REQUEST FOR PROPOSAL

Name of the Work: "Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance"

Smart City

MISSION TRANSFORM NATION

BAREILLY SMART CITY LIMITED (BSCL)

BAREILLY

(UTTAR PRADESH, INDIA)

Employer: - Bareilly Smart City Limited (BSCL)
Nagar Nigam, Bareilly- 243001
Telephone: 0581- 25510074

Email: ceo.bscl01@gmail.com

Smart City

BAREILLY SMART CITY LIMITED (BSCL)
BAREILLY (UTTAR PRADESH, INDIA)

Ref No: -BSCL/2020-21/ 522

Date:- 20/10/2020

Bareilly Smart City Limited, Bareilly invites e-tender for the following projects: -

S. No.	Name of the Work	Earnest Money Deposit (Rs.)	Tender fee with GST @ 18% (Rs.)	Work completion Period	Bid Start Date
01	Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 Year Defect Liability Period and Three years of Maintenance	20.00 Lakhs	29500	15 Months	22/10/2020
02	Engineering, Procurement & Construction of 11.21 km of Internal Roads in ABD area with 1 year defect liability and 3 years of maintenance	37.00 Lakhs	29500	12 Months	27/10/2020
03	Design, Supply, Installation with Maintenance of 16 High Mast Lights with Three years in Bareilly	2.50 Lakhs	11800	6 Months	22/10/2020
04	Sanjay Community Hall & Pond Complex External Development at Bareilly	18.00 Lakhs	11800	18 Months	22/10/2020
05	Engineering, Procurement & Construction of 5.62 km of Major Road Development in ABD Area with Street Parking, Street Development, Retrofitting & Vending Zone, Junctions Development inclusive of 2.2 km Smart Road Development on EPC Mode with 1 year Defect Liability and 3 years of Operation & Maintenance.	1.20 Crore	29500	12 Months	27/10/2020
06	Construction of R.C.C. Drain from Kargaina Police Chowki to Existing Culvert at Chainage 1600, Bareilly	17.5 Lakhs	11800	6 Months	27/10/2020
07	Supply, Installation & Commissioning of Organic Waste Composters For Decentralized Waste Management At Bareilly	2 Lakhs	11800	3 Months	27/10/2020
08	Supply, Installation and Erection, Testing and Commissioning of Puzzle type Multi Level Car Parking with one year DLP.	15.0 Lakhs	11800	6 Months	27/10/2020

1.	Detailed NIT and Bid Document shall be available on: - https://etender.up.nic.in and http://www.bareillysmartcity.in
2.	Tender call notice in two Bid systems (Part- I: General & Technical Bid and Part-II: financial Bid/Price Bid/BOQ) from intending bidders fulfilling the eligibility criteria mentioned in this Notice and other qualifying requirements mentioned in this RFP.
3.	Amendment to NIT if any would be published on website only.
4.	In case of any queries on this RFP, intending bidders may contact THE GENERAL MANAGER, BAREILLY SMART CITY LIMITED, Bareilly (Tel. No: - 0581- 25510074, 7055519602) or send an email to: ceo.bscl01@gmail.com

Chief Executive Officer,
Bareilly Smart City Limited, Bareilly.

प्रकाशन हेतू नहीं

1. सम्पादक, Times of India (All editions), Hindustan Times (All editions), Dainik Jagran (local editions) को इस अनुरोध के साथ कि अपने राष्ट्रीय संस्करण समाचार पत्र में उपरोक्त निविदा सूचना का प्रकाशन आगामी संस्करण में डी0ए0वी00पी0 दरो पर न्यूनतम स्थान में एक बार प्रकाशित करने का कष्ट करे तथा 04 प्रतियों के साथ बिल भुगतान हेतू प्रेषित करें ।
2. आयुक्त महोदय, बरेली मण्डल, बरेली की सूचानार्थ ।
3. नोटिस बोर्ड पर चस्पा हेतू ।
4. कम्प्यूटर प्रभारी/ आई.टी0 एक्सपर्ट नगर निगम बरेली को इस अनुरोध के साथ प्रेषित कि उक्त निविदा सूचना को नगर निगम, बरेली की वेबसाइट पर प्रदर्शित करने का कष्ट करें ।

Chief Executive Officer,
Bareilly Smart City Limited, Bareilly

DISCLAIMER

The information contained in this Request for Proposal document ("RFP") or subsequently provided to bidders, verbally or in documentary or any other form by or on behalf of the Bareilly Smart City Limited (here for the referred to as BSCL in this document) or any of its employees or advisers, is provided to bidders on the terms and conditions set out in this RFP and such other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is not an invitation by the Employer to the prospective Consultants or any other person. The purpose of this RFP is to provide interested bidders with information that may be useful to them in the formulation of their Proposals pursuant to this RFP. This RFP includes statements, which reflect various assumptions and assessments arrived at by the Employer in relation to the Consultancy. Such assumptions, assessments and statements do not purport to contain all the information that each bidder may require. This RFP may not be appropriate for all persons, and it is not possible for the Employer, its employees or advisers to consider the objectives, technical expertise and particular needs of each party who reads or uses this RFP. The assumptions, assessments, statements and information contained in this RFP, may not be complete, accurate, adequate or correct. Each bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments and information contained in this RFP and obtain independent advice from appropriate sources.

Information provided in this RFP to the bidder (consultant/contractor/developer/Manufacturer/Supplier etc.) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Employer accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on the law expressed herein.

The BSCL and its employees and advisers make no representation or warranty and shall have no liability to any person including any bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this RFP or otherwise, including the accuracy, adequacy, correctness, reliability or completeness of the RFP and any assessment, assumption, statement or information contained therein or deemed to form part of this RFP or arising in any way in this Selection Process.

The BSCL also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any bidder upon the statements contained in this RFP.

The BSCL may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this RFP.

The issue of this RFP does not imply that the Employer is bound to select a bidder or to appoint the selected bidder, as the case may be, for the Consultancy and the BSCL reserves the right to reject all or any of the Proposals without assigning any reasons whatsoever.

The bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the BSCL or any other costs incurred in connection with or relating to its Proposal. All such costs and expenses will remain with the bidder and the BSCL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a bidder in preparation or submission of the Proposal, regardless of the conduct or outcome of the Selection Process.

Chief Executive Officer,
Bareilly Smart City Limited,
Bareilly.

BAREILLY SMART CITY LIMITED (BSCL)

BAREILLY
(UTTAR PRADESH, INDIA)

Letter no. BSCL/2020-21/ 522 Dt. 20/10/2020

NATIONAL COMPETITIVE BIDDING THROUGH e-Procurement

Chief Executive Officer (CEO), Bareilly Smart City Ltd., Bareilly invites item Rate Bids for the work mentioned below through e-Procurement in conformity with the terms and conditions of this advertisement and the detailed tender call notice in two Bid systems (Part- I: General & Technical Bid and Part-II: financial Bid/Price Bid/BOQ) from intending bidders fulfilling the eligibility criteria mentioned in this Notice and other qualifying requirements mentioned in this RFP. Bidders can participate in the tender after registering them on E-tendering portal http://etender.up.nic.in. Bidder can download the RFP from http://etender.up.nic.in after paying the tender cost through online payment in the name of **Bareilly Smart City Limited, A/C No. : 0294001100000836, Name of Bank: Punjab National Bank, Branch: Pilibhit By-Pass Road, Bareilly, IFSC Code: PUNB0613400**. Bidder will have to upload the scanned copy of transaction slip along with technical bid, failing this; the Bid is liable to be rejected. The Bidder should deposit the Earnest Money online in above mentioned account number or in the form of FDR or Bank Guarantee in name of **Chief Executive Officer, Bareilly Smart City Limited, Bareilly**. The scanned copy of the transaction slip should be uploaded along with technical bid. The bidders should have necessary Portal enrollment (Digital Signature Certificate) under e-procurement process of Govt. of Uttar Pradesh in required class/category. In case of any queries on this RFP, intending bidders may contact CHIEF EXECUTIVE OFFICER, BAREILLY SMART CITY LIMITED, Bareilly (Tel. No: - 0581- 25510074)

S.No.	Name of the Work	Earnest Money Deposit (Rs.)	Tender fee with GST @ 18%	Work completion Period
1.	Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1-year Defect liability period and three years of maintenance	20 Lakhs	29,500	15 Months

Time schedule for Bidding:

S. No	Description	Critical Dates
1	Upload/Publish of RFP	22/10/2020 3:00 PM
2	Bid start Date/Time of RFP	22/10/2020 3:00 PM
3	Pre-Bid Meeting	— —
4	Bid Closing Date/Time of RFP	5/11/2020 3:00 PM
5	Technical Bid Opening Date/Time	6/11/2020 3:00 PM
6	Financial Bid Opening Date/Time	To be notified

1. Other details can be seen on website http://etender.up.nic.in (for view, download and bidding) and on website www.bareillysmartcity.in (for view and download only).
2. Subsequent corrigendum, if required, shall appear in these websites.
3. Authority reserves the right to reject any or all the tenders without assigning any reasons
4. Contractor who want to participate in bid must register themselves on http://etender.up.nic.in
5. For any other queries, please contact Nodal Officer, Bareilly Smart City Limited. Also, for any further queries, the bidders are advised to send an email to: ceo.bscl01@gmail.com

Chief Executive Officer,
Bareilly Smart City Limited,
Bareilly.

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Project Profile

As Bareilly is competing with other developed cities to improve its infrastructure facilities, it simultaneously needs to develop services for other aspects of human life. One of the important being physical fitness and state representation in national sports. Playing sports inculcates team spirit, develops strategic & analytical thinking, leadership skills, goal setting and risk taking. A fit and healthy individual leads to an equally healthy society and strong nation. Fitness is an extremely important component for the overall development of the state.

To enhance Bareilly as a sports hub of India, the Government needs to conduct sports events in the City, starting from state level events to get aligned with the nation's policy for promoting sports in the country. But currently in Bareilly, the existing sports infrastructure is inadequate for the current demand. There is an existing sports Complex established in 1974 and has had a few upgrades over the years but the current condition of features and services provided are lacking in terms of quality and are not par with the new modern facilities being built all over the country. For this, a state-of-the-art sports infrastructure in the city is proposed.

A well maintained, fully equipped sports facility adhering to the national/international standards can boost the sports fraternity; encouraging more and more people in the city to take up sports, encouraging and improving the sports activities already popular in the city, creating new opportunities for those who previously did not have access to good quality sports services. The plan and area details of the Indoor Sports Complex are attached in **Annexure VII.**

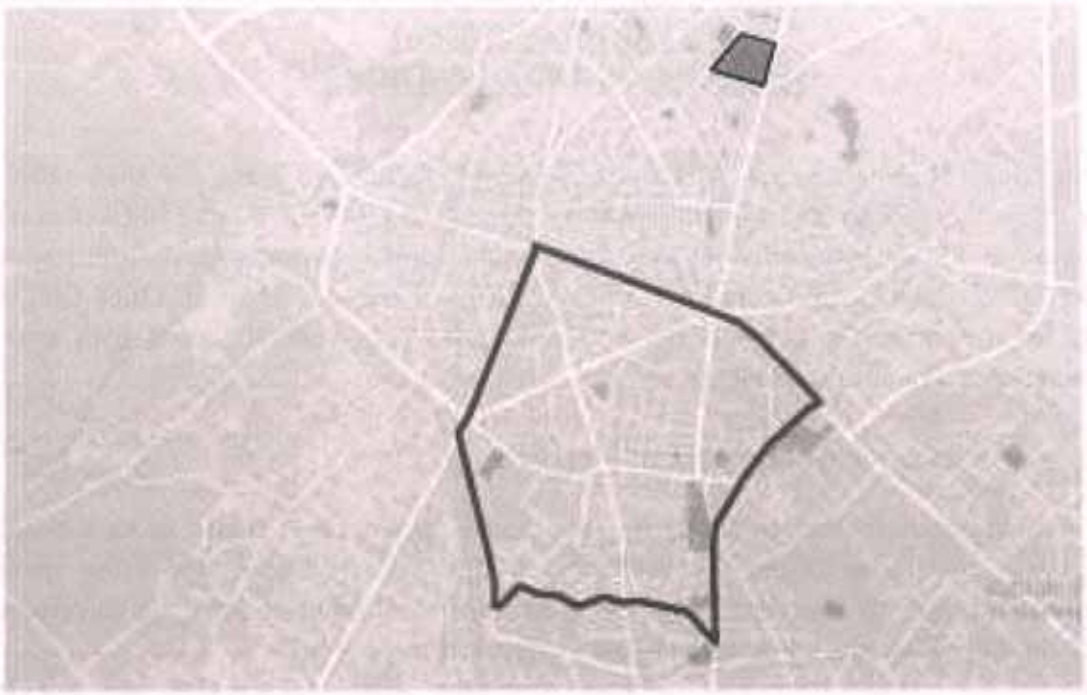
Project Objectives:

The OBJECTIVE for the project is described below: -

- To provide a venue for national sporting events and also promote sports/sportspersons by means of academies; encouraging people to enroll in sports via membership.
- People with inclination to take up professional sports would have adequate opportunities to get trained via experienced and reputed coaches under such infrastructure.
- To provide facilities for sports like handball, judo, wrestling etc. which are not currently provided in the campus.

Project Site:

The proposed site is located inside the stadium complex, which lies in the Model Town region, along the Complex Road. Project Site is approximately 2 Km from the ABD Boundary. Project Justification and Inclusion of such project in the smart City Proposal has been carried by PMC to generate and analyze the need of such project. Red area demarcated is the Site earmarked for multi-purpose Hall with the hall size of 42.5x27 m. The hall shall be placed close to the Existing Badminton Court and shall be connected with it in the future. However the Multipurpose Hall shall act as stand-alone Building.



Design Concept

The proposed multi-purpose hall is a 42.5 x 27m shed to be fully used as a playing hall. As it is located right next to the existing badminton complex, it will be integrated with the building in the renovation process. The hall also has adjoining auxiliary spaces like a double height entrance lobby, equipment storage, toilets, medical room, halls, changing area etc. In addition to that, it is connected to the existing badminton hall which will mean it will also provide direct access to the existing badminton facilities without having to exit the hall. The hall can accommodate sports like handball, volleyball, basketball, judo, wrestling, badminton, table tennis and other sports in various combinations. Existing Ticket House shall be converted into cafeteria where outdoor seating will be placed and the stone flooring of the land shall be done. This would be used actively when any event is held in the Complex.

RFP PART- 1: SECTION-I
SHORT TERMS AND DEFINITIONS

1. The words "Nagar Nigam, Bareilly", "BSCL", or "Employer" mentioned in the RFP shall mean explicitly/implicitly , Bareilly Smart City represented through its CHIEF EXECUTIVE OFFICER and shall also mean other official(s) concerned of BSCL formally or informally declared/advised/instructed by CHIEF EXECUTIVE OFFICER to act and perform the duties of BSC on behalf of ,CHIEF EXECUTIVE OFFICER " for any parts(s)/Portion(s) of the work or for the whole work. The word, BSCL shall also mean the various, committees of BSCL.

2. "Bidder" means a single entity submitting the proposals.

3. "Govt." or Govt. of Uttar Pradesh OR Urban local bodies or any other Dept." or its subordinate functionaries/ organizations/agencies mentioned in this RFP shall have the same meaning, implication and power to intervene in this work as understood/implied from the corresponding clauses of this RFP where the above terminologies appeared/mentioned.

4. After the tender is finalized and accepted the words/ expression; selected bidder, selected contractor, selected agency, contractor, Contractor, Successful bidder mentioned in this RFP shall have the same meaning and shall, ordinarily, mean/be understood as "contractor".

5. The words, contract, Contract, Agreement, agreement appearing in this RFP shall mean agreement.

6. The words, "work", "Work" and "works" shall have the same meaning unless otherwise mentioned in this RFP and it includes the deliverables by the contractor during the defect liability period of 365 days from the date of completion of the original works.

7. Clarification(s) on other terminologies, if any required, shall be issued as and when necessary.

8. **"Last three financial years" means** 2016-17, 2017-18 and 2018-19.

9. **"Similar Work"** means "Construction works of Private / Public buildings which is composite of the Civil Works, Interiors, Air Conditioning, Fire Fighting, Electrical, Plumbing and External Development of the campus and all the associated works for the site development."

10. " Maintenance" means the maintenance of the Project and includes all matters connected with or incidental to such maintenance, provision of services and facilities in accordance with the provisions of this RFP and Contract Agreement;
11. "Maintenance Period" means the period commencing from the date of signing of the Contract Agreement and ending on the last day of the Contract Period unless terminated earlier.

RFP PART- 1: SECTION-II

Detailed Tender Notice

Bid shall be submitted in 2 separate parts:

1. Technical Bid
2. Financial Bid

Eligibility criteria (Technical and Financial) for the Bidders intending to participate, Bidder shall fulfill the following Eligibility Criteria:

a. Technical Eligibility Criteria

Tenderer will have to upload the following documents to qualify for the Technical bid:

Bidder: Each intending Bidder may be a natural person/ sole proprietorship/ Company/ Partnership firm/ Limited Liability Partnership (LLP) having authority to participate in this RFP.

Bidder shall enclose the relevant registration certificates.

- GST Registration Certificate
- PAN Card Copy
- PF Registration Certificate
- Income tax return copy of last 3 years (FY 2016-17, 2017-18, 2018-19 i.e. assessment year 2017-18, 2018-19, 2019-20) duly self-attested by the Bidder.
- Balance sheet of last 3 years (FY 2016-17, 2017-18, 2018-19) duly attested by Chartered Accountant.
- Bidder has to submit Tender Fees through RTGS/ NEFT. The receipt of the transaction has to be uploaded online.
- Bidder has to submit EMD through RTGS/ NEFT or BG (Bank Guarantee) pledged in favor of Chief Executive Officer, BSCL or Bank Guarantee from Nationalized Banks. In case the EMD is submitted in form of Bank Guarantee then the Bidder will upload the scanned copy of the instrument along with the technical bid and same shall be submitted in original at BSCL office within 3 days of Bid submission due date.
- Self-declaration certificate by Bidder in the form of Affidavit is to be submitted. (Format Annexure II).
- Affidavit required by the bidder stating that the Bidding firm has not been Black listed by any Central/State Government Authority/ Department in last three (3) years. (Format Annexure III).
- No Relationship Certificate (format Annexure I).
- Income tax return copy of last 3 years (FY 2016-17, 2017-18, 2018-19) duly attested by Chartered Accountant. Bidders should have an Average Annual Turnover of value more than 600 Lakhs of the estimated project cost during last three financial years.
- Experience certificate of having successfully completed similar works during last 7 years:

  Three similar works, each were costing not less than the amount equal to 400 lakhs

  or

  Two similar works, each were costing not less than the amount equal to 500 lakhs.

  or

  One similar work costing not less than the amount equal to 800 lakhs.

"Similar work" Construction works of Private / Public buildings which is composite of the Civil Works, Interiors, Air Conditioning, Fire Fighting, Electrical, Plumbing and External Development of the campus and all the associated works for the site development."

***All the above stated documents are required to be duly attested by the Contractor/Bidder under the company seal.**
*** If any of the above documents is found missing or incorrect, then the bid will be disqualified.**
***Proof of having successfully completed similar works must be submitted in the form of a completion certificate issued by the Client.**
***Joint venture or consortium of Bidders is NOT permitted.**

Even though the Bidder meets the above qualifying criteria, he is subject to be disqualified if he has;

a. Made a misleading or false representation[s] in the Forms, Statements and Attachments submitted in Proof of the Qualification Requirements.

And/ or

b. A record of poor performance such as Abandoning a work, Poor quality of work, Claim, Litigation History, or Financial failures etc. in any State Govt. organization/services/corporations/local body etc. (by whatever names these are called).

b. <u>Financial Eligibility Criteria / Selection Process</u>

The financial Bid will be opened only if the bidder successfully qualifies the technical Bid round.

Ranking order for Bid for Selection of Contractor – Lowest Price to highest price. The bidder which qualifies all the conditions mention in the bid document and has quoted the lowest rate shall be selected for the contract.

Drawl of Agreement: If L1 bidder does not turn up for agreement after finalization of the tender, then he shall be debarred from participation in bidding at least for three years in BSCL and action may be taken to blacklist the contractor. In that case, the L2 bidder, if fulfilling, other required criteria, would be called for drawing agreement for execution of the work subject to the condition that L2 bidder negotiates his/her/their rate and terms and conditions as per with the rate quoted by the L1 bidder, otherwise the tender will be cancelled.

RFP PART- 1: SECTION-III
INSTRUCTIONS TO BIDDERS

1. Bid documents consisting of RFP are available on the e-procurement website i.e. http://etender.up.nic.in/ (for view, download and bidding) and in websites www.nagarnigambareilly.com (for view only)

2. As stated above, it is a two bid (Part1: General and Technical bid, Part II: Financial Bid) e-procurement Proposal of BSCL. As per the corresponding guidelines of Govt. of Uttar Pradesh, each on line Part-I bid, along with list of enclosures should be uploaded in the offer along with the checklist. Complete address, contact details, email address, website address, etc must be there on the letter head for easy and fast communication, legible scanned copies of valid contractor's Registration Certificate (License) (save as mentioned at above), EPF Registration, GST No., PAN CARD, Earnest Money Deposit (EMD)/Bid security, and cost of tender Documents (non – refundable).

3. Earnest Money Deposit: the value of EMD as mentioned in Tender Document) Earnest Money shall be paid through RTGS/ NEFT or bank guarantee in favor of Bareilly Smart City Limited, Bareilly. After tender opening, The EMD of the unsuccessful bidders will be returned to account provided by the bidder during the registration on e-tendering portal under beneficiary Account number. Earnest money in the form of cheques or any other form except above will not be accepted. Scanned Copy of the transaction slip has to be uploaded along with the Technical Bid. EMD of the successful bidder shall be adjusted with the security deposit.

4. Regarding submission of original documents as a prime component of Part-I bid, the following instructions are to be followed. The intending bidders should submit their bid only through e-tendering and on-line Mode.

5. The on-line technical bids received shall be opened at **3:00 PM** on **Dt.**6/11/. **2020** in the office chamber of the CEO, BSCL before Tender Evaluation Committee. If the same could not be opened on **Dt.**6/11. **2020** for any reason beyond the control of BSCL, then the same shall be opened on the next official working day at **3:00 PM** onwards.

6. Each received bid, if otherwise not rejected, shall remain valid for a period of 120 days from the date of opening. Subsequent extension of validity of any bid shall be subject to mutual consent of the respective bidder and BSCL.

7. Within 30 days after opening of the financial bids (RFP Part-II), the EMD(s) of the unsuccessful bidder(s) except the 2nd lowest bidder (L2) shall be refunded/ returned, preferably in the shape and manner submitted by the respective bidder(s) for the work on written request(s) and with proper acknowledgement(s). The EMD of L2 bidder can be refunded in the shape and manner to be decided by BSCL after finalization of the Bid for the work.

8. The intending bidders are also urged to acquaint themselves with the respective site conditions wherein, the intended works are to be executed and submit their bids accordingly.

9. In case of any inconsistency or contradiction among different clauses/ conditions/ instructions/ information furnished in this tender call notice/ RFP, then necessary clarification can be sought for by the bidders before submission of their bids. Similarly, in case of the agreement to be drawn by BSCL with the successful bidder, conditions to be stipulated in the agreement shall be followed for all practical purposes unless any of those condition(s) is/are found redundant/inapplicable and inconsistent with the relevant provisions, as issued and amended till the date of invitation of this tender. In case of any dispute between the selected bidder and BSCL regarding such overriding effect, decisions of BSCL shall be final and binding without prejudice to the remedies available to either parties under law of the nation (India), Intending bidders are requested to understand this condition thoroughly and submit their tenders accordingly. For legal dispute(s), if any, the matter shall be settled within the jurisdiction of Bareilly Court.

10. Construction and Demolition (C & D) waste materials generated, at the respective work sites during execution of the aforesaid work should be deposited at site suggested by BSCL.

11. Unusual or unilateral interpretation (if any), of any part or whole of the RFP by any bidder and subsequently by the selected bidder, of any information /condition /provision to be laid down in the agreement (to be drawn between the selected bidder and BSCL), shall be out rightly rejected. Insisting on the interpretation(s) by any bidder and seeking/claiming clarification(s)/ correspondence(s) on the same form BSCL, shall be treated as violation(s) of the terms and conditions of this RFP/agreement and hence, action as deemed fit by BSCL shall be taken against such bidder(s) or contractor. Under such circumstance(s), BSCL shall resort to any procedure deemed fit for execution/completion of the work no claim in any manner by any bidder or the contractor shall be entertained/ accepted by BSCL.

Chief Executive Officer,
Bareilly Smart City Limited,
Bareilly

RFP PART– 1: SECTION –IV
GENERAL CONDITIONS OF THE RFP/CONTRACT

1. **GST number required:** The bidder should have a valid GST number. Failure to comply with this instruction shall render his/her/there incomplete and shall be rejected with other punitive action against the said as deemed fit by BSCL. In any change or amendment made by the Government will be applicable according the instructions.

2. **Incomplete Tender(s) and Seeking Clarification(s):** Tenders received in incomplete shape or found incomplete during evaluation of the bids, are liable for rejection. However, during evaluation if felt necessary by BSCL that, further clarification(s) is/are required on any document(s) submitted by any bidder(s) then BSCL may, at its sole discretion, resort to any procedure(s) deemed fit and by assigning reasonable time(s) , as BSCL may decide just & proper for completion of the procedure(s).The result(s)of this/these time bound pursuit(s) shall have bearing(s) upon further evaluation/finalization of the corresponding tender(s) of the bidder(s) or on the tender for the work.

3. **No Claim for Bidding/Cancellation of Tender, etc.:** No claim shall be entertained towards any expenses made by any bidder for submission of the tender in case of cancellation/rejection/acceptance/withdrawal of the tender.

4. **Understanding the RFP Before Bidding:** The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the work and of the rates and prices quoted in the financial bid (RFP Part-II), which rates and prices shall, except as otherwise provided, cover all his obligations under the contract and all matters and things necessary for the proper completion and commissioning of the works. The tender amount accepted by BSCL with or without negotiation, as the case may be, shall remain firm until completion of the work. The tender(s) containing extraneous condition(s) are liable for rejection.

5. **Work Program:** The selected bidder shall submit construction schedule during signing of the agreement. The same shall be approved with necessary modifications, if any, by BSCL. However, BSCL shall reserve the right to modify the sequence of execution of different items/components/sub-items of the project as and when found necessary & in such cases it will be obligatory on the part of the selected bidder to abide by such changes in construction schedule/bar chart as per direction of BSCL. No claim and/or condition should either be put forth in any manner by the selected bidder or shall be acceptable to the BSCL.

6. **Urgent work:** If any urgent work in the opinion of BSCL becomes necessary to be executed and the contractor is unable and unwilling at once to carry out, the Engineer In-Charge may be his own or through other agency carry it out, as he may consider necessary. All incurred on it shall be recoverable from the contractor or shall be adjusted against any sum payable to the contractor.

7. **Change(s) in Name and Constitution of the Contractor:** Any change(s) in the name/constitution of the contractor, shall be forthwith notified by the contractor to BSCL for information. In case of failure to notify the change(s) within 15 days, BSCL may, by notice in writing, rescind the contract and the security deposit of the contractor shall, there upon, stand forfeited and be absolutely at the disposal of BSCL and, the same consequences shall be ensured as if the contract had been rescind thereof and in addition the contractor shall not be entitled to recover or to be paid for any work thereof actually performed under the contract.

8. **Period Of Contract:** The tender for Construction of Block shall be allotted for a period of 6 months (six months) and then after the date of commissioning & functioning of Multipurpose sports complex with 1 year of Defect liability period and 3 years of Operation and maintenance, for which an agreement with the successful bidder shall be signed as per **ANNEXURE-III** and the conditions described herein shall also be part of the agreement.

- The successful bidder(s) shall execute an agreement/contract for the fulfillment of the contract on non-judicial stamp paper of appropriate value in the format enclosed, within ten days from the date of issuance of work award letter on acceptance of the tender.
- The incidental expenses of execution of agreement/contract shall be borne by the successful bidder.
- The conditions stipulated in the agreement/contract should be strictly adhered to and violation of any of these conditions will entail termination of the contract without prejudice to the rights of the BSCL and forfeiture of security deposit with BSCL.

9. **Security Deposit/ Performance Security**

The Successful bidder shall furnish 5% of Security deposit at the time of signing the agreement which includes EMD deposited along with the bid submission through FDR or online. Remaining 5 % security deposit shall be deducted from each running bills. Hence, total 10% security deposit shall be retained by BSCL till the completion of the project.

10. **Payment and release of the Funds**

a) Payment shall be released as per the progress of the work. Contractor shall raise first running bill after approximately 15 % of the work done.
b) Other running bills shall be raised by contractor as per the progress of the work.
c) Final bill will be raised after the completion of the work in all respect.
d) After the completion of the work the contractor is liable for one year Defect Liability Period from the date of issuance of completion certificate from the concerned Department.
e) If the contractor fails to maintain the project in satisfactory manner then BSCL is free to engage another agency to do the work at the risk and cost of the contractor.

11. **Custody of Materials**

The contractor shall be responsible for safe custody of his/her/their materials at the work sites and BSCL will not be responsible for any loss or damage of the property at site. There should not be any conflict of interest or relaxation/exoneration of responsibility of the contractor as per this RFP/Contract, on any account whatsoever, regarding the work(s)/material(s)/property, of BSCL or of, any other agency/organization engaged/allowed by BSCL, available/to be made available/going on/to be started, at or in Connection with the work, failing which BSCL shall adopt any action deemed fit

against the contractor with a view to continuing and complete the works. The portion or whole of the work executed by the contractor in connection with this contract shall remain in safe custody, watch & ward of the contractor till the same are handed over by the contractor to BSCL in required shape and manner or till, BSCL takes them over either unilaterally or as per this contract. Responsibility arising out of this safe custody, watch and ward till BSCL declares/assumes its right over the same, shall lie with the contractor. No claim in this regard by the contractor shall be acceptable by BSCL.

12. Supply of Materials

i. The contractor shall at his own expenses provide all materials required for the work. The materials supplied by the contractor shall conform to relevant latest editions of BIS specifications and Codes of Practices or in their absence to other specifications as may be decided by BSCL. The contractor shall furnish necessary certificate(s) in support of the quality of the materials as may be required by BSCL. In the event of there being no specifications born in the SOR of Uttar Pradesh for the items required for the work whether included in the Financial Bid or not, such items of the work shall be carried out by the contractor in accordance with the instructions and requirements of BSCL.

ii. BSCL shall have absolute authority to test the quality of materials/Equipment at any time through any reputed laboratory at the cost of contractor. The contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials. BSCL shall have the right for removal from the work sites, of all specifications and in case of default, BSCL shall be at liberty to sell such materials and/or to employ other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials.

13. Statutory Approvals and clearances

The Contractor shall be liable to undertake all statutory clearances, NOC and approvals from the relevant Local/State/Central/Other statutory authorities for undertaking and executing the project. The Official fee for undertaking these clearances shall be paid / Reimbursed by the BSCL; however, all Incidental expenses shall be borne by the contractor.

14. Contractor to Provide and Facilitate Inspection, Safety Gear, etc.:

i. **Scaffolding:** Suitable scaffolding shall be provided for workmen for all works that cannot be safely done from the ground or solid construction except such short period of work as can be done safely from the ladders.

ii. **Inspection:** BSCL will have the right to inspect the scaffolding and centering etc. for the work and can reject partly or fully such structure if found defective in his opinion.

iii. **Precaution against Electrical Equipment:** Adequate precaution shall be taken to prevent danger from electrical equipment. Hand lamps shall be provided with Mesh guard, wherever required.

iv. **Preventing Public from Accident:** No materials on any of the sites shall be so stacked or placed as to cause danger or inconvenience to any person or public. The contractor shall provide all necessary fencing and light to protect the public from accident and shall be bound to bear expenses of defense

or any suit action or other proceedings at law that may be brought by any persons for injury sustained owning to neglect of the above precaution and to pay any damages and cost which may be awarded in any such suit action or proceedings to any such person or which may with the consent of the contractor, be paid to compromise any claim by any such person. The contractor not to come cause blockage of traffic/disruption of traffic.

v. **Personal Safety Equipment:** All personal safety equipment shall be made adequately available by the contractor for use of persons employed at the site of work and maintained in a condition suitable for immediate use. The contractor shall take adequate steps to ensure proper use of the equipment by persons concerned.

vi. **Precautions against Fire:** Suitable fire extinguishers, water and sand buckets shall be provided at the work site to tackle situations of fire.

vii. **Demolition:** Before any demolition work is commenced and also during process of work;

a. All roads and open areas adjacent to the work site shall either be closed or suitably protected.
b. No electric cable or apparatus which is liable to be a source of danger shall remain electrically charged.
c. All practical steps shall be taken to prevent danger to persons employed from the risk of fire, explosion or flooding.

15. Fair Wages Clause

The contractor shall not employ for the purpose of this contract any person who is below the age of fourteen years and shall pay to each Labor for work done by such Labor's fair wages.
Explanation- **"Fair Wage"** means wages, whether for time or piece work prescribed by the State Public Works Department provided that where higher rates have been prescribed under the minimum wages act 1948 wages at such higher rates should constitute fair wages.
BSCL shall have the right to enquire into and decide any complaint alleging that the wages paid by the contractor to any Labor for the work done by such Labor is less than the wages described above.

16. Contractor to Respond for Disengagement of Unruly Labor/Personnel

BSCL are to have round the clock access to the work sites during execution and defect liability period. BSCL may require the contractor to remove dismiss any Labor/representative(s) of person of the contractors found to be incompetent or ill-mannered/behaved or of doubtful background/integrity, etc., and the contractor shall comply with such requirements.

17. Provisions for Workman Compensation

BSCL shall not be held liable to pay any compensation to any workman under workman's compensation Act, 1923. The contractor shall have to pay the entire compensation as decided in any court of law for any injury/loss sustained by any workman during execution of the work. If, by order of any authority/court, BSCL pays any compensation to honor and abide the order, then said amount(s) shall be recovered from the contractor.

18. Contractor to Indemnify BSCL

The contractor shall take every precaution not to damage or injure life and/or property of any person/organization/entity in connection with this work. He shall indemnify and keep BSCL

indemnified against all claims for injuries or damages to any person/property which may arise out of or in consequence of any negligence or fault of the selected bidder for this work and, for all the claims, demands, proceedings, damages, costs, charges and expenses whatsoever, in respect of or in relation thereto, the contractor shall be responsible. BSCL will not assume any responsibility on this account.

19. Resident Engineer(s) and Assistant(s)

The contractor shall engage for this work with qualified and experienced Resident Engineer(s) and Assistant(s) to the satisfaction of BSCL. The Resident Engineer(s) shall represent the contractor in his/her/their absence for receiving instructions of BSCL which will be binding on the contractor.

20. Unilateral Stoppage of Work Progress

Unilateral stoppage of work by the Contractor, without prior written permission of BSCL, shall be considered as breach of contract and BSCL reserves the right to take such actions as it may be deemed fit against the contractor.

21. Rescission of Contract

Subject to other provisions contained in this RFP or in the agreement, BSCL may, without prejudice to any other right or remedy available to the contractor in respect of any delay, inferior workmanship, any claims for damages and / or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, rescind the contract in any of the following cases:

I. If the contractor having been given by BSCL a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper manner shall omit/ fail to comply with the requirement of such notice for a period of seven days thereafter.
II. If the contractor being a company shall pass a resolution on the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle to court to make a winding up order.
III. If the contractor has, without reasonable cause, suspended the progress of the work with due diligence so that in the opinion of CHIEF EXECUTIVE OFFICER (which shall be final and binding) he will be unable to secure completion of the work by the due date of completion and continues to do so after a notice in writing of seven days from Chief Executive Officer, BSCL.
IV. If the contractor fails to follow and comply with the relevant provisions this RFP and/or agreement.
V. If the contractor fails to complete the work within the stipulated date or items of the work with individual date of completion. If any stipulated, on or before such date(s) of completion and does not complete them within the stipulated period.

When the Contractor has made himself liable for action under any of the cases aforesaid, BSCL shall have the power to rescind the contract (of which rescission notice in writing to the contractor under the hand of CHIEF EXECUTIVE OFFICER shall be conclusive evidence), 20% of the value of the left over work will be realized from the contractor as Penalty in addition to other punitive measures deemed fit by BSCL including debarring the contractor from participating in BSCL Tenders at least for 3 years, blocking his/her/their Digital Signature Certificate (DSC) in the e-procurement portal and recommending the corresponding License Issuing Authority not to renew the license of the contractor. In case of rescission of contract, the contractor shall have no claim for compensation for any loss sustained by him by reasons of having purchased or procured any materials/equipment or entered any engagement on account of or with a view to execute the work/ performance of the contractor.

22. Black Listing

A contractor may be black listed for: -

a) Misbehavior/ threatening of Departmental & supervisory officers during execution of work/tendering process.
b) Involvement in any sort of tender fixing.
c) Constant non-achievement of milestones on insufficient and imaginary grounds and non- adherence to quality specifications despite being pointed out.
d) Persistent and intentional violation of important conditions of contract.
e) Security consideration of the State i.e., any action that jeopardizes the security of the state.
f) Submission of False/ fabricated/ forged documents for consideration of a tender.

In case a contractor is black listed, it will be widely published and intimated to all Departments of Government and also to Govt. of India Agencies working in the State.

23. Force Majeure

Neither the contractor nor BSCL shall be considered in default in delayed performance of its obligation if such performance is prevented or delayed because of work to hostilities, revolution, civil commotion, epidemic, accidental fire, cyclone, flood, earthquake or because of any law and order proclamation, regulations or ordinance of the Government thereof or because of an act of god or for any cause beyond reasonable control of the party affected. Should one or both the parties be prevented from fulfilling their contractual obligations due the aforesaid a state of force majeure lasting continuously for a period of 6 months, the two parties may consult each other regarding the further execution of the contract for mutual settlement.

24. Jurisdiction for Legal Dispute

That for the purpose of jurisdiction in the event of issue, if any, the contract should be deemed to have been entered in front of Chief Executive Officer, Bareilly Smart City Limited, Bareilly will be final authority to resolve the dispute.

RFP PART-1: SECTION-V

Scope of Work

Broad Scope

a. Contractors are requested to visit the site prior to filing/submission and undertake self-assessment of all the necessary works as per the specification and plans including all attributes/matters related for completion of this project.
b. The Contractor is to seek clarification prior to the submission date (where necessary), to have clarity of all the activities required to be carried out for a successful and timely completion of this project and the works which shall be carried out by the successful contractor.
c. The works under this Contract comprises, building of school block and all related works.
d. Other works may include installation or development of Electrical, Plumbing firefighting and Interior Furniture, equipment installation Works.
e. The contractor shall furnish all labour, material, tools and equipment necessary to complete the works as indicated or inferred in the supporting drawing package. Any item not specifically shown in the drawings or specified, but normally required to conform to the required outcome or such intent, should be considered part of the work unless identified by the contractor prior to commencement of works. The contractor shall include and price for such item in the BOQ accordingly.
f. The works shall be completed within the scheduled time unless otherwise approved by the Client or its representatives and shall be certified by the Employer upon Practical Completion.
g. The landscape planting shall be provided and in a healthy and vigorous growing condition.
h. The contractor shall submit for approval within 7 days of the issue of Letter of Award, his proposed Work Program based on the criteria of the overall schedule of works, showing the intended sequences, stages and order of proceeding with the works together with the period of time he has estimated for each and every stage of the progress including the resources and plant required.
i. The successful bidder shall have to prepare 'As Built Drawings' after execution depicting the exact construction carried out on site, in soft and hard copy format. Statutory and other charges for getting various required approvals as required shall be in scope of Successful bidder.
j. The successful bidder shall undertake confirmatory survey for accuracy and completeness of data prior to commencing the site works. The drawings provided with this document are also available in CAD and Bidders can collect the same, (if required) from the Employer. It is in scope of successful Bidder to undertake all relevant Site surveys, obtaining all required approvals from the relevant regulatory authorities, Prepare and submit maintenance manual to client for approval at least 4 weeks before start of post construction maintenance period. Key tasks/deliverables by the Contractor include: The contractor should submit a detailed timeline for scope of work to be carried out including details of the man power deployment for the projects prior to commencing the works for approval by the Employer.
k. The Employer or his representatives will supervise and monitor the progress of construction phase and Contractor shall provide necessary coordination.
l. Procurement programme indicating purchasing and dispatch of materials as per the implementation timelines. Shall also provide the supporting evidence for all the items delivered to the site and take possession of said items.
m. The Contractor shall prepare presentation, shop drawings/fabrication drawings for the all works in accordance with the approved concept design approved by Employer.
n. Preparation and submission of periodical progress report for all the stages on a weekly basis. The Contractor must be aware of general and specific site conditions, topography and any existing landscape prior to commencement of any landscape works on site.
o. The Bidder will arrange the site inspection for the client and consultant during the entire contract period.

Note: If work item is not detailed under Indian Standards, appointed contractor should refer to relevant international standard (BS or equivalent). This should be approved by Employer prior to commencing any works on site;

Detail Scope of Works

General

Contractor shall be responsible for making the facility fit for the intended purpose while performing all of its obligations covered under the Contract Document in its entirety. The work shall be done in accordance to the drawings approved by the statutory authorities. Scope includes Site / Campus Development, Demolition of existing structures, boundary wall, shop drawings and construct entire block and surrounding in accordance with the same. The scope shall also include preparation of as-built drawings before handing over the work to the Employer, maintaining the Quality assurance & Quality control (QA&QC) including control, corrective actions, reporting and arranging for regular inspections by all concerned. As deemed necessary by the Employer/Employer's Engineer/PMC, Contractor shall execute necessary mock-ups of all items/activities related to the Work performed required under this Contract as indicated below and the cost for the same shall be deemed to be included in the Contract price. The Contractors are advised to visit the site before submitting the Proposal for the works. The Scope includes all temporary works required for the completion of works, testing and commissioning and handover till Defect liability Period.

