

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

e-TENDER

FOR

**Supply, Installation, Testing & Commissioning of Medical Gas
Manifold System for Surgical Block at All India Institute of
Medical Sciences, New Delhi**

**VOLUME-I
PREQUALIFICATION DOCUMENT**

DECEMBER 2015



HSCC (INDIA) LTD.
(CONSULTANTS & ENGINEERS FOR MEGA HOSPITALS & LABORATORIES)
E-6(A), Sector-1, NOIDA (U.P) 201301 (India)
Phone : 0120-2542436-40 Fax : 0120-2542447
Tender No. HSCC/SES/MGMS/Surgical/AIIMS/2015

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

NOTICE INVITING e-Tender

Dated 28.12.2015

Online Bids are invited on behalf of Director-AIIMS from eligible contractors/firms for the following works:

Tender No.	Name & description of work	Completion period of work (in months)	Estimated cost (in Rs.)	Bid Security (in Rs.)	Last date to fill/upload the tender through e-tendering
HSCC/SES/MGMS/Surgical/AIIMS/2015	Supply, Installation, Testing & Commissioning of Medical Gas Manifold System at Surgical Block , AIIMS, New Delhi	6 calendar months	621.90 Lakhs	12,43,800/-	22.01.2016 up to 14.30 hrs. & opening at 15.00 hrs.
HSCC/SES/CSSD/Surgical/AIIMS/2015	Supply, Installation, Testing & Commissioning of CSSD at Surgical Block , AIIMS, New Delhi	5 calendar months	491.400 Lakhs	9,82,800/-	22.01.2016 up to 14.30 hrs. & opening at 15.00 hrs.
HSCC/SES/IOT/Surgical/AIIMS/2015	Supply, Installation, Testing & Commissioning of Integration and Data Management System for OT at Surgical Block, AIIMS, New Delhi	5 calendar months	925.20 Lakhs	18,50,400/-	22.01.2016 up to 14.30 hrs. & opening at 15.00 hrs.
HSCC/SES/PTTS/Surgical/AIIMS/2015	Supply, Installation, Testing & Commissioning of Pneumatic Tube Transport System at Surgical Block , AIIMS, New Delhi	4 calendar months	180.00 Lakhs	3,60,000/-	22.01.2016 up to 14.30 hrs. & opening at 15.00 hrs.
HSCC/SES/MOT/Surgical/AIIMS/2015	Supply, Installation, Testing & Commissioning of Modular Operation Theatres & Minor Operation Theatres at Surgical Block , AIIMS, New Delhi	6 calendar months	964.80 Lakhs	19,29,600/-	22.01.2016 up to 14.30 hrs. & opening at 15.00 hrs.

The bid document is available online from 01.01.2016. For submission & other tender details, please refer detailed NIT on HSCC e-tender portal <http://www.tenderwizard.com/HSCC>.

AIIMS /HSCC reserves the right to accept or reject any application without assigning any reason or incurring any liability whatsoever.

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.

Chief General Manager, HSCC (I) Ltd.
For & on behalf of Director (AIIMS), New Delhi

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

HSCC/SES/MGMS/Surgical/AIIMS/2015

Dated 28.12.2015

Detailed tender information

Online Bids are invited on behalf of Director-AIIMS from eligible contractors/firms for the following works:

Name & description of work	Completion period of work (in months)	Estimated cost (in Rs.)	Bid Security (in Rs.)	Last date to fill/upload the tender through e-tendering	Opening date and time through e-Tendering
Supply, Installation, Testing & Commissioning of Medical Gas Manifold System for Surgical Block at All India Institute of Medical Sciences (AIIMS), New Delhi.	6 (Six)	621.90 Lakhs	12,43,800/-	Up to 14.30 Hrs on 22.01.2016	At 15:00 Hrs on 22.01.2016

The bidder would be required to register at HSCC e-tender portal <http://www.tenderwizard.com/HSCC>. The bid document is available online from 01.01.2016. For submission of the bids, the bidder is required to have Digital Signature Certificate (DSC) from one of the authorized Certifying Authorities. The bidders are required to submit (a) Original non refundable Demand Draft of Rs.3,000/- (Rs. Three Thousand only) as cost of tender document , in favour of “ *HSCC India Limited* “ payable at Noida/Delhi (b) Original bid security in Performa for bid security bank guarantee, as per Annexure –C of Vol.- III (SCC) /Original DD in favour of HSCC (I) Ltd. to the office of Chief General Manager , HSCC (India) Ltd., Plot no. E-6(A), Sector-1, Noida (U.P.) Pin201301, before date and time fixed for opening of bid either by registered post or by hand failing which the bid will be declared non-responsive.

Complete set of Tender Documents comprising Volume- I, II, III, IV & V has been made available at e-tender portal <http://www.tenderwizard.com/HSCC>.

Interested applicant contractors/firms may like to attend the pre bid meeting which will be held at 15:00 hrs at Corporate Office of HSCC (India) Ltd on 08.01.2016.

AIIMS/HSCC reserves the right to accept or reject any application without assigning any reason or incurring any liability whatsoever.

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.

Chief General Manager , HSCC (I) Ltd.
For & on behalf of Director (AIIMS), New Delhi

DISCLAIMER

This document has been prepared by HSCC, on behalf of Director, All India Institute of Medical Sciences (AIIMS), New Delhi. The information is provided to prospective Bidders, who are interested to Bid for Supply, Installation, Testing & Commissioning of Medical Gas Manifold System for Surgical Block at All India Institute of Medical Sciences, New Delhi. This document is neither an agreement, nor an offer or invitation to perform work of any kind to any party. The purpose of this document is to provide interested parties with information to assist the preparation of their Bid. While HSCC have taken due care in the preparation of the information contained herein, and believe it to be complete and accurate, neither any of their authorities or agencies nor any of their respective officers, employees, agents or advisors give any warranty or make any representations, expressed or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it. Further AIIMS/HSCC do not claim that the information is exhaustive. Respondents to this document are required to make their own inquiry/ survey and will be required to confirm, in writing, that they have done so and they did not rely solely on the information given herein. AIIMS reserves the right not to proceed with the Project or to change the configuration of the Project, to alter the timetable reflected in this document or to change the process or procedure to be applied. It also reserves the right to decline to discuss the Project further with any respondent. No reimbursement of cost of any type or on any account will be made to persons or entities submitting their Bid.

INSTRUCTION TO APPLICANTS

PROJECT NAME : Supply, Installation, Testing & Commissioning of Medical Gas Manifold System for Surgical Block at All India Institute of Medical Sciences, New Delhi.

EMPLOYER/ : Director, All India Institute of Medical Sciences, New Delhi

1. Scope of Bid :

1.1 All India Institute of Medical Sciences, New Delhi through HSCC (I) Ltd. (the Consultant) invites online e-tenders for the above works detailed as under:

1.2 Brief Details :

ESTIMATED COST : Rs . 621.90 Lakhs

COMPLETION PERIOD : 6 (Six) months from the Consultant Order to commence to work.

1.3 Tendering is open to all the agencies / firms having sound background and specialization in carrying out similar works.

2.0 PRE-QUALIFICATION CRITERIA:

2.1 Pre-Qualification will be based on meeting all the minimum criteria for pre-qualification and other qualification criteria regarding the Applicant's work experience, personnel and equipment capabilities and financial position as demonstrated by the Applicant's responses in the forms attached to the Letter of Application.

2.2 The Applicant should meet the following minimum criteria for Pre-Qualification :

(i) Average annual financial turnover during the last three consecutive financial years [2012-2013, 2013-2014, 2014-2015] should be at least 30% of the estimated cost.

(ii) Experience of having successfully completed similar work during last 7 years ending last day of month previous to the one in which tenders are invited should be either of the following :

Three similar* completed works costing not less than the amount equal to 40% of the estimated cost.

or

Two similar* completed works costing not less than the amount equal to 50% of the estimated cost.

or

One similar* completed work costing not less than the amount equal to 80% of the estimated cost.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of receipt of application for tender.

One completed work of any nature (either part of 2.2,(ii) or separate one costing not less than the amount equal to 40% to the estimated cost with some Central/State Government organisation/Central Autonomous body/Central Public Sector Undertaking.

***Similar nature of works means supply, installation, testing & commissioning of Medical Gas Manifold System.**

A Certificate from client for completion of work(s) must be submitted along with application. Own works/ Certification of agencies shall not be considered for prequalification.

- (iii) A solvency certificate from Applicant's bank (Nationalized/ Scheduled) that Applicant is solvent for the sum of 40% of the estimated cost.
- (iv) The Company should have positive Net Worth and should not have incurred loss in more than Two years in last Five years ending 31st March 2015 duly certified by the Chartered Account.

3.0 PERSONNEL, EQUIPMENT AND FINANCIAL CAPABILITIES

- 3.1 **Personnel Capabilities:** The firm should have suitable qualified and experienced personnel for the successful completion of the works. List of employees and bio-data of key officials shall be submitted stating clearly how these would be involved in this work. (Fill enclosed ANNEXURE – I).
- 3.2 **Equipment Capabilities:** The Applicant should submit the list of equipments for successful completion of project. (Fill enclosed ANNEXURE -II).
- 3.3 **Financial Capabilities:** The Audited Balance Sheets for the last five financial years (2010-2011, 2011-2012, 2012-2013, 2013-2014 & 2014-2015) should be submitted and must demonstrate the soundness of the Applicant's financial position showing positive net worth and net profit see ANNEXURE-III). Where necessary, the Consultant (HSCC) on behalf of Employer will make inquiries with the Applicant's bankers (Applicant to fill enclosed ANNEXURE-III).

4.0 EXPERIENCE OF EXECUTING OF PROJECTS OF SIMILAR NATURE & COMPLEXITY

The applicant shall submit information about their past experience in executing projects of similar nature and complexity with information about magnitude of the Projects, Type of Projects, Completion Certificate from Client, Time Overrun if any, Cost over run if any , (Fill enclosed ANNEXURE-IV).

5.0 OTHER INFORMATION TO BE SUBMITTED ALONGWITH TENDER

- 5.1 **Registration/ Licence:** The firm should have Works Contract Tax/VAT Registration with the appropriate Authorities. In case the firm is not registered at the time of submission of bid, a declaration should be submitted by the firm that they will get themselves registered with the concerned authorities in case they are awarded the work
- 5.2 The firm should submit in original an affidavit duly notarized that they have not abandoned & blacklisted of any work of Union Government/ State Governments/ PSU's etc. during the last 5 years.

- 5.3. The applicant should provide information regarding litigation/ Arbitration cases for the last five years as per ANNEXURE- V.
- 5.4 The applicant shall submit the supporting documents regarding the information given in the ANNEXURE-I to ANNEXURE-VI.
- 5.5 Power of attorney of the signatory of the bid to commit the bidder.
- 5.6 The contractor will indemnify HSCC/ AIIMS /Principle employer/client, as the case may be, against all penal action that may be levied/effected 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.
- 6.0** Even though the Applicants meet the above criteria, they are subject to be disqualified, if they have:
- made misleading or false representation in the form, statement and attachments submitted; /or.
 - record of poor performance such as abandoning the work, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures, etc. /or
 - The performance of any agency already worked/ working with HSCC is not found satisfactory./or
 - found to have been black listed in any of the works.
- 7.0** The applicants are advised to visit the site to get first hand information as regards its approach, accessibility, working conditions, site conditions, availability of labour and material etc. and other matters affecting cost and work. All costs incurred in connection with submission of the tender shall be borne by the applicant irrespective of the outcome.
- 8.0** If any information furnished by the applicant is found incorrect at a later stage, applicant shall be liable to be debarred from tendering in HSCC. The department reserves the right to verify the particulars furnished by the applicant independently.
- 9.0** Even though the agency meets all the criteria, the Employer / Consultant reserves the right to accept or reject any applicant/disqualify any agency without assigning any reason whatsoever.

10.0 UPDATING QUALIFICATION INFORMATION

- 10.1 Applicants shall be required to update the financial information used for Pre-Qualification as and when asked for, to confirm their continued compliance with the pre-qualification criteria and verification of information provided.

11.0 SUBMISSION OF APPLICATION:

- 11.1 Application for Pre-Qualification must be submitted on line before designated date & time as per Annexure-VII on HSCC e-tender portal <http://www.tenderwizard.com/HSCC>.

12.0 GENERAL

- 12.1 Only agencies / firms who meet the pre-qualification criteria shall be considered for further evaluation.

- 12.2 If a firm submit more than one bid all bids of the party will be rejected.
- 12.3 The Employer / Consultant reserves the right to :
- (a) Reject or accept any application without assigning any reason or incurring any liability thereof
 - (b) Cancel the tendering process and reject all applications/tenders
 - (c) Split the works into different packages if required
 - (d) Amend the scope and value of any contract under this project, in such event the bids will only be called from those pre-qualified applicants who meet the requirements of the contract as amended.
- 12.4 Joint venture companies shall not be allowed to participate in the bid.
- 12.5 No correspondence either from successful / pre-qualified applicant or unsuccessful applicant will be entertained in this regard.
- 12.6 Check list format attached at Annexure VII must be filled and enclosed online along with the supporting documents in your application.

**Chief General Manager
On Behalf of Director (AIIMS)**

LETTER OF APPLICATION

[NOTE : On the letterhead paper of the applicant including full postal address, telephone no., fax no., telex no. and cable address]

Date: _____

HSCC(I) Ltd.
Plot No. 6(A), Block(E), Sector-I
NOIDA, U.P.-201301

Sirs,

1. Being duly authorised to represent and act on behalf of (hereinafter referred to as “the Applicant”) and having reviewed and fully understood all the pre-qualification information provided, the undersigned hereby apply to be pre-qualified by yourselves as a bidder for the

Supply, Installation, Testing & Commissioning of Medical Gas Manifold System and its maintenance during the Defect Liability period for Surgical Block at All India Institute of Medical Sciences, New Delhi.

Pre-Qualification Number	Client Name
HSCC/SES/Surgical/MGMS/AIIMS/2015	<i>AIIMS, New Delhi</i>

2. Attached to this letter are copies or original documents defining:
- (a) the applicants legal status
 - (b) the principal place of business
 - (c) the place of incorporation (for applicants who are corporations) or the place of registration and the nationality of the owners (for applicants who are partnerships or individually owned firms)
 - (d) application form no. 1 to 6
3. Your agency and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents and information submitted in connection with this application, and to seek clarification from our bankers and clients regarding any financial and technical aspects. This letter of application will also serve as authorization or any individual or authorized representative or any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in this application, or with regard to the resources, experience, and competence of the Applicant.
4. Your agency and its authorized representatives may contact the following persons for further information:

General, Personnel, Technical and Financial Enquiries

Contact 1 :	Telephone 1 :
Contact 2 :	Telephone 2 :

5. This application is made in the full understanding that :

(a) Bids submitted by applicants will be subject to verification of all information submitted at the time of bidding

(b) Your agency reserves the right to :

- amend the scope and value of the contract / bid under this project ; in such event, bids will only be called from pre-qualified bidders who meet the revised requirements ; and

- reject or accept any application, cancel the pre-qualification process, and reject all applications without assigning reasons or incurring any liability thereof ; and

(c) Your agency shall not be liable for any such actions and shall be under no obligation to inform the Applicant

6. The undersigned declare that statements made and the information provided in the duly completed application are , true and correct in every detail.

Sealed & Signed
Name
For and on behalf of

APPLICATION FORM NO. 1

GENERAL INFORMATION

All individual firms applying for pre- qualification are requested to complete the information in this form. Information to be provided for all owners or APPLICANTS who are partnerships or individually-owned firms.

1.	Name of firm
2	Head office address
3	Telephone Contact
4	Fax E-mail No.
5	Place of incorporation/ Year of incorporation/ registration Registration

Authorized Signatory of bidder

APPLICATION FORM NO. 2

STRUCTURE AND ORGANIZATION

1. Name & address of the applicant
2. Telephone No. / Telex No. / Fax No.
3. Legal status of the applicant (attach copies of original document defining the legal status)
 - (a) An individual
 - (b) A proprietor firm
 - (c) A firm in partnership
 - (d) A Limited Company or Corporation.
4. Particulars of registration with various Government bodies (attach attested photocopy)

Organisation /Place of registration	Registration No.
-------------------------------------	------------------
5. Name and Titles of Directors & Officers with designation to be concerned with this work.
6. Designation of individuals authorised to act for the organisation
7. Was the applicant ever required to suspend the work for a period of more than six months continuously after you commenced the work? If so, give the name of the project and reasons of suspension of work.
8. Has the applicant ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.
9. Has the applicant ever been debarred / black listed for tendering in any organisation at any time? If so, give details.
10. Has the applicant ever been convicted by a court of law? If so, give details.
11. Any other information considered necessary but not included above.

Authorized Signatory of bidder

APPLICATION FORM NO. 3

ANNEXURE - I

PERSONNEL CAPABILITIES

Sl. No.	Designation	Total Number	Number available for this work	Name	Qualification	Professional experience	Remarks

Authorized Signatory of bidder

APPLICATION FORM NO. 4

ANNEXURE - II

EQUIPMENT CAPABILITIES

Sl. No.	Name of Equipment	Nos.	Capacity or Type	Age	Condition	Remarks

Authorized Signatory of bidder

APPLICATION FORM NO. 5**ANNEXURE - III****FINANCIAL CAPABILITIES****(Rs. In lacs)**

Financial Year	Annual Turn Over in Indian Rupees (or equivalent to Indian Rupees) as per Audited Balance Sheet
2012-2013	Rs.
2013-2014	Rs.
2014-2015	Rs.
Average Annual Turnover over the past three years	Rs.

Financial Information in Rs. Equivalent	For year 2010-2011	For year 2011-2012	For year 2012-2013	For year 2013-2014	For year 2014-2015
1. Total Assets					
2. Current Assets					
3. Total Liabilities					
4. Current Liabilities					
5. Profit before Tax					
6. Profit after Tax					
7. Net Worth					

NOTE : The above data is to be supported by audited balance sheets

1. Attach copies of audited balance sheets for all five years (2010-2011, 2011-2012, 2012-2013, 2013-2014 & 2014-2015).
2. Attach recent solvency certificate from bankers.
3. Indicate financial arrangements for carrying out the proposed work.

Authorized Signatory of bidder

APPLICATION FORM NO. 6

ANNEXURE - IV

EXPERIENCE OF COMPLETION OF PROJECTS OF SIMILAR NATURE & COMPLEXITY

(During last seven years ending last day of month previous to the one in which applications are invited)

Sl. No.	Name of work / project and location	Owner or sponsoring organization	Cost of work in Lakhs	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Name and address/ telephone number of officer to whom reference may be made	Remarks

NOTE : Please attach supporting documents (completion certificates along with order copies) for the above information

Authorized Signatory of bidder

APPLICATION FORM NO. 7

ANNEXURE - V

Litigation Details
Court Cases/arbitration

Name of Bidder

Year	Name of the work	Name of the Client, with Address	Title of the court Case/Arbitration	Detail of the Court/ Arbitrator	Status Pending / Decided	Disputed Amount (Current Value, the equivalent) in case of Court Cases/arbitration	Actual Awarded Amount (Rs) in decided Court Cases/arbitration

Authorized Signatory of bidder

Annexure - VI

Technical Compliance: This information to be filled in as per the following format by all the bidders for each equipment bid by them and duly signed and to be submitted along with the techno-commercial bid:

Item Ref. (1)	Tender Specifications (2)	Compliance of parameter/ specification (3)	Non-Compliance of parameter/ specification (4)	Remarks for Sr. No.(4) (5)

The information given above is factual & based on product specification details as per the latest catalogues/ product data sheets and technical literature enclosed.

Signature of the bidder & seal:

CHECK - LIST**CHECK LIST OF DOCUMENTS TO BE SUBMITTED WITH THE BID****TECHNICAL PACKAGE - Part I**

S.No	Name of Document	Reference Volume of Tender	Mode of Submission	Page No.
1.	Original Non-refundable Demand Draft of Rs. 3,000/- (Tender Fee)	Vol.- I	In Original & Copy Online	
2.	Original Bid Security - in Performa for bid security bank guarantee, as per Annexure –C of Vol.- III (SCC)/Original DD in favour of HSCC (I) Ltd	Vol.- II	In Original & Copy Online	

TECHNICAL PACKAGE - Part II

S.No	Name of Document	Reference Volume of Tender	Mode of Submission	Page No.
1.	Checklist for the enclosed documents as per the format attached (Annexure VII)	Vol.- I	Online	
2.	Letter of Application as per the format attached	Vol.- I	Online	
3.	General Information Details as per the format attached (Form No.- 1)	Vol.- I	Online	
4.	Structure & Organization Details as per the format attached (Form No.- 2)	Vol.- I	Online	
5.	Personal Capabilities as per the format attached (Annexure – I) and as per clause 3.1	Vol.- I	Online	
6.	Equipment Capabilities as per the format attached (Annexure – II) and as per clause 3.2	Vol.- I	Online	
7.	Financial Capabilities as per the format attached (Annexure -III) and as per clause 3.3	Vol.- I	Online	
8.	Minimum Solvency Certificate as per Clause no. 2.2 (iii)	Vol.- I	Online	
9.	Experience of executing of Projects of Similar Nature & Complexity (Annexure –IV) and as per clause 2.2 (ii) & 4.0.	Vol.- I	Online	
10.	Affidavit – duly notarized as per Clause no. 5.2	Vol.- I	Online	
11.	Litigation History/ Arbitration History (Annexure - V)	Vol.- I	Online	
12.	Power of Attorney of the signatory of the bid as per clause 5.5	Vol.- I	Online	
13.	Copies of Works Contract Tax/VAT Registration or undertaking in this regard as per Clause no. 5.1	Vol.- I	Online	
14.	Indemnification to AIIMS/ HSCC - as per Clause no. 5.6	Vol.- I	Online	
15.	Item wise Technical Compliance Statement wrt. Technical Specification as per Vol-I(Annex-VI)	Vol.- I	Online	
16.	Detailed Programme in terms of PERT/ CPM - as per clause 2.0 Vol.-III (SCC)	Vol.- II	Online	
17.	Manufacturer's Authorization Form (List of Forms), Vol-III (SCC)	Vol.-II	Online	
18.	Bid documents, as listed in Notice Inviting Bids excluding the Bill of Quantities (Volume – V) but including All amendment(s)/addendum(s)/ Corrigendum(s) /Clarification(s) issued, if any duly authenticated by digital signature	Vol.- I , II,III & IV	Online	

FINANCIAL PACKAGE COMPRISING OF:

S.No	Name of Document	Reference Volume of Tender	Mode of Submission	Page No.
1.	Financial bid (Bill of Quantities – Volume- V)	Vol.- V	Online	

Note:- All documents as above to be submitted on line. In addition (a) Original non refundable Demand Draft of Rs.3,000/- (Rs. Three Thousand only) as cost of bid document , in favour of “ HSCC India Limited “ payable at Noida/Delhi (b) Original bid security in Performa for bid security bank guarantee, as per Annexure –C of Vol.- III (SCC) or Original DD in favour of HSCC (I) Ltd. to the office of Chief General Manager , HSCC (India) Ltd., Plot no. E-6(A), Sector-1, Noida (U.P.) Pin- 201301, before date and time fixed for opening of bid either by registered post or by hand failing which the bid will be declared non-responsive.

END OF VOLUME - I

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

E-Tender

for

**Supply, Installation, Testing & Commissioning of Medical Gas
Manifold System for Surgical Block at All India Institute of Medical
Sciences (AIIMS), New Delhi.**

VOLUME – II

GENERAL CONDITIONS OF CONTRACT

DECEMBER 2015



(Consultants & Engineers for Mega Hospitals & Laboratories)
E - 6 (A), Sector - I, NOIDA (U.P.) - 201 301 (INDIA)

PHONE : 0120-2542436, 2542437

FAX : 0120-2542447

E- mail : www.hsccltd.co.in

Tender No. HSCC/SES/MGMS/Surgical/AIIMS/2015

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GENERAL CONDITIONS OF CONTRACT

Definitions and Interpretation

1.1 Definitions

In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

- (a)
 - i. "Employer/Principal Employer" means the persons named as such in Volume - II of these Conditions and the legal successors in title to such person, but not (except with the consent of the Contractor) any assignee of such person.
 - ii. "Consultant" means the HSCC (India) Ltd. known as Chairman-Cum- Managing Director, HSCC(India) Ltd, and his successors in office and assignees acting for and on behalf of the employer.
 - iii. "Engineer" means the person appointed by HSCC to act as Engineer for the purposes of the contract and named as such in Part II of these Conditions.
 - iv. "Engineer's Representative" means a person appointed from time to time by the Engineer under Sub-Clause 2.2.
 - v. "Contractor" means an individual or firms (proprietary or partnership) whether incorporated or not, that has entered into contract (with the employer) and shall include his / its heirs, legal representatives, successors and assigns, successors in interest of individuals or persons. Composing such firms or successors of such firms or the permitted assigns of such individual or firms. Changes in the constitution of the firm, if any shall be immediately notified to the employer, in writing and approval obtained for continued performance of the contract.
 - vi. "Subcontractor" means any person named in the Contract as a Subcontractor for a part of the Works or any person to whom a part of the Works has been subcontracted by the contractor with the consent of the Engineer and the legal successors in title to such person, but not any assignee of any such person.
- (b)
 - i. "Contract" means these conditions (Volume I and II), the Specification, the Drawings, the Bill of Quantities, the Tender, the Letter of Acceptance, the Contract Agreement (if completed) and such further documents as may be expressly incorporated in the

Letter of Acceptance or Contract Agreement (if completed).

- ii. "Specification" means the specification of the Works included in the Contract and any modification thereof or addition thereto made under Clause 51.1 & 51.2 or submitted by the Contractor and approved by the Engineer.
 - iii. "Drawings" means all drawings, calculations and technical information of a like nature provided by the Engineer to the Contractor under the Contract and all drawings, calculations, samples, patterns, models, operation and maintenance manuals and other technical information of a like nature submitted by the Contractor and approved by the Engineer.
 - iv. "Bill of Quantities" means the priced and completed bill of quantities forming part of the Tender.
 - v. "Tender" means the Contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance. The word Tender is synonymous with "Bid" and the words "Tender Documents" with "Bidding Documents".
 - vi. "Letter of Acceptance" means the formal acceptance by the HSCC of the Tender.
 - vii. "Contract Agreement" means the contract agreement (if any) referred to in Sub-Clause 9.1.
 - viii. "Appendix to Tender" means the appendix comprised in the form of Tender annexed to these Conditions.
- (c)
- i. "Commencement Date" means the date upon which the Contractor receives the notice to commence the works as issued by the Engineer pursuant to Clause 41.1.
 - ii. "Time for Completion" means the time for completing the execution of and passing the Tests on Completion of the Works or any Section or part thereof as stated in the Contract (or as extended under Clause 44.1, 44.2 & 44.3) calculated from the Commencement Date.
- (d)
- i. "Tests on Completion" means the tests specified in the Contract or otherwise agreed by the Engineer and the Contractor which are to be made by the Contractor before the Works or any Section or part thereof are taken over by the employer.

- ii. "Taking-Over Certificate" means a certificate issued pursuant to Clause 48.1 to 48.4.
- (e) i. "Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract.
- ii. "Retention Money" means the aggregate of all monies retained by the Employer pursuant to Sub-Clause 60.1 (h) or 60.5.
- (f) i. "Works" means the Permanent Works and the Temporary Works or either of them to be executed in accordance with the contract .
- ii. "Permanent Works" means the permanent works to be executed (including Plant) in accordance with the Contract.
- iii. "Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required in or about the execution and completion of the Works and the remedying of any defects therein.
- iv. "Plant" means machinery, apparatus and the like intended to form or forming part of the Permanent Works.
- v. "Contractor's Equipment" means all appliances and things of whatsoever nature (other than Temporary Works) required for the execution and completion of the Works and the remedying of any defects therein, but does not include Plant, materials or other things intended to form or forming part of the Permanent Works.
- vi. "Section" means a part of the Works specifically identified in the Contract as a Section.
- vii. "Site" means the places provided by the Employer where the Works are to be executed and any other places as may be specifically designated in the Contract as forming part of the Site.
- (g) i. "Cost" means all expenditure properly incurred or to be incurred, whether on or off the Site, including over head and other charges properly allowable there but does not include any allowance for profit.
- ii. "Day" means calendar day.
- iii. "Foreign Currency" means a currency of a country other than that in which the Works are to be located.
- iv. "Writing" means any hand-written, type-written, or printed communication, including telex, cable and facsimile transmission.

1.2 Heading and Marginal Notes

The headings and marginal notes in these Conditions shall not be deemed part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.

1.3 Interpretation

Words importing persons or parties shall include firms and corporations and any organisation having legal capacity.

1.4 Singular and Plural

Words importing the singular only also include the plural and vice versa where the context requires.

1.5 Notices, Consents, Approvals, Certificates and Determinations.

Wherever in the Contract provision is made for the giving or issue of any notice, consent, approval, certificate or determination by any person, unless otherwise specified such notice, consent, approval, certificate or determination shall be in writing and the words "notify", "certify" or "determine" shall be construed accordingly.

ENGINEER AND ENGINEER'S REPRESENTATIVE

2.1 Engineer's Duties and Authority

- (a) The Engineer shall carry out the duties specified in the Contract.
- (b) The Engineer may exercise the authority specified in or necessarily to be implied from the Contract, provided, however, that if the Engineer is required, under the terms of his appointment by the Employer, to obtain the specific approval of the Employer before exercising any such authority particulars of such requirement shall be set out in part II of these Conditions. Provided further that any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Engineer.

2.2 Engineer's Representative

- (a) The Engineer's Representative shall be appointed by and be responsible to the Engineer and shall carry out such duties and exercise such authority as may be delegated to him by the Engineer under Sub-Clause 2.2 (b).

Engineer's Authority to Delegate

- (b) The Engineer may from time to time delegate to the Engineer's Representative any of the duties and authorities vested in the Engineer and he may at any time revoke such delegation. Any such delegation or revocation shall be in writing and shall not take effect until a copy thereof has been delivered to the Contractor.

2.3 Communication Given by Engineer's Representative

Any communication given by the Engineer's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been given by the Engineer. Provided that :

- (a) any failure of the Engineer's Representative to disapprove any work, materials or Plant shall not prejudice the authority of the Engineer to disapprove such work, materials or Plant and to give instructions for the rectification thereof;
- (b) if the Contractor questions any communications of the Engineer's Representative he may refer the matter to the Engineer who shall confirm, reverse or vary the contents of such communication.

2.4 Appointment of Assistants

The Engineer or the Engineer's Representative may appoint any number of persons to assist the Engineer's Representative in the carrying out of his duties under Sub-Clause 2.2. He shall notify to the Contractor the names, duties and scope of authority of such persons. Such assistants shall have no authority to issue any instructions to the Contractor save in so far as such instructions may be necessary to enable them to carry out their duties and to secure their acceptance of materials, Plant or workmanship as being in accordance with the Contract, and any instructions given by any of them for those purposes shall be deemed to have been by the Engineer's Representative.

2.5 Instructions in Writing

Instructions given by the Engineer shall be in writing, provided that if for any reason the Engineer considers it necessary to give any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such

oral instruction given by the Engineer, whether before or after carrying out of the instruction shall be deemed to be an instruction, within the meaning of this Sub-Clause. Provided further that if the Contractor, within 7 days, confirms in writing to the Engineer any oral instruction of the Engineer and such confirmation is not contradicted in writing within 7 days by the Engineer, it shall be deemed to be an instruction of the Engineer.

The provisions of this Sub-Clause shall equally apply to instructions given by the Engineer's Representative and any assistants of the Engineer or the Engineer's Representative appointed pursuant to Sub-Clause 2.4.

