



ALL INDIA INSTITUTE OF MEDICAL SCIENCES, PATNA
(An Autonomous body under MoHFW, Govt. of India)

EOI-DOCUMENT
(Through e-Procurement portal)

“EXPRESSION OF INTEREST (EOI)”

Expression of Interest (EOI) for Engagement of Eligible and Experienced Architectural Consultancy Firms for Providing Comprehensive Architectural Planning, Designing, and Preparation of Master Plan including Design for Mechanical, Electrical and Plumbing (MEP) Systems, Designing for Retrofitting, Preparation of Execution Plan covering Detailed Specifications of Materials required/to be used for Construction of BSL-3 Laboratory and Equipment for the BSL-3 Lab and all allied architectural services required for setting up, validation and certification of BSL-3 Laboratory, Preparation of Detailed Project Report (DPR) with Bill of Quantities (BoQ) etc. for Establishment of this Biosafety Level-3 (BSL-3) Laboratory at AIIMS, Patna.

EXPRESSION OF INTEREST (EOI)

FOR

PROVIDING ARCHITECTURAL CONSULTANCY SERVICES FOR BSL-3 LAB ESTABLISHMENT AT AIIMS PATNA

SYNOPSIS OF EOI DOCUMENT

Document Detail	Information
Issuing Authority	The Executive Director, AIIMS Patna through Dean Research, AIIMS Patna
Document Type	Expression of Interest (EOI)
Procurement Mode	Two-Stage: EOI followed by RFP
Lab Model	BSL-3, Lab-in-Lab (Fit-out within existing dedicated building)
Regulatory Framework (Mandatory)	DBT-ICMR National Guidelines for BSL-3 Laboratory, 2024 (as updated from time to time)
EOI Reference No.	AIIMSP/BSL3/ARCH/EOI/2026
Title	EOI for Engagement of Architectural Consultancy Firms for establishment of the BSL-3 Laboratory at AIIMS Patna

A. DISCLAIMER

- (a) The information contained in this EoI document, or provided subsequently to EoI Applicants in any form by or on behalf of Executive Director (hereinafter referred to as the “Competent Authority”), its employees, or advisors, is subject to the terms and conditions specified in this EoI document and any other conditions under which such information is provided.
- (b) Whilst the information in this document has been prepared in good faith and contains general information in respect of the required Architectural Services for BSL-3 lab establishment at AIIMS Patna, the EoI document is not and does not purport to contain all the information which the EoI-applicant may require for the services.
- (c) Neither the Authority nor any of its officers, employees, advisers, or consultants shall be liable or responsible for the accuracy, reasonableness, or completeness of the information provided, or for any errors, omissions, or incorrect statements, whether negligent or otherwise, in relation to the Architectural Services for establishment of the BSL-3 laboratory at AIIMS Patna. No representation or warranty, express or implied, is made regarding the information contained in this EoI document, the basis on which it is prepared, or any written or oral information provided or to be provided to the recipients or their advisers. All such liability is hereby expressly disclaimed.
- (d) This Expression of Interest (EoI) document is issued solely for the purpose of inviting responses from interested and eligible parties. It does not constitute an agreement, offer, or invitation by the Competent Authority or its representatives to the prospective applicants or any other person. The purpose of this document is to provide interested parties with information to assist the formulation of their Proposal. The information contained in this document is selective and is subject to updating, expansion, revision, and amendment. Each recipient must conduct its own analysis of the information contained in this document or to correct any inaccuracies therein that may be in this document and is advised to carry out its own investigation for required services, the legislative and regulatory regime (as updated from time to time) which applies thereto and by and all matters pertinent to the required services and to seek its own professional advice on the legal, financial, regulatory and taxation consequences of entering into any agreement or arrangement relating to required Architectural Services for BSL-3 lab establishment at AIIMS Patna.
- (e) This document includes certain statements, estimates (wherever applicable), and targets with respect to the required Architectural Services for BSL-3 lab establishment at AIIMS Patna. Such statements, estimates and targets reflect various assumptions made by the management, officers, and employees of the AIIMS Patna, which

assumptions (and the base information on which they are made) may or may not prove to be correct. No representation or warranty is given as to the reasonableness of forecasts or the assumptions on which they may be based and nothing in this document is, or should be relied on as, a promise, representation, or warranty.

- (f)** This document and the information contained herein are intended solely for entities applying to provide Architectural Services for the establishment of the BSL-3 laboratory at AIIMS Patna. It shall not be copied, distributed to any third party, or used, in whole or in part, by the EoI Applicant or any other person for any purpose other than submission of an application under this EoI.
- (g)** AIIMS Patna, its employees and advisors make no representation or warranty and shall have no liability to any person, including any EoI-applicant under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this documents or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the document and any assessment, assumption, statement or information contained therein or deemed to form part of this document or arising in any way for participation in this EoI process.
- (h)** AIIMS Patna also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any EoI-applicant upon the statements contained in this document.
- (i)** AIIMS Patna may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this documents.
- (j)** The issuance of this Expression of Interest (EoI) does not imply that AIIMS Patna is bound to shortlist or select any EoI applicant for participation in any subsequent Request for Proposal (RFP) process. AIIMS Patna reserves the right to initiate a fresh, open RFP process, which may be open to all eligible bidders, including those who have not participated in this EoI, subject to the approval of Competent Authority. Further, AIIMS Patna reserves the right to reject any or all EoI applications or bids at any stage without assigning any reason whatsoever.
- (k)** The EoI-applicant shall bear all its costs associated with or relating to the preparation and submission of its application including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the AIIMS Patna or any other costs incurred in connection with or relating to its application. All such costs and expenses shall remain with the EoI-applicant and the AIIMS Patna shall not be liable in

any manner whatsoever for the same or for any other costs or other expenses incurred by a EoI-applicant in preparation or submission of the application, regardless of the conduct or outcome of the EoI process.

- (l)** Any information or documents, whether contained in this EoI or subsequently provided to any EoI applicant or Selected Applicant, as well as any information relating to the EoI process, shall be treated as confidential. Such information shall not be disclosed, published, or made available to any third party where such disclosure is prejudicial to, detrimental to, or may endanger the planning, procurement, or implementation of the Architectural Services or otherwise for establishment of the BSL-3 Laboratory at AIIMS Patna. Accordingly, such information shall not be treated as public information or documents.
- (m)** AIIMS Patna shall have the unrestricted right to use, reproduce, adapt, modify, and incorporate, in whole or in part, any information, concepts, methodologies, or inputs submitted by the EoI Applicant(s) in response to this EoI, for the purpose of this or any subsequent procurement process, including preparation of the RFP and related documents, without any obligation, compensation, or attribution to the EoI Applicant(s). The submission of an EoI shall be deemed as unconditional consent by the EoI Applicant(s) to such use, and no EoI Applicant shall raise any claim, objection, or dispute in this regard.
- (n)** AIIMS Patna reserves the right to modify, amend, add, or delete the eligibility and qualification criteria at the RFP stage, based on inputs received during the EoI process and project requirements, without any obligation to assign reasons.

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The Dean (Research)
For The Executive Director,
AIIMS Patna

B. INDEX

The EoI-Applicant are advised to go through the following sections carefully before filling up the EoI application.

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C.ACRONYMS

Table-1

Acronym	Full Form	Acronym	Full Form
ACPH	Air Changes Per Hour	IBSC	Institutional Biosafety Committee
ACR	Air Change Rate	ICAR	Indian Council of Agricultural Research
AIIMS	All India Institute of Medical Sciences, Patna	ICMR	Indian Council of Medical Research
AMC	Annual Maintenance Contract	IEC	International Electrotechnical Commission
BAS	Building Automation System	ISO	International Organization for Standardization
BC	Biological Containment	ISO 20387	Biotechnology – Biobanking
BIBO	Bag-In-Bag-Out	ISO/IEC 15189	Medical laboratories – Requirements for quality and competence
BIM	Building Information Modelling	ISO/IEC 17025	Testing and calibration laboratories – General requirements
BMS	Building Management System	JV	Joint Venture
BSC	Biosafety Cabinet	LAN	Local Area Network
BSL-3	Biosafety Level-3	LOD	Level of Development (BIM)
CCTV	Closed-Circuit Television	MEP	Mechanical, Electrical and Plumbing
CDC	Centers for Disease Control and Prevention	MoEF&CC	Ministry of Environment, Forest and Climate Change
CFD	Computational Fluid Dynamics	NSF/ANSI 49	Biosafety Cabinet Standard
CPCB	Central Pollution Control Board	PERT	Project Evaluation and Review Technique
CPPP	Central Public Procurement Portal	PLC	Programmable Logic Controller
DBT	Department of Biotechnology	PPE	Personal Protective Equipment
DDC	Direct Digital Control	QA	Quality Assurance
DG	Diesel Generator	RCGM	Review Committee on Genetic Manipulation
DPR	Detailed Project Report	RFP	Request for Proposals

EoI: Engagement of Architectural Consultancy Firms

Acronym	Full Form	Acronym	Full Form
DPIIT	Department for Promotion of Industry and Internal Trade	rDNA	Recombinant DNA
DST	Department of Science and Technology	RG	Risk Group
ECBC	Energy Conservation Building Code	SOPs	Standard Operating Procedures
EOI	Expression of Interest	SS-304	Stainless Steel Grade 304
EPA	Environment (Protection) Act	TIA	Tender Inviting Authority
ETP	Effluent Treatment Plant	TOR	Terms of Reference
GE	Genetically Engineered	ULPA	Ultra-Low Particulate Air
GEAC	Genetic Engineering Appraisal Committee	UPS	Uninterrupted Power Supply
GFR	General Financial Rules	URS	User Requirement Specification
HEPA	High-Efficiency Particulate Air	VAV	Variable Air Volume
HVAC	Heating, Ventilation and Air Conditioning	VFD	Variable Frequency Drive
IQ/OQ/PQ	Installation Qualification (IQ), Operational Qualification (OQ), and Performance Qualification (PQ).	WHO	World Health Organization
IATA	International Air Transport Association	-	-

D. STRUCTURE OF THIS EoI DOCUMENT

- (i) This EoI document provides the relevant information and instructions to assist the prospective EoI-Applicants in preparing and submitting respective EoI. It also includes the mode and procedure for receipt and opening of EoI applications received through this EoI process. The EoI document consists of the following parts:-

Part I: EOI process-

- (i) Section I: Expression of Interest (EOI)

Part II: Terms of Reference-

- (i) Section II: Project Background
- (ii) Section III: Guidelines and Framework
- (iii) Section IV: Design Philosophy
- (iv) Section V: Design Scope and Objective
- (v) Section VI: Schedule of Services & Compliances
- (vi) Section-VII: Provisions & Safeguards
- (vii) Section-VIII: Design Inclusions
- (viii) Section-IX: Overview of Existing Building
- (ix) Section-X: List of Equipment
- (x) Section-XI: Laboratory Activities
- (xi) Section-XII: Invitation statement

Part III: EOI submission formats-

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ANNEXURE	PARTICULARS
A	EOI Covering Letter
B	EoI-Applicant Information
C	Eligibility Declarations
D	Qualification Criteria – Compliance Sheet
E	Performance Capability Statement
F	Financial Capability Statements Self-Declaration
G	Average Annual Turnover Self-Declaration
H	Checklist for EOI Applicant
I	Authorization to Attend Pre-EOI Conference
J	Self-Declaration of Details of Proposed Key Personnel
K	Project Timeline Schedule
L	Indicative Construction Phase Work Schedule
M	Design Approach and Compliance Methodology
N	Design Deviation and Optimisation Statement
O	Write-up for BSL-3 Proposed Design
P	Proposed Payment Milestone
Q	Design Timeline Schedule

PART-I

EOI PROCESS

Section I
Expression of Interest (EOI)

1. Invitation:

- (i) The Executive Director, through the Dean Research of AIIMS Patna (All India Institute of Medical Sciences, Patna invites Expression of Interest (hereinafter referred to as 'EoI') from **Eligible and Experienced Architectural Consultancy Firms for Providing Comprehensive Architectural Planning, Designing, and Preparation of Master Plan including Design for Mechanical, Electrical and Plumbing (MEP) Systems, Designing for Retrofitting, Preparation of Execution Plan covering Detailed Specifications of Materials required/to be used for Construction of BSL-3 Laboratory and Equipment for the BSL-3 Lab and all allied architectural services required for setting up, validation and certification of BSL-3 Laboratory, Preparation of Detailed Project Report (DPR) with Bill of Quantities (BoQ) etc. for Establishment of this Biosafety Level-3 (BSL-3) Laboratory at AIIMS, Patna** (hereinafter referred to as 'the architectural Services/architectural consultancy services). And, mentioned in Part II (Terms of Reference) of this EoI, which shall be deemed to form an integral part of the indicative scope of the required Architectural Services.
- (ii) Interested applicants should provide sufficient, relevant and required information demonstrating that they meet the specified eligibility criteria with the required qualifications to be shortlisted for providing the Services. This Expression of Interest (EoI) document (Reference No. AIIMSP/BSL3/ARCH/EOI/2026) outlines the EoI process leading to the subsequent Request for Proposal (RFP) stage. Accordingly, a Request for Proposals (RFP) for selecting the architectural consultancy firm, shall be subsequently issued. **AIIMS Patna reserves the right to use, modify and standardised all technical, financial and methodological inputs received through this EoI for preparation of the tender document, without any obligation to the applicant.**

2. Governing Language and Law

- (i) The EoI submitted by the EoI-Applicant and all subsequent correspondences and documents relating to the EoI exchanged between the EoI-Applicant and AIIMS Patna shall be written in English (the 'EoI Language'). Any printed literature furnished by an EoI-Applicant in any other language must be accompanied by a certified English translation. For interpretation, the English translation shall prevail.

EoI: Engagement of Architectural Consultancy Firms

(ii) The EOI process shall be subject to the laws of the Union of India and the exclusive jurisdiction of courts at Patna only.

3. **EoI data sheet:** Information and variable parameters related to this EOI process are mentioned below.

Table-3

a) Basic EOI Details			
<i>EoI Reference Number</i>	AIIMSP/BSL3/AR CH/EoI/2026	<i>Tender ID</i>	As per Portal
<i>Tender Type</i>	Expression of Interest	<i>Tender Category</i>	As per Portal
<i>No. of Covers</i>	Single Cover	<i>Product Category</i>	As per Portal
<i>Authority on whose behalf EOI is invited</i>	The Executive Director, AIIMS Patna	<i>Procuring Entity</i>	AIIMS Patna
<i>Through</i>	The Dean (Research), AIIMS Patna	<i>Address</i>	AIIMS Patna, Phulwarisharif, Patna-801507
<i>Email ID for necessary correspondence w.r.t. this EoI</i>	Email: bsl3@aiimspatna.org		
b) Critical Dates			
<i>Published Date</i>	As per CPPP	<i>EoI validity (days from the date of EoI opening)</i>	270 days
<i>Document download start date & time</i>	As per CPPP	<i>Document download end date & time</i>	As per CPPP
<i>Clarification start date & time</i>	As per CPPP	<i>Clarification end date & time</i>	As per CPPP
<i>EOI submission start date & time</i>	As per CPPP	<i>EOI submission closing date & time</i>	As per CPPP
<i>EOI opening date & time</i>	As per CPPP		
c) Permissible Categories of Applicants			
<i>Nature of EoI-Applicant</i>	Proprietorship Firm / Partnership / Limited Liability Partnership (LLP) / Company / Society / Joint Venture		

	(JV)/ Government Organizations, including Public Sector Undertakings (PSUs), Autonomous Bodies, and Government-owned or controlled institutions, are permitted to participate as EoI Applicants. Note: Unregistered Joint Ventures shall not be permitted to participate in this EoI. Only duly registered Joint Ventures, constituted as a legal entity under applicable law, shall be eligible to apply. Documentary evidence of such registration shall be submitted along with the EoI.
<i>Essential JV parameters</i>	Maximum No of JV Members: 2 (Two) Note: Details are mentioned subsequently in the EoI document.
d) Obtaining the EoI document and clarifications	
<i>eProcurement Portal</i>	https://eprocure.gov.in/eprocure/app
<i>Help Desk</i>	0120-4001 002; 0120-4001 005; 0120-6277 787 or support-eproc@nic.in
<i>Procuring entity website</i>	https://aiimspatna.edu.in/tender/
<i>Cost of EoI document (INR)</i>	Nil
Office/Contact Person (For reference)/ email for clarifications	(i) Dr. Binod Kumar Pati, Professor, AIIMS Patna (ii) Dr. Pallam Gopichand, Asst. Prof., AIIMS Patna Email: bsl3@aiimspatna.org
e) Pre-EoI Conference	
<i>Is a Pre-EoI Conference proposed to be held?</i>	Yes
<i>Place, time, and date of the Pre-EoI Conference</i>	As given on CPPP
<i>Place, time, and date before which WRITTEN QUERIES for the Pre-EoI conference must be received</i>	Queries must be submitted by email at least 48 (forty-eight) hours prior to the scheduled date and time of the Pre-EoI Conference. (Email: bsl3@aiimspatna.org)
<i>Provision for Online Pre-EoI Conference</i>	Yes , available upon request from applicants through email.
<i>Place, time, and date before which WRITTEN REQUEST for the Online Pre-EoI conference must be received</i>	Applicants shall submit participation requests to email ID bsl3@aiimspatna.org at least 24 (Twenty four) hours prior to the scheduled date and time of the meeting.
<i>Place, time, and date before which request for attending</i>	Applicants intending to participate in the offline Pre-EoI Conference shall submit their request for attending the pre-EoI conference in writing through email at least 48 (forty-eight) hours

<i>the offline Pre-EOI conference must be received</i>		prior to the scheduled date and time of the meeting. (Email: bsl3@aaimspatna.org)	
f) Preparation, submission and opening of EoI			
<i>EoI to be Addressed to</i>	The Executive Director, AIIMS Patna, through The Dean Research, AIIMS Patna		
<i>Instructions for Online EoI Submission</i>	Refer to: https://etenders.gov.in/eprocure/app?page=HelpForContractors&services=page		
<i>Language of Submission</i>	English	EoI Validity	270 days from EoI opening date
<i>EoI Opening Place</i>	On e-procurement portal(s) mentioned above		
g) About RFP that would follow			
RFP to be issued	Limited to shortlisted EoI-Applicants from this EoI or Open as deemed by Competent Authority, AIIMS Patna	Annexure of Contract from RFP	[Yes – shall be detailed in the RFP]
Selection Method	Preferably QCBS or otherwise as decided by the Competent Authority	Bid Security Requirements	[Yes – shall be detailed in the RFP]
Performance Security	[Yes – shall be detailed in the RFP]	Other Conditions	Detailed terms and conditions will be provided in the RFP

4. Qualification/Eligibility Criteria:

EoI-Applicants must meet the following eligibility/qualification criteria as of the date of their EoI submission and must continue to meet these until the subsequent RFP process.

- (i) The EoI Applicant shall be a Proprietorship Firm /Partnership Firm / Limited Liability Partnership (LLP) /Company/ Society, duly registered or formed under the applicable laws in India, or a Government Organization, including Public Sector Undertakings (PSUs)/ Autonomous Bodies/ and Government-owned/ controlled institutions, or a duly registered Joint Venture (JV) constituted as a legal entity under applicable laws in India.
- (ii) The applicant should have valid registrations regarding GSTIN, PAN, EPF, ESI, applicable Labour Law registrations, or equivalent registration certificate (as applicable) issued by the concerned authority/government as applicable to the subject Services. The same shall be applicable for JV also.
- (iii) The Applicant shall ensure that all key personnel proposed for the assignment possess the requisite educational qualifications, professional experience, and relevant registrations or certifications, wherever applicable under prevailing laws and regulations. In addition to the above, the firm's 'Lead Architect' shall be registered with the Council of Architecture (CoA), India as amended and applicable, a declaration to this effect shall be submitted in the prescribed format provided in the Annexure. The original documentary evidence of the same may be required to be produced at the RFP stage. Other domain experts as required for this project shall & must possess relevant qualifications with experience, and professional memberships/certifications, as and where applicable.
- (iv) The Applicant shall not be insolvent, bankrupt, or under liquidation or receivership, nor be in the process of being wound up, nor have its affairs administered by a court or judicial authority, nor have its business activities suspended, nor be subject to any legal proceedings relating to the foregoing or otherwise.
- (v) The Applicant, including its affiliates and subsidiaries, shall not, as on the date of submission of the EoI:
 - (a) Stand declared ineligible/ blacklisted/ banned/ debarred by the Procuring Organisation or its Ministry/ Department or as the case may be from participation in its procurement processes; and/ or
 - (b) Convicted (within three years preceding the last date of EOI submission) or stand declared ineligible/ suspended/ blacklisted/ banned/ debarred by appropriate agencies of the Government of

India from participation in procurement processes of all its entities, for:

- A. offences involving moral turpitude in business dealings under the Prevention of Corruption Act, 1988 or any other law; and/or
 - B. offences under the Indian Penal Code/Bharatiya Nyaya Sanhita, 2023 (BNS), or any other law for causing any loss of life/ limbs/ property or endangering Public Health during the execution of a public procurement contract/ or any other similar contract; and/ or
 - C. Suspected to be or of doubtful loyalty to the Country or a National Security risk as determined by appropriate agencies of the Government of India.
- (c) Not have changed its name or created a new “Allied Entity”, consequent to having declared ineligible/ suspended/ blacklisted/ banned/ debarred as above.
- (vi) Not have any association- as an EoI-Applicant/ partner/ director/ employee in any capacity:
- (a) With a retired employee of Gazetted rank of the Central or State Government or its Public Sector Undertakings, who has not completed the prescribed cooling-off period of one (1) year (or such other period as stipulated by the concerned employer) from the date of retirement; provided that this restriction shall not apply where such person has obtained a valid waiver of the cooling-off period from their former organisation.
 - (b) Whether direct or indirect, with the near relatives of any officer/official of AIIMS Patna who is involved, or is likely to be involved, in any stage of this procurement process, including preparation, evaluation, approval, or implementation.
- (vii) Not have a conflict of interest as defined in the EoI document, which substantially affects fair competition. No attempt should be made to induce any other EoI-Applicant to submit or not to submit an EOI to restrict competition as per applicable Competition commission of India guidelines.
- (viii)*The EoI Applicant shall have successfully completed, during the last seven (7) financial years, either:
- (a) At least two (02) architectural consultancy assignments/services involving architectural design of BSL-3/ABSL-3 laboratory facilities (including modular or mobile laboratories);
- OR**
- (b) At least one (01) architectural consultancy assignments/services involving architectural design of BSL-4/ABSL-4 laboratory facilities (including dedicated building BSL-4/ABSL-4 laboratories).

Accordingly, the above Services must have been executed **either**:

- in Government Departments/Autonomous Bodies/Research Institutions (such as CSIR, ICAR, ICMR, DAE, DRDO, DST, DBT, IITs, etc.),

OR

- in reputed private organizations having an average annual turnover of not less than ₹250 Crore. **(Annexure-C)**.

Note: (i) Experience from ongoing projects shall not be considered for evaluation. However, projects may be considered where architectural design deliverables have been fully completed and the project has progressed to the physical construction stage. In such cases, it is mandatory to submit a performance and completion certificate for the design services, duly issued by the client (service recipient), along with the EoI submission.

(ii) During the RFP stage, experience certificates for completed assignments may be required to substantiate the Applicant's qualifications. Such certificates, whether issued by public sector entities, publicly listed companies, or private companies, must be signed by an authorized representative of the issuing organization. The certificate shall be accompanied by documentary evidence of the signatory's authorization from the Management. A certificate from a private individual shall not be accepted. In case of experience from reputed private companies, the certificates shall be acceptable only from publicly listed companies/private companies with an annual turnover of Rs 250 crore and above.

(ix) The Applicant shall have a positive Net Worth in each of the last three (3) financial years preceding the EoI submission due date. **(Annexure-F Financial Capability Statements Self-Declaration)**.

In case the Applicant is a Joint Venture, each Member (including the Lead Member) shall have a positive Net Worth in each of the last three (3) financial years preceding the EoI submission due date.

(x) *Average Annual Turnover: The Bidder shall submit a self-declaration (Average Annual Turnover Self-Declaration) of its average annual turnover derived exclusively from Architectural Services for the last three (3) financial years within the period FY 2022-23 to FY 2024-25. Such declaration shall be furnished on the Bidder's letterhead and duly signed by an authorized signatory **(Annexure-G)**. The Authority reserves the right to seek supporting documents, including audited financial statements or client-wise revenue details, at any stage of the RFP/EoI process for the purpose of verification.

- (xi) The EoI Applicant shall provide the names and proposed key personnel with positions/designation intended for the assignment, along with a brief profile indicating their general qualifications and experience (**Annexure-J**). The detailed qualification criteria, experience requirements, and evaluation methodology (as finalized in subsequent process) for Key Personnel shall be required & specified at the RFP stage, wherein shortlisted Applicants shall be required to submit complete details and supporting documents for evaluation. The Applicant shall also submit an undertaking confirming that the proposed personnel possess relevant qualifications and experience suitable for the assignment, and any misrepresentation or failure to substantiate such claims at the RFP stage may result in rejection of the Proposal.
- (xii) **References and client testimonials:** The firm should provide references from previous clients (institution names, contacts including Email ID, and details of projects completed) that can be contacted to verify the quality of work, adherence to timelines, and ability to work within budget constraints.
- (xiii) **Case studies and technical documentation:** The firm should provide detailed case studies of previous BSL-3 projects, including: (a) Project description and scope; (b) Design approach and philosophy; (c) Technical innovations and features; (d) Construction timeline and final elements; (e) Commissioning, validation and certification results.
- (xiv) The EoI-Applicant shall mandatorily submit a detailed Project Timeline Schedule in the prescribed format at Annexure-K, clearly indicating the proposed phases/activities, associated deliverables, and timelines for execution of the assignment.
- (xv) The Applicant shall demonstrate availability of computer-aided design (CAD) systems (such as AutoCAD or equivalent), Building Information Modelling (BIM) capability, and analytical tools for simulation and performance assessment (including, where applicable, Computational Fluid Dynamics (CFD) analysis), or access to the same through in-house arrangements or formally established associations.

The EoI-Applicant shall submit details of such infrastructure, software, and technical resources, including their deployment in similar assignments, to establish their capability to deliver the required services.

Lack of adequate infrastructure and technical capability shall render the application liable to be treated as non-responsive.

- (xvi) The EoI-Applicant may submit any additional documents, information, or credentials which, in its opinion, are relevant to demonstrate its eligibility, technical capability, and suitability for undertaking the proposed assignment.

Note:-

- (i) ***The applicant must submit copies of all relevant documents only in accordance with EoI requirements, duly self-attested & seal along with application wherein the format provided herewith.***
- (ii) ***AIIMS Patna reserves the right to call or not to call again, subsequent to the submission of the EoI application and opening of the EoI, for any documents which is not in the format/unclear. Any decision in this regard is subject to the approval of Competent Authority.***
- (iii) ****- There shall be no exemption or relaxation in respect of prior turnover or prior experience at any stage of this BSL-3 establishment at AIIMS Patna for MSMEs or Start-ups, considering the critical nature of the services involved in public health. This is in accordance with the Department of Expenditure, Government of India Office Memorandum No. F.20/2/2014-PPD(Pt.) dated 20th September 2016.***

5. Conditions for EoI-applicants from restricted countries:

- (i) **Restrictions based on reciprocity-** Entities from countries as not allowing Indian companies to participate in their Government procurement shall not be allowed to participate (directly or as a sub-contractor or as a member of a JV) on a reciprocal basis in this EoI process under the “Public Procurement (Preference to Make in India) Order 2017” (MII – para 10 -d) of Department for Promotion of Industry and Internal Trade, (DPIIT). EoI-applicants must apprise themselves of the latest version of this order.
- (ii) **Restrictions based on land borders-** Order issued by the Government of India (Ministry of Finance Department of Expenditure Public Procurement Division) restricting procurement from EoI-Applicants from certain countries that share a land border with India shall apply to this EoI. EoI-Applicants must apprise themselves of the latest version of this order.