List of provisions to be made are as follows:

INDOOR SPORTS COMPLEX				
S.No.	**Classification**	**Area (sqm)**	**No.**	**Total (sqm)**
1	Ground floor			
a.	VIP entry lobby	34	1	34
b.	Sports hall	1350	1	1350
c.	Changing rooms, showers and toilets	38	2	76
d.	Equipment storage	22	1	22
e.	Circulation	42	1	42
2	**First floor**			
a.	Hall	35	1	35
b.	Medical Room	16	1	16
c.	Toilets	4	2	8
d.	Store	6	1	6
e.	Electrical Services	8	1	8
f.	Circulation	56	1	56
Total built area				**1653**

Surrounding Site Development Area				
S.No.	**Classification**	**Area (sqm)**	**No.**	**Total (sqm)**
a.	Surface parking	1025	1	1025

b.	Multipurpose public area	394	1	394
c.	Cafeteria	40	1	40
d.	Outdoor Seating	400	1	400
e.	Gatehouse	10	1	10
f.	Pedestrian Pathway	510	1	510
g.	Road	200	1	200
h.	Green area	700	1	700
Total				**3279**

Landscape Works

Scope

The Landscape scope includes procure, supply, construction, installation, furnishing, equipping, testing, commissioning and execution of landscaping works [softscape], irrigation for entire Indoor sports stadium complex including mockup for Landscaping items in accordance with the Drawings in RFP,

- Site grading as per the requirements
- Good garden earth & manure
- Trees, shrubs, ground covers, lawns as per BOQ
- Drip irrigation system for trees and shrubs.
- Tree Plantation
- The Contractor will supply and install barricades for safeguarding landscape development area and works. He may also install the barricades in the landscape development area according to his own understanding if he feels that any part of the landscape area is bound to be damaged for any reason, Contractor shall follow pre construction and during construction soil erosion control measures as per the NBC.

Civil and Structure Works

Scope

The Contractor shall carry out, and be responsible for the execution of Works of Indoor Sports Stadium Complex that includes structure, HVAC, Electrical, Plumbing, Interior, Landscape, fencing, security cabins, pavements, hardscape, drains, etc. The Scope of Work includes but is not limited to the following in relation to the design, construction, and operation of the works:

- Prepare Report based on the design regarding time schedule and submit for approval.
- Setting out the works: Site Topographic Survey and Geotechnical Investigations as deemed necessary by the Contractor. Site Clearing, Site Grading, and Excavation including excavation for sump pits / lift pits.
- Foundation & substructure works.
- Implement Anti termite treatment / Water proofing / Insulation works.
- Superstructure RCC works.
- Masonry.
- Plastering.
- Structural Steel work.
- Ancillary PCC / RCC works including equipment foundations / pedestals, etc.
- All PEB shed works

Electrical Works

Scope

The scope of work shall cover unloading, storing at site of all equipment, erection and

commissioning, test at site, performance guarantee test run, training of Employer's personnel and handing over of the complete electrical system along with mandatory spares as per the terms & conditions.

The scope of work shall comprise of, but not limited to the following:

- Power Supply system from nearest CSS to RMU.
- High Side and Low Side equipment such as Transformers and Switchgear.
- Non-segregated phase Busduct and sandwich Busduct with all associated accessories.
- Main Power Control Centers (PCC), Sub-Power Control Centers (Sub-PCC) and Motor Control Centers (MCC).
- Power Distribution boards.
- Automatic Power Factor Correction Panel with capacitors.
- Metering system.
- All HT/LT Power, control cables.
- Cable carrier system with necessary cabling accessories such as cable glands, lugs, termination and jointing kits etc.
- Fire proof sealing system comprising of fire stops and fire breaks.
- Lighting system including Fittings and fixtures.
- Common area lighting, Hall lighting and outdoor Lighting system comprising of lighting distribution boards, lighting transformers, light fittings, lighting poles, Power socket, associate lighting switches/sockets, associated cable, conduit and wiring.
- 100% DG Backup System with Diesel Storage Capacity
- DG synchronizing panel.
- Earthing system comprising of Earthing Electrodes, Earthing strips/ conductors and associated accessories.
- Miscellaneous items such as Local control push buttons, Welding Receptacles
- Safety Equipment's such as rubber mats, sign boards

System Design Requirements

The following design criteria shall be considered by the Contractor for the equipment and services supplied under this contract:

- Safety to personnel and equipment during the maintenance.
- Reliability of service.
- Minimum fire risk.
- Ease of maintenance and convenience of operation.
- Automatic protection of all electrical equipment through selective relaying system.
- Electrical supply to equipment within the design operation limits.
- Adequate provision for future extension and modifications.
- Fail safe features.
- Suitability for applicable environmental factors.
- Maximum interchangeability of equipment.
- The design and equipment shall ensure satisfactory operation under variations of voltage ±10%, frequency (+) 5% to (-) 5%, combined voltage and frequency 10% for A.C., -15% to +10% for DC as may be met under operating conditions, including those due to starting loads and short circuit and other fault conditions.

Specific requirements for Electrical Equipment's

The following additional design requirements shall be considered.

HT and RMU Panel

- RMU panel shall be metal clad, self-standing dust proof construction, outdoor cubicle type fitted with incoming load break isolators and outgoing feeders as vacuum circuit breakers with aluminium bus bar, fully draw out type. Degree of protection of RMU panel shall be IP65 or better.
- Required margin of (20%) shall be considered while sizing the bus bars and breakers for switchgear
- The relays in the 11kV RMU and 11kV HT panel shall be numerical type with IEC 61850 compatibility.

Busduct and Rising Main

- Non-segregated phase Busduct shall be TPN, Bus bar material shall be of high conductivity electrolytic Aluminium conductor. Bus duct shall have degree of protection better than or equal to IP- 54.
- 415V rising main bus bar shall be of sandwich construction and made up of high conductivity electrolytic aluminium conductor, non-ventilated design and the degree of enclosure protection shall be IP 52.
- Each Rising Main shall be equipped with an end feed unit / MCCB panel, at both ends.

Main LT Panel and Sub-Distribution panels

- Main LT panels shall be metal clad, self-standing dust proof construction, fully draw out type and IP 54.
- For feeders rated more than 400A, ACB with Numerical protection/built in microprocessor release, discrete multi-function meters or metering as part of ACB shall be provided. For all other rating feeders Microprocessor based MCCB shall be used. All ACB feeders shall be compatible for remote control, metering and monitoring.
- Incomer and busbar shall be rated for full load current of the total load connected plus a margin of 20%, rounded off to the next standard rating. All outgoing feeder modules from each PCC shall be rated for the full load current plus 10% margin, rounded off to the next standard rating. All PCC shall be provided with 20% spare feeders.
- Incoming feeders shall be provided with ACB breaker with Numerical protection relay compatible with IEC 61850.

APFC Panel

- Automatic Power Factor Correction (APFC) capacitor panels with capacitor bank of adequate kVAR rating to maintain the power factor of 0.98 lag at main LT panels.
- All Poly Propylene (APP) type Capacitor banks shall be housed in APFC Panel cabinet.

Motors

- Motors shall be energy efficient (IE2) squirrel cage induction type, TEFC, IP-55 enclosure (including terminal boxes and bearing housing) with Class-F insulation (and temperature rise limited to Class B).
- Lockable Stop Push Button (press to stop and key to release) shall be provided near to the each equipment. The enclosure shall be engineering plastic (scratch resistant), weather proof, corrosion resistant, dust and vermin-proof, suitable for mounting on wall or structures. The enclosure shall have degree of protection not less than IP55.

DC System

- The DC system shall be designed to cater the loads for control, protection and indication of 11kV switchgear, 415V breaker controlled feeder, control panel, DG AMF panel, RTCC panel shall be designed for 110V DC battery with 2 hours back-up time.
- 110V, 2 x 100%, float cum boost charger with a common 100% tubular lead acid / or better battery shall be provided which shall be located at ground floor level.

DG Set

- Emergency DG set shall be designed for complete 100% Building load redundancy. The Prime rated

DG set shall be an Indoor type open construction mounted on base frame through anti vibration mounts. The cooling system for DG set is radiator type. The DG room shall be acoustically insulated along with panels to limit the noise in line with the norms as set by pollution control board.

Power, Control Cables and Cable carriers system

- The cables shall be 11000V un-earthed grade, single / multicore, stranded aluminium, XLPE insulated with PVC inner sheath, armoured and overall sheathed with specially formulated Fire Retardant Low Smoke (FRLS) PVC. Single core cables shall have aluminium wire / formed wire armour, whereas multicore cables shall have galvanised steel strip armour.
- LT power cables shall be 1100V grade, single / multicore, stranded aluminium conductor, XLPE insulated, with PVC inner sheath, armoured and outer sheath made of specially formulated FRLS PVC compound.
- The overall voltage drop shall be limited to 5% and the voltage dip shall be limited to 15%.
- The LT control cables shall be 1100V grade, multicore, 2.5 sq.mm cross section, stranded copper conductor having 7 strands, PVC insulated, inner PVC sheathed, galvanised steel wire/formed wire armoured and outer sheath made of FRLS PVC compound conforming to the performance requirements outlined above shall be used . The cables shall conform to IS:1554 (Part-I) - 1988 / IEC-502 (1983) in all other respects.
- Cable carrier system shall be designed for 70% loading.
- Power cables and control cables shall run in different shafts. Separate riser and trays shall be provided for the LV system.
- All cabling/wiring works shall be concealed wiring except for risers and in other areas where public or tenants do not have access or approved areas by the Employer.

Lighting system

- LED Light fittings should be installed with effective reflectors. Mercury light fittings should not be used, instead Metal halide fittings shall be used.
- The luminaries shall be selected to suit architectural, functional and aesthetic requirements.

HVAC:

VARIABLE REFRIGERANT FLOW (VRF) AIRCONDITIONING SYSTEM:

System Description:

Air cooled split type multi-system air conditioning system consisting of:

i. Outdoor condensing units connected to multiple indoor units.

ii. The indoor units may be of different type/ configuration / capacities.

iii. Each indoor unit shall have the capability of individual temperature set point control.

iv. The system should have the ability to connect each condensing unit to various nos. of indoor units of different types and capacities on one refrigerant circuit, as indicated on the tender drawings. The bidder shall check the layouts and check whether the system offered meets the desired requirements.

v. Each condensing unit shall incorporate inverter driven variable speed hermetic scroll compressor, to obtain 10% to 100% step-less capacity control for enhanced power saving.

vi. Each indoor unit shall be provided with signal receiving kit to facilitate operation through remote control. Each indoor unit shall be provided with wireless or wired remote control, as specified in BOQ.

vii. The indoor and outdoor units shall be BMS compatible.

Refrigerant:

All the condensing units and indoor evaporating units shall be factory assembled and tested.

The entire refrigerant required to operate the system satisfactorily shall form part of the machines and nothing extra shall be payable on this account.

Any additional refrigerant required to meet the requirements of piping lengths shall be added at site. Nothing extra shall be payable on this account.

Additional refrigerant charge weight must be calculated based on the actual length of the refrigerant pipe work. The refrigerant charging process must be carried out with an appropriate charging station and under supervision.

Acceptable Refrigerants: R-410A.

Refrigerant Piping Distance Limits:

The system shall be capable of refrigerant piping runs suitable to the layouts indicated in the tender drawings. The bidder shall check the layouts and check whether the system offered meets the desired piping distance limits of all types.

The oil equalizing lines shall be inside the condensing units.

Refrigerant Piping:

Pipe Material:	Up to 3/4" dia: soft drawn copper tube coils and Above 3/4" dia: hard drawn copper pipes of grade L
Fittings Material:	Hard wrought copper or brass, suitable for flared / copper soldered / Silver soldered connections.
Pitching:	All refrigerant pipes shall be pitched to ensure proper oil return to the compressor.
Joints:	Sweat joints using low temperature brazing and/or silver soldered
Maintenance:	Isolation valves shall be provided at suitable locations for ease of maintenance.

Installation:

The installation shall be carried out strictly as per the refrigeration equipment manufacturer's recommendations including the required distribution joints and headers. The number of brazed joints shall be kept as minimum as possible/practical. The pipe work shall be supported on saddling arrangement with maximum 2-meter center distance. The refrigerant piping (inside the building and/or outside the building) shall be supported on perforated GI cable trays, which shall be covered from top with GI open able covers.

Orientation of Joints:

All the proprietary Distribution refrigeration pipe joints and headers shall be installed in an appropriate orientation to enable correct distribution of refrigerant. The Distribution Joints shall be factory insulated with pre-formed sections of expanded polystyrene or Equivalent insulation material.

Cleanliness of Piping:

All pipe work shall be kept clean and free from contamination to prevent breakdown of the system. All pipe ends shall be sealed and kept sealed until immediately prior to making a joint.

Testing:

After the completion of the installation of the refrigerant piping, the entire system shall be pressure tested with dry nitrogen at a pressure of 20 Kg/Sqcm (high side) and 10 Kg/Sqcm (Low side). The pressure shall be maintained for a period of 24 hours. The system shall then be evacuated to a minimum possible vacuum, which shall be maintained for 24 hours before flushing and charging the system with the refrigerant.

Insulation of Refrigerant Piping:

All suction pipes and low temperature / pressure liquid pipes of the Refrigerant pipe work shall be insulated with slip on Closed Cell Nitrile Rubber fire retardant pipe insulation having a wall thickness of not less than 13 mm. The thermal conductivity of the insulation material shall not exceed 0.032 W/m K at 0 degree C mean temperature. The density of the insulation material shall not be less than 33 + 3 Kg/cum.

All joints of the insulation shall be sealed with 100 mm width x 3 mm thick self adhesive tape of the same material as insulation and shall be of the same make as the basic insulation material. Insulation material exposed to atmosphere shall be of the material as described above and shall be provided with UV protective coating/lamination. The joint sealing tape shall also be provided with identical UV protective coating/lamination. Where indoor refrigerant pipe work is located in roof spaces or spaces where temperature may exceed 30 degree C and RH may exceed 80%, the thickness of pipe insulation shall be selected accordingly.

Outdoor Condensing Units:

i. The unit shall be fully weatherproof, factory assembled and pre-wired with all necessary electronic and refrigerant controls. The casing shall be constructed of mild steel panels finished with baked enamel or powder coating. The unit shall be completely factory wired and tested with all controls before dispatch. The unit shall be of rugged & anti-corrosion design with strong base plate for easy mounting. The unit shall be complete with state of the art microprocessor control panel. The microprocessor panel shall incorporate controls for precise monitoring of status of the system.

ii. Larger Condensing Units: The condensing units larger than 5 HP capacities shall incorporate minimum two scroll compressors with at least one inverter driven scroll compressor. The unit shall be capable of operating even if one of the compressors is unserviceable.

iii. Modular Design: The modular design of the condensing units shall allow for side-by-side installation. The outdoor unit when consisting of separate modules, each module shall have one separate inverter driven compressor.

iv. Fan Motor Speed Control: The condensing unit fan motors shall have multi-speed operation to maintain constant head pressure control in all ambient temperatures and modes of operation.

v. Compressors: Compressors shall be highly efficient hermetic scroll type of industrial quality, rugged construction direct driven, with scroll plates & suction/discharge service valves, with industrial solid motor mounts, internal motor protection and vibration isolators. The compressors shall be completely enclosed in a chamber with no leakage path and shall have the capability for scroll plates to separate.

At least one of the compressors shall be inverter driven and the controller shall vary the speed of the compressor to meet the variations in the cooling / heating loads. Each compressor shall be independently

wired and piped to its own circuit for efficient operation & ease of maintenance. All parts of the compressor shall be suitable and sufficiently lubricated. Oil heaters shall be provided in compressor casing.

vi. Heat Exchanger: The heat exchanger shall be constructed from seamless copper tubes mechanically bonded to aluminum fins to form a cross fin coil. The heat exchanger shall be with sub cooling feature for effective usage of the entire coil surface through proper circuiting in order to prevent flushing of refrigerant owing to large length of piping.

vii. Refrigerant Circuit: The refrigeration circuits of the condensing unit shall be complete with refrigeration compressors, motors, fans, condenser coils, electronic expansion valve, solenoid valves, 4 way valve, distribution headers, capillaries, filters, shut down valves, service ports, receivers and accumulators and all other components which are essential for safe and satisfactory operation of the system.

viii. Safety Devices: The condensing unit shall be complete with the following safety devices as minimum: High pressure switch, Fan Drive Overload protection switch, Fuses, Crank case heater, Fusible plugs, over current protector.

ix. Oil Recovery: The unit shall be equipped with an oil recovery system to ensure stable operation of system with long refrigerant piping. The oil recovery system shall be operated after the first hour of operation and then every consecutive 4 hours of operation. The unit shall be provided with high efficiency oil separators on the discharge side of the compressor together with factory fitted oil equalization system.

x. Fans: The unit shall be provided with necessary numbers of direct driven low noise propeller fans arranged for vertical discharge. Each fan shall be with a safety guard.

Indoor Unit:

xi. The indoor unit shall be Cassette type. The indoor unit shall be compact and shall have elegant appearance. They shall have low noise centrifugal blowers driven by special motors. The cooling coil shall be of direct expansion type made of copper tubes and integrally fitted with aluminum fins. The indoor unit shall be provided with removable and washable type polypropylene filters. Each unit shall be provided with multi-functional cordless remote control unit with special features like programmable timer and soft dry mode etc.

REFRIGERANT PIPING :

xii. All refrigerant piping for the air conditioning system shall be constructed from hard drawn/soft seamless copper refrigerant pipes with copper fittings and silver-soldered joints. The refrigerant piping arrangements shall be in accordance with good practice within the air conditioning industry, and to include charging connections, suction line insulation and all other items normally forming part of proper refrigerant circuits.

xiii. All joints in copper piping shall be sweat joints using low temperature brazing and or silver solder. Before joining any copper pipe or fittings, its interiors shall be thoroughly cleaned by passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while constructing the joints. Subsequently, it shall be thoroughly blown out using nitrogen. After the refrigerant piping installation has been completed, the refrigerant piping system shall be pressure tested using nitrogen at pressure of 20Kg per sq.cm and 10 Kg per sq.cm (low side). Pressure shall be maintained in the system for 24 hours. The system shall then be evacuated to minimum vacuum if 70mm hg and held for 24 hours.

xiv. The thickness of copper piping shall not be less than mentioned below:

Pipe Size in mm(OD)	Wall Thickness in mm

a) 54.1	1.5
b) 41.3	1.3
c) 34.9	1.3
d) 28.6	1.2
e) 25.4	1.2
f) 22.2	1.0
g) 19.1	1.0
h) 15.9	1.0
i) 12.7	0.8
j) 9.5	0.8
k) 6.4	0.8

i. The suction line pipe size and the liquid line pipe size shall be selected according to the manufacturers specified outside diameter. All refrigerant pipes shall be properly supported and anchored to the building structure using steel hangers, anchors, brackets and supports which shall be fixed to the building structure by means of inserts or expansion shields of adequate size and number to support the load imposed thereon.

CONDENSATE DRAIN PIPING :

Condensate Drain Pipes shall be UPVC of 10 Kg/cm2 condensate drain water piping with necessary clamps, supports, hangers and fitting such as bend, tees, reducers etc. duly insulated with 6 mm thick chemically cross-linked closed cell polyethylene foam.
The drain lines shall be provided at all the lowest points in the system, as well as at equipment, to remove condensate. All condensation drainage shall be pitched in the direction of flow to ensure adequate drainage, with an adequate trap seal to prevent leakage of air due to static pressure developed by air conditioning units. The Pitch shall be 20 mm per meter wherever possible, but not less than 10 mm per meter piped to nearest drain.

INLINE FANS:

This specification outlines the minimum requirements for design, engineering, selection, manufacture, test and supply of ducted inline fans with all accessories complete in all respect.

Construction:

Inline Fan shall be rectangular or circular in shape and shall have mixed flow impeller directly driven with single phase IP-44 external rotor motor having class F insulation. The casing & impeller shall be made of durable & high quality plastic. The construction of the assembly shall be such that impeller & motor block is fixed to the mounting bracket frame by means of special clamps with latches. This should also facilitate removal of impeller & motor block only without disconnecting the ducting & necessity of removal of complete assembly. The assembly must have Fan speed regulator supplied by the Fan manufacturer for air balancing. The regulator shall be mounted on the Fan Motor block itself at manufacturer works. The motor shall have in-built thermal overload protection with automatic restart. Fan motor shall be equipped with ball bearing designed for at least 40000 working hours service life. The fan shall be connected to power mains through the external terminal block. The Fans shall be compatible to be used with matching size round ducts. Fan Impeller shall be dynamically balanced. The Fan assembly shall be fixed to ceiling/wall with mounting bracket supplied by Fan manufacturer along with Fan assembly. Mounting shall

be possible at any angle.

Installation:

Fan shall have rigid supports and fitted to both ends of the casing. Wherever the fans are to be suspended from ceiling or mounted on the wall, the contractor shall include supply and fixing of all the material that may be required to complete the installation in all respect. Fan inlet and outlet connections shall be by means of flexible canvas connections having flexibility and slackness as per relevant IS Codes.

DUCTING:

Duct Material:

The ducts shall be fabricated from galvanized steel sheets of approved make. Zinc coating on galvanized steel sheets shall not be less than 120 gm / sq m. Galvanized steel sheets shall be of lock forming quality. Test certificates from the manufacturer to be submitted by the contractor along with the every lot of sheets supplied. In addition, if deemed necessary, samples of raw material, selected at random by Clint's site representative shall be subject to approval and tested for thickness & zinc coating at contractor's expense. All ducts shall be factory fabricated from galvanized steel sheets, with no intermediate bracing. Thickness of sheet shall be as per the following details: -

RECTANGULAR DUCTS (GSS)	DUCT SECTION LENGTH 1200 mm		
MAXIMUM DUCT SIZE (mm)	GAUGE	TYPE OF JOINT	BRACING
1-750	26	C & SS	Nil
751 – 1000	26	E-Flange	Nil
1001 – 1200	24	E-Flange	Nil
1201 – 1500	24	H-Flange	Nil
1501 – 1800	22	H-Flange	Nil
1801 – 2100	20	J-Flange	Nil
Above 2100	18	J-Flange	Nil

Abbreviations: (a) C – Cleat, (b) S – S Cleat (c) SS – Standing S Cleat

Duct fabrication:

All ducts shall be factory fabricated in workman like manner in accordance with SMACNA standard. The following points shall be considered during duct fabrication. Ducts to be fabricated from coil (sheet metal in roll form) to facilitate longitudinal seams at corners/ folded edges only. All ducts, to be made on CNC profile cutter for requisite accuracy of dimensions. All edges to be machine treated using lock formers. Duct shall be straight and smooth on the interior surfaces. If space available, bends shall be made with radius not less than one-half the width of the duct. Changes in dimensions and shapes of ducts shall be gradual. Tapering angles shall not be more than 30 degrees (tapering ratio shall be between 1:4 and 1:7). Cutting vanes shall be provided in all bends and duct collars to permit the air to make turn without turbulence. Splitter dampers shall be provided at all T connections.

Ducts shall be fabricated as per details on approved shop drawings. All ducts shall be rigid and adequately supported and cross- braced where required for preventing buckling, vibration or breaking. All ducts and supports shall be spray painted with white color at outer surface on site.

Duct installation:

All ducts shall be installed in workman like manner in strict accordance with the approved shop drawings. The following points to be considered during duct installation. All necessary allowances and provisions shall be made by the contractor for beams or other obstructions in the building, whether or not the same are shown on the drawings. If a duct cannot run as shown on the drawings, the contractor shall install the

duct between the required points by any path available, subject to the approval of the client/ architect/ consultant. All ductwork shall be independently supported from building elements. All horizontal ducts shall be rigidly and securely supported, by using hangers formed by fully threaded GI roads and GI channel under ducts as per SMACNA standards.

All ducts shall be totally free from vibration under all conditions of operations. Whenever ductwork is connected to fans, ducts shall be provided with flexible connections. Flexible connection shall be made from fire resistant flexible double canvas sleeves at least 100 mm deep, secured properly and bolted at both ends. The two mating flanges of the ducts shall be made air tight by providing 2 mm thick rubber gasket fixed on both mating flanges by using good quality adhesive. Wherever ducts pass through masonry walls an angle iron frame of 40 x 40 x 5 mm properly primer coated shall be riveted to the duct position passing though the wall to prevent any buckling of the duct. All ducts and supports shall be spray painted with white color at outer surface on site.

Collar dampers:

All supply air diffusers/ grilles shall be provided with removable key–operated multi-blade type louver dampers. Dampers installed in supply air grilles of air conditioning lines shall be made of aluminum and those installed in air cooling lines shall be made of mild steel or galvanized steel. Collar dampers shall be provided with suitable links, louvers and quadrants for manual control of volume of airflow and proper balancing of the air distribution system.

Duct dampers:

Duct dampers shall be multi blade box type of robust construction made out of galvanized steel and tightly fitted. Dampers shall be provided with suitable links, levers and quadrants as required for manual control of volume of airflow and proper balancing of the air distribution system. Every damper shall be having an indicating device clearly showing the damper position at all times.

Testing:

After completion of the installation of air distribution system all ducts shall be tested for air leaks. Before painting the interiors, air distribution system shall be allowed to run continuously for 24 hours for driving away any dust or foreign material lodged within the ducts during installation.

Balancing:

The entire air distribution system shall be balanced using anemometer. Air quantities at the discharge and at various outlets shall be identical to, or less than 5% in excess of, those specified and quoted. Leakage in each air distribution system shall be within 3%. Dampers shall be permanently marked after air balancing is complete so that these can be restored to their correct position if disturbed at any time. Complete air balancing report shall be submitted to the consultants for scrutiny and approval.

Duct Insulation:

All supply air ducts shall be insulated with 9 mm thick Closed Cell Elastomeric Nitrile Rubber. Thermal conductivity of elastomeric nitrite rubber shall not exceed 0.036 W/m°K at an average temperature of 0 °C. The insulation shall have fire performance such that it passes minimum CLASS 1 as per BS476 Part 7 for surface spread of flame. The closed cell elastomeric nitrile rubber insulation shall be applied as follows:-

i. Clean the surface with a wire brush and make it free from rust and oil. Apply one coat of rubber adhesive SR 998.
ii. Fix the nitrile rubber insulation on duct surface of the thickness as mentioned in BOQ.
iii. All longitudinal & transverse joints shall be sealed with self adhesive tape of same material 50 mm wide x 3 mm thick.

Linear grilles:

The supply and return air grilles shall be powder coated fabricated from aluminum extruded sections. The grille shall have 3 mm thick single horizontal extruded section fixed louvers. The grille flange shall be fabricated out of 20x20x1.5 mm aluminum angle. Grilles longer than 450 mm shall have intermediate

supports for the horizontal louvers. The samples of grilles shall have to be got approved by the consultant/ architect/ client.

Testing and balancing of air distribution system:

After completion of the installation of air distribution system all ducts shall be tested for air leaks. Before painting the interiors, air distribution system shall be allowed to run continuously for 24 hours for driving away any dust or foreign material lodged within the ducts during installation. The entire air distribution system shall be balanced to supply the air quantity for each area and the final balance of air quantity for each area shall be submitted to the Project Manager/Engineer-in-charge, for approval. The entire instrument required for testing and balancing i.e. rotating vane anemometer, thermometer, duct hood, inclined manometer etc. shall be provided by the Contractor.

Fire fighting

Scope

The Scope of works shall cover complete Fire Fighting system including Fire alarm system of Indoor Sports Stadium Complex building. The scope includes all the related things like testing at manufacturers' works, packaging, transportation, shipping, unloading at port, transportation to site, unloading, storage, insurance, transportation from stores to erection site etc.

System Design Requirements

- Main design components include Wet risers and the hydrant System including all pumps and pipe networks.
- All Accessories, but not limited to field instruments like pressure gauge & pressure switch and control cabling including junction box, erection hardware, etc., to MCC & diesel engine control panel should be included.
- Electrical panels, Cabling & earthling from MCC panels to various fire fighting system, control wiring & interlocking.
- Instrumentation and Control equipment shall be complete with primary elements, initiating contacts for alarms, instrument impulse lines, fittings, power and control cables with suitable glands and terminations and instrument installation hardware.
- 4mm thick wrapping & coating for underground piping with proper testing.
- Sprinkler System for the complete development (within the scope of this contract).
- Contractor shall carryout the hydraulic calculation using validated software.
- Fire extinguisher including mounting fixtures, anchor bolts, clamps, structures, etc. for all buildings in all the areas.
- Photo luminescent signage.
- Fire alarm system
- Firewater Storage at underground of utility building and Terrace level of each building.
- Yard hydrant system around indoor sports stadium.

Associated Works

- The complete electrical work related to Firefighting including, but not limited to installation of pumps, shall be carried out by Contractor.
- All associated Plumbing Works are also in the scope of Contractor.
- The Scope includes the associated works like Structural works for pipe supports for above ground pipes, wall supports, hose cabinet supports, etc., Civil works like wall opening, chipping of foundation, grouting of foundations, sand filling and compacting for underground pipes, etc.
- Painting of equipment, piping, supports etc. with 2 coats of primer & 2 coats of synthetic enamel as per IS: 5 shade 536 (Fire Red).
- Supply of One set of special erection and maintenance tools and tackles.
- Start up and Essential spares.
- Recommended spares for 5 years operation.
- Anchor fasteners required for pipe supports of all the systems which are engineered by vendor and all

anchor bolts, nuts, washers and inserts to be embedded in concrete for the equipment and piping.

- Shop inspection (in Vendor's works & at project site after installation along with all required Calibrated measuring instruments).]

Fire protection system shall be designed and install as per the following codes and standards

- NBC, 2016: National building code, part IV
- IS 2189:1999: Installation & maintenance of fire detection and alarm System
- 2002: Design and installation of fixed automatic sprinkler fire extinguishing system
- IS 13039:1991: Yard hydrant system
- IS 3844:1989: Internal hydrant system
- IS 1239 / IS 3589: Specification for MS Pipes
- IS 5290:1993: Specifications for hydrant landing valves
- IS 15683:2006: ABC powder type extinguishers
- IS 9457:1980: Safety colors and safety signs
- IS 12349:1988: Fire protection – safety sign and Local fire authority requirements

Plumbing

The Scope of works shall cover the complete Plumbing system including Internal and External Water Supply, Internal and External drainage including Sewerage, Storm water drainage, Rain water harvesting system of Indoor Sports Complex. The scope includes all the related things like procurement, manufacture, testing at manufacturers' works, packaging, transportation, shipping, unloading at port, transportation to site, unloading, storage, insurance, transportation from stores to erection site etc.

System Design Requirements

- All the transfer pumps, connection between tanks and transfer pumps, related piping, valves and accessories etc.
- Auto level sensors with required controls like solenoid valve for each tanks (both underground tanks and overhead tanks) for automatic operation of transfer pumps.
- Transfer pumps (1w + 1s) for each potable water & non-potable water system Water supply pipes in building
- Separate piping from building to each overhead tank through trench with required supports.

- Complete distribution of potable and non-potable water distribution for proposed block.
- There are three piping outlet to be taken from each potable and non-potable OHT. Water supply for top levels shall be supplied through booster pumps with pressure sensors. Individual piping connections shall be taken for next levels respectively to maintain the uniform pressure.
- Works to include for air vents, PRV, water meters, valves, pressure gauges, water hammer arrestors, Nahni traps, Floor gratings, Gully trap, grease trap, man holes, inspection chambers, required piping connections etc.
- Required capacity booster pumps with pressure sensor system with required controls and instruments at terrace level for each drinking water system and flushing water system with standby for each building.
- Cabling & earthling from MCC panels to various plumbing/ sanitary system, control wiring & interlocking.
- Field instruments like pressure gauge & pressure switch and control cabling including junction box, erection hardware, etc., to MCC
- Instrumentation and Control equipment included in the package unit shall be complete with primary elements, initiating contacts for alarms, instrument impulse lines, fittings, power and control cables with suitable glands and terminations and instrument installation hardware.
- Supply & Installation of following complete Sanitary Fixtures and Fittings as per the model and make mentioned in the tender specifications.

Associated Works

- The complete electrical work related to Plumbing works including, but not limited to cabling and earthing of various fixtures and control wiring shall be carried out by Contractor.
- The Scope includes the associated works like Structural works for pipe supports for above ground pipes, wall supports, hose cabinet supports, etc., Civil works like wall opening, chipping of foundation, grouting of foundations, sand filling and compacting for underground pipes, etc.,
- Painting of equipment, piping, supports etc. with 2 coats of primer & 2 coats of synthetic enamel as per relevant IS codes.
- Start up and Essential spares.
- Recommended spares for 5 years operation
- Anchor fasteners required for pipe supports of all the systems which are engineered by vendor and all anchor bolts, nuts, washers and inserts to be embedded in concrete for the equipment and piping.
- Supply of One set of special erection and maintenance tools and tackles.
- Cutting holes, chases & like through all types of walls /floors and finishing for all services crossings, including sealing, frame works, fire proofing, providing sleeve, cover plates, making good structure and finishes to an approved standard.

Road Works

Scope

The scope of proposed road works includes development of internal roads/driveways, pathways and parki ng areas within building site. The Contractor shall carry out, and be responsible for, execution of the roads works, including any site surveys, subsoil investigations and all other things necessary for proper planning, design and construction.

Design Requirements

- Contractor shall undertake the Site Topographic Survey and Geotechnical Investigations as deemed necessary.
- Contractor shall give proposed finished road levels (FRLs) / finished ground levels (FGLs) in due relation with accessibility to various buildings or developed areas and proper drainage of overall site including Site Grading.
- For all structural designs and drawings the Contractor must get the proof check done by accredited agencies at his own cost before submitting for the approval of the Employer.
- Contractor shall prepare and submit Shop drawings, fabrication Drawings, Site Layouts, etc., necessary for execution.
- The construction works shall include but not limited to Soil stabilization or other measures to be implemented to improve soil subgrade strength as per design intent.

Interior Works

Toilets: Ceramic Wall tiles of size specified in the drawing set and with large mirror. Toilet sanitary ware & CP fittings including accessories (towel rail, towel ring, soap dispenser, toilet paper holder, hand dryer, Paper towel dispenser, bottle trap, floor trap / drain) to be included of Indian range of any reputed brand (Kohler, Grohe, Jaguar).

Railings: SS 304 grade stainless steel railings with balusters and toughened glass panel as desired.

Door Windows:

a. All toilet doors to have Wooden frames (second class teak) with 38mm Flush doors with laminate.

b. All medical room, hall and equipment store area doors to match the partition system or as specified. These may be of 12mm Toughened frameless glass with floor spring and patch fittings or Aluminium frame with aluminium doors with prelam board & glass panel or Wooden 38mm flush doors with laminate and glass.

c. Staircase doors – Fire rated doors with push bar mechanism.

d. External doors of the building to be Toughened glass / Aluminium doors on patch fittings.

Modular Furniture / Cupboards / storages / counter boxes – Included as per the drawings and bill of quantity & of approved make.

Paint / Polish: Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications :Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of Special primer applied @ 0.75 ltr /10 sqm, Complete synthetic enamel paint

False Ceiling: Combination of Gypsum board ceiling with GI framing / taping and grid ceiling as shown in the drawings.

FLOORING: Flooring shall be laid as per the architecture drawing.

a. All reception, medical room, hall and corridors: Full Body vitrified / porcelain tiles digitally printed of size as specified in the project.

b. Toilets: Tiles

c. Equipment store: Kota stone

d. Outdoor circulation: Granite stone

e. Terrace: Brick Coba

f. Driveway / periphery road: Bitumen Road.

Toilets

Modular toilet cubical of 25mm thick waterproof boards with stainless steel hardware. Provision for Wall hung EWC, counter top wash basins, press and close faucets, exhaust inbuilt windows.

Plumbing fixture -

i. **EWC** wall hung of approved standard make with p or s trap with dual flush with all internal parts of make jaquar or equivalent.
ii. **Counter top wash basin/counter sunk wash basin** to be fixed on granite counter with under storage of jaquar or equivalent make.
iii. **Plumbing piping fixtures** all fixtures of standard material of government approved make to be used as per the SSR AP specification.
iv. **Faucets, traps, pillar taps, and sanitary fixtures** standard approved make as per SSR AP.

Relevant IS Codes

Standards and Specifications of following project components are given in this section;

- Structure design works should follow the latest applicable IS codes and the updates thereof.

  The Structure works design shall comply with the all the specified minimum requirements of the Authorities Structures analysis, design and detailing works shall be done by the latest software's.

- The Structural design shall be vetted by a Accredited Structural Engineer approved by the Employer This approved design shall form the basis of Construction.

Code For structures

IS-875 (Part 1) – 1987	Code of Practice for Design Loads (other than earthquake) for buildings and structures – Unit weights of buildings materials and stored material.
IS-875 (Part 2) – 1987	Code of Practice for Design Loads (other than earthquake) for buildings and structures – Imposed loads.
IS-875 (Part 3) – 1987	Code of Practice for Design Loads (other than earthquake) for buildings and structures – Wind loads.
IS-875 (Part 4) – 1987	Code of Practice for Design Loads (other than earthquake) for buildings and structures – Snow loads.
IS-875 (Part 5) – 1987	Code of Practice for Design Loads (other than earthquake) for buildings and structures – Special loads and load combinations.
IS: 456 – 2000	Code of Practice for Plain and Reinforced Concrete.
IS: 1786 - 1985	Specification for High Strength Deformed Bars and Wires for Concrete Reinforcement
IS: 432 (Part 2) - 1982	Specification for Mild Steel and Medium Tensile Steel Bars and Hard Drawn Steel Wire for Concrete Reinforcement – Hard Drawn Steel Wire.
IS: 1343 – 1980	Code of Practice for Pre-stressed Concrete
IS: 13920 - 1993	Ductile detailing of reinforced concrete structures subjected to seismic forces - Code of practice
IS: 14268 - 1995	Uncoated Stress Relieved low relaxation seven-ply strand for Pre stressed Concrete – Specification
IS: 2062 – 1999	Steel for General Structural Purposes. Specification.
IS: 1161 – 1998	Specification for Steel tubes for Structural Purposes.
IS: 800 – 1984	Code of Practice for General Construction in Steel.
IS: 1893 – 2002	Criteria for Earthquake resistant design of structures.
IS: 2210 – 1998	Criteria for Design of Reinforced Concrete structures and Folded plates.

IS : 269 – 1989	Specification for Ordinary, rapid hardening and low heat Portland cement.
IS : 455 - 1989	Specification for Portland blast furnace slag cement.
IS : 1489 -1991	Specification for Portland pozzolana cement
IS : 383 - 1970	Specification for coarse and fine aggregates from natural sources for concrete.
IS : 516 -1959	Method of test for strength of concrete.
IS : 432 -1982	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.
IS : 4990 -1993	Specification for plywood for concrete shuttering works
IS : 2645 -1975	Specification for integral cement water proofing compounds.

ARHITECTURE & FINIHING WORKS

- The Codes, Standards and Technical Specifications applicable for the design and construction of project components are:
- The following list is included for guidance only and the omission from the list does not relieve the contractor from compliance there with:

Code	Description
IS 1200	Mode of measurement.
IS 269	Ordinary portland cement.
IS 3812, 1981	Flyash for use as pozzolana and admixtures,
IS 2386	Method of test for aggregate for concrete.
IS 516	Method of test for strength of concrete
	Coarse and fine aggregate from natural sources for concrete.
IS 1077, 1970	Method of test for Bricks.
IS 456	Code of practice for plain and reinforced concrete.
IS 1597	Code of practice for construction of stone masonry.
IS 1597 PART 1	Code of practice for construction of rubble stone masonry.
IS 1130	Marble (blocks, slabs and tiles)
IS 287	Recommendation for maximum permissible moisture contents of Timber used for different purposes.
IS 1141	Code of practice for seasoning of timber.
IS 6313 PART 2	Anti-termite measures in buildings, pre-constructional chemical treatment measures.
IS 2571	Code of practice for laying in situ cement concrete flooring
IS : 226	Structural Steel (Standard Quality)
IS : 451	Technical Supply Conditions for Wood Screws
IS : 800	Code of Practice for Use of Structural Steel in General Building Construction
IS : 806	Code of Practice for Use of Steel Tubes in General Building Construction

IS : 813	Scheme of Symbols for Welding
IS : 814	Covered Electrodes for Metal Arc Welding of (part I & II) Structural Steel
IS : 816	Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel
IS : 822	Code of Practice for Inspection of Welds
IS : 961	Structural Steel (High Tensile)
IS 73	Paving bitumen.
IS 702	Industrial Bitumen
IS 1322	Bitumen felts for waterproofing and damp proofing.
IS 1609	Code of practice for laying damp proof treatment using bitumen felts.
IS 13711 & 13712	Ceramic tiles
IS 13630 Part 1 to 13	Testing for Ceramic tiles
IS 104	Specification for ready mixed painted, brushing, zinc chrome, priming.
IS 137	Ready mixed paint, brushing, matt or eggshell flat, finishing, interior to Ind standard colour as required.
IS 5410	Cement paint, colour as required.
IS 6241	Method of test for determination of stripping value of road aggregate.
IS 2720	Density test of aggregate.

