities. The contractor's staff working on Embassy Compound will take all safety precautions and comply with the standards by OSHA, local authorities, Embassy over occupational health and safety issues. All work should be carried in accordance with applicable safety regulations.

7.0 ACCESS TO GOVERNMENT BUILDINGS AND STANDARD OF CONDUCT

7.1General: The contractor shall designate a representative who shall supervise the contractor's technicians and to be contractor's liaison with the American Embassy. The contractor's employees shall be on the site only for contractual duties and not for any other business or purpose. Contractor employees shall have access to the equipment and equipment areas and will be escorted by the embassy personal.

7.2 The Government reserves the right to deny access to U.S owned and U.S operated facilities to any individual. The contractor shall provide the names, biographic data and other related details of the contractor personal who shall be used on this contract prior to their utilization. Embassy shall arrange for security clearances of the contractor technicians to be deployed at the embassy. Submission of the information shall be made within 5 days of award of the contract. **No technician will be allowed on site without prior authorization.**

7.3 Vehicles: Contractor vehicles will not be permitted inside the embassy compound without prior approval. If you need vehicle access, please submit your vehicle information (Make, Model, License Plate #) along with a written justification as to why access is necessary. This should be submitted to the Facility Manager at least (1) week prior to the visit.

7.4 US Government shall issue identity cards to contractor personal, after they are approved. Contractor personal shall display identity card(s) on their dress at all times while providing services under his contract. These identity cards are the property of the US Government. The contractor is responsible for their return at the end of the contract, when an employee leaves contractor service, or at the request of the Government.

8.0 STANDARS OF CONDUCT

8.1 General: The contractor shall maintain satisfactory standards of employee competency, conduct, cleanliness, appearance and integrity and shall be responsible for taking such disciplinary action with respect to employees as may be necessary. Each contractor shall adhere to standards of conduct that reflect credit on themselves, their employer and the United Sates Government. The Government reserves the right to direct the contractor to remove an employee from the worksite for failure to comply with the standard of conduct. The contractor shall immediately replace such an employee to maintain continuity of services at no additional cost to the Government.

8.2 Neglect of Duties: Neglect of duties shall not be condoned. This includes sleeping while on duty, unreasonable delays or failures to carry out assigned tasks, conducting personal affairs during duty hours and refusing to render assistance or cooperate in upholding the integrity of the worksite security.

8.3 Disorderly Conduct: The contractor shall not condone disorderly conduct, use of abusive or offensive language, quarrelling and intimidation by words, actions or fighting. Also included is participation in disruptive activities that interface with normal and efficient Government operations.

8.4 Intoxicates and Narcotics: The contractor shall not allow its employee while on duty to possess, sell, consume or be under the influence of intoxicants, drugs or substances which produce similar effects.

8.5 Criminal Actions: Contractor employees may be subject to criminal actions as allowed by law in certain circumstances. These circumstances include but are not limited to the following actions: falsification or unlawful concealment, removal, mutilation or destruction of any official documents or records or concealment of material facts by wilful omission from official documents or records; unauthorized use of Government property, theft, vandalism or immoral conduct; unethical or improper use of official authority or credentials; security violations; organizing or participating in gambling in any form; and misuse of weapons.

8.6 Key Control: The contractor **will not** be issued any keys. The keys needed to perform work will be provided to your escort.

8.7 Notice to the Government of Labor Disputes: The contractor shall inform the COR of any actual or potential labour dispute that is delaying or threating to delay the timely performance of this contract.

9.0 PERIOD OF PERFORMANCE

The entire work related to supply, installation, commissioning and testing of new IN-ROW Cooling system needs to be completed during a time span of 60 working days once the P.O is obligated and (NTP) Notice to Proceed is given to the contractor. The contractor shall install and commission the new system in coordination and planning with the COR and DT team as per shutdown received over the weekends.

