REQUEST FOR BUGETARY ESTIMATE

Ref.: HSCC/SES/PTTS/New Delhi/2023 dated: 24.03.2023

HSCC (India) Ltd. intends to invite on-line bids from eligible bidders, in single stage two bid system for Execution including Supply, Installation, Testing, Commissioning of Pneumatic Tube Transfer System (PTTS) for a Reputed Hospital in New Delhi.

Technical Specifications and BOQ of proposed Pneumatic Tube Transfer System (PTTS) works are Annexed at Annexure-I and Annexure-II respectively.

It is requested to submit the Budgetary Quotation of the Pneumatic Tube Transfer System (PTTS) works in Company Letter Head, as per the BOQ format enclosed at Annexure-II, in both Hard & Soft Copy within 10 days of issue of this Notice at following address:

General Manager (Procurement)
Special Engineering Services Department
HSCC (India) Ltd.,
E-6(A), Sector-1,
Noida (U.P.) - 201301.

Soft copy may please be sent to: ses@hsccltd.co.in

General Manager (Proc),
HSCC (India) Ltd.

Annexure-I

TECHNICAL SPECIFICATIONFOR PNEUMATIC TUBE TRANSPORT SYSTEM (PTTS)

Scope of Work :

Supply, Installation, Testing and Commissioning (SITC) of Pneumatic Tube Transport System on Turnkey basis and handover to the client in satisfactory condition and providing 5 yrs. comprehensive warranty including free spares and services during DLP.

PTTS contractor should be solely responsible for completion of PTTS project and smooth functionality of PTTS after installation, connection & integration with pipeline system, testing & commissioning at the hospital.

System Requirements:

1. The facility of PTTS must have the provision of self-sorting and be able to transport multi types of samples like Vacutainers/Urine container/Biopsy sample/ Blood clot sample, Pharmaceuticals, Blood bags, Documents & Reports etc.

2. Supply of Pneumatic Tube Transport System (PTTS) of 160mm pipe (outer diameter) Network, with transfer speed ranging from a minimum transfer rate of 3 m/s to maximum rate of 4 m/s; as per specifications.

3. The Primary function of the PTTS is to transport bio-samples, medicines & Blood bags etc to and from various locations/departments within the Institute.

4. The Carrier or Container should be able to carry loads weighing 3-4 kg.

5. **The Pneumatic Tube Transport System (PTTS) shall cover the entire hospital building**.

1. **MAIN CONTROL SYSTEM**:

a. The entire Pneumatic Tube Transport System (PTTS) has to be electronically controlled by Dedicated Computer / microprocessors / digitally with software unit and the main control unit, which controls the sending and receiving process and the compressor unit and supervises all system components.

b. The Main Control System of the PTTS must remain fully operational at all times without any restrictions in the event of errors detected in the system.

c. The sending process has to be indicated on the display of the Main Control System. The Main Control System has to provide information to find the cause of a system malfunction. Customer-specific data such as the system's layout, Target / Station numbers, target names, arrival signals, and priority and special functions must be selectable onsite without change or external reprogramming of memory devices of the Main Control System.

d. The Main Control System should have ability to store all data regarding carrier destination, so that, the PTTS when restarted after mains power failure, should automatically start functioning normally and the system status is restored to what it was while power failure.

Carriers must be delivered to their assigned target/station address automatically after power restoration without any manual intervention.

e. All components of the PTTS should be constantly monitored; the operating software has to be based on action-reaction control for any carrier. The status of each carrier should be checked by the master control unit/system.

f. A test program must be included in the Main Control System, so as to automatically check, move and supervise all of the system's carrier, or specific selected carrier from the master control unit.

g. During both normal operation and testing, all devices (namely Carriers and Stations) should be able to communicate to the Main Control System that the selected functional position has been reached. The PTTS should be designed in such a way that it has facility for error detection of stations.