2.6 Engineer to Act Impartiality

Wherever, under the Contract, the Engineer is required to exercise his discretion by :

- (a) giving his decision, opinion or consent, or
- (b) expressing his satisfaction or approval, or
- (c) determining value, or
- (d) otherwise taking action which may affect the rights and obligations of the Employer or the Contractor he shall exercise such discretion impartially within the terms of the Contract and having regard to all the circumstances. Any such decision, opinion, consent, expression of satisfaction, or approval, determination of value or action may be opened up, reviewed or revised as provided in Clause 67.1 to 67.4.

ASSIGNMENT AND SUBCONTRACTING

3.1 Assignment of Contract

The Contractor shall not, without the prior consent of the Consultant (which consent, shall be at the sole discretion of the Consultant), assign the Contract or any part thereof, or any benefit or interest therein or thereunder, otherwise than by:

- (a) a charge in favour of the Contractor's bankers of any monies due or to become due under the Contract, or
- (b) assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable. The provision of labour as piece work basis shall not be deemed to be subcontracting under this clause.

4.1 Sub-Contracting

The Contractor shall not subcontract the whole of the Works. Except where otherwise provided by the Contract, the Contractor shall not subcontract any part of the Works without the prior consent of the Engineer. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of a Subcontractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.

Provided that the Contractor shall not be required to obtain such consent for:

- (a) the provision of labour, or
- (b) the purchase of materials which are in accordance with the standards specified in the Contract, or

4.2 Assignment of Sub-Contractors Obligations

In the event of a Subcontractor having undertaken towards the Contractor in respect of the work executed, or the goods, materials, Plant or services supplied by such Subcontractor, any continuing obligation extending for a period exceeding that of the Defects Liability Period under the Contract, the Contractor shall at any time, after the expiration of such Period, assign to the Employer, at the Employer's request and cost, the benefit of such obligation for the unexpired duration thereof.

CONTRACT DOCUMENTS

5.1 Language/s and Law

- (a) The language in which the Contract documents shall be drawn up, is English.
- (b) The country the law of which shall apply to the Contract and according to which the Contract shall be construed is India.

5.2 Priority of Contract Documents

The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

- (1) Description of Schedule of Quantities
- (2) Particular Technical specification and specific condition of contract, if any
- (3) Relevant International / Indian Standard specifications
- (4) Drawings

(5) **General Conditions of Contract**

If there are varying or conflicting provisions made in any one document forming part of the contract, the accepting authority shall be the Engineer, who shall also be deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.

Any error in description, quality or rate in schedule of quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

6.1 Custody and Supply of Drawings and Documents

The Drawings shall remain in the sole custody of the Engineer, but two copies thereof shall be provided to the Contractor free of charge. The Contractor shall make at his own cost any further copies required by him. Unless it is strictly necessary for the purposes of the Contract, the Drawings, Specification and other documents provided by the Employer or the Engineer shall not, without the consent of the Engineer, be used or communicated to a third party by the Contractor. Upon issue of the Defects Liability Certificate (Clause 62.1), the Contractor shall return to the Engineer all Drawings, Specifications and other documents provided under the Contract.

The Contractor shall supply to the Engineer four copies of all Drawings, Specifications and other documents submitted by the Contractor and approved by the Engineer in accordance with Clause 7.1 to 7.3, together with a reproducible copy of any material which cannot be reproduced to an equal standard by photocopying. In addition the Contractor shall supply such further copies of such Drawings, Specification and other documents as the Engineer may request in writing for the use of the Employer, who shall pay the cost thereof.

6.2 One Copy of Drawings to be kept on Site

One copy of the Drawings, provided to or supplied by the Contractor as aforesaid, shall be kept by the Contractor on the Site and the same shall at all reasonable times be available for inspection and use by the Engineer and by any other person authorised by the Engineer in writing.

6.3 Disruption of Progress

The Contractor shall give notice to the Engineer, whenever planning or execution of the Works is likely to be delayed or disrupted unless any further drawing or instruction is issued by the Engineer within 30 days or such other reasonable time as may be decided by the Engineer. The notice shall include details of the drawing or instruction required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late.

6.4 Delay and Cost of Delay of Drawings

If, by reason of any failure or inability of the Engineer to issue, within a time reasonable in all the circumstances, any drawing or instruction for which notice has been given by the Contractor in accordance with Sub-Clause 6.3, the Contractor suffers delay then the Engineer shall, after due consultation with the Employer and the Contractor, determine any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3 .

6.5 Failure by Contractor to Submit Drawings

If the failure or inability of the Engineer to issue any drawings or instructions is caused in whole or in part by the failure of the Contractor to submit Drawings, Specification or other documents which he is required to submit under the Contract, the Engineer shall take such failure by the Contractor into account when making his determination pursuant to Sub-Clause 6.4.

7.1 Supplementary Drawings and Instructions

The Engineer shall have authority to issue to the Contractor, from time to time, such supplementary Drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and completion of the Works and the remedying of any defects therein. The Contractor shall carry out and be bound by the same.

7.2 Permanent Works Designed by Contractor

Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall submit to the Engineer, for approval:

- (a) such drawings, specifications, calculations and other information as shall be necessary to satisfy the Engineer as to the suitability and adequacy of that design, and
- (b) operation and maintenance manuals together with drawings of the relevant part of the Permanent Works as completed, in sufficient detail to enable the Employer to operate, maintain, dismantle, reassemble and adjust the Permanent Works incorporating that design. The Works shall not be considered to be completed for the purposes of taking over in accordance with Clause 48.1 to 48.5 until such operation and maintenance manuals, together with drawings on completion, have been submitted to and approved by the Engineer.

7.3 Responsibility Unaffected by Approval

Approval by the Engineer, in accordance with Sub-Clause 7.2, shall not relieve the Contractor of any of his responsibilities under the Contract.

GENERAL OBLIGATIONS

8.1 Contractor's General Responsibilities

The Contractor shall, with due care and diligence, design (to the extent provided for by the Contract), execute and complete the Works and remedy any defects therein in accordance with the provisions of the Contract. The Contractor shall provide all superintendence, labour, materials, Plant, Contractor's Equipment and all other things, whether of a temporary or permanent nature, required in and for such design, execution, completion and remedying of any defects, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract. The contractor shall promptly notify the Employer and the Engineer of any error, omission, fault or any other defect in the design of or specifications for the works which he discovers when reviewing the contract documents or in the process of execution of the works.

8.2 Site Operations and Methods of Construction

The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of construction. Provided that the Contractor shall not be responsible (except as stated hereunder or as may be otherwise agreed) for the design or specification of Permanent Works, or for the design or specification of any Temporary Works not prepared by the Contractor. Where the Contract expressly provides that part of the Permanent Works shall be designed by the Contractor, he shall be fully responsible for that part of such Works, notwithstanding any approval by the Engineer.

9.1 Contract Agreement

The Contractor shall, if called upon so to do, enter into and execute the Contract Agreement, to be prepared and completed at the cost of the Contractor, in the form annexed to these Conditions with such modification as may be necessary.

10.1 Performance Security

The Contractor shall provide security for his proper performance of the Contract to the Employer within 15 days after the receipt of the Letter of Acceptance. The performance security shall be in the form of bank guarantee. The amount of the bank guarantee shall be 10 percent of the Contract Price. It shall be issued by a Nationalised bank of India. When providing such security to the Employer, the Contractor shall notify the Engineer of so doing.

Without limitation to the provisions of the preceding paragraph, whenever the Engineer determines an addition to the Contract Price as a result of a change in cost and/or legislation or as a result of a variation amounting to more than 25 percent of the Contract Price, the Contractor, at the Engineer's written request, shall promptly increase the value of the performance security by an equal percentage.

Failure of the successful bidder to lodge the required bank guarantee shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Engineer may make the award to the next lowest evaluated bidder or, if there are no other bidders, call for new bids.

10.2 Period of Validity of Performance Security

The performance security shall be valid until the Contractor has executed and completed the Works and remedied any defects therein in accordance with the Contract. No claim shall be made against such security after the issue of the Defects Liability Certificate in accordance with Sub-Clause 62.1 and such security shall be returned to the Contractor within 14 days of the issue of the said Defects Liability Certificate.

10.3 Costs of Securities

The cost of complying with the requirements of this clause shall be borne by the Contractor.

11.1 Inspection of Site

The Consultant shall have made available to the Contractor, before the submission by the Contractor of the Tender, such data as have been obtained by or on behalf of the Employer from investigations undertaken relevant to the Works but the Contractor shall be responsible for his own interpretation thereof.

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself (so far as is practicable, having regard to considerations of cost and time) before submitting his Tender, as to:

- (a) the form and nature thereof, including the sub-surface conditions,
- (b) the hydrological and climatic conditions,
- (c) the extent and nature of work and materials necessary for the execution and completion of the Works and the remedying of any defects therein, and
- (d) the means of access to the Site and the accommodation he may require.

And in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Tender.

Data made available by the Employer in accordance with sub-clause 11.1 above shall be deemed to include data listed elsewhere in the contract as open for inspection at the office of the HSCC(I) Ltd., Plot no. 6A, Block - E, Sector -1, Noida (U.P.)-201 301.

12.1 Sufficiency of Tender

The Contractor shall be deemed to have based his Tender on the data made available by the Consultant and on his own inspection and examination, all as aforementioned.

The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Tender and of the rates and prices stated in the Bill of Quantities, all of which shall, except insofar as it is otherwise provided in the Contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, Plant or services or of contingencies for which there is a Provisional Sum) and all matters and things necessary for the proper execution and completion of the Works and the remedying of any defects therein.

12.2 Adverse Physical Obstructions or Conditions

If, however, during the execution of the Works the Contractor encounters physical obstructions or physical conditions, other than climatic conditions on the Site, which obstructions or conditions were, in his reasonable opinion, not foreseeable by an experienced contractor, the Contractor shall forthwith give notice thereof to the Engineer. On receipt of such notice, the Engineer shall, if in his opinion such obstructions or conditions could not have been reasonably foreseen by an experienced contractor, after due consultation with the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3 and
- (b) the amount of any costs which may have been incurred by the Contractor by reason of such obstructions or conditions having been encountered, which shall be added to the Contract Price.

And shall notify the Contractor accordingly. Such determinations shall take account of any instruction which the Engineer may issue to the Contractor in connection therewith, and any proper and reasonable measures acceptable to the Engineer which the Contractor may take in the absence of specific instructions from the Engineer.

13.1 Work to be in Accordance with Contract

Unless it is legally or physically impossible, the Contractor shall execute and complete the Works and remedy any defects therein in strict accordance with the Contract to the satisfaction of the Engineer. The Contractor shall comply with and adhere strictly to the Engineer's instructions on any matter, whether mentioned in

the Contract or not, touching or concerning the Works. The Contractor shall take instructions only from the Engineer or subject to the provisions of Clause 2.1 to 2.6, from the Engineer's Representative.

14.1 Programme to be Submitted

The Contractor shall, within 15 days after the date of the Letter of Acceptance, submit to the Engineer for his consent a programme, in such form and detail as the Engineer shall reasonably prescribe, for the execution of the Works. The Contractor shall, whenever required by the Engineer, also provide in writing for his information a general description of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

14.2 Revised Programme

If at any time it should appear to the Engineer that the actual progress of the Works does not conform to the programme to which consent has been given under Sub-Clause 14.1 the Contractor shall produce, at the request of the Engineer, a revised programme showing the modifications to such programme necessary to ensure completion of the Works within the Time for Completion.

14.3 Cash Flow Estimate to be Submitted

The Contractor shall, within 15 days after the date of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer.

14.4 Contractor not Relieved of Duties or Responsibilities

The submission to and consent by the Engineer to such programs or the provision of such general descriptions or cash flow estimates shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

15.1 Contractor's Superintendence

The Contractor shall provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorised representative approved of by the Engineer, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the Works. Such authorised representative shall receive, on behalf of the Contractor, instructions from the Engineer or, subject to the provisions of Clause 2.1 to 2.6, the Engineer's Representative.

If approval of the representative is withdrawn by the Engineer, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned, after receiving notice of such withdrawal, remove the

representative from the Works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another representative approved by the Engineer.

If the Contractor's authorised representative is not in the opinion of the Engineer fluent in English, the contractor shall have available at site at all times an interpreter competent to ensure the proper transmission of instructions and information.

16.1 Contractor's Employees

The Contractor shall provide on the Site in connection with the execution and completion of the Works and the remedying of any defects therein :

- (a) only such technical assistants as are skilled and experienced in their respective callings and such foremen and leading hands as are competent to give proper superintendence of the Works, and
- (b) such skilled, semi-skilled and un-skilled labour as is necessary for the proper and timely fulfilling of the Contractor's obligations under the Contract.

16.2 Engineer at Liberty to Object

The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person provided by the Contractor who, in the opinion of the Engineer, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on Site is otherwise considered by the Engineer to be undesirable, and such person shall not be again allowed upon the Works without the consent of the Engineer. Any person so removed from the Works shall be replaced as soon as possible.

A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of English or the contractor shall have available at site at all times a sufficient number of competent interpreters to ensure a proper transmission of instructions and information.

The contractor is encouraged to the extent practicable and reasonable to employ staff and labourers from sources within India.

17.1 Setting-out

The Contractor shall be responsible for :

- (a) the accurate setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing,

- (b) the correctness, subject as above mentioned, of the position, levels dimensions and alignment of all parts of the Works, and
- (c) the provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities.

If, at any time during the execution of the Works, any error appears in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Engineer, shall, at his own cost, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer, in which case the Engineer shall determine an addition to the Contract Price in accordance with Clause 52.1 to 52.4 and shall notify the Contractor accordingly.

The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting-out the Works.

The Contractor shall give to the Engineer not less than 72(seventy two) hours notice of his intention to set out or give levels for any part of the Works so that timely arrangement may be made for checking or issuing instructions. He shall indicate therein by which date the information, if any is required by him.

18.1 Boreholes and Exploratory Excavation

If, at any time during the execution of the works the Engineer requires the contractor to make bore-holes or to carry out exploratory excavations in excess of the requirements specified elsewhere in the contract, such requirement shall be the subject of an instruction in accordance with clause 51.1 & 51.2, unless an item or a provisional sum in respect of such work is included in the Bill of Quantities.

19.1 Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

- (a) have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons, and
- (b) provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- (c) take all reasonable steps to protect the environment on and off the Site

and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods or operation.

- (d) Screen all lights provided by the Contractor so as not to interfere with any signal light on the railways or with any traffic or signal lights of any local authority.

20.1 Care of Works

The Contractor shall take full responsibility for the care of the Works and materials and Plant for incorporation therein from the Commencement Date until the date of issue of the Taking-Over Certificate for the whole of the Works, when the responsibility for the said care shall subject to clause 20.1(b) pass to the Employer, Provided that:

- (a) if the Engineer issues a Taking-Over Certificate for any Section or part of the Permanent Works the Contractor shall cease to be liable for the care of that Section or part from the date of issue of the Taking-Over Certificate, when the responsibility for the care of that Section or part shall pass to the Employer, and
- (b) the Contractor shall take full responsibility for the care of any outstanding Works and materials and Plant for incorporation therein which he undertakes to or is otherwise required to finish during the Defects Liability Period until such outstanding Works have been completed pursuant to Clause 49.1 to 49.4.

20.2 Responsibility to Rectify Loss of Damage

If any loss or damage happens to the Works, or any part thereof, or materials or Plant for incorporation therein, during the period for which the Contractor is responsible for the care thereof, from any cause whatsoever, other than the risks defined in Sub-Clause 20.4, the Contractor shall, at his own cost, rectify such loss or damage so that the Permanent Works conform in every respect with the provisions of the Contract to the satisfaction of the Engineer. The Contractor shall also be liable for any loss or damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under Clause 49.1 to 49.4 and 50.1.

20.3 Loss or Damage Due to Employer's Risk

In the event of any such loss or damage happening from any of the risks defined in Sub-Clause 20.4, or in combination with other risks, the Contractor shall, if and to the extent required by the Engineer, rectify the loss or damage and the Engineer shall determine an addition to the Contract Price in accordance with Clause 52.1 to 52.4 and shall notify the Contractor accordingly. In the case of

combination of risks causing loss or damage any such determination shall take into account the proportional responsibility of the Contractor and the Employer.

20.4 Employer's Risks

The Employer's risks are :

- (a)
 - (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
 - (ii) rebellion, revolution, insurrection, or military or usurped power, or civil war,
 - (iii) ionising radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,
 - (iv) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speed,
- (b) loss or damage due to the use or occupation by the Employer of any Section or part of the Permanent Works, except as may be provided for in the Contract,
- (c) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible,
and
- (d) any operation of the forces of nature (insofar as it occurs on the site) which an experienced contractor:
 - (i) could not have reasonably foreseen, or
 - (ii) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:
 - (A) prevent loss or damage to physical property from occurring by taking appropriate measures, or
 - (B) insure against.

21.1 Insurance of Works and Contractor's Equipment

The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause 20.1 to 20.4, insure:

- (a) the Works, together with materials and Plant for incorporation therein, to the full replacement cost and it being understood that such insurance shall provide for compensation to be payable to rectify the loss or damage incurred.
- (b) an additional sum of 15 percent of such replacement cost, or as may be specified in Part II of these Conditions, to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature, and it being understood that such insurance shall provide for compensation to be payable to rectify the loss or damage incurred.
- (c) the Contractor's Equipment and other things brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

The insurance under clause 21.1 shall be issued by an insurance company which has been determined by the contractor to be acceptable to the Consultant.

21.2 Scope of Cover

The insurance in paragraphs (a) and (b) of Sub-Clause 21.1 shall be in the joint names of the Contractor and the Employer and shall cover:

- (a) the Employer and the Contractor against all loss or damage from whatsoever cause arising (including natural calamities, earthquake, subsidence, landslide, rock slide, flood, storm, cyclone, fire, theft, burglary, strike, riot, sabotage, terrorism), other than as provided in Sub-Clause 21.4, from the commencement date until the date of issue of the relevant Taking-Over Certificate in respect of the Works or any Section or part thereof as the case may be, and
- (b) the Contractor for his liability:
 - (i) during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of the Defects Liability Period, and
 - (ii) for loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clauses 49.1 to 49.4 and 50.1.

It shall be the responsibility of contractor to notify the Insurance Company of any change in the nature and extent of the works and to ensure the adequacy of the Insurance cover at all times during the period of contract.

21.3 Responsibility for Amounts not Recovered

Any amounts not insured or not recovered from the insurers shall be borne by the Employer or the Contractor in accordance with their responsibilities under Clause 20.1 to 20.4.

21.4 Exclusions

There shall be no obligation for the insurance in Sub-Clause 21.1 to include loss or damage caused by the risks listed under sub clause 20.4 para a (i) to (iv).

If the Contractor receives instructions from the Employer to insure against War Risk, such insurance if normally available shall be effected, at the cost of the Employer, with an Insurance Company acceptable to the Consultant and shall be in the joint names of the contractor and the Employer.

22.1 Damage to Persons and Property

The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the Employer against all losses and claims in respect of:

- (a) death of or injury to any person, or
- (b) loss or damage to any property (other than the Works) :

Which may arise out of or in consequence of the execution and completion of the Works and the remedying of any defects therein, and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, subject to the exceptions defined in Sub-Clause-22.2.

22.2 Exceptions

The "exceptions" referred to in Sub-Clause 22.1 are:

- (a) the permanent use or occupation of land by the Works, or any part thereof,
- (b) the right of the Employer to execute the Works, or any part thereof, on, over, under, in or through any land,
- (c) damage to property which is the unavoidable result of the execution and completion of the Works, or the remedying of any defects therein, in accordance with the Contract.
- (d) death of or injury to persons or loss of or damage to property resulting from any action or neglect of the Employer, his agents, servants or other contractors, not being employed by the Contractor, or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or, where the injury or damage was contributed to by the Contractor, his servants or agents, such part of the said injury or damage as may be just and equitable having regard to the

extent of the responsibility of the Employer, his servants or agents or other contractors for the injury or damage.

22.3 Indemnity by Employer

The Employer shall indemnify the Contractor against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the exceptions defined in Sub-Clause 22.2.

23.1 Third Party Insurance (Including Employer's Property)

The Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause 22.1 to 22.3, insure, in the joint names of the Contractor and the Employer, against liabilities for death of or injury to any person (other than as provided in Clause 24.1 to 24.2 or loss of or damage to any property (other than the Works) arising out of the performance of the Contract other than the exceptions defined in paragraphs (a), (b) and (c) of Sub-Clause 22.2.

23.2 Minimum Amount of Insurance

Such insurance shall be for at least the amount stated in Appendix to Tender.

23.3 Cross Liabilities

The insurance policy shall include a cross liability clause such that the insurance shall apply to the Contractor and to the Employer as separate insured.

24.1 Accident or Injury to Workmen

The Employer shall not be liable for or in respect of any damages or compensation payable to any workman other than for death or injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation, other than those for which the Employer is liable as aforesaid, and against all claims, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

24.2 Insurance Against Accident to Workmen

The Contractor shall insure against such liability and shall continue such insurance during the whole of the time that any persons are employed by him on the Works. Provided that, in respect of any persons employed by any Subcontractor, the Contractor's obligations to insure as aforesaid under this

Sub-Clause shall be satisfied if the Subcontractor shall have insured against the liability in respect of such persons in such manner that the Employer is indemnified under the policy, but the Contractor shall require such Subcontractor to produce to the Consultant, when required, such policy of insurance and the receipt for the payment for current premium.

25.1 Evidence and Terms of Insurance

The Contractor shall provide evidence to the Consultant as soon as practicable after the respective insurance have been taken out but in any case prior to the start of work at the Site that insurance required under the Contract have been effected and shall, within 84 days of the Commencement Date, provide the insurance policies to the Employer. When providing such evidence and such policies to the Employer, the Contractor shall notify the Engineer of so doing. Such insurance policies shall be consistent with the general terms agreed prior to the issue of the Letter of Acceptance. The Contractor shall effect all insurance for which he is responsible with insurers and in terms approved by the Consultant.

25.2 Adequacy of Insurance

The Contractor shall notify the insurers of changes in the nature, extent or programme for the execution of the Works and ensure the adequacy of the insurance at all times in accordance with the terms of the Contract and shall, when required, produce to the Consultant the insurance policies in force and the receipts for payment of the current premiums.

25.3 Remedy on Contractor's Failure to Insure

If the Contractor fails to effect and keep in force any of the insurance required under the Contract, or fails to provide the policies to Consultant within the period required by Sub-Clause 25.1, then and in any such case the Employer may effect and keep in force any such insurance and pay any premium as may be necessary for that purpose and from time to time deduct the amount so paid from any monies due or to become due to the Contractor, or recover the same as a debt due from the Contractor.

25.4 Compliance with Policy Conditions

In the event that the Contractor or the Employer fails to comply with conditions imposed by the insurance policies effected pursuant to the Contract, each shall indemnify the other against all losses and claims arising from such failure.

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to, the insurance referred to in Clauses 21.1 to 21.4, 23.1 to 23.3 and 24.1 to 24.2) with insurers from India.

26.1 Compliance with Statutes Regulations

The Contractor shall conform in all respects, including by the giving of all notices and the paying of all fees, with the provision of :

- (a) any National or State Statute, Ordinance, or other Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution and completion of the Works and the remedying of any defects therein, and
- (b) the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works, and the Contractor shall keep the Employer indemnified against all penalties and liability of every kind for breach of any such provision.

Provided always that the Employer shall be responsible for obtaining any planning, zoning or other similar permission required for the Works to proceed and shall indemnify the Contractor in accordance with Sub-Clause 22.3.

27.1 Fossils

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Employer and the Contractor, be deemed to be the absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same. If, by reason of such instructions, the Contractor suffers delay and/or incurs costs then the Engineer shall, after due consultation with the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3, and
- (b) the amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly.

28.1 Patent Rights

The Contractor shall save harmless and indemnify the Employer from and against all claims and proceeding for or on account of infringement of any patent right,

design trademark or name or other protected rights in respect of any Contractor's Equipment, materials or Plant used for or in connection with or for incorporation in the Works and from and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, except where such infringement results from compliance with the design or Specification provided by the Engineer.

28.2 Royalties

Except where otherwise stated, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the Works.

29.1 Interference with Traffic and Adjoining Properties

All operation necessary for the execution and completion of the Works and the remedying of any defects therein shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with:

- (a) the convenience of the public, or
- (b) the access to, use and occupation of public or private road, railway and any other right of way and footpaths to or of properties whether in the possession of the Employer or of any other person.

The Contractor shall save harmless and indemnify the Employer in respect of all claims, proceedings, arising out of, or in relation to any such matters insofar as the Contractor is responsible therefor.

If any plant (floating or otherwise) belonging to or hired by the Contractor or any sub-contractor or any person employed by the Contractor or by any sub-contractor or any materials or things therein or there from sink from any cause whatsoever, it shall immediately be reported by the Contractor to the competent authorities and the Engineer's Representative, and Contractor shall forthwith, at his cost raise and remove any such plant, materials or things or otherwise deal with the same as the Engineer may direct.

The fact that such sunken plant, materials or things are insured or have been declared a total loss or do not represent any further value shall not absolve the Contractor from his obligations under this Clause to raise and remove the same. Until such sunken plant or materials or things have been raised and removed, the Contractor shall set such buoys and display at night such lights and do all such things for the safety as may be required by the competent authorities or by the Engineer's Representative.

In the event of the Contractor not carrying out the obligations imposed on him by this Clause, the Employer may cause to set buoy and display at night light on such plant and raise and remove the same without prejudice to the right of the

Employer to hold the Contractor liable and all expenses and consequences thereon and incidental thereto shall be borne by the Contractor and shall be recoverable from him as a debt by the Employer or may be deducted by the Employer from any moneys due or which may become due to the Contractor.

30.1 Avoidance of Damage to Roads

The Contractor shall use every reasonable means to prevent any of the roads or bridges communicating with or on the routes to the Site from being damaged or injured by any traffic of the Contractor or any of his Subcontractors and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, Plant, Contractor's Equipment or Temporary Works from and to the Site shall be limited, as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such roads and bridges.

30.2 Transport of Contractor's Equipment or Temporary Works

Save insofar as the Contract otherwise provides, the Contractor shall be responsible for and shall pay the cost of strengthening any bridges or altering or improving any road communicating with or on the routes to the Site to facilitate the movement of Contractor's Equipment or Temporary Works and the Contractor shall indemnify and keep indemnified the Employer against all claims for damage to any such road or bridge caused by such movement, including such claims as may be made directly against the Employer, and shall negotiate and pay all claims arising out of such damage.

If it is found necessary for the Contractor to move one or more loads of heavy constructional plant and equipment, materials or preconstructed units or parts of units of work over roads, highways, bridges on which such oversized and overweight items are not normally allowed to be moved, the Contractor shall obtain prior permission from the concerned authorities. Payments for complying with the requirements, if any, for protection of or strengthening of the roads, highways or bridges shall be made by the Contractor and such expenses shall be deemed to be included in his contract price.

30.3 Transport of Materials or Plant

If, notwithstanding Sub-Clause 30.1, any damage occurs to any bridge or road communicating with or on the routes to the Site arising from the transport of materials or Plant, the Contractor shall notify the Engineer, as soon as he becomes aware of such damage or as soon as he receives any claim from the authority entitled to make such claim. Where under any law or regulation the hauler of such

materials or Plant is required to indemnify the road authority against damage the Employer shall not be liable for any costs, charges or expenses in respect thereof or in relation thereto. In other cases the Employer shall negotiate the settlement of and pay all sums due in respect of such claim and shall indemnify the Contractor in respect thereof and in respect of all claims, proceedings, damages, costs charges and expenses in relation thereto. Provided that if and so far as any such claim or part thereof is, in the opinion of the Engineer, due to any failure on the part of the Contractor to observe and perform his obligations under Sub-Clause 30.1, then the amount, determined by the Engineer, due to any failure on the part of the Contractor to observe and perform his obligations under Sub-Clause 30.1, then the amount, determined by the Engineer, after due consultation with the Employer and the Contractor, to be due to such failure shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly. Provided also that the Employer shall notify the Contractor whenever a settlement is to be negotiated and, where any amount may be due from the Contractor, the Employer shall consult with the Contractor before such settlement is agreed.

30.4 Waterborne Traffic

Where the nature of the Works is such as to require the use by the Contractor of waterborne transport the foregoing provisions of this Clause shall be construed as through "road" included a lock, dock, sea wall or other structure related to a waterway and "vehicle" included craft, and shall have effect accordingly.

31.1 Opportunities for other Contractors

The Contractor shall, in accordance with the requirements of the Engineer, afford all reasonable opportunities for carrying out their work to:

- (a) any other contractors employed by the employer and their workmen,
- (b) the workmen of Employer, and
- (c) the workmen of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the employer may enter into in connection with or ancillary to the Works.

31.2 Facilities for other Contractors

If, however, pursuant to Sub-Clause 31.1 the Contractor shall, on the written request of the Engineer:

- (a) make available to any such other contractor, or to the Employer or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or

- (b) permit the use, by any such, of Temporary Works or Contractor's Equipment on the Site,
- (c) provide any other service of whatsoever nature for any such, the Engineer shall determine an addition to the Contract Price in accordance with Clause 52.1 to 52.4 and shall notify the Contractor accordingly.

32.1 Contractor to keep Site Clear

During the execution of the Works the Contractor shall keep the Site reasonably free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment and surplus materials and clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.

33.1 Clearance of Site on Completion

Before the issue of any Taking-Over Certificate the Contractor shall clear away and remove from that part of the Site to which such Taking-Over Certificate relates all Contractor's Equipment, surplus material rubbish and Temporary Works of every kind, and leave such part of the Site and Works clean and in a workmanlike condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Liability Period.

34.1 Labour

The contractor shall make his own local or other arrangement for the engagement of all labour local or other.

The Contractor and his sub contractors shall abide by the local laws and regulations governing labour applicable from time to time.

Engagement of Labour

The Contractor shall make his own arrangements for the engagement of all labour, local or otherwise, and, save insofar as the Contract otherwise provides, for the transport, housing, feeding and payment thereof.

Supply of Water

The contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer's Representative, an adequate supply of drinking and clear water for the use of the Contractor's and the Engineer's staff and work people, Sub-Contractors and site visitors.

Alcoholic Liquor or Drugs

The Contractor shall not import, sell, give, barter or otherwise dispose of any alcoholic liquor, or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his sub-contractors, agents or employees.

Arms and Ammunition

The Contractor shall not give, barter or otherwise dispose off to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

Festivals and Religious Customs

The Contractor shall in all dealings with labour in his employment have due regard to all recognised festivals, days of rest and religious or other customs.

Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

Disorderly Conduct, etc.

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighbourhood of the works against the same.

Observance of Legislation etc.

The Contractor shall at all times during the continuance of the Contract comply fully with all existing Acts, regulations and bylaws including all statutory amendments and re-enactments and acts that may be passed in future either by the state or the Central Government or local authority, including, Indian Workmen's Compensation Act, Contract Labour (Regulation and Abolition) Act 1970 and Equal remuneration Act 1976. Factories Act, Minimum Wages Act provident fund regulations employees provident Fund Act and schemes made under same

Act, Health and Sanitary Arrangements for workmen, Insurance and other benefits and shall keep the Employer indemnified in case any action is commenced for contravention by the contractor. If the Employer is caused to pay or reimburse any amounts for non-observance of the provisions of this clause on the part of the contractor the Engineer shall have the right to deduct from any moneys due to the contractor or recover from the contractor personally any sum required or estimated to be required for making good the loss or damage suffered by the Employer. All registration and station inspection fees if any in respect of his work pursuant to the contract shall be to the account of the contractor.

