

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES,
ANSARI NAGAR, NEW DELHI**

Dated: 12.05.2016

AMENDMENT No. – I

Project Name: Tender for “Construction of New Paid Ward Including Associated Works, Operation & Maintenance during defect liability period in AIIMS Campus, Ansari Nagar, New Delhi for AIIMS, New Delhi

Tender No. HSCC/AIIMS/NPW/2016, dated: 25.04.2016

Reply to Pre Bid Queries raised by bidders during pre -bid meeting held on 05.05.2016 at HSCC, Head Office, Noida

S.No.	Bidders Queries	Reply
1.	In every department where the tender is more than INR.2.00 crore, the provision for mobilization advance kept in the tender documents this will be helpful for the progress of the work. In view of this, kindly made provision of Clause – 10 (ii) in Schedule – F of the tender.	Mobilisation advance shall not be applicable
2.	This may please be clarified whether structural drawings shall be supplied by the department or to be prepared by the contractor.	Refer SCC Clause 4.ii.
3.	<u>Under para – IV on page – 5 for Scope of Contract in Special Condition of Contract.</u> Provisions has been kept for taking clearance, NOCs, completion certificate & occupation certificate by the contractor from all the local bodies including DUAC. Please intimate whether the proposed project including drawings are cleared by the all local bodies including clearance from environmental department & forest department for tree cutting etc. For taking completion / occupation certificate, several formalities are to be completed which involved only client department (owner of building), Architect & Structural Engineer for certificate of soundness of structure including seismic forces. Several application forms are to	No change in tender conditions

	be signed by all the authorities & nowhere construction agency comes into picture. Possibility of refusing construction agency for entry into the office of local bodies cannot be ruled out in such matters of public dealing. Hence the provision under above para may kindly be reviewed for deletion or modification.	
4.	In para – 1.13 & 1.15 on page – 2 & 3 of the technical specification, it Is mentioned that cost of groove, bands etc & drip course is inclusive of the plastering rate; whereas as per CPWD specifications the drip course / groove to be paid separately. Please clarify the same.	No change in tender conditions
5.	The release of performance guarantee mentioned in clause – 1 is after the completion & defect liability period. In CPWD & other departments it is being released on completion of the work. It is suggested to delete the defect liability period mentioned in this clause.	No change in tender conditions
6.	In item no. – 5.15 of BOQ for fire rated doors, 11mm. glass with 120 minutes clear fire rating partly insulated (EW 120) mentioned. In India EW 120 is not being tested by CBRI, Roorkee, therefore it is to be replace by 10 mm. thick 120 minutes clear fire rated glass (E120).	No change in tender conditions. Please see enclosed Annexure-I for amendment in BOQ Items.
7.	At page C – 12, it is mentioned that hardware should pass European Certificate “CE” of conformity/UL with required fire rating. In India fire doors (metal/wooden/glazed) are tested at CBRI to BS: 476 part – 20 & 22 & IS: 3614 part – II only. Please make the amendments.	Please see enclosed Annexure - I for amendment in BOQ Items.
8.	In all the items of the fire rated doors, fire rated glass be amended to 10 mm. thick instead of 11 mm. thick as the item is compatible with all fire rated glass manufacturers.	Please see enclosed Annexure - I for amendment in BOQ Items.
9.	In item no. – 3.32 of page – PHE – 18, copper container mentioned for water heaters. Nowadays none of the manufacturers is manufacturing water heaters with copper container. Instead of copper container it should be replaced by manufacturer’s specifications.	Supplying, fixing, testing and commissioning of storage type water heater (Geyser) etc. With outer body of ABS, 2mm thick mild steel inner tank with glass line coating, option of 1/2/3 KW electrically operated single phase 230V including glass lined double heating element, Digital display, multifunction safety device, ELCB, Anode Rod System and Brackets for fixing on wall with connecting wire & plug etc.

		Confirming to IS: 2082 and energy efficient star rated model.
10.	In item no. – 3.35 at page – PHE – 20, the item of stainless steel pipes taken inclusive of fittings. The stainless steel fittings such as elbow, Tee, reducers, bend etc. are costly items & without drawing it cannot be ascertain how much quantities of fitting required. In DSR published by CPWD provision of fitting taken separately. It is requested that the qty. of fittings may taken separately.	No change in tender condition
11.	Barricading is to be provided at site whereas such item is not taken in BOQ. A separate item is available in DSR which may be included	No change in tender conditions
12.	In the list of approved make, the name of following agencies may please be considered/ added: <u>For Civil</u> i. Wooden/metal Fire Check Doors : M/S. Sukri Fire Doors ii. Item no. 41 & 46 : “MARSHALL”(being used at Supreme Court & Presidential Estate). <u>For Electrical</u> i. Bus duct / rising mains : C & S ii. Transformer : Voltamp (GE discontinued the manufacturing of dry type transformer) iii. Chemical Earthing : Add more make iv. Lighting protection : LPI / Indelec / Nimbus	No change in tender conditions No Change No Change No Change No Change
13.	Please confirm the thickness of MCB DB. In specification, it is mentioned 1.60 mm. but standard DB is not being manufactured in 1.60 mm. thickness	It is not a prewired DB. Standard thickness as per manufacturer standard practice will be accepted.
14.	For BUS DUCT: Please clarify Qty. Mts. for outdoor part. No. of bends SLD / Route map, if any avialable. For 3200Amp - no. of transformer / Panel connections For 2500Amp - no. of transformer / Panel connections For 2000Amp - no. of transformer / Panel connections	Bus duct will be indoor only. As per actual site condition.