h. Main Control System should also allow the transfer to continue functioning with a robust fault-clearance program that automatically recognizes operating errors, power failures, time-out errors and other system errors.

i. It should be possible to designate a particular station as Recovery Station wherein carriers which have been lost in transit can be returned / recovered.

j. Control unit : The system is fully automatic computer control and supervising centre that controls and monitors all transmissions within the whole system on a continuous basis. The Control unit should be connected to HMIS/BMS to report system failures. The control unit is provided with licensed software that a) enables configuration of the whole system (b) Controls and monitors the operation of the whole system (c) Enables fully analyses based on self-creating log files. (d) Graphical display is provided to display the system schematic together with the operating status of all components. (e) The control unit has a simulation mode for training and testing. (f) the control unit log all the transactions in the system to the hard disk.

2. **LINE TRANSFER ZONE/LINEAR COUPLER**:

The PTTS should be provided with a “Line Transfer Zone Mechanism” which allows the interface between all the transport lines of the PTTS, so as to allow smooth transfer of carriers between the transfer lines, providing smooth and uninterrupted operation of the PTTS.

The Line Transfer Zone Mechanism should have the following features:

a. Contactless positioning, two direction operation.

b. Carrier designated as “Emergency-Carrier” should be able to physically overtake the normal carriers in the PTTS within the Line Transfer Zone Mechanism using line prioritisation.

c. Should be equipped for transporting of emergency carrier on priority.

d. Should be able to accommodate multiple carriers within the Line Transfer Zone Mechanism, so as to prevent stacking of carriers within the incoming lines.

a. The Line Transfer Zone Mechanism shall operate without any manual intervention.

Integrates all priority and slow speed transactions. Adequate capacity to cater Nuroscience Block work load. Smart multi storage system. Silent and shockproof transport, suitable for blood transport and other bio hazard materials. Designed for intensive use. Long lifespan. Easy installation. Service and maintenance friendly, requires a minimum of service. Low energy consumption. Meets the BIS/CE guideline 2006/42/EC for mechanical engineering and the EMC standard 2004/108/EG

3. SIDE CHANNEL BLOWER WITH SPEED CONTROL(VFD)

b. Independent Blowers of maximum power consumption of 5.5/6 KW, 3-phase 400v/50Hz each, low noise, unidirectional rotation with electronic air switch to switch between compressed air and vacuum. Each blower should be provided with a system to Control frequency of the blower which will further control the speed of the carrier for transferring sensitive laboratory samples at lower transfer speed of 3-4 m/s.
c. To be provided with all accessories and mounted on vibration proof arrangement.
d. Solid particles or contaminants must be withheld using the filters before entering the side channel blower.
e. The open intake and discharge ports should be protected by wire guards

4. **TOP LOAD STATION160mm**:

NW 160 mm Stainless steel station, pass through type having LCD display, backlit, soft membrane touch buttons, full multiline 3 line/5 line display with 16 characters per line or more including RFID reader circuit board and optical sensors built-in pneumatic pressure trough passage for sample safety.

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as pass- through station.

The Pneumatic Station should be able to send and receive containers.

The conveying direction of the containers should be both sided (single tube reversing principle).

Inserting a container into the Pneumatic Station and selecting a target number should be possible independent from system status.

The container should be loaded on the top side of the Pneumatic Station.

The Pneumatic Station should be Steel made, maintenance free mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less censoring of the unit positions. There should not be any air exiting at the pneumatic station. Front load stations should be equipped with RFID Readers for container ID and inventory, which should ensure automatic container redistribution to its home address & also non-acceptance of any items than authorized container.

The Pneumatic Station should have Air cushioned soft landing facility for arriving container to protect samples. Provided with container rack and receiving basket with cushion.

Design – All Stations must have a modern front loading/Top loading design with a safety door and must be manufactured of moulded hygienic closed cell materials. The station should be capable of detecting strange object this ensures stuff cannot send anything other than Pneumatic capsules. Return to sender – The stations must have the capability of automatically returning the carrier to the sender once the receiving party removes the items, he/she receives and places the carrier back in the station. Top loading station with safety door and must be manufactured of moulded hygienic closed cell materials.