Fair Wages :

The Contractor shall pay the labours engaged by him on the work not less than a fair wage, which expression shall mean, whether or time or piecework, the respective rates of wages as fixed by the public works department as fair wages for the area payable to the different categories of labourers or those notified under the Minimum wages act for corresponding employees of the Employer whichever may be higher.

The Contractor shall notwithstanding the provisions of any contract to the contrary, cause to be paid a fair wage to the labourers indirectly engaged on the works including any labour engaged by subcontractors in connection with the said works as if the labourer has been immediately employed by him.

Notices :

The Contractor shall before he commences the work display and correctly maintain in a clean and legible condition at a conspicuous place on the Site notices in English and in a local language spoken by the majority of the workers, stating therein the rate of wages which have been fixed as fair wages and the hours of work for which such wages are earned and send a copy of such notices to the Engineer.

Wage Records :

The contractor shall maintain records of wages and other remuneration paid to his employees in such form as may be convenient and to the requirements of the Employer/Engineer and the conciliation officer (Central) Ministry of Labour, Government of India, or such other authorised person appointed by the Central or State Government and the same shall include the following particulars of each worker:

- i) Name, works number and grade
- ii) Rate of daily or monthly wage.
- iii) Nature of work on which employed
- iv) Total number of days worked during each wage period.
- v) Total amount payable for the work during each wage period.
- vi) All deductions made from the wage with details in each case of the

- ground for which the deduction is made.
- vii) Wage actually paid for each wage period.

The contractor shall provide a wage slip for each worker employed on the works.

The wage record and wage slips shall be preserved for at least 12 months after the last entry.

Inspection of Wage Records

The Contractor shall allow inspection of the aforesaid wage records and wage slip to the Engineer and to any of his workers or to his agent at a convenient time and place after due notice is received, or to the Employer or any other person authorised by him on his behalf.

The Employer and the Engineer or any other person authorised by them on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of the Fair Wages Clause. He shall also have the power to investigate into any complaint regarding any default made by the Contractor or sub-contractor in regard to such provision.

The Employer shall have the right to deduct from the moneys due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non payment of the aforesaid fair wage, except on account of any deductions that may be permissible under any law for the time being in force.

Representation of Parties

- (i) A workman shall be entitled to be represented in any investigation or enquiry under this Clause by :-
- (a) An officer of a registered trade union of which he is a member.
 - (b) An officer of a federation of trade Union to which the Trade Union referred to in pervious Sub-clause is affiliated.
 - (c) Where the Worker is not a member of any registered Trade Union, by an officer of a registered Trade Union connected with or by any other workman employed in the industry in which the workers is employed.
- (ii) The contractor or sub-contractor shall be entitled to be represented in any investigations or enquiry under this clause by an officer of an Association of Employers of which he is a member.

- (iii) No party shall be represented by a legal practitioner in any investigation or enquiry under this clause, unless all parties agree.

Safety Provisions

The Contractor shall comply with all the precautions as required for the safety of the workman by the I.L.O Convention (NO.62) as far as they are applicable to the Contract. The Contractor shall provide all necessary safety appliances, gears like goggles, helmets, masks, etc. to the workmen and the staff.

The Contractor shall be responsible for observance by his sub-Contractors of the foregoing provisions.

Footwear

The Contractor shall at his own expense provide footwear for all labour engaged on concrete mixing work and all other type of work involving the use of tar, cement, etc. to the satisfaction of the Engineer or his Representative, and on his failure to do so the Employer shall be entitled to provide the same and recover the cost from the Contractor.

The Contractor shall deliver to the Engineer's Representative at his office on the Site a return in detail in such form and at such intervals as the Employer / Engineer may prescribe showing the supervisory staff and the numbers of the several classes of labour from time to time employed on the Site.

35.1 Returns of Labour, etc.

The Contractor shall, if required by the Engineer, deliver to the Engineer's Representative, or at his office, a return in detail in such form and at such intervals as the Engineer may prescribe showing the supervisory staff and the number of the several classes of labour from time to time employed by the Contractor on the site and such information respecting constructional plant as the Engineer's Representative may require.

The Contractor shall file all labour returns in detail to the respective authorities / statutory bodies as prescribed under law applicable at the work site and inform the Employer / Engineer with copies of such returns directly filed.

MATERIALS, PLANTS AND WORKMANSHIP

36.1 Quality of Materials, Plant and Workmanship

All materials Plant and workmanship shall be

- (a) of the Respective kinds described in the Contract and in accordance with the Engineer's instructions, and

- (b) subjected from time to time to such tests as the Engineer may require at the place of manufacture, fabrication or preparation, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places.

The Contractor shall provide such assistance, labour, electricity, fuels, stores, apparatus and instruments as are normally required for examining, measuring and testing any materials or plant and shall supply samples of materials, before incorporation in the Works, for testing as may be selected and required by the Engineer.

The contractor is encouraged to the extent practicable and reasonable, to use plant and material from sources within India.

36.2 Cost of Samples

All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract.

36.3 Cost of Test

The cost of making any test shall be borne by the Contractor if such test is

- (a) clearly intended by or provided for in the Contract, or
- (b) particularised in the Contract (in cases only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfil) in sufficient detail to enable the Contractor to price or allow for the same in his Tender.
- (c) So intended or provided for, required by the Engineer to be carried out at any place other than the Site local test house or the place of manufacture, fabrication or preparation of the materials or Plant tested, than the cost of all such test shall be borne by the Contractor..

36.4 Engineer's Determination Where Tests not provided for

Where, pursuant to Sub-Clause 36.4, this Sub-Clause applies the Engineer shall, after due consultation with the Contractor, determine:

- (a) any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3, and shall notify the Contractor accordingly.

37.1 Inspection of Operations

The Engineer, and any person authorised by him, shall at all reasonable times have access to the Site and to all workshops and places where materials or Plant

are being manufactured, fabricated or prepared for the Works and the Contractor shall afford every facility for and every assistance in obtaining the right to such access.

37.2 Inspection and Testing

The Engineer shall be entitled, during manufacture, fabrication or preparation to inspect and test the materials and Plant to be supplied under the Contract. If materials or Plant are being manufactured, fabricated or prepared in workshops or places other than those of the Contractor, the Contractor shall obtain permission for the Engineer to carry out such inspection and testing in those workshops or places. Such inspection or testing shall not release the Contractor from any obligation under the Contract.

37.3 Dates for Inspection and Testing

The Contractor shall agree with the Engineer on the time and place for inspection or testing of any materials or Plant as provided in the Contract. The Engineer shall give the Contractor not less than 24 hours notice of his intention to carry out the inspection or to attend the tests. If the Engineer, or his duly authorised representative, does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the tests, which shall be deemed to have been made in the presence of the Engineer. The Contractor shall forthwith forward to the Engineer duly certified copies of the test readings. If the Engineer has not attended the tests, he shall accept the said readings as accurate or instruct the tests to be repeated at the Employer's cost to enable him to decide.

37.4 Rejection

If at the time and place agreed in accordance with Sub-Clause 37.3, the materials or Plant are not ready for inspection or testing or if, as result of the inspection or testing referred to in this Clause, the Engineer determines that the materials or Plant are defective or otherwise not in accordance with the Contract, he may reject the materials or Plant and shall notify the Contractor thereof immediately. The notice shall state the Engineer's objections with reasons. The Contractor shall then promptly make good the defect or ensure that rejected materials or Plant comply with the Contract. If the engineer so request, the test of rejected materials or Plant shall be made or repeated under the same terms and conditions. All costs incurred by the Employer by the repetition of the tests shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer and may be deducted from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer.

37.5 Independent Inspection

The Engineer may delegate inspection and testing of materials or Plant to an independent inspector. Any such delegation shall be effected in accordance with Sub- Clause 2.4 and for this purpose such independent inspector shall be considered as an assistant of the Engineer. Notice of such appointment (not being less than 14 days) shall be given by the Engineer to the Contractor.

38.1 Examination of Work before Covering up

No part of the Work shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any such part of the Works which is about to be covered up or put out of view and to examine foundations before any part of the work is placed thereon. The Contractor shall give notice to the Engineer whenever any such part of the Works or foundations is or are ready or about to be ready for examination and the engineer shall unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such part of the Works or of examining such foundations.

38.2 Uncovering and Making Opening

The Contractor shall uncover any part of the Works or make opening in or through the same as the Engineer may from time to time instruct and shall reinstate and make good such part. If any such part has been covered up or put out of view after compliance with the requirement of Sub-Clause 38.1 and is found to be executed in accordance with the Contract, the Engineer shall, after due consultation with the Contractor, determine the amount of reinstating and making good the same, which shall be added to the Contract Price, and shall notify the Contractor accordingly. In any other case all costs shall be borne by the Contractor.

39.1 Removal of Improper Work, Materials or Plant

The Engineer shall have authority to issue instructions from time to time, for:

- (a) The removal from the Site, within such time or times as may be specified in the instruction, of any materials or Plant which, in the opinion of the Engineer, are not accordance with the Contract,
- (b) The substitution of proper and suitable materials or Plant, and
- (c) The removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefor, of any work which, in respect of
 - (i) materials, Plant or workmanship, or
 - (ii) design by the Contractor or for which he is responsible, is not, in

the opinion of the Engineer, in accordance with the Contract.

39.2 Default of Contractor in Compliance

In case of default on the Contractor in carrying out such instruction within the time specified therein or, if none, within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and all costs consequent thereon or incidental thereto shall, after due consultation with the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly.

SUSPENSION

40.1 Suspension of Work

The Contractor shall, on the instructions of the Engineer, suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer may consider necessary and shall, during such suspension, properly protect and secure the Works or such part thereof so far as is necessary in the opinion of the Engineer. Unless such suspension is

- (a) otherwise provided for in the Contract, or
- (b) necessary by reason of some default of or breach of contract by the Contractor or for which he is responsible, or
- (c) necessary by reason of extra-ordinary climatic conditions on the Site, or
- (d) necessary for the proper execution of the Works or for the safety of the Works or any part thereof (save to the extent that such necessity arises from any act or default by the Engineer or the Employer or from any of the risks defined in Sub-Clause 20.4), Sub- Clause 40.2 shall apply.

40.2 Engineer's Determination following Suspension

Where, pursuant to Sub-Clause 40.1, this Sub- Clause applies the Engineer shall, after due consultation with the Contractor determine

- (a) any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3, and
- (b) the amount, which shall be added to the Contract Price, in respect of the cost incurred by the Contractor by reason of such suspension.

And shall notify the Contractor accordingly.

40.3 Suspension lasting more than 84 Days

If the progress of the Works or any part thereof is suspended on the written instructions of the Engineer and if permission to resume work is not given by the Engineer within a period of 84 days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of Sub-Clause 40.1, the Contractor may give notice to the Engineer requesting permission, within 28 days from the receipt thereof, to proceed with the Works or that part thereof in regard to which progress is suspended. If, within the said time, such permission is not granted, the Contractor may, but is not bound to, elect to treat the suspension, where it affects part only of the Works, as an omission of such part under Clause 51.1 to 51.2 by giving a further notice to the Engineer to that effect, or, where it affects the whole of the Works, treat the suspension as an event of default by the Employer and terminate his employment under the Contract in accordance with the provisions of Sub-Clause 69.1, whereupon the provisions of Sub-Clause 69.2 and 69.3 shall apply.

COMMENCEMENT AND DELAYS

41.1 Commencement of Works

The Contractor shall commence the Works as soon as is reasonably possible after the receipt by him of a notice to this effect from the Engineer, which notice shall be issued within the time stated in the Appendix to Tender after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the works with due expedition and without delay.

42.1 Possession of Site and Access Thereto

Save insofar as the Contract may prescribe:

- (a) the extent of portions of the Site of which the Contractor is to be given possession from time to time, and
- (b) the order in which such portions shall be made available to the Contractor and subject to any requirement in the Contract as to the order in which the Works shall be executed,

The Employer will, with the Engineer's notice to commence the Works, give to the Contractor possession of

- (c) so much of the Site, and
- (d) such access as, in accordance with the Contract, is to be provided by the Employer,

as may be required to enable the Contractor to commence and proceed

with the execution of the Works in accordance with the programme referred to in Clause 14.1 to 14.4, if any, and otherwise in accordance with such reasonable proposals as the Contractor shall, by notice to the Engineer make. The Employer will, from time to time as the Works proceed, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with the execution of the Works with due dispatch in accordance with such programme or proposals, as the case may be.

- (e) All water including rain water which may accumulate on the site during the progress of the works or in trenches or excavations, shall be removed promptly from the site to the satisfaction of engineer and at the cost of contractor.

42.2 Failure to Give Possession

If the Contractor suffers delay and/or incurs costs from failure on the part of the Employer to give possession in accordance with the terms of Sub-Clause 42.1, the Engineer shall, on the request of the contractor and submission of the details and documentary proof, determine:

- (a) any extension of time to which the Contractor is entitled under Clause 44.1 to 44.3, and
- (b) the amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly.

42.3 Wayleaves and Facilities

The Contractor shall bear all costs and charges for special or temporary wayleaves required by him in connection with access to Site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Works.

43.1 Time for Completion

The whole of the Works and, if applicable, any Section required to be completed within a particular time as stated in the Appendix to Tender, shall be completed, in accordance with the provisions of Clause 48.1 to 48.4, within the time stated in the Appendix to Tender for completion of the whole of the Works or the Section (as the case may be), calculated from the Commencement Date, or such extended time as may be allowed under Clause 44.1 to 44.3.

44.1 Extension of Time for Completion

In the event of

- (a) the amount or nature of extra or additional work, or

- (b) any cause of delay referred to in these Conditions by reference to clause 44.1 to 44.3, or
- (c) exceptionally adverse climatic conditions, or
- (d) any delay, impediment or prevention by the Employer, or
- (e) other special circumstances which may occur, other than through a default of or breach of contract by the Contractor or for which he is responsible,

being such as fairly to entitle the contractor to extension of time for completion of the works or any section or part thereof, the Engineer shall after due consultation with the contractor, and subject to clause 44.2 determine the amount of such extension and shall notify the contractor accordingly.

44.2 Contractor to Provide Notification and Detailed/ Particulars

The Engineer is not bound to make any determination under clause 44.1 unless the Contractor has

- (a) within 28 days after such event has arisen notified the Engineer, and
- (b) within 28 days, or such other reasonable time as may be agreed by the Engineer, after such notification submitted to the Engineer detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

44.3 Interim Determination of Extension

Provided also that where an event has continuing effect such that it is not practicable for the Contractor to submit detailed particulars within the period of 28 days referred to in Sub-Clause 44.2 (a), he shall nevertheless be entitled to an extension of time provided that he has submitted to the Engineer interim particulars at intervals of not more than 28 days and final particulars within 28 days of the end of the effects resulting from the event. On receipt of such interim particulars, the Engineer shall, without undue delay, make an interim determination of extension of time and on receipt of the final particulars the Engineer shall review the circumstances and shall determine an overall extension of time in regard to the event in consultation with the Contractor and shall notify the Contractor of the determination. No final review shall result in a decrease of any extension of time already determined by the Engineer.

45.1 Restriction Working Hours

Subject to any provision to the contrary contained in the Contract, none of the Works shall save as hereinafter provided, be carried on during the night or on locally recognised days of rest without the consent of the Engineer, except when work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise

the Engineer. Provided that the provisions of this Clause shall not be applicable in the case of any work which it is customary to carry out by multiple shift.

46.1 Rate of Progress

If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any Section is at any time, in the opinion of the Engineer, too slow to enable the contractor to complete the execution of and passing the tests on completion of the Works or such section by the time for completion, the Engineer shall so notify the Contractor who shall thereupon take such steps as are necessary, subject to the consent of the Engineer, to expedite progress so as complete the execution of and passing the tests on completion of the Works or such section by the time for completion. The Contractor shall not be entitled to any additional payment for taking such steps. If, as a result of any notice given by the Engineer under this Clause, the Contractor considers that it is necessary to do any work at night or on locally recognised days of rest, he shall be entitled to seek the consent of the Engineer so to do. Provided that if any steps, taken by the Contractor in meeting his obligations under this Clause, involve the employer in additional supervision costs, such costs shall, after due consultation with the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become to the Contractor and the Engineer shall notify the Contractor accordingly.

47.1 Liquidated Damages for Delay

If the Contractor fails to complete the execution of and passing the test on completion of the works or any section by the time for completion, in accordance with Clause 48.1 to 48.4, within the relevant time prescribed by Clause 43.1, then the Contractor shall pay to the Employer the relevant sum stated in the Appendix to Tender (Appendix - B) as liquidated damages for such default and not as a penalty (which sum shall be the only monies due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant Time for Completion and the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, subject to the applicable limit stated in the Appendix to Tender (Annexure - B). The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the contract.

47.2 Reduction of Liquidated Damages

If, before the Time for Completion of the whole of the Works or, if applicable, any Section, a Taking-Over Certificate has been issued for any part of the Works or of a Section, the liquidated damages for delay in completion of the reminder of the Works or of that Section shall, for any period of delay after date stated in such Taking-Over Certificate, and in the absence of alternative provisions in the

Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The Provisions of this Sub-Clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.

48.1 Taking-Over Certificate

When the whole of the Works have been substantially completed and have satisfactorily passed any Tests on Completion prescribed by the Contract, the Contractor may give a notice to that effect to the Engineer, accompanied by a written undertaking to finish with due expedition any outstanding work during the Defects Liability Period. Such notice and undertaking shall be deemed to be a request by the Contractor for the Engineer to issue a Taking-Over Certificate in respect of the Works. The Engineer shall, within 21 days of the date of delivery of such notice, either issue to the Contractor, a Taking-Over Certificate, stating the date on which, in his opinion, the Works were substantially completed in accordance with the Contract, or give instructions in writing to the Contractor specifying all the work which in the Engineer's opinion, is required to be done by the Contractor before the issue of such Certificate. The Engineer shall also notify the Contractor of any defects in the Works affecting substantial completion that may appear after such instructions and before completion of the Works specified therein. The Contractor shall be entitled to receive such Taking-Over Certificate within 21 days of completion, to the satisfaction of the Engineer, of the Works so specified and remedying any defects so notified.

48.2 Taking-Over of Sections or Parts

Similarly, in accordance with the procedure set out in Sub-Clause 48.1, the Contractor may request and the Engineer shall issue a Taking-Over Certificate in respect of :

- (a) any Section in respect of which a separate Time for Completion is provided in the Appendix to Tender, or
- (b) any substantial part of the Permanent Works which has been both completed to the satisfaction of the Engineer and, otherwise than as provided for in the Contract, occupied or used by the Employer, or
- (c) any part of the Permanent Works which the Employer has elected to occupy or use prior to completion (where such prior occupation or use is not provided for in the Contract or has not been agreed by the Contractor as a temporary measure).

48.3 Substantial Completion of Parts

If any part of the Permanent Works has been substantially completed and has

satisfactorily passed any Tests on Completion prescribed by the Contract, the engineer may issue a Taking-Over Certificate in respect of that part of the Permanent Works before completion of the whole of the Works and , upon the issue of such Certificate, the Contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in that part of the permanent Works during the Defects Liability Period.

48.4 Surfaces Requiring Reinstatement

Provided that a Taking-Over Certificate given in respect of any Section or part of the Permanent Works before completion of the whole of the Works shall not be deemed to certify completion of any ground or surfaces requiring reinstatement, unless such Taking- Over certificate shall expressly so state.

If the Contractor is prevented from carrying out the Tests on Completion by a cause for which the employer or the Engineer or other contractors employed by the Employer are responsible, the employer shall subject to clause 7.2 (b) be deemed to have taken over the Works on the date when the Tests on Completion would have been completed but for such prevention. The Engineer shall issue a Taking-Over Certificate accordingly. Provided always that the Works shall not be deemed to have be taken over if they are not substantially in accordance with the Contract.

If the Works are taken over under this Sub-Clause the Contractor shall nevertheless carry out the Tests on Completion during the Defects Liability Period. The Engineer shall require the Tests to be carried out by giving 14 days notice.

DEFECTS LIABILITY

49.1 Defects Liability Period

In these Conditions the expression "Defects Liability Period" shall mean the defects liability period named in the Appendix to Tender, calculated from:

- (a) the date of completion of the Works certified by the Engineer in accordance with Clause 48.1 to 48.4 or clause 63.1; or
- (b) in the event of more than one certificate having been issued by the Engineer under Clause 48.1 to 48.4, the respective dates so certified.

49.2 Completion of Outstanding Work and Remedying Defects

To the intent that the Works shall, at or as soon as practicable after the expiration of the Defects Liability Period, be delivered to the Employer in the condition required by the Contract, fair wear and tear excepted, to the satisfaction of the Engineer, the Contractor shall:

- (a) complete the work, if any, outstanding on the date stated in Taking-Over Certificate as soon as practicable after such date and
- (b) execute all such work of amendment, reconstruction , and remedying defects, shrinkages or other faults as the Engineer may, during the Defects Liability Period or within 14 days after its expiration, as a result of an inspection made by or on behalf of the Engineer prior to its expiration, instruct the Contractor to execute.

49.3 Cost of Remedying Defects

All work referred to in Sub-Clause 49.2 (b) shall be executed by the Contractor at his own cost if the necessity thereof is, in the opinion of the engineer, due to:

- (a) the use of materials, Plant or workmanship not in accordance with the Contract, or
- (b) where the Contractor is responsible for the design of part of the Permanent Works, any fault in such design, or
- (c) the neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract.

If, in the opinion of the Engineer, such necessity is due to any other cause, he shall determine an addition to the Contract Price in accordance with Clause 52.1 to 52.4 and shall notify the Contractor accordingly, with a copy to the Consultant.

49.4 Contractor's Failure to Carry out Instructions

In case of default on the part of the Contractor in carrying out such instruction within a reasonable time, the consultant shall be entitled to employ and pay other persons to carry out the same and if such work, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the Contract, then all costs consequent thereon or incidental thereto shall, after due consultation with the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly.

The Provisions of this Clause shall apply to all replacements or renewals of Plant carried out by the Contractor to remedy defects and damages as if the replacements and renewals had been taken over on the date they were completed.

The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works cannot be used by reason of a defect or damage. If only part of the Works is affected the Defects Liability Period shall be extended only for that part. In neither case shall the Defects Liability Period

extend beyond 2 years from the date of taking over.

When the progress in respect of Plant has been suspended under clause 40.1 to 40.3, the Contractor's obligations under this Clause shall not apply to any defects occurring more than one year after the Time for Completion established on the date of the Letter of Acceptance.

50.1 Contractor to Search

If any defects, shrinkage or other fault in the Works appears at any time prior to the end of the Defects Liability Period, the Engineer may instruct the Contractor, to search under the directions of the Engineer for the cause thereof. Unless such defect, shrinkage or other fault is one for which the Contractor is liable under the Contract, the Engineer shall, after due consultation with the Contractor, determine the amount in respect of the costs of such search incurred by the Contractor, which shall be added to the Contract Price and shall notify the Contractor accordingly. If such defect, shrinkage or other fault is one for which the Contractor is liable, the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case remedy such defect, shrinkage or other fault at his own cost in accordance with the provisions of Clause 49.1 to 49.4.

ALTERATIONS, ADDITIONS AND OMISSIONS

51.1 Variations

The Engineer shall make any variation of the form, or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

- (a) increase or decrease the quantity of any work included in the Contract,
- (b) change the character or quality or kind of any such work.
- (c) change the levels, lines, position and dimensions of any part of the Works,
- (d) execute additional work of any kind necessary for the completion of the Works
- (e) change any specified sequence or timing of construction of any part of the Works.

No such variation shall in any way vitiate or invalidate the Contract, but the effect, if any, of all such variations shall be valued in accordance with Clause 52.1 to 52.4. Provided that where the issue of an instruction to vary the Works is

necessitated by some default of or breach of contract by the contractor or for which he is responsible, any additional cost attributable to such default shall be borne by the contractor.

51.2 Instructions for Variations

The Contractor shall not make any such variation without an instruction of the Engineer. Provided that no instruction shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an instruction given under this Clause, but is the result of the quantities exceeding or being less than those stated in the Bill of Quantities as per approved drawings issued for construction.

52.1 Valuation of Variations

All variations referred to in Clause 51.1 to 51.2 and any additions to the Contract Price which are required to be determined in accordance with Clause 52.1 to 52.4 (for the purposes of this Clause referred to as "varied works"), shall be valued at the rates and prices set out in the Contract if, in the opinion of the Engineer, the same shall be applicable. If the contract does not contain any rates or prices applicable to the varied work, the rates and prices in the Contract shall be used as the basis for valuation so far as may be reasonable, failing which, after due consultation by the Engineer with the Contractor, suitable rates or prices shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such rates or prices as are, in his opinion, appropriate based on CPWD norms and shall notify the Contractor accordingly. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payments to be included in certificates issued in accordance with Clause 60.1 to 60.14.

52.2 Power of Engineer to Fix Rates

Provided that if the nature or amount of any varied work relative to the nature or amount of the whole of the Works or to any part thereof, is such that, in the opinion of the Engineer, the rate or price contained in the Contract for any item of the Works is, by reason of such varied work, rendered inappropriate or inapplicable, then after due consultation by the Engineer with the Contractor, a suitable rate or price shall be agreed upon between the Engineer and the Contractor. In the event of disagreement the Engineer shall fix such other rate or price as is, in his opinion, appropriate and shall notify the Contractor accordingly. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payments to be included in certificates issued in accordance with Clause 60.1 to 60.14.

The quoted rates for all the items shall be firm, fixed and binding on the contractor irrespective of any variation of quantities stated in the contract upto $\pm 25\%$ variation of the contract value as a whole. In case the contract value varies beyond $\pm 25\%$, the item rates of only those items whose individual quantities vary beyond $\pm 20\%$ of the quantities mentioned in the contract shall be considered for change in rates. The rates of such items shall be worked out on the basis of market rate analysis and only

applicable to the quantities beyond $\pm 20\%$. In the event of disagreement between the Engineer and the Contractor on these rates, the Engineer shall fix such rates and prices as are in his opinion appropriate and shall notify the Contractor accordingly. Provided also that no varied work instructed to be done by the Engineer pursuant to Clause 51.1 to 51.2 shall be valued under Sub-Clause 52.1, or under this Sub-Clause unless, within 14 days of the date of such instruction and, other than in the case of omitted work, before the commencement of the varied work, notice shall have been given either:

- (a) by the Contractor to the Engineer of his intention to claim extra payment or a varied rate or price, or
- (b) by the Engineer to the Contractor of his intention to vary a rate or price.

52.3 Variations Exceeding 25 percent

If, on the issue of the Taking-Over Certificate for the whole of the Works, it is found that as a result of:

- (a) all varied work valued under Sub-Clause 52.1 and 52.2, and
- (b) all adjustments upon measurement of the estimated quantities set out in the Bill of Quantities, excluding Provisional Sums, dayworks and adjustments of price made under Clause 70.1 to 70.3,

but not from any other cause, there have been additions to or deductions from the Contract Price which taken together are in excess of 25 percent of the "Effective Contract Price" (which for the purposes of this Sub-Clause shall mean the Contract Price, excluding Provisional Sums and allowance for day works, if any) then and in such event (subject to any action already taken under any other Sub-Clause of this Clause), after due consultation by the Engineer with the Employer and the Contractor, there shall be added to or deducted from the Contract Price such further sum as may be agreed between the Contractor and the Engineer or, failing agreement, determined by the Engineer as being fair and reasonable having regard to the Contractor's Site and general overhead costs of the Contract. The Engineer shall notify the Contractor of any determination made under this Sub-Clause. Such sum shall be based only on the amount by which such additions or deductions shall be in excess of 25 per cent of the Effective Contract Price.

52.4 Daywork

The Engineer may, if in his opinion it is necessary or desirable, issue an instruction that any varied work shall be executed on a daywork basis. The Contractor shall then be paid for such varied work under the terms set out in the daywork schedule included in the Contract and at the rates and prices affixed thereto by him in the Tender.

The Contractor shall furnish to the Engineer such receipts or other vouchers as may be necessary to prove the amounts paid and, before ordering materials, shall submit to the Engineer quotations for the same for his approval.

In respect of such of the Works executed on a daywork basis, the Contractor shall, during the continuance of such work, deliver each day to the Engineer an exact list in duplicate of the names, occupation and time of all workmen employed on such work and a statement, also in duplicate, showing the description and quantity of all materials and Contractor's Equipment used thereon or therefor other than Contractor's Equipment which is included in the percentage addition in accordance with such daywork schedule. One copy of each list and statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor.

At the end of each month the Contractor shall deliver to the Engineer a priced statement of the labour, materials and Contractor's Equipment, except as aforesaid, used and the Contractor shall not be entitled to any payment unless such lists and statements have been fully and punctually rendered. Provided always that if the Engineer considers that for any reason the sending of such lists or statements by the Contractor, in accordance with the foregoing provision, was impracticable he shall nevertheless be entitled to authorise payment for such work, either as daywork, or being satisfied as to the time employed and the labour, materials and Contractor's Equipment used on such work, or at such value therefore as shall, in his opinion, be fair and reasonable.

PROCEDURE FOR CLAIMS

53.1 Notice of Claims

Notwithstanding any other provision of the Contract, if the Contractor intends to claim any additional payment pursuant to any clause of these Conditions or otherwise, he shall give notice of his intention to the Engineer, within 28 days after the event giving rise to the claim has first arisen.

53.2 Contemporary Records

Upon the happening of the event referred to in Sub-Clause 53.1, the Contractor shall keep such contemporary records as may reasonable be necessary to support any claim he may subsequently wish to make. Without necessarily admitting the Employer's liability, the Engineer shall, on receipt of a notice under Sub-Clause 53.1, inspect such contemporary records and may instruct the Contractor to keep any further contemporary records as are reasonable and may be material to the claim of which notice has been given. The Contractor shall permit the Engineer to inspect all records kept pursuant to this Sub-Clause and shall supply him with

copies thereof as and when the Engineer so instructs.

53.3 Substantiation of Claims

Within 28 days, or such other reasonable time as may be agreed by the Engineer, of giving notice under Sub-Clause 53.1, the Contractor shall send to the Engineer an account giving detailed particulars of the amount claimed and the grounds upon which the claim is based. Where the event giving rise to the claim has a continuing effect, such account shall be considered to be an interim account and the Contractor shall, at such intervals as the Engineer may reasonable require, send further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. In cases where interim accounts are sent to the Engineer, the Contractor shall send a final account within 28 days of the end of the effect resulting from the event. The Contractor shall, if required by the Engineer so to do, copy to the Employer all accounts sent to the Engineer pursuant to this Sub- Clause.

53.4 Failure to Comply

If the Contractor fails to comply with any of the provisions of this Clause in respect of any claim which he seeks to make, his entitlement to payment in respect thereof shall not exceed such amount as the Engineer or any arbitrator or arbitrators appointed pursuant to Sub-Clause 67.3 assessing the claim considers to be verified by contemporary records (whether or not such records were brought to the Engineer's notice as required under Sub-Clause 53.2 and 53.3).

53.5 Payment of Claims

The Contractor shall be entitled to have included in any interim payment certified by the Engineer pursuant to Clause 60.1 to 60.14 such amount in respect of any claim as the Engineer, after due consultation with the Contractor, may consider due to the Contractor provide that the Contractor has supplied sufficient particulars to enable the Engineer to determine the amount due. If such particulars are insufficient particulars to substantiate the whole of the claim, the Contractor shall be entitled to payment in respect of such part of the claim as such particulars may substantiate to the satisfaction of the Engineer. The Engineer shall notify the Contractor for any determination made under this Sub-Clause.

CONTRACTOR'S EQUIPMENT, TEMPORARY WORKS AND MATERIALS

54.1 Contractor's Equipment, Temporary Works and Materials, Exclusive use for the Works

All Contractor's Equipment Temporary Works and materials by the Contractor shall when brought on to the site, be deemed to be exclusively intended for the execution of the works and the contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the Site to another,

without the consent of the Engineer provided that consent shall not be required for vehicles engaged in transporting any staff labour, contractor's equipment, temporary works, plant or materials to or from the site.

