**NATIONAL COUNCIL OF SCIENCE MUSEUMS**

**SECTOR-V, BLOCK-GN, BIDHANNAGAR,**

**KOLKATA – 700 091**

**TENDER No. I/18012/7/16(45)**

**NOTICE INVITING e-TENDER**

**For design, supply, installation and commissioning of an integrated functional fulldome digital 2D/3D immersive projection system at Science City, Kolkata**

On-line Digitally signed e-tenders are invited in two Bid System from the manufacturers or their authorized registered Indian agents who had responded and were subsequently selected against the EOI published in various newspapers for Supply, Installation, Integration, Testing and Commissioning of hardware and software packages, interfaces, tools and / or drivers, providing operational training, offering onsite warranty support of 5 (five) years, post warranty maintenance for 2 (two) years and operation for a period of 7 (seven) years of the complete and fully integrated functional fulldome digital 2D/3D immersive projection system for a 23 meter diameter perforated aluminium dome screen tilted at 23 degrees with geometrical correction, image stitching and blending etc. for seamless projection of high resolution 2D/3D digital fulldome film shows and digital planetarium shows by replacing existing 10/70 Astrovision fish eye lens projection system and GSS-Helios of GOTO Inc., Japan installed at Science City, Kolkata. The aforesaid selected agencies may download the tender documents from the Central Public Procurement Portal (CPPP): <http://eprocure.gov.in/eprocure/app> or from the Council’s website[www.ncsm.gov.in](http://www.ncsm.gov.in/) as per the following schedule:-

|  |  |
| --- | --- |
| Bid Document Published Date | September 24, 2016 (As per portal time) |
| Bid Document Download Start Date | September 24 , 2016 (As per portal time) |
| Bid Document Download End Date | October 24, 2016 (As per portal time) |
| Bid Clarification Start Date | September 26, 2016 (As per portal time) |
| Bid Clarification End Date | October 3, 2016 (As per portal time) |
| Bid Submission Start Date | September 24, 2016 (As per portal time) |
| Bid Submission End Date | October 24, 2016 (As per portal time.) |
| Earnest Money Deposit | **INR 1 Million (Rupees one Million only) or in equivalent foreign currency** |
| Technical (Techno-Commercial) Bid Opening Date | October 25, 2016 (at 11.30 a.m.) |

The online bid both Technical (Techno-Commercial) Bid and Financial bid duly furnished in Cover –I and Cover-II respectively should be uploaded by the due date and time as per the above schedule. The responsibility to ensure the same lies with the bidders. Off-line tenders shall not be accepted and no request in this regard will be entertained whatsoever. **Online Technical (Techno-Commercial) Bid will be opened at the first instance in this office at 11.30 a.m. on October 25, 2016 for technical evaluation as well as selection of techno-commercially acceptable offers** and at the second stage, the Financial Bids of only the selected and techno-commercially acceptable offers / system / equipment will be opened. Decision of the Council regarding selection of eligible and qualified vendors / firms and or equipment in particular for opening the Financial Bid shall be final and binding on the bidders. Bidders may be present during opening of tenders.

It is intended to purchase the above equipment directly from the manufacturer without involving any agent or payment of any bidder commission. Authorized Registered Indian Agents of foreign manufacturers who are capable to render after Sales Service (in case foreign manufacturers do not quote any rate to the actual users), shall submit copy of Bidder Agreement with foreign manufacturer along with the tender and in such case no bidder commission shall be paid by the Council in foreign currency.

NCSM reserves the right to accept or reject any or all tenders in full or part without assigning any reason whatsoever. NCSM shall also not be bound to accept merely the lowest tender but the technical suitability, capability and superiority of the equipment / system as well as after sales service including infrastructure to render such service etc. shall be of prime consideration for selection of the equipment / system.

# General Information and Instructions

1. The instructions given herein will be strictly binding on the bidders and deviation, if any will make the tender or tenders liable to be considered invalid. Tenders incorporating additional conditions by the bidder are liable for rejection.
2. Bids shall be submitted online only at CPPP website: <https://eprocure.gov.in/eprocure/app> Manual bids shall not be accepted.
3. The instructions given in **“Annexure-A”** for **“Instruction for Online Bid Submission”** should be strictly followed during submission of the Bid.
4. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
5. An agent of foreign OEM, for submitting the offer on behalf of OEM, would be required to produce a copy of their legal bidder agreement with their principal and a copy of registration / enlistment with DGS&D as an Indian agent failing which their bid would be disqualified.
6. Bid should be submitted along with the **Earnest Money of INR 1.00 Million (Rupees One Million only)** or in equivalent foreign currency by way of crossed Demand Draft / Pay Order on any nationalized bank of India payable in favour of “NATIONAL COUNCIL OF SCIENCE MUSEUMS, KOLKATA”. Earnest Money deposit in the form of Bank Guarantee bond or any other bond shall not be accepted and shall be rejected straightway. Earnest Money deposits in respect of such offers which are not accepted will be returned to the bidders within 30 working days from the date on which the final decision is taken about the source from which the items under tender are to be procured or within 2 (two) months from the date of the opening of the tenders, whichever is earlier. No interest will be paid on the Earnest Money deposited with the Council. Earnest Money deposit in respect of the successful bidders will be retained with the Council until entire execution of the order as per terms of the tender. If the successful bidder fails to execute the order strictly as per the Council’s drawing & specification in full or part within the stipulated delivery period of the purchase order, the Earnest Money deposit retained with the Council shall be forfeited forthwith after cancellation of the concerned order.

1. **Validity of Bids**: **The Bids should remain valid for 180 days from the date of opening of Financial bid.**
2. **Rejection of Bids:** Canvassing by the Bidder(s) in any form, unsolicited letter and post-tender correction may invoke summary rejection. Conditional tenders will be rejected. Non-compliance of applicable General Information and Instructions will disqualify the Bid.
3. The Bidders should have Digital Signature Certificate (DSC) for filling up the Bids. The person signing the tender documents should be authorized for submitting the on line e-tender.
4. The Bidders shall fill up the Prescribed Format for submission of **Technical (Techno-commercial) Bid as per “Annexure-B”** format duly signed by the authorized signatory. The person signing the tender document should be authorised for submitting the online e-tender.
5. The Financial Bid shall be filled in and signed by the authorized signatory online as per Proforma **“Annexure-C”** available at Central Public Procurement Portal e-tender system website <http://eprocure.gov.in/eprocure/app>. Off line Financial Bid shall not be accepted.
6. Tender must be uploaded in two separate covers marked **Cover-1** (Technical Bid) and **Cover-2** (Financial Bid/BOQ).The contents of Cover-1 and Cover-2 shall be as follows:-

**Cover-1**

1. “Technical (Techno-Commercial) Bid” (as per **Annexure-B** format) duly filled in and digitally signed with official stamp.
2. All relevant documents related to “Technical (Techno-commercial) Bid” as per **“Annexure-B”**.
3. Prescribed Undertaking by the “Original System Integrator” as per **“Annexure-D”** format, if applicable, duly signed by the Authorized Signatory with office stamp.
4. The Technical Brochures of each equipment with technical explanation for every feature of the product offered by the bidders.
5. The scanned copy of the Demand Draft for INR 1.00 Million (Rupees One Million only) or in equivalent foreign currency as Earnest Money Deposit.
6. The scanned copy of “General Terms & Conditions” **(Annexure-E)** duly signed by the Authorized Signatory with official stamp as a token of acceptance of the bidders.
7. The scanned copy of “Technical specifications and Scope of Work” **(Annexure-F)** duly signed by the Authorized Signatory with official stamp as a token of acceptance of the bidders.
8. “Technical Compliance Tables” (as per **Annexure-G** format) duly filled in and digitally signed with official stamp.

**Cover-2**

1. The “Financial Bid (BOQ)” (as per **Annexure-C** format) i.e. Schedule of Price Bid in the form of attached Proforma duly filled in and digitally signed
2. “Cost Break-up” (as per **Annexure-I** format) duly filled in and digitally signed with official stamp.

The Cover-1, i.e. Technical (Techno-commercial) Bid shall be opened by the Council at the first instance and evaluated by the competent authority of the Council. At the second stage, the Cover-2 containing Financial Bid of only techno-commercially acceptable offers shall be opened for further evaluation and ranking before awarding the contract.

1. Authorities of National Council of Science Museums do not bind themselves to accept mere lowest tender and reserves the right to reject or accept any or all tenders wholly or partially without assigning any reason whatsoever:-

# ANNEXURE –A

**NATIONAL COUNCIL OF SCIENCE MUSEUMS**

**SECTOR-V, BLOCK-GN, BIDHANNAGAR,**

**KOLKATA – 700 091.**

**TENDER No.: I/18012/7/16(45)**

# Instructions for Online Bid Submission

1. The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.
2. More information useful for submitting online bids on the CPP Portal may be obtained at <https://eprocure.gov.in/eprocure/app>

**REGISTRATION**

1. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app> ) by clicking on the link “**Online Bidders Enrollment**” on the CPP Portal which is free of charge.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.) with their profile.
5. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC’s to others which may lead to misuse.
6. Bidders may then log-in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

**SEARCHING FOR TENDER DOCUMENTS**

1. There are various search options built in the CPP Portal to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
2. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective ‘My Tenders’ folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3. The bidders should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

**PREPARATION OF BIDS**

1. Bidders should take into account any corrigendum published on the tender document before submitting their bids.
2. **Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.**
3. Bidders, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF / JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “My Space” or ‘’Other Important Documents’’ area available to them to upload such documents. These documents may be directly submitted from the “My Space” area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

**SUBMISSION OF BIDS**

1. Bidders should log-in to the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidders will be responsible for any delay due to other issues.
2. The bidders have to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. Bidders have to select the payment option as “offline” to pay the requisite Earnest Money Deposit (EMD) and enter detail of the instrument.
4. **Bidders should submit the EMD as per the instructions specified in the tender document. The original instrument should be posted/couriered/given in person to the Tender Processing Section, latest by the last date of bid submission. The detail of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.**
5. A standard Price Schedule format (BOQ) has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidders). No other cells should be changed. **In case no rate value is required to be quoted in any particular cell , that cell may be kept blank , figure ‘0’ (zero) shall not be entered in such cell(s)** .Once the details have been completed, the bidders should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidders, the bid will be rejected.

In addition to the above the **Cost Break-up** (Annexure- I) shall be duly filled in, digitally signed with official stamp.

1. The server time (which is displayed on the bidders’ dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
2. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener’s public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
3. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
4. Upon the successful and timely submission of bids (i.e. after Clicking “Freeze Bid Submission” in the portal), the portal will give a successful bid submission message and a bid summary will be displayed with the bid number and the date & time of submission of the bid with all other relevant details.
5. The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

**ASSISTANCE TO BIDDERS**

1. Any enquiries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal helpdesk. The contact number for the helpdesk is 1800 233 7315.

