



# INTRODUCTION

## **VOL –II-PART-A**

**CONSTRUCTION OF PROPOSED CENTRE OF EXCELLENCE OF  
FIRE TESTING TRAINING AND RESEARCH LABORATORY AT  
IIT, PATNA, BIHAR: VOL-II-PART-A INTRODUCTION**

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## 1. PREFACE

The Fire Testing Training and Research Laboratory at the Indian Institute of Technology (IIT), Patna, is a newly established centre of excellence set up in June 2025 by the Department of Civil Engineering (BCD) to conduct research on fire safety and provide specialised training. This facility, the first of its kind in the north-eastern region of India, will serve as a hub for innovation and development in the field of fire safety.

Key aspects of the laboratory for fire testing, training and research:

Purpose: To provide state-of-the-art fire testing infrastructure, offer specialised fire safety training programmes and conduct advanced research in the field of fire safety engineering.

## 2. OBJECTIVE AND BASIS OF THE REPORT

This report delineates the conceptual approach for the architecture, structure, mechanical, electrical, and plumbing (MEP) systems for the building, covering various aspects:

- i. Design criteria, intent, and approach for architectural and structural design options.
- ii. Electrical and extra low voltage services, including the base building security system.
- iii. Fire protection and detection systems.
- iv. Audio-visual systems.
- v. Site filling considerations to achieve FGL above HFL in the area.

**Key design considerations for MEP systems include:**

- i. Sustainable design meeting local authorities' requirements.
- ii. Alignment with targeted GRIHA requirements.
- iii. Adequacy of MEP design to meet building usage.
- iv. Enhancing functionality/performance.
- v. Achieving optimal operational efficiency/cost.
- vi. Incorporating current innovative, energy conservation, and environmentally friendly features.
- vii. The report showcases proposed MEP systems, providing recommendations for optimal design in constructability, maintainability, and reliability, adopting the latest technology. It emphasizes that detailed design by the EPC Contractor must align with specified parameters and gain approval from BCD on recommendation of consultant.

viii. MEP System Design focuses on reliability, maintainability, energy efficiency, and cost optimization. Green credentials and GRIHA certification are emphasized, with a minimum 3-star rating required and an aspiration for a 4-star rating.

### 3. EXECUTIVE SUMMARY

This report outlines the design proposal for Fire Testing Training and Research Laboratory in the campus of IIT, Patna. The current architectural layout includes a building block with surface parking, landscape elements, etc. There are 3 sub sections of main Building segregated by expansion joint.

- i. **Live Fire Testing Building** – This building has been designed for live fire testing, especially to withstand high temperatures. All building materials or assembly of material used for finishes (interior and exterior) must withstand a four-hour test. This is a three-floor building. We have three testing laboratories one on each floor.
- ii. **Large scale Fire Testing Laboratory** – This is 12 M triple height building for large scale fire testing purpose. The hall will have a crane to take load of 10-ton min. for the purpose of moving the heavy-duty objects.
- iii. **Institute** - This is a single-floor building. On ground floor we have -Reception, Conference Room, Waiting area, class room for 48 students and office space.

### 4. BRIEF SCOPE OF WORK

The scope of work for E.P.C. Contract shall include (but not limited to) the following works. Scope of work in brief for a glance is as below:

1. EPC contract shall include Architectural detailing on approved concept design, Soil investigation and Topographical Survey, Design of Structure and MEP services including allied works, Vetting of structural design from IITs, obtaining GRIHA Rating 3 star with an aspiration to attain a 4-star rating., obtaining all statutory preconstruction stage approvals from Local Authorities including approval of scheme of services like water supply/sewage/electricity from concerned department, preparing execution drawings, getting approval from BCD/Client, Construction and Commissioning of the project along with all necessary completion certificates from relevant authority as required .
2. EPC contract shall include Architectural detailing on approved concept design, Soil investigation and Topographical Survey, Design of Structure and MEP services including allied works, Vetting of structural

design from IITs, obtaining GRIHA Rating 3 star with an aspiration to attain a 4-star rating., obtaining all statutory preconstruction stage approvals from Local Authorities including approval of scheme of services like water supply/sewage/electricity from concerned department, preparing execution drawings, getting approval from BCD/Client, Construction and Commissioning of the project along with all necessary completion certificates from relevant authority as required .

- a. Structural Works – As per Structural DBR
  - b. Architectural & Civil Finishing Works
  - c. Plumbing Works
  - d. Fire Alarm/ Fighting Works
  - e. Bulk Electrical Services
  - f. Miscellaneous Works
  - g. Outdoor& Landscape Lighting
    - h. CCTV Network
    - i. Signage
    - j. Audio Visual
  - k. Filling the site with suitable earth, to achieve FGL of site above HFL in the area
  - l. Kitchen Exhaust Scrubber to separate and remove solid particulate matter from kitchen exhaust such as smoke, oil, dust, particles etc.
  - m. Site Development & Landscape (including landscaped roads, Paths, Streets feature & furniture)
  - u. Parking- Surface
3. The project is to be built fully compliant to minimum GRIHA 3-star rating. norms for the entire scope in this contract along with getting the final Rating from GRIHA.
  4. The details mentioned in DBR and technical specification / conceptual drawings are indicative in nature and improvements to be done.
  5. The bidder will ensure to complete the work and make functional as per NBC 2016, statutory requirements and good engineer-in-charge practices etc.
  6. The area statement given is indicative in nature. The works is to be completed as per approved concept design, drawings, scope of work, finishing schedule and prevalent codes, NBC 2016, statutory requirement guidelines etc.
  7. Bidder/EPC Contractor is advised to do their own survey detailed exploration of soil and nothing extra will be paid on deviation from soil report.

8. All drawings/ specifications / makes / shop drawings and construction methodology etc. are to be got approved from BCD on recommendation of consultant as required prior to execution / procurement. However, it does not imply that bidder absolves themselves from code provisions/statutory requirements.
9. Preparation of Detail design and drawings based on DBR.
10. Preparation of Shop drawings and its approval from BCD Consultants & from Proof checking Agency.
11. The E.P.C. contractor shall bear the complete responsibility and cost for the surveys; investigation studies; design development of the employers design/ performance criteria up to detail design level, Engineer-in-charge (including all specialised engineer-in-charge requirements mentioned in the contract or needed for the successful completion and handover of the project); Manufacture; Delivery; Construction; Erection and Installation; Testing, Commissioning, Handing Over and provision of required warranties of the entire facility.
12. The E.P.C. contractor is expected to discharge his responsibility in conformity with the contract as per the tender documents and those documents specified therein to constitute the contract document and in conformity with all laws, regulations, acts, statutes, bye-laws, applicable to all aspects of the investigation, design, Engineer-in-charge, construction, manufacture, delivery and shall indemnify the owner against any claims or damages, fines, suits, legal or administrative actions/ strictures penalties, etc. resulting from the neglect or inability or avoidance of the above said laws, regulations, statutes, etc.
13. It is re-emphasised that the employer expects the EPC Contractor to comply with all municipal regulations, environmental regulations, health and safety regulations and comply with all the requirements spelled out in this regard in the contract. Where there is a difference between the employer's requirements and regulatory requirements the more stringent provision shall prevail. It is assumed the EPC Contractor has completed his due diligence on this prior to filling the tender and no change in cost shall be considered for this.
14. The EPC Contractor shall follow all best practices, codes, standards and adhere to specifications and shall meet or exceed performance requests as spelled out in this contract.
15. The EPC Contractor shall carry out the procurement of all the materials, equipment's, Installations, accessories as may be required for completion and Installation & Commissioning of work for the project.
16. The EPC Contractor shall undertake the construction of the project in accordance with the Employer approved Design Development Documents.
17. The scope of the execution work shall be in accordance with the design development documents, as prepared by the EPC Contractor and approved by the Engineer's-in-charge Representative, inclusive of, but not limited to, civil and structural works, architectural works, hard and soft landscaping works, signage

works, all builders work associated with MEP, Fire Protection, Conveying Systems, Special Systems, LV and ELV Systems, and all associated works for the Project, as further described herein and as per the Works Requirements. The work is inclusive of all coordination with other contractors and consultants working on the Project. Specific requirements are elaborated below:

- i. The scope of work is not exhaustive however, EPC Contractor is required to execute all the items as per Scope of work, Design basis reports (DBR)/specifications, Technical Specifications, Drawings etc. to make the buildings & complex fit for its intended purpose i.e. handing over for functional use as technical institute. The details mentioned in DBR and technical specification / conceptual drawings are to be followed. The bidder will ensure to complete the work and make functional as per BIS/NBC 2016 and other standards as mentioned.
- ii. The EPC Contractor has to obtain all the statutory/ municipal and mandatory approvals /NOCs, tree cutting approval required for successful execution of work which may be required to get before start of work (Except sanction of building plans from Local Authorities/Environment Clearance), during the work and after the completion of work. The statutory fee for such approvals / clearances shall be borne by the EPC Contractor to statutory authorities.
- iii. If any modification in Civil/Structural design/ drawing is needed as per site conditions and/or change in Architectural Design and/or change in client's requirement, the agency shall do/ redo the design without any extra cost as well as suggest solutions to the problems coming across during actual execution. The decision of the Engineer-in-charge shall be final and binding. No claim whatsoever will be entertained in this regard.
- iv. Built Up area is based on approved concept drawings which include Free FAR / FAR/ Non-FAR and other components. Any increase in area as per concept drawing & area statement up to 3% due to statutory / municipal requirements / Client / BCD / BCD consultant requirement is deemed to be included in the cost, nothing extra shall be paid. However, if area increases more than 3% of area statement proportionate value should be payable on excess of 3% area. If area becomes less than area statement recovery shall be made on prorate basis.
- v. All drawings/ specifications / makes / shop drawings and construction methodology etc. are to be got approved from BCD or their consultant prior to execution / procurement. However, it does not imply that bidder absolves themselves from code provisions/statutory requirements.
- vi. All structural drawings & Facade drawings and Design Mix of Concrete shall be got approved from IITs. Statutory fee shall be paid by EPC Contractor to statutory authorities.

- vii. In case of any discrepancies between Specification due to DBR, Scope of Work, Technical Specification, CPWD Specification, IS Codes etc. Stringent of all will be applicable.
- viii. All the specialised work agencies as envisaged in CPWD manual and consultants needs to be fulfilling the similar eligibility criteria as per NIT condition for their contract value as mentioned in NIT for pre-qualification of bidder. All sub vendors / specialised agencies as mentioned have to be got approved from BCD / Client / BCD Consultant along with submission of documentary evidences on similar line as mentioned in NIT.
- ix. Design and construction of RWH for zero discharge in municipal system during rains.

#### 18. DISCLAIMER

- a) The EPC Contractor acknowledges that prior to the execution of this Agreement, the EPC Contractor has, after a complete and careful examination, made an independent evaluation of the Request for Qualification, Request for Proposals, Scope of the Project, Specifications and Standards of design, construction and maintenance, Site, local conditions, physical qualities of ground, subsoil and geology, traffic volume & restrictions, suitability and availability of access routes to the Site and all information provided by the Employer or obtained procured or gathered otherwise, and has determined to its satisfaction the accuracy or otherwise thereof and the nature and extent of difficulties, risks and hazards as are likely to arise or may be faced by it in the course of performance of its obligations hereunder. The EPC Contractor confirms that it shall have no claim whatsoever against the Employer in regard the accuracy, adequacy, correctness, reliability and/or completeness of any assessment, assumptions, statement or information provided by it. The drawings/ documents indicate the minimum requirements and the EPC Contractor is supposed to provide the best in practice products without any compromise on quality.
- i.i. The EPC Contractor acknowledges and hereby accepts to have satisfied itself as to the correctness and sufficiency of the Contract Price.
- ii.ii. The EPC Contractor acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth elsewhere in the tender document and hereby acknowledges and agrees that the Employer shall not be liable for the same in any manner whatsoever to the EPC Contractor, or any person claiming through or under any of them.
- iii. The Parties agree that any mistake or error in or relating to any of the matters set forth elsewhere in tender document shall not vitiate this Agreement, or render it voidable.



iv. In the event that either Party becomes aware of any mistake or error relating to any of the matters set forth elsewhere in tender document, that Party shall immediately notify the other Party, specifying the mistake or error.

v. Except as otherwise provided in this Agreement, all risks relating to the Project shall be borne by the EPC Contractor; and the Employer shall not be liable in any manner for such risks or the consequences thereof.

b) Design by EPC Contractor and Copyright:

All these design & drawings will become the property of BCD. The drawing cannot be issued to any other person, firm or authority or used by the EPC Contractor for any other project. No copies of any drawing or document shall be issued to anyone except BCD and authorized representative of BCD.

c) Avoidance of Interference

The EPC Contractor shall not interfere unnecessarily or improperly with:

1) The convenience of the public, or  
2) The access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of BCD or of others. The EPC Contractor shall indemnify and hold BCD harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

d) All the specialized work agencies as envisaged in CPWD manual and consultants for Architectural, Structural, MEP, Landscaping, Interiors, etc. needs to be fulfilling the similar eligibility criteria as per NIT condition for their contract value as mentioned in NIT for pre-qualification of bidder. All sub vendors/ specialized agencies as mentioned have to be got approved from BCD / Client in writing along with submission of documentary evidences on similar line as mentioned in NIT. The Structural Lead Consultant shall have Degree in Civil Engineering with Minimum 15 years' experience in the Structural design field and have done structural design of Works of Structural Design of multistorey RCC Buildings and Pre-engineered buildings.

e) Existing Services & Storage/Labour Camps within Site

## I. Existing Services

Existing drains, pipes, cables, overhead wires, sewer lines, water lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the EPC Contractor. The EPC Contractor shall identify all underground /

overhead services and take necessary measures to protect the services before starting any excavation / activity. All temporary supports and other measures required to protect and maintain the services during construction period as per direction of Engineer-in-charge, shall be deemed to be included in the quoted rate / amount of the EPC Contractor and nothing extra shall be paid on this account. For any permanent shifting, BCD shall arrange to shift the services as and when required. However, in the interest of work, if BCD decides to get it shifted by the EPC Contractor, then EPC Contractor shall be paid separately at the rates as decided by the Engineer-in-charge based on the actual quantum of the work involved in shifting such utilities/services. The decision of the Engineer-in-Charge in this regard shall be final and binding.

II.No extra payment shall be entertained by BCD towards any lead on account of transportation of Ready-Mix Concrete or any other material. The EPC Contractor has to make their own arrangement for storage/stacking of all construction materials, labour camps, fabrication yard etc. The EPC Contractor has to arrange the extra land other than the land available at site. The EPC Contractor's proposal /bid shall be deemed to have seen the site and considered this while making his proposal and his quoted price is deemed to have included the above. Further, the lease / rent charges of land, if any, shall be borne by the EPC Contractor. The Engineer-in-Charge shall only extend necessary help and issue necessary recommendations etc. to the concerned department for temporary allotment of land during construction period. The EPC Contractor shall construct double storey superior quality porta cabin structure with proper ventilation for their work force along with provision of water, electricity, washing & bathing facility, First Aid/ Medical room with qualified doctors, proper system of collection & disposal of garbage and keep the area clean and hygienic.

f) EPC Contractor's Responsibilities

By entering into the contract, the EPC Contractor acknowledges responsibility for ascertaining and securing at his own cost:

**As the building involves specialized research, training, and practices, a case study of a similar building with similar nature, must be conducted by the contractor in collaboration with the engineer-in-charge to ensure the highest precision. No extra payment shall be made.**

- i. Conditions bearing upon the proper transportation, disposal, handling and storage of materials (including but not limited to hazardous toxic substances and excavated materials).
- ii. Availability of electricity, water and gas.
- iii. Availability of skilled manpower.

iv. The character of equipment and facilities needed preliminary to and during the manufacture, installation, execution, testing, Integrated Testing, and commissioning of the Works and remedying of any defects. The protection of the environment and adjacent structures which will be necessary preliminary to and during the manufacture, installation, execution, \testing, Integrated Testing, and commissioning of the Works and remedying of any defects. The location of and the authorization required for and the means of diversion of any services and facilities required for the purposes of the Works. The EPC Contractor shall whenever be required by the Engineer-in-charge, submit details of the arrangement and methods which the EPC Contractor proposed to adopt for the execution of the Works. No alteration to these arrangements or methods shall be made without the approval of the Engineer-in-charge.

g) Accurate Setting Out

The EPC Contractor shall be responsible for:

- i. The accurate setting out of the Works in relation to the original points, lines and levels of reference given by the Engineer-in-charge in writing.
- ii. The correctness of position, levels, dimensions and alignments of all parts of the Works.
- iii. The provisions of all necessary instruments, equipment, apparatus and labour in connection with the foregoing responsibilities.
- iv. Carefully laying, protecting and preserving all bench marks, sight rails, pegs and other things used in setting out the Works. The checking of any setting-out or of any line or level by the Engineer-in-charge shall not in any way relieve the EPC Contractor of his responsibility for the accuracy or correctness thereof and the EPC Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting out the Works.

h) Temporary Works

All temporary works necessary for the proper execution of the works shall be provided and maintained by the EPC Contractor at his cost and subject to the consent of the Engineer-in-charge shall be removed by EPC Contractor at his own expense when they are no longer required and in such manner as the Engineer-in-charge shall direct. In case the EPC Contractor fails to remove the temporary works on completion the Engineer-in-charge is authorized to get the same removed and recover the cost thereof from the EPC Contractor.

i) Site Clearance

- i. During the execution of the Works, the EPC Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any EPC Contractor's Equipment or surplus material.
  - ii. The EPC Contractor shall clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.
  - iii. On completion of the works, the EPC Contractor shall clear away and remove from site all Constructional Plant, surplus material and Temporary Work.
  - iv. He should leave the whole of the site and Works in a clean, tidy and workman like condition to the satisfaction of the Engineer-in-charge.
  - v. On completion of Work the EPC Contractor shall also clear away the labour camps, hutments and other related installations and restore the land to its original condition to the satisfaction of the Engineer-in charge within 42 (forty-two) days of the physical completion of Work. The cost on account of delay in return of land and reinstatement of original condition within the stipulated time as determined by Engineer-in-charge will be recovered from the EPC Contractor's dues.
  - vi. No final payment in settlement of the accounts for Works shall be made or held to be due to the EPC Contractor, till, in addition to any other condition necessary for such final payment, site clearance and clearances of labour camps etc. shall have been affected by him. Such clearance may be made by the Engineer-in-charge through any other agency at the expense of the EPC Contractor in the event of the EPC Contractor's failure to comply with this provision within 7 days after receiving notice to that effect from the Engineer-in-charge. All expenses on such removal / clearance shall be debit able to the EPC Contractor as loans due from the EPC Contractor to the Employer, and the Employer shall be competent to recover the same from EPC Contractor's on-account or final bills, or from Performance Security amount or from any other amount payable to the EPC Contractor in any other Contract.
- j) Security of the Site
- i. The EPC Contractor shall be wholly responsible for security of site and Works. Unless otherwise stated in Special Conditions of Contract.
  - ii. The EPC Contractor shall be responsible for keeping unauthorized persons off the Site; and Authorized persons shall be limited to the Employees of the EPC Contractor, SubEPC Contractor or persons authorized by the Engineer-in-charge.
- k) Lighting

- i. The EPC Contractor shall provide sufficient lighting at project site, of the right type and at the right place / location for it to be properly effective. Lighting ought not to introduce the risk of electric shock. Therefore, 230V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g., flood lighting or high-pressure discharge lamps.
- ii. The EPC Contractor shall ensure that luminaries should always be so placed that no person is required to work in their own shadow and that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.
- iii. Luminaries should be robust, resistant to corrosion and rain proof especially at the point of the cable entry. The correct type of lamp for each luminaries should always be used and when lamps need to be replaced, it shall be in accordance with the supply voltage. Lamp holders not fitted with a lamp should be capped off.
- v. The EPC Contractor shall take every effort to illuminate the work site as per the direction of Engineer in-charge. The compliance of above provisions are deemed to be included in the quoted amount of the EPC Contractor and no claim / payment whatsoever shall be entertained on this account.

#### l) Traffic Management

- i. The basic objective of the following guidelines is to lay down procedures to be adopted by EPC Contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen at construction sites.
  - 1. All construction workers should be provided with high visibility jackets with reflective tapes as most of construction activities shall be done within right-of-way of the roads. The conspicuity of workmen at all times shall be increased so as to protect from speeding vehicular traffic.
  - 2. The guiding principles to be adopted for safety in construction zone are to-
    - a. Warn the road user clearly and sufficiently in advance.
    - b. Provide safe and clearly marked lanes for guiding road users.
    - c. Provide safe and clearly marked buffer and work zones.
    - d. Provide adequate measures that control driver behaviour through construction zones.
- ii. Permission from competent authorities-
  - 1. Wherever operations undertaken are likely to interface with public traffic, specific traffic management plans shall be drawn up and implemented by the EPC Contractor in consultation with

the approval of local police authorities, and /or the concerned metropolitan/civil authorities as the case may be.

2. Such traffic management plans shall include provision for traffic diversion and selection of alternative routes. If necessary, the EPC Contractor shall carry out road widening before commencement of works to accommodate the extra load. The EPC Contractor shall be responsible for getting the “Traffic Management Plan” approved from Traffic Police before taking up any construction activity on the road.

iii. The rates quoted by the EPC Contractor shall be deemed to be inclusive of all the related cost except the cost of road widening. The primary traffic control devices used in work zones shall include signs, delineators. Barricades, cones, pylons, pavement markings and flashing lights, deployment of sufficient number of Marshalls on diversion roads and nothing shall be paid on this account.

iv. The road construction and maintenance signs which fall into the same three major categories as do other traffic signs that are Regulatory Signs. Warning Signs and Direction (or guidelines) Signs shall only be used. The IRC:67 (Code of Practice for Road Signs) provides a list of traffic signs. The size, colours and placement of sign shall confirm to IRC:67. Nothing shall be paid on this account.

v. Regulatory signs-

Signs impose legal restriction on all traffic. It is essential; therefore, that they are used only after consulting the local police and traffic authorities and nothing shall be paid on this account.

vi. Warning signs-

Warning signs in the traffic control zone shall be utilised to warn the drivers of specific hazards that may be encountered.

vii. The EPC Contractor shall place detour signage at strategic locations and install warning signs. In order to minimize disruption of access to residences and business, the EPC Contractor shall maintain at least one entrance to a property where multiple entrances exist.

viii. A warning sign shall be installed on all secondary roads which merge with the primary road where the construction work is in progress at sufficient distance before it merges with the primary road so as to alert the road users regarding the “Construction Work in Progress”.

ix. Materials hanging over/ protruded from the chassis / body of any vehicle especially during material handling shall be indicated by red indicator (red light/flag) to indicate the caution to the road users.

- x. Adequate water supply to be ensured by the contractor and for those necessary approvals to be taken by the EPC Contractor.
- xi. The compliance of above provisions are deemed to be included in the quoted amount of the EPC Contractor and no claim / payment whatsoever shall be entertained on this account
- xii. Delineators-

The delineators are the elements of a total system of traffic control and have two distinct purposes:

- 1) To delineate and guide the driver to and along a safe path
- 2) As a taper to move traffic from one lane to another.

These channelizing devices such as cones, traffic cylinders, tapes and drums shall be placed in or adjacent to the roadway to control the flow of traffic. These should normally be retro-reflectors complying to IRC:79. Recommended Practice for Road Delineators.

m) Dewatering of Site

The rates for all items shall be considered as inclusive of pumping / bailing out water, wherever necessary for which no extra payment shall be made. The area shall be kept dry when the work is in progress even below water table. Nothing extra shall be paid for removal of slush / sludge due to subsoil condition, rains, spring etc. Incidental Works Such as Bailing-Out Water, Shoring etc.

For execution of any items of work where incidental works such as bailing out water, shoring etc. are actually required but not specifically stated in the scope of item and/ or tender document, it is to be understood that the contract amount quoted by the EPC Contractor shall cover such charges also and nothing extra on account of such incidental charges, if any, shall be paid.

n) Water Supply and Electricity

Arrangement of water for drinking purpose in addition to the water required for construction work is also to be made by the EPC Contractor at his own cost. The EPC Contractor shall also make his own arrangement for obtaining electric connection and make necessary payment directly to the department concerned. BCD will however make all reasonable recommendations to the authority concerned in this regard.

The EPC Contractor shall make his own arrangement of water for completion of work and nothing will be paid on this account. The EPC Contractor shall get the water tested with regard to its suitability and conforming to the relevant IS Code. The EPC Contractor shall obtain written approval from the Engineer-in-Charge before he proceeds by using the same for execution of work. The EPC Contractor shall arrange

recycled water for construction purpose from STPs of nearby areas/colonies at his own cost. In case the above supply is short of total requirement of water for construction purpose, then the EPC Contractor shall arrange suitable water at his own cost.

o) Various Ancillary Provisions at Site

1) Traffic cones and cylinders Traffic cones of 500mm, 750mm and 1000mm height and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflectorized red and white band shall be used wherever required.