54.2 Employer Not Liable for Damage

The Employer shall not at any time be liable, save as mentioned in Clauses 20.1 to 20.4 and 65.1 to 65.8, for the loss of or damage to any of the said Contractor's Equipment, Temporary Works or materials.

54.3 Customs Clearance

The Employer will use his best endeavours in assisting the Contractor, where required, in obtaining clearance through the Customs of Contractor's Equipment, materials and other things required for the Works. But the ultimate responsibility for getting any required customs clearance shall be of the contractor.

54.4 Re-export of Contractor's Equipment

In respect of any Contractor's Equipment which the Contractor has imported for the purposes of the Works, the Employer will use his best endeavours to assist the Contractor, where required, in procuring any necessary Government consent to the re-export of such Contractor's Equipment by the Contractor upon the removal thereof pursuant to the terms of the Contract.

54.5 Conditions of Hire Contractor's Equipment

With a view to securing, in the event of termination under Clause 63.1 to 63.4, the continued availability, for the purpose of executing the Works, of any hired Contractor's Equipment, the Contractor shall not bring on to the Site any hired Contractor's Equipment unless there is an agreement for the hire thereof (which agreement shall be deemed not to include an agreement for hire purchase) which contains a provision that the owner thereof will, on request in writing made by the Employer within 7 days after the date on which any termination has become effective, and on the Employer undertaking to pay all hire charges in respect thereof from such date, hire such Contractor's Equipment to the Employer on the same terms in all respects as the same was hired to the Contractor save that the Employer shall be entitled to permit the use thereof by any other contractor employed by him for the purpose of execution and completion the Works and remedying any defects therein, under the terms of the said Clause 63.1 to 63.4 .

54.6 Costs for the Purpose of Clause - 63.1 to 63.4

In the event of the employer entering into any agreement for the hire of contractor's equipment pursuant to Sub-Clause 54.5, all sums properly paid by the employer under the provisions of any such agreement and all costs incurred by him (Including stamps duties) in entering into such agreement shall be deemed,

for the purpose of clause 63.1 to 63.4, to be part of the cost of executing and completing the works and the remedying of any defects therein.

54.7 Corporation of Clause in Sub-contracts

The contractor shall, where entering into any subcontract for execution of any part of the works, incorporate in such subcontract (by reference or other wise) the provisions of this Clause in relation to Contractor's Equipment, Temporary Works or Materials brought on to the Site by the Subcontractor.

54.8 Approval of Material not Implied

The operation of this clause shall not be deemed to imply any approval by the engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any materials at any time by the Engineer.

MEASUREMENT

55.1 Quantities

The quantities set out in the Bill of Quantities are the estimated quantities for the Works, and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfilment of his obligations under the Contract.

56.1 Works to be Measured

The Engineer shall, except as otherwise stated, ascertain and determine by measurement the value of the works in accordance with the Contract and the Contractor shall be paid that value in accordance with clause 60.1 to 60.14. The Engineer shall, when he requires any part of the Works to be measured, give reasonable notice to the Contractor's agent, who shall:

- (a) forthwith attend or send a qualified representative to assist the Engineer in making such measurement, and
- (b) supply all particulars required by the Engineer

Should the Contractor not attend, or neglect or omit to send such representative, then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of such part of the Works. For the purpose of measuring such Permanent Works as are to be measured by records and drawings, the Engineer shall prepare records and drawings as the work proceeds and the Contractor, as and when called upon to do so in writing, shall, within 14 days, attend to examine and agree such records and drawings with the Engineer and shall sign the

same when so agreed. If the Contractor does not attend to examine such records and drawings and the Contractor does not agree such records and drawings, they shall be taken to be Correct. If, after examination of such records and drawings, the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor, within 14 days of such examination, lodges with the Engineer notice of the respects in which such records and drawings are claimed by him to be incorrect. On receipt of such notice, the Engineer shall review the records and drawings and either confirm or vary them.

57.1 Method of Measurement

The Works shall be measured net in units as indicated in the Bill of Quantities against each item, notwithstanding any general or local custom, except where otherwise provided for in the Contract.

57.2 Breakdown of Lumpsum Items

For the purposes of statements submitted in accordance with Sub-Clause 60.1, the Contractor shall submit to the Engineer, within 28 days after the receipt of the Letter of Acceptance, a breakdown for each of the lump sum items contained in the Tender. Such breakdowns shall subject to the approval of the Engineer.

PROVISIONAL SUMS

58.1 Definition of "Provisional Sum"

"Provisional Sums" means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the Works or for the supply of goods, materials, Plant or services, or for contingencies, which sum may be used, in whole or in part, or not at all, on the instruction of the Engineer. The Contractor shall be entitled to only such amounts in respect of the work, supply or contingencies to which such Provisional Sums relate as the Engineer shall determine in accordance with the Clause. The Engineer shall notify the Contractor of any determination made under this Sub-clause.

58.2 Use of Provisional Sums

In respect of every Provisional Sum the Engineer shall have authority to issue instructions for the execution of works or for the supply of goods, materials, Plant or services by :

- (a) the Contractor, in which case the Contractor shall be entitled to an amount equal to the value thereof determined in accordance with Clause 52.1 to 52.4.

- (b) a nominated Subcontractor, as hereinafter defined, in which case the sum to be paid to the Contractor therefor shall be determined and paid in accordance with Sub-Clause 59.4

58.3 Production of Vouchers

The Contractor shall produce to the Engineer all quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of Provisional Sums, except where work is valued in accordance with rates or prices set out in the Tender.

NOMINATED SUBCONTRACTORS

59.1 Definition of "Nominated Subcontractors"

All specialists, merchants, tradesmen and others executing any work or supplying any goods, materials, Plant or services for which Provisional Sums are included in the Contract, who may have been or be nominated or selected or approved by the Engineer, and all persons to whom by virtue of the provisions of the Contract the Contractor is required to subcontract shall, in the execution of such work or the supply of such goods, materials, Plant or services, be deemed to be subcontractors to the Contractor and are referred to in the Contract as "nominated Subcontractors".

59.2 Nominated Subcontractors; Objection to Nomination

The Contractor shall not be required by the Employer or the Engineer, or be deemed to be under any obligation, to employ any nominated Subcontractor against whom the Contractor may raise reasonable objection, or who declines to enter into a subcontract with the Contractor containing provision:

- (a) that in respect of work, goods, materials, Plant or services the subject of the subcontract, the nominated Subcontractor will undertake towards the Contractor such obligations and liabilities as will enable the Contractor to discharge his own obligations and liabilities towards the Employer under the terms of the Contract and will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection therewith, or arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities; and
- (b) that the nominated Subcontractor will save harmless and indemnify the Contractor from and against any negligence by the nominated Subcontractor, his agents, workmen and servants and from and against any misuse by him or them of any Temporary Works provided by the Contractor for the Purpose of the Contract and from all claims as

aforesaid; and

- (c) approved by the Engineer.

59.3 Design Requirements to be Expressly Stated

If in connection with any Provisional Sums the services to be provided include any matter of design or specification of any part of the Permanent Works or of any Plant to be incorporated therein, such requirement shall be expressly stated in the Contract and shall be included in any nominated Subcontract. The nominated Subcontract shall specify that the nominated Subcontractor providing such services will save harmless and indemnify the Contractor from and against the same and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising out of or in connection with any failure to perform such obligations or to fulfil such liabilities.

59.4 Payments to Nominated Subcontractors

For all work executed or goods, material, Plant or services supplied by any nominated Subcontractor, the contractor shall be entitled to :

- (a) the actual price paid or due to be paid by the Contractor, on the instructions of the Engineer, and in accordance with the Subcontract;
- (b) in respect of labour supplied by the Contractor, the sum if any, entered in the Bill of Quantities or, if instructed by the Engineer pursuant to paragraph (a) of Sub-clause 58.2, as may be determined in accordance with Clause 52.1 to 52.4;
- (c) in respect of all other charges and profit, a sum being a percentage rate of the actual price paid or due to be paid calculated, where provisions has been made in the Bill of Qualities for a rate to be set against the relevant Provisional Sum, at the rate inserted by the Contractor against that item or, where no such provision has been made, at the rate inserted by the Contractor in the Appendix to Tender and repeated where provision for such is made in a special item provided in the Bill of Quantities for such purpose.

59.5 Certificates of Payments to Nominated Subcontractors

Before issuing, under Clause 60.1 to 60.14, any certificate, which includes any payment in respect of work done or goods, materials, Plants or services supplied by any nominated Subcontractor, the Engineer shall be entitled to demand from the Contractor reasonable proof that all payments, less retentions, included in previous certificates in respect of the work or goods, materials, Plant or services of such nominated Subcontractor have been paid or discharged by the Contractor.

If the Contractor fails to supply such proof then, unless the Contractor :

- (a) satisfies the Engineer in writing that he has reasonable cause for withholding or refusing to make such payments and
- (b) produces to the Engineer reasonable proof that he has so informed such nominated Subcontractor in writing,

the Employer shall be entitled to pay to such nominated Subcontractor direct, upon the certificate of the Engineer, all payments, less retentions, provided for in the nominated Subcontractor and to deduct by way of set-off the amount so paid by the Employer from any sums due or to become due from the Employer to the Contractor.

Provided that, where the Engineer has certified and the Employer has paid direct as aforesaid, the Engineer shall, in issuing any further certificate in favour of the Contractor, deduct from the amount so paid, direct as aforesaid, but shall not withhold or delay the issue of the certificate itself when due to be issued under the terms of the Contract.

CERTIFICATES AND PAYMENTS

60.1 Monthly Statements

The Contractor shall submit a statement in 3 copies to the Engineer by 7th day of each month for the work executed up to the end of previous month in a tabulated form approved by the Engineer, showing the amounts to which the Contractor considers himself to be entitled. the statement shall include the following items, as applicable, which shall be taken into account in the sequence listed:

- (a) The estimated contract value of the Temporary and Permanent Works executed up to the end of the month in question, at base unit rates and prices.
- (b) The actual value certified for payment for the Temporary and Permanent Works executed up to the end of the previous month, at base unit rates and prices.
- (c) The estimated contract value at base unit rates and prices of the Temporary and Permanent Works for the month in question, obtained by deducting (b) from (a);
- (d) The value of any variations executed up to the end of the month in question, less the amount certified in the previous Interim Payment Certificate, pursuant to Clause 52.1 to 52.4;
- (e) Amounts approved in respect of Daywork executed up to the end of the

month in question, less the amount for Daywork certified in the previous Interim Payment Certificate determined from the Day work Schedule of the Bill of Quantities.

- (f) Amounts reflecting changes in cost and legislation, pursuant to Clause 70.1 to 70.3.
- (g) Any credit or debit for the month in question in respect of materials and Plant for the Permanent Works, under the conditions set forth in Sub-Clause 60.3;
- (h) Any amount to be withheld under the retention provisions of Sub-Clause 60.5, determined by applying the percentage set forth in Sub-Clause 60.5 to the amounts due under paragraphs 60.1(c), (e), (f) and (g);
- (i) Any amounts to be deducted as repayment of the Advance under the provisions of sub-Clause 60.7; and
- (j) Any other sum, to which the Contractor may be entitled under the contract.
- (k) Deleted
- (l) The amount to be deducted towards the advance income tax shall be at the rate of two percent alongwith prevailing education cess thereon and the advance works contract tax at the rate of nil percent or as per the statutory requirements in this regard.

60.2 Monthly Payments

The said statement shall be approved / amended by the Engineer in such a way that, in his opinion, it reflects the amounts due to the Contractor in accordance with the Contract, after deduction, other than pursuant to Clause 47.1 to 47.2, of any sums which may have become due and payable by the Contractor to the Employer. In cases where there is a difference of opinion as to the value of any item, the Engineer's view shall prevail. Within the 7th day of the month following the receipt of the monthly statement referred to in Sub-Clause 60.1, the Engineer shall determine the amounts due to the Contractor and shall issue to the Contractor a certificate herein called "Interim Payment Certificate", certifying the amounts due to the contractor.

Notwithstanding the terms of this Clause or any other Clause of the Contract, no amount will be certified by the Engineer for payment until the performance security has been provided by the Contractor and approved by the consultant.

60.3 Materials and Plant for the Permanent Works

With respect to materials and Plant brought by the Contractor to the Site for

incorporation in the Permanent Works, the Contractor shall (i) receive a credit in the month in which these materials and Plant are brought to the site and (ii) be charged a debit in the month in which they are incorporated in the Permanent Works, both such credit and debit to be determined by the engineer in accordance with the following provisions:

- (a) no credit shall be given unless the following conditions shall have been met to the Engineer's satisfaction:
 - i) the materials and Plant are in accordance with specifications for the Works;
 - ii) the materials and Plant have been delivered to the Site and are properly stored and protected against loss, damage or deterioration;
 - iii) the Contractor's records of the requirements, order, receipts and use of materials and Plant are kept in a form approved by the engineer, and such records are available for inspection by the Engineer.
 - iv) the Contractor has submitted a statement of his cost of acquiring and delivering the materials and Plant to the site, together with such documents as may be required for the purpose of evidencing such cost; and
- (b) the amount to be credited to the Contractor shall be equivalent of 75 percent of the Contractor's reasonable cost of the materials and Plant delivered to the Site, as determined by the Engineer after review of the documents listed in paragraph (a) (iv) above, as determined by the Engineer;
- (c) the amount to be debited to the Contractor for any materials and Plant incorporated into the Permanent Works shall be equivalent to the credit previously granted to the contractor for such materials and Plant pursuant to Sub-Clause(b) above, as determined by the Engineer.

60.4 Place of Payments

Payments to the Contractor by the consultant shall be made in Indian Rupees into a bank account or accounts nominated by the Contractor or by account payee cheque.

60.5 Retention Money

A retention amounting to 10 (Ten) percent of the amounts, determined in accordance with the procedure set out in Sub-Clause 60.1 (h) shall be made by the Engineer in the first and following Interim Payment Certificates, until the amount so retained reaches a limit of retention money (5% of Contract Price) as stated in

the Appendix to Tender (Annexure - B).

60.6 Payment of Retention Money

- (a) Upon the issue of the Taking-Over Certificate with respect to the whole of the Works, one half of the Retention Money, or upon the issue of a Taking-Over Certificate with respect to a Section or part of the Permanent Works only such proportion thereof as the Engineer determines having regard to the relative value of such Section or part of the Permanent Works, shall be certified by the Engineer for payment to the Contractor.
- (b) upon the expiration of the Defects Liability Period for the Works the other half of the Retention Money shall be certified by the Engineer for payment to the Contractor. Provided that, in the event of different Defects Liability Periods having become applicable to different Sections or parts of the Permanent Works pursuant to Clause 48.1 to 48.4, the expression "expiration of the Defects Liability period" shall, for the purposes of this Sub-Clause, be deemed to mean the expiration of the latest of such periods. Provided also that if at such time, there shall remain to be executed by the Contractor any work ordered, pursuant to Clauses 49.1 to 49.4. and 50.1, in respect of the Works, the Engineer shall be entitled to withhold certification until completion of such work of so much of the balance of the Retention Money as shall, in the opinion of the Engineer, represent the cost of the work remaining to be executed.

60.7 Payment of Mobilization advance

Deleted

60.8 Time of Payment

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other term of the Contract, shall, subject to Clause 47.1 to 47.2, be paid by the Employer to the Contractor within 30 days after the Contractor's monthly statement has been submitted to the Engineer for certification or, in the case of the Final Certificate pursuant to Sub-Clause 60.13, within 120 days after the agreed Final Statement and written discharge have been submitted to the Engineer for certification.

60.9 Correction of Certificates

The Engineer may by any Interim Payment Certificate make any correction or modification in any previous Interim payment Certificate which has been issued by him, and shall have authority, if any work is not being carried out to his satisfaction, to omit or reduce the value of such work in any Interim Payment Certificate.

60.10 Statement of Completion

Not later than 84 days after the issue of the Taking-Over Certificate in respect of the whole of the Works, the Contractor shall submit to the Engineer a Statement of Completion with supporting documents showing in detail, in the form approved by the Engineer.

- (a) the final value of all work done in accordance with the Contract up to the date stated in such Taking-Over Certificate;
- (b) any further sums which the Contractor considers to be due; and
- (c) an estimate of amounts which the Contractor considers will become due to him under the Contract.

Estimated amounts shall be shown separately in such Statement at Completion. The Engineer shall certify payment in accordance with Sub-Clause 60.2 as if the statement of completion were a statement submitted by the contractor under clause 60.1.

60.11 Final Statement

Not later than 56 days after the issue of the Defects Liability Certificate pursuant to Sub-Clause 62.1, the Contractor shall submit to the Engineer for consideration a draft final statement with supporting documents showing in detail, in the form approved by the Engineer.

- (a) the value of all work done in accordance with the Contract; and
- (b) any further sums which the Contractor considers to be due to him under the Contract.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed (for the purposes of these Conditions referred to as the "Final Statement").

If, following discussions between the Engineer and the Contractor and any changes to the draft final statement which may be agreed between them, it becomes evident that a dispute exists, the engineer shall issue an Interim Payment Certificate for those parts of the draft final statement which are not in dispute. The dispute shall then be settled in accordance with Clause 67.1 to 67.4. The Final Statement shall be agreed upon settlement of the dispute.

60.12 Discharge

Upon submission of the Final Statement, the Contractor shall give to the

Employer, with a copy to the Engineer, a written discharge confirming that the total of the Final Statement represents full and final settlement of all monies due to the Contractor arising out of or in respect of the contract. Provided that such discharge shall become effective only after payment due under the Final Certificate issued pursuant to Sub-Clause 60.13 has been made and the performance security referred to in Sub- Clause 10.1 has been returned to the Contractor.

60.13 Final Certificate

Within 28 days after receipt of the Final Statement, and the written discharge, the Engineer shall issue to the employer (with a copy to the Contractor) a Final Certificate stating:

- (a) the amount which, in the opinion of the Engineer, is finally due under the Contract, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled under the Contract, other than Clause 47.1 to 47.2, the balance, if any, due from the Employer to the Contractor or from the Contractor to the Employer as the case may be.

60.14 Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract or execution of the Works, unless the Contractor shall have included a claim in respect thereof in his Final Statement and (except in respect of matters of things arising after the issue of the Taking-Over Certificate in respect of the whole of the Works) in the Statement at Completion referred to in Sub- Clause 60.10.

61.1 Defects Liability Certificate

The Contract shall not be considered as completed until a Defects Liability Certificate shall have been signed by the Engineer and delivered to the Employer, with a copy to the Contractor, stating the date on which the Contractor shall have completed his obligations to execute and complete Works and remedy any defects therein to the Engineer's satisfaction. The Defects Liability Certificate shall be given by the Engineer within 28 days after the expiration of the Defects Liability Period, or, if different defects liability periods shall become applicable to different sections or part of the Permanent Works, the expiration of the latest such period, or as soon thereafter as any works instructed, pursuant to Clause 49.1 to 49.4 and 50.1, have been completed to the satisfaction of the Engineer. Provided that the issue of the Defects Liability Certificate shall not be condition precedent to payment to the Contractor of the second portion of the Retention Money in accordance with the conditions set out in Sub-Clause 60.3.

62.1 Unfulfilled Obligations

Notwithstanding the issue of the Defects Liability Certificate the Contractor and the Employer shall remain liable for the fulfilment of any obligation incurred under the provisions of the Contract prior to the issue of the Defects Liability Certificate which remains unperformed at the time such Defects Liability Certificate is issued and, for the purpose of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force between the parties to the Contract.

REMEDIES

63.1 Default of Contractor

If the Contractor is deemed by law unable to pay his debts as they fall due, or enters in to voluntary or involuntary bankrupt, liquidation or dissolution (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), or become insolvent, or makes an arrangement with, or assignment in favour of, his creditors or agrees to carry out the Contract under a committee of inspection of his creditors, or if a receiver, administrator, trustee or liquidator is appointed over any substantial part of his assets, or if, under any law or regulation relating to reorganisation, arrangement or readjustment of debts proceedings are, commenced against the Contractor or resolution passed in connection with dissolution or liquidation or, if any, step are taken to enforce any security interest over a substantial part of the assets of the Contractor, or if, any act is done or event occurs with respect to the Contractor or his assets which under any applicable law has a substantially similar effect to any of the foregoing acts or events, or if the Contractor has contravened Sub-Clause 3.1, or has an execution levied on his goods, or if the Engineer certifies to the Employer, with a copy to the Contractor, that, in his opinion the contractor

- (a) has repudiated the Contract, or
- (b) without reasonable excuse has failed
 - (i) to commence the work in accordance with Sub-Clause 41.1, or
 - (ii) to proceed with the Works, or any section thereof, within 28 days after receiving notice to pursuant to Sub-Clause 46.1, or
- (c) has failed to comply with a notice issued pursuant to Sub-Clause 37.4, or an instruction issued pursuant to Sub-Clause 39.1 within 28 days after receiving it, or
- (d) despite previous warning from the Engineer, in writing, is otherwise persistently or flagrantly neglecting to comply with any of the obligation under the Contract, or
- (e) has contravened Sub-clause 4.1 :

then for the avoidance of doubt the contractor shall be in default of its obligations under this contract and furthermore the Employer may, after giving fourteen days' notice to the Contractor, enter upon the Site and expel the Contractor there from without thereby voiding the Contract, or releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and powers conferred on the employer or the Engineer by the Contract, and may himself complete the Works or may employ any other contractor to complete the Works. The Engineer shall certify such completion so as to give effect to clauses 49.1(a) and 63.3. The Employer or such other contractor may use for such completion so much of the Contractor's Equipment, Plant, Temporary Works and materials which have been deemed to be reserved exclusively for the execution of the Works, under provisions of the Contract, as he or they may think proper, and the Employer may, at any time, sell any of the said Contractor's Equipment, Temporary Works and unused Plant and materials and apply the proceeds of sale in or towards the satisfaction of any sums due or which may become due to him from the Contractor under the Contract.

63.2 Valuation at Date of Expulsion

The Engineer, as soon as may be practicable after any such entry and expulsion by the Employer, shall fix and determine ex parte, or by or after reference to the parties or after such investigation or enquiries as he may think fit to make or institute, and shall certify :

- (a) what amount (if any) had, at the time of such entry and expulsion, been reasonably earned by or would reasonably accrue to the Contractor in respect of work then actually done by him under the Contract, and
- (b) the value of any of the said unused or partially used materials, any Contractor's Equipment and any Temporary Works.

63.3 Payments after Expulsion

If the Employer shall enter upon the site and expel the Contractor therefrom under Clause 63.1, he shall not be liable to pay to the Contractor any further amount (including damages) in respect of the Contract until the expiration of the Defects Liability Period and thereafter until the costs of execution completion and remedying of any defects, damages for delay in completion (if any) and all other expenses incurred by the Engineer have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum (if any) as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount exceeds the sum which would have been payable to the Contractor on due completion by him, then the Contractor shall, upon demand, pay to the Employer the amount of such excess and it shall be deemed a debt due by the Contractor to the Employer and shall be recoverable accordingly.

63.4 Assignment of Benefit of Agreement

Unless prohibited by law, the Contractor shall, if so instructed by the Engineer within 14 days of such entry and expulsion referred to in Sub-Clause 63.1, assign to the Employer the benefit of any agreement for the supply of any goods or materials or services and/or for the execution of any work for the purpose of the Contract, which the Contractor may have entered into.

64.1 Urgent Remedial Works

If, by reason of any accident, or failure, or other event occurring to or in connection with the Works, or any part thereof, either during the execution of the Works, or during the Defects Liability Period, any remedial or other work is, in the opinion of the Engineer, urgently necessary for the safety or progress of the Works and the Contractor is unable or unwilling at once to do such work, the Employer shall be entitled to employ and pay other person to carry out such work as the Engineer may consider necessary. If the work or repair so done by the Employer is work which, in the opinion of the Engineer, the Contractor was liable to do at his own cost under the contract, then all costs consequent thereon or incidental thereto shall after due consultation with the Contractor, be determined by the Engineer and shall be recoverable from the Contractor by the Engineer, and may be deducted by the employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly. Provided that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable notify the Contractor thereof.

SPECIAL RISKS

65.1 No Liability for Special Risks

The Contractor shall be under no liability whatsoever in consequence of any of the special risks referred to in Sub-Clause 65.2 whether by way of indemnity or otherwise, for or in respect of :

- (a) destruction of or damage to the "Works", save to work condemned under the provisions of Clause 39.1 to 39.2 prior to the occurrence of any of the said special risks, or
- (b) destruction of or damage to property, whether of the employer or third parties, or
- (c) injury or loss of life.

65.2 Special Risks

The special risks are :

- (a) the risks defined under paragraphs (a) sub-para (i), (ii), (iii) and (iv) of Sub-Clause 20.4.

65.3 Damage to Works by Special Risks

If the Works or any materials or Plant on or near or in transit to the Site, or any of the Contractor's Equipment, sustain destruction or damage by reason of any of the said special risks, the Contractor shall be entitled to payment in accordance with the Contract for any Permanent Works duly executed and for any materials or Plant so destroyed or damaged and, so far as may be required by the Engineer or as may be necessary for the completion of the Works, to payment for;

- (a) rectifying any such destruction or damage to the Works, and
- (b) replacing or rectifying such materials or contractor's Equipment and the Engineer shall determine an addition to the Contract Price in accordance with Clause 52.1 to 52.4 (which shall be the case of the cost of replacement of Contractor's Equipment include the fair market value thereof as determined by the Engineer) and shall notify the Contractor accordingly, with a copy to the Employer.

65.4 Projectile, Missile

Destruction, damage, injury or loss of life caused by the explosion or impact, whenever and wherever occurring, or any mine, bomb, shell, grenade, or other projectile, missile, munition, or explosive of war, shall be deemed to be a consequence of the said special risks.

65.5 Increased Costs arising from Special Risks

Save to the extent that the Contractor is entitled to payment under any other provision of the Contract, the Employer shall repay to the Contractor any costs of the execution of the Works (other than such as may be attributable to the cost of reconstructing work condemned under the provisions of Clause 39.1 to 39.2 prior to the occurrence of any special risk) which are howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this Clause hereinafter contained in regard to outbreak of war, but the Contractor shall, as soon as any such cost comes to his knowledge, forthwith notify the Engineer thereof. The Engineer shall, after due consultation with the Contractor, determine the amount of the contractor's costs in respect thereof which shall be added to the Contract Price and shall notify the Contractor accordingly.

65.6 Outbreak of War

If, during the currency of the Contract, there is an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the Works, the Contractor shall, unless and until the Contract is terminated under the provisions of this Clause, continue to use his best endeavours to complete the execution of the Works. Provided that the employer shall be entitled, at any time after such outbreak of war, to terminate the Contract by giving notice to the Contractor and, upon such notice being given, the Contract shall, except as to the rights of the parties under this Clause and to the operation of Clause 67.1 to 67.4, terminate, but without prejudice to the rights of either party in respect of any antecedent breach thereof

65.7 Removal of Contractor's Equipment on Termination

If the Contract is terminated under the provision of Sub-Clause 65.6, the Contractor shall with all reasonable dispatch, remove from the Site all Contractor's Equipment and shall give similar facilities to his Subcontractors to do so.

65.8 Payment if Contract Terminated

If the Contract is terminated as aforesaid, the Contractor shall be paid by the Employer insofar as such amounts or items have not already been covered by payments account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the contract and in addition:

- a) The amounts payable in respect of any preliminary items referred to in the Bill of Quantities, so far as the Work or service comprised therein has been partially carried out or performed.
- b) The cost of materials, plant or goods reasonably ordered for the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials, Plant or goods becoming the property of the Employer upon such payments being made by him.
- c) A sum being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure has not been covered by any other payments referred to in this Sub-Clause.
- d) Any additional sum payable under the provisions of Sub-Clauses 65.3 and 65.5.
- e) Such proportion of the cost as may be reasonable, taking into account payments made or to be made, for work executed, or removal of contractor's equipment under Sub- Clause 65.7 and, if required by the Contractor, return thereof to the Contract's main plant yard in his country

of registration or to other destination, at no greater cost.

- f) The reasonable cost of repatriation of all the Contractor's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided that against any payment due from the Employer under this Sub-Clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of Contractor's Equipment, materials and Plant and any other sums which, at the date of termination, were recoverable by the employer from the Contractor under the terms of the Contract. Any sums payable under this Sub- Clause shall, after due consultation with the Employer and the Contractor, be determined by the Engineer who shall notify the Contractor accordingly.

RELEASE FROM PERFORMANCE

66.1 Payment in Event of Release from Performance

If any circumstance outside the control of both parties arises after the issue of the Letter of Acceptance which renders it impossible or unlawful for either party to fulfil his contractual obligations, or under the law governing the Contract the parties are released from further performance, then the sum payable by the employer to the Contractor in respect of the work executed shall be the same as that which would have been payable under Clause 65.8 if the Contract had been terminated under the provisions of Clause 65.6.

SETTLEMENT OF DISPUTES

67.1 Engineer's Decision

If a dispute of any kind whatsoever arise between the Employer and the Contractor in connection with , or arising out of, the Contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. Not later than the eighty-fourth day after the day on which he received such reference the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this Clause.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Work with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision

of the Engineer unless and until the same shall be revised, as hereinafter provided in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the eighty fourth day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the seventieth day after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of 84 days expired, as the case may be give notice to the other party, with a copy for information to the Engineer of his intention to commence arbitration as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to Sub-Clause 67.4, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventieth day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

67.2 Conciliation

Where notice of intention to commence arbitration as to dispute has been given in accordance with Sub Clause 67.1, arbitration of such dispute shall not be commenced unless, the parties have explored the possibility of conciliation as per the provisions of Part-III of the Arbitration and Conciliation Act, 1996. When such conciliation has failed, the parties shall adopt the following procedure for arbitration :-

67.3 Arbitration

67.3.1 Any dispute and differences relating to the meaning of the specifications, designs, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used in the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof in respect of which :-

- a) the decision, if any, of the Engineer has not become final and binding pursuant to Sub Clause 67.1 and

b) Conciliation has not been reached as per the provisions of Clause 67.2

Shall be referred to the Sole Arbitration of a person appointed by the Chairman and Managing Director (CMD) of HSCC (I) Ltd. from the panel of Arbitrators approved by **Ministry of Health & Family Welfare, Govt of India, New Delhi**. Such Arbitrator shall be appointed within 30 days of the receipt of letter of invocation of Arbitration duly satisfying the requirements of this clause.

67.3.2 If the Arbitrator so appointed resigns his appointment, is unable or unwilling to act due to any reason whatsoever, or dies, the Chairman and Managing Director aforesaid or in his absence the person discharging the duties of CMD of HSCC (I) Ltd. may appoint a new Arbitrator in accordance with these terms and conditions of the contract, to act in his place and the new Arbitrator so appointed may proceed from the stage at which it was left by his predecessor.

67.3.3 It is a term of the contract that the party invoking the Arbitration shall specify the dispute/differences or questions to be referred to the arbitrator under this clause together with the amounts claimed in respect of each dispute.

67.3.4 The Arbitrator may proceed with the Arbitration ex-parte, if either party, in spite of a notice from the Arbitrator, fails to take part in the proceedings.

67.3.5 The work under the contract shall continue, if required, during the Arbitration proceedings.

67.3.6 The Arbitrator shall make speaking Award and give reasons for his decision in respect of each dispute/claim alongwith the sums awarded separately on each individual item of dispute or difference or claims. The Arbitrator shall make separate award on each reference made to him.