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**ANNEXURE-B**

**NATIONAL COUNCIL OF SCIENCE MUSEUMS**

**SECTOR-V, BLOCK-GN, BIDHANNAGAR,**

**KOLKATA – 700 091**

**TENDER No.: I/18012/7/16(45)**

# TECHNICAL (Techno-Commercial) BID

Notes**: ALL PARTICULARS / INFORMATIONS SHOULD BE GIVEN IN THE FOLLOWING FORMAT WITH COMPLETE DETAILS.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Name of the Bidder | **:** |  |
|  | Mailing address of the Bidder with PIN/ZIP Code | **:** |  |
|  | Contact details | **:** |  |
| Telephone numbers(s)  Mobile | **:**  **:** |  |
| Fax number(s) | **:** |  |
| E-mail address | **:** |  |
| Website | **:** |  |
|  | 1. Background details of the Bidder (State whether original manufacturer / authorised Registered Indian Agent of the manufacturer). | **:** |  |
|  | 1. In case of authorised Registered Indian Agent, submit notary certified copy of the Bidder Agreement with the manufacturer. | **:** |  |
|  | 1. In case of authorised Indian Agent, state whether enlisted with Central Purchase Organization (i.e. DGS&D) as per Compulsory Enlistment Scheme of Govt. of India (State ‘YES or ‘NO’) | **:** |  |
|  | 1. If the answer of (iii) is ‘YES’, submit notary certified copy of enlistment Certificate duly issued by the CPO (i.e. DGS&D) of Govt. of India. | **:** |  |
|  | Name and Address of the Vendor to whom the order will be placed (NCSM prefers to procure the entire system from a single source) | **:** |  |
|  | 1. Whether capable to supply and install the Fulldome System as per minimum requirement / and Technical Specification given in Annexure-E   (Please mention “YES” or “NO” | **:** |  |
|  | 1. If it is mentioned “NO” above, submit detailed deviation to be made from enclosed Technical Specification.   (Attach extra sheet, if required) | **:** |  |
|  | 1. If it is mentioned “YES” above, submit the detail specifications of the offered product including copies of Product brochure | **:** |  |
|  | Whether agreed to offer 5 (five) Years On-Site warranty for the entire Fulldome System / equipment under tender | **:** |  |
|  | Mention recommended sitting arrangement for the theatre where the equipment(s) offered shall be housed  (Submit detailed design and drawing of sitting layout) | **:** |  |
|  | Minimum down time to handle breakdown calls and/or any sort of emergencies. | **:** |  |
|  | Single point contact details for all post-installations service related issues with hierarchy levels (if any) | **:** |  |
|  | 1. Whether agreed to accept non- comprehensive AMC after the warranty period is over (State ‘YES or ‘NO’) | **:** |  |
|  | 1. If the answer above is ‘Yes’, provide detailed address and set up link from where support for maintenance during post warranty shall be offered by the firm at Kolkata, India. | **:** |  |
|  | Whether agreed to accept the Delivery Schedule mentioned in Clause No.5 of the **GENERAL TERMS & CONDITIONS FOR SUBMISSION OF TENDER.**  ( State YES or NO ) | **:** |  |
| 13. | 1. Whether agreeable to accept the payment terms mentioned in the clause no 8 of **GENERAL TERMS AND CONDITIONS FOR SUBMISSION OF TENDER.**   ( State YES or NO) | **:** |  |
|  | 1. If the answer is **NO** then mention your payment terms.   (No advance payment without adequate security in the form of Bank Guarantee etc. shall be considered / released by the Council for any reason whatsoever. | **:** |  |
| 14  15 | Shelf-life time of the Digital immersive fulldome 2D/3D projection system (i.e. up to which period technical support as well as spare parts including consumables shall be available with the firm).  Submit technical brochures indicating the detailed technical specifications of the system as given in the table below:-. | **:**  **:** | Detailed Information to be submitted by the Bidders as per following table |

|  |  |  |
| --- | --- | --- |
| S. No | **Details of Information Required** | **Qty** |
|  | Detailed specifications for perforated Aluminium Dome Screen preparation with sound proofing, acoustic and insulation. | 1 Set |
|  | Insulation of inner surface of the outer concrete dome. | 1 Set |
|  | Acoustic panelling below the dome screen | 1 Set |
|  | Details of Projector Array with special mountings. This set should contain number of projectors proposed, its make, complete specifications, its weight, dimensions, details about lenses, heat load, noise generated etc. | 1 Set |
|  | Edge blending and geometric correction details | 1 Set |
|  | Image Generator Server, Interactive planetarium software and playback system details including specifications and product catalogues. Software for conversion of large format shows into fulldome and digital library and software for playback and creation of planetarium shows. | 1 set |
|  | Display management ,calibration and alignment system details | 1 Set |
|  | Show control System details | 1 Set |
|  | Networking and data cabling schematic layout | 1 Set |
|  | 7.1 surround sound system details including product catalogues, location of speakers etc | 1 Set |
|  | RF emitters, active 3D spectacles and storage & sterilization details. | 1 Set |
|  | LED cove lighting, staircase lighting, exit and emergency exit signage | 1 Set |
|  | Complete details of U.P.S with 30 minutes back up ( with parallel redundant system) including technical catalogues/brochures | 1 Set |
|  | Seating layout and design details of reclining chairs along with line of sight diagrams **(locally available materials may be considered)**. | 1 Set |
|  | Details of Sound proofing and Acoustic treatment required to be executed at site may be submitted along with specifications of materials **(locally available materials may be considered),** schematic drawings with expected outcome. | 1 Set |
|  | Indicative list of documents/manuals/drawings that shall be provided to NCSM while handing over. Suggested training scheme, topics may also be included in this set. | 1 Set |
|  | Timeline for execution of the entire work from the date of placement of order indicating therein parallel activities and critical path to establish completion of the entire work within the stipulated time schedule | 1 Set |
|  | List and quantity of each spare that shall be provided by the bidder initially to fulfil onsite comprehensive warranty of five years. This shall also include quantity of spare lamps with housing that will be supplied along with the projectors initially. All the tools, tackles, gadgets, devices that shall be required for measuring, operation, maintenance, testing etc shall be included in this list and shall form part of the initial supply. | 1 Set |
|  | Information/Details regarding any other items not included above may be submitted in this set. | 1 Set |

**Note: Bidders shall provide detailed bill of quantities of each item as mentioned in the above table and proposed for this offer along with schematic system architecture and product catalogues for all hardware items.**

I / We hereby declare that the above statements are true. I / We also declare that the decision of National Council of Science Museums regarding selection of eligible firm(s) / type of equipment or system / multimedia show contents scheme for opening of Financial Bid (Part-II) shall be final and binding on me / us.

**Dated Official Seal Signature of the Bidder/Constituted Attorney**

**Annexure-E**

NATIONAL COUNCIL OF SCIENCE MUSEUMS

SECTOR-V, BLOCK-GN, BIDHANNAGAR,

KOLKATA – 700 091.

**GENERAL TERMS AND CONDITIONS FOR SUBMISSION of Tender for supply, installation, integration, testing and commissioning of hardware and software packages, interfaces, tools and/or drivers; providing operational training, offering onsite warranty support of five years, post warranty maintenance for two years and operation for a period of seven years of the complete and fully integrated functional fulldome digital 2D/3D immersive projection system** for a 23 meter diameter perforated aluminium dome screen tilted at 23 degrees with geometrical correction, image stitching and blending etc. for seamless projection of high resolution 2D/3D digital full dome film shows and digital planetarium shows by replacing existing 10/70 Astrovision fish eye lens projection system and GSS-Helios of GOTO Inc., Japan installed at Science City Kolkata.**.**

Bidders are required to submit along with the tender in **Cover-1** envelope, s**chematic design, schematic drawings of proposed control room/console, mechanisms with complete technical specifications, procurement strategy, flow chart of the work, fabrication strategy and a bar chart on how the work shall be completed** within the stipulated time as per **Clause 5** of the General terms and conditions.

1. The successful Bidder shall submit within 7 (seven) days from the date of placement of the work order the duplicate copy of the work order duly signed and official stamp on all the pages as a token of acceptance of the order.
2. Earnest Money Deposit (EMD) of Indian **Rs.1,000,000/- (Rupees One Million only) or in equivalent foreign currency** to be submitted by way of Demand Draft / Pay Order drawn on **National Council of Science Museums payable at Kolkata**. Earnest Money deposits of unsuccessful bidders will be returned within 30 working days from the date on which the final decision is taken about the source from which the items under tender are to be procured or within 2 (two) months from the date of the opening of the tenders, whichever is earlier. Earnest Money Deposit in respect of the successful bidder will be retained with the Council until the completion of entire execution of the order as per terms and conditions of the tender. In case, the successful bidder refuses to accept the offer after finalization and placement of the order as per the finalized and accepted terms and conditions, the order shall be cancelled forthwith without any further reference and the EMD deposited for this tender shall be forfeited.
3. **Eligibility**

It is intended to purchase the above integrated system directly from the manufacturer(s) without involving any agent(s) or payment of any bidder commission. Authorised Registered Indian Agents of foreign manufacturers who are enlisted with the Central Purchase Organization (i.e. DGS&D) as per compulsory enlistment scheme of the Department of Expenditure, Ministry of Finance, Government of India and capable to render prompt ‘After Sales Service’ (in case foreign manufacturers do not quote any rate to the actual users), should submit Notary Certified copy of the Enlistment Certificate duly issued by the CPO (i.e. DGS&D), Government of India including a copy of the Bidder Agreement with foreign manufacturer(s) along with the tender and in such case no bidder commission, in foreign currency or any other manner, shall be paid by the Council.

1. **Price:**

The price and rates indicated shall include all incidental charges like packing, forwarding, freight, insurance, and delivery etc. as may be applicable to this tender for supply, installation, commissioning, testing and training along with warranty (5 Years), post warranty (2 Years) maintenance and operation for a period of seven years of the complete and integrated functional fulldome digital 2D/3D immersive projection system at Science City, Kolkata. The price should include the cost of providing training for the operation of the system to the representatives of National Council of Science Museums /Science City in details.

**The selected bidder shall be responsible for proper co-ordination with NCSM and periodical supervision of these works at site to ensure the desired quality of workmanship and use of specified materials and the end result.**

**Bidders may submit the rates in INR/US$/Euro/British £ etc. as may be applicable. NCSM shall provide custom duty exemption certificate as per norms. However NCSM shall accept offers on DAT basis only. Offer(s) on High Sea Sales or through Bond to Bond transfer (Warehousing Bond under Section 59 of Indian Customs Act 1962) shall not be accepted since NCSM desires to acquire Propriety of the goods neither in transit nor in any Bonded Warehouse but after possessing the goods directly in their custody at Airport Terminal from the Airport Authority after due customs clearance. In case of overseas consignment on DAT basis, transport cost from Kolkata Airport / Kolkata Seaport to the site shall be borne by NCSM.**

**The rates of Excise Duty / Custom Duty (if any), Sales Tax, Service Tax and other taxes / levies to be imposed on the quoted rates shall be clearly mentioned in the offer form with proper break-up.** No Sales Tax exemption (Form C/E/D) will be issued. Prices and rates quoted shall be firm and fixed for the entire period of execution of the order and no escalation of rates on any ground whatsoever shall be accepted.

1. **Time of Completion:**

Time is the essence of the work. The entire work comprising dismantling and removal of existing projection equipment, reassembling at new location, dismantling of existing dome and associated structure, other existing installations etc. and supply, installation, commissioning, testing and training for the complete **integrated functional fulldome digital 2D/3D immersive projection system** for a 23 meter diameter perforated aluminium dome screen tilted at 23 degrees with geometrical correction, image stitching and blending etc. for seamless projection of high resolution 2D/3D digital full dome film shows and digital planetarium shows by replacing the existing 10/70 Astrovision fish eye lens projection system and GSS-Helios of GOTO Inc., Japan installed at Science City Kolkata shall be completed within **9 (nine) months from the date of placement of confirmed order or opening of Letter of Credit.**

1. Every effort should be made to complete the entire work by the successful bidder within the specified time. **In case the successful bidder fails to comply with the specified time schedule as per the approved bar chart and accepted terms and conditions, and where the progress of work is not found satisfactory, and commensurate with the expected progress as per the bar chart, National Council of Science Museums reserves the right to cancel the order.** The decision of the National Council of Science Museums in this regard shall be final and binding on the successful bidder. The successful bidder cannot claim any compensation for such cancellation or determination of contract.
2. **Inspection:**

The successful bidder shall also mandatorily arrange for inspection of the equipment including its accessories at the site on completion of supply, whenever desired by the authorized officials of National Council of Science Museums. Any /all defect(s) pointed out to the successful bidder by the competent representative of National Council of Science Museums during such inspection shall be promptly rectified at the cost (including material cost) of the successful bidder to meet the desired quality, and specification as per requirement of National Council of Science Museums failing which penal action shall be taken as deemed fit by National Council of Science Museums. The decision of National Council of Science Museums in this regard shall be final and binding on the successful bidder.