2) Drums about 800mm to 1000mm high and 300mm in diameter can be used either as channelizing or warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers.

3) Barricades The barricading of 6-meter height of approved design / design shall be erected all around the site. The structural dimension of the barricade, material and composition, its colour scheme, BCD logo and other details shall be in accordance with the drawing and the direction of Engineer-in-charge. No extra payment shall be made for providing barricading of required size/specification as the cost of barricading is deemed to be included in the quoted rates of different items by the EPC Contractor. The structural dimensions of the barricade boards, material and composition, its colour scheme, BCD logo and other details shall be as per direction of the Engineer-in-charge. The requirement of providing and fixing barricading at site shall be decided as per the direction and approval of Engineer-in-Charge. The barricading shall be provided continuously during the execution of the entire work till completion and shall not be removed at any stage without prior approval of the Engineer-in-Charge. All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricade. Conspicuity shall be ensured by affixing retro reflective stripes of required size and shape at appropriate angle at the bottom and middle portion of the barricade at a minimum gap of House. In addition, minimum one red light or red-light blinker should be placed at the top of each barricade The barricading shall include the following without any extra cost:

a. Traffic signals during construction at site for day and night, reflective signs, direction boards, marking, glow lamps, marking, caution tape, traffic signage as per requirement, flags, Traffic Marshals etc. as directed by the Engineer-in-Charge. However, traffic police signals shall not be the responsibility of the EPC Contractor.



- b. Cleaning of barricading every fifteen days with water and detergent so as to ensure that there is no dirt or splashes on the barricading. The dust accumulated along the barricades on the carriageway shall be removed every week.
- c. Installation of temporary warning signs/lamps on all barricades during the hours of darkness and kept it lit there at all times during these hours.
- d. Shifting and re-fixing in position as per the direction of Engineer-in-Charge and all incidentals to execute the job as many times as directed by Engineer-in-Charge.
- e. Repainting of the barricading after regular interval as directed by Engineer-in-Charge.
- f. Proper maintenance of the barricading till completion of the work by repairing/replacing the damaged barricade.
- g. The barricades shall be maintained in one line and level.
- h. Barricading is also required to be erected for segregating the area of work and deep excavation from the movement of man and machinery.

#### 4) Cleaning of roads

- a. The EPC Contractor shall ensure the cleanliness of roads and footpaths by deploying proper manpower for the same. The EPC Contractor shall have to ensure proper brooming, cleaning washing of roads and footpaths, at all the time, throughout the entire stretch till the currency of the contract including disposal of seepage without any extra cost.
- b. The required number of traffic guards /marshals as decided by Traffic Police /Engineer-in-charge shall be provided during construction period so as to ensure safe movement of traffic without any extra cost to BCD. In case of default, the traffic guards/ marshals shall be provided by BCD and cost thereof shall be recovered from the EPC Contractor in addition to recovery for violation of tender provisions. No claim whatsoever shall be entertained on this account.

#### 5) Diversion of Services

- a. All works pertaining to services including rerouting/diversion of services, routine testing, installation etc., embracing in one or more than one process shall be subject to examination and approval to each stage thereof by the Engineer-in-charge or concerned department as would be notified by the Engineer-in-charge or his accredited representative when such stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quantity and extent thereof and the decision of Engineer-in-Charge or his accredited representative in this regard shall be final and binding.

b. The EPC Contractor will not have any claim in case of any delay in removal of trees or shifting, raising, removing of telegraph, telephone or electric lines (overhead or underground), water and sewer lines and other structures etc., if any, which may come in the way of the work. No extension of time will be granted to cover such delays.

c. If work is delayed on site due to government guidelines, no claims will be entertained. The completion time will not be extended for any duration, even in the case of government-directed extensions in Delhi.

6) Disposal of surplus excavated earth/ Spoils

a. The EPC Contractor shall be deemed to have taken into account the quantum of excavation involved and that the surplus excavated earth remaining after use in operations such as Horticulture/Landscaping, Gardening, backfilling etc. and to be disposed-off by him; shall become his property free of cost.

b. It will be the responsibility of the EPC Contractor to get the permission for yard for dumping the surplus excavated earth from local authority if required. If any royalty/fee is payable to local authority, such royalty/fee shall also be borne by the EPC Contractor. Disposal shall be carried out strictly as per the regulations of local authority.

c. The EPC Contractor shall store the excavated earth required for operations such as Horticulture/Landscaping, Gardening, backfilling etc., at his own place other than the project site under his safe custody at his own cost. Thereafter, the earth so stored shall be backfilled at site at the appropriate time. The cost of storage, transportation (to & from site), handling etc. shall be borne by the EPC Contractor. d. The EPC Contractor shall also be deemed to have taken into account the credit to be given to BCD in his quoted price for such surplus earth obtained free of cost. e. The EPC Contractor shall also make his own arrangement for the disposal of the spoils from the works to such place where the same shall not cause nuisance and should be acceptable to the authorities concerned without any cost to BCD.

7) Access Route

a. The EPC Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site. The EPC Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the EPC Contractor's traffic or by the EPC Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

b. Except as otherwise stated in these Conditions:

- A. the EPC Contractor shall be responsible for any maintenance which may be required for his use of access routes at his own cost;
- B. the EPC Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions cost of which is deemed to be included in EPC Contractor's quoted price and nothing extra shall be admissible in this regard;
- C. BCD shall not be responsible for any claims which may arise from the use or otherwise of any access route,
- D. BCD does not guarantee the suitability or availability of particular access routes, and
- E. Costs due to non-suitability or non-availability, for the use required by the EPC Contractor, of access routes shall be borne by the EPC Contractor.

8) Inspection before Dispatch

All routine tests shall be conducted before dispatch of equipment's. No equipment shall be dispatched from the manufacture's premises without such tests being conducted and test result recorded. These test certificates shall be given along with the supply of equipment's. The Engineer In-charge shall, if he so desires inspect and witness the pre-delivery tests. For this purpose, the EPC Contractor shall give 15 days' advance notice. Agency shall arrange for inspection by BCD. BCD shall bear expenses for inspection as far as travelling, boarding and / lodging is concerned. However, waiver if any, for inspection shall be at the discretion of BCD without any cost implication but ROUTINE TEST & TYPE TEST Certificates shall have to be submitted for equipment's. Prior to dispatch, all equipment's shall be adequately protected & insured for the whole period of transit, storage and erection against corrosion and incidental damages etc. from the effect of vermin, sunlight, rain, heat and humid climate.

9) Existing Services & Storage/Labour Camps within Site

a) Existing Services-

Existing drains, pipes, cables, overhead wires, sewer lines, water lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the EPC Contractor. The EPC Contractor shall identify all underground / overhead services and take necessary measures to protect the services before starting any excavation / activity. All temporary supports and other measures required to protect and maintain the services during construction period as per direction of Engineer-in-charge, shall be deemed to be included in the quoted rate / amount of the EPC Contractor and nothing extra shall be paid on this account. For any

permanent shifting, BCD shall arrange to shift the services as and when required. However, in the interest of work, if BCD decides to get it shifted by the EPC Contractor, then EPC Contractor shall be paid separately at the rates as decided by the Engineer-in-charge based on the actual quantum of the work involved in shifting such utilities/services. The decision of the Engineer-in-Charge in this regard shall be final and binding.

1) Land for Storage/Labour Camps/RMC Since no land is available at site, the EPC Contractor has to make their own arrangement for providing/installation and commissioning of their ready-mix cement concrete plant and material stocking/stacking yard etc. at a place/location separate from site, at their own cost. No extra payment shall be entertained by BCD towards any lead on account of transportation of Ready-Mix Concrete or any other material. The EPC Contractor has to make their own arrangement for storage/stacking of all construction materials, labour camps, fabrication yard etc. The EPC Contractor has to arrange the extra land other than the land available at site. The EPC Contractor's proposal /bid shall be deemed to have seen the site and considered this while making his proposal and his quoted price is deemed to have included the above. Further, the lease / rent charges of land, if any, shall be borne by the EPC Contractor. The Engineer-in-Charge shall only extend necessary help and issue necessary recommendations etc. to the concerned department for temporary allotment of land during construction period.

b) EPC Contractor's care of the Works

The EPC Contractor shall bear full risk in and take full responsibility for the care of the Works and Materials, goods and equipment for incorporation therein from the Commencement Date until the Completion Certificate is issued, except and to the extent that any loss of or damage to the same shall arise out of any default or neglect of the Employer.