ELECTIRCAL WORKS

The contractor shall comply with all the minimum requirements of the Design and Construction of Electrical works as per the Latest Standards, Statutory requirements, National Building codes and all other relevant regulations

CODES AND STANDARDS

The system, design, materials, equipment, installation, testing and commissioning shall, in addition to all other applicable codes and standards, comply with the latest requirements of the following standards, codes, principles and specifications issued by Indian standards or IEC codes :-

Codes	Description
IS 335	Insulating oil
IS 2026	Power transformers (part I - V)
IS 10028	Code of practice for selection, installation and maintenance of transformers
IS 2099	Bushing for alternating voltages above 1000 V
IS 4257	Porcelain bushings for transformers
IS 3639	Power transformer fittings and accessories
IS 2705	Current transformers
IS 8468	On load tap changer
IS 8478	Application guide for tap changers
IS 6600	Guide of loading of oil immersed transformer

IEC 2544	Creepage distance for insulators & bushing congenial
IEC 76	Power transformers
IEC 214	On load tap changers
IEC 616	Terminal and tapping markings for power transformers
IEC 551	Determination of transformer and reactor sound levels.
IEC 137	Bushings for alternative voltage above 1000V.
IEC 354	Loading guide for oil immersed transformer
IS: 3043	Code of practice for earthing.
IEEE: 32	Neutral Grounding Devices, standard requirements, Terminology & procedure.
IS 1271	Classification of Insulating Materials.
IS 2099	Bushing for alternating voltages above 1000 V
IS 2705	Current transformers
IS 3202	Code of practice for climate proofing
IS 3639	Power transformer fittings and accessories
IS 4257	Porcelain bushings for transformers
IS 11171	Dry type Transformer
IS 8478	Application guide for tap changers
IS10028	Code of practice for selection, installation and maintenance of Transformers
IS 1248 & 3107	Direct acting Electrical indicating instruments
IS 2099	Bushings for alternating voltages above 1000V
IS 2516	AC Circuit Breakers
IS 2705	Current Transformers
IS 3156	Voltage Transformers.
IS 3427	Metal enclosed switchgear and control gear for voltages Above 1000V but not exceeding 11000 V
IS 6875	Control switches for voltages up to and Including 1000V AC and 1200 V DC
IEC 56	HV alternating current circuit breakers.
IEC 137	Bushings for alternating voltages above 1000V
IEC 298	AC metal enclosed switchgear and control gear for rated voltages above 1kV and up to and including 72.5 kV.
IS 2147	Degree of protection for enclosure
IS 3842	Specification for electrical relays for AC system
IS 2208	Specification for HRC cartridge fuse links up to 650 Volts.
IS 5082	Wrought Al. And aluminum alloys, bars, rods, tube and Sections for electrical purposes.

IEC 694	Common clauses for high voltage switchgear and control gear standards
IS 1248 & 3107	Direct acting Electrical indicating instruments
IS 2959	AC contactors up to 1000V
IS 13947	AC Circuit Breakers
IS 2705	Current Transformers
IS 3156 & 4146	Potential Transformers.
IS 4047	Specification for air break switches and combination fuse switch units for voltage not exceeding 1000V.
IS 6875	Control switches for voltages upto and including 1000V AC and 1200V DC.
IS 1822	Motor duty Switches
IS 12021	Specification for control transformer.
IS 8623	Factory built assembly of switchgear & control gear for voltage not exceeding 1000V
IS 13947 (Part I)	Degree of protection for enclosure
IS 3842	Specification for electrical relays for AC system
IS 2208 & 9224	Specification for HRC fuses.
IS 5082	Wrought Al. and aluminum alloys, bars, rods, tube and sections for electrical purposes.
IS 4237	General requirement for switchgear & control gear for voltage not exceeding 1000V.
IS 3231	Electrical relays for power system protection
IS 375	Marking and arrangement for switchgear bus bars, main connection and control aux. wiring.
IS 5578	Guide for marking of insulated conductors.
IS 3618	Pre-treatment of MS sheets for phosphatising.
IS: 4722	Specification for rotating machinery
BS: 649	Performance and testing of diesel engines for general purposes.
IS 4729	Measurement and evaluation of vibration of rotating electrical machines.
IS 1950 (1962)	Code of Practice for Sound insulation of Non Industrial Buildings.
IS 8084-1976	Interconnecting bus bars for AC voltages above 1kV
IS 8623 (part-2)	Factory built assemblies-particular requirements of bus bar trunking systems.
IEC 439 (part-2)	Particular requirements of bus bar trunking systems
IS 13925	Shunt capacitors for power system
IS 3231	Electrical relays for power system Protection
IS 2705	Current Transformers
IS 1248	Direct acting electrical indicating instruments

IS 2147	Degree of protection
IS 5578	Marking & arrangement of switchgear, bus bars, main connection and auxiliary wiring
IS: 1554 (PART-I)-	PVC insulated (heavy duty) electric cables working voltage up to and including 1100V
IS: 7098 (PART-II)	Cross-linked polyethylene insulated PVC sheathed cables for working voltages from 3.3 kV up to and including 33 kV
IS: 8130	Conductors for insulated electric cables and flexible cords.
IS: 5831	PVC insulation and sheath of electric cables.
IS:3975	Mild steel wires, strips and tapes for armoring of cables.
IS:2633	Methods of testing weight, thickness and uniformity Of coating on hot dipped galvanized articles.
IS: 209	Specification of zinc.
IS: 3961(PART-II)	Recommended current ratings for PVC insulated And PVC sheathed heavy duty cables.
IS: 10418	Wooden drums for electric cables.
IEC: 540 & 540A	Test methods for insulation and sheaths of electric cables and cords.
IS: 10462 (PART I)	Fictitious calculation method for determination of dimensions of protective coverings of electrometric and thermoplastic insulated cables.
IS: 10810 (PART 58)	Oxygen Index test
IEC 146	Semiconductor Converters
IEC 1131-2	Programmable Controllers
IEC Publication 947, 1988	
IEC Publication 439, 1985	
IS 13947, 1993	Specifications of Low Voltage Switchgear & Control Gear
IS 8623, 1993	Specifications of Low Voltage Switchgear & Control Gear assemblies.
Indian Electricity Act, 1910	
Indian Electricity Rules, 1956	
National Electrical Code 1985	
EN50081-1	EMI Emissions standard
EN50082-1	EMI Immunity standard
Electrical safety	EC730-1and CE directives effective from 1 January 1996.
IEC 146-4	Method of specifying the performance and test requirements
IEC 146-5	Switches for UPS
IEC 439	Low Voltage switch gear and control gear assemblies
IEC 801	Electromagnetic compatibility for industrial process Measurement
IEC 950	Safety of IT equipment's including electrical business equipment's

1000-2-2	Electromagnetic compatibility – Compatible levels for low frequency conducted disturbances and signaling in public low voltage power supply systems
IS 3043	Code of practice's for earthing in Electrical installation.
IEEE 1100	Recommended practice for powering and grounding of sensitive Electronic equipment.

HVAC

Code of Reference for HVAC works

Codes	Description
	National Building Code 2005
	Energy Conservation Building Code 2008
ASHRAE 90.1-2009	ANSI/ ASHRAE/ IESNA standard 90.1-2009: Energy standard for buildings except low rise residential buildings.
	AMCA : Air Movement and Control Association
	ARI - American Refrigeration Institute
AHRI 410-2001 with Addenda 1, 2 and 3	Forced-Circulation Air-Cooling and Air-Heating Coils
ANSI/AHRI 430-2009	Central Station Air Handling Units
ANSI/AHRI 440-2008	Performance Rating of Room Fan-Coils
AHRI 550	Standard for centrifugal or rotary screw water chilling packages.
AHRI 575	Standard for method of measuring machinery sound within equipment room.
ASME: Section VIII Div.1	Code for Unfired Pressure Vessels Section VIII (Design; construction, testing and certification of pressure vessels) with 'U' stamping
ANSI B31.5	Code for Refrigeration piping
ASME B31.1	Code for Process piping
	Cooling Technology Institute, CTI
ATC-105-00	Acceptance Test Code for Water-cooling Towers (CTI Std-103 Code Tower Standard Specifications).
ATC-201-96	Standard for Certification of Water Cooling Tower Performance (CTI Code Tower Standard Specifications).
ISO 2858, 5199	Specifications for pumps
ASHRAE 52.1-1992	Air Filters
ASHRAE 62-1-2007	Indoor Air Quality
	Duct Fabrication as per SMACNA
IS : 277 – 1977	GI Sheets
IS : 737	Aluminum Sheets

IS : 325	Three-phase induction motors
IS : 659	Safety code for air conditioning,
IS : 660	Safety code for mechanical refrigeration
IS : 4671	Expanded polystyrene for thermal insulation purposes
IS : 4894	Centrifugal Fans
IS : 1239 & IS 3589	Pipe & Pipe Fitting
	Fire Damper UL555, CBRI approved
IS : 659 – 1964 (Reaffirmed 1991)	Air conditioning (Safety Code)
IS : 660 – 1963 (Reaffirmed 1991)	Mechanical Refrigeration (Safety Code)
BS : EN:779 – 1993	Filters
ASHRAE Hand Books	American Society of Heating Refrigeration & Airconditioning Application 2007. Fundamentals 2005.
IEC	Relevant Sections.

FIRE FIGHTING WORKS REQUIREMENTS

The design shall comply with rules of the local fire service department / authorities.

The Fire Protection System design shall be based on the following codes & Standards:
Code for Fire fighting

Codes / Specifications	Description
National Building Code 2005	Part 4, Fire & Life Safety
Tariff Advisory Committee (TAC)-12th Edition-1998	Fire Protection Manual
Tariff Advisory Committee (TAC)-1998 Edition	Rules for automatic Sprinkler Installations
Tariff Advisory Committee (TAC)	Rules for Water Spray System
IS:3844-1989 (1995)	Fire Protection Manual

IS:13039:1991	Fire Protection Manual
IS 15105: 2002	Design and Installation of Fixed Automatic Sprinkler Fire Extinguishing System-Code of Practice
IS 12459: 1988	Code of Practice For Fire Safety In Cable Runs
IS 12469: 1988	Fire Fighting Pumps
IS 5120: 1977	Technical requirement for Rotodynamic Special Purpose Pumps
IS 325: 1996	Three-Phase Induction Motor
IS 3042: 2003	Specification For Single Faced Sluice Gates
IS 2190: 2010	Selection, Installation and Maintenance of First-Aid Fire Extinguishers-Code of Practic
IS 15683:2006	Potable Fire Extinguishers - Performance and Construction Specification
IS 5: 1994	Coloures for Ready Mixed Paints and Enamles (Fourth Revision)
IS 1239 (part-I): 1990	Mild Steel Tubes, Tubulars and Other Wrought Steel Fittings: Part-I Mild Steel Tubes (Fifth Revision)
IS 1239: (Part-II): 1992	Mild Steel Tubes, Tubulars and Other Wrought Steel Fittings: Part-II Mild Steel Tubulars and Other Wrought Steel Pipe Fittings (Fourth Revision)
IS 3589: 2001	Steel Pipes for Water and Sewage (168.3 to 2540 mm Outside Diameter) – Specification (Third Revision)
IS 6392: 1999	Specification for Steel Pipe Flanges (Seventh Reprint)
IS 12835: Part I: 1989	Code of practice for design and installation of fixed fire extinguishing system Part 1 Low expansion foam
IS:10221:1982	Code of Practice for Coating & Wrapping of underground Mild Steel Pipe Lines
IS: 5290:1983	Specification for Valve Landing (Second Revision)
IS:8442:1977	Specification for stand post type water monitor for fire fighting
IS:636:1988	Non-percolating flexible fire fighting delivery hose
IS:8423:1977	Specification for Controlled percolating hose for fire fighting
IS:4927:1968	Specification for unlined flax canvas hose for fire fighting (Amendment Nos. 1 & 2)
IS:903:1984	Specification for Fire Hose Delivery Couplings, Branch Pipe, Nozzles and Nozzle Spanner (Third Revision)
IS:906:1988	Specification for branch with revolving head for fire fighting purposes
IS 907: 1984	Specification for suction strainers, cylindrical type for fire fighting purposes(second revision)
IS:2871:1983	Specification for branch pipe, universal for fire fighting purposes (First revision)
IS: 884:1985	Specification for First Aid Hose Reel for fire fighting (First Revision) (Amendment No.1)
IS:940:1989	Specification for Portable Fire Extinguisher (Gas Pressure)

IS:2171:1985	Specification of Portable Fire Extinguisher, Dry Powder (Cartridge Type) (third Revision)
IS:2878:1986	Portable & Trolley Mounted CO2 type fire extinguisher (Third Revision)
IS:4947:1985	Specification for Gas Cartridges for use in fire Extinguishers-CO2 type (Second Revision) (Amendment Nos. 1 and 3)
IS:944:1979	Functional requirements for 1800 L/min. Trailer pump for Fire brigade use.(Second Revision) (Amendment No. 1)
IS:946:1977	Functional requirements for Engines for Motor Fire Engines (First Revision)
IS:947:1985	Functional requirements for towing tender for trailer fire pump for Fire brigade use (First Revision)
IS:10001, IS:10002	Diesel Engine-General Purpose
IS:13095: 1991	Butterfly valves
IS: 14846	Sluice Valves for Water Works 50-1200mm
IS: 9890	Ball Valves for General Purposes
IS 3624: 1987	Pressure and Vacuumed Gauge (Second Revision)
IS 2097: 1983	Specification for foam making branch pipe (first revision)
IS: 5312	Specification for Swing Check Valve
ASME B 36.10	Welded and Seamless Wrought Steel Pipe
BS:5150	C.I. Gate Valves/ Rising Stem types PN 16
BS:5153	C.I. Reflux Valves/Check Valves (Swing Type) PN16
BS:1414	Steel Wedge Gate Valves
BS:1868	Steel Check Valves
NFPA 1	NFPA Fire Prevention Code
NFPA 10	Standard for Portable Fire Extinguishers 1998 Edition
NFPA-11	Standard for installation of Low expansion Foam system
NFPA-13	Standard for installation of Sprinkler System
NFPA-15	Standard for Water Spray fixed system for the fire protection system
NFPA-20	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA-2001	Standard on clean agent fire extinguishing system
NFPA-25	Standard for the Inspection, Testing, and Maintenance of. Water-Based Fire Protection Systems
NFA-16	Standard for installation of Foam water sprinkler system or Foam water spray system
NEMA	National Electricity Manufacturers Association
IEEE	Institute of Electrical and Electronic Engineers
ISA	Instrumentation, Systems and Automation society
ANSI	American National Standards Institute

DIN	Deutsche Industries Norman
IEC	International Electrochemical Commission
VDE	Verin Deutschar Eisecnhuttenleutte
ISI	Indian Standard Institute
BS 5839	Code of practice for installation of fire alarm system
IS 2189	Code of practice for installation of automatic fire alarm system
IS:817/2008	Welded joints
UL / FM	Underwriters Laboratory / Factory Manual

PLUMBING WORKS SYSTEM

i. WATER SUPPLY SYSTEM

CODES AND STANDARADS

Unless specifically mentioned otherwise, all the applicable codes and standards published by the Bureau of Indian Standards and their subsequent revision shall govern in respect of design, workmanship, quality and properties of materials and method of testing.

The material supplied shall comply with the latest applicable Indian and / or British Standards. Other National Standards are acceptable, if they are established to be equal or superior.

Following codes and standards are made part of this specification:

IS 10446 – 1983	Glossary of terms relating to water supply and sanitation.
IS 7558-1974	Code of practice for domestic hot water piping installations
IS 2692-1989	Specification for Ferrules For Water Services.
IS 1239	Mild steel tubular and other wrought steel pipes and fittings (Part-I)
IS 1239	Mild steel tubular and other wrought steel pipes and fittings (Part-II)
IS 779 -1978	Specifications for Water Meters - Domestic Type
IS 2104 – 1981	Specification for water meter boxes (Domestic type).
IS 2401–1973	Code of practice for selection, installation, and maintenance of domestic water meters.
IS 7413-1981	Insulation Material
IS 2065 –1983	Code of practice for Water Supply In Buildings (Second Revision)
IS 778- 1984	Specifications for copper alloy Gate, Globe And Check Valves for water supply purposes.
IS 1703 – 1977	Specification for ball valves (horizontal plunger type) including floats for water supply purposes.
IS 3004 – 1979	Specification for plug for water supply purposes.
IS 3950 – 1979	Specifications for surface boxes for sluice valves.
IS 9338 – 1984	Specification for cast iron screw-down stop valves and stop and check valves for water works.
IS 4346 – 1982	Specification for washers for use with fittings for water services.

IS 5219 – Part 1	Specification for cast copper alloy traps – Part1 1982
IS 5312 – part 1	Specification for swing check type reflux (Non-return) 1969 valve for water works purposes part 1 single door pattern
IS 13049 – 1919	Diaphragm type (plastic body) float operated valve for cold water services – specification.
IS 13114 – 1991	Forged brass gate, globe and check valves for water works purposes – specification.
IS 14399 – part 1	Hot press moulded thermosetting glass fibre reinforced & Part 1 – 1996
	polyester (GRP) resin sectional water storage tanks.
IS 310 –1965	Code of Practice for Water Supply
SP –35	Handbook of water supply and drainage (with special emphasis on
IS 1172-1983	Code of Basic Requirement For Water Supply, Drainage & Sanitation (Third Revision)
IS 12183	Code of practice for Plumbing In Multi- Storey buildings Part I) – 1987 (Part 1 water supply)
IS 1200 - 1992	Method of Measurement Of Building And Civil Engg. Works.(Part 1 earthwork)
IS 2379 –1963	Specification of colour code for the identification of pipes.
SP 7 – 1983	National building code of India (Part IX – Plumbing services)
IS 2401 – 1973	Code of practice for selection, Installation and maintenance of domestic water meters.
IS 780-1984	Specification for Sluice valves for water works purposes (50 to 300mm size) (Sixth Revision)
	The Contractor shall comply with the water requirement, water supply lines and sewer lines as per the following manuals and Standards.
CPHEEO	Manual on water supply and treatment
CPHEEO	Manual on sewerage and sewage treatment

i. SANITARY AND SEWERAGE SYSTEMS CODES AND STANDARDS

Unless specifically mentioned otherwise, all the applicable codes and standards published by the Bureau of Indian Standards and their subsequent revision shall govern in respect of design, workmanship, quality and properties of materials and method of testing.

Codes	Description
IS 10446 – 1983	Glossary of terms relating to water supply and sanitation.
IS 11208 –1985	Guidelines for registration of Plumbers
IS 5382 – 1985	Specification for rubber sealing rings for gas mains, water mains and sewers.
SP – 35	Handbooks of water supply and drainage (with special emphasis on plumbing)
IS 1172-1983	Code of Basic Requirement For Water Supply, Drainage &Sanitation (Third Revision)
IS 1200 - 1992	Method of Measurement Of Building and Civil Engg. Works.(Part 1 earthwork)
IS 2379 –1963	Specification of colour code for the identification of pipes.

SP 7 – 1983	National building code of India (Part IX – Plumbing services)
IS 1742 – 1983	Code Of Practice For Building Drainage (Second Revision)
IS 301 – 1971	Code of practice for Building Drainage
IS12251-1987	Code Of Practice For Drainage In Basement
BS 5572 -1978 (Amendment No.2)	Sanitary pipe Works
BS 4660-1973 (Amendment No.1)	PVC Underground Drain Pipes & Fittings.
IS 5329 – 1983	Code of practice for sanitary pipe work above ground for buildings First Revision)
IS 2527 – 1984	Code of practice for fixing rain water gutters and down take pipes for roof drainage. (First Revision) I
IS 5961 – 1970	Specification for cast iron gratings for drainage purposes.
IS 2527 – 1984	Code of practice for fixing rain water gutters and down take pipes for roof drainage. (First Revision)
CPHEEO	Manual on sewerage and sewage treatment
IS 1626 (Part 1)	Specification for asbestos cement building pipes and pipe –1980 fittings, gutter and gutter fittings, and roof fittings

SHED WORKS

Technical Specification for PEB building		
Sl. No.	**Particulars**	**Requirement**
Part-A: DESIGN		
1	Design Code	Main Frames/ primary members as per American Institute of Steel Construction (AISC) Manual of Steel Construction, Allowable Stress Design - 9th Edition (1989). Cold form as per AISI.
2	Roof Live Loading	57 Kg/M2 plus provision for solar panels @ 15kg/m2
3	dead load.	15 KG/M2.
4	Wind Speed/ Internal pressure/ Eqk Zone	13km/h, ±0.5 and Zone II.
5	Cranes	5 T crane beam on every in each bay.
6	Building Location	
Part-B: GEOMETRY		
1	Span (width)	27m
2	Type	Tapered roof.
3	Min. height	10m clear from plinth
4	Max. Height & slope	12 on ridge clear below steel
5	Bay Spacing	8m approx.
6	Staircases	None
7	Purlins/ Sidewall girts/ End wall Girts	Yes
8	Future Expansions	Not Applicable
9	Brick wall	10m from all sides Refer Sections
10	Wind Bracing	Diagonal (Pipe/Angle) Bracing.

11	Roof Cladding	Colour coated galvalume sheet on top .
Part-C: MATERIAL		
1.	Daylight Panels	GE Polycarbonate sheet 80% transprarent. 1m wide band in the Wall cladding sheets (white colour) both 43.8m sides. +4-5% Daylight in the roof.
2	Wall Sheeting	0.5 mm thick TCT colour Galvalume Sheet above Brickwall.
3		
4	Accessories	Trims,flashings sealants etc required for completion of building in all respects.
5	Fasteners	Mechanically galvanised Hex-washer head self drilling fasteners with integral EPDM seals.
6	Rain water Gutter	Rectangular 0.6mm SMP gutter supported on properly designed brackets, of sufficient size for 100mm per hour rainfall.

8	Downspouts for rain water	0.5mm SMP Pipes inside the shed along each column as per calculation.
9	Painting- Primary & secondary members	Painting (2 coats of Zn Chromate or Other primer at Factory & 2 coats of Synthetic enamel paint at site).
10	Insulation	NA
11	Cage ladder with lifeline	Yes
Part-D: Design Parameters		
1	Design Software	STAAD Pro. Latest or Equivalent
2	Min thickness of plates	Min. 4 mm for all built up sections
3	Min thickness cold form sections	Min. 1.6 mm thk for all cold form sections.
4	Welding	Welding for Base plate & Connection Plates should be min. 6mm or as per design Fillet weld all around. For H- Beams, use min. 4 mm weld, one side full continuous & other side min. 50mm long stiches at every 1.0 m c/c.

4.Maintenance Requirements

- The Contractor shall, at all times maintain the Project Components in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits.
- The Contractor shall repair or rectify any Defect or deficiency set forth in this section within the time limit specified therein and any failure in this behalf shall constitute non-fulfilment of the Maintenance obligations by the Contractor.
- All materials and works for maintenance of roads and pavements shall conform to the Specifications for Road and Bridge Works issued by the Ministry of Road Transport & Highways (MoRT&H) and the relevant IRC publications.

- All materials and works for maintenance of Potable water supply rising mains and distribution networks, Elevated Service Reservoirs (ESR), Recycled water supply rising mains and distribution networks including valves, flow meters etc. shall confirm to CPHEEO Manual on Operation and Maintenance of water supply systems, 2005, MoUD, GOI.

- Where the Standards and Specifications for any of the above work are not given, Good Industry Practice shall be adopted to the satisfaction of the Employer's Engineer.

5.Repair/Rectification of Defects and Deficiencies

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified within the time limit set forth in the RFP.

Other Defects and Deficiencies

In respect of any Defect or deficiency not specified in RFP, the Employer's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Standards and Specifications, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Employer's Engineer.

Extension of Time Limit

Notwithstanding anything to the contrary specified in this Schedule, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified below, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Employer's Engineer and conveyed to the Contractor and the Employer with reasons thereof.

Emergency R e p a i r s /Restoration

Notwithstanding anything to the contrary contained in this Schedule, if any Defect, deficiency or deterioration in the Project Components (Administrative and Business Centre) poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

Daily Inspection by the Contractor

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Components and maintain a record thereof in a register to be kept in such form and manner as the Employer's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Employer and the Employer's Engineer at any time during office hours.

Repairs on Account of Natural Calamities

All damages occurring to the Project Components on account of a Force Majeure Event or default or neglect of the Employer shall be undertaken by the Employer at its own cost. The Employer may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

6. **Repair / Rectification of Defects and Deficiencies**

The Contractor shall repair and rectify the Defects and deficiencies specified here

Architectural, Civil maintenance

- Any break down of door / window / hatch accessories should be replaced / rectified within 24 hours.
- Any breakage of flooring, false ceiling, peeling of paint should be rectified in 48 hours.
- Any damage to External stone/ brick cladding, flooring, paving, hardscape, façade etc. shall be rectified within 48 hours.
- Any crack / peeling of Plaster shall be repaired within 48 hrs
- Any water leak in building shall be stopped with 2 hrs and suitable rectification process undertaken.

Landscape

- Any non-surviving/ unhealthy saplings should be replaced within 48 hours.
- Trees uprooted / damaged should be removed within 8 hours and replaced in one week time.
- Blockages/ leakages / damages in Irrigation System, Water Features Including Filtration System should be made good in 24 hours.
- Any Hardscape / signage damage shall be repaired within 24 hrs.

Electrical

- Any Electrical equipment / Apparatus/ cables, etc. shall be restored within two hours in case of minor faults and within eight hours in case of major faults.
- Faulty lighting fixtures should be rectified within six hours.
- Essential spares to be available for immediate repairs.

HVAC, Fire Fighting and Plumbing

- Pumps - Minor repair shall be rectified within 4 hrs. and major repair (motor/bearing failure) shall be rectified within 8 hours.
- AHU - Minor repair shall be rectified within 4 hrs. and major repair (motor/bearing failure) shall be rectified within 8 hours.
- VRF units - Minor repair shall be rectified within 4 hrs. and major repair (motor failure) shall be rectified within 24 hours.
- Fans - Minor repair shall be rectified within 4 hrs. and major repair (motor/bearing failure) s hall be rectified within 8 hours.
- Piping/valve/ traps/ fittings / Taps leakages - Shall be rectified/replaced within 2 hrs.
- Instruments like gauges/sensors - Shall be rectified / replaced within 2 hrs.
- Any damage to sanitary ceramic fixtures or CP fittings shall be replaced or rectified within 24 hours.

  Essential spares to be available for immediate repair.

Roads and Parking Areas

	Nature of Defect or Deficiency	Time Limit For Repair/Rectification
(a)	**Carriageway and Paved Areas**	
(ii)	Roughness value exceeding 2000 mm in a stretch of 1 km (as measured by a calibrated bump integrator)	30 days
(iii)	Pot holes	24 hours
(iv)	Any cracks in road surface	15 (fifteen) days
(v)	Any depressions, rutting exceeding 10 mm in road surface	30 (thirty) days
(vi)	Bleeding/skidding	7 (seven) days
(vii)	Any other defect/distress on the road	15 (fifteen) days
(viii)	Removal of debris	6 hours
(b)	**Earthen Shoulders, Side Slopes, Drains and Culverts**	
(i)	Variation by more than 1 % in the prescribed slope of camber/cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts/gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	De-silting of drains	24 hours
(vii)	Railing, parapets, crash barriers	7 (seven) days (Restore immediately if causing safety
(d)	**Road Lighting**	
(i)	Any major failure of the system	24 hours
(ii)	Faults and minor failures	8 hours
(e)	**Trees and Plantation**	
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 hours

	Nature of Defect or Deficiency	Time Limit For Repair/Rectification
(ii)	Removal of fallen trees from carriageway	4 hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days
(v)	Removal of vegetation affecting sight line and road structures	15 (fifteen) days
(f)	**Other Project Facilities and Approach Roads**	
(i)	Damage in approach roads and pedestrian facilities	15 (fifteen) days
(ii)	Damaged vehicles or debris on the road	4 (four) hours

Manpower required during Execution

Sr. No.	Position	Qualification	Experience of execution of similar works
1	Project Manager (1 Nos)	B.E/B.Tech. Civil + MBA/ Construction Management	7 Years
2	Site Engineer (1 Nos)	B.E./B.tech. Civil	5 Years
3	Site Engineer (1 Nos)	B.E./B.tech. Electrical	5 Years
4	Site Supervisor (1 Nos)	ITI or Diploma Civil	3 years
5	Quality Control engineer	B.E/ B.Tech. Civil/QC Engineer	3 years

MONITORING SYSTEM: - A Project Monitoring Unit (PMU) will be setup in the BSCL for monitoring of the Project to make it successful and sustainable and to ensure that the Construction of Maulana Azad School Block is in good condition.

a) Chief Executive Officer, BSCL shall appoint a Nodal officer for the project for the purpose of overall monitoring of the project.

b) Concerned Nodal Officer appointed by BSCL has to ensure that the Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance is working properly and check the functional status of all hardware and allied accessories during the contract period, ensure that the complaints regarding the defects has been logged in the complaint register and penalty has been imposed.

Tender Drawing Set –
List of Drawings

S.No.	Drawing Name	Drawing No.
EXTERNAL DEVELOPMENT PLAN		ED -00-00
1	Landscape Plan	ED -00- 01
ARCHITECTURE DRAWINGS		
2	Site Plan	AR -01-00
3	Ground floor plan	AR -01-01
4	First floor plan	AR -01-02
5	Terrace plan	AR -01-03
6	Elevations	AR -01-04
7	Sections	AR -01-05
8	False Ceiling GF	AR -01-06
9	False Ceiling FF	AR -01-07
10	Flooring GF	AR -01-08
11	Flooring FF	AR -01-09
12	Flooring Terrace	AR -01-10
ELECTRICAL DRAWINGS		
13	Ground Floor Electrical Layout	EL-01 -01
14	Ground Floor and Court DB details	EL-01 -02
15	First Floor Electrical Layout	EL-01 -03
16	First Floor DB Details	EL-01 -04
17	Electric SLD	EL-01 -05
18	Electrical Load Sheet	EL-01 -06
PLUMBING DRAWINGS		
19	Ground Floor Plumbing Layout	PL-01 -01
20	First Floor Plumbing Layout	PL-01 -02
FIRE FIGHTING DRAWINGS		
21	Ground Floor Firefighting Plan	FF-01 -01
22	First Floor Firefighting Plan	FF-01 -02
UTILITY DRAWINGS		
23	Ground floor HVAC layout	UT-01-01
24	First floor HVAC layout	UT-01-02
25	HVAC electrical Load	UT-01-03
STRUCTURE DRAWINGS		
26	Column Layout Plan	ST-01-01
27	Foundation Plan and Details	ST-01-02
28	Framing Plan at plinth level	ST-01-03
29	Framing plan at +4000mm level	ST-01-04
30	Framing plan at +8000mm level	ST-01-05
31	Framing plan at +8000mm level	ST-01-06

RFP PART-1: SECTION-VI

SPECIAL CONDITIONS OF THE RFP/CONTRACT

1. The stipulated date of commencement of the work shall be the date on which the agreement is signed/ executed/ drawn between BSCL & the contractor.

2. The contractor shall not be entitled to any compensation on account of delay in locating the sites by BSCL or due to any natural calamity or labor unrest or non- availability of labor, theft of materials or any kind off or majeure situation, etc.

3. Items left blank will be deemed to have included in other item. Bidder will have to execute that item at ZERO rate.

4. If the contractor could not achieve proportionate progress with respect to time, then BSCL shall have the right to take any action deemed fit against the contractor as per the agreement including rescind of contract, levy of penalty, etc. In case of non-cooperation/deliberate delay either required quality and progress/unnecessary or uncalled for correspondence(s) embedded with condition(s)/instruction(s) not commensurate with the explicit condition(s) of the agreement by the contractor for the work, BSCL shall not only have the right to rescind the contract but also to execute either the whole or balance portion of the work through any other mode, as deemed fit by BSCL and the excess expenditure incurred, if any, for execution of the same, shall be recovered from the contractor resorting to the procedures deemed fit by BSCL. **The employer (BSCL) also reserves the right whether to respond or not to the correspondence(s)/queries of the contractor or any other organization/entity regarding this work and/or the conditions/instructions associated with this work.**

5. The decision of BSCL regarding the reasons for delay, if any, in completion of the work shall be final and binding on the contractor. If the CHIEF EXECUTIVE OFFICER, BSCL is not satisfied regarding the genuineness of delay for progress and/or completion of the work, then he/she may impose penalty upon the contractor Rs. 10000 (Ten Thousand Rupees) per day for delay of the work not exceeding 10% of the total project cost.

6. BSCL reserves the right, to make such increase or decrease in the quantities and/or items of the work which are considered necessary during the course of execution. Such increase or decrease shall be at the discretion of BSCL and in no case, shall validate the contract except the corresponding financial involvement admissible by/acceptable to BSCL.

7. Extra item and/or quantities of the work, if found essential for the project, shall be covered under supplementary agreement to be drawn between the contractor and BSCL. The rate(s) for such item(s) and quantity(s) shall be the prevailing Govt. of Uttar Pradesh Schedule of Rates (SOR) of PHEO & Works Dept. or local market rate(s) or DSR, as applicable for the items/components not covered under SOR subject to approval of CHIEF EXECUTIVE OFFICER, Bareilly Smart City Limited, Bareilly.

8. The contractor shall put his/her/there signature in the measurement book(s) and bill(s) (before payment) as a token of acceptance of the quantities, specifications, rates and amounts of the bill(s) and no further claim in this regard shall be entertained by the BSCL.

9. The actual date of completion of the original work covering all the sites and corresponding date of commencement and completion of defect liability period shall be noted/declared/notified/intimated by BSCL from time to time and the same shall be binding upon the contractor.

10. The EMD, & Security Deposit(s) (SD) retained by BSCL from the contractor's bill shall be considered for release subject to fulfillment of all the conditions of the RFP/ Agreement and after checking/scrutiny of the files and expenditures by Local Finance Audit and shall be subject to deductions/recovery of any amount(s) pointed out by Audit.

a) No interest will be paid by BSCL on the EMD furnished by any bidder, on the Security Deposit of the contractor and on the amount(s) to be withheld/deducted by BSCL from the bill amount(s) if the contractor or upon delay in release of payment(s) or release of deposit(s) of the bidder(s)/contractor.

No claim in this regard in any manner by the contractor or any organization/entity shall be entertained/ accepted by CHIEF EXECUTIVE OFFICER, BAREILLY SMART CITY LIMITED, BAREILLY.

RFP PART- 1: SECTION-VII

ANNEXURE-I: FORMATS FOR PROPOSAL

CERTIFICATE OF NO RELATIONSHIP

I/We hereby certify that I/We* am/are* **related /not related** (*) to any officer of Bareilly Smart City Limited, Bareilly of the rank of Assistant Engineer & above. I/We*am/are*aware that, if the facts subsequently proved to be false, my/our*contract will be rescinded with forfeiture of EMD and security deposit and I/We* shall be liable to make good the loss or damage resulting from such cancellation.

I/We also note that, non-submission of this certificate will render my/our tender liable for rejections.

(*) – Strike out which is not applicable

SIGNATURE OF THE BIDDER

ANNEXURE-II

DECLARATION CERTIFICATE

1. I/We have visited the site(s) and have fully acquainted with the local situation regarding the materials, labor and factors pertaining to the work for completion in all respect before submitting the tender.

2. I/We have carefully studied the conditions of the construction, specifications, contract condition and all other document relating to this work and agree to execute the same accordingly.

3. I/We solemnly pledge that I/We shall be sincere in discharging my/our duties as responsible contractor and complete the work within the prescribed time limit. In case there are deviation from the construction program, I/We shall abide by the decision of Engineer-in-charge for revision of the program and arrange for the labors, materials, equipment etc. accordingly.

4. In the event of award of the work to me/us, I/We under the entire responsibility for the structural stability to reconstruct/replace the whole or part of the component of the structure in the event of failure or improper functioning/improper constructions within a period of one year from the date of completion without asking for extra payment from any account to the department.

5. I/We undertake that I/We shall not claim any escalation of cost on account of materials, laborer's, taxes, natural calamities, public nuisance, miscreants or any account in connections with work within execution of the work till the project completion period and shall not be entertained by the department (BSCL, Bareilly).

6. In case of violation of contents of department's tender documents in conditions or in any form, my /our offer / tender shall be rejected by the department without any intimation to me/us.

(*) – strike out which is not applicable

SIGNATURE OF THE BIDDER

ANNEXURE-III:

AFFIDAVIT

(Applicable for All Bidders)

(On Non – judicial stamp paper of Rs 100 duly attested by notary public)

1. I, Shri/Smt./Ms....., Son/daughter/Wife of....., Hereby declare as the contractor/as the authorized signatory on behalf of the contractor," ....." (***Strike out whichever is not applicable***).

2. It is hereby declared that I/We are currently not deprived from tendering in any govt. organization including BSCL and I/We have furnished the required eligibility documents as a valid tenderer for the above-mentioned work.

3. The undersigned also hereby certifies that neither our firm M/s_____nor any of its Directors have abandoned any contract/work or blacklisted by any State/Central Govt. agencies in participating from any bidding/ tendering process.

4. The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the BSCL.

5. The undersigned hereby authorize(s) and request(s) any bank, person, firm or Corporation to furnish pertinent information deemed necessary and requested by BSCL to verify this statement or regarding my (our) competence and general reputation.

6. I/We hereby declare that all the information and documents furnished herewith by me/us in connection with my/our tender for the work "**Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance**" in Bareilly Smart City Limited, Bareilly vide Bid Reference.....DT.....are true and correct.

My/Our present address for correspondence is.....and my/our telephone/contact number are.....and e-mail ID for correspondence is ..... I/We shall promptly intimate the Tender inviting Officer (Chief Executive Office, BSCL) for subsequent changes, if any, of my /our telephone number, email ID and address for correspondence within a week from the date of occurrence of such incident falling which, I/ We will be held responsible for any eventual delay/gap in communication(s) between me/us and BSCL and subsequent situation may arise due to such delay/gap.

(Deponent)

(Signature of the Tenderer/Company with Seal of the Firm/Company)

ANNEXURE-IV:

BID SUBMISSION LETTER FORMAT

Date: .....

To,
Chief Executive Officer
Bareilly Smart City Limited,
Nagar Nigam, Bareilly-243001,
Uttar Pradesh.

Subject: Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance

Sir,

I/We, the undersigned Bidders, having read and examined in detail the specifications and other conditions in tender document in respect to **Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1-year Defect liability period and three years of maintenance**, and submit the following information/undertaking/declaration for consideration of the BSCL.

2. Price and Validity

2.1All the prices mentioned in our financial bid are in accordance with the terms as specified in tender document. All the prices and other terms and conditions of this proposal are valid for a period of Days from the last date of submission of bids.

2.2 We do hereby confirm that our bid prices include all taxes and cess.

3. Earnest Money Deposit

The transaction slip of Amount of Earnest Money deposited (EMD): 20,00,000/- online should be enclosed in the bid submitted to Chief Executive Officer as per the details mentioned in the RFP PART 1 , SECTION II.

4. Bid Pricing

We further declare that the RATES stated in our proposal are in accordance with your terms & conditions in the tender document.

5. Qualifying Data

We confirm having submitted in qualifying data as required by you in your tender document. In case, you require any further information/ documentary proof in this regard before evaluation of our bid, we agree to furnish the same in time to your satisfaction.

6. Declarations

I/We have also carefully read the terms and conditions of the tender document and undertake that I/we shall abide.

I/We accept to the conditions mentioned in the tender document for **Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1-year Defect liability period and three years of maintenance** as per the scope of work.

I/ We possess the necessary professional, technical, financial and managerial resources and competence required by the tender document issued by the Bareilly Smart City Limited, Bareilly.

I/ We have fulfilled obligation to pay such of the taxes payable to the Union and the State Government or any local authority as specified in the tender document.

I/We are not insolvent, in receivership, bankrupt or being wound up, not have my/ our affairs administered by a court or a judicial officer, not have my/ our business activities suspended and not the subject of legal proceedings for any of the forgoing reasons.

I/We hereby declare that our proposal is made in good faith, without collusion or fraud and the information contained in the proposal are true to the best of our knowledge and belief and nothing has been concealed there from.

I / We.....hereby confirm that our firm has not been banned or blacklisted by any government organization/Financial institution/Court /Public sector URFP /Central Government.

I/We hereby confirm to the Design, Build and Operation of **Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance** and further technical specification given and other terms & conditions mentioned in the tender document.

Bid submitted by us, online and prepared so as to prevent any subsequent alteration and replacement.

We understand that you are not bound to accept the lowest or any bid you may receive.

Thanking you,

Yours faithfully,

Place:.....

Name: .....

Designation: .....

Business Address: .....

ANNEXURE V: Bank Guarantee for Earnest Money Deposit

To,

<Designation>
<Address>
<Phone Nos.>
<Email id>

Whereas <<Name of the bidder>> (hereinafter called 'the Bidder') has submitted the bid for Submission of RFP <<RFP Number>> dated <<Date>> for <<Name of the assignment>> (hereinafter called "the Bid") to <<Client>>.

Know all Men by these presents that we <<... >> having our office at <<Address>> (hereinafter called "the Bank") are bound unto the <<Client>> (hereinafter called "the Client") in the sum of Indian Rupees<<Amount in figures>> (Rupees <<Amount in words>> only) for which payment well and truly to be made to the said Client, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this <<Date>>.

The conditions of this obligation are:

1. If the Bidder having its bid withdrawn during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Client during the period of validity of bid

a) Withdraws his participation from the bid during the period of validity of bid document; or
b) Fails or refuses to participate in the subsequent Bid process after having been short listed;

We undertake to pay to the Client up to the above amount upon receipt of its first written demand, without the Client having to substantiate its demand, provided that in its demand the Client will note that the amount claimed by it is due to it owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to <<insert date>> and including <<extra time over and above mandated in the RFP>> from the last date of submission and any demand in respect thereof should reach the Bank not later than the above date.

NOTHWITHSTANDING ANYTHING CONTAINED HEREIN:

I. Our liability under this Bank Guarantee shall not exceed Indian Rupees<<Amount in figures>> (Rupees <<Amount in words>> only)
II. This Bank Guarantee shall be valid up to *<<insert date>>*)
III. It is condition of our liability for payment of the guaranteed amount or any part thereof arising under this Bank Guarantee that we receive a valid written claim or demand for payment under this Bank Guarantee on or before <<insert date>>) failing which our liability under the guarantee will automatically cease.