1. **General Terms of payment**

An irrevocable and confirmed Letter of Credit shall be opened for 100% value of the imported items quoted in foreign currency immediately upon receipt of the order confirmation. The mode of payment shall be as follows: -

1. **60% (Sixty percent)** of the total sum of the imported items on shipment of the entire materials/consignment and presentation of the dispatch documents.
2. **30% (Thirty percent)** of the total sum of the imported items after successful installation and commissioning of the fully integrated high resolution immersive Fulldome digital 2D/3D immersive projection system at site and successful running of Fulldome 2D/3D film shows and planetarium shows”.
3. **Balance 10% (Ten percent)** of the total sum of the imported items on successful operational training and handing over the equipment to our authorized representative and satisfactory running of the entire Fulldome digital 2D/3D immersive projection system for a minimum period of 10 (ten) consecutive days and on submission of a certificate issued by National Council of Science Museums stating that installation of the ordered system has been done satisfactorily and also on submission of warranty certificate as detailed in clause No.10.

**For items quoted in INR, the payment terms shall be as follows:**

1. **60% (Sixty percent)** of the total sum of the items quoted in INR on delivery of the entire materials/consignment and submission of bill of quantities.
2. **30% (Thirty percent)** of the total sum of the items quoted in INR after successful installation and commissioning of the fully integrated high resolution immersive Fulldome digital 2D/3D immersive projection system at site.
3. **Balance 10% (Ten percent)** of the total sum of the items quoted in INR on successful operational training and handing over the equipment to our authorized representative and satisfactory running of the entire Fulldome digital 2D/3D immersive projection system for a minimum period of 10(ten) consecutive days and on submission of a certificate issued by National Council of Science Museums stating that installation of the ordered system has been done satisfactorily and also on submission of warranty certificate as detailed in clause No.10.

Prior to release of balance 10% (ten percent) payment of the total value of the items quoted the successful bidder shall arrange for an irrevocable Bank Guarantee acceptable to NCSM equal to 10% ( ten percent) of the total value of the order valid for the period of five years as security for fulfilment of warranty/ defect liability obligations. Training of NCSM personnel in operation and maintenance of the entire ordered system shall be organized by the successful bidder at every stage of installation and also after satisfactory commissioning of the equipment at site and before the final 10 % (ten percent) payment is released as per terms stated above.

For annual operations (for a period of seven years) and maintenance contract for two years (beyond the warranty period of five years), the payment shall be made half-yearly on satisfactory completion of the work and this payment schedule shall continue for the entire duration of the contract.

1. **Penalty Clause**

In case of non-completion of the entire work within the stipulated time, and the delay is not attributable to site requirements, **Liquidated Damage (L.D.) @1% of the tendered value per week** shall be recovered from the bill of the successful bidder subject to a maximum of 10% of the tendered value.

1. **Defect Liability period / WARRANTY PERIOD:**

The Defect Liability /Warranty period shall be **five years** from the date of certification of the completion of satisfactory installation and commissioning of the system. The successful bidder shall be responsible for all defects of the installed equipment, manufacturing or other defects of components, playback and associated software etc. for a period of five years from the date of satisfactory completion of the installation and commissioning of the system. The successful bidder, shall at their own cost, rectify the defects and or replace the defective parts/equipment, up to the complete satisfaction of the competent authority of the National Council of Science Museums /Science City within reasonable time. **The successful bidder shall maintain an inventory of all necessary components to reduce downtime.**

1. Specifications of the items under tender are enclosed for guidance. However, if any ambiguity in the specification is detected, it shall be promptly brought to the notice of the National Council of Science Museums for clarification. The successful bidder should obtain written approval of National Council of Science Museums for any deviation from the approved specifications, if required due to site conditions or for betterment and safety of visitors and installations.

12. The authorities of the National Council of Science Museums reserve the right to amend, alter or modify the terms and conditions, specifications of the items if necessary for betterment and safety of visitors. No additional cost shall be borne by National Council of Science Museums for such amendments.

1. In case the successful bidder refuse to accept the offer after finalisation or does not comply with the Clause No.01 within 07 (seven) days from the date of placement of the order as per the finalised and accepted terms & conditions, earnest money deposit would be automatically forfeited and the order shall be cancelled forthwith.

14. The authorities of National Council of Science Museums do not bind themselves to accept the lowest tender and reserves the right to accept or reject any or all tenders wholly or partially without assigning any reason whatsoever.

15. The successful bidder shall obtain necessary trade and other licenses/permissions as may be required to carry out the tendered job at Science City, Kolkata and shall also be responsible for compliance of all statutory rules and regulations which may be in force time to time from the appropriate authorities at their own cost.

16 National Council of Science Museums, Kolkata shall not be liable for any injury or death of an employee who is deployed by the successful bidder within/outside the work site during the time of execution of the work order.

17. **Security Deposit:**

**The Security Deposit shall be 10% of the gross value of the work executed and shall be submitted by the successful bidder in the form of Bank Guarantee before release of the final payment. The Security Deposit shall be released after expiry of the defect liability period of 5 (five) years from the date of satisfactory completion of the installation and commissioning of the system.**

18. The successful bidder shall not transfer wholly or partially the order of supply, installation, testing and commissioning of the equipment to any other person(s) / firm / company for any reason whatsoever and in which case the order shall automatically stand cancelled.

19. All disputes and differences between the successful bidder and National Council of Science Museums of any kind whatever arising out of or in connection with the order on carrying out supply, installation, testing and satisfactory commissioning of the system and during the period of five years (onsite warranty and operation) and further during the subsequent period of two years of operation and maintenance beyond the warranty period (whether during the progress of the work or after the completion of work and whether before or after the determination, abandonment or breach of the terms and conditions of the order) shall be referred to the sole arbitration of a person nominated by the Director General, National Council of Science Museums, whose decision in this regard will be final and binding on both the successful bidder and the National Council of Science Museums. The provisions of the Arbitration and Conciliation Act 1996 or any statutory modification or re-enactment thereof and of the rules made there under for the time being in force shall apply to arbitration's proceedings under this Clause.

20. All other conditions given in the tender document under various sections shall stand valid and the successful bidder shall abide by them.

**ANNEXURE-F**

**Section I**

**Technical Specifications and Scope of work**

This is a two part bid (**Cover:1 -** Technical & Commercial bid without Price and **Cover:2 -** Price bid).

This is a Tender document for an integrated system with High-end heavy-duty **DLP front projectors with multiple NSH lamps** to be deployed with a 23 meter diameter perforated aluminium dome screen tilted at 23 degrees with geometrical correction, image stitching and blending etc. for seamless projection of high resolution 2D/3D digital full dome film shows and digital planetarium shows by replacing existing 10/70 Astrovision fish eye lens projection system and GSS-Helios of GOTO Inc., Japan installed at Science City Kolkata.

**The scope of work includes**

1. **Dismantling and re-assembling of existing space theatre equipment**

i). Dismantling of the existing GSS Helios planetarium system including installation and dismantling of required scaffolding, removing from the theatre and re-assembling of the GSS Helios planetarium system at designated location, dismantling of dog house only of the Astrovision 70 projection system and re-assembling in the Astrovision projection room, dismantling of all other accessories and storing/ stacking in designated places (lead space of 500 meters), including submission of bill of materials so dismantled.

ii) Dismantling and stacking of aluminium dome screen (lead space of 500 meters) and speakers including submission of bill of materials so dismantled.

iii) Dismantling and stacking of chairs (lead space of 500 meters) and carpet (lead space of 500 meters) of the existing theatre including submission of bill of materials so dismantled

**B**) **Supply, installation, integration, training, and commissioning along with onsite warranty support of five years with operation for seven years & post warranty maintenance for further two years of following sub systems. All of these provisions will be considered for evaluation of comparative statements of bids:**

1. High resolution 2D/3D visualization system with minimum 53 Million Pixel on the 23 meter perforated dome screen with 165° field of view without blending.
2. 3 Chip DLP projectors with combined ANSI lumens of minimum 174,000, minimum individual contrast ratio of 2000:1 and minimum individual native resolution of 4096 pixel x 2160 pixel with signal processing at 120 Hz, shall be used for full dome projection system with effective screen resolution of minimum 28 Million Pixel after seamless blending on the dome screen mentioned below.
3. Perforated aluminium dome screen of 23 meter diameter which allows for the panels to flush on both the horizontal and vertical seams, with only one row of rivets on both axes. The dome panels shall be paintable which shall be painted at site initially after installation and at any later date as and when required during subsequent years of operation of the theatre at installation site (bidder must specify life of paint and specification of the paint) and should not have more than 350 screen segments with seamless joints. The gain of the screen may be kept within 0.35 to 0.5 to provide sufficient foot lamberts necessary for screening of 2D/3D shows. Necessary acoustic, thermal insulation and associated works shall be within the scope of work along with all materials, labour for execution of the work, scaffolding for arranging installation and its dismantling after installation of the dome and clearing all materials from site and to provide all necessary engineering drawings for any civil work that may be required for dome installation in existing facility (as per IS Codes). The outer surface of the dome shall be covered with suitable light fabric to prevent dust accumulation, appearance of discolorations and blocking of panel perforations.
4. Each 3 chip DLP projector shall have lamp life of minimum 1500 hrs.
5. Edge blending and geometric correction for seamless display and accurate mapping to screen geometry shall have to be executed.
6. A high performance multi-channel media creation, image generator and playback system which can create as well as play high resolution 2D/3D fulldome shows, 2D/3D large format films and 2D/3D digital planetarium shows. It should provide a user friendly Graphical User Interface to control system configuration, content creation, distortion correction and blending configuration.
7. Display management system shall control the display configuration like tiling, positioning, alignment etc.
8. Data cabling to carry lossless video signals from sources viz. Media Servers and playback system, projectors and/or video players and high speed data path network (if any) among computing and storage elements through fibre optic cables.
9. Properly dressed power and data cabling for all systems and devices so as not to cause interference with video signals and data networks.
10. Estimation of power required for the complete integrated system and providing suitable UPS system having **parallel redundancy** with suitable rack mounted battery backup for at least 30 minutes for the complete display and illumination system shall be provided. The bidder must clearly specify the number and type of batteries that will be used for providing 30 minutes backup.
11. For distribution of power to the UPS Science City shall only provide a 3 phase supply as per requirement which shall be terminated inside the control room. All electrical panels for power distribution conforming to prevailing Indian Electricity Rules shall be supplied, installed and arranged by the bidder as part of their scope of work. All safety devices comprising circuit breakers, bus bars, etc. shall be suitably designed. A detailed drawing with full specifications of the proposed power distribution panel shall be submitted to Science City for approval before initiating the work.
12. Design of new seating arrangement with enhanced space between two rows and to utilize the existing space used by GSS Helios and Astrovision Projector Doghouse. The new chairs should have reclining arrangement as per required field of view of the visitors seated in different positions from the dome screen with sufficient leg space. The optimum capacity may vary from 350 - 360 seats as per the design provided by the bidder and approved by NCSM.
13. A 7.1 surround audio system with minimum 7 speakers and one subwoofer for about 350-360 visitors complete with amplifier, mixer and high quality speakers etc. giving appropriate audio power output shall be provided for the Fulldome Digital Immersive 2D/3D theatre of the Science City, Kolkata.
14. LED cove lighting and staircase lighting of the fulldome theatre and its integration with show control system. It is mandatory to have brightness of minimum 7 Lumens per unit for a Dome of 23m and sufficient number of fixtures to avoid any dark zone in the Dome.
15. Good quality active 3D glasses and design of space for distribution of special glasses for 3D films, including its storage, sanitization, collection etc.
16. Emergency LED based exit signage inside the theatre.
17. Public address system inside the theatre for making announcements and or for conducting the live show.
18. Sound proofing and acoustic treatment of the Fulldome theatre shall be under the scope of the bidder. The bidder executing the project must submit a detailed design and specifications in Cover-1 of the tender towards acoustic treatment that will be undertaken for the Fulldome theatre. The expected outcome of this sound and acoustic treatment shall be provided by the bidder and shall be measured on completion of the work. The bidder **shall arrange to execute this work based on the design, drawings and specifications submitted by the selected bidder and duly approved by NSCM authorities. The Bidder shall be responsible for closely supervising the work at site and shall co-ordinate with NCSM to ensure desired results.**
19. **The bidder shall submit detailed layout design, capacity, load calculation, requirement of special ducts for cooling of projectors etc. for HVAC system** **and requirement of HVAC system for Fulldome Theatre including area of placement of projectors, U.P.S system, Image Generators and seating area of the visitors. NCSM shall arrange to execute this work based on the design, drawings and specifications submitted by the selected bidder. The Bidder shall be responsible for closely supervising the work and** **to interact with the HVAC vendors/consultants, if required and also verify compliance of desired requirements at site and shall also co-ordinate with NCSM to ensure fulfilment of all results.**
20. The bidder shall provide site plan document with plan, elevation and mounting details for placement of Projectors, Screen, Viewer Gallery, and Rack Mounted assemblies for Image Generators and Playback system, Speakers and Display Management System.
21. Touch panel based control systems shall be provided for general illumination, dome lighting control, staircase lighting control, exit signage control and emergency exit signage control, audio, projectors, device control units, colour correction, colour matching, mount alignments, lens adjustments etc.
22. Touch panel based show control system shall be located in the viewer platform with wireless ipad/Tablet for operation of the show.
23. The system should be designed keeping in view that it must be manageable from a single control unit. All accessories needed for easy accessibility of devices for maintenance must be considered under the scope of the work.
24. The bidder may provide the requirement of fire extinguishers (type and quantity) to be placed in different areas of fulldome theatre. Supply and installation will however be under the scope of NCSM.
25. Provision for noise and heat reduction, signal stabilization and heat extraction system shall be considered under the scope of work. Requirement of air-conditioning units with suggested layout showing locations for chilled water based FCUs along with required capacity of each may be indicated for cooling of the projectors. Supply and installation of FCUs as per suggested location by the bidder shall however remain within the scope of NCSM.
26. Need based Analysis, Space Planning, Concept Design, Schematic Design, Detailed Design, Content Design, Procurement Management, Site Supervision, Content Production, Special or General Programming, Set Up, Testing and Commissioning, Training, Planned Maintenance Services, Operational Services, Audio Visual System Management, Illumination Management etc. shall all be under the scope of the work of the bidder.
27. Special mountings for the projectors and all required alignments for final adjustments etc. shall remain within the scope of the selected bidder. The selected bidder must consider cost effective non rusting materials and anti-corrosive treatment for all metallic structures of projectors. All safety measures shall be considered while designing for safety of people and equipment. The selected bidder shall remain responsible for closely monitoring the work at site to ensure that desired quality of work is executed.
28. **The design for all systems should be forward looking and should allow for future upgradation and development within the systems currently proposed and provided. The proposed designs should be of open architecture to allow for future upgradation. The upgradation path should be identified for all major systems and proposed upgradation plan may also be submitted separately.**
29. The system is to be designed with very high up-time commitment (99% over 364 days a year or 365 days in case of a leap year). The selected bidder shall maintain inventory of spares for the designated up-time commitment for on-site warranty.
30. Preventative maintenance shall be carried out by the bidder at regular intervals during the Warranty period of five years and post warranty period of two years and a logbook to this effect shall be maintained at site. Suggested schedule for preventive maintenance shall be clearly defined and submitted in Cover 1.
31. If any disparity in terms of projector intensity, colour, alignment or otherwise is noticed and reported during the warranty period, immediate redressal of the issue through repair or replacement shall be within the scope of the successful bidder.
32. Integration of all subsystems as indicated above to configure the **“Fulldome digital 2D/3D immersive projection system”** shall be the responsibility of the bidder.
33. The bidders shall also quote for annual charges for operation of the installed facility during warranty period (5 Years) and post warranty period (2 Years) on year to year basis for the visitors of Science City from 11:00 a.m. to 7:00 p.m. This timing may vary during the peak season. The show shall remain operational for 364 days in a year (and 365 days in a leap year).
34. For Technical & Commercial (Cover -1) bid evaluation, the bidders shall provide detailed bill of quantities (without cost) of each item proposed for their offer along with schematic system architecture and product catalogues for all hardware/software items.
35. NCSM shall provide incoming power cable of required capacity which the bidder shall connect to their main distribution panel. Air conditioning of all required spaces will be under the scope of NCSM. However, the bidder shall act in collaboration with the Council towards proper implementation of the same. The collaboration here will entail design finalization, installation facilitation, performance tuning etc.