5. **Multi Send/ Multi Receive Station**

The Pneumatic Station should be able to send and receive containers from the same unit.

Inserting a container into the pneumatic station and selecting a target number should be possible independent from system status.

It should control the condition of the receiving station when sending to the selected receiving station is possible.

It should be Microprocessor-controlled.

The main Lab should be provided with Multi Receive to handle bulk loads.

It should be designed as a fully automatic dispatch and receiving unit and can only be used as end station.

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensoring of the unit positions.

With RFID readers for container ID and inventory, which should ensure automatic container redistribution to its home address & also non-acceptance of any items than authorized container.

It should be built in a way that in case of power failure carriers in the transit will be stopped in the tubes . During power failure , Online UPS with PTTS will keep its Computer system and its program alive and the carriers will move as per its predesignated destinations as soon as the power will be restored in the Blowers and Pneumatic tube system.

It should have Air cushioned soft landing facility for arriving containers to protect samples.

It should be provided with container rack & PVC Slide bend/Stainless steel receiving Platform/Bend, sliced from the top for soft landing of the samples.

6. Compact End Station

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as end station.

The Pneumatic Station should be able to send and receive containers.
Inserting a container into the Pneumatic Station and selecting a target number should be possible independent from system status.

The Pneumatic Station should be controlled by the use of the integrated Touch Panel Display for the following features:

1. 7'' touch screen display with multifunctional operation screens
2. Touch panel operation via finger, safety gloves or styluses
3. Individual programmable user profiles and customized hotkeys
4. Individual authorization levels for personalized users profiles
5. Touch screen surface protection for easy cleaning addressees are individually programmable; Search button and addressee index simplify the usage.
6. Bar Code Reader for Pharmacy Stations and Blood Bank Stations

The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensoring of the unit positions.

There should not be any air exiting at the pneumatic station.

With RFID readers for carrier ID and inventory, which should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

It should have Air cushioned soft landing facility for arriving carrier to protect samples. Provided with carrier rack and receiving basket with cushion.
Dimensions: (60 x 50 x 50 cm) Approx. to occupy least possible space.

In the case, the PTS End stations are placed in the areas with increased air exchange, areas to be protected from contamination; areas causing potential contamination should use of filters at the end of the tube is must for sensitive clinical areas in which a pneumatic dispatch end – Air filter for inlet air transport Class H 14. Return to sender – The stations must have the capability of automatically returning the carrier to the sender once the receiving party removes the items, he/she receives and places the carrier back in the station.

Compact End station with safety door and must be manufactured of moulded hygienic closed cell materials..

7. CARRIERS WITH RFID:

a. Carriers for hospital use should be with easy to operate with swivel top mechanism, sealed load chamber to prevent contamination of tubing in the unlikely event of spill of transported goods.

b. The carrier lid shall be closed in a "LOCKED" position. The lid should be kept locked by a spring force and has to be equipped with seals to prevent accidental opening of the carrier in transit. Furthermore the design of the carrier shall ensure that an open carrier can't be sent.

c. Every carrier has to be equipped with two free programmable data transponders. transponders are used to electronically identify any carrier by a unique address and to offer the user automatic redistribution to home Station and optionally a second address for dedicated locations or special carrier use.

d. The carriers must be provided with an easily visible wear and tear resistant colour coding system, with caps/bands/stickers.

e. Standard 160mm Carrier Loading Dimensions are 330 x 160 mm.

f. To be provided with suitable holders of vacutainers and a pair shuttle bung for each carrier.