Any EoI-Applicant from a country that shares a land border with India, excluding countries to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects (as listed on the website of the Ministry of External Affairs), – hereinafter called ‘Restricted Countries’ shall be eligible to participate in

this EOI, only if the EoI-Applicant is registered with the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). An undertaking is to be furnished with this effect.

6. Restriction on sub-EoI-applicants/sub-contracting:

- (i) Sub-contracting or engagement of Sub-EoI Applicants shall not be permitted under this EoI or the subsequent RFP process. The Applicant shall be solely responsible for the execution of the entire scope of services and shall not assign, transfer, sublet, or otherwise delegate, in whole or in part, any of its obligations to any third party. No third party shall be permitted to participate in the EoI, either directly or indirectly, in the capacity of a sub-consultant, associate, or through any other arrangement. Any violation of this provision shall render the EoI liable for rejection as non-responsive, and if detected at any later stage, may lead to termination of the contract and other actions as deemed appropriate by AIIMS Patna.

7. Essential conditions for Joint Venture (JV):

- (i) In cases where the EoI Applicant is a Joint Venture (JV), such JV shall consist only of entities in the form of firms or companies (including Partnership Firms, Limited Liability Partnerships, or Companies) who are engaged in High containment Lab designing architectural consultancy services, duly registered or incorporated under applicable laws in India (hereinafter referred to as 'JV'), and shall comply with the following conditions:
 - (a) Members should not be more than two (02).
 - (b) The Lead member must have at least 51% participation.
 - (c) The other member, who shall have a minimum participation of thirty percent (30%) in the Joint Venture, will be considered a substantial member.
 - (d) In case the Applicant is a Joint Venture, the participation of the member other than the Lead Member shall not be less than thirty percent (30%). Any Joint Venture not complying with this requirement shall be treated as non-responsive.
- (ii) The participation share of each member in the Joint Venture shall strictly commensurate with its assigned scope of work, technical responsibility, and financial entitlement, and shall be clearly defined in the JV Agreement. Any disproportionate, artificial, or token participation without corresponding responsibility shall render the application liable for rejection.
- (iii) The JV Agreement shall mandatorily provide for detailed scope allocation, fee/consideration distribution aligned with participation share, and a clear responsibility matrix covering design, coordination, compliance, and

deliverables. Failure to establish a clear linkage between participation, scope, and fee shall render the application non-responsive.

- (iv) All payments under the contract shall be made to a single bank account in the name of the Joint Venture. Internal distribution of payments shall be in proportion to the declared participation share, unless otherwise expressly approved by AIIMS Patna.
- (v) The JV members shall submit a binding undertaking confirming that the declared participation reflects actual involvement that no side agreement exists altering the financial or technical arrangement, that no member shall receive consideration disproportionate to its participation share, and that the declared JV structure shall be maintained throughout the contract period.
- (vi) The Lead Member shall not assign, transfer, sub-contract, or otherwise delegate the core design responsibilities, nor enter into any back-to-back or proxy arrangement with any member or third party in a manner that defeats the declared JV structure. Any such arrangement shall constitute a material breach of contract.
- (vii) All members of the Joint Venture shall be jointly and severally liable for the performance of the assignment, accuracy and integrity of design, and compliance with all biosafety, statutory, and contractual requirements. AIIMS Patna shall have the right to recover any dues, damages, or losses from any one or all members, irrespective of their participation share.
- (viii) AIIMS Patna reserves the right to examine the JV Agreement and financial arrangements, seek clarifications and supporting documents, and reject the application if the participation of any member is found to be nominal, artificial, disproportionate, or not backed by commensurate responsibility.
- (ix) If at any stage it is found that the actual execution deviates from the declared participation or scope, or that any member is acting as a name-lender or token participant, AIIMS Patna shall have the right to declare the bid or contract non-responsive or terminated, forfeit performance security, and initiate debarment/blacklisting proceedings as per applicable rules.
- (x) The participation share, roles, and responsibilities of the Joint Venture members shall remain unchanged throughout the contract period. Any change without prior written approval of AIIMS Patna shall be treated as a breach of contract.

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- (xi) The Joint Venture (JV) and its members shall comply with the eligibility requirements specified in this EoI. Unless otherwise specified, eligibility criteria shall be assessed on a combined basis for the JV, except for those criteria which are expressly required to be met by the Lead Member or individual members separately.
- (xii) The essential experience requirement of designing either two (02) BSL-3/ABSL-3 or one (01) BSL-4/ABSL-4 laboratory (higher lab) shall be assessed as follows: in case the Applicant is a Joint Venture (JV), both members shall independently possess relevant design experience, and the requirement shall be equitably distributed between the two members. Accordingly, each member shall have designed at least one (01) BSL-3/ABSL-3 or higher level laboratory. All such projects shall be completed, distinct, and executed in the capacity of Architect/Design Consultant as prescribed and similar to the architectural services referred in this EoI, and experience limited to execution, supply, or supervision without design responsibility shall not be considered.
- (xiii) The Applicant may participate either as a single entity or as a Joint Venture (JV). In case of a Joint Venture, the composition of the JV, including details of all members, their respective roles, responsibilities, and participation share, along with identification of the Lead Member, shall be clearly specified in the prescribed Annexure to be submitted with the EoI.

The Lead Member shall be duly authorized by the JV members through a valid Power of Attorney to represent the JV for all purposes of this EoI, and shall act as the single point of contact for AIIMS Patna. The Lead Member shall be responsible for overall coordination, integration of services, and performance of the assignment, without prejudice to the joint and several liability of all members.

Sub-contracting or sub-consultancy of any part of the assignment shall not be permitted under this EoI. The services shall be carried out exclusively by the Applicant or the constituent members of the JV.

- (xiv) An Applicant shall submit only one application under this EoI. An entity participating individually shall not be permitted to participate as a member of any Joint Venture, and an entity participating as a member of a Joint Venture shall not be permitted to participate either individually or as a member of any other Joint Venture for the same EoI. Any violation of this condition shall result in rejection of all such applications as non-responsive.

- (xv) Notwithstanding anything contained hereinabove, in the event the Joint Venture is selected in the RFP Process, all members of the Joint Venture shall be jointly and severally liable for the performance of the entire contract, and AIIMS Patna shall have the right to enforce the contract obligations against any one or all of the members, irrespective of their participation share.
- (xvi) In case the Applicant is a Joint Venture (JV), all members of the JV shall submit their respective financial statements, and the financial capacity of the JV shall be assessed on a combined basis by aggregating the financial credentials of all members. However, the aggregate financial capacity of the JV must meet the minimum financial eligibility criteria prescribed for an individual applicant under this EoI /prospective RFP (as applicable) Notwithstanding the above, for the JV to qualify, the Lead Member shall independently meet at least fifty-one percent (51%) of the minimum financial eligibility criteria prescribed for an individual applicant, and the other member shall independently meet at least thirty percent (30%) of such criteria. **Financial eligibility for JV is presented through illustrative table below and based on the following assumptions:**

- Minimum financial eligibility (for single applicant) = ₹10 Crore turnover
- Lead Member must have \geq ₹5.1 Cr (51%)
- Other Member must have \geq ₹3.0 Cr (30%)
- Combined must be \geq ₹10 Cr

Table-4

Case	Lead Member (₹ Cr)	Other Member (₹ Cr)	Combined (₹ Cr)	Lead \geq 5.1 ?	Other \geq 3.0 ?	Combined \geq 10 ?	Result
1	6	4	10	✓ Yes	✓ Yes	✓ Yes	✓ Qualified
2	4	6	10	✗ No	✓ Yes	✓ Yes	✗ Rejected
3	8	1	9	✓ Yes	✗ No	✗ No	✗ Rejected
4	6	2	8	✓ Yes	✗ No	✗ No	✗ Rejected
5	5.5	3.2	8.7	✓ Yes	✓ Yes	✗ No	✗ Rejected
6	7	3.5	10.5	✓ Yes	✓ Yes	✓ Yes	✓ Qualified

- (xvii) Failure of either member to meet the aforesaid minimum individual financial requirements shall render the JV non-responsive, irrespective of the combined financial capacity of the JV.

8. Conflict of Interest:

- (i) Any EoI-Applicant with a conflict of interest that substantially affects fair competition shall not be eligible to participate in this EoI process. EoIs found to have a conflict of interest shall be rejected as nonresponsive. EoI-Applicant shall be required to declare the absence of such conflict of interest in Eligibility Declarations. An EoI-Applicant in this EoI shall be considered to have a conflict of interest if the EoI-Applicant:
- (a) directly or indirectly controls, is controlled by or is under common control with another EoI-Applicant; or
 - (b) receives or has received any direct or indirect subsidy/ financial stake from another EoI-Applicant; or
 - (c) has the same correspondence address or same legal representative/ agent as another EoI-Applicant for purposes of this EoI; or
 - (d) has a relationship with another EoI-Applicant, directly or through common third parties, which puts it in a position to have access to information about or influence the EoI of another EoI-Applicant; or
 - (e) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services that it provided (or were provided by any affiliate or itself that directly or indirectly controls, is controlled by, or is under common control with that firm) for the procurement planning (inter-alia preparation of feasibility/ cost estimates/ Detailed Project Report (DPR), design/ technical specifications, terms of reference (TOR)/ Activity Schedule/ schedule of requirements or the EOI/ RFP Document etc) of this procurement process; or
 - (f) has a close business or family relationship with a staff/officer of AIIMS Patna who:
 - A. are directly or indirectly involved in the preparation of the EoI document or Terms of Reference of the procurement process and/or the evaluation in EoI and/ or RFP process; or
 - B. would be involved in the implementation or supervision of the resulting contract
 - (g) Any conflict stemming from such a relationship must be reported and resolved in a manner acceptable to AIIMS Patna throughout the EoI and RFP processes and execution of the contract.

- (ii) Participation as a sub-EoI-Applicant, associate, or in any similar supporting capacity in more than one bid, or alongside submission of an independent application or as a member of a Joint Venture, shall not be permitted under this EoI.

Each entity shall submit only one application, either as an individual Applicant or as a member of a single Joint Venture. Any entity found to be participating in multiple applications in any capacity, including as a sub-EoI-Applicant, associate, or partner, shall result in rejection of all such applications as non-responsive.

- (iii) Participation of only One Entity from Affiliates: Only one entity among an Applicant and its Affiliates shall be permitted to participate in this EoI. For the purpose of this clause, an “Affiliate” shall mean any entity that directly or indirectly controls, is controlled by, or is under common control with another entity. Accordingly, an entity shall not be permitted to participate in more than one application, whether individually or as a member of a Joint Venture or in any other capacity, if any of its Affiliates is participating in this EoI. Any participation in violation of this provision shall result in rejection of all such applications as non-responsive.

- (iv) The Applicant shall disclose, in the prescribed format, any commission, fee, or gratuity paid or proposed to be paid to any agent, intermediary, consultant, or any other third party in connection with this EoI and the subsequent RFP process. Such disclosure shall include the name of the recipient, nature of services, and amount involved.

Failure to disclose such information, or furnishing of false or misleading information, shall render the application non-responsive, and may lead to rejection, termination, and further action as per applicable rules.

9. General Clauses:

- (i) **Terms of Reference (TOR):** The scope of services shall primarily comprise professional architectural consultancy services (indicative in nature), including but not limited to planning, design, coordination, and related advisory functions, as detailed in the Terms of Reference. However, AIIMS Patna reserves the right to require the Consultant to perform any ancillary, incidental, or allied professional activities that may be necessary for the proper and effective execution of the assignment, in accordance with the ToR and subsequent requirements.

Any reference to the term “Services” in this EoI shall be construed to include such consultancy functions along with all associated

and necessary obligations required for successful completion of the assignment, as may be specified by AIIMS Patna from time to time.

- (ii) **EoI formats for submission (To be filled, digitally signed, and uploaded by EoI-Applicants):** The EoI-Applicant shall submit its application strictly in accordance with the formats prescribed in Part III: “EoI Submission Formats/Annexures”. All such formats shall be duly filled, signed or digitally signed by the authorized signatory, and uploaded as part of the EoI submission. Any submission that is incomplete, not in the prescribed format, or not duly signed shall be liable to be treated as non-responsive.
- (iii) **Corrigenda/ Addenda to EoI document:**
- (a) Before the deadline for submitting EoIs, AIIMS Patna may update, amend, modify, or supplement the information, assessment or assumptions contained in the EoI document by issuing corrigenda and addenda. The corrigenda and addenda shall be published in the same manner as the original EoI document. The EoI-Applicants must check the website(s) namely <https://eprocure.gov.in/eprocure/app> & <https://aiimspatna.edu.in/> for any corrigenda/ addenda. Any corrigendum or addendum thus issued shall be considered a part of the EoI document.
- (b) If considered necessary, the AIIMS Patna may suitably extend the EoI submission deadline to give reasonable time to the prospective EoI-Applicants to take such corrigendum/ addendum into account in preparing their EoI. After AIIMS Patna makes such modifications, any EoI-Applicant who has submitted his EoI shall have the opportunity to either withdraw his EoI or re-submit his EoI superseding the original EoI within the extended time of submission as per **Critical Dates**.
- (c) AIIMS Patna reserves the right to extend the deadline for submission of EoI by issuing an amendment/corrigendum. In such an event, all rights and obligations of AIIMS Patna and the EoI-Applicants, which were earlier linked to the original submission deadline, shall be deemed to be modified accordingly and shall apply with reference to the revised deadline.
- (iv) **Right to reject any or all EoIs by AIIMS Patna:** The issuance of this EoI does not constitute any obligation on the part of AIIMS Patna to shortlist any Applicant or to proceed further with the selection process. AIIMS Patna reserves the absolute right to accept or reject any or all EoIs, or to abandon, cancel, or bypass the EoI process, and may, at its discretion, re-issue a fresh EoI for the same or similar services, at any stage before or after shortlisting of Applicants.

AIIMS Patna shall have no liability whatsoever to any Applicant in respect of such actions, and shall not be obliged to assign or disclose any reasons for its decisions.

(v) **Purchase preference policies- No exemption in prior turnover and experience:** Notwithstanding any provision contained in Government policies relating to procurement from Micro and Small Enterprises (MSMEs) and Startups, no relaxation in prior turnover or prior experience shall be admissible under this EoI, considering the critical and sensitive nature of the services relating to public health infrastructure.

This provision is in accordance with the Office Memorandum dated 20 September 2016 issued by the Department of Expenditure, Government of India, which permits such restriction in cases involving critical services..

(vi) **Availability and downloading of the EoI document:** The Expression of Interest shall be published on the eProcurement Portal (namely <https://eprocure.gov.in/eprocure/app>). It shall be available for download after the date and time of the start of availability till the deadline for availability as mentioned in critical date sheet on CPPP. The downloaded Expression of Interest is free of cost. If AIIMS Patna happens to be closed on the deadline for submitting the EOIs as specified above, this deadline shall *not* be extended. Any query/ clarification regarding downloading Expression of Interest and uploading EOIs on the portal may be addressed to their CPPP-Help Desk.

(vii) **Clarifications:** An EoI-Applicant may seek clarification of the EoI document through the eProcurement portal before the date and time prescribed in Critical Dates sheet. This deadline shall not be extended in case of any intervening holidays. No other means of submission of queries shall be entertained. All such queries shall relate to the EoI document alone, and queries related to a detailed analysis of Terms of Reference, payment terms and mode of selection shall only be entertained during the RFP Process. AIIMS Patna shall respond no later than seven days before the deadline for EoI submission. The query and clarification shall be shared with all prospective EoI-Applicants on the portal without disclosing its source. If required, AIIMS Patna may modify the EoI document that may become necessary due to the clarification through an Addendum/ Corrigendum issued as per EoI terms and conditions.

(viii) **Pre-EoI Conference:**

(a) A Pre-EoI conference is stipulated in critical dates sheet, prospective EoI-Applicants interested in participating in this EoI may attend the

Pre-EoI conference to clarify the conditions of the EoI process at the venue, date and time specified therein. Participation in the Pre-EoI conference is not mandatory but is restricted to prospective EoI-Applicants who have registered for the Pre-EoI conference.

- (b) The date and time by which the written queries for the Pre-EoI must reach the authority and the last date for registration for participation in the Pre-EoI conference are also mentioned in the EoI (refer table-3).
- (c) Delegates participating in the Pre-EoI conference must provide a photo identity and an authorisation letter as per 'Annexure-I' "Authorisation to Attend Pre-EOI Conference" from their organisation to the email mentioned in this EoI (refer Table-3); else, they shall not be allowed to participate. The Pre-EoI conference may also be held online at the discretion of AIIMS Patna.
- (d) The applicants intending to participate in the pre-bid/clarification meeting through online mode shall submit a request in writing via email to bsl3@aiimspatna.org at least 24 (twenty four) hours prior to the scheduled date and time of the meeting. In case of applicant intending to participate in the meeting through offline shall submit the request in writing via email to bsl3@aiimspatna.org at least 48 (forty eight) hours prior to the scheduled date and time of the meeting.
- (e) The request shall clearly mention the name of the firm, contact details, and details of the authorized representative who will attend the meeting. The bidder shall also forward a valid authorization letter issued by the firm along with a copy of the identity card of the authorized representative.
- (f) Only those bidders who submit such requests along with the requisite documents within the stipulated time shall be provided with the meeting link and allowed to participate in the online meeting.
- (g) Requests received after the stipulated time or without the required documents may not be entertained.
- (h) After the Pre-EoI conference, minutes of the Pre-EoI conference (including the questions asked in writing and those asked during the meeting (without identifying the source) and the responses given, together with any responses prepared after the meeting, shall be published on Portal or as decided by the competent authority, AIIMS Patna . If required, a clarification letter and corrigendum to the EoI document shall be issued, containing amendments, if any, of various

provisions (including the TOR, if required) of the EoI document, which shall be deemed part of the EoI document. AIIMS Patna may suitably extend by at least seven (07) days the deadline for the EoI submission to give reasonable time to the prospective EoI-Applicants to consider such clarifications in preparing their EoIs.

- (ix) **Preparation & submission of EoI:** EoI-Applicants must fill and submit the EoI in the Annexures in Part III - 'EoI Submission Formats'. EoI by the EoI-Applicant shall include inter-alia duly signed or digitally signed scanned copies of the original documents in pdf format.
- (x) **EoI Validity:**
- (a) Unless specified to the contrary anywhere, EoIs shall remain valid for a period not less than 270 (two hundred seventy) days from the deadline for the EoI submission end date stipulated in critical date sheet. An EoI valid for a shorter period shall be rejected as nonresponsive.
- (b) In the event that the date up to which the EoIs are required to remain valid falls on, or is subsequently declared as, a holiday or a closed day at AIIMS Patna, the validity of the EoIs shall be deemed to be automatically extended up to the next working day of AIIMS Patna.
- (c) In any circumstances, prior to the expiry of the original validity period, AIIMS Patna may request the EoI-Applicants to extend the validity of their EoIs for a specified additional period. Such request and the responses thereto shall be made in writing or through electronic means. An EoI-Applicant may either accept or decline the request for extension. However, an EoI-Applicant agreeing to such extension shall not be permitted to modify, alter, or withdraw any part of its EoI during the extended validity period.
- (i) **Relationship between EoI-Applicant and eProcurement portal:** AIIMS Patna is neither a party nor a principal in the relationship between the EoI-Applicant and the organisation hosting the e-procurement portal namely <https://eprocure.gov.in/eprocure/app>. EoI-Applicants must comply with the rules, conditions, regulations, procedures, and implied conditions/agreements of the eProcurement portal, including registration, compatible Digital Signature Certificate (DSC) etc. EoI-Applicants shall settle clarifications and disputes, if any, regarding the portal directly with them. In case of conflict between provisions of the portal with the EoI document, provisions of the portal shall prevail. EoI-Applicants may study the resources provided by the Portal for EoI-Applicants.
- (ii) **Signing of EoI:** The person signing or digitally signing the EoI and any related documents on behalf of the EoI-Applicant shall be duly authorized to do so. The EoI-Applicant shall submit an authenticated copy of the authorization document, such as a Power of Attorney, Board Resolution, or

equivalent, clearly evidencing the authority of the signatory to commit and submit the EoI on behalf of the Applicant, along with Annexure B: EoI-Applicant Information.

(iii) **Submission/ uploading of EoI:**

- (a) EOIs must be uploaded on the Central Public Procurement Portal (CPPP) until the submission deadline. If the office happens to be closed on the deadline to submit the EoI as specified above, this deadline shall not be extended. No manual EoI shall neither be made available nor accepted for submission. EoI submitted through modalities other than CPPP shall be liable to be rejected as nonresponsive.
- (b) In the case of downloaded documents, EoI-Applicants must not make any changes to the contents of the documents while uploading, except for filling in the required information. Otherwise, the EOI shall be rejected as non-responsive. Uploaded pdf documents should not be password protected. EoI-Applicants should ensure the clarity/ legibility of the scanned documents uploaded by them.
- (c) The date and time of the e-Procurement server clock, which is also displayed on the dashboard of the EoI-Applicants, shall be taken as the reference time for deciding the closing time of EoI submission. EoI-Applicants are advised to ensure they submit their EoI within the deadline of EoI submission, taking the server clock as a reference, failing which the portal shall not accept the EoIs. No request on the account that the server clock was not showing the correct time and that a particular EoI-Applicant could not submit their EoI because of this shall be entertained. Failure or defects on the internet or heavy traffic at the server shall not be accepted as a reason for a complaint. AIIMS Patna shall not be responsible for any failure, malfunction or breakdown of the electronic system used during the e-Tender process.
- (d) Only one copy of the EoI can be uploaded, and the EoI-Applicant shall digitally sign (or as required) all statements, documents, and certificates uploaded by him, owning sole and complete responsibility for their correctness/ authenticity as per the IT Act 2000 as amended from time to time. An EoI submitted by a Joint Venture shall be digitally signed by an authorised representative who has a written power of attorney signed by each member's authorised representative to be legally binding on all members.
- (e) All EoIs uploaded by EoI-Applicants to the portal shall get automatically encrypted. The encrypted EoI can only be decrypted/ opened by the authorised persons on or after the due date and time. The EoI-Applicant should ensure the correctness of the EoI before uploading and take a

printout of the system-generated submission summary to confirm successful EoI upload.

- (iv) **Implied acceptance of procedures by EoI-Applicants:** Submission of EoI in response to the EoI document is deemed to be acceptance of the procedures and conditions of the e-Procurement and EoI document unconditionally.
- (v) **Responsibility of the EoI-Applicant to declare all changes:** EoI-Applicants must advise AIIMS Patna immediately in writing of any material change to the information provided in their EoI submission, including any substantial change in their ownership, eligibility, or financial or performance capacity. For shortlisted EoI-Applicants, this requirement applies until a contract is awarded in the following RFP process. For the EoI-Applicant successful in the RFP process, this requirement shall apply till the execution of the resultant contract.
- (vi) **Modification, Resubmission and Withdrawal of EoIs:**
 - (a) **Modification & resubmission-** Once submitted in e-Procurement, EoI-Applicants cannot view or modify their EoI since it is locked by encryption. However, resubmission of the EoI by EoI-Applicants for any number of times superseding earlier EoI(s) is allowed upto the submission deadline by following procedures prescribed by the portal. Resubmission of an EoI shall require uploading all documents afresh. The system shall consider only the last EoI submitted.
 - (b) **Withdrawal-** The EoI-Applicant may withdraw his EOI before the submission deadline by following procedures prescribed by the portal, and it shall be marked as withdrawn and shall not get opened during the EOI opening. No EOI should be withdrawn after the submission deadline and before its validity period expires.
- (vii) **EoI Opening:** EoIs received shall be opened online on or after the specified date and time in critical date sheet on CPPP. EoIs cannot be opened before the specified date & time, even by the Tender Inviting Authority, the Procurement Officer, or the Publisher. If the specified date of EoI opening falls on or is subsequently declared a holiday or closed day for AIIMS Patna, the EoIs shall be opened at the appointed time on the next working day.

10. Evaluation of EoI:

- (i) Evaluation is based only on declared criteria. The evaluation shall be based upon scrutinising and examining all relevant data and details submitted by EoI-Applicants in its EoI and other allied information

deemed appropriate by AIIMS Patna. Evaluation of EoIs shall be based only on the criteria/ conditions included in the EoI document.

- (ii) Information relating to the evaluation of EoIs and shortlisting (if any) results shall not be disclosed to any participant or any other persons not officially concerned with such process until the notification of shortlisting (if any) is made.
- (iii) The determination shall not consider the qualifications of other firms, such as the EoI-Applicant's subsidiaries, parent entities, affiliates, or any other firm(s) different from the EoI-Applicant.
- (iv) In the evaluation of EoIs, AIIMS Patna shall assess the conformity of the EoI-Applicants to the eligibility and qualification criteria specified in this EoI document. In addition, any other evaluation parameters or factors expressly provided in the EoI shall also be taken into consideration, as indicated therein.

11. Clarification of EoIs and shortfall documents:

- (i) During the evaluation of EoIs, AIIMS Patna may, at its discretion, but without any obligation to do so, ask EoI-Applicants to clarify its EoI by a specified date with the approval of the Competent Authority. EoI-Applicants should answer the clarification within that specified date. The clarification request and response shall be submitted in writing or electronically. No change in the substance of the EoI shall be sought, offered, or permitted that may grant any undue advantage to such an EoI-Applicant. Any clarification submitted by an EoI-Applicant regarding its EoI that is not in response to a request by the AIIMS Patna shall not be considered.
- (ii) AIIMS Patna reserves its right to, but without any obligation to do so, seek any shortfall information/ documents. Provided such information/ documents are historical, which pre-existed at the time of the EoI opening and which have not undergone change since then and do not grant any undue advantage to any EoI-Applicant. There is a provision on the portal for requesting Short-fall documents from the EoI-Applicants or otherwise may be asked through email.
- (iii) If the EoI-Applicant fails to provide satisfactory clarification and/or missing information, its EoI shall be evaluated based on available information and documents.

- 12. Contacting during the evaluation:** From EoI submission to shortlisting (as the case may be) of EoI-Applicants, no EoI-Applicant shall contact AIIMS Patna on any matter relating to the submitted EoI. If an EoI-Applicant needs to contact AIIMS Patna relating to this EoI, it should do so only in writing or electronically. Any effort by an EoI-Applicant to influence AIIMS Patna

during the EoI process shall be construed as a breach of the Code of Integrity, and EoI shall be liable to be rejected as non-responsive in addition to other punitive actions for such a breach as per the EoI document.

13. Determining responsiveness: Only substantively responsive EoIs shall be evaluated for shortlisting. A substantively responsive EoI is complete and conforms to the EoI document's essential terms and conditions. The following are some of the crucial aspects for which an EoI shall be rejected as non-responsive:

- (i) The EoI is not in the prescribed format or is not submitted as per the stipulations in the EoI document.
- (ii) Any EoI-Applicant who does not meet the eligibility and qualification criteria prescribed in this EoI document.
- (iii) The EoI validity is shorter than the required period.
- (iv) The EoI departs from the essential requirements stipulated in the EoI document;
- (v) Non-submission or submission of illegible scanned copies of stipulated documents/ declarations, if any
- (vi) The EoI-Applicant fails to provide and/ or comply with the required information, instructions etc., incorporated in the EoI document or gives evasive information/ reply against any such stipulations.
- (vii) The EoI-Applicant furnishes wrong and/ or misleading data, statement(s) etc. In such a situation, besides rejecting the EoI as nonresponsive, it is liable to attract other punitive actions under relevant provisions of the EoI document for breach of the Code of Integrity.