**Note:**

**All civil works relating to the installation of the system/show, acoustic panelling, scaffolding for installation of dome, fabrication/installation of base steel structure for mounting of projectors array are to be taken up by the selected bidder, and all necessary materials, machines and any other machine tools required for the fabrication and installation are to be arranged by the selected bidder at their own cost. The selected bidder will provide design, drawings, details and complete specifications for acoustic treatment/dome structure /panelling and steel structure for installation of projectors array as described earlier.**

**Science City shall provide power against payment through metered system for installation and minor fabrication works at site.**

**All safety precautions and compliance of statutory obligations shall be taken care of by the selected bidder during execution of the entire project at site.**

**Client’s responsibilities:**

* + 1. NCSM shall provide electrical power for execution of the work.
    2. NCSM shall provide lockable space for storage of materials by the selected vendor.
    3. NCSM shall based on specified requirement, arrange supply, installation, testing and commissioning of HVAC installation.
    4. NCSM shall based on specified requirement, arrange modifications or additions in the existing building for installation of the dome screen. However, such modifications shall be carried out only after necessary consultations and approval of structural consultant of NCSM. In case changes suggested by the selected bidder are found unfeasible, the matter shall be resolved by the bidder through mutual consultation and with amendments in their design if required.

**Section II**

**Technical Specifications of integrated High Resolution Fulldome Digital 2D/3D Immersive Projection System** **for a 23 meter diameter perforated aluminium dome screen tilted at 23 degrees with geometrical correction, image stitching and blending etc. for seamless projection of high resolution 2D/3D digital fulldome film shows and digital planetarium shows.**

* 1. **Fully High Resolution Fulldome digital 2D/3D immersive projection system**

The integrated High Resolution Fulldome Digital 2D/3D Immersive Projection System consists of Projectors array, perforated dome screen, Blending & Geometric Correction units, Image Generator Servers & GUI server for playback, show control, Server for dome slicing and content creation for fulldome planetarium shows, Display Management, Alignment & Calibration System, UPS system, 7.1 surround sound system, LED Cove lighting and staircase lighting, Exit signage, emergency exit signage, active 3D spectacles with storage & sterilization system etc. This system is a multi channel display system with combined resolution of **53 Million Pixels without blending.** The specifications of the complete system are provided in section 1.1.1 to 1.9B.

* + 1. **Projection Screen**

Acceptable OEMs: Astrotech, Spitz

**Design parameters for Dome Screen**

1. The projection dome shall be self-supporting and capable of maintaining its hemispherical characteristics when supported by its tension ring as required by the design of the theatre.
2. The hemispheric shell shall consist, in parts, an aluminium structural rib network system of evenly spaced ribs, with a calculated depth and sufficient number of cross-members to maintain its correct shape. The inside diameter of the dome screen is 23m. The total load of the Dome should not be more than 5 Tonnes.
3. The ribs shall be accurately formed and reinforced in accordance with the manufacturer's drawings. The ribs shall be fabricated from aluminium alloy 6061-T6 and 6063-T5, or their suitable material to be specified. Framework must be at least 250 mm wide and allow people to climb ladders without their foot hitting the dome panels and climbing on the back of the dome for maintenance.
4. A girt system shall be incorporated to maintain proper rib spacing, and complete X-bracing shall be provide to maintain proper rib alignment of the dome screen. Sizing and spacing shall be as indicated on manufacturer's drawings as approved by the owner.
5. The structural gauge of the dome shall be sufficiently stiff so that deflection and settlement of the structure will not lead to deformation of the screen panels, based on the stiffness of the support system provided by the owner.
6. A circular compression ring shall be provided and located at the zenith or apex of the dome, to accommodate the terminal points for the main ribs and the perforated top circle. The compression ring shall be fabricated from aluminium alloy 6061-T6, or other suitable material acceptable to the owner.
7. An aluminium base tension rings shall be provided at the base of the hemisphere, which shall be so constructed that the ring will support the dome and provide the necessary connection points around its periphery. The base tension ring shall be aluminium alloy 6061-T6 or other suitable material, sized and reinforced in accordance with the manufacturer's drawings.
8. The projection surface shall consist of not more than 350 perforated non powder coated panels which shall be minimum 0.040 (1mm) gauge aluminium alloy type 5052-H32 containing 0.062 in. (1.6mm) diameter holes. To provide approximately 25% void area with a minimum of a 23% void. Final painting shall be executed at site.
9. 360 °Aluminium Cove Trough should be provided and be fixed at the Horizon level of the Projection Dome without compromising projection Horizon. Cove Facia should not be more than 100mm in height.
10. One Fixed Ladder should be provided in North-South direction for the purpose of human access & maintenance.

**SEAMS AND JOINTS**

1. Seams between adjacent panels will be overlapped jointed flushed in all sides. All seams should be invisible against projection.
2. Provide a small finished sample section demonstrating joint construction in an area where four (4) adjacent panels meet for inspection

**Scopes Included:**

1. Necessary scaffolding, man power and all installation related equipment and resources shall be provided by the bidder.
2. All necessary drawings for modification of the Civil structure shall be submitted by the manufacturer and will be evaluated and executed by Science City.

**Table 1.1.1**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| **Screen type and dimensions** | * The 23m/23° tilted diameter dome should be made of good quality aluminium perforated sheets with necessary ribs and support structures. * The perforation should be 1.6 mm in diameter. * The panels should be non-powder coated seamless joints, with single line of rivets with seamless overlaps. * The opening of the Dome might be less than 180° based on Planetarium manufacturer’s recommendation. * The final reflectivity of the panels will also be recommended by the Planetarium manufacturer before finalization of the contract. |

**Insulation of outer concrete dome, inner surface:**

* Dismantling of existing insulation as fixed on the inner surface of the Outer Dome using necessary scaffoldings and platforms and repair & curing work to be undertaken on the damaged surface. Work needs to executed with extreme precaution so that there is no damage on the concrete dome.
* New Insulation: Appropriate Thermal & Acoustic insulation shall be installed by replacing the old insulation material. Thermal Insulation material shall be laid with Vapour Barrier to achieve atleast R-35 as a first layer on the concrete surface. Acoustic insulation should be laid over the thermal insulation to achieve a NRC of 0.6 for the Dome Theatre. Please refer to the table below for overall minimum specification for the materials to be used:

|  |  |
| --- | --- |
| **S.No.** | **Item** |
|  | Resin bonded mineral fibre 48 kg density, 50mm thick with one side fsk (aluminium foil ) size -900 x 600mm (slab**)** |
|  | Rockwool ( slack fibre based ) resin bonded size-1m x 1/2m,48 density,**50mm** thick |
|  | Acoustic tissue paper |
|  | Solution for fixing tissue paper |
|  | Synthetic fibre netting mesh |
|  | Nuts and bolts with rawal plug and wire 18 gauge,  screws with fasteners set of atleast 10 per meter square |

**Acoustic panelling below the dome screen:**

* Wall panelling system to provide excellent acoustical performance in the Fulldome theatre by attaining at least 0.7 NRC. Modular Panels should be of  formaldehyde-free Fibre glass material or Perforated Aluminium Panels with Acoustical Mineral Wool backing with integrated mounting system to be fabricated all along the peripheral wall of the Dome theatre below the Dome Horizon from stepped floor to Cove Bottom. Panels should come in modular sizes and should meet ASTM standards of Surface Burning (Fire), Moisture & Fungus. All panels should be butt joint with good aesthetical finish. Colour should be carefully chosen to reduce cross-reflectance from Projection and should be approved before application.
* Total area should be measured before fabrication and prior approval should be obtained.
* Preferred Manufacturers: Hunter Douglas, Armstrong, Anutone.

**1.1.2 Projector Array**

Immersive Projection System: An array of projectors and allied systems with the requisite overlap and edge blending is to be provided along with suitable geometry correction for the dome screen as specified, to provide a seamless display of at least **28 MP arranged in a front projection configuration (after blending)** with the specifications as per table 1.1.2. The projectors are to be mounted on a suitable structure. Selected bidder will fabricate and install the projector mounting structure at site as per the design, details, drawings and specifications provided by the bidder. The bidder must visit the site before submission of tender and identify the most suitable place in the building for keeping the Image Generator Server, projectors, Audio racks, UPS and other necessary units and routing of the cables needed to connect all constituent components of the system.