10. PAYMENT MILESTONE

Once the complete delivery of the IN-ROW Cooling Unit, Racks and all accessories are done at the installation site, the contractor shall be entitled for release of 60% of his payment. The rest 40 % of the payment shall be made once complete, installation, testing and commissioning of the IN-ROW Cooling system is done.

11. WARRANTY

The complete installation and commissioning carried out will be warranted for any defects related to bad workmanship or quality of material used for a period of 24 months from the date of commissioning. During the warranty period the OEM shall depute a team of skilled engineers to perform routine and preventive maintenance of the installed unit on quarterly basis.

12. BUY BACK OF OLD IN-ROW Cooling system

The contractor shall provide in his cost proposal buy back of existing IN-ROW Cooling system.

13. SAFETY

Safety is the highest priority. The contractor shall direct all of those under his charge to work safely. The safety concerns shall be brought to the attention of the COR. The contractor shall take all necessary measures and precautions to avoid interruptions of government operations and delays. Contractor must provide and maintain work environment and procedures, which will safeguard the public and government personal, property, materials and equipment exposed to his operations and activities. The contractor's staff will take all safety precautions and comply with the standards issued by the embassy, local authorities over occupational health and safety issues. All work should be carried in accordance with applicable safety regulations.

SAFETY STANDARDS TO BE FOLLOWED AT CONSTRUCTION AND RENOVATION SITES

General

1. All contractor employees engaged in maintenance/construction activities must wear proper shoes appropriate for their trade. No open toed sandals, flip-flops, or bare feet are permitted at work site.

2. All workers shall be fully clothed. No half pants and other non-appropriate clothing (Dhoti) will be accepted.
3. Malba / trash accumulated on the site shall be removed at a regular interval (if possible on daily basis) to prevent trip hazards.
4. Employees exposed to occupational hazards shall wear personal protective equipment (hard-hats, eye protection, ear protection, etc.). Appropriate protective equipment for any operation varies with the size, nature and location of work to be performed.
5. Drinking water must be made available to all contractor employees.
6. It is the responsibility of the contractor to provide all personal protective equipment (PPE) per the requirements at the work site and as directed by the COR. Any mishap due to negligence on the part of the contractor shall be entirely the contractor's responsibility.

Hot Work/ Metal Work

1. All contractors' employees who are arc welding at the work site shall use a full-face shield with #10 or darker lenses. No contractor employee will be permitted to arc weld with sunglasses, no matter how dark the lenses.
2. All the contractor's employees grinding and sanding shall have approved face masks and goggles for face and eye protection.
3. Contractor's employees handling heavy metallic material shall have appropriate gloves and steel toed safety shoes.
4. Lifting and shifting of the heavy material shall be done with the help of appropriate number of employees or machines.
5. Compressed gas cylinders shall be properly marked and should always be kept in standing positions secured from falling.
6. Hoses connected to the cylinder should be in good condition.
7. The contractor shall provide ventilation during interior arc welding operations.
8. Contractor shall use sight shields during welding to protect against any potential vision hazard.
9. Always keep an approved fire extinguisher near the site of welding.
10. Workers working with metal sheets must wear appropriate gloves to avoid any cuts on the hands.

Ladders Safety

1. Contractor shall use aluminium or fiber glass ladders for most purposes. Wooden or bamboo ladders are not allowed on the site.
2. Proper ladder for the specific job shall be used (for example fiber glass ladders for electrical work etc.).
3. Damaged ladders or ladders with missing supports, shoes, etc. shall not be used at the work site.
4. Height of the ladder shall be at least two feet above the required height for the work.

Electrical

1. All the equipment / machines to be used for the execution of the job shall be properly grounded.
2. All the extension boards to be used at the site shall have proper grounding.