	For 1600Amp - no. of transformer / Panel connections	
15.	BOQ in excel may please be provided	Already available on website.
16.	<p>For MGMS (Gas Manifold Work) : TECHNICAL SPECIFICATIONS:</p> <p>NFPA 99 VS. HTM 02-01 SPECIFICATIONS</p> <p>As you have rightly given alternate detailed specifications of both the above standards in the case of Alarm Systems and Medical Gas Outlets, we request you to kindly give alternate specifications of HTM standards, also in the case of Vacuum Plant, Compressed Air plant, O2 Automatic Control Panel, and N2O Automatic Control Panel, and AGSS, as the present specifications are of for these equipments are as per NFPA 99 standard. For your kind perusal and ready reference we are enclosing the detailed specifications as per HTM standard for these items.</p>	<p>Alternate specification for O2 Automatic Control Panel, N2O Automatic Control Panel, Vacuum Plant and Compressed Air Plant as per HTM 02-01 is enclosed (Page No.14-20)</p>
	<p>Item Sr. No. 2 – Vacuum system</p> <p>Please specify the number of vacuum pumps, which would be running to supply the desired design capacity and also the number of vacuum pumps which should be as standby. This is required in order that all bidders should be on the same platform for a fair and “apple to apple” comparison</p> <p>Please ensure that the plant specifications frequency should be 50 Hz and not 60 Hz, as only 50 Hz is used in India</p>	<p>Vacuum system shall be of Duplex/Triplex System (Quadruplex/Pentaplex as per HTM) capacity 115-130 CFM/3256-3681 LPM at 19” Hg with standby option as per relevant standard. Frequency should be 50 Hz</p>
	<p>Item Sr. No. 3 - Compressed Air plant –</p> <p>You have mentioned oil less Screw / Scroll compressors. Please mention ‘<u>Oil injected rotary Screw compressors with filtration / Scroll compressors</u>’. As you know Screw Compressors are oil injected with multi stage filtration system, as mentioned in HTM 02-01 standards. Please specify the number of air compressors, which would be running to supply the desired design capacity of 60-70 cfm, and also the number of compressors which should be as standby. This is required in order that all bidders should be on the same platform for a fair and “apple to apple” comparison</p> <p>Please ensure that the plant specifications frequency should be 50 Hz and not 60 Hz, as only 50 Hz is used in India</p>	<p>Oil Free/Oil based Air Compressor (Screw/Scroll) should be provided with proper multiple stages of filtration system (4 stages filtration system for oil injected compressor) and drying system to produce air of breathing quality as per relevant standard.</p>

	Item Sr. No.4 – Distribution Piping Indigenous			
	As the copper pipe is to be of medical grade, please mention that same should be “BSI Kite mark” certified which is important quality certification for medical grade copper pipe manufacturing process and it was specified in earlier AIIMS and HSCC tenders			
19.	HVAC Works :			
19.1	BOQ ITEM NO 1.1	250 TR (actual) capacity water cooled water chilling units (ARI Certified)	<ol style="list-style-type: none"> We are offering 237 TR instead of 250 TR at tender conditions. We confirm that same chiller will deliver more than 250 TR at AHRi conditions. The chillers offered by us are 5.75 COP as per tender requirement. However, 5.75 COP chiller will give 0.72 KW/ TR at duty conditions. The pressure drop at the evaporator and condenser are 21.5 ft and 33.9 ft respectively. However the velocities will be less than 10 FPS . The Chiller offered will modulate from 100 to 15 % instead of 100 to 10%. Country of origin will be China. The pressure testing of chiller shells shall be as per country of origin. Request you to please approve 0.0001 FPS fouling factor in evaporator and 0.00025 FPS on condenser. 	<ol style="list-style-type: none"> Capacity shall be as per Tender. Single / Multiple compressor as per standard design of manufacturer is acceptable. Duty condition IKW/TR shall be as per BoQ which is to be complied. Shall be below 7m and 10m respectively for Evaporator and condenser as per design of the manufacturer. 10 FPS is acceptable. Unloading up to 15% is acceptable. Shall be as per tender conditions. Shall be as per tender conditions. Fouling factor shall be as per tender conditions.
19.2	BOQ ITEM NO 2.1,2.2,2.3 & 2.4	Pumps	Pumps shall be Horizontal/vertical split casing end suction type. Please approve.	Shall be as per tender conditions.
19.3	BOQ ITEM NO 3	Cooling tower	Motor of cooling tower shall be as per cooling tower manufacturer standard Please Clarify.	Motor as per manufacturer standard is acceptable.
19.4	BOQ ITEM	Air Handling Units	In BOQ fan section of AHU's is not mention	Shall be as per tender conditions