**Table 1.1.2**

|  |  |  |
| --- | --- | --- |
| **Specifications** | **Detailed description** | |
| **Number of Projectors** | Please specify the total number of projectors and their make proposed to be used in the projector array. NB: All Projectors must be of same specifications and from OEM and shall directly project contents on the dome screen. | |
| **Type of projector** | 3 Chip DLP Projectors with multiple NSH Lamp, with ANSI Lumens of 29000 or more and contrast ratio of 1800:1 or better |
| **Projector array comprising multiple projectors** | To cover 23 meter dome screen tilted at 23 degree |
| **Total Resolution before and after blending** | **53 MP** or higher (before blending) and **28 MP** or higher (after blending) |
| **Mounting** | Projectors are to be mounted on the specially designed structure around the dome periphery. Each mount/cradle shall provide full optical alignment and calibration support along each of the X, Y and Z axes as well as rotation about the horizontal axis. |

**1.1.3 Projector**

The specifications of individual projector are provided at table 1.1.3: The projector model quoted by the bidder must be capable of running continuously for at least 12 hours a day and 364 days a year. All projectors must be of same specifications and manufactured by the same OEM in their own factory.

Acceptable OEMs: BARCO/Christie/ JVC/NEC /Panasonic/Sony

**Table 1.1.3**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| **Display Technology** | Three chip DLP |
| Source : multiple NSH Lamp |
| **Minimum native Resolution** | 4096 pixel x 2160, 120 Hz, at minimum 1800: 1 contrast ratio. |
| **Internal Input / Output ports** | DVI/HDMI/Display port |
| **Input / Output control and networking** | RS232, TCP/IP. |
| **Lens Options** | Standard Zoom to Wide Angle Zoom to cover the entire screen area as specified (please specify further technical details along with type and OEM of lenses to be used). |
| **Calibration** | Support for controlling individual colour and intensity on each colour channel. |
| **Source Life** | Minimum 1500 hrs |
| **Operating Hours** | The System shall be capable of being used for twelve hours per day 364 days in a year. |
| **Monitoring Parameters** | Source life, Fan status, Temperature status, etc. |
| **Noise** | < 55 db at 25°C per projector |
| **Accessories** | All standard accessories including IR remote, Line cord etc. |
| **Warranty** | Manufacturer’s standard warranty of not less than five years on projectors. |

**1.1.4 Blending and Geometry Correction (BG) unit:** The solution shall be provided using projectors with physical mask and extra hardware or using projectors with embedded hardware. The specifications and functionalities of this unit are as below:

**Table 1.1.4**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| **Input / Output** | DVI in/out |
| **Image Operations** | Geometry Correction |
| Edge Blending |
| Colour Correction and Matching |
| Uniformity Correction and Matching |
| Software for geometric correction shall be incorporated in the system. |
| **Software Presets** | Software Presets should be available for Switching Brightness of Projectors for 2D & 3D Projection Modes. |

**1.2 Image Generator Server and Playback System with fulldome and planetarium show software (12+2+2 standby)**

A suitable solution shall be ensured to drive the required projector array with the specifications given below. Image GUI server shall drive projector array with two image render server for each projector for fulldome films and planetarium shows to be displayed in real time onto digital immersive dome projection screen. The Image GUI server shall provide synchronization between images projected onto the dome through various image generator servers for a seamless image without any tearing. The server shall also provide synchronization of multilingual audio tracks with the projected film shows.

**Acceptable OEMs**: Dell, HP

**Table 1.2**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| Image Generators | * Nvidia Quadro M5000 graphic cards * Nvidia Gsync fully utilized (frame and swap sync) in hardware and software * 2x high end Intel Xeon processor per computer (E5-2620 v3 6C HT, 15MB Cache, 2.4GHz) * 32GB 2133MHz DDR4 RDIMM ECC * RAIDED hard drive for redundancy * Solid state Hard drives * 256GB system hard drives, 2TB storage hard drives (to store high quality almost lossless Video * Windows 8 or higher robust operating system |
| Media Server Architecture | * Fully Genlocked hardware & software * Choice of video codecs from loss less compression to uncompressed * Full control of distortion correction-warp & blend & channel management * RAID system to be provided for both backups in case of hard drive failure, and increased disc speed due to parallel input from disc to CPU. |
| **Pre process Data transfer**  **Rate\*** | * No jerks, flicker or image tearing should appear on screen. * Frame rates up to 60fps per eye in 3D stereo. |

***\**** *Additional SSD and RAMs may be configured to meet the overall specifications, if necessary.*

**1.3 Content creation Server**

One separate workstation/server for creation of planetarium shows as well as for conversion of large format shows into fulldome shows shall be provided by the bidder with specification as mentioned in **Table 1.2.** The Workstation server should be connected to the Master GUI Server of the main cluster for seamless transfer & access of data/resource.

**Software:**

* **Latest version of OEM software with perpetual license for playback of fulldome shows and planetarium shows and with facility to convert large format shows into fulldome shows.**
* **Digital library/cloud access of the planetarium datasets for development of in-house planetarium shows.**
* **Interactive Astronomy Simulation tool & Datasets:**

**Astronomy & Earth Sciences**

* All planets
* All major moons
* Over 500,000 asteroids and over 2,000 man-made satellites
* Kuiper belt and Oort Cloud

**Complete support of AMNH’s Digital Universe, including:**

* Stars
* Open Clusters
* Nebulae
* Star-forming regions
* Exoplanets
* Globular Clusters
* Galaxies
* Galaxy Clusters
* Quasars

**Grids and reference graphics, including:**

* ecliptic
* equator
* equinoxes
* alt-az grid
* cardinal points
* local meridian
* pole lines
* long lat grid
* precession circle
* Proper motion for all Hipparcos catalog stars
* Updated archive of all exoplanets in 3D position (ra, dec, dist) in Milky Way.

**Highly detailed models of dozens of spacecrafts and robots, with supports for specular highlights, bump mapping and self-shadowing of models, including:**

* The International Space Station
* Curiosity
* Hubble
* Kepler
* Messenger
* Cassini
* All-sky survey’s in a variety of filters, including WISE.
* Streaming of planetary textures from the web, including extremely high resolution datasets with textures with up to 1m per pixel.

**Full web server access to NASA Earth Observations data, made available in collaboration with NASA Earth Observations (NEO).**

* Global mosaic of the Moon, with a spatial resolution of up to ~1 m/pixel
* Martian high resolution THEMIS colour maps and terrain at 20 m/pixel.
* Sample Martian HiRISE DTM’s, including 16-bit terrain maps and ~1 m/pixel colourmaps.
* Full-degree panorama of Gale Crater.
* 580 000 dynamical asteroids, including trojans, greeks, cubewanos and TNO’s, for easy visualization of different orbital resonances.
* USGS dataset of last 40 years of earthquakes, positioned accurately in 3D.
* Animate constellation lines over time
* Havelius artwork for constellation figures (in collaboration with Denver Museum of Nature and Science)
* 3D model of the sun, including sunspots
* Volumetric models of Milky way and other spiral galaxies
* Brown Dwarf catalog
* Star orbits around galactic center for a handful of stars

**1.4 Show Control System**

The display environment should include an integrated Show Control System, capable of controlling all hardware, other equipment, including the display system, audio, media, cove, lighting system, staircase lighting, exit and emergency exit signage lighting. The Show Control System should provide following features:

**Table 1.4**

|  |
| --- |
| **Detailed description** |
| * Table top minimum 12” colour touch panel   Communication protocols: RS 232, TCP/IP, IR.  On/Off Control: Projectors, Illumination, Audio and Dimmer control for COVE lighting |
| * Interactive touch screen for controlling DIGITAL IMMERSIVE FULLDOME PROJECTION SYSTEM |
| * Touch screen controller should be installed along with a table top screen and configured to run the entire digital immersive fulldome 2D/3D projection system |
| * The touch screen should have following: Display size: 32 inch (diagonal), Display Resolution: Upto 1920X1080 or better |

**1.5 Calibration and Alignment**

For Fulldome Projection System with multiple projectors, manual adjustments for calibration and alignment are not feasible and hence automatic features are required to maintain calibration and alignment as per table 1.5.1 & 1.5.2.

**Table 1.5.1**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| Auto alignment and  calibration | Software, hardware and multi-camera based mechanisms to be included in order to ensure error free edge blending / geometric correction on screen as well as to maintain uniform colour, brightness and contrast on projectors and dome screen. |
| Auto alignment and correction system shall be available on table top touch panel through GUI. |
| Software Preset to manage optimum brightness levels of Projectors in 2D & 3D modes. |

**Table 1.5.2**

|  |  |
| --- | --- |
| **Specifications** | **Detailed description** |
| Tools for Verification  of calibration and  alignment | Set of Instruments and software for verification of calibration and alignment parameters at site as per table 1.5.1. |

**1.6. Integrated Audio System**

A 7.1 surround audio system of **JBL, BOSE, Sony, AKG, Yamaha or equivalent approved brand** shall be an integrated part of the overall system. It shall be fully controlled under the **Show Control System** as per table 1.6 and needs to be supplied and installed and it shall address the requirements of fulldome projection environment to ensure maximum immersive experience. The system shall also provide public address system inside the theatre.

**Table 1.6**

|  |  |
| --- | --- |
| **Specification** | **Detailed description** |
| 7**.1 channel surround audio system** | The audio system shall be fully integrated with the show control system. Audio system shall consist of 7 speakers with dual subwoofer system mounted suitably above the viewing platform or else at suitable locations as may be required. Amplifiers are to be solid state and network controlled |
| **Front Left/Front Right/Centre Speakers** | Large Format 12" High Power Cinema Surround.  Power Rating1: 400 Watts continuous pink noise, 1600 Watts peak  Sensitivity (1W/1m)2: 98 dB-SPL half space/ wall mounted  Maximum Peak SPL3: 124 dB/1m  Nominal Impedance: 8 ohms |
| **Surround**  **Speakers with)** wall Mount U-Brackets for all Speakers. | Very High Power Cinema Surround Speaker for Digital Applications  Frequency Range (-10 dB): 60 Hz - 19 kHz  Frequency Response (±3 dB): 75 Hz - 17 kHz  Power Rating1: 350 watts continuous pink noise, 1400 watts peak  Nominal Impedance: 8 ohms |
| **Subwoofer :** | Dual 460 mm (18 in) Subwoofer System  Rated Impedance: 4 ohms  Minimum Impedance: 3.2 ohms  POWER HANDLING CAPABILITY:  Continuous Pink Noise1: 1200 Watts  Continuous Program2: 2400 Watts  Peak Power3: 4800 Watts |
| **Power Amplifiers for Speakers:**  **Centre / Front / Surround** | Minimum Guaranteed Power, 1 kHz:- 650Watts.Streo,8 ohms (per ch.)  Frequency Response  (At 1 watt into 4 ohms, 20Hz - 20 kHz)  Crosstalk (below rated power, A-weighted)  20 Hz to 1 kHz  >70 dB |
| **Power Amplifiers for Subwoofer** | Minimum Guaranteed Power, 1 kHz:-  1600 Watts.Bridge-Mono.8 Ohms  Frequency Response  (At 1 watt into 4 ohms, 20Hz - 20 kHz)  Crosstalk (below rated power, A-weighted)  20 Hz to 1 kHz  >70 dB  Input Impedance (nominal) 20 kilohms balanced, 10 kilohms unbalanced |
| **Audio Mixer** | 40-input channel  25-bus digital mixing  8 XLR outputs plus 6 additional line in/outputs  32 x 32 channel USB 2.0 audio interface  Motorised Faders |
| **Microphones** | The audio system should be integrated with microphones (2 numbers or more). It is to be mounted in the console area and 2 or more numbers wireless collar microphones are to be integrated. |

**1.7 U.P.S system with parallel redundancy**

A UPS system with parallel redundancy of reputed make and having backup time of 3**0 minutes** to be provided by the bidder for digital immersive fulldome 2D/3D projection system as per table 1.7 given below**.**

**Table 1.7**

|  |  |
| --- | --- |
| **Specification** | **Detailed description** |
| U.P.S system (True IGBT with parallel redundancy) with 30 minutes backup time | Please provide specifications of the U.P.S system including make and model. |
| Battery bank with suitable rack | Please specify number of SMF batteries with detailed specifications. |

**1.8 Seating Arrangement ( 360 chairs)**

The bidder shall submit scheme including sight line drawings for layout of seats, and detailed engineering drawings for change of existing layout if required. Specification of the chairs is given in table below.