3. All connections to any of the outlets shall be through three pin plugs. Direct connection of wires into receptacles is not permitted.
4. Machines/Tools with damaged wiring/ cabling shall not be used at site. The extension cord or wire with the machines shall be solid core with no breaks.
5. Electricians working on the site shall wear non-conductive shoes with rubber soles and shall use rubber gloves during execution of the work.
6. Any heavy equipment requiring voltage higher that 220VAC shall be connected under supervision of an embassy electrician.
7. No taped joint or undersize wiring is allowed at the site for the work.

Carpentry

1. Carpenters shall have dust masks to protect from the potential hazards from saw dust. Sanding machines used at the site shall have proper guards and operator shall wear suitable PPE, for example safety goggles, safety shoes, gloves etc.
2. All lumber used at the site shall be stored and must not pose a trip hazard.
3. Entire site shall be kept clean from the saw dust at the end of each workday.
4. Carpenter shall use machine guards on all machines used at the site.
5. All power carpentry equipment used at the site shall be properly grounded and wired.
6. Contractor shall use proper tools and tackles for the execution of the work at site.
7. Nails and other sharp material posing a laceration risk shall not be scattered about the site.

Fire

1. Contractor shall provide and place fire extinguishers at the work site.
2. No flammable material shall be stored inside the premises and must be removed at the end of the workday.

Lock Out / Tag Out

1. Lock out/tag out devices should be used during the testing of the electrical points and wiring.

Confined Spaces

1. If contractor's employees must work in a confined space the contractor shall contact the COR before proceeding with the work. Contractor shall arrange all the equipment as instructed by the COR to accomplish the job in a safe manner.

Hearing Protection

1. Contractor's employees working in excessively noisy environments shall wear proper hearing protection.

Height Protection

Contractor's employees working at elevations greater than 8 feet for prolonged periods (greater than 1 hour) shall use sturdy metal pipe scaffolding. Alternatives to scaffolding shall require approval of the COR.

TECHNICAL SPECIFICATIONS FOR IN-ROW COOLING SYSTEM

Thermal Solutions – Critical Equipment (DC)

S. No	Description	UOM	Qty	Price	Total
1	Supply of rack based precision InRow RD, 300mm, Air Cooled, 220-240V, 50HZ. Can be placed in between the racks or at the end rows, close to the heat source with minimum 10 KW nominal capacity. Unit shall be with Inverter Scroll compressor compatible with R410a refrigerant, crancase, locking disconnect switch, EC fan, Adjustable modular baffle system, G4 (EU4) gravimetric + Clogged Filter. Outdoor Condenser unit shall comprise of copper coils with Aluminum fins and Axial fan with fan speed controller motor. The microprocessor control system has advanced diagnostic and maintenance support, enabling multiple units to communicate and work together as a team to precisely control temperature and humidity inside containment. In addition, the controller network should provide a choice of Teamwork, Lead/Lag and Cascade functions. Rated Cooling Capacity: 10 KW, N+1 redundant	Nos	2		
2	Supply of Condenser, 2 Fan, Single Circuit, 2.3MBH /1C TD, 220/1/50 FSC	Nos	2		
3	Supply of InRow ball valve and union	Nos	2		
4	Supply of Leak Sensor - 20 ft (6.1 m)	Nos	2		
5	WSTRTUP5X8-AX-28 (Start-up service, for InRow with R32, 5X8)	Nos	2		