14. Evaluation of eligibility/qualification Criteria:

- (i) AIIMS Patna shall determine whether the EoI-Applicants are qualified and eligible in all respects to be shortlisted to provide the 'Services', as per Qualification/Eligibility Criteria and submission in Annexures listed in EoI documents. The determination shall not consider the qualifications of other firms, such as the EoI-Applicant's subsidiaries, parent entities, affiliates, or any other entity different from the EoI-Applicant. AIIMS Patna reserves the right to waive minor deviations in the qualification criteria if they do not materially affect the capability of an EoI-Applicant to perform the contract.
- (ii) The assignments completed by the EoI-Applicant's individual experts working privately or through other consulting firms cannot be claimed as the relevant experience of the EoI-Applicant or that of the EoI-Applicant's partners or sub-EoI-Applicants in Annexure E: Performance Capability Statement.

15. Verification of original documents at RFP process: AIIMS Patna reserves its right to call for verification, originals of all self-certified copies of uploaded documents from the EoI-Applicants during the following RFP Process. If the shortlisted EoI-Applicant fails at that stage to provide such originals or, in case of substantive discrepancies in such documents, it shall be construed as a breach of the Code of Integrity. Such RFP proposals shall be liable to be rejected as non-responsive in addition to other punitive actions for such a breach.

16. Declaration of Shortlisted EoI-Applicants

- (i) EoI-Applicants who meet the prescribed evaluation criteria shall be shortlisted by AIIMS Patna. Where applicable, EoI-Applicants may be provisionally shortlisted, subject to fulfilment of specified conditions, which shall be communicated to them through inviting RFP and shall be required to be complied with prior to submission of proposals at the subsequent stage.
- (ii) Shortlisted (including provisionally shortlisted) EoI-Applicants may be considered for participation in the subsequent RFP process. However, the issuance of the RFP may be either restricted to shortlisted EoI-Applicants or opened to all eligible prospective bidders, as decided by the Competent Authority of AIIMS Patna.
- (iii) All EoI-Applicants shall be advised about shortlisting of their EoIs or otherwise without disclosing the comparative position of their EoIs with that of others. Shortlisted EoI-Applicants must not advertise or publish the same in any Annexure without the prior written consent of AIIMS Patna.
- (iv) Shortlisting an EoI-Applicant is an administrative process and does not confer any legal or contractual rights on him. Since original documents/ certificates are not being called for and examined at this stage, all shortlisted shall be conditional upon final verification of such documents/ certificates during the RFP Process.

17. Publication of RFP following this EOI:

- (i) Upon completion of the evaluation of EoI responses, AIIMS Patna may, at its discretion, proceed with the next stage of the selection process by issuing a Request for Proposal (RFP) through the eProcurement portal. The decision to issue the RFP shall rest solely with AIIMS Patna and shall not be construed as an obligation arising out of this EoI process.

- (ii) The RFP may be issued either to the shortlisted EoI-Applicants or through inviting an open competitive bidding process to all eligible prospective bidders, as may be considered appropriate by the Competent Authority of AIIMS Patna, keeping in view the nature, scope, urgency, and requirements of the procurement, as well as the need to ensure adequate competition, fairness, and transparency in the procurement process.
- (iii) Any intimation/notification/alert issued by AIIMS Patna or through the Portal to shortlisted EoI-Applicants shall be purely facilitative and without any liability. All interested bidders, including shortlisted EoI-Applicants, shall remain solely responsible for regularly monitoring the eProcurement portal for any updates, corrigenda, or publication of the RFP.
- (iv) AIIMS Patna reserves the right to review, revise, modify, expand, or refine the scope of work, eligibility/qualification criteria, and other terms & conditions at the RFP stage, as deemed necessary in the interest of the procurement process. Such actions shall not be construed as a deviation affecting the validity of the EoI process or the shortlisting carried out.
- (v) Participation in the EoI process and/or inclusion in the list of shortlisted applicants shall not confer any right, entitlement, or legitimate expectation upon any applicant to participate in, or be issued, the subsequent RFP, nor shall it create any obligation on AIIMS Patna to restrict the RFP only to shortlisted applicants. No claim whatsoever shall lie against AIIMS Patna on this account.

18. Grievance redressal/complaint procedure:

- (i) EoI-Applicants have the right to submit a complaint or seek de-briefing if he is not shortlisted in this EOI process, in writing or electronically, within 07 (seven) days of the declaration of EOI evaluation results. The complaint shall be addressed to the Executive director, AIIMS Patna.
- (ii) Within five working days of receipt of the complaint, the Tender Inviting Authority shall acknowledge the receipt in writing to the complainant, indicating that it has been received. The response shall be sent in due course after a detailed examination.
- (iii) The Tender Inviting Authority shall convey the final decision to the complainant within 15 working days of receiving the complaint. No response shall be given regarding the confidential process of evaluating EOIs before the results are notified. However, no response shall be

given regarding the following topics explicitly excluded from such complaint process:

- (a) Only an EoI-Applicant who has participated in the EOI process and has not been shortlisted can make such a representation. Complaints regarding shortlisting or exclusion of other EoI-Applicants shall not be entertained.
 - (b) No third-party information (EOIs, eligibility/ qualification) shall be sought and must not be included in the response.
- (iv) Following decisions of AIIMS Patna shall not be subject to review:
- (a) Determination of the need for procurement.
 - (b) Complaints against eligibility and qualification criteria except under the premise that they are either vague or too specific to limit competition.
 - (c) Choice of the selection procedure.
 - (d) Provisions limiting the participation of EoI-Applicants in the EoI process, in terms of policies of the Government.
 - (e) Provisions regarding purchase preferences to specific categories of EoI-Applicants in terms of policies of the Government.
 - (f) Cancellation of the EoI process except where it is intended to subsequently re-tender the same Services.

19. Code of integrity in public procurement, misdemeanours and penalties:

Code of integrity and penalties for violating the Govt. of India, Ministry of Finance, Department of Expenditure shall apply to this EoI process. Procuring authorities, EoI-Applicants, suppliers, contractors, and EoI-Applicants should observe the highest standard of integrity and not indulge in prohibited practices or other misdemeanours, either directly or indirectly, during the entire procurement Process (including this EoI) or the execution of resultant contracts.

PART-II

TERMS OF REFERENCE

Terms of Reference (TOR)

Section II **‘Project Background’**

1. INTRODUCTION AND BACKGROUND:

- (a) The All India Institute of Medical Sciences (AIIMS), Patna, a premier tertiary care medical institution and teaching hospital, is committed to establishing and operationalizing a state-of-the-art, required regulatory compliant Biosafety Level-3 (BSL-3) containment laboratory facility. This facility will serve as a critical institutional resource for conducting research, diagnostic investigations, and development activities involving high-risk pathogens, risk group 3 (RG-3) microorganisms, and genetically engineered organisms that pose significant risks to human health through aerosol transmission or direct contact routes.
- (b) The establishment of this BSL-3 facility at AIIMS Patna is aligned with India's national strategy to strengthen biosafety and biosecurity infrastructure, enhance diagnostic capabilities for high-consequence infectious diseases, and support cutting-edge biomedical research. The facility will be established, designed, constructed, and commissioned in strict accordance with the "National Guidelines for the Establishment and Certification of Biosafety Level-3 (BSL-3) Containment Facility, 2024" (and as amended from time to time) published by the Department of Biotechnology (DBT), Ministry of Science and Technology, Government of India, in collaboration with the Indian Council of Medical Research (ICMR).
- (c) A dedicated, purpose-built structural envelope and building are currently available at the AIIMS Patna campus for housing this BSL-3 laboratory facility. The existing building structure has been constructed with consideration for containment requirements and is located in an area away from general institutional traffic/space. The current project encompasses comprehensive architectural planning, detailed engineering design, technical specifications, systems integration design, construction coordination and setting quality and quality's assurance parameters for implementation, and preparation of all documentation required for tendering, commissioning, validation & certification by the regulatory authorities.
- (d) Subsequently, the scope of the present procurement will follow engagement of project management consultancy services to oversee construction quality, ensure compliance with technical specifications and timelines, facilitate and coordinate with multiple stakeholders for commissioning, validation and certification. Thereafter, specialized contractors will be engaged for construction and implementation works. However, the current procurement focuses specifically on the architectural

and engineering design services etc. that will form the foundation for all subsequent construction and implementation activities.

2. Institutional Commitment and Regulatory Framework:

AIIMS Patna recognizes that the establishment of a BSL-3 laboratory is a significant undertaking requiring rigorous adherence to the highest specified safety standards and national regulatory requirements. The institution will strive all efforts and commitment for the following:

- (a) Establishing and maintaining a robust biosafety culture throughout the organization, wherein safety is regarded as paramount and is integrated into all decisions related to laboratory design, operation, staffing, and research activities.
- (b) Ensuring full compliance with all applicable national regulations, including the "Manufacture, Use/Import/Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells, Rules, 1989" notified under the Environment (Protection) Act, 1986, and all subsequent amendments and updates.
- (c) Obtaining and maintaining certification of the BSL-3 facility from the Review Committee on Genetic Manipulation (RCGM), Department of Biotechnology, or otherwise as applicable, which would be the designated competent authority for certification of such facilities for AIIMS Patna.
- (d) Implementing comprehensive biosafety and biosecurity protocols based on the institutional biosafety committee (IBSC) risk assessments and standard operating procedures (SOPs).
- (e) Provide training, organise capacity building programs, medical surveillance, and occupational health support to all personnel working in or associated with the BSL-3 facility.
- (f) Maintaining the facility in full operational and certification compliance throughout its functional life through annual validation, preventive maintenance, and re-certification protocols.

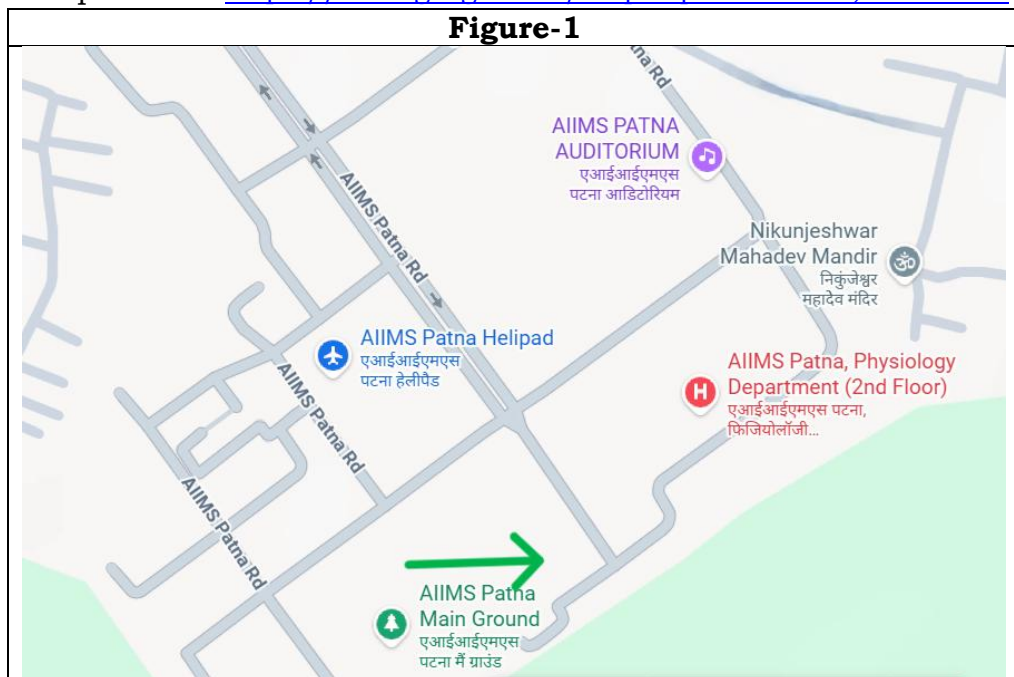
3. Project context and existing infrastructure: The existing building structure at AIIMS Patna designated for the BSL-3 laboratory has been constructed with appropriate structural design considerations for a containment facility. The building is located in a secured area of the AIIMS Patna campus that is separated from general institutional traffic, and administrative spaces. The location provides good accessibility for authorized personnel while maintaining appropriate isolation from the general public and other institutional areas. Key infrastructure features of the existing building include:

- (a) Structural framework designed to accommodate HVAC systems, equipment, and safety installations etc.
- (b) Adequate floor-to-ceiling heights to accommodate air handling units, ductwork routing, and decontamination equipment.

- (c) Provision for routing of utilities including electrical supply, water supply, and drainage systems.
- (d) Building envelope with capacity for modification to achieve required air-tightness and containment integrity. However, the existing building structure wherever requires retrofitting and engineering modifications to meet all the specific technical requirements for BSL-3 laboratory operations as specified in the DBT 2024 Guidelines, the selected architect/engineering consultant will be responsible for detailed assessment (including site visit) of the existing structure, identification of modifications required, and comprehensive design of all new systems and equipment to be integrated into the building.
- (e) The AutoCAD design drawings of the structural building are available and have been uploaded on the link provided in this EoI document for reference of the EoI-Applicants. In addition, a 2D layout/map of the facility is attached herewith in Annexure as part of this EoI. For ease of reference, an online autoCAD link is also provided: https://drive.google.com/file/d/1RzRRd8zo2T2DizFCBMpeyU9qsd1lgn-l/view?usp=drive_link

The EoI-Applicants are advised to refer to the above documents for preliminary understanding of the project. However, the same are indicative in nature, and AIIMS Patna reserves the right to modify, revise, or update the design inputs at any stage.

- (f) Site Location and Reference Map: The proposed Project is envisaged to be developed on land located within the premises of AIIMS Patna, as indicated in Figure-1 and Figure-2 given below. The figures provide a tentative visual representation of the Site, along with the geographical coordinates (Latitude: 25.558342, Longitude: 85.043121) for reference of the EoI-Applicants. For ease of reference, an online location link is also provided: <https://www.google.com/maps?q=25.558342,85.043121>





- (g) The above maps, images, and coordinates are indicative in nature and are provided solely for preliminary understanding of the Site. AIIMS Patna does not guarantee the accuracy, completeness, or reliability of such third-party map data, and shall not be responsible for any discrepancy, variation, or interpretation thereof.

EoI-Applicants are advised to independently and physically verify the site location and conditions before submission of their EoI.

Section III **‘Guidelines and Framework’**

4. National guidelines and international standards framework: The design, construction, commissioning, validation and certification of this BSL-3 facility will be governed by a comprehensive framework of national guidelines and high standards, all of which must be fully integrated into the architectural and engineering design. The key regulatory documents and standards include:

- (i) Primary national guidelines:** National Guidelines for the Establishment and Certification of Biosafety Level-3 (BSL-3) Containment Facility, 2024: This is the primary regulatory document issued by the Department of Biotechnology, Ministry of Science and Technology, Government of India, in collaboration with the Indian Council of Medical Research (ICMR) and approved by the Review Committee on Genetic Manipulation (RCGM). This document provides comprehensive specifications for design, construction, standards for engineering controls, essential tests during commissioning, validation procedures, standard operating procedures, and the certification mechanism for BSL-3 facilities.

All design elements of the proposed facility must demonstrate full compliance with these guideline in addition to other relevant provisions applicable for establishment of BSL-3 Laboratories. For reference the link of guidelines is provided herein: https://www.icmr.gov.in/icmrobject/uploads/Guidelines/1736402847_biosaftelevel3_ver3_101020243.pdf

Note: The EoI-Applicant/Consultant shall ensure that the design, planning, and all related deliverables for the proposed facility are in full compliance with the applicable regulatory guidelines, including any amendments, revisions, or updates issued from time to time by the competent authorities.

In the event of any modification or update in the relevant biosafety guidelines after issuance of this EoI, the scope of work and design requirements shall be deemed to be automatically aligned with the latest applicable guidelines, without any additional claim or deviation, unless otherwise specified by AIIMS Patna.

General Guidelines for Establishment of Biosafety Level-3 Laboratories, 2019: Published by the Indian Council of Medical Research (ICMR), these guidelines provide comprehensive information on the objectives and scope of BSL-3 laboratory facilities, specific laboratory designs tailored to Indian conditions, detailed construction considerations, staffing requirements, and operational aspects related to maintenance of these facilities. While the 2024 DBT guidelines are the primary regulatory reference, these ICMR guidelines provide

important supplementary information on laboratory design aspects specific to the Indian context.

(ii) Secondary national guidelines and regulatory framework:

Regulations and Guidelines for Recombinant DNA Research and Biocontainment: Published by the Review Committee on Genetic Manipulation (RCGM), Department of Biotechnology, these guidelines provide detailed procedures and requirements for activities involving recombinant DNA technology and handling of genetically engineered organisms. The design must provide appropriate infrastructure to support these procedures.

The facility design must support the IBSC in its oversight functions including risk assessment, SOP development, and monitoring of facility operations.

(iii) National regulations references (Indicative):

- (a) National Guidelines for Establishment and Certification of BSL-3 Containment Facility (DBT-ICMR-2024) — PRIMARY REFERENCE and all other regulatory norms mentioned therein.
- (b) DBT Guidelines for Establishment of Containment Facilities BSL-2 & BSL-3 (2020).
- (c) Environment Protection Act, 1986.
- (d) Rules for Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms / Genetically Engineered Organisms or Cells (MoEF&CC, 1989 as amended).
- (e) National Building Code of India (NBC), 2016.
- (f) Bureau of Indian Standards (BIS) applicable codes.
- (g) Applicable Institutional Biosafety Committee (IBSC) and RCGM guidelines.
- (h) CPWD manuals (as applicable).
- (i) NABL (National Accreditation Board for Testing and Calibration Laboratories) standards for validation and accreditation
- (j) National Building Code of India (NBC) 2016

(iv) International Standards and Guidelines: World Health Organization (WHO) Laboratory Biosafety Manual, Fourth Edition, 2020: This is the authoritative international reference document on laboratory biosafety. It provides detailed guidance on biosafety principles, containment levels, engineering controls, and operational practices. While the national guidelines are binding, the WHO standards represent international best practices and the design should be compliant with WHO recommendations.

Centers for Disease Control and Prevention (CDC) - Biosafety in Microbiological and Biomedical Laboratories (BMBL), 5th Edition, 2009: The CDC BMBL is widely recognized as an authoritative standard for laboratory biosafety in the United States and internationally. The design should be consistent with CDC recommendations where these do not conflict with national guidelines.

The CDC BMBL provides detailed specifications on containment equipment, facility design, and operational procedures.

(v) International standards references (Indicative): The design shall also consider international biosafety best practices. These shall not contravene national regulations applicable for high containment laboratory or BSL-3.

- (a) WHO Laboratory Biosafety Manual, 4th Edition, 2020.
- (b) CDC / NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL), 6th Edition, 2020.
- (c) NIH Design Requirements Manual (DRM) for Biomedical Laboratories and Animal Research Facilities, 2019.
- (d) NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules, 2024.
- (e) ANSI/ASSE Z9.14-2020: Testing and Performance-Verification Methodologies for Ventilation Systems for BSL-3 Facilities.
- (f) International biosafety engineering standards.
- (g) Industry standards and best practices.

(vi) Indian Standards (IS Codes):

- (a) IS 1893 (Part 1:2016): Indian Standard for Criteria for Earthquake Resistant Design - This standard provides the seismic design criteria for structures in India based on seismic zone classification. The design must incorporate appropriate seismic design features to ensure structural stability in the lab and continued operational capability during seismic events. The lab structure establishment must be designed as earthquake-resistant in accordance with this standard.
- (b) IS 13030:2008 - Code of Practice for Design, Fabrication and Erection of Non-Pressurized Cylindrical Mild Steel Vertical Welded Oil Storage Tanks: Relevant for design of holding tanks and waste decontamination systems.
- (c) IS 4651 (Part 1):2018 - Code of Practice for the Design, Installation, Operation, and Maintenance of Electrical Installations in Laboratories: Provides requirements for electrical design in laboratory environments.
- (d) IS 3956:2009 - Code of Practice for Planning, Design and Installation of Fire Protection Systems: Applicable to fire suppression system design in the BSL-3 facility.
- (e) Other relevant IS codes including those related to HVAC systems, water supply, drainage, plumbing, and building construction standards.

(vii) Environmental and Waste Management Regulations: Central Pollution Control Board (CPCB) and Bihar Pollution Control Board (BPCB) Guidelines: The design must comply with CPCB and BPCB

guidelines (as applicable) on hazardous waste management, biomedical waste handling, and environmental pollution control. Specifically, the waste decontamination systems must be designed to ensure that all biological waste is adequately treated before disposal into drainage systems.

Environment (Protection) Act, 1986 and Environment (Protection) Rules, 1986: The overall project must comply with environmental protection requirements, including appropriate disposal of treated waste and prevention of environmental contamination.

(viii) National building code and municipal regulations: National Building Code of India (NBC) 2016 or as amended from time to time: While the specialized requirements of BSL-3 design may supersede certain general building code provisions, the design must generally comply with NBC requirements including fire safety, means of escape, ventilation, and other general building standards, except where specific laboratory biosafety requirements necessitate different approaches. Any deviations from NBC must be justified based on biosafety requirements.

Energy Conservation Building Code (ECBC): The design should incorporate energy efficiency measures where these do not compromise biosafety. Considerations for efficient HVAC operation, LED lighting, and optimized heating/cooling systems should be incorporated.

Note: The design, planning, and execution of the facility shall follow the following order of precedence:

- (i)** Guidelines issued by the Department of Biotechnology (DBT)
- (ii)** Guidelines issued by the Indian Council of Medical Research (ICMR)
- (iii)** Relevant Indian Standards (IS Codes) issued by the Bureau of Indian Standards
- (iv)** Other applicable and recognized national or international industry standards

In the event of any conflict or inconsistency among the applicable standards, the order of precedence specified above shall prevail, with the higher-ranked standard taking priority.

In cases where specific aspects are not covered under the higher-order guidelines, the provisions of the next applicable standard in the hierarchy shall be followed to ensure overall safety, compliance, and functionality of the facility.

Section IV **‘Design Philosophy’**

5. Philosophy and design principles for bsl-3 laboratory at AIIMS Patna:

- (i)** The fundamental philosophy underlying the design of the BSL-3 laboratory at AIIMS Patna is to create a facility that provides comprehensive, multi-layered protection to laboratory personnel, the community, and **the environment from exposure to high-risk biological agents** that are handled within the facility. This philosophy recognizes that complete protection is achieved not through reliance on a single control measure, but through the integration and redundancy of multiple complementary containment strategies working synergistically.
- (ii) Core philosophy and protective objectives:** The BSL-3 facility design is based on the principle that protection of identified elements from biological hazards is achieved through the identification and implementation of appropriate containment components.
- (iii) Primary elements - laboratory personnel:** Laboratory personnel and support staff working in or accessing the facility represent the primary elements requiring protection. These individuals have the highest potential exposure to the biological agents being handled in the laboratory and therefore require the most stringent personal protective measures. The design must ensure that:
 - (a)** All work with biological agents is conducted within appropriately rated and certified biological safety cabinets (BSCs) that provide physical barriers and controlled airflow to prevent aerosol exposure.
 - (b)** The laboratory environment itself maintains negative pressure relative to non-containment areas, providing a protective pressure gradient that prevents escape of potentially contaminated air from the laboratory to other areas.
 - (c)** All air exiting the laboratory is filtered through HEPA filtration systems with verified efficiency to remove any potential biological agents.
 - (d)** Personal protective equipment (PPE) is readily available, appropriate for the level of risk, and is properly used by all personnel.
 - (e)** Medical surveillance and occupational health support is provided to detect any laboratory-acquired infections at the earliest possible stage.
 - (f)** Emergency response procedures and medical counter measures are in place to address potential exposure incidents.
- (iv) Secondary Elements - Community and Environment:** While laboratory personnel have direct exposure risks, the community at

large and the environment also require protection from potential release of biological agents from the laboratory. This secondary element protection is achieved through facility-level containment measures that prevent escape of potentially hazardous materials from the facility to the surrounding areas. The design must ensure that:

- (a) The laboratory building itself acts as a secondary containment barrier through sealed construction with all penetrations properly sealed and tested.
 - (b) All materials leaving the laboratory (whether air, liquid waste, or solid waste) are appropriately decontaminated or treated before environmental release.
 - (c) The facility maintains adequate separation from other institutional buildings, public areas, and community spaces.
 - (d) The design incorporates fail-safe mechanisms that maintain protective barriers even during equipment malfunctions or emergency situations.
 - (e) Monitoring and surveillance systems enable early detection of any containment breaches or operational anomalies.
- (v) **Containment strategy - four pillars of protection:** The BSL-3 facility shall achieve comprehensive containment through the integrated implementation of four complementary and mutually reinforcing containment strategies. No single strategy shall be considered sufficient in isolation.
- (a) **Physical Containment:** Physical containment refers to the use of engineering and design features to create physical barriers that prevent contact between personnel and biological agents. The facility design must be such that it facilitates (rather than hinders) the implementation of operational procedures. For example, the layout of work areas should minimize unnecessary traffic and cross-contamination; the placement of equipment should allow for proper work practices and proper storage; and the environmental conditions should support the effectiveness of decontamination procedures etc.
 - (b) **Safety Equipment:** Safety equipment, provides direct physical barriers between the operator and biological agents. The BSL-3 facility is designed to accommodate Class II, Type A2 or Type B2 biological safety cabinets that provide: required airflow that prevents escape of biological agents. Physical containment of the work surface and materials within the lab.
 - (c) **Facility Design:** The design of the facility itself provides a secondary containment layer that protects the environment and community from release of biological agents from the laboratory. This is achieved through:

- A.** Sealed and impermeable building envelope with all penetrations sealed.
- B.** Negative pressure maintained relative to non-containment areas, creating an inward airflow gradient.
- C.** HEPA filtration on all air exiting the facility to the environment.
- D.** Sealed waste decontamination systems that prevent release of biological agents through liquid or solid waste.
- E.** Restricted access with controlled entry/exit through decontamination procedures.
- F.** Monitoring and surveillance systems to detect any containment breaches.

- (d) Procedural Containment:** Procedural containment refers to the implementation of standard operating procedures (SOPs) and work practices that minimize risks through proper conduct of work. The facility design must support implementation of such procedures. For example, the workspace layout should minimize unnecessary movement that could increase contamination risk; the decontamination systems should be readily accessible and easy to use; the waste handling areas should be designed to facilitate proper decontamination procedures; and emergency systems should be clearly marked and accessible.

The facility design must support lab operational functions through appropriate infrastructure such as storage space, signage, proper coordination in workflow and in entry and exit, communication system, data management system, building management system, asset management system, store management system etc.

- (vi) Biosafety culture and design philosophy:** The overall philosophy of BSL-3 facility design is underpinned by a commitment to biosafety culture. Biosafety culture is defined as the set of norms, values, beliefs, and patterns of behaviour that are collectively shared by individuals working together to support and enhance best practices for laboratory biosafety. The facility design itself should embody and reinforce this biosafety culture by:

- (a)** Making containment features visible and prominent so that personnel are constantly reminded of the importance of safety.
- (b)** Designing work spaces to facilitate (rather than hinder) safe work practices - for example, providing adequate space for proper biological safety cabinet operation, locating emergency equipment prominently and accessibly, and organizing workflow to minimize unnecessary movement.