(Authorized Signatory of the Bank)
Seal:
Date:

ANNEXURE VI-PERFORMANCE BANK GUARANTEE

Ref:_____ Date_____

Bank Guarantee No._____

<Name>
<Designation>
<Address><Phone Nos.><Fax Nos.><Email id>

Whereas, <<name of the firm and address>> (hereinafter called "Implementing Agency") has undertaken, in pursuance of contract no. <Insert Contract No.> dated. <Date> to provide Implementation services for <<name of the assignment>> to Bareilly Smart City Limited (hereinafter called "the Authority")

And whereas it has been stipulated by in the said contract that the bidder shall furnish you with a bank guarantee by a recognized bank for the sum specified therein as security for compliance with its obligations in accordance with the contract;

And whereas we, <Name of Bank> a banking company incorporated and having its head/registered office at <Address of Registered Office> and having one of its office at
<Address of Local Office> have agreed to give the supplier such a bank guarantee.

Now, therefore, we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of Indian Rupees<Insert Value> (Rupees <Insert Value in Words> only) and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of Indian Rupees<Insert Value> (Rupees
<Insert Value in Words> only) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the bidder before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the Implementing Agency shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This Guarantee shall be valid until <<Insert Date>>) Not withstanding anything contained herein:

I. Our liability under this bank guarantee shall not exceed Indian Rupees<Insert Value> (Rupees <Insert Value in Words> only).

II. This bank guarantee shall be valid up to <Insert Expiry Date>)

III. It is condition of our liability for payment of the guaranteed amount or any part thereof arising under this bank guarantee that we receive a valid written claim or demand for payment under this bank guarantee on or before <Insert Expiry Date>) failing which our liability under the guarantee will automatically cease.

Date _____

Place _____ Signature ____

Witness _ _____ Printed name ____

(Bank's common seal)

RFP PART- II

FINANCIAL BID FORMAT

PROPOSAL FOR Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance
(On the letterhead of the Bidder)

To,
The Chief Executive Officer,
Bareilly Smart City Limited,
Bareilly

Sub: **Financial Bid for Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1-year Defect liability period and three years of maintenance.**

Dear Sir,

I/we hereby tender to execute the whole of the works as described in the scope of services indicated in called works:

a) Name of the Work: "**Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance**"
b) Plan and Specifications: The plan and specifications as detailed in bid document and DPR.
c) Scope as defined in NIT part I under Section V

The Financial quote shall be submitted as per the format given below.

I/We have visited the site of work and am/are fully aware of all the difficulties and conditions likely to affect carrying out the work. I/We have fully acquainted myself/ourselves about the conditions in regard to accessibility of site and quarries/kilns, nature and the extent of ground, working conditions including stacking of materials, installation of tools and plant conditions effecting accommodation and movement of labor etc. required for the satisfactory execution of contract.

And should this tender be accepted, I/we do here by agree and bind myself/ ourselves to abide by and fulfill all the conditions of this Tender Document, in default thereof to forfeit and pay to the Chief Executive Officer, Bareilly Smart City Limited the penalties of sum of money mentioned in the said condition.
Dated:

Bidder's Name.....
Address .....

The above tender is hereby accepted by me on behalf of the Bareilly Smart City Limited, Bareilly.

FORMAT OF THE BID

The Financial quote shall be submitted as per the format given below:

Validate Print Help

Item Rate BoQ

Tender Inviting Authority: Chief Executive Officer, Bareilly Smart City Limited, Bareilly

Name of Work: Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance

Contract No:

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #	TEXT #

Sl. No.	Item Description	Quantity	Units	BASIC RATE +GST+ Labour Cess+ other taxes as per govt norms nln Figures To be entered by the Bidder Rs. P	TOTAL AMOUNT With Taxes in Rs. P	TOTAL AMOUNT In Words
1	2	4	5	13	53	55
2	**CIVIL**					
3	**SH-1: E A R T H W O R K**					
4	Clearing jungle including uprooting of vegetation grass, bush, wood , trees and sapling of girth up to 30 cm . Measurement at a height of 1 m , above ground level and removal of rubbish upto a distance of 50 m . Outside the periphery of area.	500.00	sqm		**0.000**	INR Zero Only
5	Excavtion in foundation in ordinary soil, loamy, clay or sand including lift upto 1.5 m and lead upto 30 m including filling watering and rammming of excavated earth in to the trenches or in to the space between the building $ the side of foundation trenches or in to the plinth , removal $ disposal of surplus earth as directed by the engineer in charge upto a distance of 30 m from the foundation trenches . (Excluding royalty)	1374.00	cum		**0.000**	INR Zero Only
6	Add to above item for evry additional 30 m, lead or part of 30m . Or for every additional 1.5 m , lift or part of 1.5 m	1374.00	cum		**0.000**	INR Zero Only
7	**SH-2: Antitermite Treatment (ATT) & Water Proofing**					

8	Providing and injecting chemical emulsion for preconstructional antitermite treatment and creating and chemical barrier under and around the column pits, wall and floor along the external per meter of binding expension joints surrouding of pipes and conduits etc. complete (plinth area of the building at ground floor only shall be measured as per I.S.6313 (part ii 1981) . Aldrine emulsificable concentrate of any other approved materials such as hepthachior or chlordance will be used. te rates of application of chemical emulsion shall be as follows					
9	Treatment for masonry and foundation 5 litres per sqm					
10	Back fill in immediate contact with foundation 7.5 liters/sqm.					
11	Treatment of top surface of plinth filling 5 liters per sqm					
12	Treatment junction of soil along external per meter building 7.50 liter per sqm					
13	Treatment of soil under apron along external perimeter 5liter/sqm	73.00	sqm		**0.000**	INR Zero Only

14	Providing and laying in situ seven course water proofing treatment with APP (Atactic Polypropylene) modified Polymeric memberane over roof consisting of first coat of bitumen primer @ 0.40 Kg per sqm, 2nd, 4th & 6th courses of bonding material @ 1.20 kg/sqm, which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, 3rd and 5th layers of roofing membrane APP modified Polymeric membrane 2.0 mm thick of 3.00 Kg/sqm weight consistingof five layers prefabricated with centre core as 100 micron HMHDPE film sandwiched on both sides with polymeric mix and the polymeric mix is protected on both side with 20 micron HMHDPE film. 7th, the top most layer shall be finished with brick tiles of class designation 10 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% integral water proofing compound by weight of cement over a 12 mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat (item of laying brick tiles shall be paid for separately).	1300.00	sqm		**0.000**	INR Zero Only
15	Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry : 2 parts water) for vertical surfaces and 3 : 1 (3 parts integral crystalline slurry : 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI- 212-3R-2010 i.e by reducing permeability of concrete by more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineer-in-charge. The product performance shall carry guarantee for 10 years against any leakage.					

16	For vertical surface two coats @ 0.70 kg per sqm	153.00	sqm		**0.000**	INR Zero Only
17	For horizontal surface one coat @1.10 kg per sqm.	43.00	sqm		**0.000**	INR Zero Only
18	**SH-3: CONCRETE WORK**					
19	Providing and laying in Cement concrete 1:4:8 (1 Cement: 4 approved Coarse sand: 8 Coarse aggregate) size of aggregate shall be 4cm gauge or as approved including supply of all material labor, T&P etc. required for proper completion of the work.	214.00	cum		**0.000**	INR Zero Only
20	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. (Note :- Cement content considered in this item is @ 330 kg/cum. Excess/ less cement used as per design mix is payable/recoverable separately).					
21	All works upto plinth level	217.00	cum		**0.000**	INR Zero Only
22	All works above plinth level upto floor level	437.00	cum		**0.000**	INR Zero Only
23	Extra for providing richer mixes at all floor levels. Note:- Excess/less cement over the specified cement content used is payable /recoverable separately.					

24	Providing M-30 grade concrete instead of M-25 grade BMC/ RMC. (Note:- Cement content considered in M-30 is @ 340 kg/cum).	654.00	cum		**0.000**	INR Zero Only
25	Centering and shuttering including strutting, propping etc. and removal of form for :					
26	Foundations, footings, bases of columns, etc. for mass concrete	535.00	sqm		**0.000**	INR Zero Only
27	Lintels, beams, plinth beams, girders, bressumers and cantilevers sqm	748.00	sqm		**0.000**	INR Zero Only
28	Columns, Pillars, Piers, Abutments, Posts and Struts sqm	1664.00	sqm		**0.000**	INR Zero Only
29	Providing and laying autoclaved aerated cement blocks masonry with 100 mm thick AAC blocks in super structure above plinth level up to floor V level in cement mortar 1:4 (1 cement : 4 coarse sand). The rate includes providing and placing in position 2 Nos 6 mm dia M.S. bars at every third course of masonry work.	5.00	cum		**0.000**	INR Zero Only
30	**SH-4: STEEL W O R K**					
31	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.					
32	Thermo-Mechanically Treated bars of grade Fe-500D or more (Approved makes: Jindal, TATA steel, JSW, vizag).	719.40	per qtl		**0.000**	INR Zero Only
33	Mild steel or iron work of small size and sections such as holding down bolts, hold fast , tie rods , gratings etc (when not invluded in an over all rates) wrought to required form , including bof supply of steel , lots nuts and wastage etc. and there fixing required for proper completion of work	20.00	per qtl		**0.000**	INR Zero Only

34	Mild steel or iron work in heavy sizes such as trusses built up gates , door frames record rack ,roof work , gates etc . wrought to required form including drilling hole rivetting or welding where necessary and also including supply of steel , bolts , nuts etc and their fixing required for proper completion of the work .	287.67	per qtl		**0.000**	INR Zero Only
35	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	2000.00	kg		**0.000**	INR Zero Only
36	**SH-5: BRICK W O R K**					
37	First Class brickwork in 1:6 cement and coarse sand mortar in foundation and plinth including supply of all materials, labour and T&P etc. required for proper completion of work. As in item for wall of one brick thick.	425.00	cum		**0.000**	INR Zero Only
38	First Class brickwork in 1:6 cement and coarse sand mortar in foundation and plinth including supply of all materials, labour and T&P etc. required for proper completion of work. for wall of half brick (4.5") thick	111.00	cum		**0.000**	INR Zero Only

39	2cm 3/4" thick damp proof coarse with cement and approved coarse sand 1:2 and including water proofing materials as ordered by the Engineer-in-charge in the proportion as specified by the manufacturers including supply of all materials, labour and T&P etc. required forn proper completion of the work and including proper curing and shuttering as necessary.	50.60	Sqm		**0.000**	INR Zero Only
40	**SH-6: DOOR WINDOW**					
41	Supply and fixing of flush doors commercial quality conforming to I.S. 2202 Part-1 (1983) including fixing of wooden cleats and stoppers and including fixing and adjustment of hinges bolt locks handles springs fitting with necessary screws to be supplied departmently.					
42	35mm thick	15.12	Sq.m.		**0.000**	INR Zero Only
43	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position:					
44	Sal Wood	3.86	cum		**0.000**	INR Zero Only
45	Providing and fixing 25mm thick shutters for cup board etc:					
46	Panelled or panelled & glazed shutters:					
47	Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete:					
48	2nd class teak wood					

49	50x20mm	75.80	RM		**0.000**	INR Zero Only
50	providing and fixing special quality chromium plated brass cupboard locks with six levers including necessary screws etc. complete 9best make of approved quality) of:					
51	size 50mm	30.00	each		**0.000**	INR Zero Only
52	providing and fixing ISI marked aluminium butt hinges anodised (anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade with necessary screws etc. complete:					
53	300x16mm	100.00	each		**0.000**	INR Zero Only
54	Extra for providing vision panel not exceeding 0.1 sqm in all type of flush doors (cost of glass excluded) (overall area of door shutter to be measured):					
55	Rectangular or square	5.46	sqm		**0.000**	INR Zero Only
56	providing and fixing aluminium tee channrels (heavy duty) with rollers, stop end in pelments as curtain rod.	200.00	RM		**0.000**	INR Zero Only

57	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever requiredincluding cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions ofEngineer-in-charge. (Glazing, paneling to be paid for separately) - For Fixed portion:					
58	Powder coated aluminium (minimum thickness of powder coating 50 micron) - For fixed portion	64.13	kg		**0.000**	INR Zero Only
59	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling to be paid for separately) : For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making rovision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required including fittings, locks complete.					

60	Powder coated aluminium (minimum thickness of powder coating 50 micron) - for shutters.	64.13	kg		0.000	INR Zero Only
61	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. complete :					
62	250x10 mm	10.00	each		0.000	INR Zero Only
63	150x10 mm	20.00	each		0.000	INR Zero Only
64	providing and fixing bright finished brass handles with screws etc complete					
65	125 mm	144.00	each		0.000	INR Zero Only
66	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	20.00	each		0.000	INR Zero Only
67	Providing and fixing chromium plated brass 100 mm mortise latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	10.00	each		0.000	INR Zero Only
68	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	4.14	sqm		0.000	INR Zero Only

69	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight up to 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.					
70	With stainless steel cover plate minimum 1.25 mm thickness	2.00	each		**0.000**	INR Zero Only
71	stainless steel tube handle H type 450mm long	1.00	each		**0.000**	INR Zero Only
72	Extra for providing frosted glass panes 4 mm thick instead of ordinary float glass panes 4 mm thick in doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebate shall be measured).	100.00	sqm		**0.000**	INR Zero Only
73	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size)	320.00	each		**0.000**	INR Zero Only
74	Filling the gap in between aluminum frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over bracker rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete.					
75	up to 5mm depth and 5mm width	200.00	meter		**0.000**	INR Zero Only
76	**Structural Glazing**					

77	Designing, fabricating, testing, protection, installing and fixing in position semi (grid) unitized system of structural glazing (with open joints) for linear as well as curvilinear portions of the building for all heights and all levels, including:					
78	Structural analysis & design and preparation of shop drawings for the specified design loads conforming to IS 875 part III (the system must passed the proof test at 1.5 times design wind pressure without any failure), including functional design of the aluminum sections for fixing glazing panels of various					
79	thicknesses, aluminium cleats, sleeves and splice plates etc. gaskets, screws, toggles, nuts, bolts, clamps etc., structural and weather silicone sealants, flashings, fire stop (barrier)- cum-smoke seals, microwave cured EPDM gaskets for water tightness, pressure equalisation & drainage and protection against fire hazard including:					
80	Fabricating and supplying serrated M.S. hot dip galvanised / Aluminium alloy of 6005 T5 brackets of required sizes, sections and profiles etc. to accommodate 3 Dimentional movement for achieving perfect verticality and fixing structural glazing system rigidly to the RCC/ masonry/structural steel framework					
81	of building structure using stainless steel anchor fasteners/ bolts, nylon seperator to prevent bimetallic contacts with nuts and washers etc. of stainless steel grade 316, of the required capacity and in required numbers.					
82	Providing and filling, two part pump filled, structural silicone sealant and one part weather silicone sealant compatible with the structural silicone sealant of required bite size in a clean					

83	and controlled factory / work shop environment , including double sided spacer tape, setting blocks and backer rod, all of approved grade, brand and manufacture, as per the approved sealant design, within and all around the perimeter for holding glass.					
84	Providing and fixing in position flashings of solid aluminium sheet 1 mm thick and of sizes, shapes and profiles, as required as per the site conditions, to seal the gap between the building structure and all its interfaces with curtain glazing to make it watertight.					
85	Making provision for drainage of moisture/ water that enters the curtain glazing system to make it watertight, by incorporating principles of pressure equalization, providing suitable gutter profiles at bottom (if required), making necessary holes of required sizes and of required numbers etc. complete.					
86	This item includes cost of all inputs of designing, labour for fabricating and installation of aluminium grid, installation of glazed units, T&P, scaffolding and other incidental charges including wastages etc., enabling temporary structures and services, cranes or cradles etc. as described above and as specified. The item includes the cost of getting all the structural and functional design including shop drawings checked by a					

87	structural designer, dully approved by Engineer-in-charge. The item also includes the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working structural glazing as specified, cleaning and protection till the handing over of the building for occupation. In the end, the Contractor					
88	shall provide a water tight structural glazing having all the performance characteristics etc. all complete as required, as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer- in-Charge.					
89	Note:- 1. The cost of providing extruded aluminium frames, shadow boxes, extruded aluminium section capping for fixing in the grooves of the curtain glazing and vermin proof stainless steel wire mesh shall be paid for separately under relevant items under this sub- head.					
90	However, for the purpose of payment, only the actual area of structural glazing (including width of grooves) on the external face shall be measured in sqm. up to two decimal places.					
91	Note:- 2. The following performance test are to be conducted on structural glazing system if area of structural glazing exceeds 2500 Sqm from the certified laboratories accreditated by NABL(National Accreditation Board for Testing and Calibration Laboratories), Department of Science & Technologies, India. Cost of testing is payable separately					

92	The NIT approving authority will decide the necessity of testing on the basis of cost of the work, cost of the test and importance of the work. Performance Testing of Structural glazing system Tests to be conducted in the NBL Certified laboratories					
93	Performance Laboratory Test for Air Leakage Test (-50pa to - 300pa) & (+50pa to +300pa) as per ASTM E-283-04 testing method for a range of testing limit 1 to 200 mVhr					
94	Static Water Penetration Test. (50pa to 1500pa) as per ASTME- 331-09 testing method for a range up to 2000 ml.					
95	Dynamic Water Penetration (50pa to 1500pa) as per AAMA 501.01- 05 testing method for a range upto 2000 ml					
96	Structural Performance Deflection and deformation by static air pressure test (1.5 times desing wind pressure without any failure) as per ASTME-330-10 testing method for a range upto 50 mm					
97	Seismic Movement Test (upto 30 mm) as per AAMA 501.4-09 testing method for Qualitative test. Tests to be conducted on site.					
98	Onsite Test for Water Leakage for a pressure range 50 kpa to 240 kpa (35psi) upto 2000 ml	39.58	sqm		**0.000**	INR Zero Only
99	**SH-7: FINISHING WORK - PLASTERING AND PAINTING**					
100	12 mm cement plaster of mix:					
101	1:6 (1 cement: 6 fine sand)	2380.00	sqm		**0.000**	INR Zero Only

102	15mm cement plaster on the rough side of single or half brick wall of mix :					
103	1:6 (1 cement: 6 fine sand)	2199.00	sqm		**0.000**	INR Zero Only
104	6 mm cement plaster of mix:					
105	1:3 (1 cement : 3 fine sand)	500.00	sqm		**0.000**	INR Zero Only
106	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	5079.00	Sqm		**0.000**	INR Zero Only
107	Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications :					
108	Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of Special primer applied @ 0.75 ltr /10 sqm (Approved makes: Berger,Asian paints, Nerolac)	5079.00	Sqm		**0.000**	INR Zero Only
109	Finishing walls with textured exterior paint of required shade :					
110	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	1000.00	sqm		**0.000**	INR Zero Only
111	**SH-8: FlOORING WORK**					

112	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement: 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, leveling & dressing & finishing the top smooth.	66.00	sqm		**0.000**	INR Zero Only
113	New item:- Providing and laying "Brick Coba" 12mm thick laid with M-150 class brick bat coba 7.50 cm thick with gap of 15mm to each other,over 20 mm thick base of cement mortar 1:4 cement and course sand mixed with water proofing compound spreading cement slurry mixed with aerelic cement concrete water proofing compound filled gaps of coba & top of coba mortar mixed with water proofing compound in 1:4 cement and course sand mortar finished smooth & top mashed false square 30cm x 30cm and side wall parapet shall be monolythic plaster wall upto 30 cm. higher and junction and corner shall be rounded by vrick ballast cement and coarse sand masonary coba with top finished plaster mixed with acetic water proofing compound @ 2% by weight & including S/o all material, labour T&P etc. complete for proper complition of work.	170.00	sqm		**0.000**	INR Zero Only
114	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :					
115	25 mm thick	170.00	sqm		**0.000**	INR Zero Only
116	Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete. sqm	17.00	sqm		**0.000**	INR Zero Only

117	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.					
118	Size of Tile 600x600 mm	62.00	sqm		**0.000**	INR Zero Only
119	Size of Tile 800x800 mm	187.00	sqm		**0.000**	INR Zero Only
120	Providing and laying Vitrified tiles in different sizes (thickness to be specified by the manufacturer), with water absorption less than 0.08% and conforming to IS: 15622, of approved brand & manufacturer, in all colours and shade, in skirting, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS: 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints to be made separately).					
121	Size of Tile 600x600 mm	6.20	sqm		**0.000**	INR Zero Only
122	Size of Tile 800x800 mm	18.70	sqm		**0.000**	INR Zero Only

123	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	98.00	sqm		**0.000**	INR Zero Only
124	Providing and fixing 1st quality ceramic glazed floor tiles conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement: 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	20.00	sqm		**0.000**	INR Zero Only
125	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	200.00	sqm		**0.000**	INR Zero Only
126	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, molding and polishing to edges to give high gloss finish etc. complete					
127	Granite of any colour and shade					

128	Area of slab up to 0.50 sqm	10.00	sqm		**0.000**	INR Zero Only
129	Area of slab over 0.50 sqm	175.00	sqm		**0.000**	INR Zero Only
130	Providing and laying factory made 80 mm thick interlocking Cement Concrete tiles (30 mpa) including 25 mm thick compacted bed of fine sand compacting and proper embedding /laying of interlocking tiles leveling and dressing of surface and including labour and T&P etc. but excluding of all material, labour T&P etc. required for proper completion of work as directer by engineer in charge	451.00	SQM		**0.000**	INR Zero Only
131	**FALSE CEILING**					

132	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling					
133	section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering up to 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :					
134	12.5 mm thick tapered edge gypsum moisture resistant board	175.00	sqm		**0.000**	INR Zero Only

135	Providing and fixing mineral fibre false ceiling tiles at all heights of size 595X595mm of approved texture, design and pattern. The tiles should have Humidity Resistance (RH) of 99%, Light Reflectance > 85%, Thermal Conductivity k = 0.052 - 0.057 w/m K, Fire Performance as per (BS 476 pt - 6 &7)in true horizontal level suspended on interlocking T-Grid of hot dipped all round galvanized iron section of 0.33 mm thick (galvanized @120 gsm) comprising of main T runners of 15x32 mm of length 3000 mm, cross T of size 15x32mm of length 1200 mm and secondary intermediate cross T of size 15x32 mm of length 600 mm to form grid module of size 600x600 mm suspended from ceiling using galvanized mild steel item (galvanised@80gsm) 50 mm long 8mm outer diameter M-6 dash fasteners, 6 mm diameter fully threaded hanger rod up to 1000 mm length and L-shape level adjuster of size 85x25x2 mm, spaced at 1200 mm centre to centre along main 'T'. The system should rest on periphery walls /partitions with the help of GI perimeter wall angle of size24x24X3000 mm made of 0.40 mm thick sheet, to be fixed to the wall with help of plastic rawl plug at 450 mm centre to centre & 40 mm long dry wall S.S. screws. The exposed bottom portion of all T-sections used in false ceiling support system shall be pre-painted with polyester baked paint, for all heights. The work shall be carried out as per specifications, drawings and as per directions of the engineer-incharge.					
136	With 16 mm thick beveled tegular mineral fiber false ceiling tile (NRC 0.55 to 0.6)	5.00	sqm		**0.000**	INR Zero Only
137	**MISCELLENOUS**					

138	Providing and fixing fire resistant door frame of section 50 x 60 mm on horizontal side & 35 x 60 mm on vertical sides having built in rebate made out of 1.6 mm thick GI sheet (Zinc coating not less than 120gm/ m^2) suitable for mounting 120 min Fire Rated Glazed Door Shutters. The frame shall be filled with Mineral wool Insulation having density min 96Kg/m^3 . The frame will have a provision of G.I. Anchor fastners 14 nos (5 each on vertical style & 4 on horizontal style of size M10 x 80) suitable for fixing in the opening along with Factory made Template for SS Ball Bearing Hinges of Size 100x89x3mm for fixing of fire rated glazed shutter . The frame shall be finished with a approved fire resistant primer or Powder coating of not less than 30 micron in desired shade as per the directions of Engineer - in- charge . (Cost of SS ball bearing hinges is excluded).	21.00	metre		**0.000**	INR Zero Only
139	Providing and fixing 60 mm thick glazed fire resistant door shutters of 120 min Fire Rating confirming to IS:3614 (Part II) or EN1634-1:1999, tested and certified as per laboratory approved by Engineer-in-charge, with suitable mounting on door frame, consisting of vertical styles, top rail & side rail 60 mm x 60 mm wide and bottom rail of 110 mm x 60mm made out of 1.6mm thick G.I. sheet (zinc coating not less than 120gm/m^2) duly filled mineral wool insulation having density min 96 kg/ m^3 and fixing with necessary stainless steel ball bearing hinges of size 100x89x3mm of approved make, including applying a coat of approved fire resistant primer or powder coating not less than 30 micron etc all complete as per direction of Engineer-in-charge (panelling to be paid forseperately).	21.00	sqm		**0.000**	INR Zero Only

140	Providing and fixing glazing in fire resistant door shutters, fixed panels & partitions etc., with G.I. beading made out of 1.6 mm thick G.I. sheet (zinc coating not less than 120 gm/m²) of size 20 x 33 mm screwed with M4 x 38 mm SS screws at distance 75 mm from the edges and 150 mm c/c , including applying a coat of approved fire resistant primer/ powder coating of not less than 30 micron on G.I. beading, & special ceramic tape of 5 x 20 mm size etc complete in all respect as per NBC 2016, IS 16231 (Part 3):2016 and as per direction of Engineer-incharge with glass of required thickness having 120 minutes of fire resistance both integrity & radiation control (EW120) and minimum 20 minutes of insulation (EI20). The manufacturer have to give test report/certification of fire glass and the glass should have the stamp showing the value of E, EW & EI. The glass shall be tested in approved NABL accredited lab or by any other accreditation body which operates in accordance with ISO/IEC 17011 and accredits labs as per ISO/IEC 17025 for testing and calibration scopes shall be eligible. The maximum glazing size shall not be more than 1100x2200 mm (w x h) or 2.42 sqm.	25.00	sqm		**0.000**	INR Zero Only
141	**LIFT (Approved Brands Otis/ Schindler/ Mitsubishi/ Hitachi/ Kone)**					

142	CAPACITY (kgs) : 544 Kg, 8 persons. SPEED (mps) : 1 mps RISE (m) : 11.7 m STOPS : 4 Stops With (all opening on the same side) CONTROLLER TYPE : ACD3-MRL DRIVE : VF Regenerative (Closed Loop) POWER SUPPLY : 400/415 Volts (3 Phase AC) OPERATION : Full collective operation CAR GROUP : One car (simplex) MACHINE : PM Gearless (Located in shaft on top of guide rails) TRACTION MEDIA : Flat Coated Steel Belt CAR FINISH : Powder Coated Pain Rear Corner Panels = Powder Coated Paint FALSE CEILING TYPE : CD-41 FLASE CEILING FINISH : Cream VENTILLATION : Cross flow fan HAND RAILS : STEEL POWDER PAINTED BLACK Handrails on rear car panels					

143	FLOORING : Vinyl TilesCAR DOOR FINISH : Powder Coated PaintLANDING DOORS FINISH : Stainless Steel #4(Hairline)PIT DEPTH : 1350, OVERHEAD 4500 DOOR OPENING (W x H -mm): 800 mm W x 2000 mm HDOOR OPERATOR : DC Door OperatorCOP : COP for stops <= 12 (950mm) in Stainless Steel #4(Hairline)CAR POSITION INDICATOR : Monochrome LCD-Blue Background & White fontDot matrix (LED) Scrolling DisplayHALL FIXTURES : O2000Pan Type Fixture ,HALL FIXTURE FACE PLATE : Stainless Steel #4(Hairline)HALL BUTTON ARRANGEMENT: LCD Monochrome type(Approved Make Kajaria, Somany, Orient)	1.00	nos		**0.000**	INR Zero Only
144	**SH - 09** Design and construction of pre engineered type building as standard IS code consudering Live load 0.57KN/sqm, dead load 0.12KN/sqm, wind speed 50m/sec, additional load for solar panels at 15 kg/sqm, seismic zone 4, additional linear load of 100kg/rm for cables and pipes at 3 & 3.5m ht at each column. Building width of 26.5m o/o and length 49m o/o and height 6m at eave and 7.3m in center clear height. Post & beam Frame type with roof slope to be 1:10 and wind bracing of diagonal rod bracing for roof & walls. Roof sheeting of 0.47mm hi-rib bare galvalune steel panel of 550mpa yield strength, wall cladding of 0.5mm thick wall SMP Coated galvalume steel panel of 550mpa yield strength above 3m height. There shall not be any skylight or turbo vents. approved makes of sheeting is Jindal , Multicolor or equivalent. Steel to used of Tata, SAIL, Jindal or equivalent. Contrator to submit detailed design, shop drawing complete for approval before fabrication.	1147.50	sqm		**0.000**	INR Zero Only

145	**TENSILE CANOPY**					
146	Providing and fixing imported tensile fabric of make Ferrari or equivalent, over steel frames with all fittings and fixtures such as centenary cables PVC/SS membrane plates, swedge, fork etc. as per the direction of Engineer in Charge. Rate is inclusive of design providing and fixing fabric with all necessary accessories as required as per approved design complete. (Material Specification: -Tie Cables Galvanized Steel Core Make :- Usha Martin / Bharat Wire Rope, Material of End terminals and Nut bolts SS 304, End plates Mild Steel with Hot dip galvanized along with powder coating , Fabric Fixing Nuts and bolts HDG with 80 microns.	1100.00	sqm		**0.000**	INR Zero Only
147	Cascade water fountain : 15 Feet Diffuser Nozzle with complete fittings and holding Materi Programmable color changing LED based lights DCC Programmable controller for lights Openwell Submersible pump 5 HP Electrical panel 22 Gage CRC Sheet, power coated, contractor overload relay with face and on/off indication, protection circuit. Assembled with TC. Necessary electrical Submersible Wiring for water Body Pump, RGB Lights & Water Switch For conducting pipe ,Band , Submersible Tape, Pvc Tape, etc. (note :- all wire are in copper) Plumbing material pipe, fitting, elbow ,tee ,socket, reducer jointing all necessary plumbing item in water body's Installation /Testing /Supervision/Transport	1.00	sqm		**0.000**	INR Zero Only
148	Sculpture : ,M.S Pipe Frame Enamel Painted -20 x40 mm and 40x40 mm - 2 Tonnes Approximate weight , 1.2 mm thick CNC bent laser cut Titanium coated SS304 stainless steel sheet gold colour -100ns ., 16mm base foundation plate bolted - 500kg					

149	1.6 MM THIK SS 304 sheet CNC cut AND BENT 3D LETTHERS -100KG ., 3mm thk ACP sheeet - 4nos . M.S Pipe frame enamel painted 20x40mm,40x80mm and 50x50mm - 250 kg , 10 mm thk M.S plate for base - 20 KG	1.00	No.s		**0.000**	INR Zero Only
150	**Video wall (Approved Brand: Barco/ Dektronics / Delta)**					
151	Display Size: Out Door Stadium Size of LED Display: 3.84M X2.88 M (12.59 Feet X 9.44 Feet) LED type: RGB SMD 3 in 1 Pixel Pitch: ≥27777 Dots/m² or better Pixel Pitch Should be 6mm or higher Brightness Calibrated: ≥5500 cd/m² or better Refresh Frequency: ≥1920 Hz or better Max Power consumption: <825 W/m² or better Avg. Power consumption: <275 W/m² or better Viewing angle: 140° Hor. & 90° Ver. Or better Colors: 16.7 million or better Dimming capability: At Least 256 level adjustable IP rating: IP 65 front & IP 54 rear or better Life span: > 50000 Hours Operating temperature: -10 ° C to +50° C or better Operating Humidity: 10 % RH to 99% RH International Safety Certification (Certificate copies to be submitted along with the bid): UL - UL Listed for Compliance to UL Standard for Safety: UL 60950-1 & CAN/CSA C22.2 No. 60950-1-07- Information Technology Equipment-Safety-Part 1: General Requirement FCC -FCC Certification for Compliance to FCC For Electro Magnetic Emission which may not cause harmful interference, and must not accept any interference received Under Standard : FCC CFR Title 47 Part 15 Subpart B: 2015 Class A, CISPR 22:2008, ANSI C63.4:2014, ICES-003 Issue 6:2016 : Class A CB - CB Certification for Compliance to CB					

152	Standard for Safety: EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013, IEC 60950-1(ed.2), IEC-1(ed.2); am1, IEC 60950-1(ed.2); am2 CB - CB Certification for Compliance to CB Standard for Safety: EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013, IEC 60950-1(ed.2), IEC-1(ed.2); am1, IEC 60950-1(ed.2); am2 BIS Mandatory Certificate: BIS for LED Modules (to be submitted along with the bid) - BIS Registration (Bureau of Indian Standards) As per Standard: IS 13252(PART 1) :2010 BIS for LED Modules (to be submitted along with the bid) - BIS Registration (Bureau of Indian Standards) As per Standard: IS 13252(PART 1) :2010 Power Input : 100-240 V AC					
153	LED Chip to be used in the display: Nichia/ Cree/ Osram/ Kinglight or Nationstar (To be certified by the respective LED chip OEM during supply) Mounting the LED display: The display shall be mounted on a pole and required mounting shall be provided for the same. Data Transfer Method : Through GSM Connectivity. Suitable GSM router to be provided at each location with slots for minimum 2 x 3G/4G Sim cards with failover option. (Sim Cards to be provided by the SI)Signage system to control the displays: Should be able to remotely configure, manage and feed content to at least 25 LED Screens from a Central locationShould be able to play the selective contents at different LED Screens as per the requirementShould provide an easy-to-use playlist format for scheduling of content, images, videos etc.The Hardware for the central server has to be provided along with the proposed solution.The Hardware for the central server has to be provided along with the proposed solution. System shall be able to integrate and control from Integrated Command and control room.	1.00	no.s		**0.000**	INR Zero Only
154	**FIRE FIGHTING**					
155	**FIRE PUMPS, EQUIPMENT, PIPING, VALVES & ACCESSORIES :**					

156	Electric Motor Driven Pump (Location - Plant Room)					
157	Supplying, installing, testing and commissioning of Fire authority approved Electrical driven fire pump suitable for automatic/ manual operation consisting of the following:					
158	Horizontal mounted End Suction type fire pump having cast iron body, bronze impeller, stainless steel shaft & capable of delivering 2850 LPM against a total head of 65M while running at 2900 RPM complete with mechanical seal pressure gauge with GM cock on the delivery side of pump and including 50 mm by pass arrangement (with 50 mm valve and up to 5 meter GI class 'B' pipe) for periodical testing of working of pumping test.					
159	Squirrel cage, induction motor TEFC type suitable for 415 + 10%V, 3 phase, 50 Hz, AC supply, of suitable HP rating for the above pump with synchronous speed of 2900 RPM with flexible coupling and coupling guard .					
160	Common bed plate for mounting pump and motor fabricated of mild steel channel as per manufacturer's recommendation with heavy duty Anti Vibration pads (4 Nos., heavy duty).					
161	Coupling and coupling guard for direct coupling of pump and motor.					
162	Drain Pipe with Valve (50 mm dia)					
163	Main Fire Pump/Sprinkler Pump					
164	Discharge : 2850 LPM					
165	App. Head : 65 M	1.00	Set		**0.000**	INR Zero Only

166	Diesel Engine Driven Fire Pump [Stand by pump] (Location - Plant Room :)					
167	Supplying, installing, testing & commissioning of fire authority approved Diesel Engine driven fire pump suitable for automatic/manual operations consisting of the following:					
168	Horizontal mounted End Suction type fire pump having cast iron body, bronze impeller, stainless steel shaft & capable of delivering 2850 LPM against a total head of 60 M while running at 1800 RPM complete with mechanical seal pressure gauge with GM cock on the delivery side of pump including 50 mm bypass arrangement (with 50 mm valve and upto 5 meter GI class 'B' pipe) for periodical testing of working of pumping set pumps.					
169	Horizontal mounted End Suction type fire pump having cast iron body, bronze impeller, stainless steel shaft & capable of delivering 2850 LPM against a total head of 60 M while running at 1800 RPM complete with mechanical seal pressure gauge with GM cock on the delivery side of pump including 50 mm bypass arrangement (with 50 mm valve and upto 5 meter GI class 'B' pipe) for periodical testing of working of pumping set pumps.					
170	Radiator cooled diesel engine of suitable BHP at 1800 RPM for the above pump complete with standard accessories & suitable cooling system as described in specifications.					

171	Common base plate for mounting pump & engine of requisite strength manufactured out of M.S. channels as per manufacture's recommendation with heavy duty Anti Vibration pads. (Cushy foot) (6 nos., heavy duty)					
172	Coupling & coupling guard for direct coupling of engine & pump.					
173	200 liters capacity day oil storage tank fabricated from 16 SWG thick M.S. plates. Tank shall be provided with inlet, outlet, overflow, vent, drain connections, filling connection & level indicator. Tank shall be mounted on a suitable steel structure (Painted with 2 coats of red oxide paint). Tank shall be provided with epoxy coat from inside & two or more coats of synthetic enamel paint outside over two coats of red oxide primer.					
174	24 volts 180 AH lead acid battery (12 volts - 2 Nos) with boost/Trickle charger for starting the engine automatically complete as required.					
175	Provision for starting of Engine automatically in case of power failure at the time of fire					
176	Diesel Engine driven pump of:					
177	Discharge: 2850 LPM					
178	App. Head: 65 M	1.00	Set		**0.000**	INR Zero Only
179	Electrical Motor Driven Jockey Pump Location - Plant Room :					

180	Supplying, installing, testing & commissioning of fire authority approved electrically driven Jockey pump suitable for automatic/manual operation consisting of the following:					
181	Horizontal mounted end suction jockey pump having cast iron body, volute bronze impeller, stainless shaft capable of delivering 180 LPM against total head of 65M while running at 2900 RPM complete with mechanical seal pressure gauge with mechanical seal GM cock on the delivery side of pump including bypass arrangement (with 25 mm GM stop valve and up to 5 meter G.I. class 'B' pipe) for testing of working of the pumping set as required.					
182	Squirrel cage induction motor suitable for 415 + 10%V, 3 phase, 50 Hz, AC supply of suitable HP rating for the above pump with synchronous speed of 2900 RPM T.E.F.C type connected to pump with flexible coupling and coupling guard .					
183	Common bed plate for mounting pump and motor fabricated of mild steel channel as per manufacturer's recommendation with heavy duty 4 Nos. Anti Vibration pads.(Cushy foot)					
184	Drain pipe with valve (25 mm dia)					
185	Jockey Pump :-					
186	Discharge : 180 LPM (3 LPS)					
187	App Head : 55 M	1.00	Set		**0.000**	INR Zero Only

188	Supply, installation, testing and commissioning of Pressure switch of approved make for Hydrant pump, jockey pump and Diesel Engine Driven pump including necessary wiring and cut off valve up to central panel & other material as described in specifications.	4.00	Each		**0.000**	INR Zero Only
189	Supply, installation, testing and commissioning of Fire authority approved suitable pressure vessel with air release valve (minimum 450 mm dia & 1500 mm height) with all fittings including two nos. pressure gauge on the delivery side, 80 mm dia flanged inlet and 50 mm dia drain line with 50 mm dia G.M. gate valve.	1.00	Each		**0.000**	INR Zero Only
190	Providing, fixing, testing and commissioning of heavy class MS pipe, IS : 1239 marked with all necessary fittings like tees, elbows, flanges, reducers, gaskets, nuts and bolts etc. welded or screwed joints as required including fixing the pipe with necessary structural supports including painting of two coats of synthetic enamel paint over two coats of red oxide primer including all civil breakages and making good the same (Location: Plant room).					
191	25 mm dia (Nominal Bore)	100.00	RM		**0.000**	INR Zero Only
192	32 mm dia (Nominal Bore)	100.00	RM		**0.000**	INR Zero Only
193	65 mm dia (Nominal Bore)	10.00	RM		**0.000**	INR Zero Only
194	80 mm dia (Nominal Bore)	100.00	RM		**0.000**	INR Zero Only

195	100 mm dia (Nominal Bore)	200.00	RM		**0.000**	INR Zero Only
196	150 mm dia (Nominal Bore)	200.00	RM		**0.000**	INR Zero Only
197	Providing, fixing, testing & commissioning of heavy class MS pipe, IS : 3589 marked with all necessary fittings like tees, elbows, flanges, reducers, gaskets, nuts and bolts etc. welded or screwed joints as required including fixing the pipe with necessary structural supports (for delivery/suction manifold relating to the pumps) including painting of two coats of synthetic enamel paint over two coats of red oxide primer including all civil breakages and making good the same [Location : Plant room].					
198	200 mm dia (6.35 mm thick) with necessary supports etc. as required. (Nominal Bore)	20.00	RM		**0.000**	INR Zero Only
199	Providing, fixing, testing & commissioning of following dia C.I. Double flanged 'Y' typed Strainer including nut, bolts and 3 mm thick gasket as required.					
200	200 mm dia	2.00	Each		**0.000**	INR Zero Only
201	150 mm dia	2.00	Each		**0.000**	INR Zero Only
202	100 mm dia	2.00	Each		**0.000**	INR Zero Only
203	Providing, fixing, testing & commissioning of dual plate non-return valve complete with nuts, bolts and washers.					