S.NO	3rd Party Material Supply & Installation	Unit	Qty	Nos	TOTAL	Price	Total
1	Supply and installation of ODU Stand As per site condition with necessary supports with min of 400 MM Height with extra support (concrete base block) E angle use 75mm*75MM*6MM	Nos	2	2	4		
2	Supply & Installation of SWG16 gauge 5/8" Hard drawn copper. Refrigerant pipe between PAC Indoor & outdoor unit with Aluminum silver nitril type insulation with necessary U traps, Elbows, all fittings etc. with proper support and pipe covered with Cement type plaster insulation.	RMT	20	2	40		
3	Supply & Installation of SWG16 gauge 1/2 Hard drawn copper. Refrigerant pipe between PAC Indoor & outdoor unit with Aluminum silver nitril type insulation with necessary U traps, Elbows, all fittings etc. with proper support and pipe covered with Cement type plaster insulation.	RMT	20	2	40		
4	Supply and installation of 3 Core 10 Sq MM copper cable flexible between IDU and ODU (Cable considered for complete ODU to IDU) **Mandatory required use conduit for laying cable**	RMT	25	2	50		
5	Supply and Installation & laying of 3C*10 Sq mm Copper flexible for IDU	RMT	10	2	20		
6	Supply and charging of ecofriendly refrigerant to the units after proper vacuum.	Kgs	20	2	40		
7	Supply & Installation and Laying of communication cable for between IDU & ODU (3 core 1.5 sq mm shielded) **Mandatory required use conduit for laying cable**	RMT	25	2	50		
8	Compressor Oil	Ltr.	1	2	2		
9	Supply and installation of Cpvc Pipe 25 MM for Drain line with fittings	Mtrs	2	2	4		
10	Supply and installation of Cpvc Pipe 25 MM for Water Inlet line with fittings and valve.	Mtrs	2	1	2		
11	Supply and installation Cable Tray (G.I) 300 mm / 50 MM with Enclosing GI Sheet.	Mtrs.	20	1	20		

S.NO	Retrofit work Unloading & Shifting of Equipment's, 3rd Party Materials,	Unit	Qty	Price	Total
1	Dismantling and shifting of OLD 2 no's Inrow ACRD101 & ODU ACCD75207 with acceriews ac units from server room (5th Floor) to Ground Floor storage area through Staircase in dismantled condition including old soft copper pipes.	Lot	1		

S.NO	Description	UOM	Qty	Price	Total
1	Unloading, lifting, shifting, Installation & Handling of the precision AC Units, along with Low side materials	Lot	1		
2	Pressure testing and Vacuuming of the system as described below. 1. Pressurize the system to 450 PSI with nitrogen. Leave the system pressurized for 24 hrs then check the gauges for drop in pressure. 2. Use a Vacuum pump and pull the first vacuum down to 750 microns. The initial pull can take up to 24 hours. 3. Once the vacuum level has reached 750 microns, close the manifold gauge valves and turn off the vacuum pump. Wait for one hour (the vacuum should not rise above 1500 microns) and then break the vacuum with nitrogen gas (use the service and discharge ports) until the system pressure equals atmospheric pressure. 4. Pull a final vacuum down to 500 microns for a minimum of two hours. 5. Charge with liquid 410 a refrigerant through the service port and needle valve on the condenser until the pressure equalizes with the refrigerant canister. 6. Open the ball valves and start the system. Charge the refrigerant slowly through the suction.	Nos.	2		
3	Civil work for Refrigerant Piping Routing - Wall Opening & Gypsum Opening & closing after completion of Piping 1 for Cu Pipe	Lot	1		
4	Buy back value of old IN-ROW Cooling system	Lot	1		

General Notes:

- The entire work needs to be carried out by professionally qualified or certified persons. The craftsmanship shall be professional and maintain the Indian standards or embassy standards with necessary fire and life safety precautions wherever required.

- The contractor shall depute a full-time qualified engineer or supervisor for the entire duration at site till the time the job is performed and finished.

- The contractor must provide the names of their employees who will be working at Embassy site well in advance for arranging necessary security clearance to access the site.

- The contractor will bring his own tools and equipment to perform the job, and no support will be provided by the embassy.

- The contractor will make sure that he leaves the work site neat and clean prior to leaving on each working day.

- The contractor shall not take orders or instructions from any persons except the contracting officer or his assigned representative.
- All consumables required to perform the job will be in the scope of the contractor. Embassy will only provide power supply from one dedicated source.

- All other logistical requirements for the transportation and movement of materials shall be in the contractor's scope.