67.3.7 The award of the Arbitrator shall be final, conclusive and binding on both the parties.

67.3.8 Subject to the aforesaid, the provisions of the Arbitration & Conciliation Act, 1996 or any statutory modifications or re-enactment thereof and the Rules made thereunder and for the time being in force shall apply to the Arbitration proceedings and Arbitrator shall publish his Award accordingly.

67.4 Failure to Comply With Engineer's Decision

Where neither the Employer nor the contractor has given notice of intention to commence arbitration of a dispute within the period stated in Sub-Clause 67.1 and the related decision has become final and binding either party may, if the other party fails to comply with such decision, and without prejudice to any other rights it may have, refer the failure to arbitration in accordance with sub-Clause 67.3 as if the conditions specified in clauses 67.3(a) and (b) had been satisfied with respect to such dispute. The provisions of Sub-Clause 67.1 shall not apply to

any such reference.

NOTICES

68.1 Notice to Contractor

All certificates, notices or instructions to be given to the Contractor by the Employer or the Engineer under the terms of the Contract shall be sent by post, cable, telex or facsimile transmission to or left at the Contractor's principal place of business or such other address as the Contractor shall nominate for the purpose.

68.2 Notice to Employer and Engineer

Any notice to be given to the Employer or to the Engineer under the terms of the Contract shall be sent by post, cable telex or facsimile transmission to or left at the respective addresses nominated for the purpose in part II of these Conditions.

68.3 Change of Address

Either party may change a nominated address to another address in the Country where the Works are being executed by prior notice to the other party, with a copy to the Engineer, and the Engineer may do so by prior notice to both parties.

DEFAULT OF EMPLOYER

69.1 Default of Employer

In the event of the Employer:

- a) becoming bankrupt or being a company, going into liquidation, other than for the purpose of a scheme of reconstruction or amalgamation, or
- b) giving notice to the Contractor that for unforeseen reasons, due to economic dislocation, it is impossible for him to continue to meet his contractual obligations, or
- c) if the contractor becomes entitled under Sub-Clause 40.3 to terminate his employment under the contract in accordance with the provisions of this Sub-Clause,

the Contractor shall be entitled to terminate his employment under the contract by giving notice to the Employer, with a copy to the Engineer. Such termination shall take effect 14 days after the giving of the notice.

69.2 Removal of Contractor's Equipment

Upon the expiry of the 14 days notice referred to in Sub-Clause 69.1 the Contractor shall notwithstanding the provisions of Sub- Clause 54.1, with all reasonable despatch, remove from the site all contractor's equipment brought by him thereon.

69.3 Payment on Termination

In the event of such termination the employer shall be under the same obligations to the contractor in regard to payment as if the contract has been terminated under the provisions of clause 65.6, but, in addition to the payments specified in Sub-Clause 65.8 the Employer shall pay to the Contractor the amount of any loss or damage to the Contractor arising out of or in connection with or by consequence of such termination.

69.4 Contractor's Entitlement to suspend Works

Without prejudice to the Contractor's entitlement to interest under Sub-Clause 60.8 and to terminate under Sub-Clause 69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub- Clause 60.8 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work.

If the contractor suspends work or reduces the rate of work in accordance with the provisions of this Sub- Clause and thereby suffers delay or incurs cost the Engineer shall after due consultation with the Contractor, determine

- a) any extension of time to which the contractor is entitled under clause 44.1 to 44.3, and
- b) the amount of such costs, which shall be added to the contract price.

And shall notify the Contractor accordingly.

CHANGES IN COST AND LEGISLATION

70.1 Increase or Decrease of Cost

It shall be added to or deducted from the Contract price such sums in respect of rise or fall in the cost of labour and/ or materials or any other matters affecting the cost of the execution of the works as may be determined in accordance with part II of these conditions.

70.2 Subsequent Legislation

If, after the date 28 days prior to the latest date for submission of tenders for the Contract there occur in the country in which the works are being or are to be executed changes to any National or State Statute Ordinance Decree or other Law or any regulation or bye-law of any local or other duly constituted authority, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation or bye-law which causes additional or reduced cost to the contractor other than under sub-clause 70.1 in the execution of the Contract, such additional or reduced cost shall after due consultation with the employer and the Contractor be determined by the Engineer and shall be added to or deducted from the contract price and the engineer shall notify the Contractor accordingly.

70.3 Other Changes in Cost

To the extent that full compensation for any rise or fall in costs to the Contractor is not covered by the provisions of this or other Clauses in the Contract, the unit rates and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other rise or fall of costs.

71.1 Engineer's Authority to Correct Errors

The Engineer shall at the request of either or both parties, or at his own initiative, subject to the provisions of this subclause and with retrospective effect from the date of this Contract have authority to make a determination correcting any manifest error (including for the avoidance of doubt and without prejudice to the generality of the Engineer's authority in this regard any error of spelling, grammar or punctuation and any omission, inclusion or misplacement of text) in any provision of this Contract Provided always that:

- (a) The Engineer before making such determination shall by notice to the Employer and the Contractor provide them with a draft thereof and give them a reasonable time in which to comment on the draft.
- (b) The Engineer shall in making such determination take into consideration the presumed intentions of the parties, the wording of any provision of the Conditions of Contract for use in connection with Works or of any other standard form of contract upon which the provision to be corrected has been based, and any comments received by the Employer and/or the Contractor on the draft determination provided to them under subclause (a) of this clause.
- (c) The Engineer shall provide the Employer and the Contractor with a copy of the determination made by him and
- (d) Clause 67.1 to 67.4 shall for the avoidance of doubt apply to any dispute between the Employer and the Contractor in connection with or arising out of the Engineer's determination.

ANNEXURE – A

Deleted

ANNEXURE – B

APPENDIX TO TENDER

Important Clause	Clause No.	Volume	Remarks
Amount of Performance Security	10.1	II	10 % of the Contract Price
Minimum amount of third party Insurance	23.2	II	Rs. 50,000=00 for anyone incident, number of incidents Unlimited.
Period of commencement from Engineer's order to Commence	41.1	II	Within one week
Mobilisation advance	60.7 (a)/33(a)	III/II	Nil
Recovery of Mobilisation advance	60.7 (b)	II	
Amount of Liquidated damages	47.1	II	<u>1 % (one percent)</u> of contract price per calender week of delay.
Limit of liquidated damages	47.1	II	<u>10% (Ten percent)</u> of Contract price
Defect Liability Period	49.1	II	12 months
Percentage of retention	33(f)	III	@ 10% subject to a maximum of 5% of contract value
Programme of work and progress reports	39.6	III	Programme updated monthly, progress reported weekly.
Time of Completion	43.1	II	6 (Six) Calendar months

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

e- TENDER

FOR

**Supply, Installation ,Testing & Commissioning of Medical Gas
Manifold System for Surgical Block at All India Institute of Medical
Sciences (AIIMS), New Delhi.**

VOLUME – III

SPECIAL CONDITIONS OF CONTRACT

DECEMBER 2015



(Consultants & Engineers for Mega Hospitals & Laboratories)
E - 6 (A), Sector - I, NOIDA (U.P.) - 201 301 (INDIA)

PHONE : 0120--2542436, 2542437 FAX : 0120-2542447
E- mail : www.hsccltd.co.in

Tender No. HSCC/SES/MGMS/Surgical/AIIMS/2015

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INSTRUCTIONS TO BIDDERS

A. GENERAL

1.1 Description of Works

PART-A : Supply, Installation, Testing & Commissioning of Medical Gas Manifold System for Surgical Block at All India Institute of Medical Sciences (AIIMS), New Delhi and its maintenance during the defect liability period.

PART-B: Comprehensive Operation & Maintenance (As per BOQ) (Optional).

The site of work is within existing campus of All India Institute of Medical Sciences, *New Delhi.*

The Scope of work comprising of *Supply, Installation, Testing & Commissioning of Medical Gas Manifold System for Surgical Block at All India Institute of Medical Sciences (AIIMS), New Delhi.* The scope of work shall also includes Civil, Electrical works, HVAC work, finishing works, All PHE works & fire fighting works etc. and their maintenance during defect liability period including & preparation of all detailed shop drawings, obtaining approval from all local authorities, electrical inspector, water, sewer, drainage, electricity connection from local bodies, if any.

Contractor should visit the site ,any Civil, Plumbing, Electrical work required for satisfactorily functioning of the *Medical Gas Manifold System* shall be carried out by the Contractor and no extra payment on this account will be made.

- 1.1 All the terms and conditions, undertakings of PQ documents under which the agency has been pre qualified for this work will have to be strictly followed and will be treated as part of these tender documents in addition to other terms and conditions of the tender documents.

1.2 The Employer

All India Institute of Medical Sciences (AIIMS), New Delhi shall be the employer / owner for the subject work. All documents relating to any statutory authority for obtaining necessary clearance etc is to be signed/endorsed by principal employer/owner.

1.3 The Consultant

HSCC (India) Ltd.), E-6A, Sector-I, Noida-201301 (UP)

1.4 In these documents wherever the word Tender/ Tenderer/ Tendering has been used. The same may be considered synonymous with Bid/ Bidder/ Bidding.

1.5 Time for Completion

The successful Bidder shall complete the Works within **6 (Six) Calendar months** from Consultant's order to commence the Work.

2.0 Information to be submitted

2.1 Bids submitted shall include the following information:

- (a) Copies of original documents defining the constitution, legal status, place of registration and principal place of business of the company or firm
- (b) A work plan clearly bringing out how the Bidder proposes to carry out the work to achieve the quality and the time schedule

The work plan shall clearly spell out with specific details the following:

- i. Detailed programme in the form of a PERT/CPM network clearly bringing out details of start & completion of all important activities and also programme showing material & labour resources related to the above PERT/CPM network.
- ii. List of equipment along with details proposed to be used on the Works.
- iii. List and bio data of Engineers and other important staff members proposed to be employed on the Works.
- iv. Any other documents related to works permit if required.

3.0 Cost of Bidding

3.1 The Bidder shall bear all costs associated with the preparation and submission of his Bids and "The Consultant" will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.

4.0 Site Visit

4.1 The Bidder is advised to acquaint himself with the job involved, visit the Site & examine site conditions, climatic conditions, labour, power, water, material availability, transport and communication facilities,

environmental regulations, laws and bye-laws of Statutory bodies and the Govt. of India and collect all information that will be necessary for preparing the Bid and entering into a Contract.

The cost of visiting the Site and collecting information for the purpose of submission of the Bid shall be to the Bidder's account.

- 4.2 The Bidder and any of his personnel or agents will be granted permission by the Employer to enter upon the Site for the purpose of such inspection, but only upon the express condition that the Bidder, his personnel or agents will release and indemnify the Employer and Employer's Personnel and agents from and against all liability in respect thereof and will be responsible for personnel injury (Whether fatal or otherwise), loss of or damage to property and any other loss, damage, costs and expense however caused, which, but for the exercise of such permission would not have arisen.

B. BID DOCUMENTS

5.0 Content of Bid Documents

- 5.1 The Bid Documents comprise the following:

Volume-I = Pre Qualification Document

Volume II = General Conditions of Contract

Volume III = Comprising :

- Instructions to Bidders
- Specific Conditions of Contract
- Additional Specific Conditions of Contract
- Sample Forms of Securities
- Sample Form of Agreement

Volume IV = Technical Specifications

Volume V = Price Bid (Bill of Quantities)

- 5.2 The Bidder is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the Bid documents. Failure to comply with the requirements of the Bid Documents will be at the Bidder's own risk. Bids, which are not substantially responsive to the requirements of the Bid documents, will be rejected. **Bidders are requested to clear their queries before submission of bids and submit bids without conditions.**

6.0 Clarification on Bid Documents

- 6.1 A prospective Bidder requiring any clarifications on the Bid documents may notify the Consultant in writing or by telex or cable at the

Consultant's mailing address indicated in the Bid documents. A meeting of the prospective Bidders shall be held at which the Consultant will respond to any request for clarification which he receives within two weeks of the first date of the issue of the Tenders. Written copies of the Consultant's response (including an explanation of the query but without identifying the source of the inquiry) will be sent to all prospective Bidders who have received the Bid documents.

7.0 Amendment of Bid Documents

7.1 At any time prior to the dead line for submission of Bids, the Consultant may for any reason, whether at his own initiative or in response to a clarification requested by the prospective Bidder, modify the Bid documents by amendment.

7.2 The amendment will be sent to all prospective Bidders who have received the Bid documents, to arrive not later than 3 days prior to the original or extended deadline for submission of Bids, in writing or by telex or cable and will be binding upon them. Prospective Bidders should promptly acknowledge receipt thereof by telex or cable to the Consultant.

7.3 In order to afford prospective Bidders reasonable time in which to take an amendment into account in preparing their Bids, the Consultant may, at his discretion, extend the deadline for the submission of Bids.

C. PREPARATION OF BIDS

8.0 Language of Bid

8.1 The Bid prepared by the Bidders and all correspondence and documents relating to the Bid exchanged by the Bidder and the Consultant shall be written in the English Language.

9.0 Documents comprising the Bid

9.1 The Bid to be prepared by the Bidder shall comprise of the following: the Bid and Appendix thereto, the Bid Security, the Bill of Quantities; the Schedules of Supplementary information, and any other materials required to be completed and submitted in accordance with the instructions to Bidders embodied in these Bid documents. The Forms, Bill of Quantities and Schedules provided in these Bid documents shall be used without exception.

9.2 All documents issued for the purpose of Bidding as described in Clause 5.1 and amendments issued in accordance with Clause 7, shall be deemed incorporated in the Bid. Bid Documents prepared and submitted in accordance with Clause 14 and 15 shall be returned by Bidders to the Consultant along with the submission of the Bid.

10.0 Bid Prices

- 10.1 The Bidder shall fill the rates against each item of Bill Of Quantities both in words and figures in the blank spaces provided in the respective columns. Item for which no rate or price is entered by the bidder will not be paid for by the Consultant when executed and shall be deemed covered by the others rates and prices in the bill of quantities. Correction, if any, shall be made by crossing out, initialling, dating, stamping and rewriting.
- 10.2 All duties, taxes including work contract tax, building & construction/labour cess , service tax etc. and other levies payable by the Contractor under the Contract including Contractors profit and overheads etc. or for any other cost shall be included in the rates and prices and the total amount of bid submitted by the bidder. The evaluation and the comparison of bids by the Engineer shall be made accordingly.
- 10.3 The rates and prices quoted by the Bidder shall be fixed for items complete in all respect for the duration of the Contract and not subject to adjustment on any account except as otherwise provided in the conditions of Contract.
- 10.4 The Bidder shall fill his most competitive rates in the first instance as no negotiations shall be made after opening of the Tenders except if required with the lowest Bidder.

11.0 Bid Validity

- 11.1 The Bid shall remain valid and open for acceptance for a period of **180 days** from the last date fixed for receiving the same.
- 11.2 In exceptional circumstances prior to expiry of the original Bid validity period, the Consultant may request the Bidder for a specified extension in the period of validity. The request and the responses thereto shall be made in writing or by cable or telex. A Bidder may refuse the request without forfeiting his Bid Security. A Bidder agreeing to the request will neither be required nor permitted to modify his Bid, but will be required to extend the validity of his Bid Security correspondingly.

12.0 Bid Security

- 12.1 The Bidder shall furnish, as part of his Bid, a Bid Security of the amount of **Rs. 12,43,800/- (Rupees Twelve Lakh Forty Three Thousand Eight Hundred Only)** for Supply, Installation. Testing &

Commissioning of Medical Gas Manifold System for Surgical Block at AIIMs, New Delhi. No deviation shall be permitted from this.

- 12.2 The Bid Security shall be in the form of a Demand Draft/Pay Order/Bank Guarantee in favour of **HSCC (India) Ltd. Payable at New Delhi/NOIDA from any Nationalised/Scheduled bank.**
- 12.3 Any Bid not accompanied by an acceptable Bid Security will be straightaway rejected.
- 12.4 The Bid Securities of unsuccessful Bidders will be returned as promptly as possible but not later than 30 days after the expiration of the period of Bid validity prescribed by the Consultant.
- 12.5 The Bid Security of the successful Bidder will be returned upon the Bidder executing the Contract and furnishing the required Performance Security.
- 12.6 The Bid Security may be forfeited
- a) If a Bidder withdraws his Bid during the period of Bid validity.
 - b) In the case of successful Bidder, if he does not :
 - i) enter into the Contract, or
 - ii) furnish the necessary Performance Security
 - iii) agree to arithmetic corrections made as per terms of Bid documents.
- 13.0 No interest will be payable by the Consultant on the Bid Security amount cited above.

14.0 Format and Signing of Bid

- 14.1 The Tender shall be filled & signed only by the firm/ corporation in whose name the Tenders have been issued. The Bid shall be typed or written in indelible ink and duly signed by a person or persons duly authorised to being the Bidder to the Contract. Proof of authorization shall be furnished in the form of written Power of Attorney, which shall accompany the Bid.
- 14.2 All pages of Bid shall be initialled and stamped by the person signing the Bid where entries or amendments have been made.
- 14.3 The complete Bid shall be without alterations interlining and erasures except those to accord with instruction issued by the Consultant or as necessary to correct errors made by the Bidder in which case such correction shall be initialled by person signing the Bid.

D. SUBMISSION OF BID

15.0 Sealing, Marking & Submission

15.1 The bid shall be submitted online along with documents and mode of submission mentioned in **Check-List at Annexure-VII**, at Volume-I of tender document.

(a) **Technical Package Part- I** : Shall Comprise the following:-

- (i) Original non refundable Demand Draft of Rs.3,000/- (Tender Fee)
- (ii) Bid Security/ EMD in separate sealed envelope

(b) **Technical Package Part- II** :: Shall Comprise the documents listed at checklist Annexure-VII of Vol-I and the following:-

- (a) Letter of Application
- (b) Digital Signature Certificate (DSC) from one of the authorized Certifying Authorities.
- (b) Original Bid documents (all pages) (Volume I, II, III, & IV) duly authenticated by digital signature.
- (c) Documents regarding constitution of Bidder as indicated in Clause 2.1 of these Instructions to Bidders.
- (d) Certificate of Registration.
- (e) All the information as stipulated in clause 2.0 under information to be submitted.
- (f) S/I/T/C Schedule and Schedule for man power to be deployed at Site.
- (g) Turn Key work Schedule, **PERT Chart** and Schedule for manpower to be deployed at Site.

(c) **Financial Package** : Shall be submitted online only. Shall contain only the Bill of Quantities and rates/prices (Volume-V) duly filled and signed digitally without any conditions whatsoever. Bids containing any conditions in Financial Package are liable to be summarily rejected.

The Contractor must fill up price against each item of BOQ (Volume V) both in words and figures in the blank spaces provided in the respective columns.

Please note that the price should not be indicated in any of the documents submitted except Financial bid (Price bid). Non-compliance shall entail rejection of the Bid. Any addition, modification, alteration etc if observed in any of the bid documents containing volume -I to IV at any stage the bid shall be summarily rejected.

16.0 Deadline for Submission of Bids

16.1 Bids must be received on line as per checklist Annexure-VII , on or before **of the designated date & time.**

16.2 The Engineer may, at his discretion, extend the deadline for submission of Bids through the issuance of an amendment in accordance with Clause 7 in which case all rights and obligations of the Employer and the Bidders previously subject to the deadlines shall thereafter be subject to the new deadline as extended.

17.0 Late Bids

17.1 Any Bid received by the Consultant after the prescribed deadline for submission will liable to be rejected and will be returned unopened to the Bidder.

18.0 Modification and Withdrawal of Bid

18.1 The Bidder may modify or withdraw his Bid after Bid submission, provided that modification or notice of withdrawal is received in writing by the Consultant prior to the prescribed deadline for submission of Bids.

18.2 The Bidder's modification or notice of withdrawal shall be prepared, sealed, marked and despatched in accordance with the provisions for the submission of Bids. Notice of withdrawal may also be sent by telex or cable but shall be followed by a signed confirmation copy, postmarked not later than the deadline for submission of Bids.

18.3 No Bid may be modified subsequent to the dead line for submission of Bids.

18.4 No Bid may be withdrawn in the interval between the deadline for submission of Bids and the expiration of the period of validity of the Bid specified. Withdrawal of a Bid during this interval may result in the forfeiture of the Bid Security.

E. BID OPENING AND EVALUATION

19.0 Bid Opening

- 19.1 Bids shall then be opened at HSCC (I) Ltd., at Plot - 6 (A), Block - E, Sector - I, Noida, Uttar Pradesh - 201 301, half an hour after the prescribed time for Bid submission in presence of the Bidders' representatives who may wish to be present.

Technical Package Part - I : Shall be opened first. If the Bid Security & tender document fee is not found as prescribed, the Bid shall be summarily rejected.

Technical Package Part - II : Shall be opened next. Bids of parties who do not accept the conditions laid above in the Bid documents are also liable to be rejected.

- 19.2. The Engineer will examine the Bids to determine whether they are complete, whether the requisite bid securities have been furnished, whether the Bids have been properly signed and stamped and whether the Bids are generally in order.

- 19.3 Telegraphic/ Fax offer will be treated as defective, invalid and rejected. Only detailed complete Bids received prior to the closing time and date of the Bids will be taken as valid.

- 19.4 The Bidder's names, general technical details, the presence of the requisite Bid Security and such other details as the Engineer, at his discretion may consider appropriate will be announced at the Bid opening.

Financial Package : Shall contain the price Bid (volume-V). Whose bid is found to be generally in order and substantially responsive shall be opened either at the Bid opening or at a subsequent date to be intimated in advance to such eligible Bidders.

- 19.5 Only summary of prices quoted by the Bidders will be read out.

- 19.6 The Bid of any Bidder who has not complied with any of the instructions contained herein may not be considered.

20.0 Process to be Confidential

- 20.1 After the public opening of Bids, information relating to the examination, clarification, evaluation and comparisons of Bids and recommendations concerning the Award of Contract shall not be disclosed to Bidders or other persons not officially concerned with such process.

20.2 Any effort by the Bidder to influence the Consultant in the process of examination, clarification, evaluation and comparison of Bids and decision concerning Award of Contract may result in the rejection of the Bidder's Bid.

21.0 Clarification of Bids

21.1 To assist in the examination, evaluation and comparison of Bids, the Consultant may ask Bidders individually for clarification of their Bids, including breakdowns of unit prices. The request for clarification and the response shall be in writing or cable or telex, but no change in the price or substance of the Bid shall be sought, offered or permitted except as required to confirm the correction or arithmetical errors discovered by the Consultant during the evaluation of the Bids in accordance with Clause 24 hereof.

22.0 Determination of Eligibility & Responsiveness

22.1 The Consultant will determine whether the Bid is substantially responsive to the requirements of the Bid documents.

For the purpose of this Clause, a substantially responsive Bid is one which conforms to all the terms, conditions and specifications of the Bid documents without any deviation or reservation.

22.2 A Bid, which in relation to the cost estimates of the Consultant is unrealistically priced and which cannot be substantiated satisfactorily by the Bidder may be rejected as non responsive.

22.3 Every effort has been taken to put forth general specifications in these bid documents. If inadvertently, any of the specification drawn happens to match with the specifications of any one particular firm's product only, in respect of critical parameters, than it will not automatically mean that this particular firm's offer is only technically suitable. In general, the specifications offered by other firms will be assessed in their own entirety to ascertain whether or not the broad functions in general expected of the requirement are available with reasonable tolerance on the desired requirements of the purchaser and accordingly the offers would be considered based on prudent assessment and sole discretion of the Consultant.

23.0 Correction of Errors

- 23.1 Bids, determined to be substantially responsive will be checked by the Consultant for any arithmetical errors in computation and summation. Errors will be dealt by the Consultant as follows :
- a) Where there is discrepancy between rates indicated in figures and in words, rates in words will govern.
 - b) Incorrectly added totals will be corrected.
 - c) In case of any clerical error between rates indicated in figures and words, the rate in words would prevail. In case there is any inconsistency between the rate and the value extended (after multiplication with the tender quantity),The rate quoted shall multiplication with the tender quantity),the rate quoted shall prevail.
- 23.2 If a Bidder does not accept the correction of errors as outlined above, his Bid will be rejected.

24.0 Evaluation and Comparison of Bids

- 24.1 Only such of the Bids as have been determined to be substantially responsive to the requirements of the Bid documents, in accordance with Clause 22 will be evaluated. Other non-responsive Bids will be rejected.
- 24.2 Bidders shall note that no preference of any nature will be given to any Bidder notwithstanding any custom, usage or instructions to the contrary.
- 24.3 Evaluation of the Bids will take into account, in addition to the Bid amounts, the following factors:
- a) Arithmetical errors corrected in accordance with Clause 23.
 - b) Such other factors as the Consultant considers may have a potentially significant impact on Contract execution price and payments.
- 24.4 Offers, deviations and other factors, which are in excess of the requirements of the Bid documents or otherwise result in the accrual of unsolicited benefits to the Consultant, shall not be taken into account in Bid evaluation.
- 24.5 Price adjustment provisions applying to the period of execution of the Contract shall not be taken into account in Bid evaluation except to the extent specifically stated in the Contract.

F. AWARD OF CONTRACT

25.0 Award Criteria

25.1 Subject to Clause 26, Consultant will Award the Contract after prior approval to the Bidder whose Bid has been determined to be eligible and to be substantially responsive to the Bid documents and who has offered the lowest evaluated Bid of the Bill of Quantities, provided further that the Bidder has the capability and resources effectively to carry out the Contract Works.

26.0 Consultant's Right to Accept any Bid, to Reject any or all Bids

26.1 Notwithstanding Clause 25, the Consultant reserves the right to accept or reject any Bid including the lowest and to annul the Bidding process and reject all Bids, at any time prior to Award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligations to inform the affected Bidder or Bidders of the grounds for the Consultant's action.

27.0 Notification of Award

27.1 Prior to the expiration of the prescribed period of Bid validity, the Consultant will notify the successful Bidder by cable or telex or letter confirmed in writing by registered letter that his Bid has been accepted.

27.2 The notification of Award will constitute the formation of the Contract.

27.3 Upon the furnishing by the successful Bidder of a Performance Security in accordance with the provisions of Clause 29, the Consultant will promptly notify the unsuccessful Bidders that their Bids have been unsuccessful.

28.0 Signing of Agreement

Upon the receipt of the notification of Award by the successful Bidder, the successful Bidder shall fill the Agreement in accordance with form of Agreement included in the Bid documents and submit the same to the Consultant within two weeks of the date of receipt of notification of Award. The Consultant shall return the draft duly approved within one day from the date of receipt of the draft and the successful Bidder shall get the same engrossed, have the correct amount to stamp duly adjudicated by Superintendent of Stamps and thereafter return the same duly signed and executed on behalf of the successful Bidder, all at his own cost within 3 days from the receipt of the approved draft.

29.0 Performance Security

- 29.1 Within 15 days of receipt of the notification of Award from the Consultant, the successful Bidder shall furnish to the Consultant a Security in the form of a Bank Guarantee from Nationalised/Scheduled bank for an amount of 10 percent of the Contract sum. The validity of the Performance Security shall be upto the end of the Defect Liability Period.
- 29.2 In cases, where the aggregate of expected Contract payment would at any time exceed the Consultant's estimate of actual work performed by more than the amount of Performance Security specified in Clause 29.1 such Security shall be increased accordingly at the expense of the successful Bidder.
- 29.3 Failure of the successful Bidder to lodge the required Bank Guarantee shall constitute sufficient grounds for the annulment of the Award and forfeiture of the Bid Security.

SPECIFIC CONDITIONS OF CONTRACT

The Conditions of Contract shall be GENERAL CONDITIONS OF CONTRACT in Volume II (hereinafter called the General Conditions) as modified or added to by the following Specific Conditions of Contract, which shall be read and construed with the General Conditions as if they were incorporated therewith.

Insofar as any of the Conditions of Specific Conditions of Contract conflict or be inconsistent with any of the General Conditions, the conditions of Specific Conditions of Contract shall prevail.

30.0 Definitions

- a) "PRINCIPAL EMPLOYER/ EMPLOYER " means Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh.
"Consultant" means **Chief General Manager of HSCC (India) Ltd.** or any officer nominated by the Chairman-cum-Managing Director, HSCC (India) Ltd. to act as Consultant from time to time.
- c) "Month" and "Year" and all dates shall be calculated according to the Gregorian Calendar.

31.0 Insurance of Works

All Insurances referred to in General Conditions shall be effected with an Indian Insurance Company incorporated and registered in India. All insurances and labour license to be submitted before commencement of works.

32.0 Guarantees

Performance Guarantees, Retention money Guarantee and any insurance policies entered into by the Contractor under the terms of the Contract, shall stipulate that the proceeds of any claim shall be payable to **Employer**.

33.0 Certificates and Payments

- a) Deleted

- b) The Contractor shall submit to the Consultant after the end of each month a detailed statement including measurements showing the estimated contract value of the Permanent Works executed up to the end of the month together with particulars of other amounts to which he is entitled under the Contract.
- c) The statement shall be submitted on a printed proforma (prepared at the cost of the Contractor) approved by the Consultant along with soft copy of the same in a CD.
- d) The Contractor shall be paid monthly, on the certification of the Engineer, the amount due to him which shall be the sum of the following amounts :
 - i) Subject to and in accordance with these Specific Conditions, the estimated value of the Permanent Works executed upto the end of the previous month less retention money named in the Bid, and
 - ii) Deleted
- e) Deleted
- f) Retention Money at the rate of 10% shall be deducted from each Interim Payment Certificate subject to the maximum of 5% of the contract price.
- g) The Retention Money shall, subject to Clause 60.6 (a) & 60.6 (b) of General Conditions of Contract, become due and shall be paid to the Contractor when the Consignee/Employer shall issue the Taking Over certificate notwithstanding that at such time there may be outstanding claims by the Contractor against the Consultant, provided always that if at such time there shall remain to be executed by the Contractor any Works ordered during the Defect Liability Period pursuant to Clause 49.1, 49.2, 49.3, 49.4 and 50.1 of the General Conditions hereof, the Consultant shall be entitled to withhold payment until the completion of such Works as much of the Retention Money as the Consultant may in his absolute discretion think fit.
- h) Payment against each monthly R/A bills upon each of the Consultant's certificates shall be made by **the Consultant** within 30 days after such certificate has been issued by the Consultant.
- i) The Consultant may at any time make any corrections or modifications to any certificate, which shall have been issued by him and shall have power to withhold any certificate if the Works or any parts thereof are not being carried out to his satisfaction.

- j) The responsibility for making the payments or meeting other obligations to the Contractor in respect of all Works as certified by the engineer shall be that of the Consultant and not of the employer.
- k) After completion of work and prior to final payment, the contractor shall furnish to the Consultant, a release of claim against the Consultant arising out of contract, other than claims specifically identified, evaluated and excepted from the operation of the release by contractor.

34.0 Settlement of Disputes - Arbitration

Sub Clause 67.1, 67.2, 67.3 and 67.4 of G.C.C. shall be followed.

35.0 Address

- a. The address of the Employer is as follows :

All India Institute of Medical Sciences (AIIMS), New Delhi.

- b. The address of the Engineer (Consultant) is as follows

The Chief General Manager , HSCC (India) Ltd., Plot - 6 (A), Block - E, Sector - 1, Noida, Uttar Pradesh - 201 301.

- c. The address of the Contractor is

36.0 THE FOLLOWING SHALL BE READ IN ADDITION TO CLAUSE 34.1 TO THE GENERAL CONDITIONS

- 36.1 Variation in price

No Variation shall be payable in price on account of labour, material (General) , POL and / or any other account. Also no variation/escalation shall be payable on account of time over run if any in completion.