	NO 5.1		but in technical Specification,Fan shall be centrifugal with backward inclined blades. Please clarify that it shall be as per manufacturer selection sheet or it shall be as per technical specification.	
19.5	Technical specification	AHU TS - 2.4 Specs – AC- Page -16 R1/ <u>Housing/ Casing:-</u> PUF pressure injected having density 40 Kg/m3 insulation.	It shall be vary 38 kg/m3 (+ -2). As per manufacturer standard.	Shall be 40 +/- 2 Kg/m3
19.6	BOQ ITEM NO. 5.1	Air Handling Units	Please clarify that AHU shall be with VFD /without VFD or AHU motor shall be only VFD compatible as mentioned in BOQ Specification.	Without VFD. However all AHU motors shall be VFD compatible.
19.7	BOQ ITEM NO. 5.1	Air Handling Units / k. Controls for AHUs comprising of a set of pressure independent type 2 Way Modulating Flow Control valve with integrated 2 way modulating control of required size having manual override facility alongwith proportional thermostat & wiring for interconnection with 1.5 sq. mm Cu Conductor multicore armoured complete as required. The valve actuator shall be capable of accepting 2-10	Please clarify length in RMT and core of cu conductor armoured wiring.	1.5 sqmm Cu conductor as required.

		volt DC, 4-20 mA electric signal and shall provide similar transduced feedback output signal to control system. The minimum close off pressure of valve must be 1.5 times shut OFF head of pump.		
19.8	BOQ ITEM NO. 8	Axial Flow Fan / Technical Specification:- Fan motor shall be selected in such a way that sound level is lowest (max. 75 db at 1 m distance) while running.	Please accept Noise level minimum shall be 80-85 dba@ 1 m distance.	Shall be as per Tender conditions
19.9	BOQ ITEM NO. 16 (16.2 to 16.5) &16.1 & 16.2	GSS DUCTING	PLEASE CLARIFY THE DUCTING HAS TO BE CONSIDERED ROUND TYPE OR RECTANGULAR TYPE AS THERE IS HUGE DIFFERENCE IN COST OF ROUND TYPE & RECTANGULAR TYPE. Also , confirm us the GSM of the Sheet for the ducting of BOQ Point no 16.2 to 16.5 Also confirm us TDS and C & S for BOQ point no:- 16.1 & 16.2	Rectangular type For 16.2 to 16.5 it shall be 120 GSM Shall be as per Tender conditions
19.10	BOQ ITEM NO. 17	AL DUCTING	Please confirm us the GSM of the Sheet for the Al ducting of BOQ Point no 17.1.1 to 17.1.3	Shall be as per Tender conditions
19.11	List of make	Main Panel	Kindly also approve their channel partners because most of time we are facing problem to get the quotation from main panel	Shall be as per Tender conditions

			manufacturer which is mentioned in the approved list of make. If not approved the point then please provide us the contact details (Name/Mob no and their email Id)	
19.12	List of make	AHU/ ventilation electrical panels	Kindly also approve SPC/EAP/Neptune/Advance/Application Control.	Shall be as per Tender conditions
19.13	List of make	Centrifugal /Axial Flow Fans/Tube Axial (AMCA Certified)- Flakt/ Nicotra/ Comefri/ Kruger	Kindly also approve “Greenheck/Airflow/Wolter/Humidin”. .Request you to kindly approve. Flakt/ Comefri/- these two makes are not able to provide Axial fan	Shall be as per Tender conditions
19.14	List of make	Air Handling Units/FCU CARYAIRE/Blue star/Zeco/Voltas/Flaktwo od/waves/Edgetech	Please add “Unique” make.	Shall be as per Tender conditions
1.	<p>Vol.-I (NIT/ITB) : Clause 2.3.3. on page 18 (Instruction to bidders), Section-II :</p> <p>Para 1.- As per clause no. 1.4.1(b)(ii) on page 11 the experience of one completed work of costing not less than 40% of the estimated cost on any Central/ State Govt. is essentially required whereas as per clause (B) (a) of Technical package Part –II on page 21 and under checklist of Annexure-I, Technical Package Part-II at Sl.no.-14 on page 35-36 only clause 1.4.1.(i) of Vol.-i has been indicated/ shown. The same way please be clarified.</p> <p>However, it is to inform you that two works of central Govt./Ministry of defence of DG MAP of the tender amount Rs.154.607 Cr. and Rs.103.875 Cr. are in progress at Jaipur and Faizabad & Bamrauli are in progress respectively. The work at jaipur is expected to be completed within 3-4 months tentatively. Whereas the work Faizabad & Bamrauli will take little more time in completion of this project.</p> <p>It is further to inform you that as per list of Contractor of DG MAP (Phase-II) which can be seen on ‘Google’ this company M/s Purvanchal Const. Works Pvt. Ltd. has been placed at Sl.No. 13/140 indicating the Bidding capacity of Largest work of Rs.390 Cr. and available assessed capacity of Rs.644 Cr. (Copy enclosed) for ready reference.</p>			Shall be as per tender condition.