204	200 mm dia	1.00	Each		0.000	INR Zero Only
205	150 mm dia	3.00	Each		0.000	INR Zero Only
206	100 mm dia	1.00	Each		0.000	INR Zero Only
207	80 mm dia	1.00	Each		0.000	INR Zero Only
208	65 mm dia	1.00	Each		0.000	INR Zero Only
209	Providing, fixing, testing & commissioning of 100 mm dia Burden type, Stainless Steel dial type pressure gauge (in Pump Room) including brass isolation valve and pipe having caliberation of 0-15 Kg/cm2.	4.00	Each		0.000	INR Zero Only
210	Providing and fixing exhaust, Diesel engine driven pump exhaust M. S. pipe class 'C' 150 mm dia including fitting like flanges, bends, reducers, etc. 50 mm thick fibre wool insulation aluminium cladding, 24 gauge, necessary excavation, fixing of silencer connections at engine exhaust, necessary supports, back filling, cutting and making good, bird proof and weather proof flap complete in all respect as directed.	15.00	RM		0.000	INR Zero Only
211	Providing and fixing M.S. structural work fabricated from standard sections, (MS rounds, angles, channels etc.) including cutting to size, drilling welding including cost of fasteners clamps in R.C.C. structural members as directed, including two or more coats of synthetic enamel paints over one coat of primer after surface preparation including cutting and making good walls.	1000.00	Kg		0.000	INR Zero Only

212	**FIRE HYDRANT SYSTEM :**					
213	Excavation of required width for fire fighting pipes including excavation for sockets and dressing of sides, ramming of bottom depth upto 1.5 m including getting out the excavated soil and then returning the soil as required in layer not exceeding 20 cms in depth including consolidating each deposited layers by ramming, watering etc. and disposing of surplus excavated soil as directed within a lead of 100m for all kinds of soil.					
214	Pipes, exceeding 80 mm dia but not exceeding 300 mm dia.	200.00	RM		**0.000**	INR Zero Only
215	Supply, Installation testing & commissioning of Black Mild Steel Class 'C' (Heavy Duty) pipes conforming to IS : 1239 Part-I including cutting, threading, welding & all fittings like flanges, tees, elbows, bends junctions, reducers, ball valves etc. welded or screwed joints, clamps structural steel supports (as per TAC norms) or as required/ directed at site including cutting & making good the walls, floors, RCC work etc cutting chases & filling the same with cement concrete 1:3:6 (1 cement :3 coarse sand :6 graded stone aggregate 20 mm nominal size) (For Internal work).					
216	Note: Pipes upto and 50 mm dia shall be threaded joints, above 50 mm shall be welded joints.					
217	25 mm dia (Nominal Bore)	120.00	RM		**0.000**	INR Zero Only
218	32 mm dia (Nominal Bore)	120.00	RM		**0.000**	INR Zero Only

219	40 mm dia (Nominal Bore)	120.00	RM		0.000	INR Zero Only
220	50 mm dia (Nominal Bore)	50.00	RM		0.000	INR Zero Only
221	65 mm dia (Nominal Bore)	50.00	RM		0.000	INR Zero Only
222	Supply and painting for M.S. Pipe with a coat of red oxide Primer and two or more coats of synthetic enamel paint of approved colour to give an even shade including surface preparation and cleaning of pipe from all external material.					
223	25 mm dia (Nominal Bore)	120.00	RM		0.000	INR Zero Only
224	32 mm dia (Nominal Bore)	120.00	RM		0.000	INR Zero Only
225	40 mm dia (Nominal Bore)	120.00	RM		0.000	INR Zero Only
226	50 mm dia (Nominal Bore)	50.00	RM		0.000	INR Zero Only
227	65 mm dia (Nominal Bore)	50.00	RM		0.000	INR Zero Only
228	Providing and applying two coat of 4 mm thick 'PYPKOTE' antirust protection including primer and lap of 25 mm on M.S. pipe in trenches or complete including surface preparation coating and wrapping shall be confirm to ISI 10221 including conducting required Test.					
229	80 mm dia	20.00	RM		0.000	INR Zero Only
230	100 mm dia	10.00	RM		0.000	INR Zero Only
231	150 mm dia	100.00	RM		0.000	INR Zero Only

232	Providing & Fixing of gun metal double headed hydrant valves with 100 mm dia flanged inlet & 63 mm dia female outlet complete with rubber blank cap and chain as per IS : 5290 (For internal hydrant). [ISI marked should be embosed]	2.00	Each		**0.000**	INR Zero Only
233	Providing & Fixing of gun metal single headed ISI marked oblique pattern hydrant landing valves with 80mm dia flanged inlet & 63 mm dia female outlet complete with gun metal cap and GI chain twist release type plugh and all accessories as per IS : 5290-1983 Type A	24.00	Each		**0.000**	INR Zero Only
234	Providing & Fixing of 63 mm dia 15 m long non-percolating flexible hose (RRL- type A) as per IS : 636. Type A with Gunmetal male & female instantaneous type coupling (IS 903)	24.00	Each		**0.000**	INR Zero Only
235	Providing & Fixing of standard gun metal 63 mm dia branch pipe with nozzle of 20 mm nominal bore outlet as per IS:903 suitable to fit with standard instantaneous type 63mm dia coupling ISI marked (IS:903) complete.	24.00	Each		**0.000**	INR Zero Only
236	Providing & Fixing of standard Fireman's Axe with heavy insulated handle conforming to (IS:926).	24.00	Each		**0.000**	INR Zero Only
237	Providing & Fixing of wall mounting swinging type first aid fire hose reel with drum, hanging bracket, 36.5 Mtr. length x 20 mm dia high pressure hose reel tubing as per IS: 444 with gun metal (GM) shut off nozzle having 5 mm dia orifice. The hose reel shall be conforming to IS : 884-1985. Rate shall include 25 mm dia M.S. pipe connection from Riser to hose reel, sockets, nipples, elbows and ball valve (25 mm dia). Drum shall be fixed on adjoining wall through anchor fasteners / cement concrete block as and when required.	24.00	Each		**0.000**	INR Zero Only

238	Providing & Fixing of 100 mm dia gun metal fire brigade suction hose coupling of (gunmetal draw off connection) with 100 mm dia M.S. 'C' Class suction pipe with 100 mm dia C.I. foot valve. (Pipe max. 10 m long). Cost shall include a wall mounted box of M.S. construction (16 SWG) with glass door (4.0 mm thick) to house the above mentioned component to be connected to static water tank.	1.00	Set		**0.000**	INR Zero Only
239	**PORTABLE FIRE EXTINGUISHERS :**					
240	Providing & fixing of ISI marked (IS:940) portable chemical Fire Extinguisher, water (gas pressure) type capacity 9 ltrs with gun-metal cap. and nozzle and complete in all respects including initial fill and wall suspension bracket.	12.00	Each		**0.000**	INR Zero Only
241	Providing & fixing of ISI marked (IS:2878) portable fire extinguisher, carbondioxide type flat base including valve, discharge hose of not less than 10 mm dia. 1 M long & complete in all respects including initial fill with CO2 gas confirming to IS:307-1966 filled to a filling ratio of not more than 0.667 of not more than 0.667 and wall suspension bracket.					
242	Capacity 4.5 kg	12.00	Each		**0.000**	INR Zero Only
243	Providing & fixing of ISI marked (IS: 13386-1992) mechanical foam type fire extinguishers 50 kg consisting of welded M.S. trolley mounted cylindrical body, squeeze lever discharge valve fitted with pressure discharge hose, discharge nozzle, trolley etc., finished externally with red enamel paint and fixed to wall with brackets complete with internal charges.	4.00	Each		**0.000**	INR Zero Only

244	Providing and fixing of carbon-di-oxide fire extinguishers (22.5 kg) trolley mounted with all accessories internal discharge tube, high pressure discharge hose, discharge nozzle, ISI marked as per IS:2878 finished externally with red enamel paint and fixed to wall with brackets complete with internal charge.	2.00	Each		**0.000**	INR Zero Only
245	Providing and fixing of self illuminated / auto glow "EXIT" signs printed on photoluminescent sheet containing self illuminated base chemical, of appropriate size not less than 400 x 150 mm, suspended from ceiling or fixed to the walls with accessories as required and as directed at site.	24.00	Nos		**0.000**	INR Zero Only
246	**SUB HEAD-B (FIRE HYDRANT ACCESSORIES)**					
247	Providing and fixing SS304 Single headed landing valve conforming to IS -5290 (Type-A) with 63 mm dia. single instantaneous female coupling on the outlet SS304 metal blank cap and chain, necessary companion flanges, nuts, bolts, washer and gasket complete as per specification. (ISI marked). All parts and body shall be of SS304 as per IS:5290.					
248	Single outlet	8.00	Nos		**0.000**	INR Zero Only
249	Providing and fixing first aid fire hose reel drum wall mounting, swinging type(Powder coated finish in fire red) fitted with 20 mm dia. 30 m long high pressure hose(IS:444, Type-2) with 5 mm outlet SS nozzle with shut off valve (IS:8090). Name of Manufacturer should be embossed on the drum and complete hose reel drum shall be conforming to IS:884)	6.00	Nos		**0.000**	INR Zero Only

250	Providing and fixing 63 mm dia. 15m long rubberized lined hose including SS304 male and female instantaneous type coupling approved by fire authority, machine wound with copper wire complete in all respects. Hose shall conform to IS 636 Type-A and coupling to IS 903 -1975 (ISI marked)	12.00	Nos		**0.000**	INR Zero Only
251	Providing and fixing standard short size SS304 branch pipe with gunmetal nozzle 16 mm dia. outlet with standard instantaneous type 63 mm dia. coupling. (ISI marked, IS:903)	8.00	Nos		**0.000**	INR Zero Only
252	Providing and fixing door with frame for all internal fire hydrants fabricated from 20x20x3 mm and 40x20x3 mm aluminium hollow box sections mounted with 3 no. of 100 mm Aluminium butt hinge on Aluminium angle frame of 45x45x5 mm size with hold fasts fixed to wall with P.C.C. (1:2:4) blocks 100x100x100 mm including 2 nos allen key lock for locking along with padlock arrangement & fully glazed with 4 mm thick float glass approved by local Fire Authority, powder coated fire red finish with " fire hose' written on front suitable to house 15 mm long two length of canvas hose with couplings, one no of branch pipe, one fire mans axe and two numbers of portable extinguishers, first aid fire hose and supports for hoses, branch pipes, Axe and hose reel. Size 2100x 900 mm complete as per approved design including necessary fixing arrangement for hoses & axe and branch pipe.)	6.00	Nos		**0.000**	INR Zero Only

253	Providing and fixing fire hose cabinet fabricated from 16 gauge M.S. Sheet with single or double glazed front door and locking arrangement, painted "Fire Red" with powder coated paint "Fire Hose" written on front including suitable supports to place 900 mm above ground level, approximately size 750x600x250 mm deep (to house two lengths of canvas hose with couplings, branch pipe and nozzle for external hydrants)	4.00	Nos.		**0.000**	INR Zero Only
254	Providing and fixing gunmetal fire brigade inlet head as per IS:904 Specification tested for 20 Kg/cm2 with 63 mm dia. instantaneous type inlet and 100/150mm dia.. flanged outlet with built-in check valve for fire brigade connection to under ground tanks and fire risers including companion flanges as portable " E" including nuts, bolts & washers etc.					
255	Three way	1.00	Nos		**0.000**	INR Zero Only
256	Providing and fixing gunmetal fire brigade suction 150 mm dia. for fire tank complete with PVC Cap companion flange as per table "E" nuts, bolts, gasket etc					
257	150 mm	1.00	Nos.		**0.000**	INR Zero Only
258	Supplying and fixing of Fire Man's Axe with heavy insulated rubber tested upto 20 KV and confirming to IS :926.	6.00	Nos.		**0.000**	INR Zero Only
259	Air Cushion Tank for Risers					
260	Providing and fixing of air vessel of the following specifications fabricated with MS Pipe of thickness specified.					
261	specifications					

262	a. Diameter : 200 mm					
263	b. Shell Thickness: 6.35 mm					
264	c. Dish Ends : 10 mm					
265	d. Height : 1000 mm					
266	e. Finishing: Two coats of red enamal					
267	paint over primer out side and two					
268	coats of epoxy coating inside.					
269	f. Material of construction: M.S					
270	g. Test Pressure: 20 Kg/Sq.Cm.					
271	i. Height of supporting legs: 400 mm					
272	j. Quantity	1.00	Each		**0.000**	INR Zero Only
273	Note: Contractor should submit general arrangement drawings before fabrication of vessel and ultrosonic test report to be submitted on supply of vessel and test to be conducted at the presence of Plumbing-In-Charge. Also cost shall include two nos. Gunmetal NRV(ISI Marked)					
274	**SUB HEAD-C (SPRINKLERS ACCESSORIES)**					
275	Providing and fixing 15 mm gunmetal sprinkler head with quartz bulb and set to operate at specified temperature pendent/ upright/ side wall /quick response as per instruction fixed with loctite. Temperature of operation 68 deg.C K-80					

276	Normal response Pendent type/ upright type	100.00	Nos		**0.000**	INR Zero Only
277	Normal response Pendent type	100.00	Nos		**0.000**	INR Zero Only
278	Normal response Side wall type	50.00	Nos		**0.000**	INR Zero Only
279	Extended throw normal response Side wall type.	10.00	Nos		**0.000**	INR Zero Only
280	Providing & fixing 25mm dia. UL listed gunmetal inspector test and drain valve with integral sight glass connected to drain line complete in all respects.	5.00	Nos		**0.000**	INR Zero Only
281	Providing and fixing electrically operated flow indicating switches model System Sensor in sprinkler branch line on each floor with necessary junction box installed in accessible place (Wiring from switches to panel and stair case pressurization not included)					
282	100/65/50 mm dia.	5.00	Nos		**0.000**	INR Zero Only
283	Providing and fixing gunmetal installation valve with turbine type automatic alarm to be connected with control valve , drain valve, test valve and piping as per manufacturer's specifications complete in all respects.					
284	150 mm dia.	1.00	Nos		**0.000**	INR Zero Only
285	Providing and fixing UL/Fm listed powder coated finish Escutcheon plate complete including fixing in position on pipe and ceiling complete in all respects. (Size=15NB)	100.00	Each		**0.000**	INR Zero Only

286	Providing and fixing UL/Fm listed SS braided flexible pipe with accessories complete with all accessories specified in technical specifications(Size=15B)					
287	a. 780mm long	12.00	Each		**0.000**	INR Zero Only
288	b. 1000mm long	12.00	Each		**0.000**	INR Zero Only
289	**EQUIPMENT**					
290	Supply & Installation of EB-Moveable Basketball Pole: Made with MS PipePole will Made 17 CM(6") Round Pipe & Having Channel SystemAvailable in 2.2 Mtr Extn.Acrylic Board Thickness - 20 MM (Imported Quality),Size of Board - 180cm x 105cmHaving Tray System to Fill Extra Weight in Form of Aggregates at SiteDunking RingQuality NetEpoxy PaintedWeight - Approx 1400 Kgs each pairColour - White net with Blue & White PostProduct Construction - Having Tray System to fillExtra Weight at SiteProduct Installation Brief Details - It will be assembled at site after completion of flooring work.(Brand Koxton, NF sportch)	1.00	Set		**0.000**	INR Zero Only

291	Supply & Installation of EB Movable Badminton Pole Made with MS PipeHaving Provision ofTray System to Keep Extra Loose Weight or Fill it SiteEasy Movement on 2 PU Wheel.Made of 40mm Round / Square MS PipeEpoxy PaintedGarware Tournament quality Net - UV Treated.Weight - Approx 160 Kgs each pairColour - Mehroon net withBlue/White/Green PostProduct Construction - Moveable Type & having loose extra weight.Product Installation Brief Details - Product will get assembled at site after completion of flooring work.(Brand Koxton, NF sportch)	4.00	Sets		**0.000**	INR Zero Only

292	Supply & Installation of EB Movable Volleyball Pole Made with MS Pipe Easy Movement on 2 PU Wheel Height Adjustable for Juniors, Men or Women Made of 3"x4" Iron Pipe Epoxy Painted Comprises a Special Internal Ratchet System With Garware Tournament Quality Net Total 200 Kgs weight on each side. (Approx) Weight - Approx 500 Kgs each pair Colour - Black net with Red/Yellow Post Product Construction - Moveable Type & having Loose Extra Weight. Product Installation Brief Details - Product will get assembled at site after completion of flooring work. (Brand Koxton, NF sportch)	1.00	Set		**0.000**	INR Zero Only
293	LED Multi-sport scoreboard Size of Board - 3 FT x 4 FT Sport Scored: Basketball, Volleyball, Wrestling Digit Sizes: 13", 10" Dimensions: H = 3' 0" W = 4' 0" D = 0' 6" Control: All Sport 5000 Caption Options: Vinyl, Team Name Message Centers Digit Colors: Mixed (Red, Amber), White Digit Technology: PanaView, UniView Construction: Durable, lightweight aluminum Tuff Sport® cabinet Cabinet Color: 150+ Colors	1.00	No.		**0.000**	INR Zero Only

294	LED Multi-sport scoreboard Size of Board - 8 FT x 5 FT Sport Scored: Basketball, Volleyball, Wrestling Digit Sizes: 13", 10" Dimensions: H = 8' 0" W = 8' 0" D = 0' 6" Control: All Sport 5000 Caption Options: Vinyl, Team Name Message Centers Digit Colors: Mixed (Red, Amber), White Digit Technology: PanaView, UniView Construction: Durable, lightweight aluminum Tuff Sport® cabinet Cabinet Color: 150+ Colors	1.00	No.		**0.000**	INR Zero Only

295	**HANDBALL GOAL POST** Material (Vertical Goalposts and Horizontal Cross Bar) :Aluminium AlloyMaterial of Back- Board and Side Boards : Aluminium AlloyThickness of Backboard and Side Boards (excluding Coating) : 50 mmPadding of inside surface of Back- Boards and Side BoardsThick Rubber Granules coatingThickness of Padding (Rubber Granules Coating) :5 millimeterCross section of Vertical Goalposts and Horizontal Cross Bar: RectangularWall thickness of Vertical Goalposts and Horizontal Cross Bar (mm): 3.5Vertical Goalpost and Horizontal Cross bar Reinforcement: YesWidth of Goal Posts and Horizontal Cross Bars (Rectangular Crosssection :50 millimeterDepth of Goal Posts and Horizontal Cross Bars (Rectangular Crosssection) : 70 millimeter(Brand Koxton, NF sportch)	2.00	No.s		**0.000**	INR Zero Only
296	**HANDBALL GOAL POST NET NYLON (DOUBLE PLY)** Material of Net Cord NylonBreaking Strength of Cord as per IS:3345 = 27 Kgf MinDIMENSIONSMounted Length of the Net : 3.66 meterMounted Height of the Net : 2.14 meterMounted Depth of the Net at Bottom (minimum) : 1.2 meterMounted Depth of the Net at Top (minimum) : 0.9 meterMaximum distance between attachments of Net to the back ofthe goal-posts and cross-bar : 150 millimeter (Brand Koxton, NF sportch)	2.00	No.s		**0.000**	INR Zero Only

297	**Automated Seating (Approved Brand Hussey Seating / Hugon Tribunal / Afcender)**					
298	Supply, installation, testing and commissioning of Automated moving retractable seating specifications- The Retractable Seating System to incorporate applicable design parameters from National Building Code-India (NBC) and provides safety design for all students/ spectators while using the system.Design load of the system to be already tested in the factory to maximum 9.6 kN/sq.mtr.Manufacturer to provide: 3rd party reports from a certified structural engineering company that the model of system is structurally tested in the factory for as high upto 30 rows (atleast 3 times of the existing no. of rows planned in this project for each of the units) at any point in time in the factory.The retractable seating system should have specialized graphic logos inbuilt and should not be pasted superficially.The graphics are printed as full color CMYK pigmented resin and adhesive layer onto a 100UM polyester clear glossy release film (transfer sheet).The graphics are printed as full color CMYK pigmented resin and adhesive layer onto a 100UM polyester clear glossy release film (transfer sheet).The application process uses a combination of heat and pressure to activate the adhesive and permanently bond the resin to the HDPE seat module. Once applied, the graphic cannot be removed from the seat module without damaging or destroying the seat module surface. Customer must provide vector-based digital artwork, and approved layout indicating tiled application to individual seat modules. The graphic logos to be manufactured as per design already approved in the drawings.	340.00	No.		**0.000**	INR Zero Only

299	Each unit of retractable seating system should have Auto Rotating Aisle rails (as per already approved drawings) for safety and usability. The Auto Rotating Aisle Rail is a hands-free product actuated and rotated 90 degrees and under no circumstances should be required to operate manually. The Auto Rotating Rail should be permanently mounted on the aisles and automatically rotates to the proper open or closed position as the system is operated with a push of a button. It is an extremely important safety feature and usability requirement especially for elderly people and small kids intending to climb up and down the system. **Lower Track**: Continuous Positive Interglide System interlocks each adjacent CPI unit using an integral, continuous, anti-drift feature and through-bolted guide at front to prevent separation and misalignment. CPI units at end sections of powered banks and manual sections shall contain a Low Profile Posi-Lock LX to lock each row in open position and allow unlocking automatically. Slant Columns: High tensile steel, tubular shape. Slant column design is mandatory for this understructure type for better structural safety of the product					

300	Sway Bracing (for more safety): High tensile steel members through-bolted to columns. The tension sway bracing should be coined on all edges for safety and should not have any sharp edges.Wheels: Not less than 5" [127] diameter by 1 1/4" [32] with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil-impregnated bushings to fit 3/8" [10] diameter axles secured with E-type snap rings.Deck Stabilizer: High tensile steel member through-bolted to nose and riser at three locations per section. Interlocks with adjacent stabilizer on upper tier using low-friction nylon roller to prevent separation and misalignment. Incorporates multiple stops to allow field adjustment of row spacing.Deck Support: Securely captures front and rear edge of decking at rear edge of nose beam and lower edge of riser beam for entire length of section. Side Rails & Rear Rails: To be powder coat black and self-storing type SEATING:Ergonomically contoured forward "waterfall" edge for enhanced spectator comfort and minimization of sensitive pressure point area, regardless of leg positioning. Fore & Aft contoured seat surface for uniform support and minimize high pressure points under the buttocks. Power Operation: Each pair of Powered Frames (driven by ½ horse power, 1725 RPM motor) shall consist of output shaft gear reducer with 6" [152] diameter x 4" [102] wide wheels covered with non-marring 1/2" [13] thick composite rubber, and operate the system. Client to provide input power supply at locations as per drawing from where the system can be connected and operated. Materials Grade					

301	A. Structural Steel Shapes, Plates and Bars: ASTM A 36. B. Uncoated Steel Strip (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip. C. Uncoated Steel Strip (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip. D. Uncoated Steel Strip (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip. E. Galvanized Steel Strip: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality. F. Structural Tubing: ASTM A500 Grade B, cold-formed. G. Fasteners: Vibration-proof, of size and material standard with manufacturer. - Seat Attachment: Each polymer seat module shall be securely anchored by a steel clamp bracket that provides steel-to-steel, through bolted attachment to the front nose beam of the bleacher. Attachment eliminates fore / aft movement of the seat module on the nose beam. - Seat modules to be gas assisted injection-molded, high density, HDPE (high density polyethylene) modules in monochromatic colors providing, dual textured scuff resistant 10" [254] wide seat surface with ½" *13+ minimum interlock on seat and face. Approved Make : Hussey seating, hugon tribunal, Ascender seating or Equivalent					
302	JUDO MAT					

303	THICKNESS Thickness (min) 50 millimeter MATERIAL Material Bounded PU Foam Density (Kg per cubic Meter) 30 Top surface and side lamination Fully laminated with strong & hygienic Polyester Vinyl with rice straw pattern, edges should be sealed. Bottom Lamination Anti slip bottom of wa□e rubber also fully laminated and edged	2.00	No.		**0.000**	INR Zero Only
304	**WOODEN FLOORING**					

305	System Thickness - 75 mm (Comprising of 20mm Top Solid Wood followed by 45mm Pine Wood Runner and 10mm Power Rubber Pad) Wooden Flooring Strip Size: 20 x 120 x 1800 mm (2-Strip) 1 Box will have 6 Strips which equals to : 1.296 Sqm 4 Sided Tongue and Groove System Placement of Runners with 350mm Spacing Centre to Centre Placement of Rubber pads on every 300mm Warranty - 6 Years against any manufacturing defects (Life Span - Over 30 Years) 100% sustainable and manageable plantation resources - Our raw material come from local rubber plantation farm with the eco-friendly manufacturing process.Kilned and dried technology-Our factory use high technology drying process to protect the quality of wood, and maintaining the suitable moisture content. Non-Toxic Pest Prevention-We use non-toxic pest and fungi and fungi prevention which not cause harmful to user as well as kids and pets.Water based, Non-VOC coating material making it Environmental friendly - We use water-based wood stains, non VOC paints and non VOC coating with no heavy metal and mercury that cause harmful to health & environment. Area elastic- Area elastic floors deflect any impact over a much wider area and have much greater shock absorption and vertical deformation than a typical point elastic system. E-ZERO Glue (D4)Since we concern the effect of Formaldehyde, we use E-zero (E-0) glue (D4) which is certified by international standard. Flooring should be air flex wooden flooring certified by Badminton World Federation (Approved Brand:Ebaco / Gerflor/ Enlio)	12358.26	Sqft		**0.000**	INR Zero Only
306	**BADMINTON MAT**					
307	Product conforming to International/ National federation requirements like BWF (International Badminton Federation)/ BFI (Badminton Federation of India)	4.00	No.		**0.000**	INR Zero Only
308	PVC material, 15m x7.2m, 6.7 mm thick)					

309	**WRESTLING MAT**					
310	DESCRIPTION OF MAT Scope of Supply Wrestling Mat consisting of complete set of Multiple pieces of Foam Mat with Wrestling Cover Overall Size of the Wrestling Mat 12 mtrs X 12 mtrs (square) Overall Size of Cover 13 mtrs X 13 mtrs MATERIAL Material of Mat EVA with non woven carpet on both sides Thickness of Mat 7 cm Material of Cover PVC Coated Synthetic Material Mass of Cover (gram per square mtr) :500 gram Cover provided with Velcro along the border for fixing to fexible surrounding Border Material of Cover is UV Resistant	1.00	No.		**0.000**	INR Zero Only
311	**TABLE TENNIS**					
312	Stag Internation Deluxe	4.00	No.s		**0.000**	INR Zero Only
313	Table Tennis Surrounds					
314	Pyramid	24.00	No.s		**0.000**	INR Zero Only
315	Arena	24.00	No.s		**0.000**	INR Zero Only
316	GYMNASTICS					
317	STAG PARALLEL BARS WITH FIBRE GLASS BARS	1.00	No.s		**0.000**	INR Zero Only
318	STAG BALANCING BEAM CLUB	1.00	No.s		**0.000**	INR Zero Only

319	STAG TRAMPOLINE 5.20 x 3.15mtr	1.00	No.s		0.000	INR Zero Only
320	STAG HORIZONTAL BAR COMPETITION Adjustable Ht. 250-295cms.	1.00	No.s		0.000	INR Zero Only
321	STAG ROMAN RING APPARATUS COMPETITION	1.00	No.s		0.000	INR Zero Only
322	STAG CRASH LANDING MAT INTERNATIONALPolyurethene Foam 3m x 2m x 30cm	1.00	No.s		0.000	INR Zero Only
323	STAG UNEVEN BAR / ASSYMETRIC BAR CLUB	1.00	No.s		0.000	INR Zero Only
324	STAG VAULTING HORSE CLUB	1.00	No.s		0.000	INR Zero Only
325	STAG VAULTING TABLE	1.00	No.s		0.000	INR Zero Only
326	STAG SPRING BOARD COMPETITION	1.00	No.s		0.000	INR Zero Only
327	STAG VAULTING BOX 1.10 mtr. BEECH WOOD	1.00	No.s		0.000	INR Zero Only
328	STAG VAULTING BOX 3 PC JUNIOR TEAK WOOD	1.00	No.s		0.000	INR Zero Only
329	STAG WALL BAR	1.00	No.s		0.000	INR Zero Only
330	STAG GYMNASTIC BENCH Wooden & Coloured 3.5M.With Padding	1.00	No.s		0.000	INR Zero Only
331	STAG POMMEL HORSE COMPETITION NEW ELITE	1.00	No.s		0.000	INR Zero Only
332	STAG MUSHROOM HORSE SMALL TRAINING	1.00	No.s		0.000	INR Zero Only

333	**PLUMBING**					
334	**PLUMBING WORKS (INTERNAL & EXTERNAL)**					
335	**STORM WATER (SCHEDULED ITEMS)**					
336	Excavating trenches of required width for pipes, cables, etc, including excavation for sockets, depth upto 1.5 m, including getting out the excavated materials, returning the soil as required in layers not exceeding 20 cm in depth, including consolidating each deposited layers by ramming, watering etc., stacking serviceable material for measurements and disposal of unserviceable material as directed, within a lead of 50 m : All kinds of soil					
337	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia	200.00	Metre		**0.000**	INR Zero Only
338	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collers jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement :2 fine sand) including testing of joints etc. complete :					
339	150 mm dia. R.C.C. pipe	80.00	Metre		**0.000**	INR Zero Only
340	250 mm dia. R.C.C. pipe	80.00	Metre		**0.000**	INR Zero Only
341	300 mm dia. R.C.C. pipe	25.00	Metre		**0.000**	INR Zero Only

342	**SANITARY WORK**					
343	Providing, fixing, jointing, testing and commissioning of UPVC pipe with fittings (for waste pipe from individual fixtures to floor trap / floor drain & vent pipe& rain water) IS : 4985 (Pipe Class III - 6 kg / sq.cm) cut to required lengths including all necessary fittings and specials such as bends, junctions offsets, access pieces . Fixing at wall / ceiling level supported by G.I. clamps, hangers etc. duly epoxy coated. Cost shall be inclusive of providing and laying 1:2:4 cement concrete all around the pipe including pillers, supports, shuttering & centering.					
344	110 mm dia	100.00	Metre		**0.000**	INR Zero Only
345	90 mm dia	100.00	Metre		**0.000**	INR Zero Only
346	Providing and fixing MS holder-batclamps of approved design to Upvc pipe embedded in and including cement concrete blocks 10 x 10 x 10cm of 1:2:4 (1 cement:2 coarse sand: 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the wads etc.					
347	110 mm dia	60.00	Each		**0.000**	INR Zero Only
348	90 mm dia	30.00	Each		**0.000**	INR Zero Only
349	Providing and fixing uPVC bend of required degree with access door, insertion rubber washer 3mm thick, bolts and nuts complete.					

350	110 mm dia	20.00	Each		0.000	INR Zero Only
351	90 mm dia	10.00	Each		0.000	INR Zero Only
352	Providing and fixing uPVC plain bend of required degree					
353	100 mm dia	15.00	Each		0.000	INR Zero Only
354	75 mm dia	10.00	Each		0.000	INR Zero Only
355	Providing and fixing uPVC double equal junction of required degree with access door, insertion rubber washer 3mm thick, bolts and nuts complete.					
356	100 x 100x100x100 mm	10.00	Each		0.000	INR Zero Only
357	75 x 75 x 75 x 75mm	5.00	Each		0.000	INR Zero Only
358	Providing and fixing uPVC double equal plain junction of required degree					
359	100 x 100x100x100 mm	10.00	Each		0.000	INR Zero Only
360	75 x 75 x 75 x 75mm	5.00	Each		0.000	INR Zero Only
361	Providing and fixing uPVC single equal plain junction of required degree with access door, insertion rubber washer 3mm thick, bolts and nuts complete					

362	100 x 100x100x100 mm	10.00	Each		0.000	INR Zero Only
363	75 x 75 x 75 X 75mm	5.00	Each		0.000	INR Zero Only
364	Providing and fixing uPVC single equal plain junction of required degree					
365	100x100x100 mm	10.00	Each		0.000	INR Zero Only
366	75x75x 75mm	5.00	Each		0.000	INR Zero Only
367	Providing and fixing uPVC door piece, insertion rubber washer 3mm thick, bolts and nuts complete - 100mm					
368	110 mm dia	10.00	Each		0.000	INR Zero Only
369	90 mm dia	5.00	Each		0.000	INR Zero Only
370	Providing and fixing uPVC trap of self cleansing design with screwed down or hinged grating with or without vent ami complete, including cost of cutting and making good the walls and floors					
371	100mm inlet and 100mm outlet	15.00	Each		0.000	INR Zero Only

372	Providing and fixing G.I. Pipes complete with G.I. fittings and clamps, i/c making good the walls etc. concealed pipe, including painting with anti corrosive bitumastic paint, cutting chases and making good the wall :					
373	15 mm dia nominal bore	50.00	metre		**0.000**	INR Zero Only
374	20 mm dia nominal bore	150.00	metre		**0.000**	INR Zero Only
375	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. External work					
376	15 mm dia nominal bore	10.00	metre		**0.000**	INR Zero Only
377	20 mm dia nominal bore	100.00	metre		**0.000**	INR Zero Only
378	25 mm dia nominal bore	20.00	metre		**0.000**	INR Zero Only
379	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.0m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge.					
380	Internal work- Exposed on wall					

381	25mm nominal bore	100.00	Metre		0.000	INR Zero Only
382	32mm nominal bore	60.00	Metre		0.000	INR Zero Only
383	40mm nominal bore	50.00	Metre		0.000	INR Zero Only
384	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.0m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge.					
385	Concealed work including cutting chases and making good the walls etc.					
386	15mm nominal bore	100.00	Metre		0.000	INR Zero Only
387	20mm nominal bore	150.00	Metre		0.000	INR Zero Only
388	25mm nominal bore	100.00	Metre		0.000	INR Zero Only
389	32mm nominal bore	100.00	Metre		0.000	INR Zero Only
390	Providing and fixing brass stop cock of approved quality					
391	15mm nominal bore	15.00	Each		0.000	INR Zero Only
392	20mm nominal bore	15.00	Each		0.000	INR Zero Only

393	Providing and fixing gun metal gate valve with CI wheel of approved quality (screwed end).					
394	25 mm nominal bore	4.00	Each		0.000	INR Zero Only
395	50mm nominal bore	4.00	Each		0.000	INR Zero Only
396	Providing and fixing unplastcised PVC connection pipe with brass unions:					
397	30 cm length (15mm nominal bore)	12.00	Each		0.000	INR Zero Only
398	Providing and fixing C.P . brass stop cock (concealed) of standard design and of approved make conforming to IS:8931.					
399	15mm nominal bore	12.00	Each		0.000	INR Zero Only
400	Providing and fixing C.I. double acting air valve of approved quality with bolts, nuts, rubber insertions etc. complete (The tail pieces, tapers etc if required will be paid separately)					
401	50mm dia	4.00	Each		0.000	INR Zero Only
402	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :					

403	100x100 mm size P type					
404	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4.00	Each		**0.000**	INR Zero Only
405	Constructing brick masonry circular type manhole 0.91m internal dia at bottom and 0.56m dia at top in cement motar 1:4 (1 cement :4 coarse sand), in side cement plaster 12 mm thick with cement motar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 mix (1 cement :3 coarse sand sand :6 graded stone aggregate 40mm nominal size), and making necessary channel in cement concrete 1:2:4 (1cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement all complete as per standard design:					
406	0.91 m deep with S.F.R.C. cover and frame (heavy duty, HD-20 grade designation) 560mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182kg., fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete. (Excavation, foot rests and 12mm thick cement plaster at the external surface shall be paid for separately):					
407	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4.00	each		**0.000**	INR Zero Only

408	Constructing brick masonry chamber for underground C.I. Inspection chamber and bends with common burnt clay F.P.S (non modular) bricks of class designation 7.5 in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) R.C.C. top slab with 1:2:4 mix (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement: 3 coarse sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design:					
409	Inside dimensions 455 x 610 mm and 45 cm deep for single pipe line					
410	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	14.00	Each		**0.000**	INR Zero Only
411	Extra for depth beyond 45 cm of brick masonry chamber with common burnt clay F.P.S (non modular) bricks of class designation 7.5.					
412	For 455 x 610 mm size-					
413	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2.00	metre		**0.000**	INR Zero Only

414	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement and making necessary channels for the drain etc. complete :					
415	For pipes 100 to 250 mm diameter	2.00	Each		**0.000**	INR Zero Only
416	For pipes 250 to 300 mm diameter	2.00	Each		**0.000**	INR Zero Only
417	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design :					
418	With common burnt clay F .P .S. (non modular) bricks of class designation 7.5	4.00	Each		**0.000**	INR Zero Only
419	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion. (i) Single socketed pipes.					
420	110mm diameter single socketed pipes	200.00	metre		**0.000**	INR Zero Only

421	Providing and fixing on wall face unplasticised-PVC moulded fittings/accessories for unplasticised-Rigid PVC rain water pipes conforming to IS:13592 Type A including jointing with seal ring conforming IS: 5382 leaving 10mm gap for thermal expansion.					
422	Single pushfit Coupler :					
423	110mm Single Pushfit Coupler	40.00	each		**0.000**	INR Zero Only
424	Bend 87.5°					
425	110mm bend Bend 87.5 degree	40.00	each		**0.000**	INR Zero Only
426	Shoe (Plain)					
427	110mm Shoe (Plain)	40.00	each		**0.000**	INR Zero Only
428	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 25cm diametre and weighing not less than 440 grams.	40.00	each		**0.000**	INR Zero Only
429	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS: 13983 with CI brackets and stainless steel waste with plug 40mm including painting of fittings and brackets, cutting and making good the walls wherever required.					