- (c)** Including redundancy in critical safety systems to demonstrate commitment to safety and to prevent situations where a single component failure compromises containment.
- (d)** Integrating monitoring and surveillance systems that allow continuous verification that the facility is operating as designed.
- (e)** Designing communication and alert systems that immediately notify personnel of any deviation from required operating parameters.
- (f)** Creating physical environments that are clean, well-maintained, and organized, which reinforces attention to hygiene and safety.
- (g)** Incorporating emergency response infrastructure (eyewash stations, showers, evacuation routes) in prominent locations to emphasize preparedness.
- (h)** Providing comfortable and functional work environments that do not impose undue hardship on personnel, which increases compliance with safety procedures.

Section V **‘Design Scope and Objective’**

- 6. Design objectives:** The overall design objectives for the BSL-3 facility at AIIMS Patna are:
- (i) To provide a completely isolated, separate facility with physical and administrative separation from general institutional areas, ensuring that the handling of high-risk biological agents is confined to a dedicated, controlled environment.
 - (ii) To establish and maintain a protective negative pressure gradient (as per guidelines) relative to non-containment areas in the facility, ensuring that any unintended leakage of air from the laboratory is inward (from less contaminated to more contaminated areas) rather than outward.
 - (iii) To implement comprehensive HEPA filtration on both inlet and outlet air streams, with design redundancy to allow maintenance of filtration capability during component maintenance or replacement.
 - (iv) To ensure biological safety cabinets and other primary containment equipment operate as designed with verified and validated performance meeting relevant standards (NSF/ANSI 49, WHO standards or as applicable).
 - (v) To design all interior surfaces (walls, floors, ceilings, benches, and equipment) using materials that are impermeable, corrosion-resistant, and capable of being effectively decontaminated using standard disinfectants and sterilization procedures.
 - (vi) To establish and maintain sealed waste decontamination systems that prevent environmental release of untreated biological waste in solid, liquid, or gaseous form.
 - (vii) To provide engineered redundancy in critical systems (HVAC, power supply, pressure monitoring, building management system, IT infrastructure, security and surveillance etc.) such that the failure of any single component does not result in loss of containment capability.
 - (viii) To integrate continuous monitoring and surveillance systems that provide real-time data on critical operating parameters (pressure differentials, HVAC performance, temperature, humidity) with automated alarms that alert personnel to any deviations from design specifications and standards.
 - (ix) To design the facility in compliance with all applicable national guidelines (DBT 2024, ICMR) or as amended from time to time, international standards (WHO, CDC), and Indian Building Standards (IS codes, NBC), as applicable.
 - (x) To facilitate the safe conduct of routine research, diagnostic, and quality control work with RG-3 pathogens and genetically engineered

organisms through design features that do not impose excessive operational constraints.

- (xi) To enable full certification of the facility by the Review Committee on Genetic Manipulation (RCGM) upon completion, demonstrating that all design specifications have been met and all mandatory commissioning tests and validation studies have been successfully completed.
- (xii) To support long-term operation and maintenance of the facility through design features that facilitate routine maintenance, periodic testing, and re-validation of critical parameters.

7. Scope of architectural and engineering services: The architectural and engineering services consultant shall provide comprehensive architectural and engineering services for the design, planning, specification, and technical documentation of the BSL-3 laboratory facility at AIIMS Patna. The scope encompasses all aspects of facility design, technical specifications, construction drawings, and preparation of documentation required for construction, commissioning, validation, and certification. The services shall be provided in accordance with the National Guidelines for Biosafety Level-3 (BSL-3) Containment Facility 2024 (DBT) and all referenced standards and regulations.

8. Context of 'the architectural services/architectural consultancy services/engineering services: The architectural services/architectural consultancy services/engineering services are required for establishing BSL-3 lab at AIIMS Patna which includes but not limited to *“Providing Comprehensive Architectural Planning, Designing, and Preparation of Master Plan including Design for Mechanical, Electrical and Plumbing (MEP) Systems, Designing for Retrofitting, Preparation of Execution Plan covering Detailed Specifications of Materials required/to be used for Construction of BSL-3 Laboratory and Equipment for the BSL-3 Lab and all allied architectural services required for setting up, validation and certification of BSL-3 Laboratory, Preparation of Detailed Project Report (DPR) with Bill of Quantities (BoQ) etc. for Establishment of this Biosafety Level-3 (BSL-3) Laboratory at AIIMS, Patna”*.

9. Overall objectives of the architectural consultancy services/engineering services: The fundamental objectives of the architectural and engineering services are:

- (a) To conduct a comprehensive site characterization and existing structure assessment to understand the baseline conditions for Lab in Lab BSL-3 facility design.
- (b) To prepare detailed architectural and engineering designs that fully comply with all requirements of the National Guidelines for BSL-3 Containment Facility 2024 (as amended from time to time).
- (c) To specify all building systems, equipment, materials, and finishes in accordance with relevant Indian Standards (IS codes) and international best practices aligned with prescribed national guidelines.

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- (d) To prepare comprehensive construction drawings and technical documents that provide sufficient detail for contractors to construct the facility to design specifications.
- (e) To specify all specialized equipment including biological safety cabinets, autoclaves, HVAC systems, and monitoring systems etc. with detailed performance requirements.
- (f) To design infrastructure that will facilitate successful commissioning, validation and certification as per DBT guidelines of the facility, including specification of validation and certification test protocols.
- (g) To prepare bills of quantities (BoQ) and preliminary cost estimates for all construction materials, equipment, and systems.
- (h) To provide technical guidance and coordination during the construction phase to ensure compliance with design specifications as per the requirement of the assignment.
- (i) To support preparation of commissioning and validation test protocols and participate in commissioning activities.
- (j) To prepare operation and maintenance manuals and documentation that will support long-term operation and periodic re-certification of the facility (as required).

Section VI **‘Schedule of Services & Compliances’**

10. Indicative services & scope components:

- (i) **Site analysis, investigation, and characterization:** The consultant shall conduct comprehensive site and existing structure investigation to understand site conditions, requirements, and opportunities for BSL-3 facility design within the dedicated building at AIIMS Patna. This investigation shall include but not limited to:
- (i) **Electrical supply:** Assessment of the adequacy of the existing electrical supply to meet the facility’s requirements, including provision of UPS systems, measures to prevent complete power failure in laboratory and operational areas, provisioning of dedicated diesel generator backup, and capability for 24×7 uninterrupted operations. The assessment shall also determine whether the existing supply is sufficient or if augmentation or upgrade from the utility provider is required.
 - (ii) **Water supply:** Evaluation of existing water supply infrastructure, capacity, water quality, pressure characteristics, and seasonal variations. Assessment of whether existing supply is adequate for facility needs including makeup water for HVAC systems, laboratory operations, emergency showers, and eyewash stations.
 - (iii) **Drainage and wastewater:** Evaluation of existing drainage infrastructure, capacity, and connection to municipal sewerage system. Assessment of adequacy for handling treated laboratory waste after biological and chemical/steamed decontamination.
 - (iv) **Telecommunications:** Evaluation of required communication infrastructure including fibre optic availability for building management systems and monitoring systems including security & surveillance. This must include necessary wiring arrangement for land line connection, wifi, D2H/Cable TV, CCTV Camera.
 - (v) **Compressed air and vacuum:** Assessment of required compressed air or vacuum systems, air lock system and determination of level of dedicated systems etc. as required for BSL-3 operations.
 - (vi) **Gas supply:** If required, assessment of availability & inclusion of specialty gases (nitrogen, argon, CO₂ etc.) provision in design, as needed for equipment operation or laboratory work.
- (ii) **Environmental and contamination assessment:** Assessment of environmental conditions and potential contamination sources:
- (a) Assessment of air quality and potential sources of air contamination (dust, pollen, vehicular emissions, industrial emissions) that may affect inlet air quality specifications.

- (c) **Decontamination/Ante-area:** An area between the main laboratory and non-containment areas that serves as a transition zone. This area shall include chemical disinfectant spray/wipe supplies, hand hygiene facilities, and temporary storage for materials being decontaminated. Design shall allow for proper hygiene practices before moving from the containment lab area.
- (d) **Equipment/utility room:** Space for installation of autoclaves, biological liquid waste decontamination systems, air handling units, electrical equipment, and other ancillary equipment.
- (e) **Material pass-through area:** A dedicated space for the double-sided pass-through autoclave or chamber used for transferring materials and samples between the containment laboratory and non-containment areas. This area shall have adequate space for safe operation of the pass-through unit and for handling of materials before and after transfer.
- (f) **Sample/specimen storage:** Secure, climate-controlled storage for samples and cultures awaiting processing. Storage shall be within the containment area with appropriate refrigeration units (4°C, -20°C, -80°C as needed) for sample preservation.
- (g) **Personnel facilities:** Areas for personnel to don (put on) PPE before entering the containment lab, including shelving for personal belongings, bench space for changing, and hooks for hanging protective apparel. Adequate space shall be provided to prevent cross-contamination between contaminated and uncontaminated items.
- (h) **Personnel facilities:** Areas for personnel to doff (remove) PPE and contaminated clothing when exiting the containment lab. Containers for disposable PPE and receptacles for reusable protective clothing that requires decontamination shall be provided. Provision for autoclaving as required.
- (i) **Emergency shower and eyewash:** Properly positioned emergency shower and eyewash stations shall be located at convenient locations, with at least one shower/eyewash station with direct access to emergency exit. These shall be installed in compliance with ANSI standards and shall provide tepid water suitable for emergency eye and body washing.

- (j) **Emergency exits:** Independent emergency exits shall be provided from the containment laboratory area, clearly marked with illuminated exit signage, with access to the external environment or to safe non-containment areas. Emergency exits shall be kept clear of obstruction and shall have self-closing mechanisms.
- (k) **Office/administrative area:** Space for administrative work, documentation, record keeping, and meetings related to laboratory operations. This area may be partially within the containment area (for supervisory staff) or in non-containment areas depending on operational needs.
- (l) **Support spaces:** Areas for supply storage, cleaning equipment, waste management, and other support functions required for laboratory operations.
- (vi) **Access control and security:** The facility design shall incorporate multiple levels of access control to ensure that only authorized, trained personnel can access the BSL-3 laboratory and to prevent unauthorized access. The design shall include:

 - (a) **Facility-level access:** A perimeter security system with controlled access to the entire BSL-3 facility building. This may include fencing wall or any suitable means, gates, or location within a secured section of the campus. Only authorized personnel with valid institutional credentials shall have access.
 - (b) **Building-level access:** Access to the building housing the BSL-3 laboratory shall be strictly controlled through a single designated entry point, equipped with electronic access control systems (such as card readers, biometric authentication, or a combination thereof). Entry shall be subject to monitoring through security personnel and/or surveillance systems to ensure regulated and authorized access at all times.
 - (c) **Laboratory-level access:** Controlled access to the primary containment laboratory through electronic access control systems. Access credentials should be registered in a log, which shall be maintained for security and biosafety tracking purposes. Only personnel who have completed required training and received authorization from the IBSC shall be granted access.
 - (d) **Anteroom/airlock access:** Entry to the laboratory shall be through a properly designed anteroom or airlock that creates a buffer zone between the non-containment and containment areas.

The anteroom design shall ensure that doors to the containment area and non-containment area cannot be opened simultaneously, preventing accidental creation of direct connections between containment and non-containment areas.

- (e) **Emergency access:** Emergency exits shall be provided to ensure safe and unobstructed evacuation in case of emergency, in compliance with applicable safety norms. Such exits shall allow quick egress, while incorporating suitable security measures (such as alarmed or monitored exits) to prevent unauthorized access. The design shall ensure that emergency exits do not compromise the safety, security, or containment of the facility.
- (f) **Three-tiered security system:** As specified in the DBT Guidelines, a three-tiered security system shall be built into the facility access control architecture. This may include: Tier 1 - General institutional facility access; Tier 2 - Specialized laboratory access with training requirement; Tier 3 - BSL-3 primary containment area access with additional authorization and medical clearance.
- (vii) **Material and surface specifications:** All interior surfaces, fixtures, and materials within the containment laboratory area shall be selected and specified to support biosafety objectives of decontamination, easy cleaning, and prevention of harbouring of biological agents. Detailed specifications shall be provided for.
 - (a) **Flooring:** The flooring system shall be designed to be durable, non-porous, and easy to clean and decontaminate, and shall prevent accumulation of contaminants. It shall support safe working conditions, including slip resistance where required, and shall ensure proper sealing at all junctions.
 - (b) **Walls:** Internal wall finishes shall be smooth, impermeable, and easy to clean, and shall prevent accumulation or penetration of contaminants. All joints, corners, and interfaces shall be designed to maintain continuous and sealed surfaces.
 - (c) **Ceilings:** Ceiling systems shall be designed to be non-porous, sealed, and compatible with decontamination processes, and shall avoid configurations that may lead to accumulation or concealment of contaminants. All service penetrations shall maintain integrity of containment.
 - (d) **Benches and work surfaces:** Work surfaces shall be smooth, non-absorbent, and resistant to operational conditions, and shall support repeated cleaning and decontamination. The design shall avoid gaps, joints, or features that may harbour contaminants.

- (e) **Doors:** Doors shall be designed to ensure controlled access, proper sealing, and safe operation, and shall support containment requirements. Door systems shall be configured to prevent unintended airflow or cross-contamination.
- (f) **Windows:** Windows, where provided, shall be designed to maintain containment integrity, safety, and environmental control, and shall prevent infiltration, contamination, or operational disturbance (as per DBT guidelines).
- (g) **Penetrations:** All penetrations for utilities and services shall be designed and executed to ensure airtightness, sealing integrity, and ease of inspection and maintenance, while maintaining containment requirements.
- (h) **Electrical outlets and switches:** Electrical systems shall be designed to ensure safe operation, protection against environmental exposure, and compatibility with cleaning and decontamination requirements, while supporting operational needs.
- (i) **Lighting fixtures:** Lighting systems shall be designed to provide adequate illumination for laboratory activities, while ensuring sealed integration with the building envelope and compatibility with cleaning and decontamination processes.
- (j) **Communication and monitoring systems:** Communication and monitoring systems shall be designed to ensure effective operational oversight, safety, and coordination, and shall be integrated in a manner that maintains containment and environmental integrity.

Note: All materials, finishes, and surfaces used in the facility shall be according to DBT guidelines and as per latest technology and must be robust, durable, and suitable for high-containment laboratory environments, and shall be capable of withstanding repeated exposure to cleaning, disinfection, and decontamination processes without deterioration of performance.

Such materials and surfaces shall be resistant to commonly used laboratory chemicals and disinfectants, and shall maintain their structural and functional integrity under normal operational conditions. They shall be non-fragile and resistant to breakage, cracking, peeling, or degradation during routine use.

Further, all surfaces shall be smooth, non-porous, and easy to clean, and shall not permit accumulation, absorption, or harbouring of contaminants. The design and selection of materials shall ensure long-term performance, operational safety,

and compatibility with biosafety requirements, in accordance with applicable standards and guidelines.

(viii) Decontamination systems and waste handling areas: The facility design shall include comprehensive systems for decontamination of waste materials and prevention of environmental release of biological agents. The design shall include:

- (a) Biological liquid waste decontamination system:** The facility shall be provided with a biological liquid waste decontamination system designed to ensure safe collection, storage, treatment, and disposal of laboratory-generated liquid waste in compliance with applicable biosafety and environmental regulations. The system shall be capable of adequate storage and handling of liquid waste based on operational requirements, and shall ensure effective treatment and decontamination, including appropriate provisions for achieving necessary contact, mixing, and treatment conditions. The design shall incorporate suitable arrangements for monitoring, control, and verification of treatment effectiveness, including sampling and operational checks, and shall ensure that the treated waste meets applicable discharge standards, including any required conditioning prior to disposal. All components of the system shall be durable, corrosion-resistant, and compatible with repeated exposure to chemicals and operational conditions, and the system as a whole shall ensure safe operation, containment, and prevention of environmental release, including appropriate sealing and emission control measures. The detailed system configuration, capacity, and technical specifications shall be finalized at the RFP stage/contract in accordance with applicable guidelines and project requirements. Also the material used should have enough shelf life.
- (b) Pass-through autoclave:** A double-sided, pass-through autoclave shall be installed to provide a barrier for decontamination of solid waste and materials. The design shall include: (a) Double-door design allowing loading from containment area and removal from non-containment area without creation of direct connection between areas; (b) Appropriate chamber size to accommodate anticipated waste volumes and equipment being sterilized; (c) Validation protocols to ensure sterilization of all waste; (d) Appropriate cycle selection for different waste types (wrapped items, unwrapped items, liquids, etc.); (e) Exhaust with HEPA filtration to prevent environmental release of steam or aerosols; (f) Connection to facility supply water and drainage systems.
- (c) BAG-IN-BAG-OUT (BIBO) system:** For items too large to fit through the pass-through autoclave (such as HEPA filters requiring replacement), a BIBO system shall be designed. The

system shall allow: (a) Double-bagging of contaminated materials in the laboratory; (b) External bag removal and decontamination after removal from laboratory; (c) Passage of contaminated items through a pass-through box or chamber with decontamination capability; (d) Final removal of items in non-contaminated form for appropriate disposal.

- (d) **Chemical disinfectant distribution:** The facility shall have convenient access to appropriate chemical disinfectants at: (a) Work benches for surface decontamination; (b) Exits from containment areas; (c) Waste handling areas. Disinfectants shall be specified for effectiveness against the pathogens being handled and shall be appropriate for use on laboratory surfaces, equipment, and waste.
 - (e) **Waste storage area:** Temporary storage shall be provided for: (a) Contaminated materials awaiting decontamination; (b) Decontaminated waste pending removal by waste contractor; (c) Appropriate receptacles for sharps, biohazard waste, and other waste types. The storage area design shall prevent odours, pest infestation, and environmental contamination.
 - (f) **Drainage and trap systems:** All floor drains and waste water pipes shall be: (a) Sealed to prevent back-siphoning and ingress of external contamination; (b) Equipped with appropriate traps (P-traps, S-traps or as applicable) to prevent gas backflow; (c) Regularly flushed and maintained; (d) Designed to facilitate cleaning and inspection. The design shall prevent accumulation of biological material in traps and drain lines.
- (ix) **Emergency systems and safety infrastructure:** The facility design shall incorporate comprehensive emergency systems including:
- (a) **Emergency eyewash and shower stations:** Clearly marked, accessible emergency eyewash and shower stations shall be provided at convenient locations. The design shall ensure: (a) Minimum required shower/eyewash stations in the facility, with at least 1 with direct access to emergency exit; (b) Tepid water temperature suitable for emergency use; (c) Easy activation (hands-free or minimal effort activation); (d) Adequate supply of water for continuous use; (e) Adequate drainage to prevent water accumulation and speedy removal; (f) Clear signage indicating location and operations in the entire lab and premises; (g) Regular maintenance and testing schedules.
 - (b) **Emergency power-off (EPO) switches:** High-visibility EPO switches shall be prominently located as per standard norms and regulations. All locations should be strategic locations. The EPO

switches shall immediately shut off all non-essential electrical power in case of emergency.

- (c) **Fire suppression systems:** The facility shall be provided with fire detection and suppression systems appropriate for high-containment laboratory environments, designed to ensure effective fire safety without compromising containment integrity and equipment. The system shall include provisions for early detection of fire hazards, suitable suppression mechanisms for different types of fire risks, and firefighting equipment at appropriate locations. The design shall also incorporate emergency lighting and safety provisions to facilitate safe evacuation and response during fire incidents. All fire safety equipment and systems shall be clearly identified and accessible, and shall comply with applicable fire safety regulations and standards. Detailed configuration, system selection, and technical specifications shall be proposed by the selected Architectural Consultancy Service Provider at the post-RFP stage, in accordance with applicable guidelines, standards, and project requirements, and shall be subject to review.
- (d) **Emergency communication system:** Two-way communication systems shall be provided to enable: (a) Communication from laboratory to emergency responders and institutional authorities; (b) Communication from laboratory management to laboratory personnel; (c) Audible and visual alarms for system malfunctions or breaches in containment; (d) Recording capability for incident documentation.
- (e) **Evacuation routes and signage:** Clear evacuation routes from the containment laboratory to external safety shall be: (a) Clearly marked with illuminated signage; (b) Maintained clear of obstructions; (c) Have emergency lighting functional during power failure; (d) Sized to allow rapid egress of all personnel from the facility; (e) Designed to prevent circulation back into the contaminated area during evacuation.
- (f) **Decontamination capability for personnel:** Systems for emergency decontamination of personnel during evacuation shall include: (a) Emergency shower capable of decontaminating personnel prior to leaving the facility; (b) Change facilities for removal of contaminated clothing; (c) Receptacles for contaminated clothing and PPE; (d) Connection to staff member tracking and medical evaluation if exposure has occurred.

- (x) **Mechanical and HVAC system design (critical component):** The HVAC (Heating, Ventilation, and Air Conditioning) system is the most critical engineering system in a BSL-3 facility. The HVAC design must establish and maintain the fundamental protective features of the BSL-3 facility: negative pressure gradient, HEPA filtration, appropriate air change rates, and directional airflow as per the latest regulatory and applicable guidelines. The entire facility design and personnel safety depends on proper HVAC design and operation. The HVAC design shall include but not limited to Overall HVAC system architecture, supply air handling, exhaust air handling, return air pathway and pressure relief etc.

Notes:

- (a) The HVAC system shall be designed as a dedicated, independent system serving only the BSL-3 facility. The system shall NOT be connected to or share components with the general institutional HVAC system. The BSL-3 system shall be completely independent to prevent potential cross-contamination between the BSL-3 facility and other institutional areas.
- (b) **Exhaust air handling:** Air exiting the laboratory shall be exhausted through a dedicated exhaust system. The exhaust air path shall include: (a) Exhaust collection ductwork throughout the containment area to capture all air; (b) Primary HEPA filter (99.97% efficiency or better) located immediately after collection of exhaust air, providing the first barrier for biological agents in exhaust air; (c) Optional charcoal adsorption filter for absorbing volatile organic compounds or other chemical contaminants if required by the nature of the pathogens being handled; (d) Secondary HEPA filter as a backup in case of failure of primary filter, allowing continued operation while primary filter is replaced; (e) Exhaust fan (typically at the end of the system to prevent pressurization of filter housings); (f) Exhaust ductwork routed to a stack location above the facility roofline.
- (c) Concept of pressure relief should be provisioned.

(xi) **Negative Pressure Maintenance and Control:** The negative pressure gradient is fundamental to BSL-3 containment. The facility must maintain negative pressure relative to the non-containment areas, such that any unintended leakage of air is inward (from outside the laboratory toward the inside) rather than outward. The design shall achieve and maintain:

- (a) **Target pressure:** The containment laboratory shall be designed to maintain appropriate negative pressure conditions relative to surrounding non-containment areas, so as to ensure containment of potentially contaminated air. The design shall provide for continuous

measurement, display of pressure including monitoring, and adjustment of pressure differentials, in coordination with relevant institutional and operational requirements. The specific pressure values and operating range shall be in accordance to DBT guidelines, and project requirements and must be specified at the detailed design stage.

(b) Pressure gradients: The facility shall be designed to establish a progressive negative pressure gradient from areas of lower contamination risk to areas of higher contamination risk, ensuring controlled directional airflow towards containment zones. The design shall define appropriate pressure relationships between non-containment areas, transition/anteroom spaces, and primary containment laboratories to maintain containment integrity and prevent reverse airflow. The specific pressure differentials shall be finalized at the detailed design stage, in accordance with applicable biosafety guidelines and project requirements.

(c) Failure mode and safety: The facility shall be designed to ensure that, in the event of mechanical or system failure, containment integrity is maintained to the extent practicable and appropriate fail-safe responses are triggered. The design shall incorporate provisions to ensure that airflow behaviour under failure conditions does not compromise containment, including suitable control logic between supply and exhaust systems. The system shall include automatic control measures to respond to imbalance conditions, along with alarm and monitoring mechanisms to alert personnel to any deviation from required pressure differentials. The design shall also ensure that no unintended airflow pathways or bypass routes are created that could defeat the containment strategy. Detailed failure modes, control strategies, and system responses shall be specified at the detailed design stage in accordance with applicable biosafety guidelines and project requirements.

(xii) Air change rate and airflow requirements: The facility shall be designed to achieve appropriate air change rates that ensure adequate dilution of any contaminants, maintenance of negative pressure, and removal of heat generated by equipment. The design specifications include:

(a) Air change rate (ACH): The facility shall be designed to provide adequate air exchange within containment areas to support effective dilution and removal of airborne contaminants, in accordance with applicable biosafety requirements. The design shall ensure that the air change rate is sufficient to maintain containment, environmental control, and operational safety, while allowing for flexibility to optimize

performance, energy efficiency, and system sizing. The specific air change rate and associated parameters shall be specified at the detailed design stage, in accordance with applicable guidelines and project requirements.

- (b) **Supply air volume and exhaust air volume:** The ventilation system shall be designed to ensure appropriate supply and exhaust air volumes for each functional space, based on factors such as room size, operational requirements, heat loads, environmental control needs, and containment objectives. The system shall maintain controlled airflow patterns and pressure relationships, including provision for exhaust air volume to suitably exceed supply air volume where required to achieve containment. The design shall allow for balancing, modulation, and optimization of air volumes to ensure stable and efficient operation under varying conditions. Detailed calculations, air volume requirements, and system configurations shall be provided at the detailed design stage, in accordance with applicable biosafety guidelines and project requirements.
- (c) **Airflow patterns and directional airflow:** The facility shall be designed to establish and maintain controlled and directional airflow patterns that support containment and safe laboratory operations. Air distribution shall ensure effective movement of air across work areas without stagnation, avoiding the formation of dead zones or recirculation pockets. The design shall promote movement of air from clean to potentially contaminated zones and ensure that airflow around critical work areas supports operator safety and containment objectives. Provision shall be made for verification of airflow patterns during commissioning to confirm compliance with design intent and applicable biosafety requirements.
- (d) **Turbulence and airflow velocity:** The facility shall be designed to maintain optimum airflow velocity and stability to ensure effective removal of airborne contaminants while minimizing turbulence that could adversely affect containment or laboratory operations. The airflow characteristics shall be such that disturbance of contaminants is avoided and performance of critical equipment is not compromised. The specific airflow velocities and design parameters shall be finalized at the detailed design stage, in accordance with applicable biosafety guidelines and project requirements.
- (e) **Air distribution diffusers and returns:** The design shall provide for appropriate placement and configuration of supply and return air elements to support effective ventilation and containment requirements. The system shall ensure balanced air distribution across

different areas, with provisions for adjustment and fine-tuning during commissioning and operation. Adequate consideration shall be given to accessibility for inspection, cleaning, and maintenance. Detailed arrangement and specifications shall to be specified at the detailed design stage, in accordance with applicable guidelines and project requirements.