	<p>Para 2 :- As per clause (xviii) under list of documents on page-7 Vol.-I requirement of undertaking on 'Form M' under clause 1.28 on page 16-17 of Vol.-I has not been found enclosed/attached with Vol.-I (NIT/ITB). Please clarify the above for completing the tender / bid documents accordingly.</p>	<p>Format of Form- M (Undertaking) attached at Annexure –II.</p>
<p>21.</p>	<p>Clause - 10CA – Schedule – F (Vol.-II-GCC) (Price variation)</p>	<p>Refer, Schedule - F of GCC (Vol.-II) of the tender document. 10CA is applicable for Cement and Reinforcement steel.</p> <p>Base price of items under clause 10 CA are as given below:</p> <p>1) Cement (OPC) : Rs. 4500.00 Per MT</p> <p>2) Reinforcement Steel – Primary Manufacture : Rs. 35800.00 Per MT</p>

All other terms & Conditions of the Tender shall remain unchanged.

Prospective bidders are advised to regularly scan through HSCC e-tender portal <http://www.tenderwizard.com/HSCC> as corrigendum/amendments etc., if any, will be notified on this portal only and separate advertisement will not be made for this.

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Chief General Manager (PG-II), HSCC (India) Ltd.,
For & on behalf of Director, AIIMS, New Delhi

Name of the Work: Construction of New Paid Ward AIIMS, New Delhi

ANNEXURE - I

Refer Vol.-V (BOQ) of Civil work :

Sl. No	Item as per BOQ	Amended Item
5.14	<p>Providing and installation of fully insulated wooden fire rated shutter of 120min. fire rating conforming to BS: 476 part 22 and IS: 3614 Part II as per the prototype tested and certified by CBRI Roorkee, of minimum 50 mm thickness, comprising of 75mm x 44mm hardwood internal timber frame work, with infill of 96 kg/m³, ceramic fiber blankets, coated with intumescent coating on both sides for insulation. The coated insulation shall be sandwiched between 12mm thick, Non combustible Boards (Calcium Silicate of approved quality and manufacture) on both sides (edge to edge on internal Hardwood frame) and cladded with 3mm thick commercial ply of approved quality & 1mm thick laminate of approved brand and manufacture on both sides, with 50mm x 14mm 2nd class teak wood lipping all round the shutter.</p>	<p>Providing and installation of fully insulated wooden fire rated shutter of 120min. fire rating conforming to BS: 476 part 22 and IS: 3614 Part II as per the prototype tested and certified by CBRI Roorkee, of minimum 50 mm thickness, comprising of 75mm x 44mm hardwood internal timber frame work, with infill of 96 kg/m³, ceramic fiber blankets, coated with intumescent coating on both sides for insulation. The coated insulation shall be sandwiched between Non combustible Boards (Calcium Silicate of approved quality, thickness and manufacture) on both sides (edge to edge on internal Hardwood frame) and cladded with 3mm thick commercial ply of approved quality & 1mm thick laminate of approved brand and manufacture on both sides, with 50mm x 14mm 2nd class teak wood lipping all round the shutter.</p>
	<p>The shutter is suitable for mounted on the door frame, as per the item given below. Both frame and shutter shall be fitted with fire & smoke intumescent seal of Viper or equivalent make of size 20 x 4mm on all the three sides except bottom. The pasting of the ply/veneer/laminate should be done using automatic machine and should be free from any nails or perforations. The board shall be Resistant to vermin, mould growth, minor impact, abrasion and short term water attack. The shutter shall be fixed with the frame with the help of SS 304 grade ball bearing hinges of size 100x76x2mm with necessary screws and making cut out for vision panel. Provisions/reinforcement for fixing all fixtures shall be built in on the door prior to the supply. The rate shall include all</p>	<p>The shutter is suitable for mounted on the door frame, as per the item given below. Both frame and shutter shall be fitted with fire & smoke intumescent seal of approved brand and manufacturer of size 20 x 4mm on all the three sides except bottom. The pasting of the ply/veneer/laminate should be done using automatic machine and should be free from any nails or perforations. The board shall be Resistant to vermin, mould growth, minor impact, abrasion and short term water attack. The shutter shall be fixed with the frame with the help of SS 304 grade ball bearing hinges of size 100x76x2mm with necessary screws and making cut out for vision panel. Provisions/reinforcement for fixing all fixtures shall be built in on the door prior to the supply. The rate shall include all the</p>

	the materials, labor and T&P for the works described in the item above.	materials, labor and T&P for the works described in the item above.
a)	Single/Double Shutter	Single/Double Shutter
5.15	<p>Providing and fixing of Hollow metal fire rated doors as per IS 3614 part-1 & part-2 for stability and integrity. Pressed Galvanized steel confirming to IS 277 with the following specification. Door frame shall be double rebate profile of minimum size 154mm X 77 mm made out of 1.60mm (16gauge) minimum thick galvanized steel sheet. NDRF 154x77 Frames shall be Butt jointed and field assembled with self-bolted. The frames should be finished with Thermosetting Powder Coating in desired RAL Shade. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry wall opening. Door leaf shall be minimum 49mm thick fully flush double skin door with or without vision lite. Door leaf shall be manufactured from 1.25mm (18guage) minimum thick galvanized steel sheet. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be Rockwool treated with Viper FRS 881 LH or equivalent. All doors NSD 12049 shall be factory prepped for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked with a bending radius of 1.4mm. For pair of doors astragals has to be provided on the meeting stile for both active and inactive leaf. Vision lite wherever applicable should be provided as per manufacturer's recommendation with a beeding and screws from inside. However the glass should be contraflam Door Lite 11 mm clear 120 min fire rated and partially insulated</p>	<p>Providing and fixing of Hollow metal fire rated doors as per IS 3614 part-1 & part-2 for stability and integrity. Pressed Galvanized steel confirming to IS 277 with the following specification. Door frame shall be double rebate profile of minimum size 154mm X 77 mm made out of 1.60mm (16gauge) minimum thick galvanized steel sheet. NDRF 154x77 Frames shall be Butt jointed and field assembled with self-bolted. The frames should be finished with Thermosetting Powder Coating in desired RAL Shade. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry wall opening. Door leaf shall be minimum 49mm thick fully flush double skin door with or without vision lite. Door leaf shall be manufactured from 1.25mm (18guage) minimum thick galvanized steel sheet. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be treated Rockwool. All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked. For pair of doors astragals has to be provided on the meeting stile for both active and inactive leaf. Vision lite wherever applicable should be provided as per manufacturer's recommendation with a beeding and screws from inside. However the glass should be 11 mm clear,interlayered 120 min fire rated (EW120& EI 15), Non Wired Toughened glass of approved brand and manufacturer.</p>