- 36.2 Subsequent Legislation

If, after the date seven days prior to the latest date for submission of Bids for the Works, there occurs changes to any National or State Statute, Ordinance, Decree or other law or any regulation or bye-law of any local or other duly constituted authority or the introduction of any such statute ordinance, etc. which causes additional or reduced cost, the same shall be certified by the engineer and shall be paid by or credited to the Consultant and the Contract Price adjusted accordingly. Notwithstanding the foregoing such additional or reduced cost shall not be separately paid or credited if the same shall already have been taken into account in the indexing of any inputs to the price adjustments formula in accordance with the provisions of Sub-Clauses (1) & (2) of this Clause.

The following items are not to be included in the price adjustment calculations:

- a. Liquidated Damages.
- b. Retention money withheld and released.
- c. Advance payments in the form of loan and their repayments.
- d. Value of any additional or varied work valued at current price.
- e. Payment to nominated subcontractors included as "Provisional sums" or "Prime cost" items in the Contract Price.

37.0 Taxation

The Contractor shall pay all taxes, duties, levies, work contract tax etc. of the Government provisions of the Income tax act or as per the advice of the Income Tax Authority. Deduction of Income Tax/work contract tax/other taxes shall be made from each certificate of payment as per relevant provisions of the income tax Act or as per the advice of the Income tax Authority/other Competent Authority.

38.0 Co-ordination Meeting

The Contractor shall be required to attend co-ordination meetings with the employer, the Consultant and the other Contractors during the period of Contract as instructed by the Consultant. All costs incidental to such interaction shall be to the Contractor's account and no claim will be entertained by the Consultant on this account.

39.0 Special Applications

39.1 Site Information

- 39.1.1 The proposed Site is located at All India Institute of Medical Sciences (AIIMS), New Delhi.
- 39.1.2 Proper arrangement of security, safety, transportation, manpower, lighting arrangement to be maintained during execution of works at night.
- 39.1.3 The entire works will be liable to be inspected by Chief Technical Examiner i.e. CTE. The contractor will provide all necessary help required for in this connection. The contractor will have to comply with the observations/suggestions of the CTE in respect of quality, specifications, workmanship in his scope of work, if any,. No extra payment will be made on this account however, any recovery arising out of the CTE's observation will be borne by the contractor.
- 39.1.4 Any damage to the site, building, fittings, fixtures etc. during execution of the works shall be got repaired/replaced by the contractor at his own cost to the satisfaction of the Employer/Consultant.
- 39.1.5 Any openings in walls, floor, ceiling slab, chasing/drilling in walls etc., if required to be made for the execution of works shall be got done by the contractor at his own cost. However after completion of the works the same shall be got repaired by the contractor at his own cost to the satisfaction of the Employer/Consultant.
- 39.1.6 All the foundations etc. required for installation of equipments and completing the works shall be provided by the contractor at his own cost.
- 39.1.7 Power distribution cables from the distribution panel, water distribution line wherever required and drain lines wherever required upto and from each equipment, shall be provided by the contractor at no extra cost. Only the main incoming power supply upto the power distribution panel and main water supply line shall be provided to the Contractor.
- 39.2.1 Contractor's Working Area
- Suitable working area will be provided by the Employer to the Contractor. The Contractor may have to carry out some cutting / filling work for making his working area. The cost of all such Works shall be deemed to have been included in the rates and prices quoted for the Works and no extra payment shall be made on this account.
- 39.2.2 Contractor's Temporary Structures
- The Contractor may, at his own expense and subject to the approval of the Employer/Consultant and statutory authorities, construct offices, stores, Workshop in the area allocated to him and remove the same as per the orders of the Employer/Consultant on completion of Works. The

Contractor shall furnish such details of his Temporary Works as may be called for by the Employer/Consultant and the Contractor shall satisfy the Employer/Consultant as to their safety and efficiency. Employer/Consultant may direct those Temporary work which he considers unsafe or inefficient be removed and replaced in a satisfactory manner. The Contractor shall immediately follow Employer's/Consultant's directions/instructions.

The Contractor shall make his own arrangement at his own expense for labour camp / accommodation of his labour and staff and their conveyance to Site as no workers/ staff shall unless with the specific approval of the Employer/Consultant be allowed to stay within the Site. Gate passes shall be issued by the Employer/Consultant to authorise the Contractor's staff and workers to enter the Site.

39.2.3 Procurement of Various Materials

The Consultant will not supply any construction materials required for the Works under this Contract. The Contractor must, therefore, make his own arrangements for timely procurement of various materials including steel and cement. Prior approval of each and every material including steel cement, aggregate, bricks etc or any other fittings & fixtures to be taken from Consultant before its procurement to site.

39.2.4 Water Supply & Power Supply

The Contractor shall make his own arrangement for water supply at Site for drinking as well as construction purposes from the source provided by the client. The Contractor shall also make his own arrangements for power supply at Site for construction purposes and general use from the source provided by the client. Non-availability of power supply and/or water from whatever source shall not entail any additional claims or extension of Contract period in this account. The contractor will provide water & electricity to the Consultant's office free of cost for the required quantity by the Consultant's site office.

39.2.5 Telecommunications

The Contractor shall apply to the P&T authorities for the necessary telephone and communication lines at his cost.

39.2.6 Temporary Fencing

The Contractor shall at his own expense, erect and maintain in good condition temporary fences and gates along the boundary of the areas assigned to him for the purpose of execution of the Works.

The Contractor shall, except when authorised by the Employer/Consultant, confine his men, materials and plant within the Site of which he is given possession. The Contractor shall not use any part of the Site for purposes not connected with the Works unless prior written consent of the Employer/Consultant has been obtained. Access shall be made to such areas only by way of approved gateways.

39.2.7 Testing of Materials

All materials used in the works shall be subject to inspection and test. The Contractor shall carry out sampling of such materials and making of concrete test cubes as per the appropriate Indian Standards and as directed by the Consultant. The contractor shall deliver the samples of materials and concrete test cubes to the site office of the Consultant at site office/Site Testing Lab in a manner as directed by Consultant who will inspect the same and then order for testing of materials and concrete cubes.

The Contractor shall arrange for testing of materials normally in site testing lab but samples may be sent outside testing laboratories if necessary.. The delivery of the samples shall be undertaken by the Contractor. The cost and charges for sampling of materials and concrete cubes and delivering the same to the office of the Consultant and/or other places including all incidentals in connection with the same as directed by the Consultant and the testing charges there of shall be borne by the Contractor and shall be deemed to be included in the rates and prices quoted in the Bill of Quantities. The results of the tests carried out shall be binding on the Contractor who shall comply with any rectification measures that the Consultant may deem fit and order to be executed by the Contractor as a result of testing.

39.2.8 Approval of Samples prior to use

The Contractor shall submit the samples of all materials (Whether in list of approved make or not in list of approved make) he proposes to use in the Works for prior approval of the Consultant. A sample room shall be maintained at Site in which all approved samples shall be kept for comparison with materials being used at Site. Any materials not conforming to the approved samples shall be rejected.

39.3 Drawings to be supplied by Consultant

The Consultant shall supply to the Contractor from time to time during the progress of the Works such further drawings as will be necessary in his opinion for the proper and adequate execution and maintenance of the Works in accordance with the design and or any modification thereof as decided by the Consultant and the Contractor shall carry out the work in accordance with the said drawings. Any further drawing/

detailing required shall be made by the Contractor at his own expense and all drawings to be supplied in hard and soft copies both.

39.4 "AS MADE" Drawings

The Contractor shall supply two complete sets of "As Made" Drawings on polyester tracing film 75 micron thick and also on computer floppy / CD and three prints showing details of all the Works as executed. The drawings and prints shall be delivered to the Consultant within one month of completion of the various Sections of the work or at such other times as directed by the Consultant. The drawings shall be fully dimensioned with the Consultant's standard title block or as approved by the Consultant. The cost of making the "As Made" drawings shall be deemed to be included in the rates quoted in the Bill of Quantities.

39.5 Monthly Progress Photograph

The Contractor shall supply to the Consultant a CD, negative and three prints of colour progress photographs of such portions of the work in progress or completed works every month end or as directed by the Consultant. The CD, negative and the photographs shall become the property of the Consultant. The photographs shall be of approximate size 169 mm x 115 mm each. The photographs shall be mounted in albums approved by Consultant and shall be suitably inscribed and captioned. The albums in a chronological order shall be handed over to the Consultant. No CD prints or the negatives may be supplied to any persons without the authority of the Consultant. All photographs to be taken from digital camera and software to be provided for transformation it to the computer. The photographs may be up to 100 nos per month as required by Consultant

39.6 Programme of Work and Progress Reports

The Contractor shall submit to the Consultant within four weeks of the Award of the Contract, six copies of detailed Schedule showing in an approved form the estimated dates of commencement and completion of different parts of the Works including the expected dates for completion of the various Sections of the Works. The detailed Schedule shall be such as it can be updated quarterly or as directed by the Consultant. Six copies of the revised Schedule shall be supplied to the Consultant as and when it is revised.

The Contractor shall submit to the Consultant before the second day of every week, a progress report for the preceding week showing the unto date progress and progress during the preceding week on all items of each section of the Works in relation to and in consideration of the detailed Schedule.

39.7 Metric Units

Metric units have been used in the specifications and on all the drawings.

If any materials described in the Contract or ordered by the Consultant are described by dimensions in the metric units and the Contractor can not in accordance with the Contract, procure such materials in the measure specified in sufficient time to avoid delay in the performance of his other obligations under the Contract, but can obtain such materials in other measure to dimensions approximating to those described in the Contract or ordered by the Consultant, then the Contractor shall henceforth give notice to the Consultant of these facts stating the dimensions to which such materials are procurable in the other measure. As soon as practicable after the receipts of any such notice the Consultant shall give an order to the Contractor which shall either

- (a) Direct the Contractor to supply such materials to the dimensions stated in his said notice to be procurable instead of the dimensions described in the Contract or originally ordered by the Consultant, or
- (b) Direct the Contractor to make some other variation whereby the need to supply such materials to the dimensions described in the Contract or originally ordered by the Consultant will be avoided.

39.8 Contractor shall carryout inspection, testing, checks and and shall maintain records of inspection, testing & checks of material, works and activities related to construction works in the ISO 9001 quality system formats, checklists etc. to be given by consultant during execution period. After getting approval from the Consultant, The contractor shall print at his own cost all forms, tables, formats etc.

40.0 Rates/Prices

The quoted rates/prices for the items shall be complete in all respect including all labour, material, plant and machinery, tools and tackles, all taxes, duties, levies, octroi, statutory levies applicable from time to time and others as specified in SCC etc. The Contractor should quote his rates/prices accordingly for the complete items in all respects.

41.0 Compliance of Statutory Obligations

The Contractor shall comply all the statutory obligations and obtain all required clearances to implement the project without any financial

repercussions to HSCC/Client and ensure all follow up actions with the local authorities in this respect for smooth completion of the project.

42.0 Unpriced Bids

The unpriced copies of the purchase orders of major items/equipments and of subcontracts placed by the Contractor shall be furnished to the Consultant.

ADDITIONAL SPECIFIC CONDITIONS OF CONTRACT

SPECIFIC CONDITIONS OF CONTRACT RELATING to Medical Gas Manifold System.

1.0 General

- 1.1 The following additional specific conditions and specifications shall be read in conjunction with instructions to bidders, General and Specific conditions of Contract. If there are any provisions in these additional specific conditions and specifications which are at variance with the provisions in the above mentioned documents, the provisions in these additional specific conditions and specification shall take precedence.

2.0 Scope of Contract

- 2.1 The Scope of work involves Supply, Installation, Testing & Commissioning of Medical Gas Manifold System at Surgical Block at All India Institute of Medical Sciences (AIIMS), New Delhi as detailed in specifications, Bill of Quantities & drawings etc.

3.0 Stores and Materials

- 3.1 The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, Bill of Quantities and specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can be reasonably inferred therefrom. In case of any discrepancy in the drawings or between the drawings, Bill of Quantities and specifications, the more stringent shall be followed. The decision of the Consultant in this regard will be final and binding upon the contractor.

4.0 Supply of Equipment/materials

Equipment/materials shall be strictly as per the specifications/standards given in the bid documents and approved by the Employer.

- 4.1 The contractor shall submit manufacturers test certificates of all the equipment supplied.
- 4.2 The contractor shall submit the original "Excise Paid Certificates", and exit Gate passes form manufacturer's factory/works clearly bearing the batch numbers and date of despatch.

5.0 Working Drawings etc.

HSCC/SES/MGMS/Surgical/AIIMS/2015

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- 5.1 The Contractor shall within 20 days of signing of the contract prepare and submit to the Consultant for approval, 2 sets of detailed working/shop drawings for the systems/ equipment indicating the layout of equipments, fabrication details, foundation details of equipments, electrical drawings, piping layout drawings indicating position/location of valves etc. and other drawings as required for the execution of the works under the contract.
- 5.2 The shop drawings shall also contain details of construction, size, arrangement, operating clearances, performance characteristics, and capacity of all items of equipment, as also details of all related items of work by other disciplines.
- 5.3 If the Consultant makes any amendment in the above drawings, the Contractor shall supply two fresh sets of drawings with the amendments duly incorporated, along with the drawings on which corrections were made. After final approval has been obtained from the Consultant, the Contractor shall submit a further six sets of shop drawings for the exclusive use of and retention by the Consultant.
- 5.4 The shop Drawings shall be submitted for approval sufficiently in advance of planned delivery and installation of any material, to allow Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to failure to produce shop drawings in time.
- 5.5 Approval rendered on shop drawings shall not be considered as a guarantee of measurements or of building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail nor does it in any way relieve the Contractor from his responsibility of furnishing materials or performing work and giving the performance of the System at Surgical Block at AIIMS, New Delhi as required by the Contract.

6.0 Completion Drawings

- 6.1 Following "AS BUILT" drawings shall be submitted by the contractor on completion of the work.
- a. Installation drawings giving complete details of the entire equipment including foundations.
 - b. Electrical drawings showing cable sizes, equipment capacities, control components and control wiring.
 - c. Schematic control drawings giving detailed sequence of operation and notes to explain the operation of the control circuit.

- d. Piping drawings showing all pipe sizes, valves and fittings indicating its location.
- e. Any other drawings to be supplied as per instructions of the Consultant.

The Drawings shall be cross checked and approved by the Consultant before acceptance.

7.0 Operation and Service Manuals

7.1 The contractor shall submit 3 sets of operation and service manuals in respect of the complete systems/ equipments including salient details of equipments, controls etc.

Following minimum details shall be furnished:

- i) Detailed equipment data as approved by the Consultant.
- ii) Manufacturer's maintenance and operating instruction.
- iii) Approved test readings.

The contractor shall also submit four (4) sets of technical literature on all automatic controls and complete technical literature on all equipment and materials. The contractor shall frame under glass, in the systems/ equipment room all consolidated control diagrams and all piping diagrams.

8.0 Inspection

8.1 **The Contractor should get third party certificates from the third party certifier like SGS/TUV/Llyods . The third party certifier should certify that the Medical Gas Manifold System inspected meet tender specification in their original letter head.** The Consultant and his representatives shall at all reasonable time have free access to the contractor's premises/works. The contractor shall give every facility to the Consultant and his Representative and necessary help for inspection and examinations and test of the materials and workmanship. Engineer may instruct for any test this has to be got done by Contractor at their own cost.

8.2 The Consultant's Representative shall have full powers to inspect drawings of any portion of the work or examine the materials and workmanship and their equipments & accessories at the contractor's works or at any other place from where the material or equipment is obtained. Acceptance of any material or equipment shall in no way, relieve the contractor of his responsibility for meeting the requirement of the specifications and giving the performance of the equipments and complete system/ equipments as per the contract.

9.0 Sub - Contracting

The contractor may subcontract the works with the written approval of the Consultant but subcontracting of any works shall not relieve the contractor

from the responsibility of supplying the equipments/materials and giving the performance as per the conditions given in the contract and the overall responsibility of the contractor for compliance with the contract terms does not alter by subcontracting.

10.0 Material Submittals

The contractor shall submit material submittals for all equipments, materials and machinery for the written approval of the Consultant before placing orders. The material submittals shall comprise of at least the following :

- a. Manufacturer's technical catalogues and brochures giving technical data about performance and other parameters.
- b. Manufacturers drawings/ sketches showing construction, dimensional and installation details.
- c. Rating charts and performance curves clarifying rating of equipment selected or proposed.

11.0 Samples and Prototypes

The contractor shall submit samples of valves, controls , copper pipes , gas outlets, alarms and/ or any other parts or equipment as required by the Consultant for prior approval in writing before placing the order. The contractor shall also construct prototype or samples of work as laid down in the contract or as instructed by the Consultant. Such samples and prototypes after approval shall be retained by the Consultant and shall serve as the standards to be achieved in final construction.

12.0 Testing and Commissioning

12.1 Tests on the equipment as called for in the Specifications shall be carried out by the Contractor in accordance with the specifications, the relevant Standard Specifications and the relevant Indian and International Standards.

12.2 The initial tests shall include but not be limited to the following :

- a. To operate and check the proper functioning of all electrically operated components/equipments.
- b. To operate and check the proper functioning of all electrical panels, switch gears, safety and other controls.

- c. To check the systems against leaks in different circuits, alignment of motor, Belt adjustments etc.
- d. To check the vibration and noise levels of the equipment.
- e. Setting of all control and all such other tests which are essential for smooth functioning of the equipments, system, plant.
- f. Leakage detection test for the complete pipeline distribution system
- g. Check the operation and functioning of valves
- h. Check proper functioning of complete safety system like alarms, interlockings etc.

12.3 The Contractor shall pay for and arrange without any extra cost, all necessary balancing and testing equipment, instruments, materials, accessories, power, water, fuel and the requisite labour for testing and commissioning of various equipments and the complete System/ Equipments. Any defects in materials and/or in workmanship detected in the course of testing shall be rectified by the Contractor entirely at his own cost, to the satisfaction of the Consultant. The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Consultant. All tests shall be carried out in the presence of the Consultant or the Consultant's Representative.

13.0 Provisional Taking Over

13.1 After completion of the installation of the System / Equipments and associated works the same shall be tested for its performance as per the contract. All adjustments should be made prior to this test so that proper conditions/working are achieved during this testing.

The System/ Equipments shall be provisionally taken over after successful completion of the above tests and the defects liability period shall commence after provisional taking over of the equipments/systems.

14.0 Operation and Maintenance of Medical Gas Manifold System for Surgical Block at AIIMS, New Delhi.

14.1 After provisional taking over, the contractor shall provide operation and maintenance services for the complete Medical Gas Manifold System till the successful completion of Defect Liability Period. The comprehensive operation & maintenance services during this period shall be inclusive of all spares, accessories, manpower, tools and tackle, replacement of parts,

routine servicing and maintenance of equipments/system etc. complete in all respect. The consumables like water, electricity and medical gases, during this period shall be arranged and provided by the Employer/Consultant.

- 14.2 During providing operation & maintenance services, the contractor shall deploy adequate skilled manpower, spare parts and tools and tackles for smooth operation and maintenance of the manifold system. The Employer/Consultant shall have the right to ask for more manpower or ask for the replacement of existing manpower in case it is found that the operation and maintenance services provided by the contractor is not satisfactory. The decision of Employer/Consultant in this regard shall be final and binding on the contractor.

15. Guarantee and Defects Liability Period

- 15.1 All the equipments, components and the Medical Gas Manifold System as a whole shall be guaranteed for its performance and against any manufacturing defect. The defect liability shall be valid for a period of **1 year** (12 months) from the date of satisfactory completion of works and issue of provisional taking over certificate. The contractor shall guarantee that all equipments shall be free from any defect due to the defective materials and bad workmanship or any other cause and that the equipment shall work satisfactorily and that the performance and efficiencies of the equipment shall be not less than the guaranteed values. Any parts found defective during the defect liability period shall be replaced by the contractor at his own expense. The services of the contractor's personnel, if requisitioned during this period for such work, shall be made available free of any cost to the Employer/Consultant. If the defects are not remedied within a reasonable time mentioned in the written notice, the Consultant may proceed to do so at the contractors risk and expenses without prejudice to any other rights. Joint inspection report shall also be deemed as written notice for this purpose.

The contractor shall submit a Guarantee, jointly along with the Original Equipment Manufacturer/s (OEM), that they shall supply all necessary spares demanded for the routine and emergency maintenance of Medical Gas Manifold System for a period of 10 years from the date of issue of provisional taking over certificate. A detailed list of spares will be supplied by the Contractor for the purpose of enabling the Employer/Consultant to decide spares needed for routine and emergency maintenance.

16.0 Measurement of Works

- 16.1 All works shall be measured in units as specified in the bill of quantities against each item. In case the method of measurement for any item is not

clarified in the specifications, the same shall be measured in accordance with the relevant standards/codes.

- 16.2 The Consultant may from time to time intimate to the contractor that he requires the works to be measured and the contractor shall forthwith attend or send a qualified agent to assist the Consultant or the Consultant's Representative in taking such measurements and calculations and to furnish all particulars or give all assistance required by either of them. Should the contractor not attend or neglect or omit to send such agent, then the measurements of the works, carried out by the Consultant or his Representative shall be taken to be the correct measurements of the works, in accordance with the standard method of measurements, as in prevalent use.

The contractor or his agent may at the time of measurement take such notes and measurements as he may require. The contractor shall submit Running bills supported by detailed measurement sheets.

17.0 Variation in Quantities

- 17.1 The quantities for ancillary work given in the drawings and/or specifications are for the guidance of the bidder. The contractor shall, however, be paid on the basis of actual quantities of works carried out.

18.0 Performance Guarantee

- 18.1 The contractor shall submit a performance guarantee certificate that the equipments and the complete System & equipments shall maintain the desired performance and shall also guarantee that the capacity of various components as well as the whole system covered under scope of work, technical schedules and bill of quantities etc. shall not be less than the specified capacities. The guarantee of the specific equipment supplier alone with regard to the performance of the system shall not be acceptable. However, this does not alter the overall responsibility of the contractor for compliance with the contract terms and conditions.

19.0 Painting

- 19.1 All equipment and ancillary items such as pipes, supports etc., will be painted in approved manner, using standard colour scheme as approved by the Consultant.

20.0 Safe Custody and Storage

- 20.1 Safe custody of all materials and equipments supplied by the contractor shall be his own responsibility till the final taking over by the Consultant. He should, therefore, employ sufficient staff for watch and ward at his own

expenses. The Consultant may, however, allow the contractor to use the manifold room/any other spare able room in site premises for temporary storage of his equipment if such spaces are ready and available.

21.0 Terms of Payment

21.1 For purposes of estimating the contract value of works executed for certificate of payment, the following norms shall be followed:

- 1) 65 % of the BOQ contract rates on delivery of equipments at site after inspection and passing on pro-data basis.
- 2) 25% of BOQ contract rates on satisfactory certification by client after erection and installation, testing and commissioning of equipments on pro-data basis.
- 3) 10 % of BOQ contract rates after successful completion of trial run of 30 days from the date of handover to the client.

22.0 Training of Personnel

The contractor shall arrange to train the Employer's personnel on the following aspects.

- a) Operation and routine maintenance of all equipments and the complete Intensive Care Units.
- b) Adjustments of settings for controls and protective devices.
- c) Preventive maintenance.
- d) Disassembling and assembling of equipments including identification and replacement of worn out parts.

23.0 Downtime Penalty

The maintenance services during the period of the defect liability, the contractor shall attend to any problem/ fault arising in the MGMS is put back to satisfactory operation within 72 Hours.

In case of failure by the contractor in restoring proper functioning of the Intensive Care Units within 72 Hours, a downtime penalty shall be paid by the contractor @ Rs 10,000(Rs Ten Thousand) per day, for a period of 4 days; and @ Rs 20,000(Rs Twenty Thousand) per day thereafter.

- 24.0 **Operation & Comprehensive Maintenance Contract (O& CMC)**
- 24.1 **The bidder must quote cost of Operation & CMC for 4 years after completion of defect liability period in the Price Bid and the rate will be added with the total cost of Medical Gas Manifold System and associated works for evaluation and ranking purpose.**
- 24.2 The bidder must quote **cost of one Year operation and Maintenance during defect liability period separately as per BOQ.**
- 24.3 The bidder should quote **cost of Operation & CMC for 4 Years after DLP in the Price Bid and the rate of CMC will be added for evaluation and ranking purpose.**
- 24.4 **Operation & Comprehensive Maintenance contract (O& CMC):**
(All India Institute of Medical Sciences (AIIMS), New Delhi reserves the right for contract, placement of order and necessary payment.)
- 24.5 The purchaser / consignee reserve the rights to enter into Operation & Annual Comprehensive Maintenance Contract between Consignee and the Supplier for the period as required after the completion of Defect liability period.
- 24.6 The supplier along with its Indian Agent and the Operation & CMC provider shall ensure continued supply of the spare parts for the machines and equipments supplied by them to the purchaser for 4 years after the expiry of one year defect liability period.
- 24.7 The Contractor shall provide Operation & comprehensive maintenance services for the **Medical Gas Manifold System** and system **for a period of Forty Eight (48) Months after completion of defect liability period** as detailed below:
- a. For the Medical Gas Manifold System along with accessories and system for 4 years.
 - b. With labour and spares after satisfactory completion of defect liability period.
 - c. The cost of Operation & CMC may be quoted along with taxes applicable on the date of tender opening.
 - d. **The bidder must quote cost of Operation & CMC in the Price Bid and the rate of Operation & CMC will be added with total cost of S/I/T/C of Medical Gas Manifold System for evaluation and ranking purpose.**
 - e. The payment of Operation & CMC will be made on quarterly basis after satisfactory completion of contract, duly certified by user.

- f. **There will be 95% uptime during Operation & CMC period of the complete system otherwise with penalty of extension of Operation & CMC period by double the downtime period.**
- 24.8 The Operation & comprehensive maintenance services during this period shall be inclusive of all spares, accessories, manpower, tools and tackle, replacement of parts, routine servicing and maintenance of equipment/systems etc. complete in all respects. The consumables like water, electricity and detergents during this period shall be arranged and provided by the Consignee. The Contractor shall carry out all routine and special maintenance of the equipment/plant/system and attend to any defects that may arise in operation of the equipments/system and plant. Consumable items required during the maintenance, loss of which is not attributable to bad material and/or workmanship will be arranged by the Consignee without cost to Contractor.

FORM OF AGREEMENT

AGREEMENT

This Agreement made the _____ day of _____ 20____ between **M/s HSCC (India) Ltd., E6A, Sector-I, Noida-201301 on behalf of All India Institute of Medical Sciences (AIIMS), New Delhi** after called "The Employer") represented by M/s HSCC (India) Ltd. who enters into this Agreement of the one part and M/s _____
_____ (hereinafter called "The Contractor") of the other part.

Whereas the Consultant is desirous that certain works should be executed by the Contractor, viz _____ ("the Works") and has accepted a Bid by the Contractor for the execution and completion of the works and the remedying of any defects therein.

Now this Agreement witnesseth as follows :

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz :
 - (a) The Letter of Award;
 - (b) The said Bid;
 - (c) The General Conditions of Contract;
 - (d) Instructions to Tenderers and Specific Conditions of Contract;
 - (e) The Specification;
 - (f) The Drawings;
 - (g) The Priced Bill of Quantities;
 - (h) Any other relevant documents referred to in this Agreement or in the aforementioned documents
3. In consideration of the payments to be made by the HSCC(India) Ltd acting as Consultant to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Consultant to execute and complete the Works and remedy any defects therein in conformity with the provisions of the Contract in all respects.
4. The Consultant hereby covenants to pay the Contractor through HSCC in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

In Witness whereof the parties hereto have caused this Agreement to be executed the day and year first before written.

signed, Sealed, and Delivered by the Said

Binding Signature of [HSCC India Ltd.] for and on behalf of **All India Institute of Medical Sciences, New Delhi.**

Binding Signature of Contractor _____

In the presence of

Witness (1) :

Witness (2) :

ANNEXURE - B

PROFORMA FOR PERFORMANCE BANK GUARANTEE

(On a stamp paper of appropriate value from any Nationalised Bank or Scheduled Bank)

To,

M/s HSCC (India) Ltd.,
Plot No. 6(A), Block E, Sector 1,
NOIDA - 201 301.

Dear Sir,

In consideration of the (hereinafter called 'Consultant') having awarded to M/S (hereinafter referred to as the said Contractor or 'Contractor' which expression shall wherever the subject or context so permits include its successors and assignees) a Contract No. _____ in terms inter alia, of the HSCC Letter No. _____ dated _____ and the General Conditions of Contract and upon the condition of the Contractor's furnishing Security for the performance of the Contractor's obligations and discharge of the Contractor's liability under and in connection with the said Contract upto a sum of Rs. _____ (Rupees _____ only) amounting to _____ percent of the total Contract value.

1. We, _____ (hereinafter called 'The Bank' which expression shall include its successors and assignees) hereby jointly and severally undertake to guarantee the payment to the Consultant in rupees forthwith on demand in writing and without protest or demur or any and all moneys payable by the Contractor to the consultant in respect of or in connection with the said Contract inclusive of all the consultant's losses and damages and costs, (inclusive between attorney and client) charges and expenses and other moneys payable in respect of the above as specified in any notice of demand made by the consultant to the Bank with reference to this guarantee upto an aggregate limit of Rs. _____ (Rupees _____ only).
2. We _____ Bank Ltd. further agree that the Consultant shall be sole judge of and as to whether the said Contractor has committed any breach or breaches of any of the terms and conditions of the said Contract and the extent of loss, damage, cost, charges and expenses caused to or suffered by or that may be caused to or suffered by the consultant on account thereof and the decision of the consultant that the said Contractor has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by the consultant from time to time shall be final and binding on us.

3. The Consultant shall be at liberty without reference to the Bank and without affecting the full liability of the Bank hereunder to take any other Security in respect of the Contractor's obligations and liabilities hereunder or to vary the Contract or the work to be done there under vis-a-vis the Contractor or to grant time or indulgence to the Contractor or to reduce or to increase or otherwise vary the prices of the total Contract value or to release or to forbear from enforcement of all or any of the Security and/or any other Security(ies) now or hereafter held by The Consultant and no such dealing(s) reduction(s) increase(s) or other indulgence(s) or arrangements with the Contractor or release or forbearance whatsoever shall absolve the bank of the full liability to the Consultant hereunder or prejudice the rights of the Consultant against the bank.
4. This guarantee shall not be determined or affected by the liquidation or winding up, dissolution, or change of constitution or insolvency of the Contractor but shall in all respects and for all purposes be binding and operative until payment of all monies payable to the Consultant in terms thereof.
5. The bank hereby waives all rights at any time inconsistent with the terms of this guarantee and the obligations of the Bank in terms hereof shall not be anywise affected or suspended by reason of any dispute or disputes having been raised by the Contractor stopping or preventing or purporting to stop or prevent any payment by the Bank to the Consultant in terms hereof.
6. The amount stated in any notice of demand addressed by the Consultant to the Bank as liable to be paid to the Consultant by the Contractor or as suffered or incurred by the Consultant on account of any losses or damages or costs, charges and/or expenses shall be conclusive evidence of the amount so liable to be paid to the Consultant or suffered or incurred by the Consultant as the case may be and shall be payable by the Bank to The Consultant in terms hereof.
7. This guarantee shall be a continuing guarantee and shall remain valid and irrevocable for all claims of the Consultant and liabilities of the Contractor arising upto and until midnight of _____.
8. This guarantee shall be in addition to any other guarantee or Security whatsoever that the Consultant may now or at any time anywise may have in relation to the Contractor's obligations/or liabilities under and/or in connection with the said Contract, and the Consultant shall have full authority to have recourse to or enforce this Security in preference to any other guarantee or Security which the Consultant may have or obtain and no forbearance on the part of the Consultant in enforcing or requiring enforcement of any other Security shall have the effect of releasing the Bank from its full liability hereunder.
9. It shall not be necessary for the Consultant to proceed against the said Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding that any Security which The Consultant may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the said bank hereunder be outstanding or unrealised.