430	Kitchen sink without drain board, 610x510 mm bowl depth 200 mm	1.00	Each		0.000	INR Zero Only
431	Providing and fixing uPVC floor drain of following size inlet and outlet including cutting and making good the walls and floors wherever required complete in all respects.	20.00	Each		0.000	INR Zero Only
432	Providing and fixing uPVC cleanout plug with openable cap for uPVC pipes					
433	For 110 mm OD pipes	20.00	Each		0.000	INR Zero Only
434	Making khurras 600x600mm with average minimum thickness of 5 cms cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 20mm nominal size) over PVC sheet 1m x 1m x 400 micron, finished with 12mm plaster in cement mortar 1:3(1 cement :3 coarse sand) finished with floating coat of neat cement induding rounding of edges and finishing of outlet, complete in all respects.	8.00	Nos		0.000	INR Zero Only
435	Providing and fixing in position uPVC PIPE and fittings of heavy class (c) conforming to IS:1239 (for waste pipe from individual fixtures to floor trap / floor drain & vent pipe) Including fixing at wall / ceiling level supported by galvanized clamps and hangers etc.					
436	For waste pipes					
437	40mm OD	65.00	Metre		0.000	INR Zero Only

438	50mm OD	40.00	Metre		0.000	INR Zero Only
439	Providing and fixing PTMT liquid soap container 109mm wide, 125mm high and 112mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality colour and make, weighing not less that 105gms.(Make:Jaquar/Varmora/Essel)	8.00	Each		0.000	INR Zero Only
440	Providing and fixing Division plate for the partition of urinals (Make Hindware/Vermora/Essex)	6.00	Each		0.000	INR Zero Only
441	Providing & fixing electric operated hand dryer with photovoltic control of reputed manufacturer complete as per specification & instructions of engineer.	5.00	Each		0.000	INR Zero Only
442	Providing and fixing toilet paper holder . (Make: Jaquar/Varmora/Essex)					
443	C.P. brass	14.00	Each		0.000	INR Zero Only
444	Providing and fixing towel ring trapezoidal shape 215 mm long, 200 mm wide with minimum distances of 37 mm from wall face with concealed fittings arrangement of approved quality and colour, weighing not less than 88 gms.(Make:Jaquar/Varmora/Essex)	5.00	Each		0.000	INR Zero Only

445	Providing and fixing water closet squatting pan (indian type W.C. pan) with 100mm sand cast iron P or Strap, 10 litre low level white P.V.C. flushing cistern with manually controlled device (handle lever) conforming to IS: 7231, with all fitting and fixture complete including cutting and making good the walls and floors wherever required :					
446	White vitreous china orissa pattern W.C. pan of size 580X440mm with intergal type foot rests	2.00	each		**0.000**	INR Zero Only
447	Providing and fixing white vertreous china pedastal type water closet (european type) with seal and lid, 10 litre low level white vitreous china flusing cistern & C.P flush bend with fitting & C.I. brackets, 40mm flush bend, overflow arrangement with special of standard make and mosquito proof coupling of approved municipal design complete including painting of fitting and brackets cutting and making good the walls and floors wherever required :					
448	W.C. pan with ISI marked white solid seat and lid .	10.00	each		**0.000**	INR Zero Only
449	Provinding and fixing white vetreous china flat back or wall corner type lipped front urinal basin of 430 X 260 X 350mm and 340 X 410 X 265mm sizes respectively with automatic flushing cistern with standard flush pipe and C.P. brass spreaders with brass unions and G.I. clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :					
450	One urinal basin wit 5 litre white P.V.C automatic flushing cistern	7.00	each		**0.000**	INR Zero Only

451	Providing and fixing P.V.low level flushing cistern with manually controlled device (handle lever) conforming to IS : 7231, with all fitting and fixture complete					
452	10 litre (full flush) capacity-white	7.00	each		**0.000**	INR Zero Only
453	Providing and fixing white vitreous china wash basin including making all connection but excluding the cost of fitting					
454	Flat back wash basin of size 630 X 450mm	10.00	each		**0.000**	INR Zero Only
455	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C waste fitting complete					
456	40mm dia (flexible pipe)	10.00	each		**0.000**	INR Zero Only
457	Providing and fixing 600 X 450mm bevelled edge mirror of superior glass (of approved quality) complete with 6mm thick hard board ground fixed to wooden cleats wiyh C.P. brass screws and washers complete.	10.00	each		**0.000**	INR Zero Only
458	Providing and fixing toilet paper holder :					
459	C.P. brass	8.00	each		**0.000**	INR Zero Only

460	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipe but without fittings and base support for tank.	30000.00	per ltr.		**0.000**	INR Zero Only
461	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810gms.					
462	20mm dia, nominal bore	12.00	each		**0.000**	INR Zero Only
463	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standard and weighing not less than 690gms.					
464	15mm dia, nominal bore	12.00	each		**0.000**	INR Zero Only
465	Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to IS : 8931.					
466	15mm dia, nominal bore	12.00	each		**0.000**	INR Zero Only
467	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931					
468	15mm dia, nominal bore	24.00	each		**0.000**	INR Zero Only

469	Providing laying and jointing glazed stoneware pipes grade 'A' with stif mixture of cement mortar in the of 1:1 (1 cement : 1 fine sand) including testing of joints etc complete.					
470	100mm diameter	50.00	RM		**0.000**	INR Zero Only
471	150mm diameter	50.00	RM		**0.000**	INR Zero Only
472	**INTERNAL ELECTRICAL WORK**					
473	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.					
474	First Point Controlled by single switch	56.00	Point		**0.000**	INR Zero Only
475	Loop Points Controlled by same single switch	95.00	Point		**0.000**	INR Zero Only
476	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	200.00	meter		**0.000**	INR Zero Only

477	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
478	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	20.00	meter		**0.000**	INR Zero Only
479	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	60.00	meter		**0.000**	INR Zero Only
480	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.					
481	25 mm	80.00	meter		**0.000**	INR Zero Only
482	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.					
483	15/16 A switch	12.00	Each		**0.000**	INR Zero Only
484	3 pin 5/6 A socket outlet	4.00	Each		**0.000**	INR Zero Only
485	6 pin 15/16 A socket outlet	12.00	Each		**0.000**	INR Zero Only
486	Telephone socket outlet	4.00	Each		**0.000**	INR Zero Only
487	TV antenna socket outlet	2.00	Each		**0.000**	INR Zero Only

488	Bell push	1.00	Each		0.000	INR Zero Only
489	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	5.00	Each		0.000	INR Zero Only
490	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	4.00	Each		0.000	INR Zero Only
491	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required					
492	1 or 2 Module (75 mmX75 mm)	1.00	Each		0.000	INR Zero Only
493	3 Module (100 mmX75 mm)	1.00	Each		0.000	INR Zero Only
494	4 Module (125 mmX75 mm)	12.00	Each		0.000	INR Zero Only
495	6 Module (200 mmX75 mm)	1.00	Each		0.000	INR Zero Only
496	8 Module (125 mmX125 mm)	2.00	Each		0.000	INR Zero Only
497	12 Module (200 mmX150 mm)	1.00	Each		0.000	INR Zero Only
498	Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required.					
499	1 or 2 Module	1.00	Each		0.000	INR Zero Only

500	3 Module	1.00	Each		0.000	INR Zero Only
501	4 Module	12.00	Each		0.000	INR Zero Only
502	6 Module	1.00	Each		0.000	INR Zero Only
503	8 Module	2.00	Each		0.000	INR Zero Only
504	12 Module	1.00	Each		0.000	INR Zero Only
505	Installation, testing and commissioning of wall bracket /ceiling fittings of all sizes and shapes containing upto two GLS/CFL/ LED lamps per fitting, complete with all accessories including connections etc. as required.	71.00	Each		0.000	INR Zero Only
506	Installation, testing and commissioning of wall bracket /ceiling fittings of all sizes and shapes containing upto two GLS/CFL/ LED lamps per fitting, complete with all accessories including connections etc. as required in COURT AREA	80.00	Each		0.000	INR Zero Only
507	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	5.00	Each		0.000	INR Zero Only

508	Supplying and fixing extra conduit down rod of 20 cm length G.I. pipe 15 mm dia, heavy gauge including painting etc. as required. (Note : More than 5 cm length shall be rounded to the nearest 10 cm and 5 cm or less shall be ignored)	5.00	Each		**0.000**	INR Zero Only
509	Installation of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required.					
510	Upto 450 mm sweep	2.00	Each		**0.000**	INR Zero Only
511	Extra for fixing the louvers/ shutters complete with frame for a exhaust fan of all sizes.	2.00	Each		**0.000**	INR Zero Only
512	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.					
513	1 run of cable	30.00	Each		**0.000**	INR Zero Only
514	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/ 6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	4.00	Each		**0.000**	INR Zero Only
515	**DBS< MCBS & MCCBS**					

516	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.					
517	63 A, 25kA, FPMCCB	3.00	Each		**0.000**	INR Zero Only
518	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A, tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required. (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)					
519	4 way (4 + 12), Double door	2.00	Each		**0.000**	INR Zero Only
520	12 way (4 + 36), Double door	1.00	Each		**0.000**	INR Zero Only
521	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
522	Single pole	60.00	Each		**0.000**	INR Zero Only
523	Triple pole	2.00	Each		**0.000**	INR Zero Only

524	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	4.00	Each		**0.000**	INR Zero Only
525	Supplying and fixing Cable End Box (Loose wire box) suitable for triple pole and neutral, sheet steel, Vertical MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc. as required.	3.00	Each		**0.000**	INR Zero Only
526	**MAIN LT PANEL**					

527	Supplying, installation, testing &commissioning of Indoor cubical type LT panel suitable for 415 V, 3 Phase, 4 Wire 50 Hz AC supply system fabricated in compartmentalized (preferably) design from CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland, plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having 2500 Amp capacity extensible type TPN aluminium alloy bus bars of high conductivity, DMC / SMC bus bars of high conductivity,DMC/ SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 Sec.,bottom base channel of MS section not less than 100 mm x 50 mm x 5 mm thick, fabrication shall be done in transportable sections, entire panel shall have a common COPPER earth bar of size 25 mm x 5 mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of Al. bus bars and control wiring with sq. mm. PVC insulated copper conductor S/C cable, cable alleys, cable gland plates in two half. The Panel shall have suitable rating of Ammeter, Voltmeter with selector switches and Phase indicating lights. The Panel shall be installed on suitable foundations with provision of incomin and outgoing LT Cables i/c providing following switch gears :-					
528	MAIN INCOMER (FROM EXISTING SOURCE)					
529	1 No.MCCB 630A, FP, 50KA MICROPROCESSOR BASED RELEASE, O/L, S/C & E/F PROTECTION					
530	UNDER VOLTAGE RELEASE, 415V AC FOR ACB					

531	METERING & INDICATION					
532	RYB PHASE INDICATING LIGHT, 230V AC					
533	ON/OFF/TRIP INDICATING LIGHT, 230V AC					
534	CT FOR METERING, 630/5A , CL-1.0, 15VA					
535	DIGITAL MULTIFUCTION METER with RS-485					
536	TNC SWITCH, 25A					
537	A/M SELECTOR SWITCH					
538	AUXILIARY CONTACTOR, 230V AC 2NO+2NC					
539	VOLTAGE MONITORING RELAY (VMR)					
540	MCB, 63A, FP, 10KA					
541	OUTGOINGS					
542	1 Nos.MCCB, 400A, FP, 36KA THERMAL MAGNETIC BASED RELEASE, O/L & S/C PROTECTION					

543	1 Nos.MCCB, 250A, FP, 36KA THERMAL MAGNETIC BASED RELEASE, O/L & S/C PROTECTION					
544	2 Nos.MCCB, 125A, FP, 36KA THERMAL MAGNETIC BASED RELEASE, O/L & S/C PROTECTION					
545	12 Nos.MCCB, 63A, FP, 36KA THERMAL MAGNETIC BASED RELEASE, O/L & S/C PROTECTION	1.00	set		**0.000**	INR Zero Only
546	**Supply of LT XLPE Cables:**					
547	Supply of LT XLPE Cables of 1.1 KV Grade,Aluminium Armoured,of following sizes as per latest IS Code.					
548	3.5 Core X 300 Sqmm.	300.00	mtr		**0.000**	INR Zero Only
549	3.5 Core X 70 Sqmm.	100.00	mtr		**0.000**	INR Zero Only
550	4 Core X 16 Sqmm.	500.00	mtr		**0.000**	INR Zero Only
551	4 Core X 10 Sqmm.					
552	**LAYING OF LT CABLES**					
553	**Laying of LT Cables :**					
554	Laying of One number PVC Insulated ,PVC Sheathed/XLPE Power Cables					

555	1.1KV Grade of Following Size direct in Ground including exacavation,					
556	Sand Cushioning and protective covering and refilling the trench etc.					
557	Upto 35 sqmm	300.00	mtr		**0.000**	INR Zero Only
558	Above 35 & upto 95 sqmm.	60.00	mtr		**0.000**	INR Zero Only
559	Above 185 & upto 400 Sqmm	220.00	mtr		**0.000**	INR Zero Only
560	Laying of One number ADDITIONALPVC Insulated ,PVC Sheathed/XLPE					
561	Power Cable 1.1KV Grade of Following Size direct in Ground in the same					
562	Trench including excavation,Sand Cushioning and protective covering					
563	and Refilling the trench etc as reqd.					
564	Upto 35 sqmm	100.00	mtr		**0.000**	INR Zero Only
565	Above 35 & upto 95 sqmm.					
566	Above 95 & upto 185 Sqmm.					

567	Above 185 & upto 400 Sqmm	50.00	mtr		**0.000**	INR Zero Only
568	Laying of 1 No. PVC insulated and PVC					
569	sheathed/ XLPE power cable of 1.1 KV					
570	grade of following size in the existing RCC/HDPE/Metal pipe/Open Trench/Cable Trays etc. as required.					
571	Upto 35 sqmm	100.00	mtr		**0.000**	INR Zero Only
572	Above 35 & upto 95 sqmm.	40.00	mtr		**0.000**	INR Zero Only
573	Above 185 sqmm and upto 400 sqmm	30.00	mtr		**0.000**	INR Zero Only
574	**TERMINATION OF LT CABLES**					
575	Supplying and making end termination with brass					
576	compression gland and Al. lugs for following					
577	size of PVC insulated and PVC sheathed/XLPE					
578	Al. conductor cable of 1.1 KV grade as required.					
579	3.5x300sq. mm	6.00	set		**0.000**	INR Zero Only

580	3.5 Core X 70 Sqmm.	4.00	set		**0.000**	INR Zero Only
581	4 Core X 16 Sqmm.	30.00	set		**0.000**	INR Zero Only
582	**EARTHING**					
583	Earthing with coper Earth Plate 600 mm x 600 mm x 3 mm thick i/c accessories and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc. with salt & Charcoal.	2.00	set		**0.000**	INR Zero Only
584	Earthing with GI earth place 600 mm x600 mm x 6 mm thick i/c accessories and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc. (but without charcoal or coke and salt) complete as required.	4.00	set		**0.000**	INR Zero Only
585	Providing and fixing 25mm x 5 mm Copper strip in 40 mm dia GI pipe from earth electrode as required.	20.00	mtr		**0.000**	INR Zero Only
586	Providing and fixing 25mm x 5 mm GI strip in 40 mm dia GI Pipe step on surface or in recess for connection etc. as required.	40.00	mtr		**0.000**	INR Zero Only
587	providing and fixing 25x5 MM copper strip on surface	10.00	mtr		**0.000**	INR Zero Only
588	Providing and fixing 25x5MM GI strip on surface	100.00	mtr		**0.000**	INR Zero Only
589	**LIGHT FIXTURES & FANS**					

590	Supply & Installation of Light Fixtures & Fans					
591	Makes : PHILIPS, WIPRO					
592	Supply of Following type of Fans & Fixtures of all sizes and shapes LED lamps per fitting, complete with all accessories.					
593	24 W LED Recessed/Surface' Light Fixtures as marked L1	12.00	Each		**0.000**	INR Zero Only
594	18 watt LED Recessed/Surface Lighters as marked L2.	46.00	Each		**0.000**	INR Zero Only
595	200 Watt LED FLOOD LIGHT Fixtures as Marked FL	80.00	Each		**0.000**	INR Zero Only
596	**VRF AIR CONDITIONING SYSTEM**					
597	**SUPPLY & INSTALLATION OF VRF SYSTEM**					
598	**OUTDOOR UNIT**					

599	Supply, Istallation, Testing & Commissionig of modular type outdoor units complete with highly effiient inverter type/ digital type scroll compressors, air cooled condenser with low noise fan having interconnected control wiring and refrigerant piping housed in compact housing. Refrigerant should be R410A. The quoted price shall include the cost of refrigerent top up. All structural frame work platforms required shall be of HVAC vendor as per site conditions. The electrical contractor shall terminate the required size cable in the PDB for ODUs to be supplied under the scope of this tender, further cabling from this PDB to outdoor units shall be provided by HVAC contractor. Make: Hitachi/ Daikin/Blue Star/Toshiba					
600	22 HP (Cooling Only)	4.00	Nos		**0.000**	INR Zero Only
601	14 HP (Cooling Only)	1.00	Nos		**0.000**	INR Zero Only
602	12 HP (Cooling Only)	2.00	Nos		**0.000**	INR Zero Only
603	**INDOOR UNITS**					

604	Supply, installation, testing & commissioning of indoor Units of VRF system complete in all respect. The indoor unit shall coprise of evaporator with coil, fan and fan motor, necessary galvanised steel supports etc. as per specifications. Refrigerant should be R410A. Make: Hitachi/ Daikin/Blue Star/Toshiba					
605	4 way cassette Type					
606	2.0 TR	3.00	Nos		**0.000**	INR Zero Only
607	Ductable Type					
608	4.0 TR/1600 cfm	1.00	Nos		**0.000**	INR Zero Only
609	2.5 TR/1000 cfm	1.00	Nos		**0.000**	INR Zero Only
610	Air Handling Units (AHU)					
611	Cabinet type Double skin Ceiling Suspended AHU					
612	6000 CFM/ 15 TR @ 40mm wg TSP	6.00	Nos		**0.000**	INR Zero Only
613	AHU Expansion Valve & control kit	6.00	Nos		**0.000**	INR Zero Only
614	Supply, installation testing & commissioning of Cordless Remote controller with LCD display.	3.00	Nos		**0.000**	INR Zero Only
615	Supply, installation testing & commissioning of Corded Remote controller with LCD display.	2.00	Nos		**0.000**	INR Zero Only

616	Supply & installation of Y Joints/ Branch Ditributors					
617	For Indoor Units	16.00	Nos		**0.000**	INR Zero Only
618	For Outdoor Units	8.00	Nos		**0.000**	INR Zero Only
619	**COPPER PIPING (REFRIGERANT PIPING)**					
620	Supply, Installation, Testing & Commissioning of high pressure copper refrigerant piping suitable for R 410A refrigerant of suitable size as required and duly insulated with 19mm/13mm thick closed cell elastomeric insulation in tubing form. Piping shall be of following sizes :					
621	41.3 mm dia Pipe (insulation - 19 mm thick)	40.00	Rmt		**0.000**	INR Zero Only
622	34.9 mm dia Pipe (insulation - 19 mm thick)	10.00	Rmt		**0.000**	INR Zero Only
623	28.6 mm dia pipe (insulation - 19 mm thick)	30.00	Rmt		**0.000**	INR Zero Only
624	25.4 mm dia pipe (insulation - 19 mm thick)	0.00	Rmt		**0.000**	INR Zero Only
625	22.2 mm dia pipe (insulation - 19 mm thick)	50.00	Rmt		**0.000**	INR Zero Only
626	19.1 mm dia pipe (insulation - 13 mm thick)	40.00	Rmt		**0.000**	INR Zero Only
627	15.9 mm dia pipe (insulation - 13 mm thick)	50.00	Rmt		**0.000**	INR Zero Only

628	12.7 mm dia pipe (insulation - 13 mm thick)	60.00	Rmt		**0.000**	INR Zero Only
629	9.5 mm dia pipe (insulation - 13 mm thick)	40.00	Rmt		**0.000**	INR Zero Only
630	**DRAIN PIPING**					
631	Supply, installation, testing and commissioning of UPVC of 10 Kg/cm2 condensate drain water piping with necessary clamps, supports, hangers and fitting such as bend, tees, reducers etc. duly insulated with 6 mm thick chemically cross-linked closed cell polyethylene foam.					
632	25 mm DIA	10.00	Rmt		**0.000**	INR Zero Only
633	32 mm DIA	10.00	Rmt		**0.000**	INR Zero Only
634	40 mm DIA	10.00	Rmt		**0.000**	INR Zero Only
635	50 mm DIA	20.00	Rmt		**0.000**	INR Zero Only
636	**CABLE TRAY**					
637	Supply and installation of GI Tray of 300 mm x 75 mm size,constructed from 16G GSS, MS angle support for Tray, covered with 20G GI sheet cover for all copper refrigerent pipes					
638	300 mm x 75 mm	70.00	Rmt		**0.000**	INR Zero Only
639	INLINE FAN FOR EXHAUST					

640	Supply, installation, testing & commissioning of inline fans for exhaust air as shown on drawings, complete with sheet metal casing, direct driven centrifugal fan, motor with proper protection and inspection door,gravity louvers etc. as per the specifications. Fan should be suitable for operation on 240 +10 %, 50 Hz, single phase AC power supply as required. Fan shall be suitable for following capacities : (Make: Kruger/System Air/Humidin/Cayraire)					
641	Capacity: 1000 cfm, Static: 15 mmWg	2.00	Nos		**0.000**	INR Zero Only
642	Capacity: 200 cfm, Static: 15 mmWg	1.00	Nos		**0.000**	INR Zero Only
643	**PROPELLER FANS**					
644	Supply, Installation, Testing and Commissioning of Propeller Fans for exhaust air of Toilets as shown on drawings. Each fan shall be complete with permanent split capacitor, mounting plate and accessories like wire guard, bird screen and gravity louvers for weather protection as required. Fan shall be suitable for operation on 220 ± 6% volts, 50 Hz cycle single phase power supply. The propeller fan shall be complete in all respects as per the approved drawings & specifications and suitable for the following capacities:-					
645	250 mm dia	1.00	Nos		**0.000**	INR Zero Only
646	200 mm dia	2.00	Nos		**0.000**	INR Zero Only

647	**HVAC Electrical Panel**					
648	Electrical Panel made of 2.0 mm thick steel sheet duly powder coated, complete with voltmeter,ammeter,indicating lights, selector switch incoming/outgoing isolators,current operated single phase preventor as per specification and drawings. (The electrical contractor shall terminate required size cables at incomer of ODU PDB. All the cabling from PDB to ODUs & IDUs shall be in the scope of HVAC contractor)					
649	1 nos Incoming TP+NL MCCB @ 250 A					
650	4 nos Outgoing TP+NL MCB @ 63 A for ODUs					
651	3 nos Outgoing TP+NL MCB @ 40 A for ODUs					
652	6 nos DOL starter for AHU motors 3.7 Kw each					
653	HVAC Electrical Panel as described above	1.00	Nos		**0.000**	INR Zero Only
654	Local isolators for AHU	6.00	Nos		**0.000**	INR Zero Only
655	Power wiring from HVAC Panel to ODUs & AHUs					
656	Supply,Installation,testing & layoing of armoured copper cable of size					
657	4C x 16 sqmm	50.00	Rmt		**0.000**	INR Zero Only

658	3C x 6 sqmm	30.00	Rmt		**0.000**	INR Zero Only
659	**Control Cable**					
660	Supply, installation, testing and commissioning of control cabling with PVC insulated, PVC sheathed, multicore copper conductor control cable in suitable conduits between indoor and outdoor units.					
661	2C x 1.5 sqmm	200.00	Rmt		**0.000**	INR Zero Only
662	**EARTHING**					
663	EARTING Conductor					
664	25 x 3 GI Flat	100.00	Rmt		**0.000**	INR Zero Only
665	8 SWG GI Wire	20.00	Rmt		**0.000**	INR Zero Only
666	**DUCT WORK (Factory Fabricated)**					
667	Supply, Installation, testing and balancing of factory fabricated ducts made of galvanised steel sheet complete with fire retardent gasket, slip on flanges, GI fully threaded rods, GI chanel supports etc. in accordance with the approved shop drawings and specifications.					
668	24 gauge GSS	40.00	SqM		**0.000**	INR Zero Only

669	22 gauge GSS	100.00	SqM		**0.000**	INR Zero Only
670	Round Ducting (24 gauge) GSS	450.00	SqM		**0.000**	INR Zero Only
671	**DUCT INSULATION**					
672	Supply and application of insulation on external surface supply air ducting using 9 mm thick closed cell elastomeric insulation with adhesive. Longitudinal & transverse joints shall be sealed with self adhesive tape of same material as per specifications.	470.00	SqM		**0.000**	INR Zero Only
673	**ACOUSTIC LINING**					
674	Supply and application of acoustic lining within supply and return air ducts with 25 mm thick fiber glass insulation of density 32 Kg/m³ as per the approved drawings & specifications.					
675	Duct acoustic lining as described above	120.00	SqM		**0.000**	INR Zero Only
676	Canvas Connection					
677	Supply, Installation and Testing of fire retardant canvas connection for AHUs and Smoke extraction fans as per the approved shop drawings and specifications.	1.00	SqM		**0.000**	INR Zero Only

678	**DAMPERS**					
679	Supply, Installation and Balancing of multiblade box type galvanised steel sheet dampers for ducts to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system as per the approved shop drawings and specifications.	3.00	SqM		**0.000**	INR Zero Only
680	Supply, Installation and Balancing of multiblade type louver dampers of Aluminium construction for duct collars to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system as per the approved shop drawings and specifications.	1.00	SqM		**0.000**	INR Zero Only
681	**FIRE DAMPERS**					
682	Supplying of G.I fire dampers of 90 minutes rating in supply air duct/ main branch and return air path as & where required of required sizes including control panel and control wiring. The damper shall be motorised and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be in-built mechanism and not externally mounted. The damper shall also be closed in the event of a fire signal and switchoff the AHU as required.					
683	Bare Fire Damper	5.00	SqM		**0.000**	INR Zero Only
684	Actuator with control panel and wiring	12.00	Nos		**0.000**	INR Zero Only

685	**GRILLES/ DIFFUSERS**					
686	Supply, Installation, Testing & Balancing of powder coated extruded aluminium Supply / Return air diffusers/grilles as per approved shop drawings and specifications.	4.00	SqM		**0.000**	INR Zero Only
687	Supply, Installation, Testing & Balancing of powder coated extruded aluminium Spot Diffusers/ Jet Nozzles with butterfly dampers (300mm diameter) as per approved shop drawings and specifications.	48.00	Nos		**0.000**	INR Zero Only
688	Supply, Installation, Testing & Balancing of powder coated extruded aluminium toilet exhaust valves (150mm diameter) as per approved shop drawings and specifications.	20.00	Nos		**0.000**	INR Zero Only
689	Supply, Installation, Testing & Balancing of powder coated extruded aluminium Fresh Air Intake / Exhaust Louvers complete with bird screen.	1.00	SqM		**0.000**	INR Zero Only
690	**FLEXIBLE ROUND DUCTS**					

691	Supply, Installation, testing and commissioning of factory insulated flexible round ducts. The inner and outer skin of flexible duct shall be constructed out of aluminum sheet. The flexible ducts shall be of the following sizes in accordance with the approved shop drawings:					
692	Upto 150 mm dia	40.00	Rmt		**0.000**	INR Zero Only
693	**UNDERDECK INSULATION**					
694	Supply and application of under-deck insulation by using 16 mm thick closed cell elastomeric insulation material in sheet form for the roof exposed to sun. The quoted price shall be inclusive of Pidilite SR-998 as required and in conformity with the specifications.	1200.00	SqM		**0.000**	INR Zero Only
695	**LANDSCAPE**					
696	Geosynthetic Drainagewith two filtering nonwoven geotextiles having a "W" configuration as longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75mm having pores of 150 micron and tensile strength of 8.0 kN/m and having plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kPa pressure ,tensile strength of 18 kN/m , with mass per unit area of 740 gsm.	250.00	sqm		**0.000**	INR Zero Only

697	Supplying and stacking of good earth at site including royalty and carriage upto 5 km complete (earth measured in stacks will be reduced by 20% for payment).	60.00	cum		**0.000**	INR Zero Only
698	Supplying and stacking at site dump manure from approved source, including carriage upto 5 km complete (manure measured in stacks will be reduced by 8% for payment) :					
699	Screened through sieve of I.S. designation 20 mm	400.00	cum		**0.000**	INR Zero Only
700	Supply and stacking of Ficus benjamina (green) plant of height 150-165 cm., bushy with healthy branches and lush green foliage in big size HDPE bags as per direction of the officer-incharge.					
701	Ficus benjamina (green) of height 150-165 cm., bushy with healthy branches and lush green foliage in big size HDPE bags	300.00	Nos		**0.000**	INR Zero Only
702	Supply and stacking of plant Bauhinia acuminata of height 60-75 cm. in earthen pots of size 20 cm as per direction of the officer-in-charge.					
703	Bauhinia acuminata of height 60-75 cm. in earthen pots of size 20 cm	300.00	Nos		**0.000**	INR Zero Only

704	Providing and laying Neelgiri/Mexican grass turf with earth 50mm to 60mm thickness of existing ground prepared with proper level and ramming with tools wooden (Dhurmos) and than rolling the surface with light roller make the surface smoothen and light waterning with sprinkler and maintenance for 30 days or more till the grass establish properly, as per direction of officer-in-charge	1500.00	sqm		**0.000**	INR Zero Only
705	**EXTERNAL DEVELOPMENT**					
706	**SH-1: E A R T H W O R K**					
707	Excavtion in foundation in ordinary soil, loame, clay or sand including lift upto 1.5 m and lead upto 30 m including filling watering and rammming of excavated earth in to the trenches or in to the space between the building $ the side of foundation trenches or in to the plinth , removal $ disposal of surplus earth as directed by the engineer in charge upto a distance of 30 m from the foundation trenches . (Excluding royalty)	751.00	cum		**0.000**	INR Zero Only
708	**SH-2: C O N C R E T E W O R K**					
709	Providing and laying in Cement concrete 1:4:8 (1 Cement: 4 approved Coarse sand: 8 Coarse aggregate) size of aggregate shall be 4cm gauge or as approved including supply of all material labor, T&P etc. required for proper completion of the work.	215.00	cum		**0.000**	INR Zero Only

710	**SH-3: FlOORING WORK**					
711	Laying of 25 mm Kota stone of 45 x45 cm and above flooring over previously prepared base with 2 cm thk 1:3 cement and sand mortar including filling of joints with cement mixed with pigment required for matching the shade of floor as per direction - Engineer in charge , Including cutting, polishing with wax polish including supply of all material T & P Etc required vfor completion of work					
712	25 mm thick	458.00	sqm		**0.000**	INR Zero Only
713	Providing and laying gang saw cut 18 mm thick, mirror polished pre moulded and pre polished machine cut granite stone of required size and shape of approved shade, colour and texture in footpath, flooring in road side plazas and similar locations, laid over 20mm thick base of cement mortar 1:4 (1cement : 4 coarse sand) including grouting the joints with white cement mixed with matching pigment, epoxy touch ups etc. complete as per direction of Engineer-in-Charge.					
714	With granite stone of area less than 0.50 sqm.	10.00	sqm		**0.000**	INR Zero Only
715	With granite stone of area less than 0.50 sqm.	560.00	sqm		**0.000**	INR Zero Only
716	**SH-9: AREA DEVELOPMENT WORK**					

717	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	920.00	Sqm		**0.000**	INR Zero Only
718	Construction of granular sub-base by providing close graded Material conforming to specifications, mixing in a mechanical mix plant at OMC, carriage of mixed material by tippers to work site, for all leads & lifts, spreading in uniform layers of specified thickness with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge.					
719	With material conforming to Grade-I (size range 75 mm to 0.075 mm) having CBR Value-30	322.00	cum		**0.000**	INR Zero Only

720	Providing and laying design mix cement concrete of M-30 grade, in roads/ taxi tracks/ runways, using cement content as per design mix, using coarse sand and graded stone aggregate of 40 mm nominal size in appropriate proportions as per approved & specified design criteria, providing dowel bars with sleeve/ tie bars wherever required, laying at site, spreading and compacting mechanically by using needle and surface vibrators, levelling to required slope/ camber, finishing with required texture, including steelform work with sturdy M.S. channel sections, curing, making provision for contraction/ expansion, construction & longitudinal joints (10 mm wide x 50 mm deep) by groove cutting machine, providing and filling joints with approved joint filler and sealants, complete all as per direction of Engineerin-charge (Item of joint fillers, sealants, dowel bars with sleeve/ tie bars to be paid separately). Note:- Cement content considered in M-30 is @ 340 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately.					
721	Cement concrete prepared with batch mixing machine	170.00	cum		**0.000**	INR Zero Only
722	Extra for providing and mixing hardening compound of approved quality as per manufacturer's specification in cement concrete.	100.00	litre		**0.000**	INR Zero Only

723	Providing and fixing in position pre-moulded joint filler in expansion per cm depth joints. Size is 5cm x 10cm	100.00	per cm depth joints. per cm width per m length		**0.000**	INR Zero Only
724	Providing and laying in position bitumen hot sealing compound for expansion joints etc. 16.46.1 Using grade 'A' sealing compound.: Size is 5cm x 10cm	100.00	per cm depth joints. per cm width per m length		**0.000**	INR Zero Only
725	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	8.00	cum		**0.000**	INR Zero Only
726	**SH-10: FURNITURE**					
727	Garden Umbrella with side pole (with base stand mounting, 230 gsm fabric, 300 cm rib length, nylon water resistant, ms frame)	3.00	no.		**0.000**	INR Zero Only
728	Outdoor Restaurant Table (table top stone finish)	3.00	no.		**0.000**	INR Zero Only

729	Cafeteria Chair with frame of MS Powder Coated and Plastic moulded seat (polyester fabric upholstery, ms powder coated frame, co polymer finish)	12.00	no.		**0.000**	INR Zero Only
730	**SCULPTURE**					
731	M.S Pipe Frame Enamel Painted -20 x40 mm and 40x40 mm - 2 Tonnes Approximate weight , 1.2 mm thick CNC bent laser cut Titanium coated SS304 stainless steel sheet gold colour -100ns ., 16mm base foundation plate bolted - 500kg	1.00	nos		**0.000**	INR Zero Only
732	1.6 MM THIK SS 304 sheet CNC cut AND BENT 3D LETTHERS -100KG ., 3mm thk ACP sheeet - 4nos . M.S Pipe frame enamel painted 20x40mm,40x80mm and 50x50mm - 250 kg , 10 mm thk M.S plate for base - 20 KG	1.00	nos		**0.000**	INR Zero Only
733	**SOUND SPEAKER**					

734	Supply,Installation,testing and commissioning of Main FOH loudspeaker which shall be a multidriver,full range loud speaker system:The loud speaker free space sensitivity shall be a tleast 92dB SPL in the 50Hz to 16kHz range with both measurement sreferenced to a1Watt(2.83V) pink noise input measured at 1meter. The nominal horizontal beam width shall be 100 degrees or better, and the nominal vertical beam width shall be 70 degrees or more.The powerhandling capacity of the loudspeaker shall be atleast 240Watts continuous pinknoise ,band limited from 50Hz to 16kHz. Max continuous SPL shall be 117dB(123dBPeak) or better with a nominal impedance of 8Ohms or higher. The Loudspeaker shall be ratedIP55 or better for weather rated applications Make: Bose Panaray 802IV Loudspeakers	8.00	nos		**0.000**	INR Zero Only

735	Supply, installation , testing & Commissioning of 8channel class D Power amplifier with a Max Output Power of 8x500W @4/8ohms ,or bridged mode output power of 4x1000W @8ohms/70/100V .20Hz-20KHz, SNR of 101 d Band THD+Nof<0.4% with built in protection suchasLimiters, Temperature, DC, ShortCircuit, PeakCurrentLimiters ,Turnondelayetc. Built in DSP for Matrix routing, Speaker equalization, Delays, ArrayEQs etc. with Ethernet Port for NetworkControl, programming and monitoring. The Damping factor shall be>5000. The amplifier shall implement Dual Voltage and Current feedback technology to provide power as per the load demand. Shall offer optional Network audioconnectivity (DanteorCobraNet) through expansions lot.Warranted for atleast 5years. Make: Bose PM8500 Digital Amplifier	1	nos		**0.000**	INR Zero Only
736	Supply, installation, testing & Commissioning of wallmount bracket with pitch angle & customised as per site requirement Make: Customised	8.00	nos		**0.000**	INR Zero Only
737	Supply, installation, testing & Commissioning of DVD player for input - AAC,CD,CD-R/RW, DVD-Video, JPEG, LPCM, MP3, MPEG-1, SimpleMPEG4, SVCD, VideoCD, WMAPlaybackSystem , PowerRequirements-110-240VAC50/60Hz , PowerConsumption-10WMake: Sony	1.00	nos		**0.000**	INR Zero Only

738	Supply, installation, testing & Commissioning of EquipmentRacks 16U should have Contemporary, sleek appearance, Strong frame structure, Multiple vendor equipment compatibility ,Fullline of accessories & a Family of sizes and styles with Baying Kits, casters, Bolt Down Kits, Cable Management, Power Strips –vertical or Rack mount, Enclosure Monitoring System, Blanking Panels, Fans complete with PDU. Make: DLink	1.00	nos		**0.000**	INR Zero Only
739	Supply, installation, testing & Commissioning of Digital Audio DSP with 32-bit fixed /floating-point DSP 456MHz/ARM Cortex A8600 MHz Processor, Balanced Analog I/O–12inputs (routabletoAEC), 8outputs, GPIO–5x5 expandable general purpose control,Control Space Network Port – Interfaces with Bose and 3rd party control, Dante Network Port–64x64channel, 1Gbps, 2-LineVoIP–SIP2.0 -Compliant ITweb configurationpage, USBPort–Micro-BUSB for PC soft codecs with stereo input and output, Amplink–8-channel uncompressed, ultra-low latency digital audio, Serial Port–3-wireRS-232C (DTE)serial interface connection, PSTN(RJ-11)–Supports world wide analog telephone connection, DynamicRange>115dB, A-weighted 20Hz–20kHz, analog input to analog output; MaximumInput Level+24dBu; Equivalent Input Noise-118 dB at 48dB gain setting; Phantom Power+48VDC, 10mA, selectable per input; Output Channels 8 balanced, linelevelMake: Bose EX-1280C	1.00	nos		**0.000**	INR Zero Only
740	Supply, installation, testing & Commissioning of Sound Reinforcement System- Networked and programmable controller;	1.00	nos		**0.000**	INR Zero Only

741	Supply, installation, testing & Commissioning of Condenser goose neck microphone (cardioid), black, length 500mm (20"), with externally controlled LED ring and 5-pinmale XLR connector ,ZSH20 is a shock mount for goose neck microphone providing maximum isolation from physical vibration. It can be used for all microphones of the SHM and Class is series with amaleXLR connection	2.00	nos		**0.000**	INR Zero Only
742	Supply, installation, testing & Commissioning of TGH34 neck worn microphone (condenser,supercardioid),	2.00	nos		**0.000**	INR Zero Only
743	Supply,installation,testing & Commissioning of wireless hand held microphone with (UHF) receiver, 18 Channel Preset or better	2.00	nos		**0.000**	INR Zero Only
744	Supply,installation,testing & Commissioning of Armoured Speaker cable 2.5sqmm -2 core shielded twisted pair Size of Cable-2.50mm^2-EDGE Size of Strand-0.20mm, ConductorType- Annealed Tinned Copper,Pairing-Twisted, OverallDia.-8.40mm FlexLife-4000cycles, NoofStrands-80, DCResistance @20°C-7.8Ω/Km Insulation Resistance-10000MΩ. matDC125V, 20°CApplicable Temperature---20°C+70°C Nominal Velocity of propagation-76%.	1200.00	nos		**0.000**	INR Zero Only
745	Supply, installation, testing & Commissioning of Cable & Connectors, Microphone cable as required of High quality compatible for the required setup	1.00	nos		**0.000**	INR Zero Only
Total in Figures					**0.00**	INR Zero Only
Quoted Rate in Words		**INR Zero Only**				

Quoted Amount = Rs.....

Total sum of (In Figures as in C) ₹.....(In Words)
Rupees.....
And should this tender be accepted, I/we do here by agree and bind myself/ ourselves to abide by and fulfill all the conditions of this Tender Document, in default thereof to forfeit and pay to the Chief Executive Officer, Bareilly Smart City Limited the penalties of sums of money mentioned in the said condition.

Dated:
Bidder's Signature
Seal
Address .....
Witness: .....
Address: .....
The above tender is hereby accepted by me on behalf of the Bareilly Smart City Limited.

(Designation)
SIGNATURE OF AUTHORITY BY WHOM the TENDER IS ACCEPTED

Format of Letter of Intent

To,
XXXXXXXXX,
XXXXX ,

Ph: .....

Subject: - Letter of Intent (LOI) for "**Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance**".
Tender ID: 2020_....._....._..
Dear Sir,

We refer to the tender published on XX/XX/2020 on e-tender website and technical bid opened on XX/XX/2020 in response to the invitation for Bids for "**Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance**"

Bareilly Smart City Limited, Bareilly (BSCL) is pleased to inform you that your Bid has been accepted by the BSCL.

You have been selected as the Preferred Bidder for the captioned project at the Contract Price of (inclusive of GST) **Rs X /-** [IN WORDS] (hereinafter referred to as the "**Contract Price**").

This Contract price is subject to fulfilment of all terms and conditions specified in the bid document. The Contract Price will be inclusive of all applicable taxes, duties, statutory charges, levy and any other charges as applicable from time to time. The payment will be made as per the payment conditions mentioned in the bid document.

As per the bid document, you have to submit 10% as Security Deposit of the basic Bid amount (exclusive of GST), i.e. **RsX/-.** The amount of Rs.X/- has already been received in the form of EMD vide slip no ..... Hence, you are requested to pay the remaining security deposit amount of **Rs.X/-,** within 10 (Ten) days of the receipt of this Letter of Intent in the form of FDR (to be retained by the BSCL till the project completion) in favor of **CEO, Bareilly Smart City Ltd, Bareilly** or Amount can be deposited through online payment in the name of **Bareilly Smart City Limited, A/C No. : 0294001100000836, Name of Bank: Punjab National Bank, Branch: Pilibhit By-Pass Road, Bareilly, IFSC Code: PUNB0613400**.

The bidder shall execute an agreement/contract for the fulfilment of the contract on non-judicial stamp paper of Rs.100/- within 10 (Ten) days from the date of issuance of letter of intent.

The Bidder shall furnish an affidavit on a stamp paper of Rs.10/- stating that if there is any change in the govt. guidelines regarding the company contracts or increase in stamp duty to be paid then

the bidder needs to submit the stamp papers of appropriate value. In the event of failure, the BSCL shall have full rights to recover the balance stamp duty from the Bid Security deposit.

Kindly acknowledge the acceptance of this **"Letter of Intent"** by signing duplicate copy by your authorized Representative and deliver the same to us.

Chief Executive Officers
Bareilly Smart City Limited, Bareilly

Agreed and Accepted

Signature of the Authorized Representative of the Agency (i.e._____)

Name:
Designation:

Address:

Place:

Date:

Company Seal

DRAFT CONTRACT AGREEMENT

(To be signed by the Owner and the Successful Bidder within the period specified in the Bidding Documents after the issue of Letter of Intent)
(To be stamped in accordance with the Stamp Act, of the State)

THIS AGREEMENT is made on ..... day of ....., 2020 between **Bareilly Smart City Limited**, a company incorporated under the Companies Act, 2013 having its CIN No. as U93000UP2018SGC102746 and its Registered Office at "C/O Executive Engineer, Municipal Board, Nagar Nigam, Bareilly UP-243001", (hereinafter referred to as "Owner', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) of the **ONE PART**

and

....., having its office at ..... (hereinafter referred to as the "Contractor", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) of the **OTHER PART**.

WHEREAS the Owner, desirous of associating with the Contractor for "**Construction of Multisport Indoor Sports Complex in Bareilly Stadium with 1 year Defect liability period and three years of maintenance**" (the Project) on the terms and conditions contained in the Bidding Documents and amendments of the clarifications in respect there of issued by the Owner in response to Invitation for Bid (IFB) dated .....

AND WHEREAS the Contractor had submitted its Bid for the said Project under its Letter dated ..... (as hereinafter referred to as the "Bid").

AND WHEREAS the Owner has accepted the Bid, as conveyed to the Contractor vide Letter of Intent No. .....**dated** ..... (hereinafter referred to as the "Letter of Intent"), on the terms and conditions brought out in the said Letter of Intent and the Documents referred to therein, resulting into a Contract.

AND WHEREAS the Contractor has accepted the Letter of Intent, as conveyed to the Owner vide dated .....(hereinafter referred to as the "Letter of Acceptance"), resulting into this Contract.

NOW THEREFORE THIS AGREEMENT WITNESSETH AS UNDER:

Article -1.0 - Definition

In this Agreement the words and expressions shall have the same meaning as are respectively assigned to them in the Contract Documents specified hereunder attached herewith which form an integral part of this Contract Agreement. This Agreement together with all the Documents attached therewith is referred to as the Contract for all intent and purposes of the aforesaid Project.

Article - 2.0 - Date of commencement of Contract

This Contract has come into force with effect from ..... i.e. from the date of the signing of Contract Agreement.

Article - 3.0 - Contract Documents

The Contract shall be performed strictly as per the terms and conditions stipulated herein and in the following documents attached hereto (hereinafter referred to as Contract Documents):
(i) The Contract Agreement between the Owner and the Contractor and the attachments thereto. (This Contract Agreement).
(ii) Accepted Letter of Intent till the execution of Contract Agreement between the Owner and the Contractor.
(iii) Bid submitted by the Successful Bidder
(iv) RFP issued to the Bidder (comprising Instruction to Bidders, General Conditions of Contract, Special Conditions of Contract and Technical Specification) and Corrigendum
(v) Designs and Drawings. (As per Tender Drawing Set Annexure VII)

The above Contract Documents shall form an integral part of this Agreement. If there is an ambiguity or discrepancy or conflict within the Contract Documents, the priority of the Documents shall be in the order in which the Contract Documents are listed above. All Documents forming part of the Contract Documents are intended to be correlative, complementary and mutually explanatory. The Contract shall be read as a whole.

Subject to the provisions relating to Arbitration specified in General Conditions of Contract of the Contract Document, in case of any conflict amongst Contract Documents, the decision of the Owner shall be final & binding on the Contractor.

Article - 4.0 - Scope of Work

The detailed scope of work of the Contractor, under the Contract, has been brought out in the RFP Documents. However, the above scope of work of the Contractor shall also include such items of work as may not have been specifically brought out in the said Contract Documents but as may be necessary for the safe and successful completion of the various items of work, envisaged, as per good engineering practice and recognized principles.