	(EW120), Non Wired Toughened, interlayered glass having a sound reduction of >37dB, LT of 86% and compliant to class 2(B)2 category of Impact Resistance as per EN 12600 standard from Saint Gobain.	
	All doors and frames shall be finished with Powder coating in desired Shades. Rate should include supply and installation of door and hardware as per application. Note: All Hardware's should have a minimum 02 Years of manufacturer warrantee from the date of supply.	All doors and frames shall be finished with Powder coating in desired Shades. Rate should include supply and installation of door and hardware as per application. Note: All Hardware's should have a minimum 01 Year of manufacturer warrantee from the date of supply.
	Recommended fire door should have been tested earlier of similar design at CBRI for maximum rating of 2hrs tested with vision panel of minimum 0.1 Sqmtr per shutter as requirement & application. Individual Test certificates should also be available for glass used in vision lites confirming the required fire ratings /panels being a part of the fire door assembly. Doors should be finished in Thermosetting Powder Coating desired RAL Shades. Manufacturer test certificate shall cover doors both single & double leaf doors and Hardware should pass European certificate "CE" of conformity / UL with required fire ratings. Any deviation in specification and sheet thickness other than what is mentioned in the test certificates are not allowed. Proper label confirming the type of door and the hourly rating is mandatory. The manufacturer should be compliant to ISO 9001: 2008 and CE certified, manufacturer should be covered under IGBC scheme. Approved manufacturer subject to Engineer approval. And should be ISO Certified company.	Recommended fire door should have been tested of similar design at CBRI for maximum rating of 2hrs tested with vision panel of minimum 0.1 Sqmtr per shutter as requirement & application. Individual Test certificates should also be available for glass used in vision lites confirming the required fire ratings /panels being a part of the fire door assembly. Doors should be finished in Thermosetting Powder Coating desired RAL Shades. Manufacturer test certificate shall cover doors both single & double leaf doors and hardwares with required fire rating. Proper label confirming the type of door and the hourly rating is mandatory.
5.16	Supply & fixing of 120 min. fire rated approved Make 46mm thick steel fire rated Glazed Fire door single swing , Single or Double Leaf type of 120 minutes fire rating duly tested and	Supply & fixing of 120 min. fire rated approved Make 46mm thick steel fire rated Glazed Fire door single swing , Single or Double Leaf type of 120 minutes fire rating duly tested and

	<p>6certified at CBRI,Roorkee as per BS : 476 Part 20 & 22 & IS 3614 Part 2 - 1992.The Shutter is fabricated with 1.2mm thick galvanized steel sheet with infill of fire rated proprietary insulation filler with lock seam joints at stile edges and internal reinforcement at top, bottom and stile edges for strength for its stability and integrity of the fire door. The door frames are manufactured from 1.6mm thick galvanized steel sheet pressed form to Double rebated profile of section 143x57mm. The shutter is having a profile as Top Rail, Lock Rail and Vertical Styles as 100x46mm and Bottom Rail as 200x46mm, The shutter is provided with GI beading of suitable size made out of 1.2mm thick GI sheet to Fix FR Glass in the shutter. The Shutter is fixed with Shutter with SS Ball Bearing hinges of Size 100x75x3mm (Payable In Extra Item) .A copy of test report for a design test carried out earlier at CBRI, Roorkee will be provided along with MTC. Provisions for fixing all fixtures shall be built in on the doors prior to the supply. The door shutter is provided with Fire rated Glass of 120 min. fire rating. The Glass should be of approved quality 11mm thick Clear, 120 minute Rated (E120) Non Wired, Toughened Glass tested in accordance to BS:476 Part 20 & 22. The Glass should be compliant to Class A Category of Impact Resistance to BS 6206:1981 Safety Glazing Material. The Glass should have a Light Transmission ration of approx. 87% according to EN 410 standards.</p>	<p>certified at CBRI,Roorkee as per BS : 476 Part 20 & 22 & IS 3614 Part 2 - 1992.The Shutter is fabricated with 1.2mm thick galvanized steel sheet with infill of fire rated proprietary insulation filler with lock seam joints at stile edges and internal reinforcement at top, bottom and stile edges for strength for its stability and integrity of the fire door. The door frames are manufactured from 1.6mm thick galvanized steel sheet pressed form to Double rebated profile of section 143x57mm. The shutter is having a profile as Top Rail, Lock Rail and Vertical Styles as 100x46mm and Bottom Rail as 200x46mm, The shutter is provided with GI beading of suitable size made out of 1.2mm thick GI sheet to Fix FR Glass in the shutter. The Shutter is fixed with Shutter with SS Ball Bearing hinges of Size 100x75x3mm. A copy of test report for a design test carried out at CBRI, Roorkee will be provided along with MTC. Provisions for fixing all fixtures shall be built in on the doors prior to the supply. The door shutter is provided with Fire rated Glass of 120 min. fire rating. The Glass should be of approved quality 11mm thick Clear, interlayered, 120 min Rated (E120& EI 15) Non Wired, Toughened Glass tested in accordance to BS:476 Part 20 & 22. The Glass should be compliant to Class A Category of Impact Resistance to BS 6206:1981 Safety Glazing Material.</p>
5.20	<p>Providing & fixing min 10 mm thick clear glass of approved make tested upto 2 hours fire rating and complied with BS 476: Part 22 as vision panel including cost of fire rated ceramic tape and moulding/beading all complete.</p>	<p>Providing & fixing 11 mm thick clear, interlayered glass, 120 min fire rated (EW 120 & EI 15) of approved make tested upto 2 hours fire rating and complied with BS 476: Part 22 as vision panel including cost of fire rated ceramic tape and moulding/beading all complete.</p>