10. We, the said Bank undertake not to revoke this guarantee during its currency except with the consent of the Consultant in writing and agree that any change in the constitution of the said Contractor or the said bank shall not discharge our liability hereunder.
11. We _____ the said Bank further that we shall pay forthwith the amount stated in the notice of demand notwithstanding any dispute/difference pending between the parties before the arbitrator and/or that any dispute is being referred to arbitration.
12. Notwithstanding anything contained herein above, our liability under this guarantee shall be restricted to Rs. _____ (Rupees _____) and this guarantee shall remain in force till _____ and unless a claim is made on us within 3 months from that date, that is before _____ all the claims under this guarantee shall be forfeited and we shall be relieved of and discharged from our liabilities there under.

Dated _____ day of _____ 20

For and on behalf of Bank.

Issued under seal :

PROFORMA FOR BID SECURITY BANK GUARANTEE

(To cover payment of Bid Security and Conditions of Contract)

(On a stamp paper of appropriate value from any Nationalised Bank or Scheduled Bank)

To

M/s HSCC (India) Ltd.,
Plot No. 6(A), Block E, Sector 1,
NOIDA - 201 301.

Dear Sir,

In consideration of your agreeing to accept Bank Guarantee for Rs.
(Rupees) in lieu of
payment from M/s having its /their
registered office at
(hereinafter called the Bidder) towards Bid Security in respect of your Tender no.
..... calling for Tender for
at and for due fulfilment of the terms and conditions
of the said Tender, we hereby undertake and agree to indemnify and keep you
indemnified to the extent of Rs (Rupees
.....).

In the event of any loss or damages, costs, charges or expenses caused to or suffered by
you by reason of any breach or non observance on the part of the Bidder of any terms
and conditions of the said Tender, we shall on demand and without cavil or argument, and
without reference to the Bidder, irrevocably and unconditionally pay you in full satisfaction
of your demand the amounts claimed by you, provided that our liability under this
guarantee shall not at any time exceed Rs
(Rupees).

This guarantee herein contained shall remain in full force and till you finalise the Tender
and select the Tender as per your choice and it shall in the event of the said Bidder being
selected and entrusted with the said work, continue to be enforceable till the said Bidder
executes the Agreement with you and commences the work as stipulated under the terms
and conditions of the said Tender have been fully and properly carried out by the said
Bidder and accordingly discharges the guarantee.

We also agree that your decision as to whether the Bidder has committed any breach or
non observance of the terms and conditions of the said Tender shall be final and binding
on us.

We under take to pay the Consultant any money so demanded by the Consultant
notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or
proceedings pending before any Court or Tribunal relating thereto, our liability under this
present being absolute and equivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such a payment.

This guarantee shall continue to be in full force and effect for a period of 180 days from the date of submission of Bid. Notwithstanding the above limitations, we shall honour and discharge the claims preferred by you within thirty days of expiry of this guarantee.

We shall not revoke this guarantee during its currency except with your previous consent in writing. This guarantee shall not be affected by any change in Constitution of our bank or of the Bidder firm. Your neglect or forbearance in the enforcement of the payment of any money, the payment whereof is intended to be hereby secured or the giving of time for the payment hereto shall in no way relieve us our liability under this guarantee.

Dated this day of

Yours faithfully,

For

MANUFACTURER'S AUTHORIZATION FORM

No. -----

Dated -----

To

Dear Sir,

Tender No. -----

We _____ who are established and reputed manufacturer of _____ (name & description of goods offered) having factories at _____ (address of factory) do hereby authorize M/s _____ (Name & address of agent) which has been our dealer/distributor since _____, to submit a bid, and sign the contract with you for the goods manufactured by us against the above tender.

No company or firm or individual other than M/s _____ are authorized to bid and conclude the contract for goods manufactured by us against this specific tender.

We hereby extend our full guarantee and defect liability period as per the clause of Condition of Contract and Additional Specific Conditions of Contract of above tender for goods and services offered for supply by our authorized firm .

Yours faithfully,

(Name)
(Name of Manufacturer)

Note: This authorization letter should be on the letter head of the manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer. It should be included by the bidder in its bid.

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

e- TENDER

FOR

**Supply, Installation, Testing & Commissioning of Medical Gas
Manifold System for Surgical Block at All India Institute of Medical
Sciences, New Delhi**

VOLUME – IV

TECHNICAL SPECIFICATION

DECEMBER 2015



(Consultants & Engineers for Mega Hospitals & Laboratories)
E - 6 (A), Sector - I, NOIDA (U.P.) - 201 301 (INDIA)

PHONE : 0120-2542436, 2542437 FAX : 0120-2542447
E- mail : www.hsccltd.co.in

Tender No. HSCC/SES/MGMS/Surgical/AIIMS/2015

TECHNICAL SPECIFICATION OF MEDICAL GAS MANIFOLD SYSTEM

Scope of work **Supply, installation, testing, commissioning including turnkey work and handing over of Medical Gases Manifold and Distribution System to the client. Operation and Maintenance including providing of free spare parts and service during Defect Liability Period.**

The system shall comprise of:

A. Source Equipments

Fully Automatic Oxygen manifold & control panel
Fully Automatic N2O manifold & control panel
Vacuum (suction) supply system
Medical Compressed Air System
Anesthesia Gas scavenging system
Liquid Medical Oxygen Tank

B. Distribution pipes.

C. Outlets and bed head panel for Wards etc. with accessories.

D. Complete Alarm system.

E Horizontal Bed Head Panel

G. Accessories

Oxygen flow meter with humidifier
Ward vacuum units
Theatre Suction units.

STANDARDS

The design & selection of items should be of international standard like NFPA 99(latest version) standard and UL listed or DIN EN (latest version) and UL listed/CE marked or HTM 02 01 (latest version) standard and CE marked. This supersedes single/multiple standards mentioned at any other places in the tender specification involving item/system/capacity etc. The products should be of one standard only. All indigenous items should be compatible to the main system.

1.0 OXYGEN SYSTEM

Oxygen System Shall consists of the followings:-

- a) Oxygen Manifold System
- b) Fully Automatic Oxygen Control Panel
- c) Oxygen Emergency supply system
- d) Liquid Oxygen

1. a Oxygen Manifold

- **The oxygen manifold shall be of size 20+20 bulk cylinders.** Manifold shall consist of two high-pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with 20 numbers of cylinder pigtail connections to suit cylinder valves as per IS 3224 incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections. Each header bar assembly shall be provided with a high-pressure shut-off valve.
- The manifold should be so designed that it shall suit easy cylinder changing and positioning.
- The cylinder should be placed with the help of cylinder brackets and fixing chains which should be zinc plated.
- The manifold should be suitable to withstand a pressure of 145 Kg/cm². The manifold should be tested (hydraulically) at 3500 psig pressure and to be supplied along with necessary test certificate.
- The Oxygen Manifold System shall be compatible to allow integration with the Liquid Oxygen Tank.

1. b Fully Automatic Oxygen Control Panel .:

The Oxygen Control Panel shall be of microprocessor based and preferably Digital/Analogue Display Type. Pressure reduction shall be in two stages. Panel shall be integrated with pressure gauges inside panel on downstream of pressure regulator. Panel shall be fitted with standby line regulator. Line regulators shall have pressure relief mechanism for testing and servicing purpose.

- Panel shall be Fully Automatic and shall switch over from “Bank in Use” to ‘Reserve Bank’ without fluctuation in delivery line pressure and without the need of external electrical power. After the switch-over, the “Reserve Bank” shall become the “Bank in

Use” and the “Bank in Use” shall become the “Reserve Bank”. The Control Panel will be powered by a microprocessor.

- A Microprocessor circuit board assembly shall provide a relay output to give indication when or just before the manifold switches from one bank of cylinders to another. The switch over shall be mechanically controlled, not electrically.
- To avoid excess pressure being supplied to the distribution system, a pneumatically relief valve for the line regulator shall be incorporated. An intermediate pressure relief valve shall be installed between the high-pressure regulators and the line delivery regulators.
- The control panel incorporates six coloured LED’s, three for the Left Bank and three for the Right Bank: One for Bank in use, One for Bank ready and One for Bank empty. Both the Left and Right bank pressures and the main line pressure should be displayed on the front door of the cabinet by means of LED's. All pressure transducers, micro switches, and display LED’s shall be pre-wired to an internal microprocessor circuit board.
- All components inside the Control Panel like Pressure Regulators, piping and control switching equipment shall be cleaned for Oxygen Service and installed inside the cabinet to minimize tampering with the regulators or switch settings.
- The Control Panel should be made to provide Heavy Duty with a Delivery Flow Capacity of over **2000 lpm at 55-60 psig.**
- Control Panel should be CE marked /UL listed

1.c **Emergency Oxygen System:**

It will have emergency arrangement of 10-cylinder configuration, with Copper tail pipes, Non Return Valves & high flow regulator with pressure gauges for Cylinder & line pressure and safety valve. Pressure regulator shall be detachable from the manifold.

1d. **Terminal outlets with probes/adapters**

As per Sl. No.-16

1e. **LIQUID MEDICAL OXYGEN STORAGE TANK-20KL CAPACITY**

The double walled Vacuum Insulated Evaporator shall be constructed of stainless steel inner vessel contained within a carbon steel outer vessel. The annular space between the vessels shall be filled with non-inflammable perlite insulation material to insulate under vacuum. The VIE should be self pressurizing type by partial evaporation of liquid oxygen through a pressure building coil by a non ferrous imported pressure regulator. The vessel shall be supplied as a functional whole with all materials of construction & the cleaning regime suitable for medical grade liquid oxygen.

Quantity : 1 No.

Installation	:	Outdoor
Type	:	Double walled, vertical
Capacity	:	Minimum 20000 ltrs water capacity
Design Code	:	ASME Sec.VIII Div.I Latest Edition/EN 13458-2 Annexure –C/AD2000 MARKBLATTER 2004 Edition
Max working pressure	:	17 Bar G
Design temperature	:	- 196°C to + 50°C
Hydraulic test pressure	:	26 bar G
Type of Insulation	:	Vacuum, Perlite filled
Safety Valve Set pressure	:	17 Bar G (dual safety valve with three way diverter valve)
Bursting Disc Set pressure	:	23 Bar G (Bursting disc)
Standard fittings	:	Pressure rising coil, Pressure building regulator of adequate capacity and size, dual safety valve with imported three way diverter valve, bursting disc., pressure gauges, liquid over flow line, Liquid level gauge and adequate numbers of extended spindle glove valve etc.
Maximum Evaporation Rate	:	<0.35% of net value.
Material of Construction	:	Inner shell and wetted parts of SS-304 Outer shell of CS ASTMA 516 Gr.70/CG3412002 EN13455 S275/S355
Joint Efficiency	:	100%
Radiography	:	100% for inner, for outer spot
External piping	:	From LMO Tank to Vaporizer SS304 From Vaporizer to Inlet of Pressure Reducing Station SS304 From Outlet of Pressure Reducing Station to Main header Copper
Cryogenic Valves	:	Non Ferrous .

Cryogenic Safety Valves	:	Imported
Pressure Building Regulator	:	Non ferrous .
Leak Detection test	:	Helium Leak Detection
Painting	:	Primer and finish with White RAL 9010
Inspection	:	By 3 rd party (SGS/LLOYDS/TUV)
Cleaning	:	Degreasing for Oxygen Service and Pressurize with Nitrogen.
Withdrawl rate	:	1000 Cum hr. at 12 Bar G
Accessories	:	

LMO Tank along with P & ID shall be fitted with the following accessories:

- Top Fill Valve
- Bottom Fill Valve
- Liquid charging line blow valve
- Liquid Delivery valve
- Overflow Valve
- Gas blow valve
- Filling Coupling
- Vaporizer Coupling
- Liquid Level Gauge (Dial 100 mm)
- High Level Valve
- Equalizing Valve
- Low level Valve
- Pressure Gauge (100mm dial, Range 0-25 kg/sq.cm)
- Pressure Gauge Isolation Valve
- Pressurizing Valve
- Pressurizing Coil
- Filter
- Pressure Regulator
- Economizer
- Check Valve
- Evacuation Port
- Vacuum Gauge Connection Port/Vacuum probe valve.

SAFETY FITTING:

- Two safety valves for inner vessel fitted on pipe line with flow divert valve.

- Rupture disc for inner vessel
- Safety valve for inlet pipeline
- Safety valve for pipeline of pressurizing evaporator
- One rupture disc/safety device on outer vessel.

SUBMITTALS:

The Liquid Medicals oxygen tank shall accompany the Original Quality Test Certificate covering following documents:

- Approvals letter from CCOE along with approved drawing from CCOE.
- Approval letter from CCOE for use of cryogenic vessel(s) at site.
- Certificate from the authorized inspection agency.
- Heat chart for pressure parts.
- Dimension checks parts.
- Dished End reports.
- Mechanical properties test reports.
- Visual inspection report.
- Radiography examination report.
- Liquid penetrant examination.
- Cleaning inspection report.
- Hydro-pressure test report.
- Pneumatic pressure test report.

Inner vessel rub-off sheet.

Material test reports for pressure gauges, level gauge etc.

NOTE :

- The date of manufacturing of Liquid Medical Oxygen Storage tank shall not be prior to Jan 2014
- All valves shall be long stem valves with SS body.
- Contractor to provide technical specifications for all the accessories in their offer.

C ATMOSPHERIC VAPORIZER:

Continuous duty atmospheric vaporizing of minimum flow capacity 1200 NM³/hr. along with required/interconnecting pipelining from VIE to Vaporizer, Vaporizer to Pressure reducing station and to gas supply header. Scope of work should cover provision of all required supports, valves, accessories etc.

Duty Cycle	:	Continuous
Quantity	:	One
Capacity	:	Minimum 1200 Nm ³ /hr
Type	:	Vertical
Fluid	:	Liquid Oxygen
Operating Inlet Temperature	:	-196°C
Operating Outlet Temperature	:	Not less than 10 deg Centigrade below ambient
Max Operating Pressure	:	25 Bar G
Pneumatic Test Pressure	:	30 Bar G
Material of construction	:	Aluminium alloy
Design code	:	ASME section VIII Division 2000

D The tendered shall submit duty cycle and design details pertaining to the vaporiser including overall dimensions, type/size of flanges & tubes etc.

e. PRESSURE REDUCING STATION:

Pressure reducing station with by pass arrangement comprising of Pressure regulators designed for flow rate of minimum 2000 LPM along with inlet –outlet pressure gauges, necessary valves & filters and piping connection.

-Inlet pressure 17 Bar G

-Outlet pressure 0-10 Bar G

As liquid oxygen is the primary source, cylinder bank be designed as per flow rate calculations.

1f. High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.

2.0 NITROUS- OXIDE SYSTEM

Nitrous Oxide system shall consist of the followings :

- a Nitrous Oxide main manifolds supply system
- b Fully automatic Nitrous Oxide control panel
- c Nitrous-oxide emergency supply system

2.a Nitrous Oxide Manifold

- **The Nitrous Oxide manifold shall be of size 8+8 bulk cylinders.** Manifold shall consist of two high-pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with 8 numbers of cylinder pigtail connections to suit cylinder valves as per IS 3224 incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections. Each header bar assembly shall be provided with a high-pressure shut-off valve.
- The manifold should be so designed that it shall suit easy cylinder changing and positioning.
- The cylinder should be placed with the help of cylinder brackets and fixing chains which should be zinc plated.
- The manifold should be suitable to withstand a pressure of 145 Kg/cm². The manifold should be tested (hydraulically) at 3500 psig pressure and to be supplied along with necessary test certificate.

2.b Fully Automatic Nitrous Oxide Control Panel .

- The Nitrous Oxide Control Panel shall be of microprocessor based and preferably Digital/Analogue Display type. Pressure reduction shall be in two stages. Panel shall be integrated with pressure gauges inside panel on downstream of pressure regulator. Panel shall be fitted with standby line regulator. Line regulators shall have pressure relief mechanism for testing and servicing purpose.
- Panel shall be Fully Automatic and shall switch over from “Bank in Use” to ‘Reserve Bank’ without fluctuation in delivery line pressure and without the need of external electrical power. After the switch-over, the “Reserve Bank” shall become the “Bank in

Use” and the “Bank in Use” shall become the “Reserve Bank”. The Control Panel will be powered by a microprocessor.

- A Microprocessor circuit board assembly shall provide a relay output to give indication when or just before the manifold switches from one bank of cylinders to another. The switch over shall be mechanically controlled, not electrically.
- To avoid excess pressure being supplied to the distribution system, a pneumatically relief valve for the line regulator shall be incorporated. An intermediate pressure relief valve shall be installed between the high-pressure regulators and the line delivery regulators.
- The control panel incorporates six coloured LED's, three for the Left Bank and three for the Right Bank: One for Bank in use, One for Bank ready and One for Bank empty. Both the Left and Right bank pressures and the main line pressure should be displayed on the front door of the cabinet by means of LED's. All pressure transducers, micro switches, and display LED's shall be pre-wired to an internal microprocessor circuit board.
- All components inside the Control Panel like Pressure Regulators, piping and control switching equipment shall be cleaned for Oxygen Service and installed inside the cabinet to minimize tampering with the regulators or switch settings.
- The Control Panel will have heaters to prevent ice formation on the regulators at high flow rates.
- The Control Panel should be made to provide Heavy Duty with a Flow Capacity of over **700 lpm at 55-60 psig.**
- Control Panel should be CE marked /UL listed

2.c **Emergency Nitrous Oxide System-**

Emergency system shall have arrangement of 4 Cylinder configuration with Copper tail pipes, Non Return Valves & high flow regulator with pressure gauges for Cylinder & line pressure and safety valve. Pressure regulator shall be detachable from the manifold.

2d. **Terminal outlets with probes/adapters**

As per Sl. No.-16

2e. High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.

3.0 **VACUUM (SUCTION) SYSTEM .**

3a Vacuum system shall be of **system capacity 220 cfm/6230 LPM at 19” Hg to be delivered to the hospital with necessary standby as per the requirement of relevant International Standard.**

- The system shall be of consisting of lubricated rotary vane vacuum pumps with Control Panel equipment and one tank.
- This system shall be capable of removing 99.9% of oil and smoke particles from the exhaust.
- The system shall include the following accessories for each pump: inlet check valve, inlet isolation valve, vacuum control switch, oil temperature gauge, thermal malfunction switch and vacuum control switch. Provide flexible connectors on inlet and exhaust of each pump, exhaust tee with union, cock valve as well as copper tubing with shut-off cock for gauge and vacuum switches. The system shall include vacuum storage tank of suitable capacity. The inside of the tank shall be coated for rust protection with a two component coating which provides a hard, durable lining.
- Provide vibration mounting as per NFPA 99/HTM2022/DIN EN (latest version).
- The system shall have UL listed/CE marked control panel
- Provide the panel with a programmable controller with removable terminals to allow quick and easy replacement in the field. The system should be designed to function even if the programmable controller fails. The system shall be equipped with a flashing light pump failure alarm/shutdown at any of the following conditions: motor overload tripped, main disconnect is off, blown fuse, control transformer failure, starter coil failure, Selector Switch is off. The central control unit shall incorporate a colour display with LED indicators and have easy access to system operational information.
- Provide audible and visual local alarm (complete with indicating lights and individual sets of auxiliary contacts wired to the terminal strip for remote alarm indication) for the following: vacuum pump thermal malfunction and reserve vacuum pump in use. Provide manual reset for thermal malfunction shut-down. All control and alarm functions shall remain energized while any vacuum pump in the system remains electrically on-line.
- The bacteria filtration system shall incorporate high efficiency filter elements. A differential vacuum indicator shall be installed across the filter to indicate blockage. Each filter shall be designed and sized to carry the full plant design flow capacity with minimum drop. Bacteria filter elements shall have penetration levels not exceeding 0.005% when tested and utilizing particles 0.02 to 2 micron size range.
- The item should be CE marked /UL listed

3b. Terminal outlets with probes/adapters

As per Sl. No.-16

- 3c. Flexible tubing having Antistatic core as per ISO with proper colour coded complete as per specifications.

4.0 AIR COMPRESSORS .

4a. The system shall be consisting of **Oil free Compressed Air System to provide system capacity 150 scfm/2830 LPM at 10 bar to be delivered to the hospital with necessary standby as per the requirement of relevant standard along with** allied equipment, suitable tank and control panel

- The medical air compressors shall be of the totally oil-less air-cooled design/ Screw/Scroll. Each compressor shall be belt driven by a suitable HP, 3 phase, 50 cycle, 415volt, motor.
- The system shall be equipped with filters.
- The system shall have UL listed/CE marked control panel.
- Dual air dryers, dual 0.5 micron pre-filters, dual 0.5 micron after-filters, line pressure regulating valves, dew point monitor, CO monitor and other accessories required to meet and exceed the current code requirements shall be mounted on the compressor system base.
- All components shall be completely single-point service connections as per latest international standards.
- There shall be two identical banks of air treatment equipment, piped in parallel and provided with valves to by-pass either filter set for element replacement, maintenance and repair work on one of the sets while still treating medical compressed air through the other set without any sacrifice in air quality. Each bank should consist of three stages of treatment.
- The first stage shall be a prime efficiency come together with particles removal down to 0.5 micron with 99.9999% retention. This filter removes aerosols and solid particles.
- The second stage shall be desiccant heatless air dryer equipped with purge control. Built-in purge saver control shall automatically minimize and adjust the amount of purge air to match the variable airflow. The dry compressed air is discharged from the on-line tower into the third stage.
- The third stage shall be a prime efficiency particulate after filter with particle removal down to 0.5 micron. The after filter element shall be provided high particles retention, low pressure drop and long element life.
- Downstream pressure regulators shall maintain constant discharge pressure of 55 to 60 PSIG (field adjustable).
- Digital dew point and CO monitors with alarm set points at +39 °F and 10 PPM are provided with dry contacts for connection to remote alarm panels. A “demand check” for maintenance should as per current code requirements of latest international standards.
- Besides meeting the requirements of the relevant standard, filtration of medical compressed air shall conform to ISO 8573.1 Class 1.3.1 of medical breathing air.

- The item should be CE marked /UL listed

4b & 4c **Terminal outlets with probes/adapters**

As per Sl. No.-16

- 4d. High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.

5.0 DISTRIBUTION PIPING (INDIGENOUS)

- Medical graded Copper pipes shall be solid drawn, tempered, seamless, phosphorous deoxidized, non-arsenic and degreased for oxygen service. Distribution Copper Pipe should be Cu-DHP grade half hard and manufactured as per BSEN:13348: 2008,.
- The supply of pipes shall accompany with manufacturers test certificates for physical properties and chemical composition. The supply of pipes shall be further substantiated with inspection certificates from third party inspectors like LLOYDS.
- Each pipe shall be capped at both ends before supply.
- The contractor shall use the following sizes:

	<u>Outer Dia.</u>	<u>Thickness</u>
1.	12mm	0.7mm
2.	15mm	0.9mm
3.	22mm	0.9mm
4.	28mm	0.9mm
5.	42mm	1.2mm
6.	54mm	1.2mm
7.	76.1mm	1.5mm

Copper Fittings – Manufacturing Standard: be established.

Pipe jointing fittings - Pipe jointing fittings should be end-feed capillary fittings to BS EN 1254-1. Fittings should be factory degreased and individually packed and certified by the manufacturer for medical use

Brazing Filler Metals – Manufacturing Standard: EN 1044: 1999

- a. Brazing filler metal for Copper to Copper Brazing: CP 104 with 5% silver
- b. Brazing filler metal for Copper to brass Brazing: AG203 with 43% silver content

Copper to Copper joints shall be made on site using silver-copper-phosphorous brazing alloy to BS-1044: 1999. Copper to brass or gunmetal joints shall not be made on site. Except for mechanical joints used for components, all metallic pipeline joints shall be brazed or welded. All pipelines shall be routed in such a way that their not exposed to a temperature less than 5 deg Celsius above the dew point of the gas distribution pressure. Pipeline shall be supported at interval to prevent sagging.

- Installation and testing
 - i) Installation of piping shall be carried out with utmost cleanliness. Only pipes, fittings and valves that have been degreased and fittings brought in polythene sealed bags will be used at site. Pipes fixing clamps shall be of non-ferrous and non-deteriorating plastic suitable for the diameter of the pipe.
 - ii) All pipe jointing fittings and sub-assemblies of fittings for connection to pipes must be cleaned and degreased for oxygen service and be free of particulate matter and toxic residues. They must be individually sealed in bags or boxes and delivered to site identified as medical gas fittings.
 - iii) All pipe joints shall be made using inert gas using flux less silver brazing method (silver brazing). Continuous purging with oil-free nitrogen to be carried out while brazing is done.
 - iv) Adequate supports shall be provided while laying pipelines to ensure that the pipes do not sag. Suitable sleeves shall be provided wherever pipes cross through walls/slabs. All pipe clamps shall be non-reactive to copper.
 - v) Brazing should be carried out using oxygen-free nitrogen as an internal inert gas shield to prevent the formation of oxides on the inside of the pipes and fittings. This method leaves a bright, clean bore. Purging shall be required to remove the internal shield gas and the other particulate matter not associated with the brazing operation.
 - v) After erection, the pipes will be flushed with dry nitrogen gas and then pressure tested with dry nitrogen at a pressure equal to twice the working pressure or 150 psig, whichever is higher for period of not less than 24 hours.
 - vi) Heat Source for Brazing: Oxy-acetylene gas should be used for achieving proper working temperatures for brazing.

- vii) PTFE tape is not an acceptable sealing material on oxygen systems or elsewhere downstream of final filters on supply plants.
- viii) All the piping system shall be tested in the presence of the site-engineer or his authorized representative.
- ix) Painting :

All exposed pipes should be painted with two coats of synthetic enamel paint and color codification should be as per IS:2379 of 1990.

6.0 ALARM SYSTEM_ .

- a. The master and area alarms as per required locations.
- b. Alarm shall be microprocessor based with individual microprocessors on each area display and sensor board. The sensors shall be capable of local or remote mounting. Each area display module/sensor unit shall be gas specific. With an error message display for an incorrect connection.
- c. The alarms shall be field expandable with the addition of extra modules. Upto six services can be accommodated per standard box
- d. Each specific service shall be provided with an LED digital read out comprising of 0-250 psi for positive pressure and 0-30 inch Hg for vacuum. The digital readout shall provide a constant indication of each service being measured. A bar graph trend indicator shall be provided for each service indicating a green "NORMAL", yellow "CAUTION" and a red "HIGH" or "LOW" alarm condition. Under normal operation the bar graph display shall move up and down in the green range depending on service usage. If an alarm occurs, the "RED" alarm light will flash and the audible alarm will sound. Pushing the "ALARM SILENCE" button will cancel the audible alarm but the unit will remain in the alarm condition until the problem is rectified.
- e. The default set points shall be +/- 20% variation from normal condition.
- f. In the calibration mode the following parameters shall be field adjustable:
 - i) High/Low set points
 - ii) Imperial/Metric Units
 - iii) Repeat alarm enable/disable
- g. Set points shall be adjustable by two on board push buttons.

- h. In addition “PUSH TO TEST” & “ALARM SILENCE” buttons shall be easily accessible to operate and test the unit.
- i. Combination master/area alarms shall have no moving parts and shall require no maintenance after initial installation.
- The item should be CE marked /UL listed

ALTERNATELY

ALARM SYSTEM .

Alarm system should have microbial coating labels for touch control and capability of monitoring of installed gas services by means of sensors that detect deviations from the normal operating limits. The medical gas area alarm shall fully comply with requirements of BSEN 60601-1 and BS EN 60601-1-2 and BS EN ISO 7396-1. The cover, back box and bezel (if required) shall be polyester powder. A single tamper proof fastener shall be used to gain access to the hinged door. The hinge shall operate through a minimum of 120° to provide adequate access. It should have each gas service shall be displayed by cored LED to show Normal (green), Low and High pressure (red) conditions. Medical vacuum systems shall be displayed in the Normal (green) and Low vacuum (red) conditions. Failure indicators shall be displayed by flashing lights and normal indications shall be steady. Each LED block indicator shall be a plug-in component with individual long life LED connected in parallel in two banks to provide duplex circuits. An audible warning shall sound simultaneously with any failure indication and a mute facility shall be provided. Following a mute selection the audible will resound after 15 minutes (approx.) or shall operate simultaneously should a further alarm condition occur. A Mute switch shall be provided inside the panel for use during any maintenance resulting in prolonged pipeline or plant shutdown. This facility shall automatically reset when the gas service returns to normal. The alarm panel shall have a Test facility to prove the integrity of the internal circuits, LED and audible warning. The alarm panel shall incorporate a volt free normally closed relay to allow for interconnection to either a medical gas central alarm system or an event recording circuit of a building management system. Each Alarm shall provide a green LED to indicate that electrical power is available at the panel and a red LED to indicate ‘System Alarm’. In the event of an electrical power supply failure the ‘System Alarm’ LED shall illuminate (flashing) and the audible warning shall be delayed for 30 seconds to enable standby generator tests. Line continuity monitoring circuits shall be provided to constantly monitor the integrity of the input sensors and interconnecting wiring . In the event of any fault the line continuity monitoring circuits shall initiate the specific gas service failure indication, a System alarm indication and an audible warning. Further aids to fault diagnosis shall be provided to allow connection of up to 5 repeater panels, enabling the visual and audible alarm signals to be repeated at other locations within department.

It should be connected through Pressure and Vacuum Switches. Pressure and Vacuum switches shall be manufactured with brass wetted parts and house a PCBA with line continuity monitoring resistors. Electrical connectors shall be designed for frequent disassembly (Spade connectors are not acceptable). Pressure switches shall include both high and low pressure settings in the same switch, using only a single 1/4" BSP threaded pipeline connection to minimize number of sealed joints. The body and housing of the Pressure switch shall be manufactured from impact resistance, rigid and inherently corrosion proof materials. (Coating or plating of Mild Steel is not acceptable). Pressure Switches shall connect directly to the Area Alarm Panel. (It is not acceptable to fit a separate connection Box to convert switch signals to data signal.)

- The item should be CE marked /UL listed

7.0 HORIZONTAL BED HEAD PANELS (HBHP) 1800MM LONG

Pre OT (Outlets- Oxygen -1, Vacuum-1, Medical Air-1), Post OT- (Outlets- Oxygen -2, Vacuum-2, Medical Air-1)

Minor OT (Outlets- Oxygen -2, Vacuum-2, Nitrous-1, Medical Air-1, Surgical Air-1 and AGSS-1)

- The item should be CE marked/US FDA /UL listed
- Efficient, safe &. Robust design in extruded aluminum section
- Smooth curved surfaces, and choice of base colour and fascia plates.
- Unit should have integrated rail system to mount accessories&.
- The headwall system should be constructed of aluminum extrusions joined together to form a carcass to suit the particular application. Unit shall be factory assembled for electrical and mechanical components.
- Segregation of services i.e. Low voltage supplies, High Voltage supply and Medical gases shall be maintained throughout.
- Front fascia plate should be removable individually to access for respective service.
- Bed space management system with optional equipment rail.
- With all Equipment Rail mount Accessories.
- All Down drops shall be installed at one end preferably & Vertical drop installed at one end should be covered with Aluminium boxing with matching color.
- Entire pipe line shall run in continuous horizontal panels with no break for each unit & length as per area where it has to be installed
- Medical gas pipe line outlets shall be provided as mentioned above. Outlets should be CE certified/UL listed. Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C/DIN EN (latest version)

- Facility (To be locally sourced) per unit as under;

i) 6/15 Amp Modular Electrical Sockets with switches	= 6 sets
ii) IV Pole	= 2nos
iii) Vacuum slide	= 1no.
iv) Sliding blocks	= 2nos.
v) Nurse call system module	= 1No.
vi)) Infusion Pump Mounts	= 1 No
vii) Monitor Tray with Slider	= 1 No.
viii) Utility Basket	= 1 No.