The EPC Contractor shall throughout the execution of the Works including the carrying out of any testing, commissioning (including Integrated Testing and Commissioning), or remedying of any defect:

- i. Take full responsibility for the adequacy, stability, safety and security of the Works, Plant, Goods, EPC Contractor's Equipment, Temporary Works, operations on Site and methods of manufacture, installation, construction and transportation;
- ii. Have full regard for the safety of all persons on or in the vicinity of the Site (including without limitation persons to whom access to the Site has been allowed by the EPC Contractor), comply with all relevant safety regulations, including provision of safety gear, and insofar as the EPC Contractor is in occupation or otherwise is using areas of the Site, keep the Site and the Works (so

far as the same are not completed and occupied by the Employer) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Employer indemnified against all injuries to such persons.

- iii. Provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Engineer-in-charge or by laws or by any relevant Employer for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site; and
- iv. Where any work would otherwise be carried out in darkness, ensure that all parts of the Site where work is being carried out are so lighted as to ensure the safety of all persons on or in the vicinity of the Site and of such work.

c) HOUSE-KEEPING

- 1) Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defence against accidents and injuries. General House-keeping shall be carried out by the EPC Contractor and ensured at all times at Work Site, Construction Depot, Fabrication Yard, Workshop, Batching Plant, Labour Camp, Stores, Offices and toilets/urinals etc. The EPC Contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.
- 2) All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, fire-fighting equipment, first aid stations, and other emergency stations shall be kept clean, un-obstructed and in good working order.
- 3) All surplus earth and debris shall be removed/ disposed-off from the working areas immediately. Trucks carrying sand, earth and any pulverized materials etc. shall be covered while moving in order to avoid dust or odour impact. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.
- 4) No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.
- 5) Roads shall be kept clear and materials like: pipes, steel, sand boulders, concrete, chips and brick etc., shall not be allowed on the roads to obstruct free movement of road traffic.
- 6) Water logging or bentonite spillage on roads shall not be allowed.

- 7) Proper and safe stacking of material are of paramount importance at fabrication stores, stores and such locations where material would be unloaded for future use.
- 8) The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.
- 9) Flammable chemicals, compressed gas cylinders etc. shall be safely stored. Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations(s). All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from the site. Lumber with protruding nails shall be either bent/ removed and properly stacked.
- 10) The EPC Contractor shall be penalised at Rs.5000/- per single violation/ non-compliance of above-mentioned provisions except s no (ii) above, which will be covered under relevant clause of Traffic management, compounded to a maximum of Rs.50000/- at any single instance. The decision of BCD, regarding violation and the number of instances, shall be final and binding on the EPC Contractor. The compliance of above provisions are deemed to be included in the quoted amount of the EPC Contractor and no claim / payment whatsoever shall be entertained on this account.

d) PERSONAL PROTECTIVE EQUIPMENTS (PPEs)

The EPC Contractor shall provide required PPEs to workmen to protect against safety and/or health hazards. Primarily PPEs are required for the following protection.

- 1) Head Protection (Safety helmets)
- 2) Foot Protection (Safety footwear, Gumboot, etc.)
- 3) Body Protection (High visibility clothing (waistcoat/jacket, Apron, etc.)
- 4) Personal fall protection (Full body harness, Rope-grip fall arrester, etc.)
- 5) Eye protection (Goggles, Welders glasses, etc)
- 6) Hand protection (Gloves, finger coats, etc.)
- 7) Respiratory Protection (Nose mask, SCBAs, etc.)
- 8) Hearing protection (Ear plugs, Ear muffs, etc)

The PPEs and safety appliances provided by the EPC Contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the EPC Contractor shall procure PPE and safety appliances, as approved by the Engineer-in-charge.

All construction workers should be provided with high visibility jackets with reflective tapes confirming to the requirement specified under BS EN 471: 1994. The conspicuity of workmen at all times shall be increased so as to protect them from speeding vehicular traffic. The EPC Contractor shall provide safety helmet, safety shoe and high visibility clothing for all employee including workmen, traffic marshal and other employees who are engaged for any work under this contract.

In addition, any other PPE required for any specific jobs like, welding and cutting, working at height, tunnelling etc. shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job. The EPC Contractor shall not pay any cash amount in lieu to PPE to the workers/sub-EPC Contractors and expect them to buy and use during work.

The EPC Contractor shall at all-time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Engineer-in-charge during the inspections. It is always the duty of the EPC Contractor to provide required PPEs for all visitors& BCD staff. Towards this required quantity of PPEs shall be kept always at the security post.

Notwithstanding the above, the EPC Contractor shall at their expense arrange for the safety provision as per all relevant Indian Standard Safety Codes local bye-laws. The EPC Contractor shall provide all facilities in connection therewith and shall also issue the identity card to his labourer.

e) Confidentiality

EPC Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out obligations under it or to comply with applicable Laws. The EPC Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the previous agreement of BCD.

f) Compliance of Laws

The EPC contractor shall keep himself fully informed of all acts and laws of the Central and state govt. all local bye laws, ordinances, rules and regulations and all orders and decree of bodies or, tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the works. EPC Contractor shall at all times, observe and comply with all such laws, ordinances, rules, regulations, orders and decrees, and shall give all notices and pay out of his own money any fees or charges to which he may be liable. He shall protect and indemnify BCD and its officers and employees against any claim or liability arising

out of violations of any such law, ordinances, legislations, order or decree, whether by himself or by his employees & authorised representatives.

g) Unforeseeable Difficulties

Except as otherwise specifically stated elsewhere in the Contract:

- 1) The EPC Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works;
- 2) By signing the Contract, the EPC Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; and
- 3) The Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.
- 4) BCD shall not provide any material either on chargeable or on free issue basis to the EPC contractor for execution of the project.

h) Contractor's Operations on Site

The EPC Contractor shall confine his operations to the Site, and to any additional area which may be provided to the EPC Contractor and agreed by the Engineer-in-charge as working areas. The EPC Contractor shall take all necessary precautions to keep his personnel and equipment within the Site and such additional areas, and to keep and prohibit them from encroaching on adjacent land.

19. Contractor Team Leaders

Appoint a design director (the "Design Director") who will head the Contractor's design units and shall be responsible for surveys, investigations, collection of data, and preparation of preliminary and detailed designs;

The Employer shall notify the Engineer-in-charge (the "Employer's Engineer"), in as its representative for the Project within 7 (Seven) days of the issue of LOA. The Employer shall notify to the EPC Contractor the name, Designation and address of the Engineer-in-charge.

The above requirement of technical representatives is mandatory till the work is at least 90% complete. After 90% completion of work, all the technical representatives may not be required at site and type & number of technical representatives to be deployed at site, will be as decided by Engineer in-Charge which will be final and binding on the EPC contractor.

**The above scope of work is not exhaustive however, EPC contractor is required to execute all the items as per Scope of work, Design basis reports (DBR)/specifications, Technical Specifications, Drawings etc. to make the buildings & complex fit for its intended purpose.**



## 5. GENERAL REQUIREMENTS

### 1. Contract Requirements

The particular section of Specification shall be read in conjunction with the Drawings and other sections of the Specification. Specification given in any one section shall apply to other sections unless specifically stated otherwise.

Notwithstanding anything contained herein, the EPC Contractor shall be responsible for complying in all respects with bylaws and regulations imposed by authorities having jurisdiction, as may be in force at the time of execution of the Works. The EPC Contractor shall provide and do everything necessary for the proper execution of the Works according to the intent and meaning of the Tender Documents, whether the same may or may not be particularly shown on the documentation comprising the Tender Documents, provided the same can be reasonably inferable there from.

The EPC contractor should ensure all provisions for safety in case of any natural calamity or hazard like floods, earthquakes etc.

The Works shall be completed strictly in accordance with the Tender Documents and drawings and specifications issued by the EPC Contractor and approved by the Engineer-in-charge Representative, and with instructions issued by the Engineer-in-charge Representative during the execution of the Works.