8. RADIO FREQUENCY ID (RFID)

The system should be provided with an integrated Radio frequency ID (RFID) solution within the Stations, Carriers as standard supply, so that proper management of carriers can be achieved; especially the return of empty carriers. The RFID system has to be built-in to all stations and carriers. No separate module of RFID system shall be used in any station for carrier / station authentication. The RFID system shall be programmed so that it shall not allow anything other than legitimate carriers to go in the PTT system.

9. DIVERTERS (THREE-WAY)

The routing device shall consist of One incoming and Three outgoing delivery tubes. It should Air Tight with Steel Housing and provided with Optical Sensors. The Routing device must provide smooth connection between incoming and outgoing tube, to prevent impact on transported items. The Routing device must consist of a maintenance-free rotary oscillating pipe in a pneumatically sealed device housing to prevent air loss with self-adjusting Teflon gaskets providing airtight operation in negative as well as positive pressure operation.

10. FORWARDING TUBE (Grey & Transparent):

Every Station and Routing device must be provided transparent tube. The forwarding tube should be made of medium density PVC of 160 mm Outer Diameter and 153-154 mm (approx.) Inner Diameter ie. with thickness of approx. 3.2 mm with properties such as good Physical tensile strength, absorption of water, self-extinguishing.

11. BENTS(Grey & Transparent):

It should be of 90 deg. with radius not more than 800 mm (centre) with length approx 1.5 metre, for optimal space utilization.

12. MISCELLANEOUS:-

160mm Pipe clamp, Screw bolts, Cable Tie, Clips, 90 Deg Bends for Air Tube, Dowel, PVC Conduit for Cable, Baskets, Cushion, insert for carrier PU Foam including other misc. items Complete with all accessories as per detail technical specification

COMPOSITE SYSTEM CABLE:

Forwarding tube should be supplied with the necessary cable and other tube mounting accessories for networking between Pneumatic Stations. It should not be localized and it should be supplied from the principal equipment manufacturer with company brand name marked.

INSERTS:

Cushion Bag or Foam Pad for holding vacutainers.

13. **ONLINE UPS**:

Uninterruptable Power Supply shall be provided for Main Controller. It should be of reputed make of capacity 6 KVA, Back-up of minimum 30 minutes power backup for Main Control System & peripherals excluding Blowers.

14. QUALITY CONTROL

The Contractor must ensure that the works conform to the quality standards and to the satisfaction of the Institute. The contractor shall submit his quality plan in accordance with the above. The works and materials shall be subject to tests from time to time as per best practices in the industry. Wherever mentioned in the Contract, the tests must be carried out at the Contractor's expense. The materials shall be procured from reputed vendors approved by the Institute's Engineer. The Contractor must also supply samples to the Institute's Engineer for his approval and also carry out the tests as and when required by the Engineer.

15. TESTS AFTER COMPLETION

After completion of the project, the Institute may carry out the tests after completion, which shall be carried out under normal operating conditions to assure that the system performs well under normal operating conditions. These tests will include but not limited to:

i. Running of equipment and system as a whole to a minimum of 7 days.

ii. System specific tests and equipment specific test

iii. Any other test which Institute intends to carry out to check the stability and reliability of the system.

iv. Any defects if pointed out in the tests after completion shall be ratified at Contractor's expense and within time as deemed reasonable by the Institute.

16.MAINTENANCE AND TRAINING REQUIREMENTS FOR SYSTEMS, MACHINES AND EQUIPMENT

i) The Contractor shall submit Operation manuals, Maintenance manuals and As-Built drawing.

ii) The Contractor shall train the staff of the Institute for proper operation and essential trouble shooting of the system. The Contractor shall make arrangements for demonstration & trial run before commissioning of the system.