(xiii) HEPA Filtration Requirements: HEPA (High Efficiency Particulate Air) filtration is critical for preventing release of biological agents to the environment. The HEPA filter specification shall include:

- (a) Filter standard and efficiency:** HEPA filters shall meet the definition of removing 99.97% of particles 0.3 microns or better as per applicable standards. The specification shall require certification of filter efficiency by an accredited testing laboratory.
- (b) Filter location - inlet (supply) air:** The facility shall be designed to ensure that incoming air to containment areas is appropriately treated and filtered to maintain required environmental quality and protect personnel and operations. The filtration system shall be designed to ensure effective removal of particulates and contaminants, with suitable provisions to enhance system performance and service life. The detailed filtration configuration, stages, and the final design parameters and system details shall be adhered to during the detailed design stage, in accordance with applicable standards and regulatory framework.
- (c) Filter location - exhaust air:** The facility shall be designed to ensure that exhaust air from containment areas is appropriately filtered prior to discharge, so as to prevent release of contaminants into the external environment. The filtration arrangement shall incorporate redundancy and reliability features to maintain containment integrity and allow safe operation during maintenance or component failure. The overall system shall be designed to ensure safe handling and discharge of exhaust air, consistent with biosafety and environmental requirements. The detailed filtration arrangement and system configuration must be developed and delivered during subsequent design stages, in accordance with applicable guidelines and project requirements.
- (d) Filter sizing and pressure drop:** The filtration system shall be designed such that filter capacity and airflow handling are appropriately matched to operational requirements, ensuring effective performance under both clean and loaded conditions. The design shall account for progressive loading of filters over time, while maintaining

required airflow, pressure relationships, and containment integrity. Adequate provisions shall be made to ensure continuity of operation and minimal disruption during maintenance or replacement of filters. The detailed sizing approach, performance parameters, and system arrangements shall be included during the design development stage, in accordance with applicable guidelines and project requirements.

(e) Filter housing and connections: The filtration system shall be designed with robust and adequately supported housings to ensure structural integrity and reliable operation. The arrangement shall ensure airtight sealing and prevention of air bypass, including at joints, access points, and connections. Provisions shall be made for safe isolation and maintenance of filtration units without compromising overall system integrity, along with suitable means for monitoring filter performance and condition. The system shall also facilitate verification and testing of filtration effectiveness as required. The detailed configuration and associated provisions must be included during the detailed design stage, in line with applicable biosafety and project requirements.

(f) Filter replacement and disposal: The design shall facilitate safe filter replacement: (a) Filters shall be accessible for replacement without requiring entry into contaminated areas; (b) Appropriate containment during filter removal shall prevent environmental release of any biological agents that may have been collected by the filter; (c) The BIBO (Bag-In-Bag-Out) system or other containment method shall allow removal of contaminated filters; (d) Filters shall be decontaminated (typically through steam sterilization in autoclave or chemical treatment) before disposal or incineration.

(xiv) Biological safety cabinet (BSC) exhaust integration: The facility HVAC design must be fully integrated with the operation of Class II Biological Safety Cabinets. BSC exhaust airflow must be accommodated and handled appropriately:

(a) Exhaust ducting: Each biological safety cabinet shall have dedicated exhaust ducting that: (i) Connects to a dedicated exhaust plenum or ductwork from the cabinet; (ii) Is properly sized for the airflow rate of the cabinet (iii) Has no dampers or devices that restrict airflow or create back-pressure (unless specifically designed for that purpose); (iv) Includes appropriate drains and provisions to prevent water accumulation in ducts; (v) Is accessible for cleaning and inspection.

(b) Exhaust plenum or manifold (as per requirement): BSC exhaust from multiple cabinets may be combined into a common exhaust plenum or ductwork system. The design shall: (a) Ensure that the plenum is

properly sized to handle the combined airflow without back-pressure; (b) Prevent back drafting that could cause one cabinet to pull contaminated air from another; (c) Include appropriate baffles and separators if needed; (d) Connect to the facility HEPA filtration and exhaust system.

- (c) **Exhaust fan sizing:** The facility exhaust fan shall be sized to accommodate: (a) General room exhaust based on air change rate; (b) Biological safety cabinet exhaust; (c) Equipment exhaust as applicable; (d) Margin for filter loading and system impedance; (e) Capability to maintain required negative pressure even at peak usage.
- (d) **Pressure and airflow monitoring in BSC exhaust:** Monitoring systems shall verify: (a) That BSC exhaust is not being back-pressured by facility exhaust system limitations; (b) That each BSC is drawing appropriate inward airflow for safe operation; (c) Any change in BSC exhaust conditions that might indicate filter loading or system problems.

(xv) Environmental Conditions - Temperature and Humidity: The HVAC system shall maintain appropriate temperature and humidity conditions for personnel comfort and equipment operation:

- (a) **Temperature:** The facility shall maintain a comfortable temperature during normal working hours. During periods when the facility is unoccupied, temperature may be allowed to drift within a wider range to conserve energy, but should still maintain conditions that do not promote microbial growth. The design shall include appropriate heating and cooling capacity to maintain temperature even during extreme weather conditions.
- (b) **Humidity:** Relative humidity should be maintained in the range to provide comfort and prevent excessive static electricity. Humidity too low (below 30% or as applicable) can cause static electricity discharges and discomfort; humidity too high (above 60% or as applicable) can promote condensation and microbial growth. The HVAC system shall include appropriate humidification or dehumidification equipment to maintain humidity within this range under varying external humidity conditions.
- (c) **Controls and set points:** The HVAC system shall include thermostats and humidity sensors to control temperature and humidity. The controls shall: (a) Allow adjustment of set points; (b) Include override capability for emergency situations; (c) Provide indication of current conditions; (d) Interface with the building automation system for monitoring and documentation of conditions.

(xvi) Noise control: HVAC equipment and airflow can generate noise that affects laboratory operations and personnel. The design shall minimize noise through:

- (a) **Equipment location:** HVAC equipment (fans, compressors) shall be strategically located w.r.t. the laboratory or in mechanically isolated equipment rooms to minimize transmission of noise into the laboratory.
- (b) **Vibration isolation:** Equipment shall be mounted on vibration isolation pads or springs to prevent transmission of vibration to the building structure.
- (c) **Ductwork lining:** Supply and exhaust ductwork may be lined with acoustic material to reduce noise transmission. Materials used shall be appropriate for biological safety applications (smooth, non-porous surfaces that can be easily decontaminated as per requirement).
- (d) **Diffuser design:** Supply air diffusers shall be designed to minimize noise from high-velocity air jets entering the laboratory.
- (e) **Target noise level:** The facility shall be designed to ensure that background noise levels remain within acceptable limits to support safe, comfortable, and effective laboratory operations, including normal communication among personnel. The design shall consider measures to minimize noise generated by equipment and building systems, thereby providing a conducive working environment. The specific noise criteria and control measures shall be provided by the service provider, in accordance with applicable standards and project requirements.

(xvii) Electrical and power system design: The electrical and power system design is critical for ensuring 24/7 reliable operation of the BSL-3 facility. The facility must maintain containment and operational capability even during power disruptions or emergencies. The facility shall have dedicated electrical infrastructure designed to ensure uninterrupted power supply for critical systems. The electrical design shall include but not limited to:

- (a) **Main electrical supply:** The facility shall have a dedicated electrical feed from the main transformer or distribution board of AIIMS Patna as the case may be. The capacity shall be sized to accommodate: (a) Peak demand during full facility operation with all equipment running; (b) HVAC system at full load; (c) Lighting and emergency systems; (d) Charging of backup power systems. The estimated peak demand and flexibility for future electrical demand shall be calculated during design based on equipment specifications and operational requirements.
- (b) **Uninterruptible power supply (UPS):** An Uninterruptible Power Supply system shall be installed to provide temporary backup power in case of utility power failure. The UPS shall: (a) Be sized with minimum 2 hours autonomy to allow safe shutdown of all equipment and possible transition to generator power; (b) Provide power to critical systems including: pressure monitoring and alarms, lighting in containment areas, emergency communication system, building management system, and biological safety cabinets if in use; (c) Be installed in a dedicated, climate-controlled, secure room with proper

ventilation; (d) Include battery modules with appropriate capacity and technology; (e) Have redundant charger and inverter units to ensure continued operation if a single unit fails; (f) Include monitoring and alarm systems to alert personnel to battery status and need for replacement.

- (c) **Diesel generator:** A dedicated silent diesel generator set shall be installed to provide extended backup power in case of prolonged utility failure. The generator shall: (a) Be sized to provide power for all essential facility systems; (b) Be housed separately with appropriate exhaust and soundproofing; (c) Have automatic transfer switch (ATS) that automatically switches to generator power if utility power is lost, and back to utility power when it is restored; (d) Include load management system that sheds non-essential loads if generator capacity is exceeded; (e) Be regularly tested and maintained to ensure operational readiness; (f) Have exhaust ductwork appropriately routed to prevent back-drafting or contamination of facility.
- (d) **Automatic transfer switch (ATS):** An ATS shall automatically transfer critical electrical loads from main utility supply to UPS when power is lost, and from UPS/generator back to utility supply when it is restored. The ATS design shall: (a) Ensure seamless switching with no or minimal power interruption; (b) Prevent dangerous back-feed of generator power to the utility supply; (c) Include manual bypass capability to allow manual control during maintenance; (d) Have appropriate protective relays and monitoring.

(xviii) **Electrical distribution and circuits:** The facility shall have a comprehensive electrical distribution system designed to safely distribute power to all systems:

- (a) **Main distribution board:** A main electrical distribution board shall be located in a dedicated, accessible electrical room. The board shall: (a) Receive the main electrical feed and distribute power to various sub-circuits and equipment; (b) Include appropriate main disconnects allowing shutdown of all facility power in case of emergency; (c) Include protective devices (circuit breakers, ground fault protection) on all circuits; (d) Have a large reserve capacity (30-35%) for future expansions or equipment additions; (e) Be clearly labelled and documented with circuit diagrams.
- (b) **Electrical circuits and outlets:** The facility shall be served with appropriate electrical circuits including: (a) Dedicated circuits for HVAC equipment, compressors, and motors; (b) Circuits for laboratory equipment and biological safety cabinets; (c) Circuits for lighting; (d) Circuits for emergency systems; (e) Circuits for charging of UPS systems; (f) Redundant circuits for critical equipment allowing operation with single circuit failure; (g) Adequate capacity margin (30-35%) on all circuits to prevent overloading; (h) Circuit for Building

Management System (BMS); (i) Circuit for IT infrastructure and security surveillance system.

- (c) **Safety outlets and switches:** All electrical outlets and switches in laboratory areas shall: (a) Be GFCI (Ground Fault Circuit Interrupter) protected to prevent electrocution hazards in wet areas; (b) Be positioned at appropriate heights and locations to support laboratory work without use of extension cords; (c) Have sufficient number to prevent necessity for daisy-chaining of power strips; (d) Be protected with covers or housings to prevent water infiltration; (e) Be appropriately grounded and bonded to ensure safety; (f) Be compliant with standards of BSL-3 Labs; (g) Be compliant to the containment requirement of BSL-3 Labs.
- (d) **Pendant power and ceiling outlets:** For convenience of laboratory work, pendant power supplies or ceiling outlets may be provided for equipment that is frequently repositioned. The design shall ensure: (a) Safe mechanical attachment without risk of dropping equipment; (b) Appropriate circuit protection and electrical safety; (c) Adequate cable length and flexibility without creating tripping hazards.

(xix) Lighting systems: Proper lighting is essential for laboratory operations and for assessment of cleanliness of work surfaces. The lighting design shall include:

- (a) **Illumination level:** The facility shall be designed to provide illumination level of minimum 500 lux (50 foot-candles) on laboratory work surfaces. This level is sufficient for detailed laboratory work and for assessment of surface cleanliness. Some areas (e.g., microscopy areas) may require higher illumination levels up to 750 lux. Lighting design shall take into account daylight availability (if any) and provide supplemental electric lighting as needed.
- (b) **Light source type (indicative):** The facility shall be designed to provide energy-efficient lighting solutions suitable for laboratory environments, ensuring adequate illumination for safe and effective operations. The lighting design shall consider visual comfort, operational requirements, and energy efficiency, and may incorporate appropriate provisions for adjustment of light levels as required. The selection of lighting systems shall minimize heat generation and support long-term operational reliability with reduced maintenance needs.

Notwithstanding the above, the lighting design shall be fully compliant with the requirements applicable to BSL-3 facilities and the relevant regulatory guidelines.

- (c) **Light fixture mounting and design:** All lighting fixtures shall: (a) Be flush-mounted to ceiling or wall surfaces (no recessed fixtures with open cavities); (b) Have sealed trim rings and housings to prevent dust

- accumulation; (c) Be constructed of materials that can withstand decontamination (stainless steel or epoxy-coated); (d) Be positioned to avoid shadows on work surfaces; (e) Have appropriate diffusers or shades to prevent glare; (f) Be installed with sealed conduit and penetrations through walls/ceiling.
- (d) Emergency lighting:** In addition to normal work lighting, the facility shall include: (a) Battery-backup emergency lighting in all work and egress areas that automatically activates if main power fails; (b) At least 10 foot-candles (approximately 100 lux) of illumination in egress paths and emergency exits; (c) Visual alarm strobes in addition to audible alarms for emergency situations; (d) Emergency lighting powered by the UPS system with minimum 2 hours autonomy.
- (e) Switches and controls:** Lighting switches and controls shall: (a) Be clearly marked and logically grouped (e.g., separate switches for different lab areas); (b) Include manual override switches for emergency situations; (c) Interface with building automation system for monitoring and scheduling; (d) Have appropriate protection against accidental activation (e.g., covers on master switches).
- (xx) Electrical safety and grounding:** Comprehensive electrical safety measures shall be incorporated in the design:
- (a) Grounding and bonding:** All metallic equipment and surfaces shall be properly grounded and bonded to a common grounding system to prevent electrical shock hazards and to provide safe paths for fault currents. The grounding system shall: (a) Include a ground rod driven into the earth; (b) Connect all metal frames, housings, and large equipment to the ground system; (c) Use appropriately sized conductors for bonding; (d) Be tested for continuity and proper resistance.
- (b) Protective devices:** The electrical system shall include protective devices to prevent shock hazards and fire risks: (a) Circuit breakers sized appropriately for the circuits they protect; (b) Ground Fault Circuit Interrupter (GFCI) protection in bathrooms, around sinks, and other wet areas; (c) Surge protection devices to protect sensitive equipment from voltage spikes; (d) Arc Flash hazard assessment and appropriate personal protective equipment if maintenance work is required.
- (c) Electrical panel labelling:** All electrical panels, circuits, and breakers shall be clearly labelled to identify what equipment or areas they serve. The labelling shall be: (a) Durable and permanent; (b) Legible and understandable; (c) Updated whenever circuits are changed; (d) Supported by circuit diagrams posted in the electrical room.
- (d) Maintenance access:** The electrical room and equipment shall be: (a) Clearly marked and labelled; (b) Kept locked to prevent unauthorized access; (c) Accessible to authorized maintenance personnel; (d) Kept

clear of storage of materials or equipment; (e) Appropriately sized to allow safe working space around equipment.

(xxi) Plumbing and Water Systems Design: The plumbing and water systems are critical for laboratory operations, personnel safety, and waste decontamination. The design shall ensure reliable supply of appropriate water and safe disposal of contaminated wastewater. The facility shall have dedicated water supply infrastructure meeting all operational requirements. The plumbing design shall include:

- (a) Main water supply:** The facility shall receive adequate water supply from the institutional water system. The design shall: (a) Have a dedicated water meter to measure water consumption; (b) Have isolation valves to allow shutdown of water supply for maintenance without affecting other institutional areas; (c) Include pressure regulation to maintain appropriate supply pressure; (d) Provide backup storage or pressure maintenance system to ensure supply even if institutional water pressure drops.
- (b) Water supply uses:** Water supply shall serve multiple needs: (a) Laboratory work including media preparation, culture washing, equipment operation; (b) Hand-washing and hygiene at sinks; (c) Emergency eyewash and shower stations requiring large volumes of tepid water; (d) HVAC system makeup water for humidification and evaporative cooling; (e) Equipment operation including autoclaves and other equipment requiring water.
- (c) Tempering valve for emergency showers:** Emergency eyewash and shower stations require tepid water (approximately 25°C or as applicable) for comfortable use and to prevent thermal shock. A mixing valve or thermostatic valve shall: (a) Blend hot and cold water to achieve approximately 25°C or as applicable; (b) Automatically adjust to maintain constant temperature as incoming water temperatures vary; (c) Be readily accessible for maintenance and adjustment; (d) Include pressure limiting to prevent excessive pressure/temperature.
- (d) Hot water supply:** Hot water may be required for: (a) Personnel hand washing; (b) Autoclave operation; (c) Equipment operation. The design shall include: (a) Electric water heater or connection to institutional steam/hot water system; (b) Appropriate insulation of hot water pipes to prevent heat loss and condensation; (c) Temperature and pressure relief valve; (d) Return circulation loop to maintain temperature availability without excessive waiting time.

(xxii) Waste-water and liquid waste system: The facility shall have comprehensive systems for collection, treatment, and disposal of contaminated waste-water to prevent environmental contamination:

- (a) Contaminated waste stream separation:** Laboratory waste-water shall be separated from other building drainage to allow appropriate

treatment. The design shall: (a) Collect all potentially contaminated waste-water from laboratory areas (sinks, equipment drains, autoclave condensate) into a separate waste stream; (b) Provide individual floor drains throughout the laboratory with appropriate traps; (c) Route all contaminated waste-water to the biological liquid waste treatment system. This contamination requirement is for reference only, however the architect consultant must evaluate and adhere to the norms required for BSL-3 and environment protection laws.

- (b) **Floor drains and traps:** Each floor drain shall: (a) Have appropriate P-trap or S-trap to prevent back-siphoning of sewer gases into the laboratory; (b) Be regularly flushed and maintained to prevent accumulation of biological material; (c) Have accessible cleanout ports for maintenance; (d) Be designed to prevent overflow into laboratory areas during system overload; (e) Include screens or strainers to prevent larger debris from entering the system.
- (c) **Liquid waste treatment system:** The facility shall be provided with a system for collection, treatment, and safe disposal of laboratory-generated liquid waste, ensuring that such waste is rendered non-hazardous prior to discharge.

The design shall ensure that liquid waste is adequately treated and conditioned to meet applicable environmental and biosafety standards before being discharged into the sewerage system. The system shall incorporate appropriate provisions for controlled handling of treatment effectiveness, along with safeguards to prevent any untreated or inadequately treated discharge. The overall arrangement shall ensure protection of personnel, environment, and public health, and shall not result in any adverse impact on the surrounding community.

Notwithstanding the above, the system shall be in full compliance with applicable biosafety, environmental, and statutory guidelines.

- (d) **Autoclave drain connections:** Autoclaves generate condensate water that must be: (a) Appropriately cooled before entering the drainage system to prevent thermal stress on pipes; (b) Treated as contaminated waste and routed through the waste treatment system; (c) To ensure it does not bypass the treatment system.
- (e) **Dedicated effluent treatment plant (ETP):** The facility shall include with an Effluent Treatment Plant (ETP) for collection, treatment, and safe disposal of waste generated from the facility, ensuring that the treated effluent meets applicable environmental and statutory discharge standards prior to release into the sewerage system or other approved disposal points.

The ETP shall be designed to handle the anticipated quantity and characteristics of effluent, incorporating appropriate treatment processes to achieve the required quality of discharge. The system shall include provisions for treatment of laboratory-related liquid waste streams, including those arising from activities involving biological materials, samples, and other potentially contaminated waste, ensuring that such waste is adequately treated and rendered non-hazardous prior to discharge.

The system shall include provisions for monitoring, control, and verification of treatment performance, along with safeguards to prevent discharge of untreated or inadequately treated effluent. The overall arrangement shall ensure safe operation, environmental protection, and compliance with applicable regulations, without adverse impact on public health or surrounding areas. The design shall also consider operational reliability, ease of maintenance, shall be insulated from clash and ensure coordination with long-term sustainability.

The ETP area and associated access points shall be designed with appropriate containment measures, including provision of an airlock or necessary arrangement, to ensure controlled movement and prevent any potential release of contaminants.

The detailed process configuration, treatment methodology, and technical specifications shall be developed during design stages, in accordance with applicable environmental guidelines and project requirements.

(xxiii) Compressed air and vacuum systems: Some laboratory equipment and biosafety cabinets may require compressed air or vacuum for operation. The design shall include:

- (a) Compressed air system:** Wherever, compressed air is required for equipment operation: (a) A compressed air system shall be provisioned; (b) Appropriate filtration (oil removal, water removal, particle removal) shall be installed to provide clean, dry compressed air; (c) Pressure regulation and check valves shall prevent contamination backflow; (d) Drain valves shall be provided for periodic removal of condensate; (e) Air quality shall meet specified standards for laboratory equipment.
- (b) Vacuum system:** Wherever, vacuum is required for equipment operation or BSC function: (a) A vacuum system shall be provisioned; (b) Appropriate filtration and trap systems shall prevent contaminated material from entering the pump; (c) Vacuum pump exhaust may require HEPA filtration if vacuum is used for handling biological

materials; (d) Pressure monitoring and check valves shall indicate proper vacuum operation.

(xxiv) Fire safety and detection systems: Comprehensive fire safety measures shall be incorporated into the facility design, recognizing the specific requirements of high-containment laboratory environments. The design shall also include an assessment of the existing fire protection systems available at the site, and, where feasible, the proposed systems shall be integrated with or aligned to the existing infrastructure, with necessary augmentation or modifications to meet applicable safety and regulatory requirements. The following are indicative requirement:

- (a) Smoke and heat detectors:** Smoke and heat detectors shall be installed throughout the facility to detect fires at an early stage. The design shall include: (a) Smoke detectors in all areas to detect combustion by-products; (b) Heat detectors in areas where smoke detectors might be triggered by steam or dust (e.g., equipment rooms); (c) Detectors positioned to provide complete coverage without dead zones; (d) Connection to the facility fire alarm system.
- (b) Fire alarm system:** A fire alarm system shall: (a) Provide audible and visual alarm throughout the facility when fire is detected; (b) Automatically contact the fire department or institutional security/emergency response; (c) Include manual alarm stations (pull-stations) at multiple locations for manual activation if needed; (d) Be monitored 24/7 for system integrity; (e) Include recording capability for documentation of alarm activation and response.
- (c) Emergency lighting in egress paths:** Emergency lighting shall activate upon fire detection or power loss to illuminate all egress paths, emergency exits, and key areas to enable safe evacuation.

(xxv) Fire suppression systems: Specialized fire suppression systems appropriate for biological laboratories shall be installed such as:

- (a) Wet sprinkler system:** A wet sprinkler system (or as suitable in the high containment lab such as BSL-3 Lab) using water shall be installed for fire suppression. The system design shall: (a) Provide coverage of all laboratory and support areas; (b) Use water as the suppression medium (The fire suppression system, which can create pressure transients damaging to containment barriers, or other agents that could interfere with biological safety, should be avoided); (c) Automatically activate when fire temperature is detected at sprinkler heads; (d) Include manual valve to allow shutdown of system if accidental activation occurs; (e) Have pressure/flow monitoring to indicate system status; (f) Could be regularly tested and maintained.

- (b) Manual fire extinguishers:** Portable fire extinguishers shall be provided at strategic locations (near exits, near high-risk equipment areas) for use against small fires that can be safely attacked. The extinguishers shall: (a) Be of appropriate type for fires likely in a laboratory (Class A and B multipurpose extinguishers as suitable for this Lab); (b) Be clearly marked and readily accessible; (c) Could be regularly inspected and serviced.
- (c) Suppression system impact on containment:** The design shall ensure that: (a) Activation of fire suppression systems does not compromise containment of biological agents; (b) Water from sprinklers and manual suppression systems does not escape to non-containment areas in ways that could spread contamination; (c) Drainage of water from the laboratory is routed through decontamination systems if necessary; (d) The facility can be re-established in a contained state after fire suppression system activation.
- (xxvi) Monitoring, control, and building automation systems:** Real-time monitoring and control of facility parameters is essential for ensuring continued safe operation and for early detection of any system malfunction. Comprehensive monitoring and building automation systems shall be designed to provide (indicative list is mentioned below):

 - (a) Pressure monitoring system:** Continuous monitoring of pressure differentials is critical to verify that negative pressure containment is being maintained.
 - (b) Pressure sensors and measurement points:** Differential pressure sensors shall measure: (a) Pressure differential between the primary containment laboratory and non-containment areas; (b) Pressure differential between BSL-3 laboratory and anteroom/transition area; (c) Pressure differential across HEPA filters to indicate filter loading and need for replacement; (d) Absolute air pressure in the laboratory.
 - (c) Sensor specification and installation:** Pressure sensors shall: (a) Have appropriate range and sensitivity to measure differentials of ± 5 Pa with accuracy of ± 0.5 Pa; (b) Be properly installed with appropriate tubing and vents to avoid measurement errors from vibration or thermal effects; (c) Could be regularly calibrated to ensure accuracy (calibration interval may be provided); (d) Be selected for durability and reliability in laboratory environments.
 - (d) Pressure indication:** Pressure values shall be: (a) Continuously displayed on a digital indicator or building automation system screen; (b) Recorded by data logging system for documentation of facility performance over time; (c) Accessible to facility personnel to monitor

current status; (d) Connected to alarm systems to alert personnel to deviations from design parameters.

- (e) **Alarm set-points:** Alarm systems shall be configured to alert personnel if: (a) Pressure falls below minimum target value; (b) Pressure becomes positive or less negative (loss of negative pressure containment); (c) Pressure becomes extremely negative (HVAC system failure or blockage); (d) Rate of pressure change is unusual (indicating system malfunction). Alarms shall be both audible and visual to ensure personnel awareness.
- (xxvii) **Airflow monitoring:** Verification that the HVAC system is delivering appropriate airflow is essential for proper containment:
- (a) **Airflow measurement devices:** Airflow shall be monitored through: (a) Anemometers or airflow sensors in supply and exhaust ducts to measure volumetric flow rate; (b) Differential pressure sensors across the supply and exhaust fans to indicate fan performance; (c) HEPA filter differential pressure sensors to indicate filter loading.
 - (b) **Airflow indication and recording:** Airflow data shall be: (a) Displayed on monitoring system showing current airflow rates; (b) Recorded by data logging for documentation of facility performance; (c) Analyzed to verify that target air change rates (as required by the DBT guidelines) are being achieved; (d) Trended over time to identify any degradation in system performance.
 - (c) **Airflow alarms:** If airflow drops below minimum required levels, alarms shall alert personnel. The alarms shall be configured with: (a) Set-points reflecting minimum required airflow rates; (b) Audible and visual alarm indication; (c) Recording of alarm events for incident documentation and to be integrated with BMS.
- (xxviii) **Temperature and humidity monitoring:** environmental conditions of temperature and humidity affect personnel comfort, equipment operation, and potential for microbial growth:
- (a) **Temperature sensors:** Temperature sensors shall: (a) Be distributed throughout the facility to measure temperature in work areas and equipment rooms; (b) Include set-point control to activate heating or cooling if temperature drifts outside acceptable range; (c) Provide continuous indication of current temperature; (d) Be recorded for documentation of environmental conditions.
 - (b) **Humidity sensors:** Humidity sensors shall: (a) Measure relative humidity throughout the facility; (b) Provide indication of current humidity levels; (c) Be recorded for documentation; (d) Have set-points to activate humidification or dehumidification if humidity drifts outside acceptable range.

- (c) **Alarms and alerts:** If temperature or humidity drift outside acceptable ranges, alerts may be issued to inform personnel. However, such deviations are not usually emergencies requiring immediate evacuation; rather, they warrant investigation of the cause and adjustment of HVAC controls.