The work to be performed under this Contract includes, but is not necessarily limited to, design development, procurement, and the furnishing of all supervision, labour, materials, temporary works, temporary utilities, false-work, plant, machinery, cranes, equipment, parts, tools, taxes, duties, insurance, commissions, supplies, transportation, utilities, construction facilities, scaffolding, incidentals and logistic support necessary for the performance and maintenance of the Works, and accomplishing the same in a workmanlike manner.

All work shall be executed by skilled tradesman who shall be thoroughly acquainted with all aspects of their trade including any special local customs and modes of operation.

Engineer In charge or Engineer's Representative, and any person authorized by them shall at all times have access to the Works and to the Site and to all workshops and places where work and/or material or equipment is being obtained and/or undertaken for the Works.

The Contract documents include Drawings, Design Basis and Specifications etc., which indicate the scope of the Works in terms of general design intent. The Drawings and Specification do not indicate or describe in detail, all of the work required for the performance and completion of the Works.

From the Concept Designs, the EPC Contractor shall carry on design development and produce construction documents, from which it shall execute all works. The EPC Contractor shall provide all items required for the proper execution and completion of the Works, in so far as such items are consistent with the intent, quality and character indicated on the Contractor's Design Development Drawings and Specification, as approved by the Engineer-in-charge Representative. The EPC Contractor shall provide all supplementary parts necessary to complete the Works whether or not each component or detail is specifically shown on the initial Concept Drawings and Specification which were provided.

Modifications approved by the Engineer-in-charge Representative that appear on the construction documents that do not materially affect the design intent shall not be considered as a basis for additional compensation. Such determinations shall be made by the Engineer-in-charge Representative.

The scope of the Work includes, without limitation, all engineer-in-charge, demolishing, labour, supervision, material, tools, equipment and other services necessary for the installation, testing and commissioning of all Works under the Contract.

All government fees, duties, visa charges, permits, deposits, Statutory Approvals related to design and drawing etc., as applicable and in compliance with the laws, regulations and codes applicable to Delhi in particular, and Indian/ Standards/ National Standards or Codes in general, shall be paid by the EPC Contractor.

The EPC Contractor shall include any and all sundry expenses such as transportation, freight charges, taxes, interim storage, escalation, any special permits required to carry out the work, related quality control, compliance to safety requirements as called for in the Specification and in compliance with applicable laws and regulations applicable to site in particular, and Indian/ Standards/ National Standards or Codes in general.

The EPC Contractor is responsible for coordination with the other contractors, not limited to those identified in these Sections, during all phases of engineer-in-charge, construction, testing, commissioning, completion and handover.

## **2. Design and Engineering Responsibility**

**a)** The EPC Contractor shall be fully responsible for all design and for the project and submit to the Engineer-in-charge Representative for review and approval, names and credentials of their designers, including Professional Indemnity Insurance coverage, who will perform design services on behalf of the EPC Contractor and clearly identify the scope elements and areas covered therein.

The EPC Contractor is also required to furnish the names of such Architect/designers with its Tender. The EPC contractor shall get the structural design vetted from any IIT/Equivalent Government Institutions. The EPC Contractor shall include, as a minimum, the following design and engineer-in-charge responsibilities:

- i. For all components and elements of the project for which design development is carried out.
- ii. Work items and systems that are described in the specifications with requirements to comply with certain performance parameters.
- iii. Secondary steel, embeds, concrete and/or rebar work necessitated to install mechanical, electrical, curtain wall, cladding and conveying systems. (Secondary work includes works that are not part of the structural system, but are required for installation of other building systems).
- iv. Builder's work associated with mechanical, electrical, curtain wall, cladding, conveying systems, finishes and other building systems.
- v. Any design and engineer-in-charge of systems as indicated in Specification and as noted in Drawings, to provide a complete installation.
- vi. All necessary design and engineer-in-charge of supports for mechanical and electrical installation, equipment and piping, including the provision of additional bracing of structures as required in line with imposed loads.
- vii. Verification of specified acoustic treatments and installations including floating floors, in close coordination with the acoustic sub-consultant.
- viii. All temporary facilities, equipment and installations; including any modifications, reinforcements, supports, etc., to the permanent Works.

### 3. Work Sequence

The overall phasing and sequence of construction shall be agreed between the EPC Contractor and the Engineer-in-charge Representative. The Works shall be performed in accordance with the Milestone Dates, Sectional Completion Dates, and the Time for Completion and Schedule requirements in the Contract Documents. The EPC Contractor shall fully acquaint itself with the contents of this schedule and ensure compliance therewith.

The EPC Contractor shall note that the Project is based on a fast-track approach to design and construction. Its schedule of works shall be flexible enough to accommodate the special needs arising there from. The EPC Contractor shall allow for certain "out of sequence" work and "come-back" work that will be necessitated on the Project. The EPC Contractor shall allow for all costs arising out of such phasing, sequencing, out-of-sequence and come-back work.

The EPC Contractor shall refer to the requirements for schedule, phasing and completion of the Works, as detailed within this document. Other contractors may be present on the Site and the EPC Contractor shall allow for all costs reasonably resulting from phasing the Works around these parties.

The phasing and the sequencing may be changed during the course of construction. Any such change shall be considered as a shared tool for use by The EPC Contractor and the Engineer-in-charge Representative for the benefit of the Project, with priority given to the requirements of the Employer.

#### 4. Inspection and Testing

The EPC Contractor shall include in its Contract Sum for all costs and time for carrying out all tests on the Works as required by the design development documents to be prepared by the EPC Contractor, as approved by the Engineer-in-charge Representative.

#### 5. Licenses, Permits and Approvals

The EPC Contractor shall obtain and renew all NOC's (No Objection Certificates) and all applicable approvals, permits required for construction from various government agencies. The EPC Contractor shall coordinate with the Engineer-in-charge Representative for this requirement.

The EPC Contractor shall include for all governmental inspections as required and applicable fees during the various phases of work, as per the rules, regulations of various authorities concerned. Include for all necessary inspections required for the operation prior to final acceptance / hand over. During the construction period, the EPC Contractor shall submit to the Engineer-in-charge Representative copies of all Certificates of Approval, Permits, or Licenses obtained from Municipality Departments and other Authorities having Jurisdiction, which are required for the performance of the work.

Prior to the issuance of the Taking-Over Certificate, The EPC Contractor shall furnish the Engineer-in charge Representative with a complete set of originals with five (5) copies of all the above-mentioned Certificates, Licenses and Permits.

The requirements under this Clause include also for the provision of all temporary facilities, utilities and the like, as appropriate; and all costs resulting thereof shall be borne by the EPC Contractor.

## 6. REGULATORY REQUIREMENTS

### 1. Building Codes

All references to codes, specification and standards referred to in the Concept Design Drawings and Specification shall mean, and are intended to be, the latest edition, amendment or revision of such reference standard in effect as of the date of the Drawings and Specification. The EPC Contractor shall provide a copy, on the request of the Engineer-in-charge Representative, of the latest edition of all codes and standards.

The Contractor's design development documents shall be prepared in accordance with the National Building Code of India, 2016 Edition, as published by the Bureau of Indian Standards. Other codes, regulations and standards may be deemed applicable to the Works by the authorities having jurisdiction.

In the specifications to be prepared by The EPC Contractor during the design development, other Codes and Standards should be prescribed, as applicable and pertinent, for the fabrication, testing, safety, etc., for items, materials and components in technical specifications.

The standards and codes, in their latest edition shall be applied to the works covered by the Contractor's Specification being prepared as part of the design development. Where no such standard exists, as for example in the case of patents or special materials, all such materials and workmanship shall be of the best quality, and full details of the materials and any tests to which they are subjected shall be submitted to the Engineer-in-charge Representative for review.

## **2. Labour Requirements**

The EPC Contractor shall make its own arrangements for the engagement of all labour, local or otherwise, and, save insofar as the Contract otherwise provides, shall be solely liable and responsible for the transport, housing, feeding and payment thereof. Any idling of labour at the Site shall be within the Contractor's scope and included in the Contract Price.

The EPC Contractor shall, having regard to local conditions, provide on the Site, to the satisfaction of the Employer, an adequate supply of drinking and other water for the use of the Contractor's staff and workforce. Further, The EPC Contractor shall comply with model rules framed by the Government or any authority for labour welfare, protection of health, and sanitation, failing which the Employer reserves the right to affect such arrangements at the Contractors' risk and cost. The Employer and the Owner shall not at any time be liable for any such provisions and the EPC Contractor shall indemnify the Contractor's Personnel in this regard.