17. TURNKEY WORKS

a. Bidders are strongly advised to visit the site and carry out the assessment of works before bidding.

b. Area dedicated for plant room is available at site.

c. Plant room should aesthetically look good and all the tubes, cables, diverters etc. should be properly routed .

d. All electrical work required for commissioning and installation of equipment like cable wire, electrical outlets, switches, cable trenches, railings, etc. should be fire proof, of reputed make, certified for electrical safety as per international standard. All work has to be done by the bidder including Electrical Isolators, MCBs, Electrical boards, Switches, Sockets and any other thing which are required for smooth running of Equipment.

e. Institute will provide one point electrical supply and further distribution within the plant room will be responsibility of bidder as per approved layout.

f. Carry out the complete partitioning/separation of the work site with controlled access.

g. Bidder has to provide sound proof (noise level below 65 dB) enclosure/ room for the operator in the plant room.

h. Provide all necessary safety equipment to site as per international guide line.

i. Ensure that signage are posted all around (Work permit, hot work permit, Site inspection check list, etc).

j. Carry out the Civil work including core cut, wall breaking and complete flooring inclusive of all materials.

k. Carry out any other finishes required in the area of work such as wall protectors, corner guards, etc.

l. Air conditioner and electrical wiring/data cable wiring for PTTS to be provided by the vendor as works on turnkey basis. Electrical supply at single point to be provided by HSCC/Client. Power may be available at site but payment to be made by the vendor for consumption of electricity. In case power supply is not available at site, vendor has to arrange of its own.

m. Supply, install, testing & commission the Electrical Control Panels, distribution box, circuit breaker, fire sensors & extinguishers and cabling from the nearest mains power supply. Re-routing all electrical, fire safety, telephone, security & network cables as per planning and design.

n. To be Carried out all plant area renovation, maintenance and preparation, including, doors, furniture, windows, tiles, ceilings, lights, painting etc.

Note 1: General: Bidders are requested to make sure that they should attach the list of equipment for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipment to periodically check the electrical safety aspects as per BIS Safety Standards IS-13540 which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipment. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipment checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive maintenance call.

Note 2: Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS)The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month All software updates should be provided free of cost during warranty period

Manufacturer Authorization: Eligible bidders should submit a mandatory letter of authority from the Foreign Principal / Manufacturer, mentioning country of origin with name of manufacturing company for major products quoted by them.

The makes for other items of PTS shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document

Responsibility of bidder

Bidders are strongly advised to visit the site for assessment before the submission of tender offer

1. Bidder shall be responsible for complete design, supply, installation, testing and commissioning including turnkey works, demolition and construction as applicable. The bidders are required to survey the site before furnishing the quotations.

2. Bidder shall execute all required civil, electrical, plumbing, lighting, fire safety, exhaust systems and other works as maybe required for complete installation and trouble-free functioning as a part of the 'turnkey work'.

3. Hospital will provide one point electrical supply with isolator in the plant. The wiring, peripheral lighting, fans, exhaust etc have to be done by the bidder.

3. The bidder shall be responsible for the complete works including the submission of working drawings, and isometric views, detailed work schedule and materials. Bidder shall be responsible for design, supply, installation, testing and commissioning of medical gas supply system in coordination with respective institute authorities & HSCC.

4. Bidder shall be responsible for free maintenance of all component of PTT system during warranty period including all filters & consumables.

5. Bidder should provide factory test certificates for the materials used. Bidder should supply complete set of manuals, **Operation and Service manuals and As-built drawing** for all the equipment, systems and subsystems supplied. Final electrical safety test, system test, leakage and calibration should be done by authorized persons using calibrated test equipment as per standards.

6. Third party quality certification of the PTTS equipment from SGS/TUV/Lloyds/Bureau Veritas should be submitted as "Certifies that the PTTS equipment meets the technical specification and DBR of the tender document".

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7. Based on the building drawings to be provided, **Bidder has to submit drawing and data sheet within 15 days after Letter of commencement**.

8. Bidder should be responsible for suitable arrangement of Ventilation/ Air-condition as per offered PTTS plant requirement/recommendation from the Manufacturer and as per local site condition for 24 x 7 as per requirement.