(xxix) Building automation and control system (BAS/BMS): A comprehensive Building Automation System (BAS) or Building Management System (BMS) shall be installed to integrate monitoring and control of all facility systems:

- (a) **System architecture:** The BAS shall: (a) Receive inputs from all monitoring sensors (pressure, airflow, temperature, humidity, filter status, etc.); (b) Provide control outputs to HVAC equipment, fan variable frequency drives, dampers, and other equipment; (c) Process data and implement control logic to maintain design operating parameters; (d) Provide user interface for facility personnel to view status and adjust set-points; (e) Record all data to hard disk or cloud storage for long-term documentation.
- (b) **Control logic:** The BAS shall implement control logic to: (a) Maintain target negative pressure by automatically adjusting exhaust fan speed to balance supply and exhaust airflow; (b) Maintain target temperature and humidity through operation of heating, cooling, and humidification equipment; (c) Monitor HEPA filter differential pressure and alert personnel when filter replacement is needed; (d) Implement fault detection and diagnosis to identify system malfunctions; (e) Implement interlocks to prevent operation of supply fan if exhaust is compromised or if negative pressure cannot be maintained.
- (c) **User interface:** The BAS user interface shall: (a) Display current values of all monitored parameters on computer screens or mobile devices; (b) Show historical trends of parameters over hours, days, or weeks; (c) Allow authorized personnel to adjust set points and operating schedules; (d) Provide alerts and alarms for any system deviations; (e) Include password protection to prevent unauthorized changes to control settings; (f) Be located in the facility (or accessible remotely) for continuous monitoring of facility status.
- (d) **Data logging and documentation:** The BAS shall maintain detailed records of: (a) All measured parameters (pressure, airflow, temperature, humidity, fan speeds, filter status, etc.); (b) All equipment operation (when fans start/stop, when heating/cooling is activated, etc.); (c) All alarm and alert events with time stamps; (d) All manual adjustments made by personnel; (e) All maintenance activities and calibrations performed. These records shall be retained for minimum 5

years to document facility performance and to support certification and re-validation activities.

(xxx) Security and access control system: Electronic access control systems shall manage and monitor access to the facility:

- (a) Access control readers:** Electronic access control shall utilize: (a) Card readers using institutional ID badges with embedded RFID or magnetic stripe technology; (b) Biometric readers such as fingerprint or iris scan for high-security access to primary containment area; (c) PIN (personal identification number) entry keypads as secondary/backup authentication.
- (b) Access logging:** The access control system shall maintain detailed logs of: (a) Who accessed the facility, when, and for how long; (b) Any unauthorized access attempts; (c) Any system malfunctions or security breaches. These logs shall be retained for minimum 1 year and reviewed periodically for security audit.
- (c) Integration with other systems:** The access control system shall: (a) Interface with the building automation system to potentially restrict facility access if dangerous conditions exist (e.g., loss of negative pressure); (b) Record access events in conjunction with other facility events for incident investigation if needed; (c) The facility shall be equipped with a system capable of automated lockdown in emergency situations, whereby access points are automatically controlled or restricted based on predefined emergency conditions. The system shall ensure that unauthorized entry is prevented, while allowing safe and unobstructed egress for personnel, and maintaining the required containment integrity and security of the facility.

The system shall further incorporate provisions for controlled and authorized emergency override, enabling access to designated emergency response personnel (such as rescue, fire, or medical teams) through predefined protocols, without compromising overall safety and containment requirements.

Such override mechanisms shall be secure, monitored, and limited to authorized personnel only, and all such events shall be recorded for traceability and audit purposes.

(xxxi) CCTV surveillance system: Closed-circuit television (CCTV) surveillance shall continuously monitor (24x7) laboratory and allied areas for security and operational oversight:

- (a) Camera placement:** Cameras shall be positioned to: (a) Monitor all work areas of the laboratory including allied areas without creating

obstruction to laboratory work; (b) Provide coverage of entry/exit points; (c) Monitor biological safety cabinet work areas; (d) Monitor waste handling areas etc.

The camera placement shall balance security with privacy and operational requirements.

- (b) **Camera specifications:** Cameras shall: (a) Have sufficient resolution to identify personnel and document activities; (b) Operate in various lighting conditions including dim light; (c) Have wide angle lenses to cover large areas; (d) Be housed in sealed, corrosion-resistant enclosures; (e) Be positioned to prevent blinding by bright lights or HVAC airflow; (f) Be suitable for all weather conditions.
- (c) **Recording and storage:** CCTV recordings shall: (a) Be continuously recorded (24/7) on hard disk or digital storage; (b) Have sufficient storage capacity for minimum 30 days of recordings; (c) Include timestamps on all recordings for reference; (d) Be accessible to authorized personnel for review in case of incidents or security concerns; (e) Be securely protected to prevent unauthorized access or tampering.

(xxxii) **Commissioning and validation test specifications:** The facility design shall be such that all facility components, when properly installed and tested, will successfully pass the mandatory commissioning, validation, accreditation and certification tests specified in the National Guidelines for BSL-3 Certification or as updated from time to time. The architect consultant shall prepare detailed specifications for all commissioning tests to be performed, including but not limited to:

(a) **Pressure differential testing:**

1. Initial measurement: Following completion of facility construction and during commissioning, the negative pressure differential shall be measured and documented. The measurement shall: (a) Be performed using calibrated differential pressure manometers at multiple locations in the laboratory; (b) Confirm that minimum target pressure is achieved; (c) Verify that pressure gradients between different zones are appropriate; (d) Be performed under normal operating conditions with all doors closed and occupancy typical of normal work.

2. Pressure hold test: A pressure hold test shall verify that the laboratory envelope is adequately sealed: (a) The HVAC system is turned off; (b) Initial pressure is measured; (c) Pressure is measured at regular intervals (every 5-10 minutes); (d) The rate of pressure change is measured - a properly sealed room should show minimal pressure drift; (e) If pressure drifts significantly, the source of leakage is identified and sealed.

3. Smoke testing: Visual smoke testing may be performed to: (a) Verify directional airflow patterns, showing that air flows into the laboratory from non-containment areas; (b) Identify any unintended air leakage paths or dead zones. Smoke sources are used to visualize airflow, and the patterns are to be photographed and documented.

(b) HEPA filter integrity testing:

1. Pre-installation certification: Before installation, all HEPA filters shall be certified to meet test standards: (a) Filter is subjected to 0.3 micron test particles; (b) Efficiency is verified to be 99.97% or greater; (c) Certification documentation is provided by filter manufacturer.

2. Post-installation testing: After installation in the facility ductwork, HEPA filter integrity is to be verified: (a) Upstream and downstream air samples are collected; (b) Presence of particles indicates any leakage in the filter seal or damage to the filter; (c) Proper installation procedures ensure no gaps between filter and housing that could allow bypass.

3. Periodic testing: During facility operation, HEPA filter condition is to be monitored: (a) Differential pressure across filter indicates degree of dirt loading; (b) When pressure drop reaches specified limit, filter is scheduled for replacement; (c) Before removal of saturated filter, integrity may be tested again to confirm filter has not failed.

(c) Air change rate and airflow measurement:

1. Tracer gas method: Air change rates may be measured using tracer gas methodology or as suggested by the architectural consultant: (a) A non-toxic tracer gas (typically sulphur hexafluoride or helium) is to be introduced into the laboratory; (b) Air samples are collected at multiple locations; (c) Concentration decay over time is to be measured; (d) Rate of concentration decay is to be used to calculate air change rate; (e) Minimum Air Change shall comply with DBT guidelines as updated from time to time.

2. Airflow measurement: Direct measurement of supply and exhaust airflow using anemometers or flow meters or as suggested by the architectural consultant: (a) Supply airflow is measured in supply ductwork; (b) Exhaust airflow is measured in exhaust ductwork; (c) Results are compared to design specifications; (d) If measured airflow differs significantly from design, system balancing is required by adjusting dampers and fan speeds.

3. Airflow pattern visualization: Smoke or other tracer particles may be used to visualize airflow patterns: (a) Smoke is released at various points in the laboratory; (b) Airflow patterns are observed and photographed; (c) Proper directional airflow is to be verified (from

less contaminated to more contaminated areas, and out through exhausts).

(d) Decontamination system validation:

1. Chemical efficacy: The biological liquid waste decontamination system should be validated to confirm that the selected disinfectant and contact time are adequate to kill the pathogens being handled: (a) Cultures of representative pathogens (or non-pathogenic surrogate organisms) are mixed with waste; (b) Standard disinfectant treatment is applied; (c) Post-treatment samples are cultured to verify no surviving organisms; (d) pH, temperature, and contact time parameters are verified to match design specifications; (e) Validation documentation is to be prepared.

Or

Steam / Thermal Efficacy (Alternative to Chemical Treatment):

The biological liquid waste decontamination system may be designed with a steam-based (thermal) treatment option. The system shall be validated to demonstrate effective inactivation of pathogens under defined temperature, pressure, and exposure conditions, as follows:

(a) Liquid waste containing representative pathogens (or suitable non-pathogenic surrogate organisms) shall be subjected to controlled steam treatment;

(b) Treatment parameters such as temperature, pressure, and exposure time shall be maintained as per validated design (e.g., equivalent to autoclaving standards);

(c) Post-treatment samples shall be cultured to confirm complete inactivation of microorganisms;

(d) System shall ensure uniform heat distribution and adequate penetration within the waste stream;

(e) Monitoring and recording of critical parameters (temperature, pressure, time) shall be ensured through calibrated instruments;

(f) Validation and performance qualification documentation shall be prepared and maintained.

2. System monitoring: During facility operation, the decontamination system is to be monitored: (a) pH of treated waste is to be verified before discharge; (b) Disinfectant concentration is to be monitored; (c) Temperature during contact time is to be verified; (d) Periodic sampling of treated waste must verify sterilization.

(xxxiii) Technical drawings and documentation: The Architect/Consultant invited through this Expression of Interest (EoI) shall be responsible for providing comprehensive architectural consultancy services for establishment of the Biosafety Level-3 (BSL-3) Laboratory at AIIMS Patna, including but not limited to architectural planning, preparation of master plan, detailed architectural design, design of Mechanical, Electrical and Plumbing (MEP) systems, retrofitting design (where applicable),

preparation of execution plan, development of detailed specifications of materials and equipment, and all allied architectural and engineering services required for construction, commissioning, validation, certification, and accreditation of the facility, along with preparation of Detailed Project Report (DPR) including Bill of Quantities (BoQ).

The Architect/Consultant shall prepare comprehensive technical drawings and documentation covering all aspects required for planning, construction, commissioning, validation, certification, accreditation, and long-term operation and maintenance of the facility. All drawings and documents shall be prepared in accordance with applicable Indian Standards and relevant biosafety and regulatory guidelines, and shall include appropriate scales, dimensions, legends, notes, and technical details necessary for execution and implementation.

The drawings and documentation shall include, but not be limited to, the requirements specified herein and shall be read in conjunction with the following note:

Note: The table provided in this EoI presents an indicative and non-exhaustive list of technical drawings, documents, and design deliverables expected from the Architectural Consultant for the proposed BSL-3 facility. The purpose of this table is to enable EoI-Applicants to understand the approach, and requirement for this assignment. It is hereby clarified that:

- (i) The listed items are illustrative and indicative in nature and shall not be construed as exhaustive. The EoI-Applicant shall be responsible for proposing a complete, compliant, and functional set of deliverables, aligned with applicable biosafety, engineering, and statutory requirements.
- (ii) The EoI-Applicant shall, under each specified category, clearly indicate the deliverables proposed to be provided as part of this consultancy, along with the methodology, necessary clearance and approach for execution.
- (iii) The responses submitted by the EoI-Applicant shall form the basis for assessment of their technical competence, domain expertise, and suitability for the assignment.
- (iv) The proposed scope shall necessarily address critical aspects including validation strategy, workflow planning, failure mode considerations, and regulatory compliance mapping, as applicable to BSL-3 laboratory facilities.
- (v) The final scope of work, level of detailing, system configurations, and technical specifications shall be refined and finalized at the subsequent

stage, in accordance with applicable guidelines and project requirements.

Table-5

1. Biosafety & regulatory documentation			
Sl. No.	Category	Requirement	Description
1	Biosafety	Biosafety Design Basis Report	Design philosophy aligned with DBT/ICMR guidelines
2	Biosafety	Risk Assessment Report	Hazard identification, mitigation strategy
3	Compliance	Regulatory Mapping	Mapping of design to applicable guidelines
4	Approval	IBSC Coordination	Integration with Institutional Biosafety Committee
5	Approval	Certification Strategy	Plan for BSL certification and validation
2. Containment & Zoning Design			
6	Containment	Zoning Plan	Clean → semi → containment zones
7	Containment	Pressure Zoning	Pressure cascade strategy
8	Containment	Airlocks	Personnel and material airlocks
9	Containment	Decontamination Flow	Entry/exit workflow design
10	Containment	Barrier Design	Physical containment strategy
3. HVAC & Containment Systems			
11	HVAC	Airflow Strategy	Directional airflow design
12	HVAC	Pressure Control	Monitoring and control philosophy
13	HVAC	Redundancy	N+1 or backup systems
14	HVAC	HEPA Filtration Strategy	Supply & exhaust filtration
15	HVAC	Exhaust Discharge Design	Stack location and dispersion
16	HVAC	Failure Mode Analysis	System response during failure
4. Biosafety Equipment Planning			
17	Equipment	BSC Layout	Type, location, airflow compatibility
18	Equipment	Autoclave Integration	Pass-through systems
19	Equipment	Decontamination Systems	Surface/space decontamination
20	Equipment	Storage Systems	Biohazard storage design
5. Utility & Support Systems			
21	Electrical	Power Redundancy	UPS + DG backup
22	Electrical	Critical Load Segregation	Essential vs non-essential loads
23	Plumbing	Water Systems	Lab-grade water supply
24	Plumbing	Drainage Design	Contaminated vs non-contaminated
25	Gas	Gas Distribution	If applicable (CO ₂ , etc.)

6. Safety Systems			
26	Safety	Fire Safety Integration	Detection + suppression
27	Safety	Emergency Showers	Eyewash, safety showers
28	Safety	Alarm Systems	Audible/visual alarms
29	Safety	Access Control	Secure entry/exit
30	Safety	CCTV & Monitoring	Surveillance integration
7. Waste Management Systems			
31	Waste	Liquid Waste System	Decontamination before discharge
32	Waste	Solid Waste Handling	Biohazard waste flow
33	Waste	Autoclaving	Waste sterilization
34	Waste	Storage & Disposal	Temporary and final disposal
8. Automation & Monitoring/Supervisory Control and Data Acquisition (BMS/SCADA)			
35	Automation	BMS Integration	HVAC, pressure, alarms
36	Automation	Data Logging	Time-stamped records
37	Automation	Alarm Management	Critical alerts
38	Automation	Remote Monitoring	Control room integration
9. Commissioning, Validation & Testing			
39	Validation	IQ/OQ/PQ Protocols	Installation, operation, performance
40	Testing	HEPA Integrity Testing	PAO/DEHS testing
41	Testing	Airflow Visualization	Smoke testing
42	Testing	Pressure Validation	Differential verification
43	Testing	System Balancing	HVAC balancing
10. Documentation & Handover			
44	Documentation	As-Built Drawings	Final drawings post construction
45	Documentation	O&M Manuals	Operation & maintenance
46	Documentation	SOPs	Standard operating procedures
47	Documentation	Training	Staff training modules
48	Documentation	AMC Strategy	Maintenance planning
11. Operational Planning			
49	Operations	Workflow Design	Personnel & material flow
50	Operations	Maintenance Access	Serviceability planning
51	Operations	Cleaning Protocol Design	Cleanability planning
52	Operations	Lifecycle Planning	Long-term sustainability

- (xxxiv) Design specifications and bills of quantities:** Detailed written specifications shall be prepared for all building systems and materials. These specifications shall include but not limited to:
- (a) Material specifications:** Detailed specifications for all materials including: (a) Flooring material, color, finish, and application specifications; (b) Wall finishes with thickness and fastening details; (c) Ceiling material and finishes; (d) Door material, frame, hardware, and sealing specifications; (e) Window material and installation specifications; (f) All other materials including fasteners, sealants, insulation, etc.
 - (b) Equipment specifications:** Detailed specifications for all equipment including: (a) Biological safety cabinet (manufacturer, model, type [A2 or B2], certifications); (b) Pass-through autoclave (size, temperature/pressure capacity, cycle specifications); (c) HVAC equipment (AHU size, fan capacity, filter sizes, motor specifications); (d) Diesel generator (capacity, fuel consumption, noise level); (e) UPS system (capacity, battery type, charging specifications); (f) All monitoring and control equipment; (g) Fire suppression equipment; (h) Emergency equipment (eyewash, showers).
- (xxxv) Standby Provision:** The design shall incorporate mandatory standby and redundancy arrangements for all critical laboratory systems and allied services to ensure uninterrupted operation, biosafety compliance, and regulatory adherence at all times. This shall include, but not be limited to, systems such as ETP, HVAC, AHU, HEPA filtration units, exhaust systems, chillers, heaters, ducting/conduits etc. and other essential utilities. The standby systems shall be designed to automatically or seamlessly take over in the event of failure, without compromising containment integrity, safety, or ongoing laboratory operations. This requirement shall be treated as critical and non-negotiable in the overall facility design.

Section-VII **‘Provisions & Safeguards’**

11. Intellectual property and ownership:

- (a) All designs, drawings, specifications, and documentation prepared by the Bidder shall be the intellectual property of AIIMS Patna. The Bidder hereby assigns all rights in the work product to AIIMS Patna.
- (b) AIIMS Patna shall have unrestricted right to use, modify, and distribute the design documentation for construction, commissioning, validation, and future maintenance of the facility.
- (c) The Bidder may not use the design or facility details for any other purpose or for promotion without prior written consent of AIIMS Patna.

12. Confidentiality:

- (a) All information obtained during the project (site information, institutional policies, research activities, financial information) shall be treated as confidential and proprietary to AIIMS Patna.
- (b) The Bidder shall not disclose project details, designs, or other information to any third party without prior written approval of AIIMS Patna.
- (c) Confidentiality obligations shall continue even after completion of the project and termination of the contract.

13. Warranties and performance guarantee:

- (a) The Bidder warrants that all design work shall be performed in accordance with the Terms of Reference, in a professional and competent manner, and shall result in a facility that can successfully achieve full certification as a BSL-3 laboratory by the Review Committee on Genetic Manipulation (RCGM).
- (b) The Bidder shall warrant that the designs and specifications, when properly constructed and commissioned by qualified contractors, shall result in a facility that meets all design parameters.
- (c) If the facility, upon commissioning and testing, fails to meet design specifications, the Bidder shall, at no additional cost to AIIMS Patna:
 - (a) Identify the source of the deficiency;
 - (b) Recommend corrective measures;
 - (c) Provide engineering support for implementation of corrections;
 - (d) Verify that corrections result in achievement of design parameters.

14. Professional liability and insurance:

- (a) The Bidder shall maintain professional liability insurance (errors and omissions insurance) adequate to cover the scope and value of the project.
- (b) The Bidder shall provide proof of insurance coverage upon award of contract.

15. Dispute resolution:

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- (a) Any disputes arising out of this TOR or the contract for services shall be resolved through: (a) Good faith discussion between the parties; (b) Mediation by a mutually agreed third party if discussion fails; (c) Arbitration in accordance with the Arbitration and Conciliation Act, 1996, if mediation fails. The seat of arbitration shall be Patna, Bihar, India.

Section-VIII **‘Design Inclusions’**

16. Expectations write-up:

- (a)** This section outlines the indicative and minimum design inclusions expected for the proposed BSL-3 laboratory facility, with an associated BSL-2 laboratory, to provide clarity to the EoI-Applicants regarding the functional intent, scope, and expectations of the project.
- (b)** The items, systems, and provisions described herein are illustrative and non-exhaustive in nature, and are intended to serve as a baseline reference for the level of design, safety, and functionality envisaged for the facility. The EoI-Applicant shall not limit their proposal to the contents of this section.
- (c)** The Applicant is expected to apply their professional expertise, domain knowledge, and best industry practices to develop a comprehensive, integrated, and optimized design solution, ensuring that the proposed facility is state-of-the-art, technologically advanced, safe, compliant with applicable biosafety guidelines, and operationally efficient.

The design shall:

- (i)** Maximize functional utility and space optimization within the available building footprint;
 - (ii)** Incorporate advanced engineering systems, automation, and monitoring;
 - (iii)** Ensure robust containment, biosafety, and regulatory compliance;
 - (iv)** Provide for flexibility, scalability, and future expansion, wherever feasible;
 - (v)** Integrate efficient workflow, material flow, personnel movement, and digital reporting systems.
- (d)** It is further clarified that the final design, detailed specifications, system configurations, and technology selection shall be developed and finalized at the subsequent RFP and detailed design stages, based on applicable guidelines, site conditions, and project requirements.
 - (e)** Accordingly, the EoI-Applicant shall clearly demonstrate, through their submission, their approach, understanding, and capability to deliver a facility that meets and exceeds the above expectations.

(f) In addition to the general expectations outlined above, the EoI-Applicant shall clearly address the following specific functional requirements, with appropriate design provisions and justification:

(i) **BSL-3 containment laboratory configuration:** The design shall provide for a BSL-3 laboratory comprising a minimum of two distinct containment zones, namely- (a) Sample Handling / Lysis Room for receipt and initial processing of samples; and (b) Culture Room for handling of TB and other viral agents.

The design shall ensure proper segregation, containment integrity, and workflow continuity between these zones, with appropriate provisions for biosafety, access control, and operational safety.

(ii) **Allied support and containment facilities for BSL-3:** The BSL-3 laboratory shall be supported with all necessary ancillary and containment-supporting spaces, including but not limited to- store room, anteroom/airlock, change rooms, shower rooms (preferably separate for male and female), fumigation/decontamination room, control/monitoring room, post-shower change area, autoclave area, pass-box, dunk tank, sample storage area, locker facilities, and instrument storage spaces.

The design shall ensure that these facilities are functionally integrated, support safe entry/exit protocols, and maintain strict containment and decontamination pathways in accordance with biosafety requirements.

(iii) **Supporting BSL-2 laboratory facility:** The BSL-3 laboratory shall be supported by a functionally integrated BSL-2 facility, designed with three defined operational zones, namely- (a) Positive Pressure Zone; (b) Nucleic Acid Extraction and Purification Room; and (c) Instrument Room.

The BSL-2 facility shall include essential infrastructure and equipment such as at least one biological safety cabinet, chest freezer (-20° C), refrigerated centrifuge in each of (a) Positive Pressure Zone & (b) Nucleic Acid Extraction and Purification Room, working tables, and associated laboratory equipment. The design shall ensure that Real-Time PCR operations are accommodated within the instrument room, with appropriate environmental and operational conditions.

The overall design shall ensure clear functional linkage with the BSL-3 facility, while maintaining required biosafety separation, workflow efficiency, and operational reliability.

- (iv) Site development, external works and perimeter security:** The design shall include comprehensive planning of the external environment and site development, including: (a) Landscaping of the building surroundings with appropriate plantation, ensuring compatibility with BSL-3 biosafety norms and avoidance of vectors/pests; (b) Land development and refurbishment of surrounding areas, including grading, paving, and drainage; (c) Design of Entry Gate & boundary wall/fencing, including provision of anti-climb, anti-bird/monkey measures (e.g., wired fencing), controlled access points, and security features; (d) External lighting, pathway illumination, and signage systems (including biosafety and biomedical waste signage); (e) Identification and planning of chiller and major utility equipment locations ensuring safe, accessible, and non-contaminating placement.
- (v) Facility planning, utilities and movement systems:** The design shall incorporate: (a) Provision of utility/service lift (dumbwaiter or equivalent) for safe material movement; (b) Clearly defined zoning concept for donning and doffing, ensuring strict segregation and contamination control; (c) Unidirectional flow design, ensuring no cross-contamination between entry and exit pathways; (d) Adequate storage rooms and support spaces aligned with operational requirements; (e) Provision for standby wiring, redundancy planning, and retrofitting flexibility for future upgrades.
- (vi) Engineering design, safety and performance:** The design shall ensure: (a) Overall system performance covering ventilation, containment, safety, and operational efficiency; (b) Provision for backup power systems for all critical infrastructure and containment systems; (c) Materials and finishes (floor, walls, doors, surfaces) shall be non-porous, smooth, and resistant to repeated chemical cleaning and decontamination; (d) Facility design shall enable easy cleaning, maintenance, and decontamination; (e) Provision for fire safety audits, BMS audits, and periodic safety evaluation mechanisms; (f) Design flexibility to allow future modification/upgradation in case of changes in regulatory guidelines.

- (vii) Digital systems, IT infrastructure and data management:** The design shall include: (a) Provision for complete IT infrastructure, including computers, printers, networking, and integration with laboratory systems; (b) Data storage and management systems, ensuring secure, traceable, and compliant record-keeping; (c) Stock and asset management systems for inventory tracking and lifecycle management of equipment and materials; (d) Integration of digital signage systems, including biomedical waste identification and operational displays.
- (viii) Project planning, execution and management deliverables:** The Consultant shall provide: (a) Pre-construction planning and management concept, including methodology and execution strategy; (b) Detailed project execution plan, including stage-wise sequencing of activities; (c) Construction milestone definition along with indicative payment linkage; (d) Project scheduling with timelines and dependencies; (e) Use of Program Evaluation and Review Technique (PERT) or equivalent for monitoring project progress; (f) Technical assistance in tender preparation for subsequent stages.
- (ix) BIM (Building Information Modelling) requirements:** The Consultant shall develop a comprehensive BIM model of the facility, which shall: (a) Be multi-dimensional (3D/4D/5D as applicable), integrating architectural, structural, and MEP systems; (b) Include clash detection and coordination across all services; (c) Support construction sequencing (4D) and cost estimation (5D); (d) Enable facility management integration, including asset tagging and maintenance planning; (e) Provide detailed as-built BIM model at project completion, aligned with executed conditions; (f) BIM should provide an analysis (as applicable) w.r.t. privacy and women safety at all places excluding private and personal areas.
- (x) CFD (Computational Fluid Dynamics) analysis:** The Consultant shall carry out CFD simulations and analysis for critical areas, which shall include: (a) Validation of airflow patterns, pressure gradients, and containment performance; (b) Assessment of air distribution, dead zones, turbulence, and directional airflow compliance; (c) Simulation of failure scenarios and system behaviour under abnormal conditions; (d) Optimization of HVAC design to ensure compliance with biosafety requirements and

energy efficiency; (e) Submission of detailed CFD reports with visual outputs and design recommendations.

- (xi) Commissioning, documentation and handover:** The Consultant shall ensure: (a) Preparation of Operation and Maintenance (O&M) manuals for all systems (as required); (b) Submission of as-built drawings, CAD files, and documentation; (c) As-built design and certification confirming compliance with approved design and standards; (d) Preparation of handover plan, including final inspection schedule and stage-wise inspection protocols; (e) Development of maintenance schedules and breakdown maintenance protocols.
- (xii) Safety, emergency and operational planning:** The design shall include: (a) Medical emergency response plan, including first aid and internal incident response; (b) Preparedness for emergencies such as fire, flood, system failure, etc.; (c) Integration of safety protocols into design and operations.
- (xiii) Compliance and standards all designs shall be:** (a) Compliant with CPWD norms and applicable national standards; (b) Aligned with biosafety guidelines and regulatory requirements; (c) Designed to meet certification and validation requirements for BSL-3 facilities.
- (xiv) Construction phase work schedule (indicative):** The EoI-Applicant shall submit an indicative construction phase schedule, outlining major activities, sequencing, and workflow expected during execution. This schedule shall serve as a reference framework for verification of contractor performance at the execution stages.
- (xv) Design approach and compliance methodology:** The Applicant shall provide a detailed methodology/approach demonstrating how the proposed design shall achieve compliance with applicable BSL-3 biosafety guidelines (including DBT requirements).

This shall be submitted in the prescribed template, covering aspects such as design philosophy, compliance mapping, validation approach, and system integration strategy.