8.0 ICU PENDANT

Suspended technical column ensuring the fitting out of electrical and medical gas equipment for ICU, HDU & Transplantation-. CE marked/US FDA certified /UL listed

A rust-inhibitive coated anchoring plate shall ensure its fixing between the concrete ceiling and false ceiling for a later mounting of the column after the fixing of ceilings. The successful tenderer shall contact the other contractors regarding the necessary power supply (LV and ELV) and medical gas outlets.

The columns shall be made of aluminium profiles ensuring medical gas supply and full access to accessories and pipes in 3 compartments individually closed by 2 removable covers (complying with international standards). Non removable covers are prohibited.

Electrical and medical gas connections shall be in the column and shall be accessible without damaging the ceiling. If the ceiling is not ventilated, its medical gas compartments shall have to be made airtight.

The height of the column shall be defined so to leave a 46 cm (18 in) space between the floor and the bottom of the column.

The electrical and medical gas fittings are completely modular, which allows the components to be extended, moved, removed or maintained without cutting the housing. The design of the technical column also allows an invisible yet efficient ventilation of the medical gas compartment, and a mechanical separation between electrical and medical gas networks. The covers shall be wired to the earth at the bottom of the unit. Prong systems are prohibited.

The round curves and smooth surface of the product enable its safe use and easy cleaning.

The section of the profiles so assembled must be able to resist important shocks (bed with patient) without damaging the column, or causing equipment to fall over. Its bearing capacity shall be 150 kg (3 cwt) minimum.

Two attached stainless steel tubes of a diameter of 30 mm (1.2 in) and a height of 150 cm (59 in) shall be laterally installed on supports placed 20 cm (8 in) away from the body of the column so to hold accessories (syringe pumps, a monitoring unit, a shelf, a rail, and so on...) without denying access to medical gas and power supply equipment.

A leading system for tubes and wires shall be planned (shape of supports or movable elements) for hygienic reasons pertaining to the crossing of clean and dirty elements. That system shall also be easy to clean and shall enable the quick handling of these tubes and wires.

Entire pipe line shall run in continuous Pendant with no break for each unit & length as per area where it has to be installed

Each work station shall be equipped with :

- 10 earthed 6/16 A sockets pre-wired on 2 lines.
- 1 RJ45 socket for computer not pre-wired (to be connected to the ELV network)
- 1 RJ45 socket for monitor not pre-wired (to be connected to the ELV network)
- 2 Oxygen (O₂) outlets
- 1 Compressed Medical Air (4 Bar) outlet
- 2 Vacuum (Vac) outlets

Outlets should be CE certified/UL listed. Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C/ DIN EN (latest version).

- Item should be CE marked/US FDA certified /UL listed

9.0 VALVE BOXES

A Each recessed zone valve box shall consist of the following components: A steel valve box which can house single or multiple shut-off ball valves with tube extensions, A three piece design Valve, an aluminium frame, and a pull-out removable window.

B The valve box shall be constructed of 18 gauge steel complete with a baked enamel finish.

The doorframe assembly shall be constructed of anodised aluminium and shall be mounted to the back box assembly by screws as provided. The removable front shall consist of a clear window with a pullout ring pre-mounted to the centre of the window.

C Access to the zone shut-off valves shall be by merely pulling the ring assembly to remove the window from the doorframe. The window can be reinstalled without the use of tools only after the valve handles have been returned to the open position.

D The window shall be marked with the following :-

"CAUTION: MEDICAL GAS CONTROL VALVE

CLOSE ONLY IN EMERGENCY"

- E Valves shall be a 4-bolt design, bronze body, double seal, union ball-type, with Teflon (TFE) seats and Viton seals, "O" ring packing, and ball which seals in both directions, blow-out proof stem, with a pressure rating of 2760 kPa (400 psig). Valves shall be operated by a lever-type handle requiring only a quarter turn from a fully open position to a fully closed position. All valves shall be equipped with type "K" washed and degreased copper pipe stub extensions of sufficient length to protrude beyond the sides of the box.
- F The entire valve body and pipe stubs shall be plated to a minimum of 25 mm (1") beyond the sides of the back box, but in no instance shall the plating be extended to the ends of the pipe stubs. All pipe stub extensions shall be supplied with suitable plugs or caps to prevent contamination of the assembly prior to installation.
- G Each valve shall be supplied with an identification bracket bolted directly onto the valve body for the purpose of applying an approved medical gas identification label. A package of labels shall be supplied with each valve box assembly for application by the installer.
- H Valves shall be available with line pressure gauges, as required. Gauges shall be 51 mm (2") diameter, with metal case and ring.
- I Pressure gauges shall read 0-700 kPa (0-100 psig) for all gases except nitrogen, which shall read 0-2000 kPa (0-300 psig), and vacuum, which shall read -100-0 kPa (0-30" Hg).

10.0 ISOLATION VALVES

The isolation valves are Non Lubricated Ball type with PTFE seat, suitable for oxygen service. All valves has been pneumatically tested for twice the working pressure and factory degreased for medical gas service before supply.

11.0 ANESTHESIA GAS SCAVENGING SYSTEM . CE marked/UL listed

11a The Duplex Medical Vacuum System must be fully compliant with the latest edition of NFPA 99/HTM02-01/EN737/DIN Standard and should be suitable for anaesthetic gas scavenging for 14 nos. Operation Theatres & CT Scanner, One pump will be standby with the other in operation.

The package should consist of two 'oil-less' rotary vane vacuum pumps, a control panel and a receiver all mounted on a common base frame.

Vacuum Pump :

Each vacuum pump shall operate completely dry and shall be equipped with self-lubricating carbon/graphite vanes.

Bearings shall be permanently lubricated and sealed

No oil shall be permitted in any pump

Each pump should be completely air cooled and have absolutely no water requirements

Each pump should have a 5 micron inlet filter and should be equipped with a vacuum relief valve, check valve to prevent back-flow through off-cycle units, flexible connector, isolation valve and vibration isolators at each mounting location

The receiver should be rated for a minimum 150 psig design pressure and have a three valve bypass system to allow for draining of the receiver without interrupting the vacuum service.

Control System :

The duplex control system should be U.L. labelled/CE marked

The control system should provide automatic lead/lag sequencing with circuit breaker disconnects for each vacuum pump with external operators, full voltage motor starters with overload protection, control circuit transformers, visual and audible reserve unit alarm with isolated contacts for remote alarm, hand-off-auto lighted selector switches and runtime hour meters.

A programmable logic controller (PLC) should control the automatic alteration of both vacuum pumps with provision for simultaneous operation if required, and automatic activation of reserve unit if required.

11b Terminal outlets with probes/adapters

As per Sl. No.-15

11c Hose Assembly

12.0 ELECTRICAL DISTRIBUTION PANEL (INDIGENOUS):-

Panel shall be wall mounted and fabricated from 16/14 SWG CRCA Sheet duly powder coated. Panel shall incorporate isolators for the following equipments.

- I. Isolator for Medical Compressed air system.
- II. Isolator for Medical Vacuum System
- III. Isolator for AGSS System.

Panel shall have following instrumentations for easy monitoring purpose.:-

- a. Incoming power supply indications of each Phase
- b. Mains indication for mains supply on for each Phase.
- c. Mains shall have digital metering.
- d. Each circuit shall have digital meter.

- e. Mains and each circuit shall be with MCCB only.

13.0 ACCESSORIES

13.a Flow meter with Humidifier .

Back Pressure Compensated flow meter will be of accurate gas flow measurement with following features:

- A Control within a range of 0 – 15 Lpm.
 - B It will meet strict precision and durability standard.
 - C The flow meter body should be made of brass chrome plated materials.
 - D The flow tube and shroud components should be made of clear, impact resistant polycarbonate.
 - E Flow Tube should have large and expanded 0 – 5 lpm range for improved readability at low flows.
 - F Inlet filter of stainless steel wire mesh to prevent entry of foreign particles.
 - G The humidifier bottle is made of unbreakable & Reusable of polycarbonate material and autoclavable at 121 degree centigrade.
- It should be CE marked /UL listed

13.b Ward Vacuum Units

Ward vacuum Unit shall be wall mounted and shall consists of followings with same make :-

- Suction Controller/ Regulator (Digital/Analogue type- easy view)
- Collection bottle 500 and 2000ml with mounting arrangement.

The vacuum regulator will be step-less adjustable and have large vacuum gauge providing digital/analogue indication of the suction supplied by the regulator.

Safety trap shall be provided inside the jar to safeguard the regulator from overflowing. Different color options should be available.

The unit will be consisting of reusable 500 to 2000 ml shatter resistant bottle, each made up of Polycarbonate material and fully autoclavable at 121 degree centigrade.

13.c Theatre Vacuum Units

The vacuum regulator will be step-less adjustable and have large vacuum gauge providing Digital/Analogue indication of the suction supplied by the regulator. Safety trap will be provided inside the jar to safeguard the regulator from overflowing. Different color options should be available.

The unit will be consisting of two reusable 2000 ml each shatter resistant bottle, each made up of Polycarbonate material and fully autoclavable at 121 degree centigrade.

A 3-way valve will select the collection jars : Left, Right or Both.

All the above items should be mounted on aluminum Trolley having free moving castor wheels.

14. **LOW PRESSURE SILICON TUBING**

Flexible having Antistatic core as per ISO with proper colour coded Silicon tubing

15 **CARBON DI OXIDE SYSTEM-**

15a Manifold system **4+4 CO₂ Cylinders** Imported shall consist of two high-pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with 2 numbers of cylinder pigtail connections to suit cylinder valves as per IS 3224 incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections. Each header bar assembly shall be provided with a high-pressure shut-off valve.

The manifold should be so designed that it shall suit easy cylinder changing and positioning.

The cylinder should be placed with the help of cylinder brackets and fixing chains which should be zinc plated.

The manifold should be suitable to withstand a pressure of 145 Kg/cm². The manifold should be tested (hydraulically) at 3500 psig pressure and to be supplied along with necessary test certificate.

15b **Fully Automatic Carbon Di-oxide Control Panel .**

The Carbon Di-oxide Control Panel shall be of microprocessor based and preferably Digital/Analogue Display type. Pressure reduction shall be in two stages. Panel shall be integrated with pressure gauges inside panel on downstream of pressure regulator. Panel shall be fitted with standby line regulator. Line regulators shall have pressure relief mechanism for testing and servicing purpose.

Panel shall be Fully Automatic and shall switch over from “Bank in Use” to ‘Reserve Bank’ without fluctuation in delivery line pressure and without the need of external electrical power. After the switch-over, the “Reserve Bank” shall become the “Bank in

Use” and the “Bank in Use” shall become the “Reserve Bank”. The Control Panel will be powered by a microprocessor.

A Microprocessor circuit board assembly shall provide a relay output to give indication when or just before the manifold switches from one bank of cylinders to another. The switch over shall be mechanically controlled, not electrically.

To avoid excess pressure being supplied to the distribution system, a pneumatically relief valve for the line regulator shall be incorporated. An intermediate pressure relief valve shall be installed between the high-pressure regulators and the line delivery regulators.

The control panel incorporates six coloured LED's, three for the Left Bank and three for the Right Bank: One for Bank in use, One for Bank ready and One for Bank empty. Both the Left and Right bank pressures and the main line pressure should be displayed on the front door of the cabinet by means of LED's. All pressure transducers, micro switches, and display LED's shall be pre-wired to an internal microprocessor circuit board.

All components inside the Control Panel like Pressure Regulators, piping and control switching equipment shall be cleaned for Oxygen Service and installed inside the cabinet to minimize tampering with the regulators or switch settings.

The Control Panel should be made to provide Heavy Duty with a Flow Capacity of over **500 lpm at 55-60 psig.**

- The control panel should be CE marked /UL listed

15c. 2 Cylinder Emergency Carbon di Oxide complete with high flow regulator with gauges, safety valve and other accessories etc. complete in all respect complete as per specifications

15d. Terminal CO2 outlets with probes/adapters Imported

As per Sl. No.-15

15e. High Pressure tubing

Flexible having Antistatic core as per ISO with proper colour coded

16.0 Gas Outlets (No. As per table annexed) .

- Outlets shall be manufactured with a 165 mm long Copper inlet pipe stub which is silver brazed to the outlet body. The inlet pipe should be capable of swiveling by 360 degrees for enabling the same to be connected to the pipeline system.

- Outlet shall be equipped with a primary and secondary check valve and the secondary check valve shall be rated at minimum pressure of 200 p s i. In the event the primary check valve is removed for maintenance there should not be any leakage (on-line maintenance should be possible w/o disrupting the functioning of other outlets). Outlet bodies shall be gas specific by indexing each gas service to a gas specific dual pin indexing arrangement on the respective identification module.
- There should be a push button release mechanism for disconnecting apparatus accessible from top, bottom and side of outlets.
- A large color-coded front plate shall be used for ease of gas identification and aesthetic appeal.
- With the back rough in mounted the outlet shall adjust up to 25 mm variation in wall thickness.
- The latch valve assembly should accept only corresponding gas specific adaptors.
- All outlets shall be cleaned and degreased for medical gas service, factory assembled and tested.
- The outlets should be CE marked /UL listed

Alternately

Gas Outlet .

- Shall have gas indexing geometry to BS 5682:1998. Terminal unit front fascia should be metal and it should be hundred percent metal. Gas specific components comprising the terminal unit second fix shall be manufactured from die cast Zinc alloy or similar hard wearing metal. Plastic Components should not be acceptable. Terminal units socket shall be permanently coated with a low friction fluoropolymer for maximum reliability and service life.
- The terminal unit socket die-casting shall incorporate a gas indexing pin to overcome the risk of loosening due to rough handling/mishandling. The second fix socket shall incorporate a sheer plane to safeguard the first fix and pipeline in the event of accidental damage or bed jacking. Gas specific components shall incorporate the gas identity marking permanently stamped or cast into the component surface. The first fix shall all metal construction with a brass base block and copper stub pipe. The first fix shall incorporate an integral check valve to enable servicing of the second fix and valve seals without isolation of the gas supply. Probe roller pins shall be manufactured from stainless steel. Wall mounted terminal unit s shall be Provided with white ABS

mounting Box with matching fascia. The mounting box shall have smooth rounded corners to avoid the possibility of injury. A bezel shall be available to cover the plaster edge, provide a neat and easily to clean finish.

- The outlets should be CE marked /UL listed

17. Civil construction of Manifold Room

Construction of Manifold room (40'x30') complete including, foundations, brick works, reinforced concrete work, Flooring, plastering, Painting, aluminium frame and flush shutters 30mm thick for doors, aluminium frame and shutter with 4mm thick clear float glass and aluminium grill for windows, painting, roofing in Powder coated CGI sheets over truss and purlins, water supply, internal electrical installations, power and telephone conduit and wiring, external service connection etc complete as per standard CPWD Specifications. Necessary Electrical cabling from nearby source for power supply to the Manifold Room.

18. Construction of Liquid Oxygen area

Liquid Oxygen Area (Suitable to the requirement for 20KL Tank as per the CCE) surrounded with industrial typed Fencing of height 2mtrs. fabricated from Angle posts and 10 swg Diamond Mesh welded into MS frame from ISA 75x75x8 And Double leaf Gate 5mtr x 2mtrs of same material of Fencing. Gate should have lock and key arrangement from outside and should be opened outside. A 9Kg DCP Fire Extinguisher and sand Bucket should be provided at one corner of the installed area. Electrical Earthing Point and Electrical Power socket and proper lighting should be provided. A Hard Stand with Anti Crash Barrier of 1.2mtr height-3 Nos of area 9.5mtrx 5.0 mtrs should be provided in the Liquid Oxygen Area. RCC Hard Stand should be suitable for LMO Tank. Thickness of Concrete 150mm and the slope 1:200. Size of Concrete Plinth should be suitable to 20KL LMO Tank . Proper signages should be fitted at the proper location. 1/2" water Tap with 6m Hose shall be provided at the installed area. . Necessary Electrical cabling from nearby source for power supply to the LMO tank area.

19. IN ADDITION TO THE ABOVE, FOLLOWING TURNKEY WORKS FOR INSTALLATION AND COMMISSIONING OF MEDICAL GAS MANIFOLD SYSTEM ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR:

- Bidder must take into consideration in its bid, costs to be incurred for any additional work pertaining to Civil, Electrical, Mechanical and any other protections relevant as per State/Central Govt. regulation/local authority, Servo stabilisers, U.P.S. etc. **and office furniture (Table and Chairs)** required for successful installation testing and commissioning of the system and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order package on a "turn key basis". Demolishing, re-constructing, water roofing, plumbing, repainting and replacement Any demolition , reconstruction, water proofing, necessary

plumbing, patchwork, replacement of any door or windows to provide structured design for Manifold system.

- **Electric distribution panel** for the above complete with all switchgears, wiring and controls etc complete. (Switch gears of L&T/ Siemens/ ABB/GE or Schneider make). **Earthing system** of control panel and other electrical instrument and accessories in the Manifold and Plant Room **as per standard guidelines of BIS(Latest edition)**. All cable trenches and railings should be made wherever required.
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Fluorescent Light, Fan, Light Points, Power points, etc in the Medical Gas Pipeline System.
- Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for **Control Panel** for Medical Gas Pipeline System.
- Installation of all **electrical cabling** must be of IS: 1554 (As per latest amendment) standard and wiring as per IS: 732 standard and proper earthing of all Medical Gas Pipeline System and other electrical instrument and accessories in the Medical Gas Pipeline System as per standard guidelines of BIS.
- **Ventilation** of Plant Room and Manifold Room of the MGMS and exhaustion of suctioned gases/air from the Vacuum unit.
- Arrangement for requisite **Fire Extinguishing** for the entire effective zones in the Manifold and Plant Room.

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the MGMS then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES

1.	Air Blower	SWAM/ EVEREST/ KAY/Beta
2.	Cable	SKYTONE/KEI/UNIVERSAL/NATIONAL/RR CABLE
3.	PVC Pipe Class III with Fitting	FINOLEX/ SUPREME/ PRINCE/ ORI-PLAST
4.	G.I. / M.S. Pipe Heavy Class	TATA/ JINDAL/ SAIL
5.	MCCB/Contactor/Relay	L&T/ABB/SIEMENS/SCHNEIDER
6.	Pressure Gauges	H.GURU /FIEBIG
7.	Stainless steel	TATA/SALEM/JINDAL
8.	Aluminium Sheet	BALCO/NALCO/HINDALCO

9.	Grilles/Diffusers	RAVISTAR/CARYAIRE/ MAPRO/DYNACRAFT
10.	Copper Pipe-	MAXFLOW/RAJCO/PRECISION

Note :

- The bidder should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues
- The bidder should quote rates for **operation of manifold system during DLP**
- The bidder should quote rates for Post-DLP CMC (5 years) of Manifold system without which bid shall be rejected. Agreement for CMC will be done between the hospital authority and the contractor.
- The contractor shall be responsible for the complete works including submission of working drawing and walk through view.
- The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.
- Final electrical and pressure and other safety test, system test and calibration should be done by authorized person with test instruments.
- Engineer may instruct for any test this has to be got done by contractor at their own cost.
- The contractor should provide all electrical accessories like cable wire, electrical outlets, switches etc, and they should be fire proof of reputed make, certified for electrical safety.
- Wherever makes have not been specified for certain items, the contractor should provide the same as per BIS and as per approval of HSCC.
- Training of personnel of the Institute should be 30 days at least by the contractor.
- The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Air Washing and Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation.
- The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for MGMS.
- The contractor should provide Third party quality certificate of the MGMS equipment from SGS/TUV/Lloyds saying as "Certifies that the MGMS equipment meets the technical specification and BOQ of the Contract".

Outlets Disposition Chart (AIIMS Surgical)

Floor/Department	Oxygen	Vacuum	MA4	SA7	N2O	CO2	AGSS	WVU	TVU	O2 Flow Meter
Ground Floor										
Minor OT (2 Nos.)	4	4	2	2	2		2		4	4
Pre Operative (2 Beds)	2	2	2					2		2
Post Operative (2 Beds)	4	4	2					4		4
First Floor										
Wards (8 Beds)	8	8						8		8
Wards (8 Beds)	8	8						8		8
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
CT Scan	1	1	1		1		1	1		1
Ultrasound	1	1	1					1		1
Second Floor										
Wards (8 Beds)	8	8						8		8
Wards (8 Beds)	8	8						8		8
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
Wards (7 Beds)	7	7						7		7
Wards (7 Beds)	7	7						7		7
Isolation Rooms (3 Nos.)	3	3	3					3		3
Rooms (6 Nos.)	6	6						6		6

Third Floor										
Wards (8 Beds)	8	8						8		8
Wards (8 Beds)	8	8						8		8
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
Wards (6 Beds)	6	6						6		6
Wards (7 Beds)	7	7						7		7
Wards (7 Beds)	7	7						7		7
Isolation Rooms (3 Nos.)	3	3	3					3		3
Rooms (6 Nos.)	6	6						6		6
Fourth Floor										
Laprosopy Centre	8	8	8	8	8	8	8		8	8
Fifth Floor										
ICU Beds (13 Nos.)	26	26	26					26		26
Transplantation Beds (10 Nos.)	20	20	20					20		20
H.D.U Beds (11 Beds)	22	22	22					22		22
Sixth Floor										
OT* (6 Nos.) (considered in OT package)	24	24	12	12	12	12	12		24	24
Pre Operative (5 Beds)	5	5	5					5		5
Post Operative (5 Beds)	10	10	5					10		10
Seventh Floor										
Pvt. Wards (10 Nos.)	10	10						10		10
Eigth Floor										
OT* (6 Nos.) (considered in OT package)	24	24	12	12	12	12	12		24	24
Pre Operative (5 Beds)	5	5	5					5		5
Post Operative (5 Beds)	10	10	5					10		10
Total	324	324	134	34	35	32	35	264	60	324
Considered in OT Package	52	52	26	26	26	24	26			
Net Total	272	272	108	8	9	8	9	264	60	324

**ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI**

e- TENDER

FOR

**Supply, Installation, Testing & Commissioning of Medical Gas
Manifold System for Surgical Block at All India Institute of Medical
Sciences, New Delhi**

VOLUME –V

BILL OF QUANTITIES (BOQ)

DECEMBER 2015



(Consultants & Engineers for Mega Hospitals & Laboratories)
E - 6 (A), Sector - I, NOIDA (U.P.) - 201 301 (INDIA)

PHONE : 0120-2542436, 2542437 FAX : 0120-2542447
E- mail : www.hsccltd.co.in

Tender No. HSCC/SES/MGMS/Surgical/AIIMS/2015

BILL OF QUANTITY							
The prices are to be quoted in the below mentioned form and shall include the Supply, installation, testing , commissioning of Medical Gases Manifold System, Operation and its maintenance (during 1 year Defect liability period) and 4years Operation (24x7) and CMC at site including all the equipments, ancillary materials as specified and all such items what so ever which may be required to fulfill the intent and purpose as laid down in the specifications, conditions and or the drawings.							
PART - I							
Item No.	Description	Unit	Qty	Unit Rate (In Figure) Rs.	Unit Rate (In Words) Rs.	Amount Rs	
1	OXYGEN SYSTEM						
1a	Oxygen Manifold of 20+20 Cylinders capacity(Bulk cylinder D Type). The Oxygen Manifold should be hydraulically tested to 3500 psig pressure. The Oxygen Manifold shall be complete with all accessories etc as required complete as per specifications.	Set	1				
1b	Fully Automatic Control Panel for the Oxygen Manifold system complete with all accessories etc. complete as per specifications	Set	1				
1c	10 Cylinder Emergency Oxygen Manifold with a high flow regulator with gauges and safety valves complete with all accessories etc. as required complete as per specification	Set	1				
1d	Terminal (Oxygen) outlets with probes/adapters complete as per specifications (Outlets for OT are included in the OT package)	Nos.	272				
1e	Liquid Medical Oxygen System with 20 KL Tank complete as required with all accessories as per technical specification	Nos.	1				
1f	High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.	mtr	1088				
2	Nitrous Oxide System						
2a	Nitrous Oxide Manifold of 8+8 Cylinder capacity(Bulk cylinder D Type). The Nitrous Oxide Manifold should be hydraulically tested to 3500 psig pressure. The N2O manifold shall be complete with all accessories etc. and complete as per specifications	Set	1				
2b	Fully Automatic Control Panel for N2O system and complete with all accessories etc. as required and complete as per specifications	Set	1				
2c	4 Cylinder Emergency Nitrous Oxide complete with high flow regulator with gauges, safety valve and other accessories etc. complete in all respect complete as per specifications	Set	1				
2d	Nitrous Oxide Terminal Outlets with probes/adaptors complete as per specifications (Outlets for OT are included in the Modular OT package)	Nos.	11				
2e	High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.	mtr	44				

3	VACUUM SYSTEM				
3a	Vacuum system shall be of system capacity 220 cfm/6230 LPM at 19" Hg to be delivered to the hospital with necessary standby as per the requirement of relevant International Standard complete as required as per specifications.	Set	1		
3b	Vacuum Terminal Outlets with probes/adapters complete as per specifications.(Outlets for OT are included in the OT package)	Nos.	272		
3c	Flexible tubing having Antistatic core as per ISO with proper colour coded complete as per specifications.	Metre	1088		
4	AIR COMPRESSOR				
4a	The system shall be consisting of Oil free Compressed Air System to provide system capacity 150 scfm/4250LPM at 10bar to be delivered to the hospital with necessary standby as per the requirement of relevant standard complete in all respect and as per specifications Compressed Air Terminal Outlets with probes/adapters complete as per specifications.	Set	1		
4b	For C.A. (4 Bar) (Outlets for OT are included in the OT package)	Nos.	108		
4c	For C.A. (7 Bar) (Outlets for OT are included in the OT package except Minor OT)	Nos.	8		
4d	High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.	Metre	464		
5	DISTRIBUTION PIPING (Indigenous)				
	Medical graded Copper pipes shall be solid drawn, tempered, seamless, phosphorous deoxidized, non-arsenic and degreased for oxygen service. The chemical composition shall be as per BS-6017: 1981 Table 2, Cu-DHP grade. Distribution Copper Pipe manufactured as per BSEN:13348 complete with dew point apparatus and carbon monoxide monitoring facility as per specifications.				
a	76.1 mm ODx 1.5mm thk	Metre	200		
b	54mm ODx 1.2mm thk	Metre	400		
c	42mm ODx 1.2 mm thk	Metre	450		
d	28mm ODx 0.9 mm thk	Metre	1500		
e	22m Odx 0.9 mm thk	Metre	3000		

f	15mm ODx 0.9 mm thk	Metre	3500		
g	12mm ODx 0.7 mm thk	Metre	2000		
6	ALARM				
	Master (Main) Alarm Panel to indicate any abnormality of gas pressures and other failures of the system. The alarm system shall be complete with digital display, sensor module and power supply. The alarm shall be complete with all indications controls, wirings, accessories etc. complete as required and as per specifications.	Set	1		
	Area Alarms for all critical areas The alarm system shall be complete with pressure sensors, indications alarms etc. and with all accessories as required as per specifications.				
a	5 S	Nos	16		
c	3 S	Nos	7		
d	2 S	Nos	11		
7	HORIZONTAL BED HEAD PANEL				
	Bed head panels for installation of outlets with provision for mounting necessary gas outlets. The bed head panel shall be provided with electrical points, switches, wiring etc . The panels shall be made in extruded aluminium profiles with powder coating and shall accomodate the gas outlets, electrical sockets etc. complete as per specifications.	Set	30		
8	ICU PENDANT				
	A rust-inhibitive coated anchoring plate shall ensure its fixing between the concrete ceiling and false ceiling for a later mounting of the column after the fixing of ceilings. The successful tenderer shall contact the other contractors regarding the necessary power supply (LV and ELV) and medical gas outlets.	Nos	35		
9	VALVE BOX				
a	Valve Box - 2 Gas Services	Nos	12		
b	Valve Box - 3 Gas Services	Nos	7		
d	Valve Box - 5 Services	Nos	16		

10	ISOLATION VALVE complete as per specifications.					
a	54mm	Nos	10			
b	42mm	Nos	10			
c	28mm	Nos	10			
d	22 mm	Nos	120			
e	15 mm	Nos	120			
11	ANAESTHETIC GAS SCAVENGING SYSTEM (AGSS)					
11a	Duplex Medical Vacuum System The system shall comprise of two oil less rotary vane vacuum pumps, a control panel and a receiver all mounted on a common base frame. One pump shall be a standby The system shall be complete with all accessories as required and as per specifications.	Set	1			
11b	AGSS Terminal Outlets with probes/adapters complete as per specification (Outlets for OT are included in the OT package)	Nos.	9			
11c	AGSS Hose Assembly	Nos.	9			
12	ELECTRICAL DISTRIBUTION PANEL					
	Panel shall incorporate isolators for the Isolator for Medical Compressed air system. I. II. Isolator for Medical Vacuum System III. Isolator for AGSS System.	Nos.	2			

13	ACCESSORIES				
13.a	Oxygen Flowmeter with Humidifier (0-15 litres/minute) with adapter, tubing etc. complete with all the required accessories and shall be complete as per specifications	Sets	324		
13.b	Theatre vacuum unit. The vacuum regulator will be step-less adjustable and have large vacuum guage providing digital indication of the suction supplied by the regulator complete with all accessories and as per specifications.	Set	60		
13.c	Ward Vacuum Unit wall mounted type complete with all accessories as required and as per specifications.	Set	264		
14	Low Pressure Silicon Tubing	mtr	500		
15	CARBON DI OXIDE SYSTEM				
15a	4 +4 Cylinder Co2 Manifold with gauges and safety valves complete with 8 Nos Pigtail pipes & 4 Nos non-return valves with middle frame all accessories etc. complete as per specification	Set	1		
15b	Automatic CO2 Control Panel 1500 LPM with heater System complete as per specification	Nos.	1		
15c	2 Cylinder Emergency Carbon di Oxide complete with high flow regulator with gauges, safety valve and other accessories etc. complete in all respect complete as per specifications	Set	1		
15d	Terminal (Carbon di Oxide) outlets with probes/adapters complete as per specification (Outlets for OT are included in the Modular OT package except Minor OT) complete in all respect complete as per specifications	Nos.	8		
15e	High Pressure tubing flexible having Antistatic core as per ISO with proper colour coded complete as per specifications.	Nos	32		
16	GAS OUTLETS AS MENTIONED ABOVE	Nos			
17	CIVIL CONSTRUCTION OF MANIFOLD ROOM complete in all respect complete as per specifications	Nos.	1		
18	CONSTRUCTION OF LIQUID OXYGEN AREA complete in all respect complete as per specifications	Nos.	1		
19	TURNKEY	Lot	1		
				SUB TOTAL Rs.	
	Part-II				
	Item No. 1	Unit	Qty 4		Amount Rs 7
1	Operation Charges for the complete Medical Gas Manifold System during one year Defect Liability Period as per the contract.	Nos	1		
				SUB TOTAL Rs.	

Part-III						
	Item No.	2	Unit	Qty		Amount
			3	4		Rs
						7
1	Operation(24x7) and Comprehensive Maintenance Charges for the complete Medical Gas Manifold System including spares, repair or replacement of defective equipments/parts, tolls, tackles, accessories, consumables, labour charges etc. complete in all respect after completion of DLP as per the contract.					
	Ist Year		Job	1		
	2nd Year		Job	1		
	3rd Year		Job	1		
	4th Year		Job	1		
					SUB TOTAL Rs.	
SUMMARY OF RATES QUOTED						
	TOTAL (PART-I)					
	TOTAL (PART-II)					
	TOTAL (PART-III)					
	Grand Total Amount (PART - I + PART - II + PART - III) (in Figures) :-					
	Grand Total in Words: Rupees					