**Table 1.8**

|  |  |
| --- | --- |
| **Specification** | **Detailed description** |
| Reclining chair | 1. Tip-up and back push reclined chair  2. Center to center 20”.  3. ABS molded housing for seat & back cushions  4. All sheet metal parts with powder coated  5. Arm rest in Polyurethane injection moulded.  6. Seat numbering on inner both the side of the chair stands with silicon fluorescent thin stickers.  7. Row number for seat along the aisles.  8. Provision for LED lights on sides along with aisles with the row and the seat numbers display.  9. For Noise Reduction Nylon 66 components on moving parts |
| Frames | 15 mm thick high pressure steam pressed hard ply wood for seat  and the back out of which the back is of 12mm the bent ply. |
| Fabric | Colour to be approved by Science City authorities. All fabric that shall be used shall be fire retardant. Test certificates shall be submitted |
| Spring | Spring for tip-up and back push mechanism torsion spring/spring steel IS:44541981 grade III |
| Sheet-metal components | HRCA/CRCA Sheet metal IS:1079 1994  a) Side stand 3mm (+/- 0.2 mm) thick size: 415 mm(+/-5 mm) x 345 mm (+/-5mm) both side bottom circular cutting with 140 mm radius.  b) 75 mmx25 mm 16g 190 mm length tubular pipe for the leg wielded  to the 3 mm plate.  c) Flat for base of the stands 280 mm (+/-2 mm) length 50 mm (+/-  2 mm) x 5 mm (+/-0.2mm).  d) Mechanism components 2 mm HRCA Back push box 180 mm(+/-2 mm) x 70 mm (+/-2 mm) & height of the box 15 mm(+/-2 mm), ear “L” bracket attached to the box 190 mm (+/-2 mm) x 135 mm (+/-2 mm). With two slot holes for fixing the back. Tip-up box 180 mm (+/-2 mm) x 70 mm (+/-2 mm) & height of the box 15mm (+/-2mm), ear “L” bracket attached to the box 95mm (+/-2mm) x 125 mm (+/-2mm). With two slot holes to fix the seat. |
| Seat and Back cushion housing | ABS moulded vacuum forming out of 2mm sheet |

**1.9 A. LED Cove light and staircase lighting**

Cove lighting to be integrated with show control system.

|  |  |
| --- | --- |
| **Specification** | **Detailed description** |
| Cove Light | Beam Angle 120° x 120°  Lumens 7.4  LED Channels Red / Green / Blue  Mixing Distance 2 in (51 mm) to uniform light  Lumen Maintenance† 50,000 hours L50 @ 50° C (full output) |
| Design | 360° Layout in Aluminium Cove Trough in aesthetical indirect lighting arrangement. Ample amount of LED Modules to be provided to avoid dark zones.  Provision for software programmability of different modes and colour effects along with programmable hardware presets. |
| Staircase case lighting, Exit signage and Emergency Exit signage | * **Step Lighting**: The lighting effect should be created using a fibre optic rod that is end-illuminated with high intensity LEDs with 50,000 hour life expectancy. * The unit should flush with 6mm Carpet * **Entry & Exit Ramps Lighting:** LED wall light should provide 2.2 lux at 1.9m distance when mounted 300mm above floor. * **Seat Row Indicators:** Seat row indicators should be installed to identify the location of seating rows, to provide illumination for guidance (e.g. by emergency exits) or to illuminate the floor for safe movement in fulldome theatre when the main lighting is dimmed. |

**1.9 B. Active 3D spectacles with storage and sterilization (1000 active 3D spectacles)**

|  |  |
| --- | --- |
| **Specification** | **Detailed description** |
| Active 3D spectacles | * For high-quality images preserved at all seating positions * Automatic power-off function saves energy * Bright images and natural colours * Automatic radio frequency(RF) synchronization, wide reception angle |
| Sterilization | Machine suitable for sterilization of 3D spectacles working with AC 230 V. |

**2.0 Brochures and complete specifications**

Bidders shall provide printed brochures and detailed specifications for various OEM products. The brochures, documents and engineering drawings as per Table 2.0 have to be provided along with the technical bid including compliance Table 2.0. The bidders have to respond within stipulated time for additional information/clarifications sought afterwards, if any.

**Bidders may be required to make technical presentations explaining their offered scheme after opening of Technical & Commercial Bids (Cover-1), if decided by NCSM. The decision of the Council in respect of techno-commercial evaluation of Cover-1 of the tender and selection of qualified and eligible vendors for opening of Financial Bid (Cover-2) shall be final and binding on the bidders.**

**Table 2.0 Information to be submitted by the bidders in Cover-1**

|  |
| --- |
| **Detailed description** |
| 1. Detailed material specifications along with product catalogue for dome screen preparation, insulation of inner surface of outer concrete dome and acoustic panelling below the dome screen. |
| 1. Brochures and specifications for Projectors, Lenses, Mounts, Blending and Geometric Correction Units, Display Management System, etc. |
| 1. Brochures and specifications for Image generator servers, Interactive planetarium software and fulldome configurator & playback system and projection systems. |
| 1. Brochures and specifications for Show Control System. |
| 1. Brochures and specifications for Calibration and related instruments and software. |
| 1. Brochures and specifications for Software Elements along with licensing details. |
| 1. Brochures and specifications for Audio systems. |
| 1. Brochures and specifications for UPS system with 30 minutes backup. |
| 1. Engineering drawing (plan, elevation and sectional views wherever necessary for viewer’s gallery and image servers room in pdf and AutoCAD file format), complete solution diagram, connectivity diagram, system deployment and foot print detail, electrical power requirement and location marked diagram/drawings, system cooling requirement (in BTU) with proper layout drawings. |
| 1. Detailed write-up and specific system solution document explaining the integrated working of offered solution with the hardware and software describing various technical, interface and performance aspects, wiring / network diagram of the proposed solution. This has to explain how the proposed design or solution meets the specifications and overall requirements as mentioned in the tender document. |
| 1. Schematic diagram and broad material specifications of the structure for mounting the projector array showing suggested location of the projectors including arrangement for accessibility to the projectors for maintenance. |
| 1. Details and product catalogues of acoustic treatment of inner surface o concrete dome and acoustic panelling below the aluminium dome inside the theatre proposed and with relevant drawings, material specifications etc. |
| 1. Details and product catalogues of LED Cove light, exit signage and emergency exit signage lightingand staircase lighting scheme. |
| 1. Details regarding source of content development for planetarium shows using datasets/library of 3D models/cloud assets. |
| 1. Details and product catalogues of 3D spectacles and storage and sterilization equipment. |

**2.1 Write Ups Related to Design**

Bidders shall provide following documents as per Table 2.1 along with technical bid.

**Table 2.1**

|  |
| --- |
| **Detail Description** |
| Document on design techniques highlighting how Fulldome Digital 2D/3D immersive projection system will be met by the offered solution using the proposed sub-systems. Detailed write-up of functional role of each subsystem in integrated solution shall be described. |

**3.1 User Training and Documentation**

Two levels of training are to be arranged – Basic training of two days for 5 executives and 10 days of technical training for 10 participants is required to be organized at Science City, Kolkata. **Training material and complete installation manual in both hard and soft copies is to be provided (two sets of each).** The faculty should be certified from parent company (OEM) or technical and experienced persons from system integrator.

**Table 3.1 Training Topics on FULLDOME PROJECTION SYSTEM**

|  |  |
| --- | --- |
| Sl. No. | Detailed Description |
|  | Architecture of FULLDOME PROJECTION SYSTEM |
|  | Hardware components of FULLDOME PROJECTION SYSTEM (Projectors, screen, controller, image servers, network elements, storage etc) |
|  | FULLDOME PROJECTION SYSTEM Administration: Hardware and Software Installation, Configuration, Trouble-shooting and Maintenance procedure including preventative maintenance |
|  | Alignment and Calibration with usage of instrument and tools |
|  | Field replaceable components and applicable procedures for field replacement |
|  | Special features of the show control software |
|  | FAQs |

**4.**  **Delivery Schedule**

The entire work shall be completed within **Nine months** from the date of placement of order or opening of Letter of Credit whichever is later.

**5. Warranty and AMC:**

**Warranty**: The successful bidder shall provide **Single Window** **Onsite** **Comprehensive** **Warranty** on all the items supplied under the purchase order **except projector lamps** as has been enumerated in details below under clause 6 (f). **The Warranty period for the entire installation is for five years for all the components of the system except chairs for which warranty will be 2 years from the date of issue of acceptance certificate by NCSM.**

**AMC**: The non-comprehensive annual maintenance contract will be for a period of two years, after expiry of the warranty period of five years. The bidder must submit the list of spares along with applicable rates during the period of Annual Maintenance Contract. The list of spares shall include all the items that may require replacement beyond warranty period of five years.

**i)** Bidders shall quote for **non-comprehensive annual maintenance charges** along with applicable taxes **for two years**, after expiry of warranty period of five years from the date of commissioning and handing over to NCSM on year to year basis. The tax break-up for all such rates shall be clearly spelt out as on the date of submission of the tender.

**During Non-Comprehensive Maintenance Contract, comprising two years, the following terms shall be applicable.**

a) Preventive Maintenance for all the equipment and peripherals supplied by the bidder. The bidders shall submit a schedule for such preventive maintenance and shall form part of the agreement.

b) Repair of faulty / defective parts and peripherals.

c) Replacement of faulty parts and peripherals **against payment as per the rates mentioned in the list of spares submitted by bidder**. All replaced parts shall remain as property of NCSM.

d) If needed, the successful bidder shall install standby equipment / peripheral(s) in respect of faulty equipment / peripheral(s) till the faulty ones are made operational. Further, if the faulty ones are not made operational within the period under contract, then the standby equipment /peripheral(s) installed/supplied in place of faulty ones will become the sole property of NCSM. The replaced part should be compatible with the system.

e) During the AMC period (when the life of the batteries is likely to be over) the selected bidder has to replace all the UPS batteries. The batteries shall be provided by NCSM.

f) **During the warranty period (beyond the lamp warranty provided by OEM) and during the AMC period of two years, the successful bidder shall replace faulty/expired lamp(s) of the projection system. The lamps shall be provided by NCSM, or the cost shall be reimbursed. No additional charges towards labour for replacement of lamps shall be borne by NCSM.**

h) All the parts including networking cables, connectors, etc. that may be required to maintain the system shall be supplied by the bidder at their own cost.

i) Any break-down, failure or malfunctioning of the system shall be attended to and put back in service within 48 hours. However, all round efforts must be made to set right the system in shortest possible time. Service shall be available for at all times for 364 days in a year.

j) The selected bidder will maintain the minimum essential spares at their own stores and the required tools / test equipments / software so as to reduce the break-down time.

k) Spare parts manufactured by Original Equipment Manufacturer (OEM) will be preferred. However in unavoidable situations spares manufactured by equivalent manufacturers may be used with prior approval of NCSM.

**In case of any requirement for replacement of any supplied spares or lamps by the bidder, NCSM shall not be responsible for re-export of the damaged components and that will be replaced by the successful bidder.**

**6. Operation of 2D/3D Fulldome planetarium and film shows:**

Successful bidder shall operate full dome shows from 11:00 a.m to 7:00 p.m for the visitors of Science City. This timing may vary during the peak seasons. The show shall remain operational for 364 days in a year (and 365 days in a leap year). Sterilization, cleaning and distribution of Active 3D spectacles to the visitors shall be under the scope of the successful bidder.