The EPC Contractor shall not, in accordance with Law, import, sell, give, barter or otherwise dispose off any alcoholic drinks or drugs or permit or suffer any such importation, consumption, sale, gift, barter or disposal by the Contractor's Personnel. The EPC Contractor shall not give, use, barter or

otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid. The EPC Contractor shall in all dealings with its labour in its employment in connection with the Works have due regard to all recognized festivals, days of rest and religious or other customs.

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

The EPC Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same. The EPC Contractor shall maintain harmony and good industrial relations and solve problems among the personnel employed in connection with the performance of its obligations under the Contract and persons located on or near the Site and with law enforcement agencies.

The EPC Contractor shall, at its cost, provide, equip and maintain throughout the construction period and so far as may be necessary during the Defects Notification Period, in a position on or near the Site approved by the Employer, suitable and sufficient first aid facilities for the general use of the Contractor's Personnel.

The EPC Contractor shall be responsible for observance by its Personnel of the foregoing provisions. The EPC Contractor shall ensure that its Subcontractors also adhere to the obligations of The EPC Contractor under the Contract and assume its liabilities under the Contract, to the extent any portion of the Works sub contracted to them.

The EPC Contractor shall, in respect of labour employed by him, comply and shall ensure compliance by its Subcontractors without limitation with the requirements of Laws, and specifically all labour legislations in relation to the performance of Works, such as the Apprentices Act, 1961; the Building and other Construction Workers Welfare Cess Act, 1996; the Child Labour Prohibition and Regulation Act, 1951; the Children (Pledging of Labour) Act, 1933; the Contract Labour (Regulation and Abolition) Act, 1970; the Employees Provident Funds and Miscellaneous Provisions Act, 1952; the Employees Provident Funds Scheme, 1952; the Employees State Insurance Act, 1948; the Works Liability Act, 1938; the Equal Remuneration Act, 1976; the Industrial disputes Act, 1947; the Industrial Employment (Standing Orders) Act, 1946; the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979; the

Labour Laws (Exemption from Furnishing Returns and Maintaining Registers by Certain Establishments) Act, 1988; the Maternity Benefit Act, 1961; the Mines Act, 1952; the Minimum Wages Act, 1948; the Payment of Wages Act, 1936; the Personal Injuries (Compensation Insurance) Act, 1963 the Weekly Holidays Act, 1942; the Workmen's Compensation Act, 1923; The Employees State Insurance Act 1948; The Building and Other Construction Workers (RECS) Act 1996 (BOCW ACT) and modifications thereof in force or amended from time to time and any other labour legislations, which may be applicable to The EPC Contractor from time to time.

The EPC Contractor shall provide the quantum of labour it deems necessary, or required by the Employer, for the performance of the Works. The EPC Contractor shall employ local labour, as far as possible. Arrangements which affect the engagement, transport, paying, feeding and housing of labour and all other matters in connection therewith shall be subject to the regulations and orders of the Government or authorities now in force or which may be made from time to time during the continuance of the Contract.

The EPC Contractor shall, in respect of all Contractor's Personnel ensure or procure the payment of rates of wages, emoluments and expenses and observe hours and conditions of labour according to the conditions established for the trade or industry or prescribed by Law in force in the place where the Work is carried out.

The Employer shall, on report having been made by an inspecting officer as defined in the Contract Labour (Regulation and Abolition) Act, 1970 and rules made there under, have the power to deduct from the moneys due to The EPC Contractor any sum required or estimated for making good the loss suffered by a worker or workers by reason of non-fulfilment of the provisions of the relevant Laws for the benefit of workers, non-payment of wages or of deductions made from his or their wages which are not justified by the provisions of the relevant Laws or non-observance of the Contract Labour (Regulation and Abolition) Act, 1970 and rules made there under.

The EPC Contractor shall maintain all prescribed registers, records and other documents in compliance with applicable labour laws and allow The EPC Contractor to have access to these documents for inspection. However, these inspections shall not absolve The EPC Contractor of its responsibility for any breach or violation of rules and regulations under Laws. The EPC Contractor shall deposit all necessary contributions in this regard regularly with the prescribed authority and in token of which shall submit, every month, necessary documentary evidence as may be required by the Employer.

The EPC Contractor shall obtain prescribed recommendations from the Regional Provident Fund Commissioner under the Employees' Provident Fund and Miscellaneous Provisions Act, 1952 and shall cause provident fund contributions from all eligible employees to be deposited regularly with the prescribed authority and in token of which shall submit, every month, necessary documentary evidence as may be required by the Employer.

The EPC Contractor shall indemnify and hold harmless the Works Personnel against any payments, suits, lien or default charges to be made under and for observance of the aforesaid provisions.

The EPC Contractor must fully satisfy itself as to the requirements of labour legislations and other Laws and The EPC Contractor represents and warrants that the cost, risk and expense of the same, has considered the same and accordingly agreed to the Contract Price. There will be no increase in the Contract Price on the grounds of complying with any labour legislation or the provisions of any other Laws.

The EPC Contractor shall, if required by the Employer deliver a return in detail, in such form and at such intervals as the Employer may prescribe showing the supervisory staff and the numbers of the several classes of labour from time to time employed by The EPC Contractor on the Site and such information regarding the constructional plants and equipment as deployed.

A breach of any of the provisions of this Schedule shall be treated as a material breach of the Contract.

### **3. Technical Literature**

The EPC Contractor shall have a copy of the latest technical literature referenced in its Design Development Drawings and Specification kept on the Project Site and maintained in good order and available to the Engineer-in-charge Representative at all times.

### **4. Contractor Use of Site**

The EPC Contractor shall not use the Site for any purpose other than carrying out the Works.

Access to the Site shall be agreed with the Engineer-in-charge Representative prior to commencement. The EPC Contractor shall take all necessary steps to ensure the safety of all authorized persons. In addition,

The EPC Contractor shall be responsible for all damage resulting from the use of the agreed access. The EPC Contractor shall have possession of the Site at the location of the Works only and be subject to the rights and obligations of other contractors and be responsible for arranging its own working space, labour camps, the storage of materials, locating all temporary accommodations, utilities and other logistical issues at locations to be agreed with the Engineer-in-charge



Representative. No claim whatsoever will be entertained for any reason regarding the location, allocation or relocation of any working space regardless of the distance.

The EPC Contractor shall be responsible for consulting regularly with the relevant authorities to confirm that its method of working is not such as to impede in any way vehicular road traffic and for modifying its method of working if any operations or activities are adversely affected by its activities. On the instruction of the Engineer-in-charge Representative, The EPC Contractor shall promptly remove any vehicle or equipment and plant within its control that may be causing obstruction to the use of the existing facilities by others.

## **7. SCOPE OF WORK FOR ARCHITECTURAL PLANING & ENGINEERING CONSULTANCY AND WORKS**

The EPC Contractor is required to complete the project on Design & Build basis as specified in the Scope of Work, Technical Specification & Drawings, tender documents etc. covering the entire site area. Site everything completes in all respect i.e., including all internal services so as to make the complex fit for purpose i.e. handing over to prospective buyers and the contractor's quoted rates are deemed to include everything from the award of work up to & including handing over of completed project, defect liability period and Operation and Maintenance period. However, The EPC Contractor is required to connect all the external services like Water Supply, Sewerage, Drainage, Electric Supply, LAN/WAN, Telephone Lines etc. to the main lines of the authorities/service providers which shall be integral part of his Scope of work and deemed to be included in his quoted price. All municipal & mandatory approvals required for occupation and completion of the project shall be obtained by the EPC Contractor. All statutory fees will be paid by EPC Contractor.

The detailed Design Basis Report (DBR), Technical Specifications and Drawings for each function like Civil, Electrical, Plumbing, Fire, are attached as various Sections to the tender documents. The same also includes specific scope of each work & conditions particular to the work.

Indicative Items of Civil, Electrical, Plumbing, Fire, External Development, etc. is given in Technical Specification for reference purpose only. The bidders, before quoting the tender are deemed to have ascertained/verified/worked out all the items & quantities etc. from the Design Basis Report, drawings, technical specifications for complete scope of work to make the buildings & complex fit for its intended purpose i.e., handing over for use to the end user. The EPC Contractor shall submit their detailed Items and quantities of each item within 30 days to BCD from the date

of award of work for BCD's reference & records. No claim on account of any discrepancies, left over items etc. in Indicative Items given in the tender, and submitted by the contractor, and as actually executed at site, shall be admissible. Thus, The EPC Contractor is required to execute all the works/items and quantities as per Scope of work, Design basis reports (DBR)/specifications, Technical Specifications, Drawings etc. and to quote their amount/financial bid accordingly. In case of contravention of stipulation of this clause from any other clause/provision elsewhere in the tender document, then this clause shall have superseding effect to the extent of contravention and decision of Engineer-in-charge shall be final & binding on the EPC contractor.