- (xvi) Safety audit framework:** The Applicant shall propose indicative safety audit protocols and mechanisms, including periodic audit

strategies for systems such as HVAC, BMS, fire safety, and containment performance etc., to ensure continued compliance and operational safety.

(xvii) Design deviations/optimization statement: The Applicant shall clearly indicate any deviations, enhancements, or optimizations proposed over and above the indicative requirements provided in this document. Such submissions shall be made in the prescribed format/template, with proper justification and impact assessment.

(xviii) Design flexibility and coordination: The design shall be developed with adequate flexibility to accommodate variations in equipment makes, models, and manufacturers, ensuring interoperability and adaptability during procurement, installation, and future upgrades. The Applicant shall demonstrate robust design coordination practices, ensuring compatibility across all building systems and avoidance of conflicts.

(xix) Write-up for BSL-3 facility: The Applicant may submit a comprehensive write-up outlining the step-by-step approach for establishing the BSL-3 laboratory, including planning, design development, execution support, validation, and commissioning strategy.

(xx) Payment milestone proposal: The Applicant shall provide an indicative payment milestone schedule, clearly linked to deliverables and stages of consultancy services. It shall be noted that the engagement of the consultant is expected to continue up to completion of construction and finalization of the facility, and the milestone schedule shall be aligned accordingly.

(xxi) Design timeline schedule: The Applicant shall submit a design timeline, detailing stages such as concept design, preliminary design, detailed design, coordination, and final deliverables, with clear timelines and dependencies.

(xxii) Construction milestone framework (indicative): The Applicant shall provide an indicative construction milestone schedule, identifying key stages of construction and integration. This shall

serve as a reference benchmark for monitoring project progress during execution.

Note:

- A.** The above requirements are indicative but critical, and the EoI-Applicant is expected to demonstrate a structured, technically sound, and integrated approach in addressing these aspects while developing the design proposal.

- B.** The above submissions are essential for demonstrating the Applicant's technical approach, planning capability, and project understanding. These shall be considered during evaluation and may be refined at subsequent stages of this project procurement.

Section-IX **‘Overview of Existing Building’**

17. Existing Building Layout – Brief Concept Note:

- (a) This section provides a brief overview of the existing building proposed for development of the BSL-3 laboratory, with the objective of giving EoI-Applicants a basic understanding of the current infrastructure. The details are presented in a simple and indicative manner based on available drawings, to help Applicants appreciate the building configuration, space availability, and general layout.

The information provided herein is for reference only and shall not be treated as exhaustive. Applicants are expected to undertake their own assessment and develop an appropriate design solution in line with project requirements.

- (b) The proposed building for establishment of the BSL-3 laboratory is a dedicated two-storey structure, comprising a ground floor and first floor, along with a terrace level.
- (c) The ground floor includes a main entrance lobby, along with lift and staircase area. It also comprises supporting spaces. The first floor has a similar circulation arrangement, and provides a large open hall area suitable for laboratory planning, along with toilet facilities. The terrace level is largely open.
- (d) The building has a central circulation core, adequate floor height for accommodating engineering services, and façade elements including glazed areas as seen in elevations. Sectional drawings indicate connectivity between floors and availability of spaces.
- (e) It is clarified that the above description is indicative and provided only for general understanding of the existing building. The EoI-Applicant is expected to undertake detailed assessment of the structure and propose an optimized design for development of a fully compliant BSL-3 facility, including necessary retrofitting and integration of biosafety and engineering systems. Detailed AutoCAD drawings are available in the Google Drive link provided in the EoI document for further reference.

Section-X
‘List of Equipment’
 (To be installed in lab)

18. Concept note of Equipment:

- (a) The following section presents an indicative list (minimum) of equipment required for the proposed BSL-3 laboratory facility at AIIMS Patna. The equipment has been categorized based on functional domains such as primary containment, sterilization, molecular diagnostics, genomics, cell culture, imaging, safety systems, and laboratory support infrastructure, to facilitate understanding of requirements and spatial planning.
- (b) This list is intended to serve as a design reference for EoI applicants, enabling them to assess the functional equipment density, and infrastructure dependencies associated with a BSL-3 environment. The inclusion of specialized systems such as biosafety cabinets, autoclaves, sequencing platforms, and advanced imaging equipment reflects the need for stringent biosafety compliance, workflow segregation, and controlled laboratory conditions.
- (c) Applicants are expected to utilize this equipment framework to inform space planning, zoning (BSL-3 / BSL-2 / support areas), HVAC design, electrical load estimation, utility provisioning, and storage requirements. Adequate consideration must be given to equipment footprint, maintenance clearance, operational workflow (clean-to-contaminated pathways), and integration of safety systems, ensuring that the final design adheres to applicable biosafety and regulatory standards.
- (d) It is clarified that this list is indicative and not exhaustive, and may be refined during subsequent design stages; however, it establishes the minimum functional and infrastructural baseline for the proposed facility.

Table-6

S.No.	Equipment Name / Description	Minimum Qty Required (Fill / Strike)	Indicative Comfortable Required Qty.
A. PRIMARY CONTAINMENT — BIOLOGICAL SAFETY CABINETS			
1	Biological Safety Cabinet (BSC) Class II Type A2	4	
2	Biological Safety Cabinet (BSC) Class II Type B2 (100% exhaust)	-	
3	Biological Safety Cabinet (BSC) Class III (Glove Box)	-	

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4	Flexible Film Isolator / Rigid Isolator	-	
5	Laminar Air Flow Unit – Horizontal (media/reagent prep)	1	
B. AUTOCLAVES & STERILIZATION			
6	Double-door Pass-through Autoclave (300–500 L)	1	
7	Bench-top Single-door Autoclave (50–80 L)	1	
8	Liquid Waste Decontamination / Effluent Treatment System	1	
9	Dry-Heat Oven (Sterilization Grade, 250°C)	-	
C. HIGH-SPEED PROCESSING EQUIPMENT			
10	High-Speed Refrigerated Centrifuge – Floor Model (≥20,000 rpm)	2	
11	Ultracentrifuge (≥60,000 rpm)	-	
12	Refrigerated Micro-centrifuge (Bench-top, ≥15,000 rpm)	2	
13	Continuous-Flow / Zonal Centrifuge	-	
14	Cell Separator / Elutriation System	-	
D. PCR & MOLECULAR DIAGNOSTICS			
15	Real-Time PCR System (qPCR) – 96-well	-	
16	Digital PCR System (dPCR)	-	
17	Conventional Thermal Cycler	-	
18	Multiplex PCR / Syndromic Panel Platform	-	
19	RT-PCR System (Reverse Transcriptase)	-	
20	Isothermal Amplification Platform (LAMP/NEAR/RPA)	-	
21	PCR Workstation with UV Decontamination	1	
E. NUCLEIC ACID EXTRACTION & ELECTROPHORESIS			
22	Automated Nucleic Acid Extractor (16 samples)	-	
23	Gel Electrophoresis System – Horizontal (nucleic acids)	-	
24	Gel Electrophoresis System – Vertical (proteins / SDS-PAGE)	-	
25	Gel Documentation / Imaging System	-	
26	Bioanalyzer / Fragment Analyzer	-	
F. CELL CULTURE & VIRUS CULTURE			
27	CO ₂ Incubator – Tri-gas (CO ₂ , O ₂ , N ₂) with HEPA filter	1	
28	Inverted Microscope (Tissue Culture Grade)	1	
29	Roller Bottle Apparatus	-	
30	Bioreactor / Fermenter (Contained, 5–10 L)	-	
31	Cell Counter – Automated Image-based	-	

32	Multimode Microplate Reader (Absorbance, Fluorescence, Luminescence)	-	
33	ELISA Washer (Automated)	-	
G. COLD CHAIN & SAMPLE STORAGE			
34	Ultra-Low Temperature Freezer (-80°C)	1	
35	-20°C Laboratory Freezer	3	
36	+4°C Laboratory Refrigerator	2	
37	Liquid Nitrogen (LN ₂) Storage Dewar – 50 L	-	
38	LN ₂ Dry Shipper / Transport Dewar	-	
39	Cryogenic Sample Management System (Rack + Box set)	-	
H. MICROSCOPY & IMAGING			
40	Fluorescence Microscope – Upright (with cooled camera)	1	
41	Confocal Laser Scanning Microscope	-	
42	Transmission Electron Microscope (TEM)	-	
43	Scanning Electron Microscope (SEM)	-	
44	Phase-Contrast Microscope – Upright	-	
45	Digital Slide Scanner (Whole-slide imaging)	-	
I. FLOW CYTOMETRY & CELL ANALYSIS			
46	Flow Cytometer – Multi-laser (min 4 lasers, ≥12 parameters)	-	
47	Cell Sorter (FACS) with Aerosol Containment	-	
48	Luminex Multi-analyte Platform (xMAP / MagPix)	-	
J. GENOMICS & SEQUENCING PLATFORMS			
49	Next-Generation Sequencer – Mid-output (Illumina NextSeq 550/2000 or equivalent)	-	
50	Nanopore Sequencer (Oxford Nanopore MinION / GridION)	1	
51	Sanger Sequencer – Capillary Electrophoresis (8–24 capillary)	-	
52	Library Preparation Workstation (Automated)	-	
K. PROTEOMICS & BIOCHEMISTRY			
53	Western Blot System (Semi-dry + Tank transfer)	-	
54	Chemiluminescence / Fluorescence Imaging System	-	
55	Spectrophotometer / NanoDrop (UV-Vis, micro-volume)	-	
56	Lyophilizer / Freeze Dryer	1	
57	Homogenizer / Bead Beater – Sealed Tube Format	-	
58	Sonicator / Ultrasonic Disruptor	-	
59	ELISA Plate Reader (Dedicated backup unit)	-	
L. PERSONAL PROTECTIVE EQUIPMENT — SUPPORT EQUIPMENT			

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60	Powered Air-Purifying Respirator (PAPR) – Complete Set (hood + blower + battery)	10	
61	PAPR Battery Charger Units	3	
62	Respirator Fit-Testing Equipment (PortaCount or equivalent)	2	
63	Personal Aerosol Monitor (worn)	-	
64	Chemical Shower – Emergency Decontamination	1	
65	Eye Wash Station – Plumbed (with tepid water)	3-4	
M. WASTE MANAGEMENT & DECONTAMINATION			
66	Chemical Dunk Tank / Disinfectant Pass-bath	4	
67	Biohazardous Waste Cart (Leak-proof, SS, lidded)	4	
68	Sharps Disposal Containers (in-cabinet, puncture-proof)	4	
69	Infectious Spill Containment Kit	4	
N. IT, COMMUNICATIONS & SECURITY			
70	Laboratory Information Management System (LIMS) Workstation	1	
71	Two-way Intercom / Video Communication System	1	
72	CCTV Surveillance System – BSL-3 compatible	1	
73	UPS – Uninterruptible Power Supply	1	
74	Diesel Generator (DG Set) with ATS	1	
75	Electronic Access Control – Biometric + Smart Card	1	
O. MISCELLANEOUS LABORATORY EQUIPMENT			
76	Magnetic Stirrer with Hot Plate	-	
77	Analytical Balance (0.0001 g precision)	-	
78	pH Meter / Multi-parameter Meter	-	
79	Water Purification System (Type 1 & Type 2)	1	
80	Vortex Mixer	4	
81	Orbital Shaker / Rocking Platform	-	
82	Dry Bath / Heating Block	2	
83	Ice Machine (Flaked/Nugget)	1	
84	Glassware Washer (Laboratory Grade)	1	
85	Label Printer / Barcode Printer	1	
86	Emergency Trolley / First Aid Station (BSL-3 configured)	1	

Section-XI

‘Laboratory Activities’

- 19. Scope of Laboratory Work:** This section outlines the proposed diagnostic and research activities to be undertaken in the BSL-3 laboratory, covering handling of high-risk viral pathogens, molecular diagnostics, virus culture, Tuberculosis sample processing & culture, and serological assays. The listed work profiles define the biosafety requirements, workflow design, and infrastructure planning necessary for safe and compliant laboratory operations. The indicative list is given below:

Table-7

S. No.	Work Category	Activity / Pathogens / Tests
(i)	BSL-3 Viral Pathogens (Handling & Testing)	Avian Influenza, SARS-CoV-2, Rabies virus, Hantavirus, Nipah virus*, Yellow Fever (wild strains), Polio PII, Crimean-Congo Hemorrhagic Fever (CCHF), Mpx virus, Variola virus, Hendra virus, Ebola virus, Marburg virus
(ii)	PCR / Real-Time PCR Diagnostics	Molecular detection of Avian Influenza, SARS-CoV-2 and other listed viral pathogens
(iii)	Cell Culture / Virus Isolation	SARS-CoV-2, Influenza virus, West Nile virus, Japanese Encephalitis, Dengue virus, Zika virus, Polio virus
(iv)	Serology (ELISA Testing)	Nipah IgM/IgG, CCHF IgM/IgG, Kyasanur Forest Disease (KFD) IgM/IgG, West Nile Virus IgG/IgM

Section-XII
‘Invitation statement’

20. Invitation statement: *This comprehensive Terms of Reference document outlines the requirements for architectural and engineering services for the establishment of a world-class Biosafety Level-3 laboratory facility at AIIMS Patna. The facility will serve as an important institutional and regional resource for research, diagnostics, and development work on high-risk pathogens, while maintaining the highest standards of safety for personnel, community, and environment.*

The project presents an exciting opportunity for qualified architectural and engineering consultants to demonstrate their expertise in specialized laboratory design and to contribute to building India's biosafety infrastructure in accordance with international standards and national regulatory requirements.

Interested firms are invited to respond to this Expression of Interest with detailed information about their qualifications, experience, team composition, understanding of the project requirements, and proposed approach to the design. Applicants should demonstrate thorough understanding of: (1) Biosafety principles and the DBT 2024 Guidelines; (2) Engineering requirements for negative pressure laboratories; (3) Indian regulatory and standards compliance; (4) Ability to work effectively with institutional stakeholders and regulatory authorities.

PART-III

EOI SUBMISSION FORMATS/ANNEXURES

EOI Covering Letter

(On Letter-head)

(To be submitted with supporting documents, if any)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

Sub

EoI Ref:

Sir,

Having examined the abovementioned EOI document, we, the undersigned, hereby submit/ upload our Expression of Interest (EOI) for further process.

(Please tick appropriate boxes or strike out sentences/ phrases not applicable to you)

- 1) **About us:** We, M/s _____, hereby certify that we are a firm (or members of our JV are) of proven, established, and reputed EoI-Applicant having the required Experience, Past performance, Personnel, and Financial capability, with offices at _____.
- 2) **Our Eligibility and Qualifications to participate:**
 - a) We comply with all the eligibility criteria stipulated in this EOI document, and the relevant declarations are made along with documents in Annexures of this EOI-Form.
 - b) We fully meet all the qualification criteria stipulated in this EOI document, and the relevant details are submitted along with documents in Annexures.
 - c) We undertake to provide originals of all self-certified copies of uploaded documents during the RFP Process, as per requirement. We have understood the ramifications of failure to do so as detailed in clauses of EoI.
 - d) We have/don't have any conflict of interest with any other EoI-Applicant.
 - e) No commissions and gratuities have been paid or are to be paid to agents or any other party by us relating to this EOI.
- 3) **Affirmation of terms and conditions of the EoI document:** We have understood the complete terms and conditions of the EOI document. We accept and comply with these terms and conditions without reservations, although we are not signing any agreement against this EOI document.

- 4) **Abiding by the EOI Validity:** We agree to keep our EOI valid for acceptance for a period up to 270 days as required in the EOI document, or for a subsequently extended period, if any, agreed to by us.
- 5) **Non-tempering of downloaded EOI documents and uploaded scanned copies:** We confirm that we have not changed/ edited the contents of the downloaded EOI Formats. We realise that any such change noticed at any stage, including after the contract award, shall be liable to punitive action in this regard stipulated in the EOI document. We also confirm that scanned copies of documents/ affidavits/ undertakings (as the case may be) uploaded along with our EOI are valid, true, and correct to the best of our knowledge and belief. We shall be responsible, if any dispute arises regarding the validity and truthfulness of such documents/ affidavits/ undertakings. Upon our successful shortlisting through EoI or RFP (as the case may be), we undertake to submit for scrutiny, on-demand by AIIMS Patna, originals and self-certified copies of all such certificates, documents, and affidavits/undertakings.
- 6) **Signatories:** We confirm that we are duly authorised to submit this EOI and make commitments on behalf of the EoI-Applicant. Supporting documents are submitted in Annexures, attached herewith. We acknowledge that our digital/digitised signature is valid and legally binding (wherever used in the EoI submission).
- 7) **Rights of AIIMS Patna to Reject EOI(s):** We understand that AIIMS Patna is not bound to accept any EOI or invite for RFP, it may receive against the above-referred EOI document.

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

EoI-Applicant Information

(On Letter-head)

(Along with supporting documents, if any)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Sir,

(Please tick appropriate boxes or strike out sentences/ phrases not applicable to you)

EoI-Applicant/ Contractor particulars:

Name of the EoI-Applicant's Organisation:	
Corporate Identity No. (CIN) if available:	
Date of incorporation/ start of business:	
Place of Registration/ Principal place of business:	
Number of Years in Business:	
Number of Years in providing High Containment Lab Design Services:	
EoI-Applicant's Website URL (if any):	
Complete Postal Address:	
Pin code/ ZIP code:	
Telephone nos. (with country/ area codes):	
Mobile Nos.: (with country/ area codes):	
Contact persons with Name, Number & Designation:	
Email IDs:	
PAN Number:	
GSTIN No:	

Note:

(i) *In the case of JV, repeat these details for all members.*

(i) Authorisation of Person(s) signing the EOI on behalf of the EoI-Applicant

(a) Full name: _____

(b) Designation: _____

(c) Signing as:

A sole proprietorship firm. The person signing the EOI is the sole proprietor/ constituted attorney of the sole proprietor,

A partnership firm. The person signing the EOI is duly authorised being a partner to do so under the partnership agreement or the general power of attorney,

○ A company. The person signing the EOI is the constituted attorney by a resolution passed by the Board of Directors or in pursuance of the authority conferred by the Memorandum of Association/ Articles of Association.

○ A Society. The person signing the EOI is the constituted attorney.

○ A Joint Venture. The person signing the bid is the designated lead member, as named in the JV agreement/ MOU or similar document in connection with the formation of the JV or are all future proposed members, in case (JV) has not been legally constituted at the time of bidding.

(i) EoI-Applicant's Authorized Representative Information

Name:

Address:

Telephone/ Mobile numbers:

Email Address:

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Eligibility Declarations

(On Letter-head)

(Along with supporting documents, if any)

Reference No.....

Date.....

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

Eligibility Declarations

(Please tick appropriate boxes or cross out any declaration not applicable to the EoI-Applicant)

We hereby confirm that we comply with all the stipulations of EOI Clause of the EOI document and declare as under and shall provide evidence of our continued eligibility to AIIMS Patna as and when it may be required by the institute:

- i. **Legal Entity of EoI-Applicant:** We are:
 - a) a/an.....(proprietorship/firm/company/joint venture etc.) relevant documents enclosed
 - b) We are an organization with valid registration regarding GSTIN, PAN, EPF, ESI, Labour, or equivalent registration certificate as applicable to the subject Services in this document.
- ii. **Eligibility:** We solemnly declare that we:
 - (a) Are not insolvent, in receivership, bankrupt or being wound up, not have our affairs administered by a court or a judicial officer, not have our business activities suspended.
 - (b) Do not stand declared ineligible/ blacklisted/ banned/ debarred by the any govt. organization or its Ministry/ Department from participation in its procurement processes; and/ or
 - (c) Are not convicted within three years preceding the last date of EOI submission.

- (d) Neither have any association nor have any conflict of interest, which substantially affects fair competition. No attempt has been made or shall be made by us to induce any other EoI-Applicant to submit or not to submit an EOI to restrict competition.
- (e) I/We confirm compliance with reciprocity provisions and certify that we are not from a country restricting Indian participation in government procurement, where applicable.
- (f) Adhere to the restrictions on procurement from a country or countries or a class of countries under Rule 144 (xi) of the General Financial Rules 2017.

(iii) Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and undertake to advise any future changes to the above details. We understand that any wrong or misleading self-declaration would violate the Code of Integrity and attract penalties.

[Note: The above list is indicative only. You may attach more documents as required to confirm your eligibility criteria.]

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Qualification Criteria – Compliance Sheet

(Along with supporting documents, if any)
(On Letter-head)

Reference No.

Dated.....

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

Qualification Criteria Compliance Table

Experience:	Quantum, as detailed in this EoI (or as the case may be)	Remarks (Yes, or No)
a) Experience in Architectural Designing Services for BSL-3 or higher containment Lab (BSL-4):		
b) Number of Architectural Designing Services assignments completed or substantially completed in last 7 years		

Note:

- A. *AIIMS Patna reserves its right to call for verification originals of all self-certified copies of stipulated documents supporting the fulfilment of qualifying criteria during the following RFP Process. If the EoI-Applicant fails at that stage to provide such originals or, in case of substantive discrepancies in such documents, it shall be construed as a breach of the Code of Integrity. Such RFP proposals shall be liable to be rejected as nonresponsive in addition to other punitive actions for such a breach.*
- B. *EoI-Applicant shall provide evidence of their continued qualification to perAnnexurethe Services satisfactorily to AIIMS Patna, as AIIMS Patna may request at any stage during the RFP process that would follow this EOI.*

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Performance Capability Statement
Statement of Performance of Consultancy Services
(On EoI-Applicant's Letter-head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Sir,

1. EoI-Applicant or member of a Joint Venture (JV) must fill in this annexure to prove conformance to specified Criteria -General and Similar Experience. Mention contracts in which a EoI-Applicant or a member of a JV is or has been a party, whether as a EoI-Applicant, affiliate, associate, subsidiary, Sub-EoI-Applicant, or any other role.
 2. List only those assignments for which the EoI-Applicant was legally contracted as a company or was one of the joint venture members. Assignments completed by the EoI-Applicant's individual experts working privately or through other consulting firms cannot be claimed as the relevant experience of the EoI-Applicant or that of the EoI-Applicant's partners/member.
- (a) **The number of years of experience in designing high containment laboratory.** Provide details for the length of experience in designing high containment laboratory (BSL-3/ABSL-3/BSL-4/ABSL-4) and cross-reference (if any), the details may be provided in the table below:

Details to be provided for each Lab/project
(attach separate sheet for each Lab/Project)

Sl. No.	Particulars	Details to be Provided by the Applicant (as applicable)
1	Name of Project / Laboratory	
2	Name of Client / Institution	
3	Address / Location of Facility (City, State, Country)	
4	Type of High Containment Laboratory (BSL-3 / ABSL-3 / BSL-4 / ABSL-4)	
5	Nature of Consultancy Services Provided (Architectural Design / Engineering Design / DPR Preparation / Detailed Engineering / Turnkey Design Support / Validation Consultancy/PMC Consultancy)	
6	Role of Applicant (Lead Consultant / Architectural Consultant / Engineering Consultant / JV Partner)	
7	Total Built-up Area of the Facility (in Sq. m.)	

8	Area of High Containment Zone BSL-3 or 4 / ABSL-3 or 4 area (in Sq. m.)	
9	Compliance Standards Followed (WHO Biosafety Manual / CDC BMBL / DBT Guidelines / ICMR Guidelines etc)	
10	Work Order / Contract Award No	
11	Work Order / Contract Award Date	
12	Date of Completion of Design / Consultancy	
13	Date of Commissioning of Facility	
14	Project Cost (in INR)	
15	Current Status of the Laboratory (Functional / Commissioned / Under Commissioning)	
16	Validation Status (from qualified and competent ISO/IEC 17025 accredited organizations or otherwise, please specify)	
17	Certification Status (from RCGM, DBT or Concerned line Ministry of Government of India or DHR, ICMR/DoH&FW or otherwise, please specify)	
18	Any Regulatory Approval Obtained	
19	Contact Person for Reference (Name, Designation, Phone, Email)	

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Financial Capability Statements Self-Declaration

(On EoI-Applicant's Letter-head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Sir,

Financial Data for Previous Three (3) Years ending upto 31st Mar 2025

	Year 1:	Year 2:	Year 3:
Information from the Balance Sheet			
Total Assets			
Total Liabilities			
Net Worth			
Current Assets			
Current Liabilities			
Working Capital			
Information from Income Statement			
Total Revenues			
Profits Before Taxes			
Profits After Taxes			

(a) Note to EoI-Applicant:

(i) EoI-Applicant and each member of a joint venture or other association that is a party to the EoI-Applicant shall fill the above information.

(ii) Declaration: The above details have been furnished based on the financial data and records maintained by the organization, including financial statements and relevant accounting documents.

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Average Annual Turnover Self-Declaration
(On Letter-head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

The Applicant shall declare the Annual Financial Turnover & Annual Financial Turnover (exclusively from design and consultancy services) for the last three consecutive financial years ending on 31 March 2025. Where no turnover exists for any financial year, it shall be considered as zero for that year.

Year	Total Turnover Amount	Turnover from exclusively from design and consultancy services
Average Annual Turnover		

Note: Each EoI-Applicant or member of a Joint Venture making up a EoI-Applicant must fill in these annexures.

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Checklist for EOI Applicant
(On Letter-head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Checklist

Sl. No.	Requirement / Description	Submitted (Yes/No)	Page No.
1	EoI Covering Letter (Annexure-A)		
2	Applicant Information (Annexure-B)		
3	Eligibility Declarations (Legal status, Non-blacklisting, Non-insolvency, Conflict of Interest-Annexure-C)		
4	Qualification Criteria Compliance (as per eligibility conditions-Annexure-D)		
5	Technical Experience: BSL-3 (≥ 2) OR BSL-4 (≥ 1) Projects (last 7 years)		
6	Financial Capability (Positive Net Worth – last 3 years-Annexure-F)		
7	Average Annual Turnover (Architectural Services-Annexure-G)		
8	Performance Capability Statement (Annexure-E)		
9	Key Personnel Details (including Lead Architect – CoA Registered-Annexure-J)		
10	Project Timeline Schedule (Annexure-K)		
11	Construction Phase Work Schedule (Indicative)- (Annexure-L)		
12	Design Approach & Compliance Methodology (DBT Guidelines)-(Annexure-M)		

13	Design Deviation / Optimization Statement (Annexure-N)		
14	BSL-3 Proposed Design Write-up (Annexure-O)		
15	Payment Milestone Proposal (Annexure-P)		
16	Design Timeline Schedule (Annexure-Q)		
17	Technical Capability (CAD/BIM/CFD tools availability)		
18	Case Studies / Project References (if submitted)		
19	Any Additional Supporting Documents		

Note to EoI-Applicant: *This checklist is merely to help the EoI-Applicant to prepare their EoIs. It does not override or modify the requirement of the EOI. EoI-Applicant must do their due diligence also.*

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Authorization to Attend Pre-EOI Conference

(On the Letter Head)

Ref:.....

Dated

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Subject: Authorization to attend Pre-EOI Conference on.....(date).

Sir,

The following persons are authorized to attend the Pre-EOI Conference for the EOI mentioned above on behalf of M/s in the order of preference given below.

Sr.	Name	Designation	Contact No	Valid ID
I.				
II.				
Alternate Representative				

Note:

- (a) Maximum of two representatives (carrying valid IDs) shall be permitted to attend the Pre-EOI conference. An alternate representative shall be permitted when regular representatives are not able to participate.
- (b) Permission to enter the hall/online meeting link vide which the Pre-EOI conference is conducted may be refused if authorization as prescribed above is not submitted.
- (c) Prospective bidders who wish to attend the meeting through online mode may request the same by sending an email to the email ID mentioned in this EoI document, along with the authorization letter, at least 24 hours prior to the scheduled Pre-EoI conference.