* Manning, operation and maintenance of the system shall be the sole responsibility of the successful bidder at their risk and cost by mobilising their resources and trained technical manpower. Adequate manpower shall be deployed for the complete duration of the operation of the theatre.
* Successful bidder shall operate the system in proper and professional manner without downtime and shall fulfil the statutory obligatory requirements on bidder’s part for the purpose of contract.
* All necessary manpower, tools and tackles with allied requirements will be arranged by the successful bidder for operation of the system.
* The date for commencement of operation shall be communicated by NCSM at an appropriate time after successful commissioning of the entire installation. This shall be through a separate written communication after completion of Supply, Installation, Testing, Commissioning and successful completion of training and other compliances as may be applicable to commence operation.

**ANNEXURE - G**

**TECHNICAL COMPLIANCE TABLES**

**Projection Screen**

**Table 1.1.1.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any, with complete justification** |
| **Screen type and dimensions** | The 23m/23° tilted diameter dome should be made of good quality aluminium perforated sheets with necessary ribs and support structures. The perforation should be 1.6 mm in diameter. **The panels should be non-powder coated to enable scope for future repainting of the screen if required and shall have seamless joints, with single line of rivets with seamless overlaps**. The opening of the Dome might be less than 180° based on Planetarium manufacturer’s recommendation. The final reflectivity of the panels will also be recommended by the Planetarium manufacturer before finalization of the contract |  |  |

**Table 1.1.1.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any, with complete justification** |
| **Dome**  **Insulation** | Resin bonded mineral fibre 48 kg density, 50mm thick with one side fsk (aluminium foil ) size-900x600mm (slab**)** |  |  |
| Rockwool ( slack fibre based ) resin bonded size-1m x ½mtr,48 density,**50mm** thick |  |  |
| Acoustic tissue paper |  |  |
| Solution for fixing tissue paper |  |  |
| Synthetic fibre netting mesh |  |  |
| Nuts and bolts with raw al plug and wire 18 gauge  screws with fasteners set of 10 per meter square |  |  |

**Acoustic panelling**

**Table 1.1.1.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any, with complete justification** |
| Acoustic panelling | Wall panelling system to provide excellent acoustical performance in the Fulldome theatre by attaining at least 0.7 NRC. Modular Panels should be of  formaldehyde-free Fibre glass material or Perforated Aluminium Panels with Acoustical Mineral Wool backing with integrated mounting system to fabricated all along the peripheral wall of the Dome theatre below the Dome Horizon from stepped floor to Cove Bottom. Panels should come in modular sizes and should be meet ASTM standards of Surface Burning (Fire), Moisture & Fungus. All panels should be butt joint with good esthetical finish. Colour should be carefully chosen to reduce cross-reflectance from Projection and should be approved before application.   * Total area should be measured before fabrication and prior approval should be obtained.   Preferred Manufacturers: Hunter Douglas, Armstrong, Anutone. |  |  |

**1.1.2 Projector Array**

**Table 1.1.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any , with complete justification** |
| Number of Projectors | Please specify the total number of projectors and their make proposed to be used in the projector array. NB: All Projectors must be of same specifications and from OEM and shall directly project contents on the dome screen. |  |  |
| Projector type | 3 Chip DLP Projectors with multiple NSH Lamp, with ANSI Lumens of 29000 or more and contrast ratio of 1800:1 or better |  |  |
| Projector array comprising multiple projectors | To cover 23 meter dome screen tilted at 23 degree |  |  |
| Total Resolution before and after blending | 53 MP or higher (before blending) and 28 MP or higher (after blending) |  |  |
|  |  |
| Mounting | Projectors are to be mounted on the specially designed structure around the dome periphery. Each mount/cradle shall provide full optical alignment and calibration support along each of the X, Y and Z axes as well as rotation about the horizontal axis. |  |  |

**1.1.3 Projector**

**Table 1.1.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any with complete justification** |
| Display Technology | Three chip DLP |  |  |
| Source : multiple NSH Lamp |  |  |
| Minimum native Resolution | 4096 pixel x 2160, 120 Hz, at minimum 1800: 1 contrast ratio. |  |  |
| Internal Input / Output ports | DVI/HDMI/Display |  |  |
| Input / Output control and networking | RS232, TCP/IP. |  |  |
| Lens Options | Standard Zoom to Wide Angle Zoom to cover the entire screen area as specified (please specify further technical details along with type and OEM of lenses to be used). |  |  |
| Calibration | Support for controlling individual colour and intensity on each colour channel. |  |  |
| Source Life | Minimum 1500 hrs |  |  |
| Operating Hours | The System shall be capable of being used for twelve hours per day 364 days in a year. |  |  |
| Monitoring Parameters | Source life, Fan status, Temperature status, etc. |  |  |
| Noise | < 55 db at 25°C per projector |  |  |
| Accessories | All standard accessories including IR remote, Line cord etc. |  |  |
| OEM | BARCO/Christie/ JVC/NEC /Panasonic/Sony |  |  |
| Warranty | Manufacturer’s standard warranty of not less than five years on projectors. |  |  |

**1.1.4 Blending and Geometry Correction (BG) unit:**

**Table 1.1.4**

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifications** | **Detailed description** | **Compliance (Yes/No)** | **Reasons for deviation, if any with complete justification** |
| Input / Output | DVI in/out |  |  |
| Image Operations | Geometry Correction |  |  |
| Edge Blending |  |  |
| Colour Correction and Matching |  |  |
| Uniformity Correction and Matching |  |  |
| Software for geometric correction shall be incorporated in the system. |
| Software Presets | Software Presets should be available for Switching Brightness of Projectors for 2D & 3D Projection Modes. |  |  |

**1.2 Image Generator Server and Playback System with fulldome and planetarium show software**

|  |  |  |  |
| --- | --- | --- | --- |
| Specifications | Detailed description | Compliance  (Yes/No) | Reasons for deviation, if any with complete justification |
| Image Generators | Nvidia Quadro M5000 graphic cards Nvidia Gsync fully utilized (frame and swap sync) in hardware and software 2x high end Intel Xeon processor per computer (E5-2620 v3 6C HT, 15MB Cache, 2.4GHz) 32GB 2133MHz DDR4 RDIMM ECC RAIDED hard drive for redundancy Solid state Hard drives 256GB system hard drives, 2TB storage hard drives (to store high quality almost lossless Video Windows 8 or higher robust operating system |  |  |
| Media Server Architecture | Fully Genlocked hardware & software. Choice of video codecs from loss less compression to uncompressed. Full control of distortion correction-warp & blend & channel management RAID system to be provided for both backups in case of hard drive failure, and increased disc speed due to parallel input from disc to CPU. |  |  |
| Pre process Data transfer  Rate\* | No jerks, flicker or image tearing should appear on screen. Frame rates up to 60fps per eye in 3D stereo. |  |  |

**Table 1.3 Content creation and software**

|  |  |  |
| --- | --- | --- |
| Detailed description | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Latest version of OEM software with perpetual license for playback of fulldome shows and planetarium shows and with facility to convert large format shows into fulldome shows. |  |  |
| Digital library/cloud access of the planetarium datasets for development of in house planetarium shows. |  |  |
| Interactive Astronomy Simulation tool & Datasets: |  |  |

**1.4 Show control system**

**Table 1.4**

|  |  |  |
| --- | --- | --- |
| Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Table top minimum 12” colour touch panel Communication protocols: RS 232, TCP/IP and IR. On/Off Control: Projector, Lighting, Audio and dimmer control. |  |  |
| Interactive touch screen for controlling DIGITAL IMMERSIVE FULLDOME PROJECTION SYSTEM. |  |  |
| Touch screen controller should be installed along with a table top screen & configured to run the entire digital immersive dome projection system. |  |  |
| The touch screen should have following: Display size: 32 inch (diagonal), Display Resolution: Upto 1920X1080 or better. |  |  |

**1.5 Calibration and Alignment**

**Table 1.5.1**

|  |  |  |  |
| --- | --- | --- | --- |
| Specifications | Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Auto  Alignment and calibration | Software, hardware and camera based mechanisms to be included in order to ensure error free edge blending / geometric correction on screen as well as to maintain uniform colour, brightness and contrast on projectors and dome screen. |  |  |
| Auto alignment and correction system shall be available on table top touch panel through GUI. |  |  |
| Software Preset to manage optimum brightness levels of Projectors in 2D & 3D modes. |

**Table 1.5.2**

|  |  |  |  |
| --- | --- | --- | --- |
| Specifications | Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Tools for Verification  of calibration and alignment | Set of Instruments and software for verification of calibration and alignment parameters at site as per table 1.5.1. |  |  |

**1.6. Integrated Audio System**

**Table 1.6**

|  |  |  |  |
| --- | --- | --- | --- |
| Specifications | Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| 7.1 channel surround audio system | The audio system shall be fully integrated with the show control system. Audio system shall consist of 7 speakers and one dual subwoofers system mounted suitably above the viewing platform or else at suitable locations as may be required. Amplifiers are to be solid state and network controlled. |  |  |
| Front Left/Front Right / Center Speakers | Large Format 12” High Power Cinema Surround.  Power Rating1: 400 Watts continuous pink noise, 1600 Watts peak  Sensitivity (1W/1m)2: 98 dB-SPL half space/ wall mounted  Maximum Peak SPL3: 124 dB/1m  Nominal Impedance: 8 ohms |  |  |
| Surround Speakers with Wall Mount U-Brackets for all Speakers. | Very High Power Cinema Surround Speaker for Digital Applications  Frequency Range (-10 dB): 60 Hz – 19 kHz  Frequency Response (±3 dB): 75 Hz – 17 kHz  Power Rating1: 350 watts continuous pink noise, 1400 watts peak  Nominal Impedance: 8 ohms |  |  |
| Subwoofer. | Dual 460 mm (18 in) Subwoofer System  Rated Impedance: 4 ohms  Minimum Impedance: 3.2 ohms  POWER HANDLING CAPABILITY:  Continuous Pink Noise1: 1200 Watts  Continuous Program2: 2400 Watts  Peak Power3: 4800 Watts |  |  |
| Power Amplifiers for Speakers :-  Center/Front/Surround | Minimum Guaranteed Power, 1 kHz:- 650Watts.Streo,8 ohms(per ch.)  Frequency Response  (At 1 watt into 4 ohms, 20Hz – 20 kHz)  Crosstalk (below rated power, A-weighted)  20 Hz to 1 kHz >70 dB |  |  |
| Power Amplifiers for Subwoofer | Minimum Guaranteed Power, 1 kHz:-  1600 Watts.Bridge-Mono.8 Ohms  Frequency Response  (At 1 watt into 4 ohms, 20Hz – 20 kHz)  Crosstalk (below rated power, A-weighted)  20 Hz to 1 kHz  >70 dB  Input Impedance (nominal) 20 kilohms balanced, 10 kilohms unbalanced |  |  |
| Audio Mixer | 40-input channel  25-bus digital mixing  8 XLR outputs plus 6 additional line in/outputs  32 x 32 channel USB 2.0 audio interface  Motorised Faders |  |  |
| Microphones | The audio system should be integrated with microphones (2 numbers or more). It is to be mounted in the console area and 2 or more numbers wireless collar microphones are to be integrated. |  |  |

**1.7 U.P.S system with parallel redundancy**

**Table 1.7**

|  |  |  |  |
| --- | --- | --- | --- |
| Specifications | Detailed description | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| U.P.S system (True IGBT with parallel redundancy) with 30 minutes backup time | Please provide specifications of the U.P.S system including make and model |  |  |
| Battery bank with suitable rack | Please specify number of SMF batteries with detailed specifications |  |  |