The 'Design Basis/Brief Report' is also enclosed for reference of the bidders in their Design purpose. The Design Basis/Brief Reports are the minimum standards that the construction agency has to fully comply with operational and functional part of the project.

BCD will bear no responsibility for the lack of such knowledge and also the consequences thereof to the EPC contractor. The information and site data shown in the drawings and mentioned in the tender documents are furnished for general information and guidance only. The Engineer-in-Charge in no case shall be held responsible for the accuracy thereof or/and deductions, interpretations or conclusions drawn there from by The EPC Contractor and no claim shall be entertained whatsoever on this account, if the site conditions/information is different or otherwise incorrect. It will be presumed that The EPC Contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination which may be required between the different agencies.

### **7.1. Integration of Internal Services & Facades etc**

Integration of drawing of internal services given by BCD into his Civil/structural Design & Drawings and execution of the same i.e. Plumbing & Sanitary & Electrical Works etc. complete for the building including all pipes, conduits, fittings, fixtures, testing, commissioning etc. complete as approved by BCD. The EPC Contractor so as to retain the spirit & detail of designs given to the contractor.

### **7.2. Protection of Environment**

The EPC Contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or other resulting from pollution, noise or other causes arising as a consequence of his methods of operation. The EPC

Contractor shall be required to follow all the rules/norms of National Green Tribunal/ EIA applicable to this work. The EPC Contractor shall indemnify BCD/its officials against any claims or obligations arising out of any damage to adjacent property, structure or to building work done by him. During continuance of the contract, The EPC Contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, by-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority. However, Salient features of some of the major laws that are applicable are given below:

The Water (prevention and Control of Pollution) Act, 1974: This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health or animals or plants or of aquatic organisms.

The Air (prevention and Control of Pollution) Act, 1981: This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986: This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the interrelationship which exists among and between water, air and land, and human being, other living creatures, plants, micro-organism and property.

The public Liability Insurance Act, 1991: This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment

(Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

### **7.3. Prevention of Nuisance and Pollution**

The EPC Contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties and any pollution. He shall make good at his own cost and to the satisfaction of the Engineer-in-charge, any damage to roads, paths, drainage works or public or private property whatsoever caused by the execution of the work or by traffic brought thereon by the EPC contractor. All waste or superfluous materials shall be cleaned away by The EPC Contractor without any reservations entirely to the satisfaction of the Engineer-in-charge at no extra cost.

The site has to be kept clean of all debris, rubbish and dirt & surplus/waste material all the time. It also includes maintenance, cleaning & de-silting the pipe lines laid by the agency for all internal services etc. executed by the agency to the entire satisfaction of the Engineer-in-charge during the maintenance periods. Cleaning and de-silting will also be done by the agency before handing over the completed commercial spaces to BCD. All machines, equipment and labour for this purpose will be arranged by EPC contractor at no extra cost to BCD.

## **8. STATUTORY FEE PAYMENT**

Statutory fees, if any, to be paid by The EPC Contractor to the local bodies/Authorities in connection with the approval of the project / connection of the services/shifting of the services. The cost of restoration of any services damaged by The EPC Contractor during execution shall however be borne by the contractor.

## **9. STATUTORY REQUIREMENTS**

The EPC Contractor along with others shall carry out all statutory tests and trials, under the supervision of the Engineer-in-charge, necessary for obtaining sanction of the competent authority.

## **10. CONTRACTOR'S WARRANTY OF DESIGN**

The EPC Contractor shall be fully responsible, for the suitability, adequacy, integrity, durability and practicality of the Contractor's proposal.

The EPC Contractor warrants that the Works have been or will be designed, manufactured, installed and otherwise constructed and to the highest standards available using proven up-to-date good practice. By submitting the Drawings for review to the Engineer-in-charge, The EPC Contractor shall be deemed to have represented that it has determined and verified that the design and engineer-in-charge, including field construction criteria related thereto, are in conformity with the Scope of the Project, the Specifications and Standards and the Applicable Laws.

The EPC Contractor warrants that the Contractor's Proposals meet the requirements and is fit for the purpose thereof. Where there is any inadequacy, insufficiency, impracticality or unsuitability in or of the Requirements or any part thereof, the Contractor's Proposal shall take into account, address or rectify such inadequacy, insufficiency, impracticality or unsuitability at Contractor's own cost.

The EPC Contractor warrants that the Works will, when completed, comply with enactments and regulations relevant to the Works.

The EPC Contractor shall also provide a guarantee from the Designer for the design for suitability, adequacy, and practicality of design for Employer's Requirements.

The EPC Contractor shall indemnify the Employer against any damage, expense, liability, loss or claim, which the Employer might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty set out in this Clause.

Notwithstanding that such design may be or have been prepared, developed or issued by the Employer, any of Contractor's consultants, his sub-contractors and/or his qualified personnel/persons or cause to be prepared, developed or issued by others.

Notwithstanding any warranties, guaranties and/or indemnities that may be or may have been submitted by any other person. Notwithstanding that the same have been accepted by the Engineer-in-charge.

The EPC Contractor shall be fully responsible for the Plants, Materials, goods, workmanship, preparing, developing and coordinating all design Works to enable that part of the Works to be constructed and/or to be fully operational in accordance with the Contract's requirements.

No claim for additional payment or extension of time shall be entertained and/or no review and/or observation of the Engineer-in-charge and/or its failure to review and/or convey its observations on any Drawings shall relieve The EPC Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Engineer-in-charge the Employer be liable for the same in

any manner; and if errors, omissions, ambiguities, inconsistencies, inadequacies or other Defects are found in the Drawings, they and the construction works shall be corrected at the Contractor's cost, notwithstanding any review under this section.

#### **7.7.1 Guarantee/Warranty**

All plant/equipment/machinery installed/commissioned shall be guaranteed or warrantee (as per applicability of guarantee/warranty given in technical specifications for each plant/equipments/machinery) for a period of 12 months (minimum) from the date of acceptance and taking over of the installation by BCD against un-satisfactory performance and/or breakdown due to defective design, material, manufacture, workmanship or installation. The guarantee/warranty period given above is the minimum period for which a plant/equipments/machinery is required to be covered under guarantee/warranty. However, if required guarantee/warranty period in technical specification is specified more than 60 month for any plant/equipment's/machinery from the date of acceptance and taking over of the installation by BCD; then the higher period will be the required period of guarantee/warranty for that particular plant/equipment's /machinery. The plant/equipment's/machinery or component or any part thereof so found defective during the guarantee/warranty period shall be repaired or replaced free of cost to the satisfaction of the Engineer in-charge. In case it is felt by BCD that undue delay is being caused by The EPC Contractor in doing this, the same will be got done by BCD at the risk and cost of the EPC contractor. The decision of Engineerin-charge in this regard shall be final.

## **11. AS-BUILT DRAWINGS AND DOCUMENTS**

Prior to issue of any taking over certificate, The EPC Contractor shall furnish to the Employer and the Engineer-in-charge a complete set of as-built Drawings, in 6 (six) hard copies and in micro film form or in such other medium as may be acceptable to the Employer, reflecting the Project as actually designed, engineer-in-charge and constructed, including an as-built survey illustrating the layout of the Project and setback lines, if any, of the buildings and structures forming part of Project Facilities. The work shall not be considered to be completed for the purpose of taking over until such documents have been submitted to the Engineer-in-charge. Data produced, capacity of equipment and accessory in this report is minimum. Actual capacity shall be arrived by bidder after

doing design calculation considering all components and guidelines. If the calculated capacity / rating is more than that given in the document, then the higher capacity /equipment rating shall be provided as per actual calculation. Works given hereafter and given in respective head / part of the scheme sub-head. If any services/ equipment/ accessory required to make the bldg. / scheme habitable, complete for functioning as per applicable norms, is not covered in the scope of services; then same shall be presumed that the same shall be provided within the quoted cost and nothing extra shall be paid on this account.