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Self-Declaration of Details of Proposed Key Personnel

(To be submitted on the letterhead of the Applicant)

S. No	Position	Minimum Qualification	Minimum Experience	Type of Facility Experience	Nature of Relevant Experience	Key Role / Responsibility (Action-Oriented)
1	Team Leader / Lead Architect					
2	Biosafety Expert					
3	HVAC / Mechanical Engineer					
4	Electrical Engineer					
5	PHE / EDS Engineer					
6	BMS / Instrumentation Expert					
7	Structural Engineer					
8	Validation Expert					
9	Equipment Specialist					
10	Fire & Safety Expert					
11	Infection Control Expert					
12	BIM Lead					
13	Construction / Phasing Expert					
14	Any other					

(Please add row as per requirement)

I/We hereby declare that the above-mentioned personnel are proposed for deployment in the subject assignment and possess relevant qualifications and experience commensurate with their proposed roles.

I/We understand that detailed curriculum vitae (CVs), qualification certificates, and supporting documents will be submitted at the RFP stage.

I/We further undertake that all information provided herein is true and correct to the best of my/our knowledge. In case any information is found to be false or misleading at any stage, the EoI/Proposal shall be liable for rejection.

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

**Project Timeline Schedule
(To be submitted by EoI-Applicant)**

Sl. No.	Phase / Activity (to be filled by Applicant)	Key Deliverables	Duration (Days)	Remarks (if any)
1				
2				
3				
4				
5				

(Please add row as per requirement)

- (i)** The Applicant shall propose a phase-wise project timeline, clearly indicating activities, deliverables, and sequencing.
- (ii)** The total duration shall not exceed 45 days from the date of commencement given in NoA.
- (iii)** The timeline shall be:
 - (a) Logical and sequential
 - (b) Reflective of design, validation, and regulatory requirements
 - (c) Inclusive of review and approval stages
 - (d) Overlapping of activities may be proposed where justified.
 - (e) Incomplete or unrealistic timelines may be treated as non-responsive.
- (iv)** The EoI-Applicant may, inter alia, consider stages such as site investigation and existing assessment, conceptual design and planning, preliminary engineering of MEP systems, detailed design and technical documentation, validation planning (including IQ/OQ/PQ framework), regulatory coordination (such as IBSC/RCGM), preparation of DPR and BoQ, and finalization and submission of documents while preparing the project timeline. These stages are indicative and non-exhaustive, and the Applicant is expected to propose an appropriate, comprehensive, and optimized workflow based on its methodology and understanding of the project requirements.

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Indicative Construction Phase Work Schedule
(To be submitted by EoI-Applicant on Letter head)

A. Construction Schedule (Indicative)				
Sl. No.	Activity / Stage	Duration	Sequence	Key Output
1	Site Preparation & Mobilization			
2	Civil / Structural / Retrofitting Works			
3	Architectural Works & Finishes			
4	HVAC & Containment Systems			
5	Electrical & Power Backup Systems			
6	Plumbing, Drainage & ETP Systems			
7	Equipment Installation (BSC, Autoclave, etc.)			
8	BMS / Automation Integration			
9	Safety Systems (Fire, Access, CCTV)			
10	Testing, Commissioning & Validation			
11	Final Inspection & Handover			

(Applicant may modify/add activities as per their methodology.)

B. Brief workflow note (Provide a concise description of execution approach, sequencing, and coordination strategy):

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Design Approach and Compliance Methodology
(To be submitted by EoI-Applicant on Letter head)

Sl. No.	REQUIREMENT / DESIGN CRITERIA As per DBT-ICMR National BSL-3 Guidelines 2024 or any amendment therein, as applicable	APPLICANT'S RESPONSE(Proposed Design Approach / Compliance Methodology)
SECTION A: DESIGN PREREQUISITES		
A.1	The BSL-3 facility shall be located in a dedicated building space.	
A.2	Access to the building shall be strictly restricted. Design must incorporate a 3-tiered electronic security access control system with anteroom/airlock facility, biometric/fingerprint-based entry, and CCTV surveillance.	
A.3	The site must have uninterrupted supply of water and electricity.	
A.4	A detailed conceptual proposal with comprehensive drawings and plans, justifying construction objectives as per national BSL-3 guidelines, shall be formulated by the appointed architects and engineers.	
SECTION B: FACILITY LAYOUT & ARCHITECTURAL DESIGN		
B.1 - General Layout		
B.1.1	The facility shall be based on the 'Lab-in-Lab' principle: the more-contaminated (core) area is surrounded by less-contaminated areas. The lab room shall act as secondary barrier when infectious work is handled in primary barriers (BSCs/IVCs).	
B.1.2	Design shall define workflow and preparation of flowcharts for personnel, material, and pathogen movement, covering the entire scope of work. Detailed flow diagrams must be submitted.	
B.1.3	Columns and beams inside the containment lab room shall be avoided wherever possible to facilitate cleaning and decontamination.	
B.1.4	Ample space must be provided for safe conduct of laboratory work, cleaning, and maintenance. Storage space must be adequate to hold immediate-use supplies to prevent bench-top clutter. Additional long-term storage shall be provided outside the lab.	
B.1.5	Facilities for storing food, drink, personal items, jackets, and outerwear must NOT be provided inside the laboratory. Separate areas for eating and drinking are mandatory outside the containment zone.	

B.1.6	Space and facilities must be provided for safe handling and storage of chemicals, solvents, radioactive materials (if applicable), and compressed/liquefied gases.	
B.2 - Entry / Exit & Anteroom Design		
B.2.1	Entry/exit shall be through a dedicated cloth-change anteroom and shower room. Design shall incorporate at least two anterooms: Anteroom 1 (for logging, head-cover, first glove layer) and Anteroom 2 (for donning full PPE - Tyvek suit, N95, eye cover).	
B.2.2	The anteroom shall have clearly demarcated facilities for separating clean (street) clothing from dedicated BSL-3 lab clothing. Layout and workflow to be clearly illustrated in drawings.	
B.2.3	All anteroom doors shall be self-closing and interlocking so that only one door can be open at a time. A breakout/break-through panel shall be provided for emergency exit.	
B.2.4	An airlock with a gaseous decontamination system shall be provided for entry/exit of materials that cannot be autoclaved. Interlocking doors shall ensure only one door opens at a time; the clean-side door shall only open after the decontamination cycle is complete.	
B.2.5	Airlocks shall be provided at all transitional points between spaces of different bio-containment levels through which personnel and/or materials must pass.	
B.2.6	An emergency exit must be incorporated in case of fire or other emergency with override facility for all interlocked doors. Emergency door shall remain closed with key in a glass-fronted box nearby. SOPs for emergency exit to be planned and documented.	
B.3 - BSL-3 Type Classification		
B.3.1	The architect shall confirm the applicable BSL-3 type as per the guidelines, based on the scope of work defined by AIIMS Patna. Design shall meet all secondary barrier requirements for the applicable type, including: Class II A2 BSC, eye-wash, hand-wash, wet shower (if mandated), on-site autoclave, 100% fresh air ventilation, and required ACPH.	

B.3.2	The number and layout of Biosafety Cabinets (BSCs) shall be based on the scope of work. BSCs shall be positioned away from walking areas and crosscurrents from doors and ventilation systems.	
B.4 - Doors, Windows & Vision Panels		
B.4.1	Laboratory entrance doors shall have vision panels (to prevent accidents during opening), appropriate fire ratings, and shall be self-closing.	
B.4.2	All doors shall be appropriately labelled with international biohazard warning symbols wherever biohazardous materials are handled and stored.	
B.4.3	All windows shall be of fixed type, sealed, and made with unbreakable double glass. No openable windows are permitted within the containment zone.	
SECTION C: ROOM ENVELOPE, SURFACES & INTERIOR FINISHES		
C.1	Floors shall be made of seamless material; impervious, abrasion-resistant, non-slip when wet, and cleanable. Floors shall withstand disinfectants and washing with 82°C hot water with detergents under hose pressure. No open seams permitted.	
C.2	Wall-floor junctions shall be coved continuously (curved cove finish from floor running up the wall) to eliminate open joints. All penetrations through walls, floors, and ceilings (for service pipes, conduits, etc.) shall be fully sealed.	
C.3	Walls shall be constructed with non-porous materials and finished with industrial-grade epoxy/paint or PU/low-lustre acrylic enamel. Surfaces shall be scratch-, stain-, moisture-, chemical- and heat-resistant.	
C.4	Ceilings shall be monolithic, resistant to liquids and chemicals, with all penetrations sealed. Continuity of seal to be maintained between all wall-ceiling and wall-floor interfaces.	
C.5	Interior coatings shall be gas- and chemical-resistant, capable of withstanding chemical disinfection and fumigation (e.g., formaldehyde/VHP/peracetic acid). Applicant to specify proposed coating system.	

C.6	Laboratory bench tops shall be: impervious to water; resistant to disinfectants, acids, alkalis, organic solvents and moderate heat; monolithic (no open seams); and fitted with marine edges/drip stops for spillage containment. Backsplashes shall be tight to wall and sealed at bench-wall junction.	
C.7	Laboratory furniture shall be fit for purpose. Open spaces between and under benches, cabinets, and equipment shall be accessible for cleaning. Doors, drawers, handles shall have rounded rims/corners. Cabinet doors shall be self-closing and lockable. Drawers shall be one-piece construction with catches.	
C.8	Reagent shelving shall be equipped with lip edges. All open bench seams are prohibited.	
SECTION D: HVAC, VENTILATION & NEGATIVE PRESSURE SYSTEM		
D.1 - Air Handling System		
D.1.1	Separate, dedicated Air Handling Units (AHUs) shall be installed for non-containment and containment zones. Each AHU serving a containment area shall supply 100% fresh (single-pass, non-recirculating) air. No recirculation of air from containment zones is permitted.	
D.1.2	Direction of airflow shall be from less-contaminated area to more-contaminated area. Airflow within the containment area shall be from entrance towards the rear area.	
D.1.3	Supply and exhaust HVAC systems shall be fully independent. Exhaust capacity shall be approximately 15% (or as applicable) more than supply air capacity. Variable speed drive (VSD/VFD) on exhaust fan is recommended to facilitate room pressure control adjustments.	
D.1.4	All laboratory rooms shall be provided with visual monitoring devices (magnehelic/photohelic gauge or digital readout) indicating directional inward airflow. Audible and visible alarms for HVAC system failure shall be installed.	
D.2 - Negative Pressure & Differential Pressure		
D.2.1	The BSL-3 core facility shall be maintained under continuous negative pressure relative to adjacent areas. Minimum differential pressure between any two adjacent functional spaces shall be 15 Pascal.	

D.2.2	All negative pressure in the containment area shall be measured with reference to a common single atmospheric set point.	
D.2.3	The HVAC system shall be capable of sensing and responding to unusual outside pressure conditions (e.g., storms) and maintaining negative pressure in all weather conditions. The system shall withstand maximum design pressure under supply and exhaust fan failure (no wall distortion or damage).	
D.3 - Air Changes & HEPA Filtration		
D.3.1	Air changes per hour (ACPH): Exact figure to be based on risk assessment for mandated work.	
D.3.2	All exhaust air from the containment area and containment equipment (BSCs, IVCs) shall be HEPA/ULPA filtered (efficiency $\geq 99.97\%$) before discharge to atmosphere. Double HEPA filters in series are recommended in higher-contamination areas.	
D.3.3	HEPA filter housings shall have: (a) in-situ leak testing facility; (b) isolation valves (zero-leakage bio-seal dampers) on both upstream and downstream sides; (c) ports for injecting decontamination chemicals before filter removal/replacement; (d) differential pressure gauges to monitor filter loading. BIBO (Bag-In-Bag-Out) configuration is preferred.	
D.3.4	Pre-filters shall be installed upstream of all HEPA filters (supply and exhaust) to extend HEPA filter life. Used pre-filters shall be decontaminated before removal from containment area.	
D.3.5	Supply and exhaust HEPA filter housings shall be located as close as possible to the containment space to minimise the length of containment ductwork.	
D.3.6	HEPA filters shall be designed for appropriate rated capacity to allow sufficient margin for dust loading.	
D.4 - Ductwork		
D.4.1	Air supply and exhaust ducts within the containment BSL-3 lab shall be airtight (zero-leakage), constructed of SS-304 (stainless steel) material to prevent rusting. Duct material shall be fumigation-compatible.	

D.4.2	All supply and exhaust air dampers shall be airtight and tested before installation. The complete laboratory ductwork shall be tested for leakage by pressure decay test at +1000 Pascal pressure (or soap bubble test) prior to commissioning.	
D.4.3	All air duct openings and service penetrations running between non-containment and containment areas shall be sealed to prevent air circulation between zones.	
D.4.4	Exhaust air shall be discharged from the roof, preferably vertically upward at a velocity greater than 3000 fpm (900 m/min) to maintain negative pressure under worst weather conditions. The exhaust outlet shall be suitably designed to prevent rainwater ingress. Exhaust stack shall be positioned such that exhaust and supply air inlets are separated by at least 7 m to prevent re-entrainment.	
D.4.5	Outside air intake shall be protected against rain ingress with bird screen (6mm or 12mm) and shall not allow rain to wet or clog supply air filters.	
D.5 - Interlocking & Controls		
D.5.1	Supply fan shall start only after the exhaust fan is switched on (supply-exhaust interlock). The HVAC control system (DDC/BAS/PLC) shall be fully electronic and prevent positive pressurisation of the laboratory at all times.	
D.5.2	Isolation valves (zero-leakage) shall be provided in HEPA filter housings to prevent leakage of contaminated air and to facilitate gaseous decontamination of the laboratory in case of AHU breakdown.	
D.5.3	Standby fans and pumps shall be provided in supply and exhaust ventilation systems. N+1 redundancy for chillers (where applicable) to prevent overheating of interior rooms.	
SECTION E: MECHANICAL SYSTEMS		
E.1	Air compressor (if required for pneumatic controls or compressed air supply within BSL-3) shall be oil-free and moisture-free, installed outside the containment area. Sound level < 60 dB. Shall be mounted on vibration isolators with automatic moisture drain valve.	

E.2	Analysis for centralized steam generator (oil-fired or electric boiler) or stand-alone electric steam generators shall be conducted based on requirement. Steam supply is required for: autoclave operation, liquid waste decontamination, and hot water generation for showers/central heating.	
E.3	The BSL-3 facility shall have a Diesel Generator (DG) set capable of 100% load requirement with Automatic Mains Failure (AMF) panel. Fuel storage shall be designed for extended operation during prolonged power outages. DG set shall be housed in an environmentally friendly enclosure meeting CPCB/BPCB norms. Noise level < 60 dB. A standby/second generator is recommended (subject to cost-risk analysis at design stage).	
SECTION F: PLUMBING, DRAINAGE & EFFLUENT TREATMENT		
F.1	Each floor drain shall have a minimum 125 mm deep trap connected directly to the Effluent Treatment Plant (ETP). Cleanout plugs shall be provided within the containment zone. Liquid waste pipes shall be acid- and chemical-resistant, leakproof, and easily cleanable.	
F.2	Drain traps shall withstand maximum negative pressure (as per risk assessment) to prevent reverse airflow from drain lines. Traps shall always remain filled with water/chemical disinfectant for sealing. Sewer lines shall be appropriately protected.	
F.3	A foot/elbow/sensor-operated hand washing station shall be provided near the exit of each functional space. Sinks shall be acid- and chemical-resistant, preferably SS-304 or epoxy-coated resin.	
F.4	A sensor-based or foot/elbow-operated eye wash station shall be provided in the laboratory, preferably near the exit door.	
F.5	Service pipes shall be installed with sloping lines and backflow preventers to isolate branch water lines. Piping shall be mounted with a gap from the wall for cleaning access and to avoid contamination.	
F.6	Compressed air lines for instrument control shall be oil-free and moisture-free, fitted with small inline HEPA filters and backflow preventers.	

F.7	Vacuum outlets (if provided) shall be protected by HEPA filters and liquid disinfectant traps. HEPA filter efficiency >= 99.97%; validated/replaced annually.	
F.8	All sewer and vent lines shall be appropriately protected. Liquid waste (biological/effluent) treatment system (ETP/kill tank) shall be provided based on risk assessment. Steam-based disinfection protocol shall be followed for spore-forming bacteria, fungi, and other infectious agents. Chemical disinfection in ETP may be considered for virus-culture-only facilities following proper validation.	
F.9	For facilities with washrooms, effluent from washrooms shall also be decontaminated before disposal to municipal sewer. Drain traps shall have minimum 125 mm water seal.	
F.10	Double-door barrier autoclave (in-situ, pass-through type) with interlocked doors shall be provided for decontamination of all contaminated waste and materials leaving the facility. Waste loaded from inside the facility; removed from outside only after autoclave cycle is complete. Lab clothing shall be decontaminated by autoclaving before washing.	
F.11	A fumigation airlock shall be provided for materials that cannot be steam autoclaved.	
F.12	Pass-through cabinets / dunk tanks shall be provided for transfer of biological materials. Door interlocking with override facility. Dunk tank provision based on risk assessment.	
SECTION G: ELECTRICAL SYSTEMS		
G.1	Separate power and lighting panels shall be provided for containment and non-containment spaces. All main distribution panels shall be located outside the containment space for ease of maintenance.	
G.2	All conduit openings (inside and outside) running from non-containment to containment areas and across different containment zones shall be fully sealed to prevent air circulation. Sealing shall be done at accessible locations for inspection and maintenance.	

G.3	All lights shall be energy-efficient as per the Energy Conservation Building Code (ECBC). Lighting levels: 300-500 lux in laboratory areas; 700-800 lux in cleaning cycle areas. Emergency lighting shall be sufficient to permit safe stopping of work and safe exit. Emergency lights shall have UPS backup.	
G.4	All critical systems (signage, emergency lights, BAS/DDC, communication network, exhaust system for maintaining negative pressure, and other critical equipment) shall be provided with online UPS with minimum 120 minutes backup. A standby UPS of 100% capacity of the designed UPS capacity shall be installed.	
G.5	A standby generator with AMF panel capable of bearing 100% facility load shall be available for power failure scenarios.	
G.6	Electrical load shall be divided equally across each phase. A centralized voltage regulator ($\pm 10\%$ of rated supply) shall be provided, located outside the facility. Equipment requiring servo voltage ($\pm 2\%$) shall be identified at design stage and served by a separate central servo stabilizer outside the facility.	
G.7	A separate standby cable with 100% load capacity shall be kept as standby and used in case of fault in the main cable to reduce downtime. Electrical load calculations shall account for future equipment additions.	
G.8	Wiring for interlocking of double-door entry, airlocks, pass boxes, and double-door autoclaves shall be designed so that both doors cannot be opened simultaneously under any condition.	
G.9	Earthing system: Copper earth plate 600mm x 600mm x 3mm thick, in masonry enclosure with 2.7m (or as per standard technical specification) watering pipe and funnel. Separate earthing for neutral and for general earthing as per Indian Electricity Rules. Separate earthing for main electric supply and each generator. Voltage difference between neutral and earth shall be $< 5V$.	
SECTION H: COMMUNICATIONS, BAS & SECURITY		

H.1	The laboratory shall be equipped with a communication network between containment areas, outside support areas, and service areas. Data and voice points (CAT5/6 or equivalent) shall be provided in all zones. A suitable EPABX system shall be provided for required incoming and outgoing lines. The system shall be connected to a manned location at all times during laboratory operation.	
H.2	LAN network and data transfer systems shall be provided for electronic transfer of information within and outside the containment laboratory. Paper transfer shall be discouraged; if unavoidable, paper must be decontaminated through autoclave/fumigation chamber/airlock before removal.	
H.3	CCTV surveillance system shall be installed at all entry, exit, and containment areas: high-resolution colour cameras, multiplexer cum DVR, LED monitor, and associated power and control cabling. Footage storage and access provisions to be detailed.	
H.4	Direct Digital Control (DDC) and Building Automation System (BAS) are mandatory for automated monitoring and control of all critical containment parameters (negative pressure, ACPH, HVAC status, access control, alarms). Architecture and integration scope to be detailed.	
H.5	Access control system with biometric/fingerprint scanning shall be integrated with the entry/exit interlocking system. A 3-tiered security system shall be designed as part of the overall security architecture.	
SECTION I: SAFETY EQUIPMENT & BIOSAFETY CABINETS		
I.1	Biological Safety Cabinets (BSCs): Class II A2 (minimum); Class III for highest-risk activities, as per risk assessment. BSCs shall be placed away from walking areas and crosscurrents from doors and ventilation systems. Exhaust air from BSCs (after HEPA filtration) shall be discharged without interference with the cabinet's air balance or the building exhaust system.	

I.2	Individually Ventilated Cages (IVCs) shall be provided where animal experimentation with RG-3 agents is part of the mandate. Details to be based on facility type and scope.	
I.3	Fire safety systems shall be designed and installed: fire extinguishers, water sprinklers (where applicable), and emergency/incident response equipment based on risk assessment. Fire security and flood risk considerations shall be incorporated in the design.	
I.4	First-aid facilities shall be readily accessible and suitably equipped/stocked within the facility. Location to be indicated in drawings.	
I.5	Appropriate decontamination methods for waste (disinfectants, autoclaves) shall be available in proximity to the laboratory. Safety systems covering fire, electrical emergencies, and emergency/incident response shall be incorporated.	
SECTION J: COMMISSIONING & VALIDATION PROVISIONS		
J.1	The design shall incorporate provisions to facilitate formal commissioning and validation as per Annexure II, III, and IV of the DBT-ICMR BSL-3 Guidelines 2024. Essential tests during commissioning include (but are not limited to): directional airflow, negative pressure verification, ACPH measurement, HEPA filter integrity testing (DOP/PAO scan), duct leakage test, autoclave validation, room containment integrity test, electrical system checks, and BAS/DDC functional verification.	
J.2	All HEPA filter housings shall be installed in a manner that permits in-situ decontamination and integrity testing without compromise to containment. In-situ HEPA scanning provisions shall be specifically detailed in the design drawings.	
J.3	Design shall include provisions for annual revalidation of critical systems: directional airflow, air velocity, ACPH, AHU performance, HEPA filter integrity, BSC certification, autoclave efficacy, particle count, and room perimeter integrity. All revalidation to be by ISO/IEC 17025 accredited organizations.	

J.4	Structural provisions for commissioning access: Adequate access panels, test ports, and maintenance corridors shall be designed and clearly marked to allow safe access to all critical systems (HEPA housings, dampers, AHU components) without breaching containment.	
SECTION K: REDUNDANCY & EMERGENCY SYSTEMS		
K.1	Design principle: Failure of any single electrical, mechanical, or power source shall NOT result in shutdown of critical biocontainment systems. Sufficient redundancy (N+1 or N+2 as applicable) shall be incorporated for all critical systems based on criticality and cost-risk analysis.	
K.2	Standby fans and pumps shall be provided for supply and exhaust ventilation. Chiller redundancy (N+1) shall be considered for thermal management of interior rooms.	
K.3	Emergency exit provisions: Emergency exit door with override for all interlocked doors, key in glass-fronted box, tested minimum once per year. The emergency door shall remain closed at all other times. Break-through panel in anteroom for emergency egress.	
K.4	Emergency/incident procedures shall be planned into the design. Provisions for emergency decontamination, spill management, and personnel emergency exit without breach of containment shall be detailed in the design concept.	
SECTION L: SCOPE OF DRAWINGS & DOCUMENTATION TO BE SUBMITTED		
L.1	Master Plan & Site Layout: Site plan showing location of BSL-3 facility relative to other institution buildings, access roads, and utilities; justification for site selection based on guidelines.	
L.2	Architectural Drawings: Floor plans (all levels), elevations, sections, detailed layout of all zones (core lab, anterooms, change rooms, shower areas, clean corridors, support areas, autoclave room, ETP/waste treatment area). Room data sheets for each space.	
L.3	Containment & Zoning Plan: Diagrammatic representation of containment zones, pressure cascade zones, personnel flow, material flow, and waste flow routes.	

L.4	HVAC / MEP Schematic Drawings: HVAC single-line diagrams; supply and exhaust air system layouts; HEPA filter housing locations; pressure monitoring points; AHU placement; duct routing in containment zone; electrical single-line diagrams; plumbing and drainage schematics; ETP/effluent system schematic; compressed air, steam, and gas services layouts.	
L.5	BAS/DDC/Security: System architecture for BAS, DDC, CCTV, and access control integration; alarm matrix; BMS monitoring points list.	
L.6	Equipment Layout Plan: Placement of all major equipment (BSCs, IVCs, autoclaves, pass boxes, centrifuges, incubators, freezers/ULTs, etc.) with service connections and clearance for operation and maintenance.	
L.7	Specifications: Technical specifications for all major construction materials (flooring, wall coatings, ceiling, sealants), HVAC equipment, HEPA filters, BSCs, autoclave, electrical systems, and plumbing fittings, as per guideline requirements.	
L.8	Project Implementation Plan: PERT/CPM chart or detailed schedule showing milestones from design through construction, commissioning, validation, and handover to AIIMS Patna.	
L.9	Regulatory Compliance Statement: A statement confirming that the design will meet all requirements for certification under the DBT-ICMR National Guidelines for BSL-3 Containment Facility 2024, and will facilitate application for BSL-3 Certification to the concerned Line Ministry.	

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Design Deviation and Optimisation Statement
(To be submitted by EoI-Applicant on Letter head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Sl. No.	Clause Ref.	Type (Deviation / Enhancement / Optimization)	Proposal Description	Justification	Proposed Revised Clause
1					
2					
3					

Note: This Annexure is intended to capture any deviations, enhancements, or optimization proposals that the Applicant proposes over and above the specified design requirements outlined in this EoI document.

The Applicant shall clearly identify and document all such proposals with reference to the relevant clause(s), along with detailed technical justification and impact assessment.

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Write-up for BSL-3 Proposed Design
(To be submitted by EoI-Applicant on Letter head)

To,
The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Write-up:

(Provide a comprehensive write-up outlining the step-by-step approach for establishment of the BSL-3 laboratory, including planning, design development, execution support, validation, and commissioning strategy)

(Applicant may modify/add activities as per their methodology.)

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Proposed Payment Milestone

(To be submitted by EoI-Applciant on Letter head)

To,

The Executive Director,
All India Institute of Medical Sciences,
Phulwarisharif, Patna-801507

EoI Ref:

Payment Milestone Schedule (Indicative)

Sl. No.	Stage / Deliverable <i>(Applicant may modify/add stages as per their methodology.)</i>	Description of Deliverable	% of Payment
1	Concept Design Stage		
2	Preliminary Design Stage		
3	Detailed Design & Drawings		
4	DPR & BoQ Submission		
5	Tender Support & Finalization		
6	Construction Phase Support		
7	Commissioning & Validation Support		
8	Final Handover & Completion of the BSL-3 Lab		

.....
(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....

Design Timeline Schedule

(To be submitted by EoI-Applicant on Letter head)

To,
 The Executive Director,
 All India Institute of Medical Sciences,
 Phulwarisharif, Patna-801507

EoI Ref:

Design Timeline Schedule

Sl. No.	Design Stage	Description	Duration	Dependency / Remarks	Deliverable
1	Concept Design				
2	Preliminary Design				
3	Detailed Design & Drawings				
4	Design Coordination (MEP, HVAC, etc.)				
5	Final Design Submission				
6	DPR & BoQ Preparation				

(Applicant may modify/add stages as per their methodology.)

.....

(Signature with date)

Name and designation:.....

(Duly authorized to sign for and on behalf of

M/s:.....

[Seal of the applicant]:.....