5.32	Providing and fixing of fire rated heavy duty door closer of approved quality for fire door in accordance with BS: 476 Part 22 for fire rating) and BS EN 1154 with minimum one year warranty.	Providing and fixing of fire rated heavy duty door closer of approved quality for fire door of 120mm minimum fire rating with minimum one year warranty.
5.33	Providing and fixing fire rated mortice dead lock tested in accordance with European Standard EN12209 / DIN18251 and 80mm Long cylinder to EN1303 of approved brand and manufacturer having min. 1 year manufacturer's warranty.	Providing and fixing fire rated mortice dead lock and 80mm Long cylinder of approved brand and manufacturer for 120 mm fire rated door having min. 1 year manufacturer's warranty.

MGMS Specification as per HTM 02-01 :

1. Fully Automatic Changeover Control Panel for Oxygen of 1500lpm to 2000lpm Imported:

It should fully complies and meets with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be provided with a copy of the certificate of origin.

Automatic Changeover Manifolds shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. Under this directive, med gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. It should have all regulators which should be adiabatic certified. The manifold control panel shall be designed and certified for use with oxygen at 200 bar and 60°C. Auto-ignition testing shall be carried out and a copy of the test report shall be shall be provided for review. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. Central regulator panel with cylinder headers each side. Headers are complete with gas specific cylinder tailpipes. Pre-wired for alarm connection to BMS outputs. All components degreased for oxygen use. Mild steel powder coated enclosure with Perspex window. The manifold control system shall be powered by an extra low voltage on board supply. The controller shall include normally closed alarm connections and two sets of BMS connections for both normally open and normally closed operation. Line pressure shall be continuously monitored by an electronic pressure switch; mechanically actuated pressure switches are not acceptable. There shall be a manual changeover button to enable selection of the duty bank. 50 W cartridge heaters with thermostat control: N2O and O2/N2O manifolds. Two non-return valves, one for

each bank, shall be provided within a line pressure manifold block and shall provide gas tight isolation of each bank during maintenance and ensure supply continuity in the event of any upstream component failure. In the event of a low line pressure condition, both solenoid valves shall open to enable both banks to deliver gas and restore normal pipeline pressure. A manifold status panel shall be provided with colour coded LED indication lights for the following operating and fault indications:

- Power On (Green)
- High Line Pressure (Red)
- Low Line Pressure (Red)
- Reserve Low (Amber)
- Left Bank Running (Green)
- Left Bank Low (Amber)
- Left Bank Empty (Amber)
- Right Bank Running (Green)
- Right Bank Low (Amber)
- Right Bank Empty (Amber)

The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications:

- Normal (Green)
- Duty Bank Empty (Amber)
- Standby Low (Amber)
- Reserve Bank Low (Amber)
- Pipeline Pressure Fault (Red)
- System Fault (Red)

In the event of a power supply failure, both solenoid valves shall open to enable gas to be supplied from both cylinder banks simultaneously until restoration of the power supply.

2. Medical Vacuum Plant (Vacuum System) Quadruplex/Pentaplex System capacity 115-130 CFM/3256-3681 LPM at 19" Hg 3 Phase 50 Hz (Package Unit) Imported

It should fully comply and meet with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. Under this directive, medical gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. Three

identical vacuum pumps should be working and two stand by.

Comprising of Pentaplex rotary vane vacuum pumps (5 x 11kw 2400kpm each),

2 x 3625lpm each working as duty and 2 x 2400lpm as standby.

4 x 15KW rotary vane vacuum pump base/floor mounted (2400 lpm flow rates of each pump).

3 x 3000 liters capacity vertical vacuum receiver tanks.

79 dBA sound pressure level. 76mm OD pipe work and 42mm is exhaust pipe.