**1.8 Seating Arrangement**

**Table 1.8**

|  |  |  |  |
| --- | --- | --- | --- |
| Specification | Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Reclining chair | 1. Tip-up and back push reclined chair 2. Center to center 20”. 3. ABS molded housing for seat & back cushions 4. All sheet metal parts with powder coated 5. Arm rest in Polyurethane injection moulded. 6. Seat numbering on inner both the side of the chair stands with silicon fluorescent thin stickers. 7. Row number for seat along the aisles. 8. Provision for LED lights on sides along with aisles with the row and the seat numbers display. 9. For Noise Reduction Nylon 66 components on moving parts |  |  |
| Frames | 15 mm thick high pressure steam pressed hard ply wood for seat and the back out of which the back is of 12mm the bent ply. |  |  |
| Fabric | Colour to be approved by Science City authorities. All fabric that shall be used shall be fire retardant. Test certificates shall be submitted |  |  |
| Spring | Spring for tip-up and back push mechanism torsion spring/spring steel IS:44541981 grade III |  |  |
| Sheet-metal components | HRCA/CRCA Sheet metal IS:1079 1994   1. Side stand 3mm (+/- 0.2 mm) thick size: 415 mm(+/-5 mm) x 345 mm (+/-5mm) both side bottom circular cutting with 140 mm radius. 2. 75 mmx25 mm 16g 190 mm length tubular pipe for the leg wielded to the 3 mm plate. 3. Flat for base of the stands 280 mm (+/-2 mm) length 50 mm (+/- 2 mm) x 5 mm (+/-0.2mm). 4. Mechanism components 2 mm HRCA   Back push box 180 mm(+/-2 mm) x 70 mm (+/-2 mm) & height of the box 15 mm(+/-2 mm), ear “L” bracket attached to the box 190 mm (+/-2 mm) x 135 mm (+/-2 mm). With two slot holes for fixing the back. Tip-up box 180 mm (+/-2 mm) x 70 mm (+/-2 mm) & height of the box 15mm (+/-2mm), ear “L” bracket attached to the box 95mm (+/-2mm) x 125 mm (+/-2mm). With two slot holes to fix the seat. |  |  |
| Seat and Back cushion housing | ABS moulded vacuum forming out of 2mm sheet |  |  |

**1.9 A. LED Cove light and staircase lighting**

**Table 1.9 A**

|  |  |  |  |
| --- | --- | --- | --- |
| Specification | Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Cove Light | Beam Angle 120° x 120°  Lumens 7.4  LED Channels Red / Green / Blue  Mixing Distance 2 in (51 mm) to uniform light  Lumen Maintenance† 50,000 hours L50 @ 50° C (full output) |  |  |
| Design | 360° Layout in Aluminium Cove Trough in aesthetical indirect lighting arrangement. Ample amount of LED Modules to be provided to avoid dark zones.  Provision for software programmability of different modes and colour effects along with programmable hardware presets. |  |  |
| Staircase case lighting, Exit signage and Emergency Exit signage | **Step Lighting**: The lighting effect should be created using a fibre optic rod that is end-illuminated with high intensity LEDs with 50,000 hour life expectancy.  The unit should flush with 6mm Carpet  **Entry & Exit Ramps Lighting**: LED wall light should provide 2.2 lux at 1.9m distance when mounted 300mm above floor.  **Seat Row Indicators**: Seat row indicators should be installed to identify the location of seating rows, to provide illumination for guidance (e.g. by emergency exits) or to illuminate the floor for safe movement in fulldome theatre when the main lighting is dimmed. |  |  |

**1.9 B. Active 3D spectacles with storage and sterilization**

|  |  |  |  |
| --- | --- | --- | --- |
| Specification | Detailed description | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Active 3D spectacles | For high-quality images preserved at all seating positions  Automatic power-off function saves energy  Bright images and natural colours  Automatic radio frequency (RF) synchronization, wide reception angle |  |  |
| Sterilization | Machine suitable for sterilization of 3D spectacles working with AC 230 V. |  |  |

* 1. **Brochures & Complete Specifications**

**Table 2.0**

|  |  |  |
| --- | --- | --- |
| Detailed description | Compliance (Yes/No) | **Reasons for deviation, if any** |
| Detailed material specifications along with product catalogue for dome screen preparation. |  |  |
| Insulation of inner surface of outer concrete dome |  |  |
| Acoustic panelling of area below the dome screen |  |  |
| Brochures and specifications for Projectors, Lenses, Mounts, Blending and Geometric Correction Units, Display Management System, etc. |  |  |
| Brochures and specifications for Image generator servers interactive planetarium software, fulldome configurator & playback system and projection systems. |  |  |
| Brochures and specifications for Show Control System. |  |  |
| Brochures and specifications for Calibration and related instruments and software. |  |  |
| Brochures and specifications for Software Elements along with licensing details. |  |  |
| Brochures and specifications for Audio systems. |  |  |
| Brochures and specifications for UPS system with 30 minutes backup. |  |  |
| Engineering drawing (plan, elevation and sectional views wherever necessary for viewer’s gallery and image servers room in pdf and AutoCAD file format), complete solution diagram, connectivity diagram, system deployment and foot print detail, electrical power requirement and location marked diagram/drawings, system cooling requirement (in BTU) with proper layout drawings. |  |  |
| Detailed write-up and specific system solution document explaining the integrated working of offered solution with the hardware and software describing various technical, interface and performance aspects, wiring / network diagram of the proposed solution. This has to explain how the proposed design or solution meets the specifications and overall requirements as mentioned in the tender document. |  |  |
| Schematic diagram and broad material specifications of the structure for mounting the projector array showing suggested location of the projectors including arrangement for accessibility to the projectors for maintenance. |  |  |
| Details and product catalogues of acoustic treatment of inner surface of concrete dome and acoustic panelling below the aluminium dome inside the theatre proposed and with relevant drawings, material specifications etc. |  |  |
| Details and product catalogues of LED Cove light, exit signage and emergency exit signage lightingand staircase lighting scheme. |  |  |
| Details regarding source of content development for planetarium shows using datasets/library of 3D models/cloud assets. |  |  |
| Details and product catalogues of 3D spectacles and storage and sterilization equipment. |  |  |

**3.0 Delivery Schedule**

|  |  |  |
| --- | --- | --- |
| Time Schedule | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| The entire work shall be completed within nine months from the date of placement of order or opening of Letter of Credit. |  |  |

**4.0 Warranty and AMC:**

|  |  |  |
| --- | --- | --- |
| Description | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| The Onsite comprehensive Warranty period is for five years from the date of issue of acceptance certificate by NCSM |  |  |
| The non comprehensive annual maintenance contract will be for a period of two years, after expiry of the warranty period. |  |  |

**5.0 Operation of 2D/3D fulldome planetarium and film shows**:

|  |  |  |
| --- | --- | --- |
| Description | Compliance  (Yes/No) | **Reasons for deviation, if any with complete justification** |
| Operation of full dome shows from 11:00 a.m to 7:00 p.m for the visitors of Science City. This timing may vary during the peak season. The show shall remain operational for 364 days in a year (and 365 days in a leap year). Sterilization, cleaning and distribution of Active 3D spectacles to the visitors shall be under the scope of the successful bidder. |  |  |

**ANNEXURE-D**

**PROFORMA FOR ISSUING “UNDERTAKING BY ORIGINAL SYSTEM INTEGRATOR”**

**(To be submitted in OEM’s Letterhead)**

Dated:

**To**

**The National Council of Science Museums,**

**Block-GN, Sector-V, Bidhannagar,**

**Kolkata : 700 091.**

Dear Sir,

We, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hereby state that the product offered vide this tender by our authorized agent, M/s. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and to be supplied if found suitable and selected shall be our original equipment and is to be deemed as if the supply has been made by us directly.

Accordingly, we stand by all the terms, conditions and stipulations as defined in tender I/18012/7/16(45)of National Council of Science Museums.

We also undertake to directly make good of any shortcomings either in product quality and/or in services which my/our authorized agent may fail to fulfil as a part of his obligations under the terms & conditions of this tender.

Thanking you,

Yours faithfully,

(Authorised Signatory with Seal).

**ANNEXURE – I**

**Cost Break-up**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.**  **No.** | **Description** | **Quantity/Unit cost as may be applicable** | **Rate** | **Amount** | **Applicable Taxes**  **(with break-up)** | **Total Amount** |
| **1** | 1. **Dismantling and stacking of existing space theatre equipment, chairs and carpet etc.** |  |  |  |  |  |
|  | 1. **Assembling and installation of GSS Helios planetarium system within Space Odyssey building.** |  |  |  |  |  |
|  | 1. **Dismantling and stacking of existing dome along with steel structure, all installed insulation, equipment etc. including cost of scaffolding, labour etc.** |  |  |  |  |  |
| **2.** | **Supply and installation of Projection Dome Screen including all associated structures and including cost of scaffolding, labour etc** |  |  |  |  |  |
| **3a** | **Supply and installation of Dome Insulation of inner wall of outer concrete dome.** |  |  |  |  |  |
| **3b** | **Acoustic panelling below the dome screen.** |  |  |  |  |  |
| **4.** | **Supply, installation, testing and commissioning (SITC) of Projector Array with geometric correction and image blending for seamless projection.** |  |  |  |  |  |
| **5.** | **SITC of Image Generator Server networked with Image generator workstations.** |  |  |  |  |  |
| **6.** | **SITC of Interactive planetarium and fulldome configurator and playback software** |  |  |  |  |  |
| **7.** | **SITC of Show control system** |  |  |  |  |  |
| **8.** | **SITC of Automatic Calibration and alignment system** |  |  |  |  |  |
| **9.** | **SITC of Integrated 7.1 surround sound system** |  |  |  |  |  |
| **10.** | **SITC of U.P.S system with parallel redundancy with 30 minutes backup including electrical panel for distribution of power to the installed equipment.** |  |  |  |  |  |
| **11.** | **Seating Arrangement**   1. **Supply, fabrication and installation of tubular structure for new seating layout with enhanced leg space and covering the structure with 32 mm plywood (marine grade, water proof, termite resistant and fire retardant) with all required fasteners and structural materials for complete finished floor suitable for installation of chairs and laying of carpet.** |  |  |  |  |  |
|  | 1. **Supply and installation of 360 chairs as per approved layout.** |  |  |  |  |  |
| **12.** | **SITC of LED Cove light, staircase lighting, exit and emergency exit signage etc.** |  |  |  |  |  |
| **13.** | **Supply of Active 3D spectacles (1000 nos.) along with supply and installation of storage and sterilization equipment.** |  |  |  |  |  |
| **14.** | **Training on FULLDOME PROJECTION SYSTEM** |  |  |  |  |  |
| **15.** | **Any other items of work/equipment etc. not covered above, under Sl. No. 1 to 14 but required as per scope of work provided.**  *(add additional rows as may be required)* |  |  |  |  |  |

**Important Notes:**

1. The bidders shall along with Annexure I submit in their letterhead a detailed list of deliverables along with cost break-up of each item, break-up of taxes considered while arriving at the gross value of each item as per the following format.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Description of item** | **Base rate**  **(INR/USD/EURO )** | **Quantity** | **Total amount** | **Details of taxes and duties included with clear break-up of each tax considered** | **Any other cost with details** | **TOTAL**  **(INR/USD/EURO)** |

1. The bidders may note that while arriving at the total cost, NCSM shall consider the total cost of initial installation and subsequent cost of operations and maintenance for a period of seven years to decide on the lowest bidder.
2. The bidders shall consider the prevailing tax rates while quoting the rates. However, in the event of any changes in the statutory taxes and duties, the rates applicable at the time of payment shall be made by NCSM against submission of supporting documentary evidence.
3. **Cost/ information of the following items may also be provided**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No.** | **Item description** | **License fee for one year lease** | **License fee for five year lease** | **License fee for perpetual lease** |
| **1.** | **List of available 2D/3D fulldome shows with time duration of each on topics related to science, technology, environment etc**. **suitable for screening after completion of this facility with charges for yearly/5 yearly/perpetual lease.** |  |  |  |
| 1. **2D/3D Fulldome Planetarium shows** |  |  |  |
| 1. **2D/3D Fulldome shows** |  |  |  |
| 1. **Large format converted 2D/3D live shows**     **( Attach extra sheet if required)** |  |  |  |
| **2.** | **Shelf-life time of the Digital immersive fulldome 2D/3D projection system (i.e. up to which period technical support as well as spare parts including consumables shall be available with the firm).** |  | | |
|  |  |  | | |