Article - 5.0 - Contract Price

The Total Contract Price under the Contract shall be **Rs. ...../-** (Rupees .....only) inclusive of all the GST, taxes, duties, levies, fees etc. as specified in General Conditions of Contract and the Price Bid Schedules forming part of this Contract. The price shall remain fixed and firm and shall not change on any account whatsoever, for the duration of the Contract. All the matters relating to the payments to the Contractor shall be as per the Terms and

Conditions and subject to the requirements as specified in the said General Conditions of Contract.

Article - 6.0 - Contract Schedule

Time is the essence of Contract and shall be strictly adhered to. The Contractor shall so organize its resources and perform its work as to complete the work in **6 months and (Operate) it for a period of 36 (Thirty Six) months** from the date of Signing of Contract and as per the Projects Completion Schedule forming part of the Bid submitted by the Contractor subject to further modifications/ changes as may be mutually agreed to between the Owner and the Contractor.

Article – 7.0 – Owner's Engineer Functions

The Owner's Engineer in relation to the Contractor shall have such functions as are delegated to it by the Owner from time to time and intimated to the Contractor. The Contractor shall carry out the instructions issued by the Owner's Engineer as if they were the instructions issued by the Owner. If there is any difference between the Contractor and Owner's Engineer, on any matter about the implementation of this Contract/Project, the matter shall be referred to the Owner whose decision shall be final and binding on the

Contractor and the Owner's Engineer. This Contract is executed in English Language in two originals, each Party receiving one set and both the sets will be authentic. M/s ..... has furnished an Amount of **Rs...../-** through NEFT/RTGS?FDR on ..... vide Txn No. ..... along with the EMD Deposited of **Rs...../-** in the account of Bareilly Smart City Limited, A/C No. : 0294001100000836, Name of Bank: Punjab National Bank, Branch: Pilibhit By-Pass Road, Bareilly, IFSC Code: PUNB0613400 vide Txn No. ..... as Security Deposit for the **Tender ID No :** ..... Hence the total requisite amount for the agreement is **Rs...../-** has been furnished by **M/s** .....

IN WITNESS WHEREOF the Parties through their duly authorized representatives have executed these presents on the day, month and year first above mentioned, at Bareilly.

(.....)	(.....)
Chief Executive Officer	For M/S .....
Bareilly Smart City Limited	(CONTRACTOR)

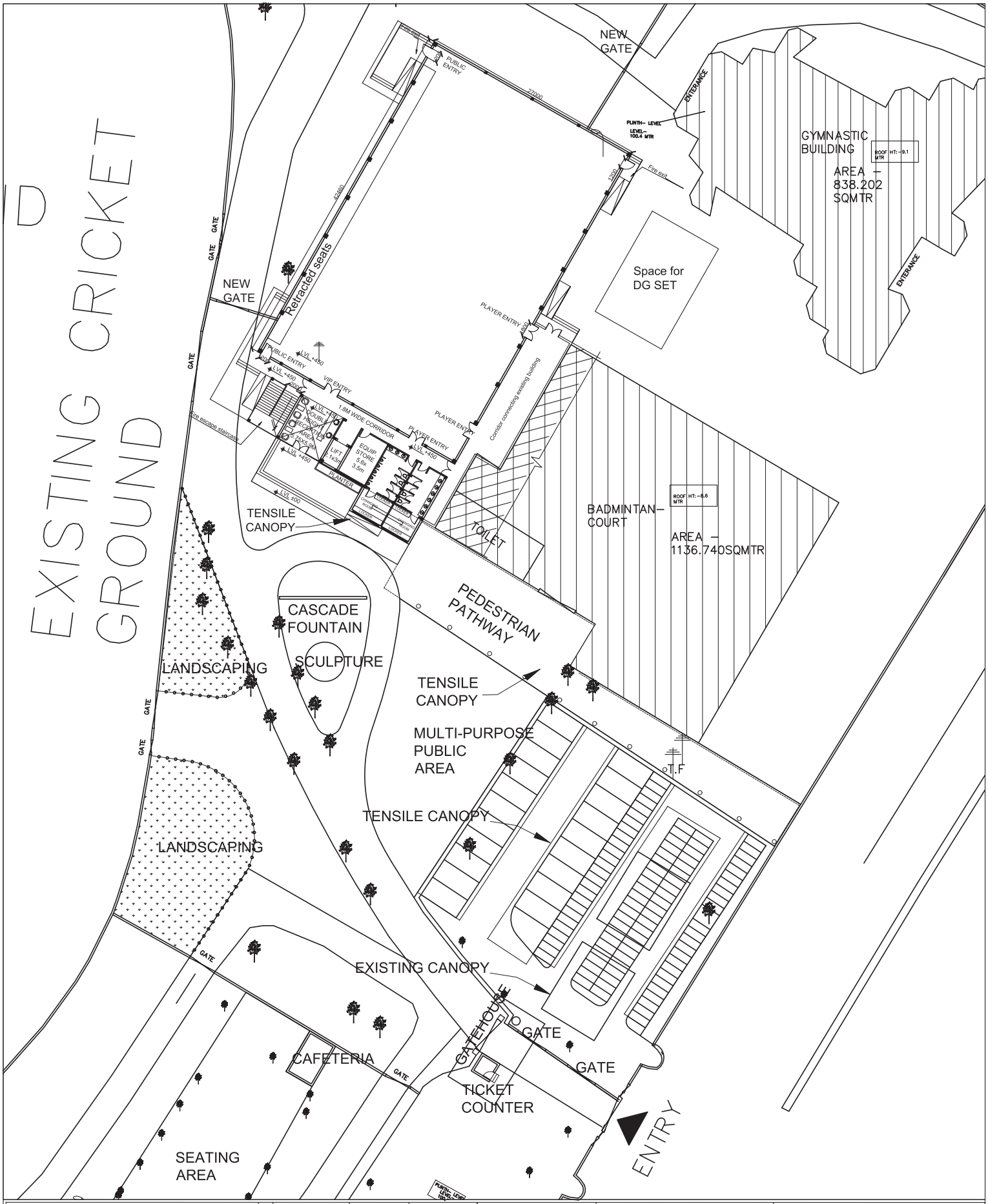
Witness:

1.
2.

ANNEXURE VII

DRAWING SET

LIST OF DRAWINGS		
S.No.	**Drawing Name**	**Drawing No.**
	EXTERNAL DEVELOPMENT PLAN	**ED -00-00**
1	Landscape Plan	ED -00- 01
	ARCHITECTURE DRAWINGS	
2	Site Plan	AR -01-00
3	Ground floor plan	AR -01-01
4	First floor plan	AR -01-02
5	Terrace plan	AR -01-03
6	Elevations	AR -01-04
7	Sections	AR -01-05
8	False Ceiling GF	AR -01-06
9	False Ceiling FF	AR -01-07
10	Flooring GF	AR -01-08
11	Flooring FF	AR -01-09
12	Flooring Terrace	AR -01-10
13	Connection Drawing	AR-01-11
	ELECTRICAL DRAWINGS	
14	Ground Floor Electrical Layout	EL-01 -01
15	Ground Floor and Court DB details	EL-01 -02
16	First Floor Electrical Layout	EL-01 -03
17	First Floor DB Details	EL-01 -04
18	Electric SLD	EL-01 -05
19	Electrical Load Sheet	EL-01 -06
	PLUMBING DRAWINGS	
20	Ground Floor Plumbing Layout	PL-01 -01
21	First Floor Plumbing Layout	PL-01 -02
	FIRE FIGHTING DRAWINGS	
22	Ground Floor Firefighting Plan	FF-01 -01
23	First Floor Firefighting Plan	FF-01 -02
	UTILITY DRAWINGS	
24	Ground floor HVAC layout	UT-01-01
25	First floor HVAC layout	UT-01-02
26	Terrace floor HVAC layout	UT-01-03
27	HVAC electrical Load	UT-01-04
28	HLC	UT-01-05
29	RDS	UT-01-06
30	Design Basis	UT-01-07
	STRUCTURE DRAWINGS	
31	Column Layout Plan and details	ST-01-01
32	Foundation Plan and Details	ST-01-02
33	Footing sections and details	ST-01-03
34	Framing plan and beam details at plinth level	ST-01-04
35	Framing plan and beam details at first floor level	ST-01-05
36	Framing plan and beam details at terrace floor level	ST-01-06
37	Framing plan and beam details at top roof level	ST-01-07



GENERAL NOTES:

1. All dimensions are in metres and are dimensions unless otherwise specified.

2. All levels are in milimetres and are finished unless otherwise specified. All levels are mentioned in the section.

3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-00-01

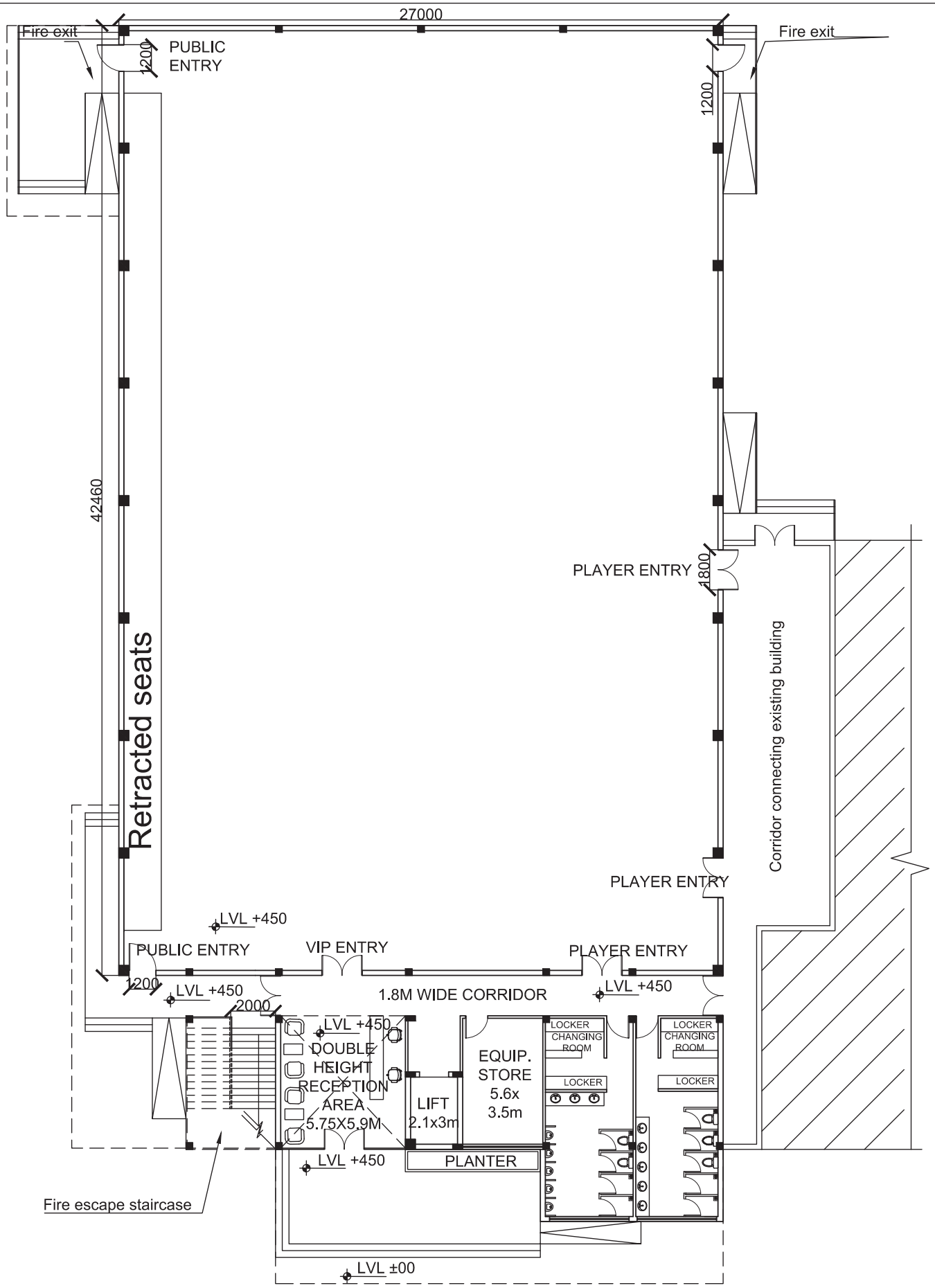
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Site Plan

SREI



GENERAL NOTES:

1. All dimensions are in metres and are dimensions unless otherwise specified.

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NO.	REVISION	DATE	CHECKED BY

Note:

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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-01

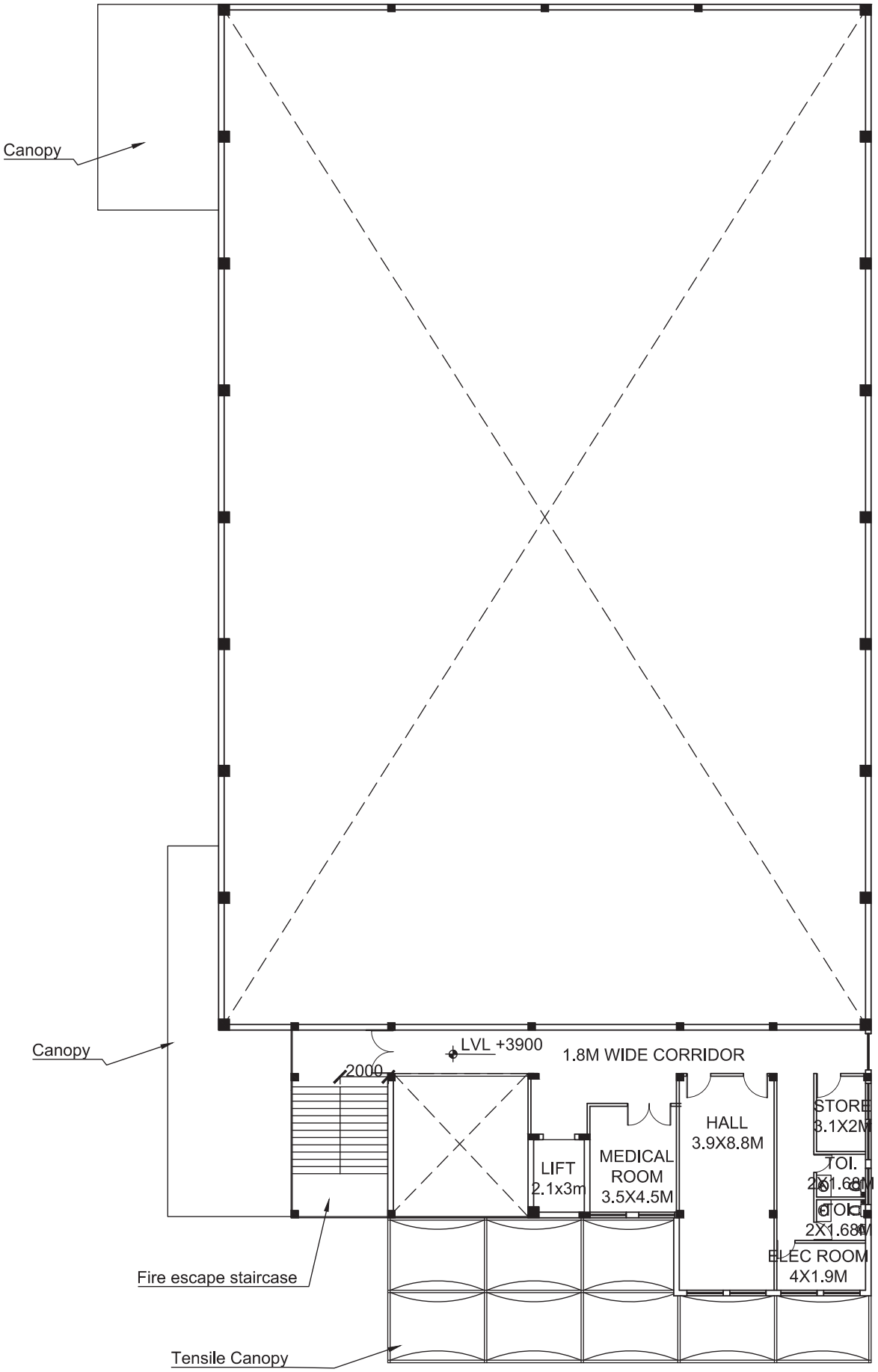
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor Plan

SREI



GENERAL NOTES:

1. All dimensions are in metres and are dimensions unless otherwise specified.

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-02

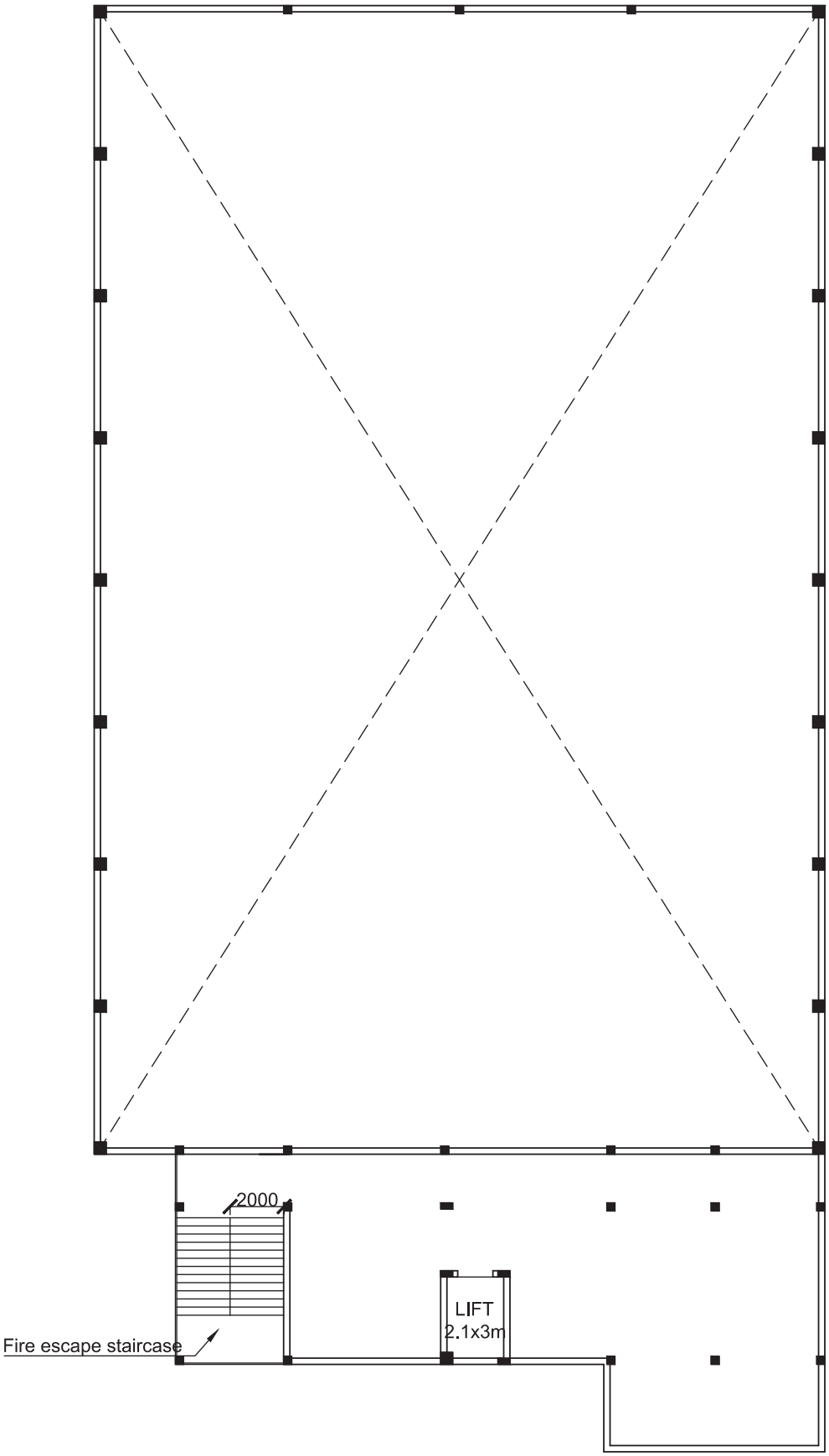
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor Plan

SREI



GENERAL NOTES:

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2. All levels are in milimetres and are finished unless otherwise specified. All levels are mentioned in the section.

3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-03

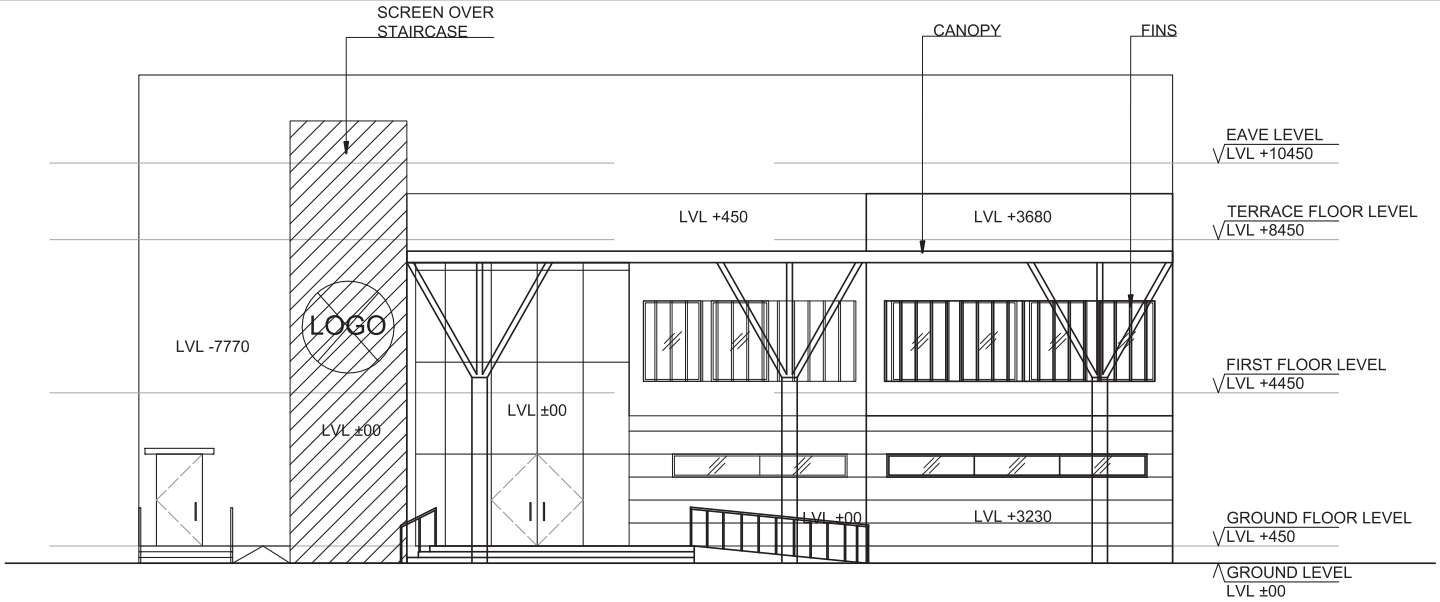
Checked by: NG

Date: 28.01.20

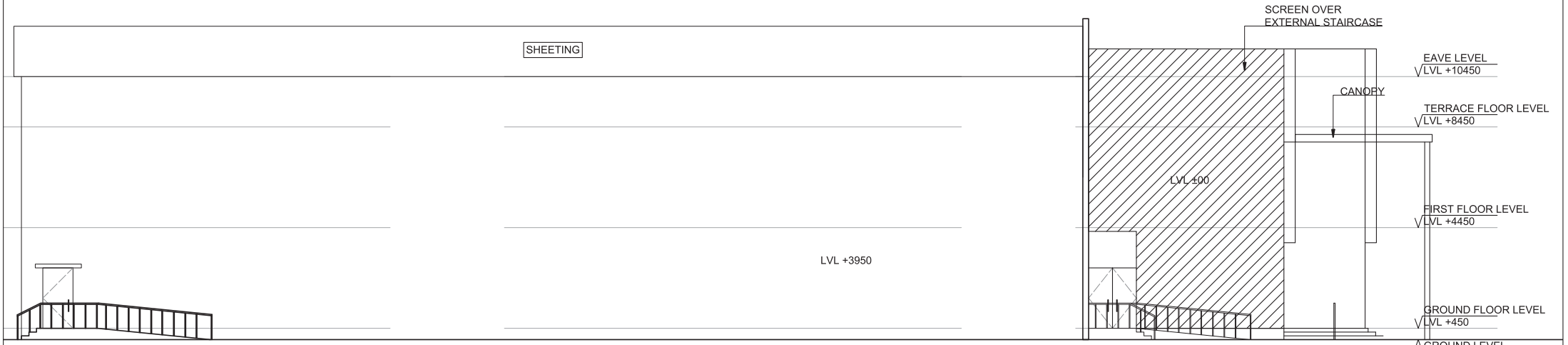
Dealt by : KG

Title: Terrace Floor Plan

SREI



ELEVATION A



ELEVATION B

GENERAL NOTES:

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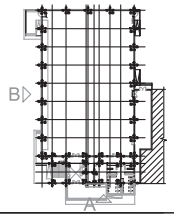
NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Key Plan :



Purpose :

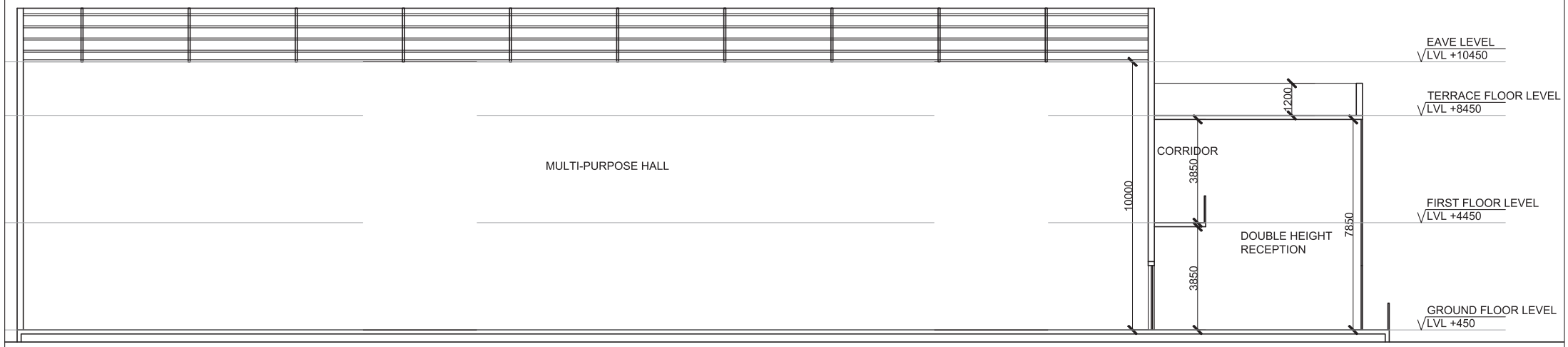
TENDER DRAWING

Client-
BAREILLY SMART CITY LTD.

Project-
Indoor Stadium

Scale: Not to Scale @ A3	North:	Drg No: AR-01-04
Checked by: NG	Date: 28.01.20	Dealt by : KG

Title:
Elevations



SECTION AA'

GENERAL NOTES:

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

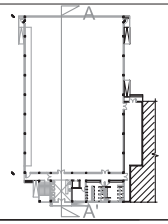
4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Key Plan :



Purpose :

TENDER DRAWING

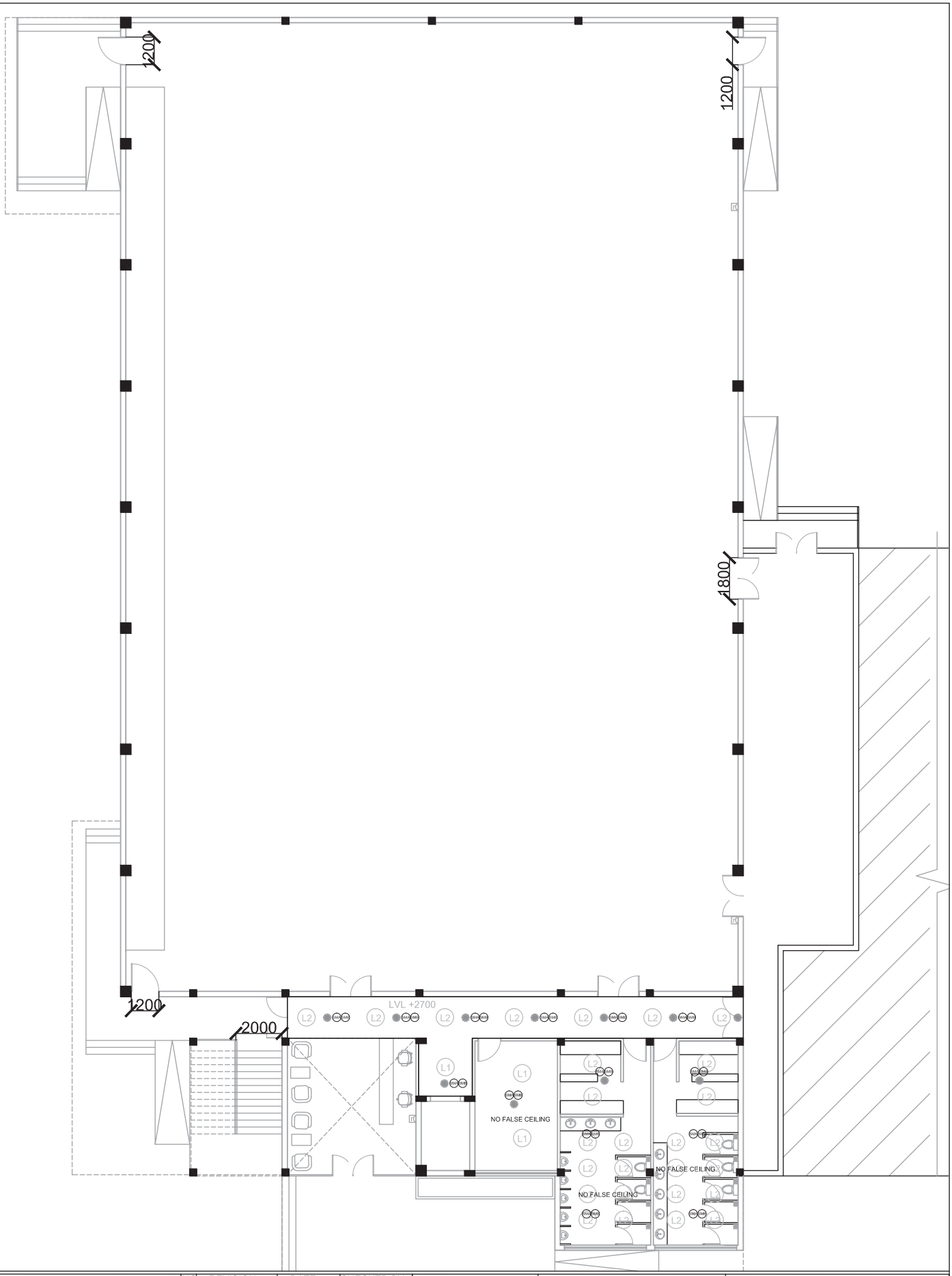
Client-
BAREILLY SMART CITY LTD.

Project-
Indoor Stadium

Scale: Not to Scale @ A3	North:	Drg No: AR-01-05
Checked by: NG	Date: 28.01.20	Dealt by : KG

Title:
Section

SREI



GENERAL NOTES:

1. All dimensions are in metres and are dimensions unless otherwise specified.

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

S.No.	Symbol	Description
1	SM SD	Smoke Detector
2		Sprinkler
3	L1	12W LED LIGHT (RECESSED SURFACE)
4	L2	18 W LED PANEL (RECESSED SURFACE)
5	FL	200W FLOOD LIGHT
6		HVAC Exhaust valve
7		INTered light
8		Cassette AC unit

Purpose :

TENDER DRAWING

Client-
BAREILLY SMART CITY LTD.

Project-
Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-0□

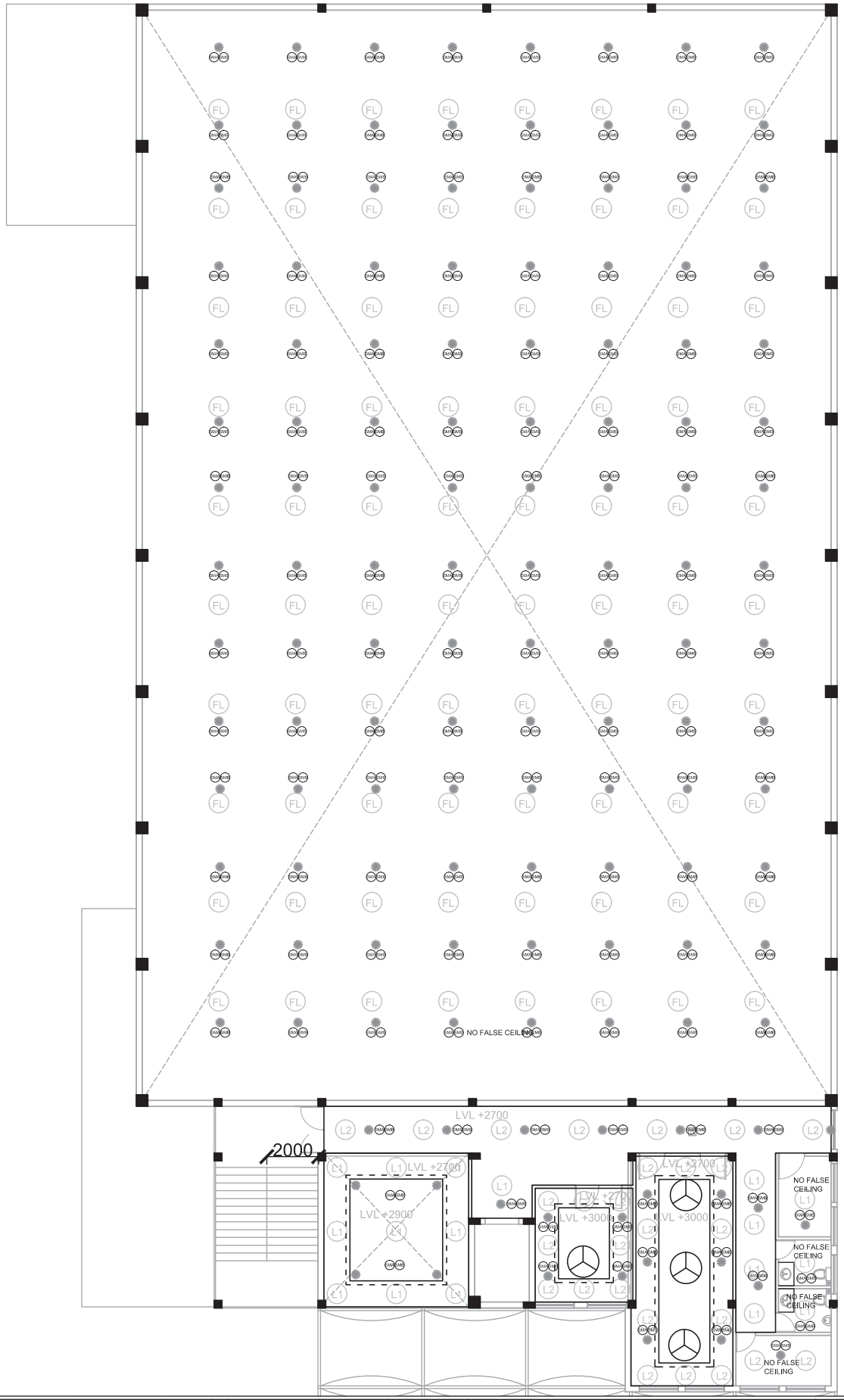
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title:
Ground Floor False Ceiling

SREI
Together We Make Tomorrow Happen



GENERAL NOTES:

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

S.No.	Symbol	Description
1		Smoke Detector
2		Sprinkler
3	L1	24W LED LIGHT (FRC/SSSTD-SURFACE)
4	L2	18 W LED PANEL (FLUESSED-SURFACE)
5	FL	200W FLOOD LIGHT
6		HVAC Exhaust valve
7		EXIT Sign light
8		Cassette AC unit

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-0□

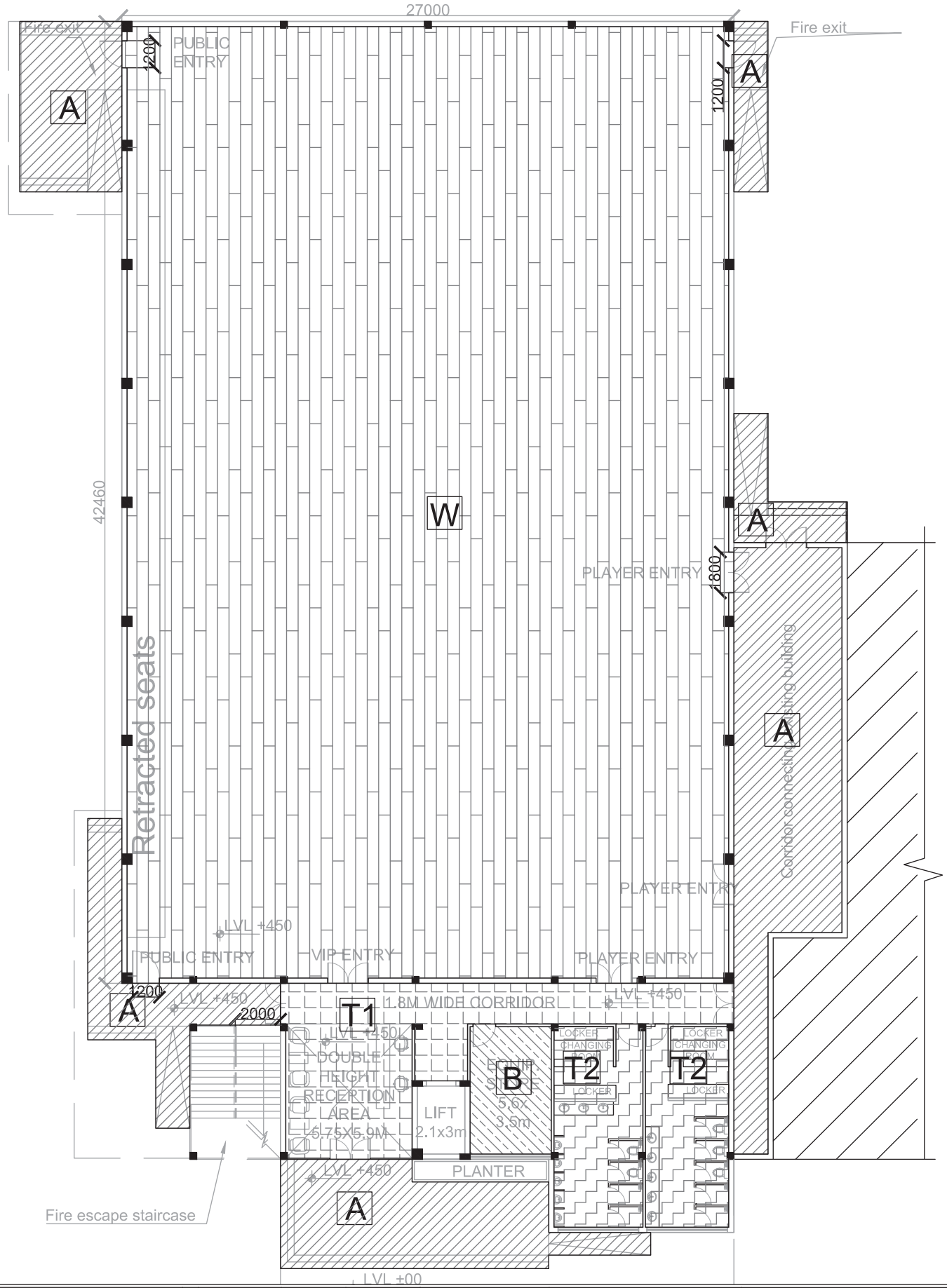
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor False Ceiling

SREI Together We Make Tomorrow Happen



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1. All dimensions are in metres and are dimensions unless otherwise specified.