The Medical Vacuum Plant shall be fully tested. A test certificate shall be provided showing the results of the tests, including the free-air flow rate obtained at an inlet vacuum of 450 mmHg. Type testing of plant flows or testing in component form is not acceptable. Vacuum pumps shall be air-cooled, oil lubricated rotary vane type suitable for both continuous and frequent start/stop operation at nominal inlet vacuum levels of between 475 mmHg and 650 mmHg. Rotors shall be driven by directly coupled totally enclosed fan-cooled electric motors. Pump inlets shall include a wire mesh filter and integral non-return valve to prevent oil suck back and pressure increases in the vacuum system. Each vacuum pump shall be provided with an oil mist eliminator delivering a virtually oil-free exhaust. Each pump shall be fitted with anti-vibration pads between the pump foot and mounting frame and an oil level sight glass. A pressure switch shall be included to provide an indication that the pump is operating normally once it has been called into service.

Vacuum Pump Starter Units :Pump starter units shall be provided with Direct-On-Line (DOL) motor starters for nominal motor powers up to 7.5 kW and Star-Delta (Wye-Delta) motor starters for motors above 7.5 kW. Each motor shall be protected by a thermal overload relay. The incoming supply shall terminate at a door interlock isolator. An ammeter shall be fitted to each starter panel indicating the current drawn by the motor. Each pump starter unit shall incorporate a 24V transformer that provides power to the Plant Control Unit such that complete control of the plant is maintained in the event of a single power supply failure. The pump starter unit shall provide LED indication lights for the following operating and fault conditions:

- Mains Supply On (Green)
- Selected (Green)
- Called For (Green)
- Operating (Green)
- Control Circuit Failed (Amber)
- Overload Tripped (Amber)
- Over Temperature, if fitted (Amber)

- Pump Fault (Amber)
- Pump Failed (Amber)

Plant Control Unit :The Plant Control Unit shall incorporate an intuitive menu driven display for access to operational information and service functions. A securely protected engineer's mode shall also be provided that can only be accessed by authorised personnel to modify operational parameters. The Plant Control Unit central control system shall operate at extra low voltage and include BMS connections for plant fault, plant emergency, reserve fault and pressure fault. A mechanical backup pressure switch shall ensure continued system operation in the event of a control system or transducer malfunction. The Plant Control Unit shall incorporate an intuitive menu driven LCD display, providing easy access to system operational information and alarm resets.

The Interface Indicator shall be provided with colour coded LED indication lights for the following operating and fault indications:

- Normal (Green)
- Plant Fault (Amber)
- Plant Emergency (Amber)
- Check Status (Amber)
- Pipeline Pressure Fault (Red)
- System Fault (Red)

Vacuum Vessel(s) : 3 x 3000ltrs Vacuum vessels shall comply with BS 5169:1992 and be manufactured from heavy gauge fusion welded steel with a minimum wall thickness of 5 mm and dished ends with a minimum wall thickness of 6 mm. Total vacuum vessel volume shall be at least 100% of the plant capacity in 1 minute in terms of free air aspired at normal working pressure. Where only a single vessel is supplied it shall be connected to the bacteria filters in parallel with the pumps such that operation of the system can continue during receiver isolation for periodic internal inspection. The vessel shall include a drain valve and a 100 mm nominal diameter vacuum gauge complete with isolating valve.

Bacteria Filters :Quaduplex arrangement of bacteria filters shall be provided, incorporating high efficiency filter elements. Each filter shall be generously sized to carry the full plant design flow capacity with a pressure drop not exceeding 22 mbar (16.5 mmHg). Bacteria Filter elements shall

have penetration levels not exceeding 0.005% when tested by the sodium flame method in accordance with BS 3928:1969 utilising particles in the 0.02 to 2 micron size range. Each filter shall be provided with a differential pressure gauge. A drain flask shall be connected to each filter. Drain flasks shall be manufactured from transparent Pyrex with a polymer coating on the inner and outer surfaces in order to maintain a seal in the event of inadvertent breakage of the Pyrex flask. All drain flasks shall be suitable for sterilisation and be connected via a manual isolating valve.

2.0 Medical Air Plant (Air Compressor) Quadruplex/Pentaplex system capacity 60-70CFM/1700-1980LPM at 115 psi 3 Phase 50 Hz (Package Unit) Imported

It should fully comply and meet with the requirements of the UK DOH Health Technical Memorandum 02-01 (HTM 02-01) standards only. It shall be duly CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. Under this directive, medical gas products are classified as Class IIb Medical Devices. It shall be provided with a copy of the certificate of origin. Medical Air Plant of 11bar for both 4bar MA4 Air supply and SA7 Air supply.

Quadruplex (4 x 22kw SCREW compressors), with duplex drier and filtration,

- 2 x 22KW (2280lpm) each screw air compressor will always be running to produce 7200lpm.
- 2 x 22KW (2280lpm) each screw air compressor will be stand by.
- 4 x 22KW each screw air compressor base frame mounted.
- 3 x 1500 liters capacity vertical air receiver.
- 2 x air dryer.
- 68 dBA sound pressure level.
- 42mm OD pipe work.

Each base frame mounted screw compressor will provide 2280 lpm air flow. EMC certificate copy must be submitted. Compressors shall be directly driven by EFC IP55 energy saving CEMEP Class EFF1 high efficiency electric motor.