9. Bidder should be responsible for dedicated earthling (Chemical type) for PTTS Plant room (If required)

10. Bidder has to design the PTTS as per the approved SLD and technical specification mentioned in the tender, any clarification/suggestions regarding design of PTTS should be submitted at Pre-bid meeting.

11. Bidder has to clarify their doubts or prerequisites during pre-bid meeting. Bidder has to submit the list of prerequisites along with bid. No further pre-requisite/requirement after placement of NOA will be addressed.

12. Zoning of PTTS should be done to meet the peak flow requirement with suitable back up arrangements for all services, if required.

BOQ - PTTS

Package - Execution including Supply, Installation, Testing and Commissioning of PNEUMATIC TUBE TRANSFER SYSTEM including 1 year warranty (DLP)

Rate shall be inclusive of all charges like Freight, Cess, Insurance, GST @18% etc.

Item No.	Description	Unit	Qty	Rate In Rs.	Amount in Rs.
1.0	Main Control System: including hardware, software package with license key for programming, real time monitoring & RFID pack for all carriers , stations & transfer System Complete with all accessories as per detail technical specification	Nos	1		-
					-
2.0	Line Transfer Zone Mechanism/Linear Coupler for 8 zones at least Complete with all accessories as per detail technical specification	Nos	1		-
					-
3.0	Side Chanel Blower 5.5/6 kw with speed control(VFD) Complete with all accessories as per detail technical specification	Nos	9		-
					-
4.0	Diverter 160 mm, 3-Way, Air Tight, Steel Housing. Provided with Optical Sensors Complete with all accessories as per detail technical specification	Nos	15		-
					-
5.0	Front/Top load station : 160 mm , with OEM carrier rack , OEM soft-landing basket Complete with all accessories as per detail technical specification	Nos	50		-
					-
					-
6.0	Multi Rceive station of 160 mm	Nos	2		-
					-
7.0	Multi Send Station of 160 mm	Nos	1		-
					-
8.0	Compact end Station of 160 mm	Nos	15		-
					-
					-
9.0	Standard 160mm Carrier loading dimension 330 x160 mm: **compatible** with the 160mm transfer line system, size programmable RFID tag for easy return of empty carrier Complete with all accessories as per detail technical specification.	Nos	240		-
					-

Item No.	Description	Unit	Qty	Rate In Rs.	Amount in Rs.
10.0	Miscellaneous 160mm Pipe clamp, Screw bolts, Cable Tie, Clips, 90 Deg Bends for Air Tube, Dowel, PVC Conduit for Cable, Baskets, Cushion, insert for carrier PU Foam including other misc. items Complete with all accessories as per detail technical specification	lumpsum	1		-
					-
11.0	Grey Tubing material suitable for 160 mm system including 160mm Tube, Air tube, Bends, Endpiece, Sleeve, Special Adhesive Glue, Cleaner for PVC Tube, System cable & Mounting tools etc Complete with all accessories as per detail technical specification	mtr	2200		-
					-
12.0	Transparent Tubing material suitable for 160 mm system including 160mm Tube, Air tube, Bends, Endpiece, Sleeve, Special Adhesive Glue, Cleaner for PVC Tube, System cable & Mounting tools etc Complete with all accessories as per detail technical specification	mtr	50		-
					-
13.0	Grey Tube bents of 160mm Complete with all accessories as per detail technical specification	mtr	400		-
					-
14.0	Transparent Tube bents of 160mm Complete with all accessories as per detail technical specification	mtr	30		-
					-
15.0	ON LINE UPS Complete with all accessories as per detail technical specification	Nos	1		-
					-
16.0	TURNKEY WORKS Complete with all accessories as per detail technical specification				-
a	Air Conditioning	LS	1		-
b	Electrical Cabling	LS	1		-
c	Earthing	LS	1		-
d	Switch & Scoket	LS	1		-
e	Light & Fan	LS	1		-
f	Foundation of Blower	LS	1		-
g	Furniture for Computer, printer & operator	LS	1		-
	Total Amount in Rs.				**-**