Medical Air Plants are intended to provide a continuous supply of medical quality air conforming to the European Pharmacopoeia medicinal air monograph (ref. 1238), for respiratory use in healthcare facilities. The system shall be duplex such that the supply is maintained in single fault condition. Standby compressors shall be provided such that the specified volumetric flow is achieved with either one reserve

compressor on standby where an automatic backup manifold of sufficient capacity is provided, or two compressors not running if the backup manifold is unable to deliver the medical air system design flow. Medical Air Plants shall be supplied fully tested and comply with the United Kingdom Department of Health (DoH) publication HTM 02-01 and NHS Model Engineering Specification C11. The entire Medical Air Plant shall be factory tested. A test certificate shall be provided showing the results of the tests, including the free-air flow rate obtained at normal working pressure. Type testing of plant flows or testing in component form is not acceptable. Penlon Medical Gas Solutions Medical Air Plants are CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (Lloyd's). Under this directive, Medical Air Plants are classified as Class IIb Medical Devices.

Medical Air Compressors

Compressors shall be oil injected rotary screw compressors suitable for both continuous and frequent start/stop operation at a nominal outlet pressure of 1100 kPa (11 bar). Compressors shall be supplied with a block and fin style after cooler with a dedicated quiet running fan to maximise cooling and efficiency. A multistage oil separator capable of achieving 2ppm oil carry over shall be fitted to minimise contamination and maintenance. EFF1 (CEMEP) rated TEFC, IP55 class F electric motors shall be used and incorporate maintenance-free greased for life bearings. Motors with lower efficiency ratings are not acceptable. A mechanical back-up facility shall ensure continued operation in the event of a control system malfunction. The control system shall normally employ automatic rotation of the lead compressor to maximise life and ensure even wear.

Compressor shall be provided with Star-Delta (Wye- Delta) motor starters and each motor shall be protected by a thermal overload relay. The incoming supply shall terminate at a door interlock isolator. An ammeter shall be fitted to each starter panel indicating the current drawn by the motor.

Purification Module

The duplexed filter and dryer module shall incorporate high efficiency oil filters, heatless regenerative desiccant dryers, impregnated activated carbon filters and bacteria filters. Contaminants in the delivered air downstream of the bacteria filters. Each dryer tower shall have the water concentration in the delivered air continuously monitored by a dedicated sensor providing an alarm indication for high dew point on the respective dryer as backup to the alarm provided by the hygrometer with digital display. The outlet air pressure shall be regulated through a duplex arrangement of non-relieving pressure regulators and protected from over-pressure by duplex pressure safety valves. The output of the both dryers shall be joined to a common pipe prior to entering the pressure regulators to allow either pressure regulator to be used with either dryer.

Plant Control Unit

The central control system shall provide an intelligent human machine interface incorporating on board flash memory and real-time clock for recording operational parameters in the in-built event log. The central control system shall operate at low voltage and include BMS connection for plant fault, plant emergency, reserve fault and pressure fault. Visualisation of plant inputs, outputs and status through a web browser, using a simple Ethernet connection shall be available. The central control unit shall incorporate a user friendly 5.7" high-definition colour display with clear pictograms and LED indicators, providing easy access to system operational information.

Digital Dew Point Display

The purification module shall incorporate a ceramic dew point hygrometer with an accuracy of $\pm 1^\circ\text{C}$ in the range -20 to -80°C atmospheric dew point and 4-20 mA analogue output. Aluminium oxide or palladium wire sensors are not acceptable. An alarm condition shall trigger on the dryer control panel if the dew point exceeds a -46°C atmospheric (67 ppm v/v) set point. Volt-free contacts shall be included to enable the dew point alarm signal (Plant Emergency) to be connected to a central medical gas alarm system and/or building management system (BMS).

Air Receiver(s)

Air receivers shall comply with BS EN 286-1;+A2 2005 and be manufactured from heavy gauge fusion welded steel with a minimum wall thickness of 5 mm and dished ends with a minimum wall thickness of 6 mm. Total air receiver volume shall be at least 50% of the plant capacity in 1 minute in terms of free air delivered at normal working pressure. Air receiver shall be connected to the dryer in parallel such that operation of the system can continue during receiver isolation for periodic internal inspection. The receiver assembly shall be fitted with a pressure safety valve set at 11 bar. The receiver shall be further protected by a fusible plug and include a 100 mm nominal diameter pressure gauge complete with isolating valve.

Each air receiver shall be fitted with an electrically actuated drain valve with integral solid-state timer providing user adjustable opening time and actuation frequency. The valve shall be fitted with a manual test button and LED indication lights to show operating status. The drain shall be protected from blockage by debris with a strainer. Float type mechanically actuated drain valves are not acceptable. Drain valves to be connected locally to a single phase supply.

*All other technical features of tender document for MGMS will remain unchanged

ANNEXURE – II

Form-M

UNDERTAKING

We M/s _____ indemnify HSCC/AIIMS/Employer/Client, as the case may be, against all penal action that may be levied/effectuated by any concerned authority for default in any labour regulation/PF/ESI and other statutory requirements of the relevant Acts/Laws related to the work of the contractor and will bear the legal charges, if any, and will pay the legal charges/dues directly to the concerned authority..

(Signature of Applicant)