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

TILE TYPE	MATCH	DESCRIPTION
A		GRANITE
B		KOTA STONE
C		BRICK COBA
T1		TILES 800X800
T2		TILES 600X600
W		WOODEN FLOORING

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-08

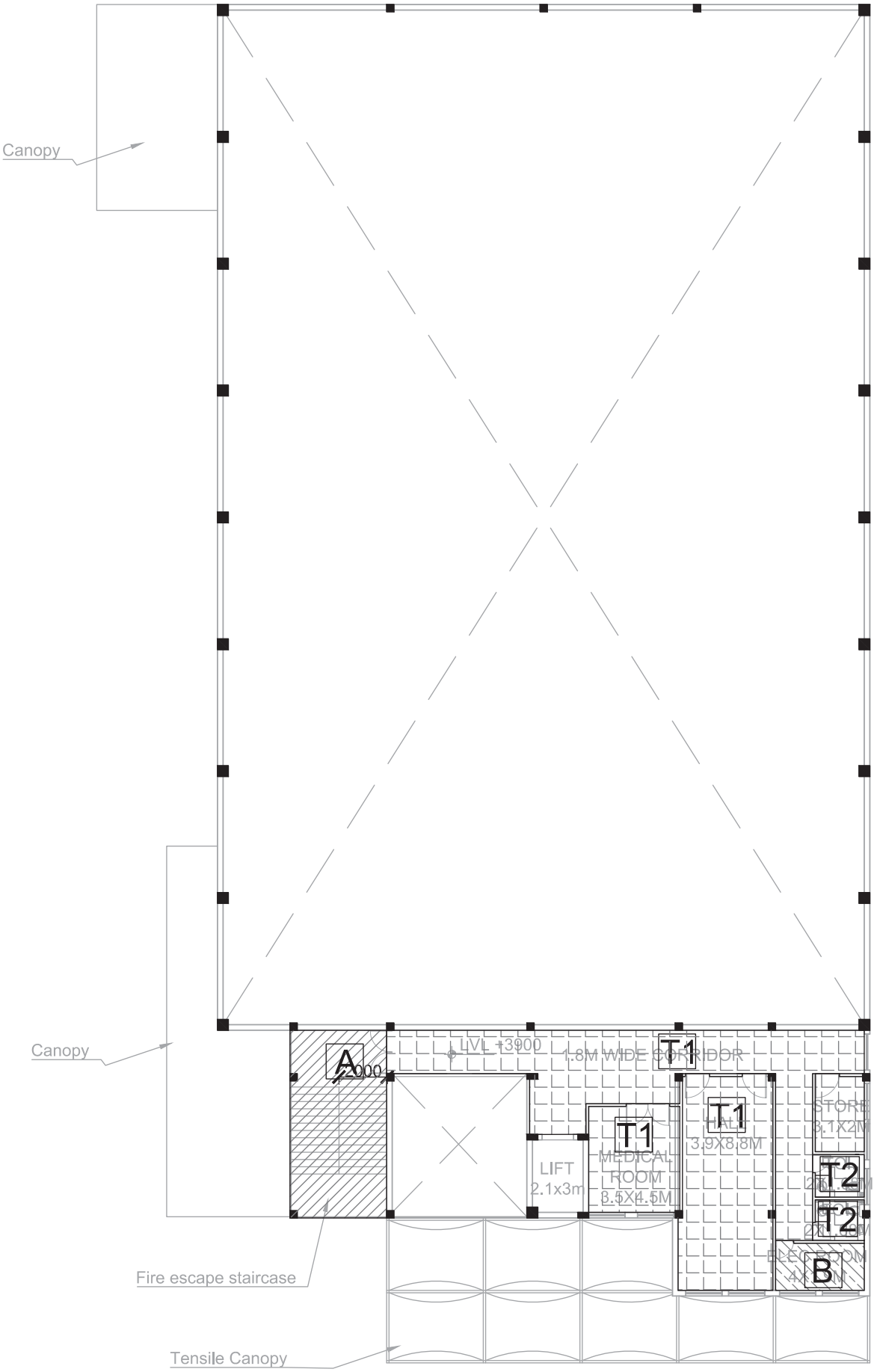
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor Flooring Plan

SREI



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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

TILE TYPE	PATCH	DESCRIPTION
A		GRANITE
B		KOTA STONE
C		BRICK COBA
T1		TILES 800X800
T2		TILES 600X600
W		WOODEN FLOORING

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-0□

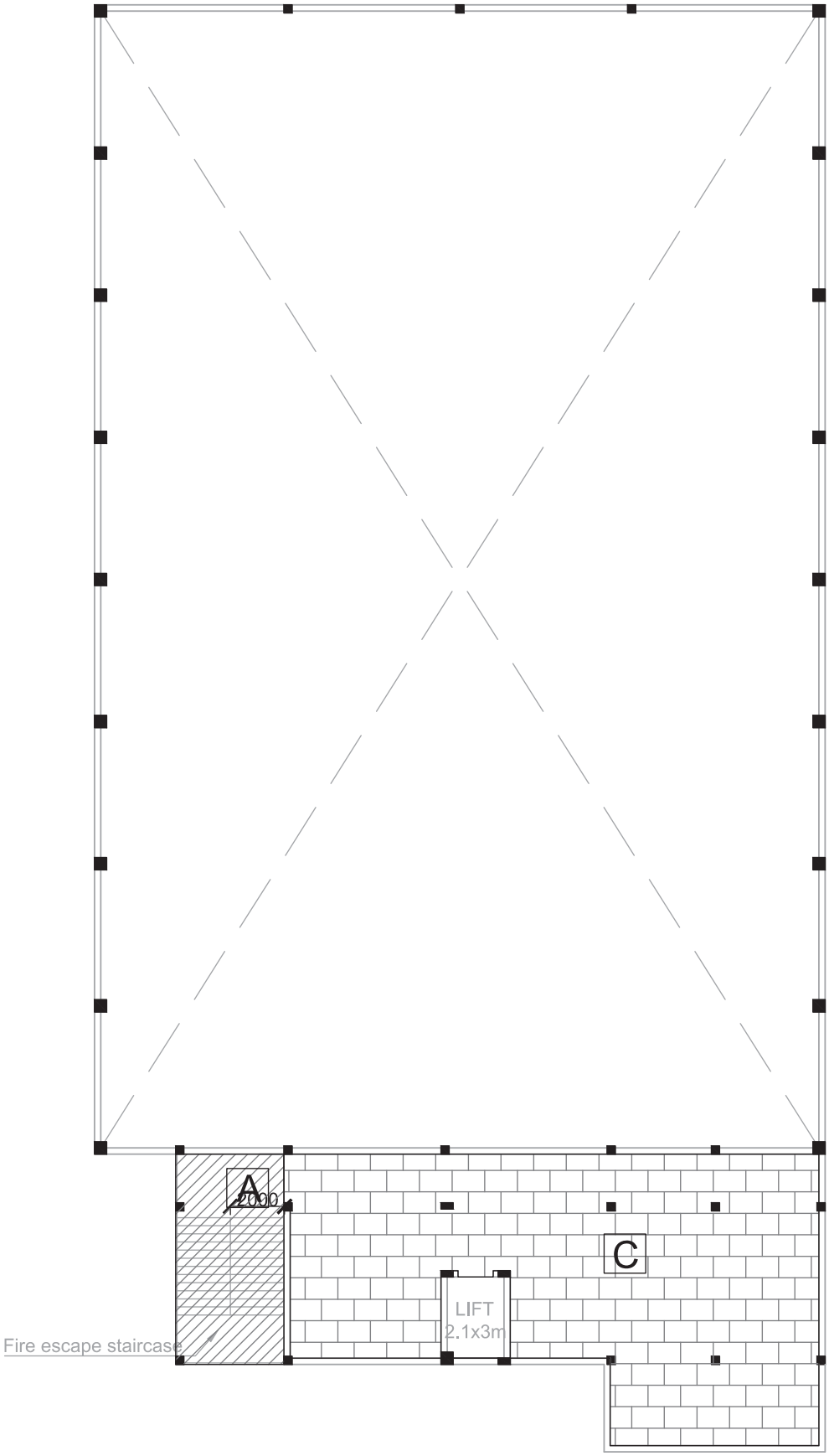
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor Flooring Plan

SREI
Together We Make Tomorrow Happen



GENERAL NOTES:

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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

TILE TYPE	HATCH	DESCRIPTION
A		GRANITE
B		KOTA STONE
C		BRICK COBA
T1		TILES 800X800
T2		TILES 600X600
W		WOODEN FLOORING

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: AR-01-10

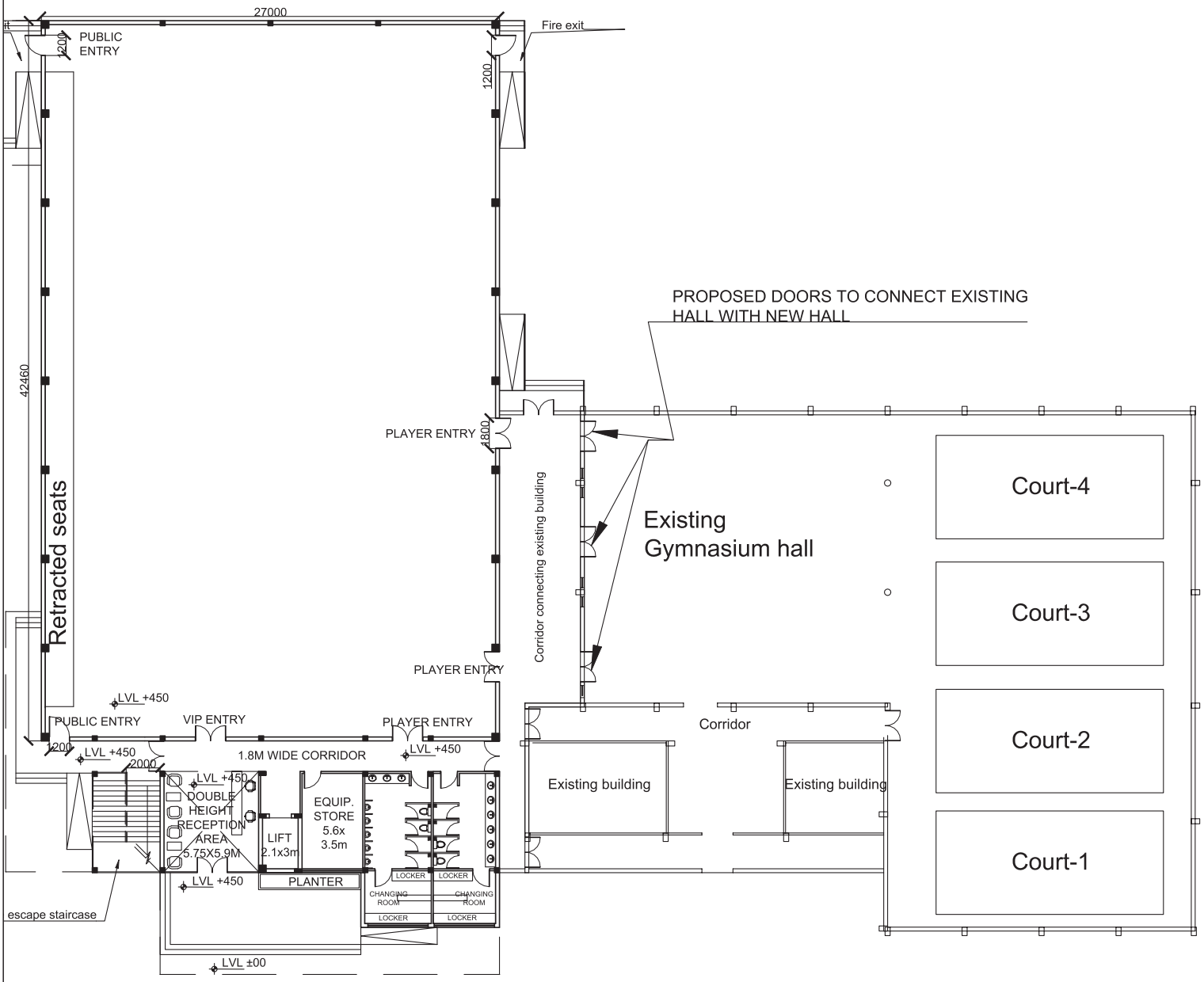
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Terrace Flooring Plan

SREI
Together We Make Tomorrow Happen



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3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

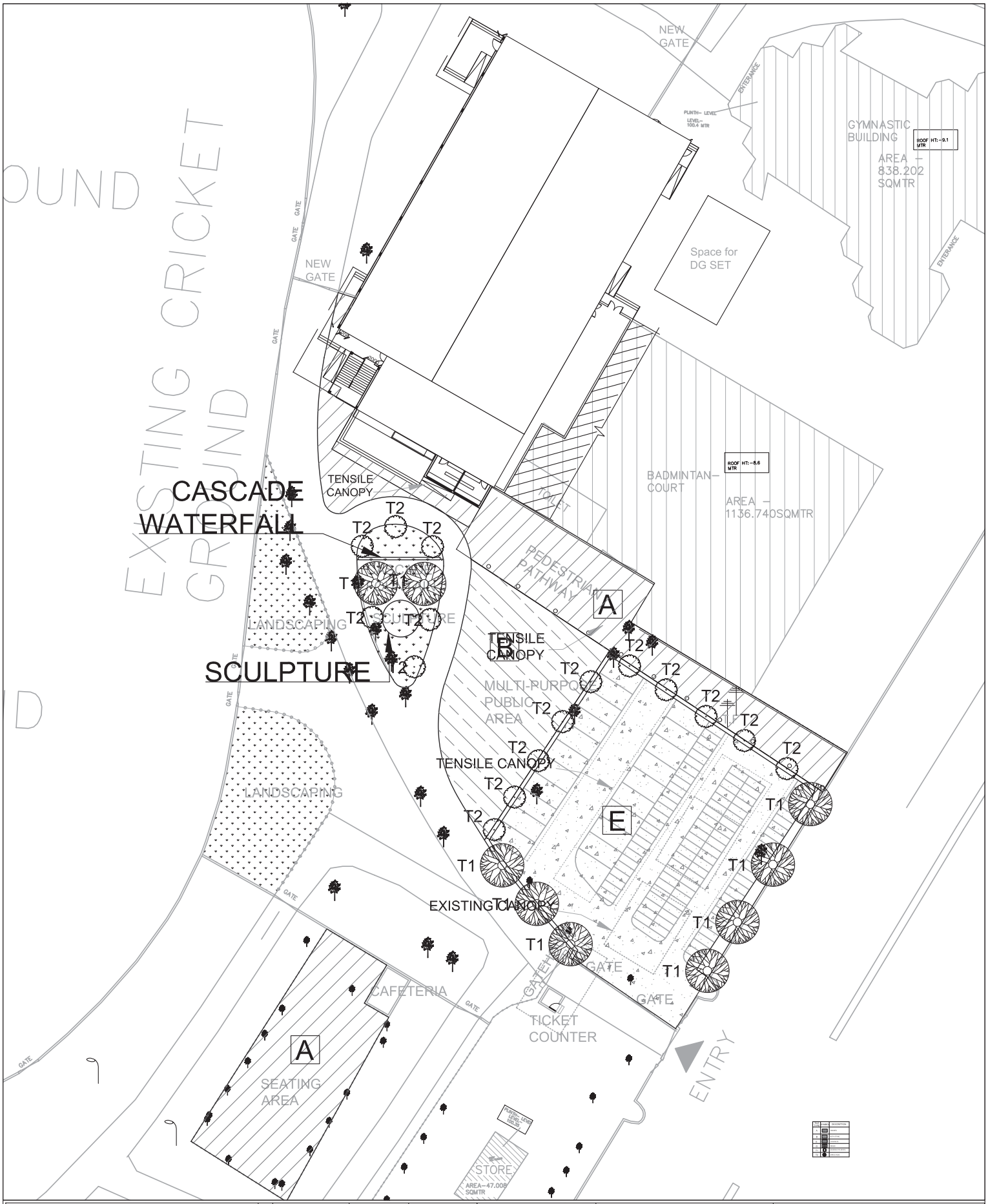
Drg No: AR-01-11

Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Connection to existing badminton court



GENERAL NOTES:

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4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

TILE TYPE	SYMBOL	DESCRIPTION
A		GRANITE
B		KOTA STONE
E		CONCRETE
G		GRASS
T1		AZADIRACHTA INDICA
T2		ARECA PALM

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: ED-00-01

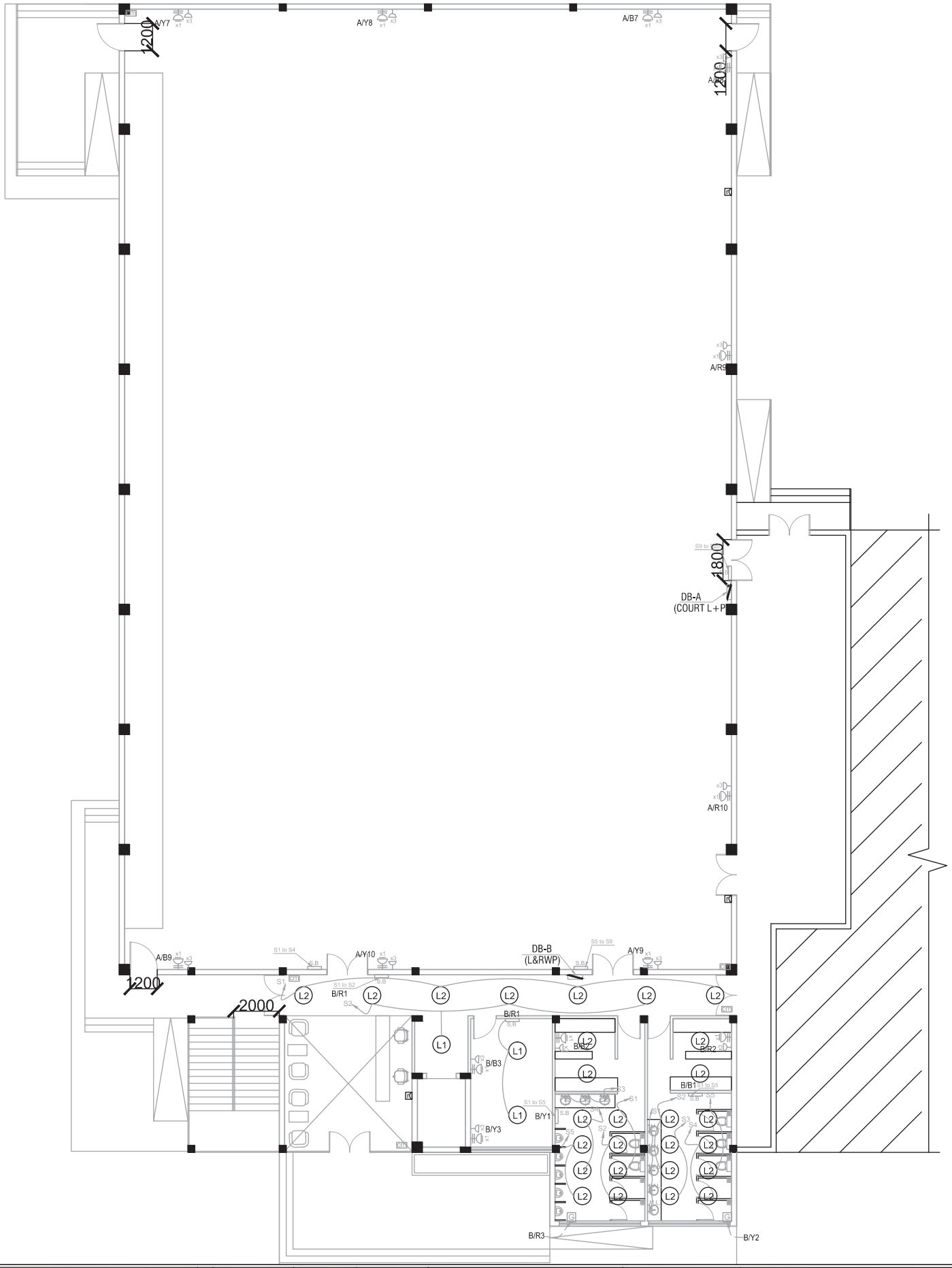
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Landscaping Plan

SREI



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4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

ELECTRICAL SYMBOLS

S. NO.	NOTATION	DESCRIPTION	HEIGHT	S. NO.	NOTATION	DESCRIPTION	HEIGHT
1	S.B	SWITCH BOARD	3'-0"	10	R	WIRELESS ROUTER	CEILING
2	1/2	1/2 AMP SOCKET	1'-0"	11	T.L.	TUBELIGHT POINT	CEILING
3	1/2	1/2 AMP SOCKET	1'-0"	12	G	GEYSER POINT	
4	E.X.	EXHAUST FAN	8'-0"	13	L1	36W LED LIGHT (RECESSED SURFACE)	
5	T.P.	TELEPHONE	1'-0"	14	L2	36W LED LIGHT (RECESSED SURFACE)	
6	B.L.	BRACKET LIGHT	8'-0"	15	FL	200W FLOOD LIGHT	
7	CAM	CAMERA	7'-0"				
8	M.L.	MIRROR LIGHT	5'-0"				

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: EL-01-01

Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor Electrical Plan

SREI

DB-B (Light & Raw Power 4 Way TPN DB)

Location :- GROUND FLOOR

Size of Sub Main :-4Cx16Sqmm AL.ARM.XLPE CABLE				
Rating of Incomer :- 63 Amp 4 Pole MCCB,25KA)				
Ckt No.	No. of Points	Connected Load Watt	Size of Wire In Sqmm	Rating of MCB
B/R1	L2=7x18 L1=4x24	222	3 x 1.5	10A/SP
B/Y1	L2=8x18 ML=4x8	176	3 x 1.5	10A/SP
B/B1	L2=8x18 ML=4x8	176	3 x 1.5	10A/SP
B/R2	1x1000	1000	3 x 4	20A/SP
B/Y2	1x2000	2000	3 x 6	20A/SP
B/B2	1x1000	1000	3 x 4	20A/SP
B/R3	1x2000	2000	3 x 6	20A/SP
B/Y3	1x1000	1000	3 x 4	20A/SP
B/B3	1x1000	1000	3 x 4	20A/SP
B/R4	L1=4x24	216	3 x 1.5	10A/SP
B/Y4 & B/B4		SPARE		
	TOTAL	8790W		
	SAY	8.79KW		

DB-A (Light □ Raw Power 12 Way TPN DB)

Location :- COURT AREA

Si□e of Sub Main :-4Cx1□S□mm AL.ARM.XLPE CABLE				
Rating of Incomer :- □3 Amp 4 Pole MCCB,2□KA)				
Ckt No.	No. of Points	Connected Load Watt	Si□e of Wire In S□mm	Rating of MCB
A/R1	FL□4x200	800	3 x 2.□	10A/SP
A/R2	FL□4x200	800	3 x 2.□	10A/SP
A/Y1	FL□4x200	800	3 x 2.□	10A/SP
A/Y2	FL□4x200	800	3 x 2.□	10A/SP
A/B1	FL□4x200	800	3 x 2.□	10A/SP
A/B2	FL□4x200	800	3 x 2.□	10A/SP
A/R3	FL□4x200	800	3 x 2.□	10A/SP
A/R4	FL□4x200	800	3 x 2.□	10A/SP
A/Y3	FL□4x200	800	3 x 2.□	10A/SP
A/Y4	FL□4x200	800	3 x 2.□	10A/SP
A/B3	FL□4x200	800	3 x 2.□	10A/SP
A/B4	FL□4x200	800	3 x 2.□	10A/SP
A/R□	FL□4x200	800	3 x 2.□	10A/SP
A/R□	FL□4x200	800	3 x 2.□	10A/SP
A/Y□	FL□4x200	800	3 x 2.□	10A/SP
A/Y□	FL□4x200	800	3 x 2.□	10A/SP
A/B□	FL□4x200	800	3 x 2.□	10A/SP
A/B□	FL□4x200	800	3 x 2.□	10A/SP
A/R□	FL□4x200	800	3 x 2.□	10A/SP
A/R8	FL□4x200	800	3 x 2.□	10A/SP
A/Y□	1x1000	1000	3 x 4	20A/SP
A/Y8	1x1000	1000	3 x 4	20A/SP
A/B□	1x1000	1000	3 x 4	20A/SP
A/B8	1x1000	1000	3 x 4	20A/SP
A/R□	FL□4x200	1000	3 x 2.□	20A/SP
A/R10	FL□4x200	1000	3 x 2.□	20A/SP
A/Y□	1x1000	1000	3 x 4	20A/SP
A/Y10	1x1000	1000	3 x 4	20A/SP
A/B□	1x1000	1000	3 x 4	20A/SP
A/B10,A/R11,A/R12,A/Y11, A/Y12,A/B11 □ A/B12		SPARE		
	TOTAL	1□000W		
	SAY	1□00KW		

GENERAL NOTES:

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2. All levels are in milimetres and are finished unless otherwise specified. All levels are mentioned in the section.

3. Do not scale drawings. Only written dimensions shall be followed, any discrepancy noted shall be brought to the notice of the Architect prior to the execution.

4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: EL-01-02

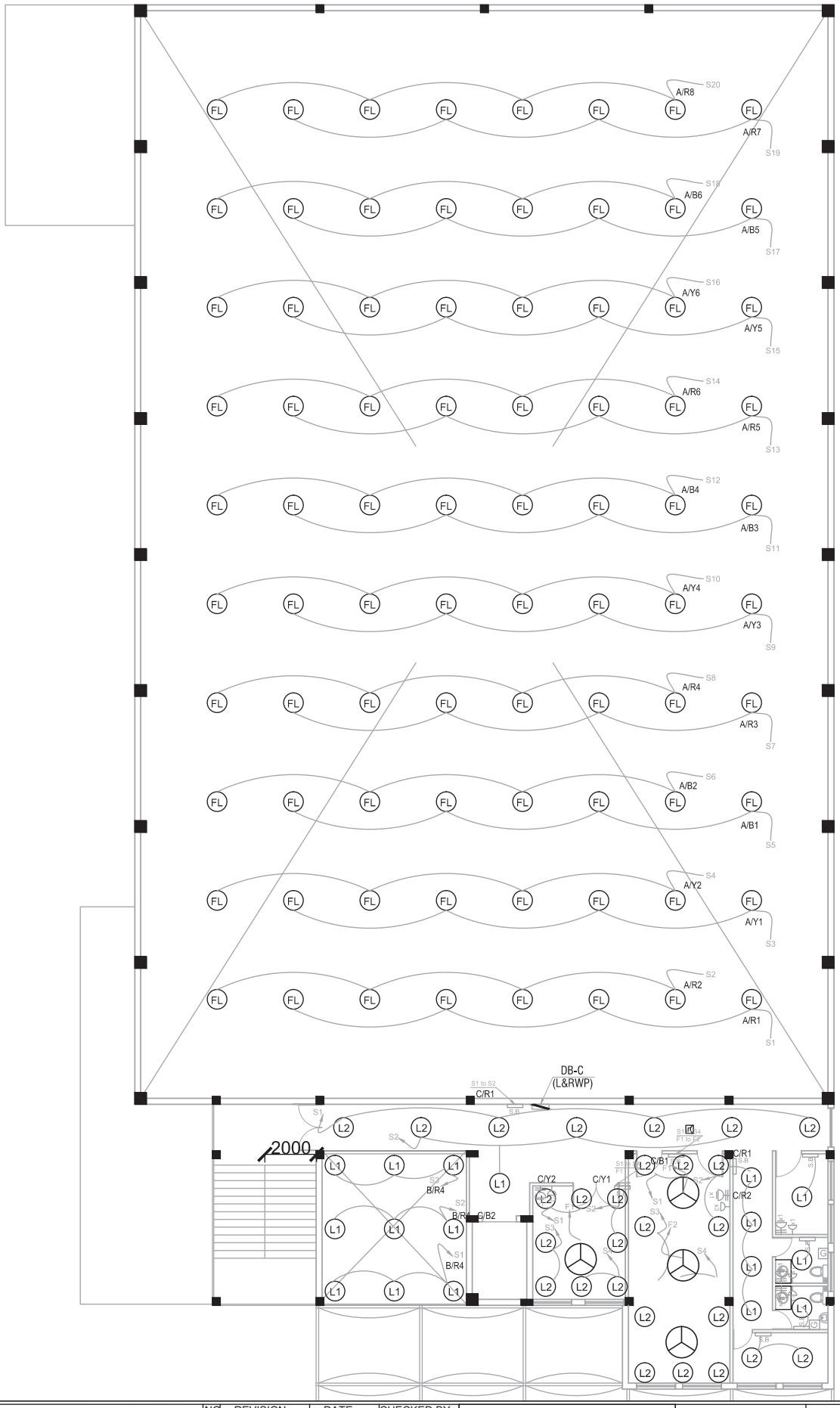
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor and Court Area DB Details

SREI



GENERAL NOTES:

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4.For details such as pathways, fencing, railing, grills, lighting fixtures, street sections etc. refer relevant architectural/landscape drawings.

NO.	REVISION	DATE	CHECKED BY
1	-	Date: 28.01.20	
2	01	Date: 28.02.20	

ELECTRICAL SYMBOLS

S. NO.	NOTATION	DESCRIPTION	HEIGHT	S. NO.	NOTATION	DESCRIPTION	HEIGHT
1	S.B.	SWITCH BOARD	3'-7"	10	W	WIRELESS ROUTER	CEILING
2	1/2	1/2 AMP SOCKET	1'-6"	11	T.L.	TUBELIGHT POINT	CEILING
3		1/2 AMP SOCKET	1'-6"	12	G	GEYSER POINT	
4	E.X.	EXHAUST FAN	8'-0"	13	L1	36W LED LIGHT (RECESSED FIXTURE)	
5	T.P.	TELEPHONE	1'-6"	14	L2	18W LED PANEL (RECESSED FIXTURE)	
6	B.L.	BRACKET LIGHT	8'-7"	15	FL	200W FLOOD LIGHT	
7	CAM	CAMERA	7'-6"				
8	M.L.	MIRROR LIGHT	5'-7"				

Note:

1.This is a Tender Drawing. Selected Contractor shall submit a detailed shop drawing (GFC) for approval by the client.

Purpose :

TENDER DRAWING

Client-
BAREILLY SMART CITY LTD.

Project-
Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: EL-01-03

Checked by: NG

Date: 28.01.20

Dealt by : KG

Title:
First Floor Electrical Plan

SREI

DB-C (Light & Raw Power 4 Way TPN DB)

Location :- FIRST FLOOR

Size of Sub Main :-4Cx16Sqmm AL.ARM.XLPE CABLE				
Rating of Incomer :- 63 Amp 4 Pole MCCB,25KA)				
Ckt No.	No. of Points	Connected Load Watt	Size of Wire In Sqmm	Rating of MCB
C/R1	L2=7x18 L1=4x24 FP=1X60	282	3 x 1.5	10A/SP
C/Y1	L2=8x18 FP=2X60	264	3 x 1.5	10A/SP
C/B1	L2=8x18 FP=2X60	264	3 x 1.5	10A/SP
C/R2	1x1000	1000	3 x 4	20A/SP
C/Y2	1x1000	1000	3 x 4	20A/SP
C/B2	1x1000	1000	3 x 4	20A/SP
C/R3	SPARE			
C/Y3	SPARE			
C/B3	SPARE			
C/R4,C/Y4 & C/B4		SPARE		
	TOTAL	3810W		
	SAY	3.81KW		

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NO.	REVISION	DATE	CHECKED BY

Note:

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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: EL-01-04

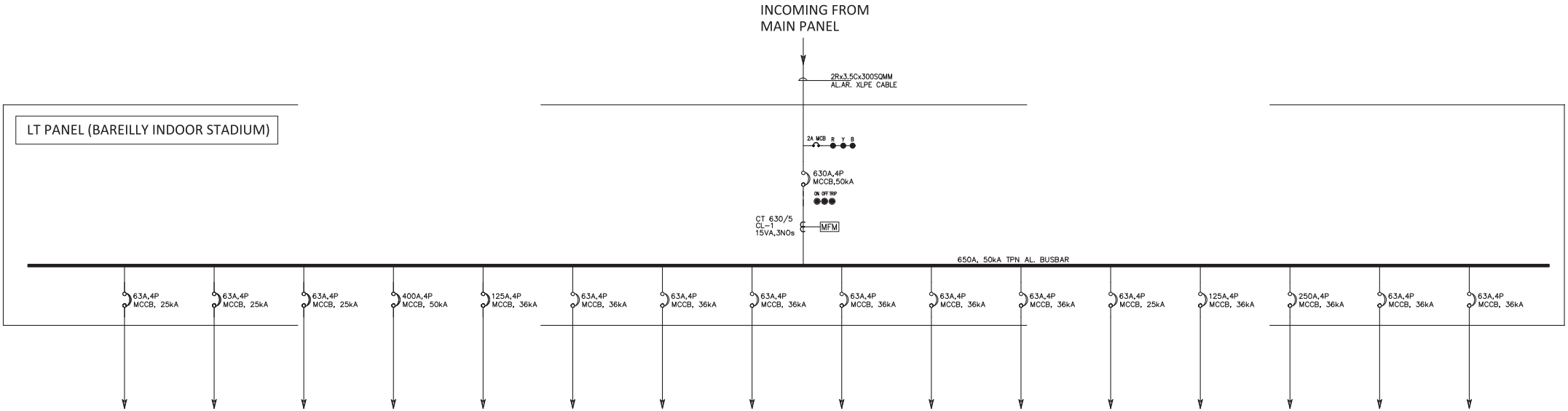
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor DB Details

SREI



FEEDER DESCRIPTION	(L&RWP)	(L&RWP)	COMPOUND/ EXT.LIGHTING	HVAC	FIRE FIGHTING ETC	TESTING MACHINE-1	TESTING MACHINE-2	TESTING MACHINE-3	TESTING MACHINE-4	TESTING MACHINE-5	TESTING MACHINE-6	COURT LIGHTING	SPARE	SPARE	SPARE	SPARE
LOCATION	GROUND FLOOR	FIRST FLOOR	-	-	-											
LOAD IN KW	15	10	10	150	20	10	10	10	10	10	10	15				
Size of Cable (SQMM AL.AR. XLPE CABLE)	4x16	4x16	4x16	3.5x300	3.5x70	4x16	4x16	4x16	4x16	4x16	4x16	4x16				

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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: EL-01-05

Checked by: NG

Date: 28.01.20

Dealt by : KG

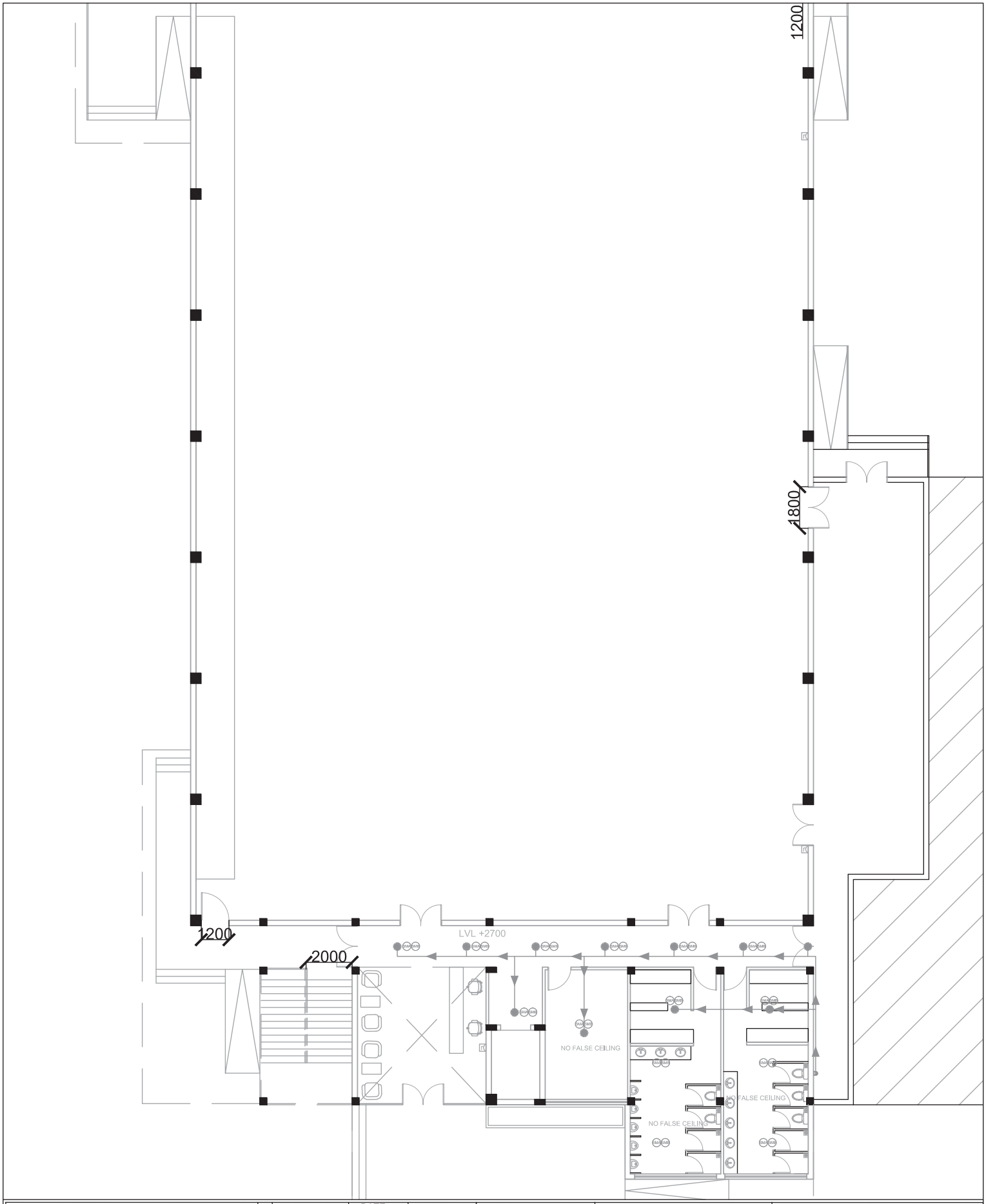
Title: SLD

SREI

LOAD CALCULATIONS & SLD FOR LT PANEL

BAREILLY INDOOR STADIUM

sn	LOCATION	LIGHTING LOAD	MOTORISED LOAD	TOTAL LOAD	RATING & TYPE OF	SIZE OF CABLE	FEEDER NO
		IN KW	IN KW	IN KW	SWITCHGEAR IN AMP	IN SQMM AL.ARM	OF LT PANEL
1	INCOMER OF LT PANEL			310	630A,4P,MCCB,50 KA	2RUNS OF 3.5X300	F1
2	GROUND FLOOR(L&RWP)	15		15	63A,4P,MCCB 25KA	4X16	F2
3	FIRST FLOOR(L&RWP)	10		10	63A,4P,MCCB 25KA	4X16	F3
4	COMPOUND/EXT.LIGHTING	10		10	63A,4P,MCCB 25KA	4X16	F4
5	HVAC		150	150	400A,4P,MCCB,50KA	3.5X300	F5
6	FIRE FIGHTING ETC		20	20	125A,4P,MCCB,36KA	3.5X70	F6
7TO 12	TESTING MACHINES 6 NOS		6X10KW EACH	60	6NOS,63A,4P,MCCB,36KA	6 NOS CABLES OF 4X16	F7-F12
13	COURT LIGHTING	15		15	63A,4P,MCCB 25KA	4X16	F13
14	SPARE FEEDERS				125A,4P,MCCB,36KA		F14
15	SPARE FEEDERS				250A,4P,MCCB,36KA		F15
16	SPARE FEEDERS				63A,4P,MCCB,36KA		F16
17	SPARE FEEDERS				63A,4P,MCCB,36KA		F17
	Total			280			
	10% for future Provision	10%		30			
	Grand Total			310			



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NO.	REVISION	DATE	CHECKED BY

Note:

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S.No.	Symbol	Description
1	SM SMB	Smoke Detector
2		Sprinkler

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: FF-01-01

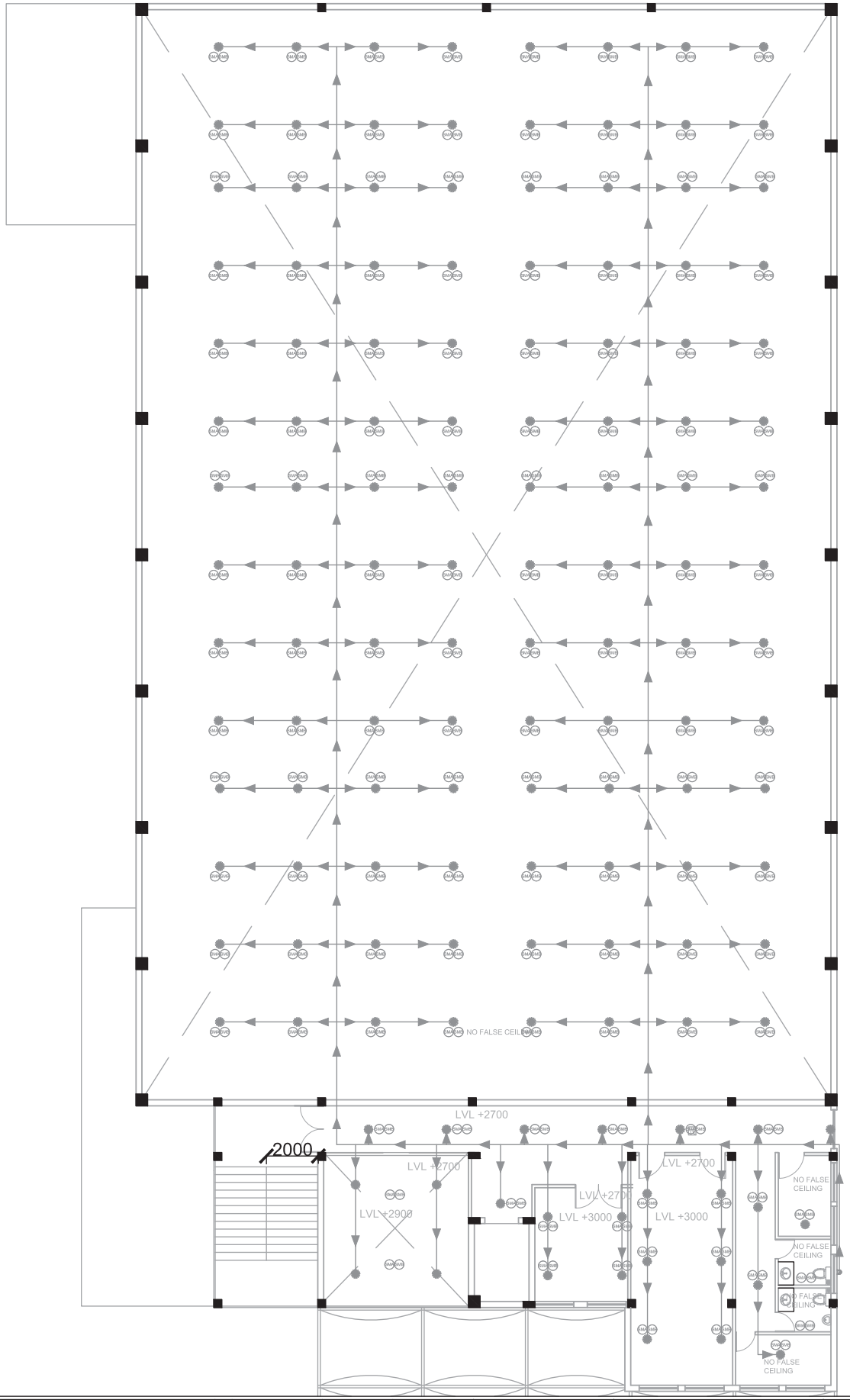
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor Firefighting Plan

SREI



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S.No.	Symbol	Description
1		Smoke Detector
2		Sprinkler

Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: FF-01-02

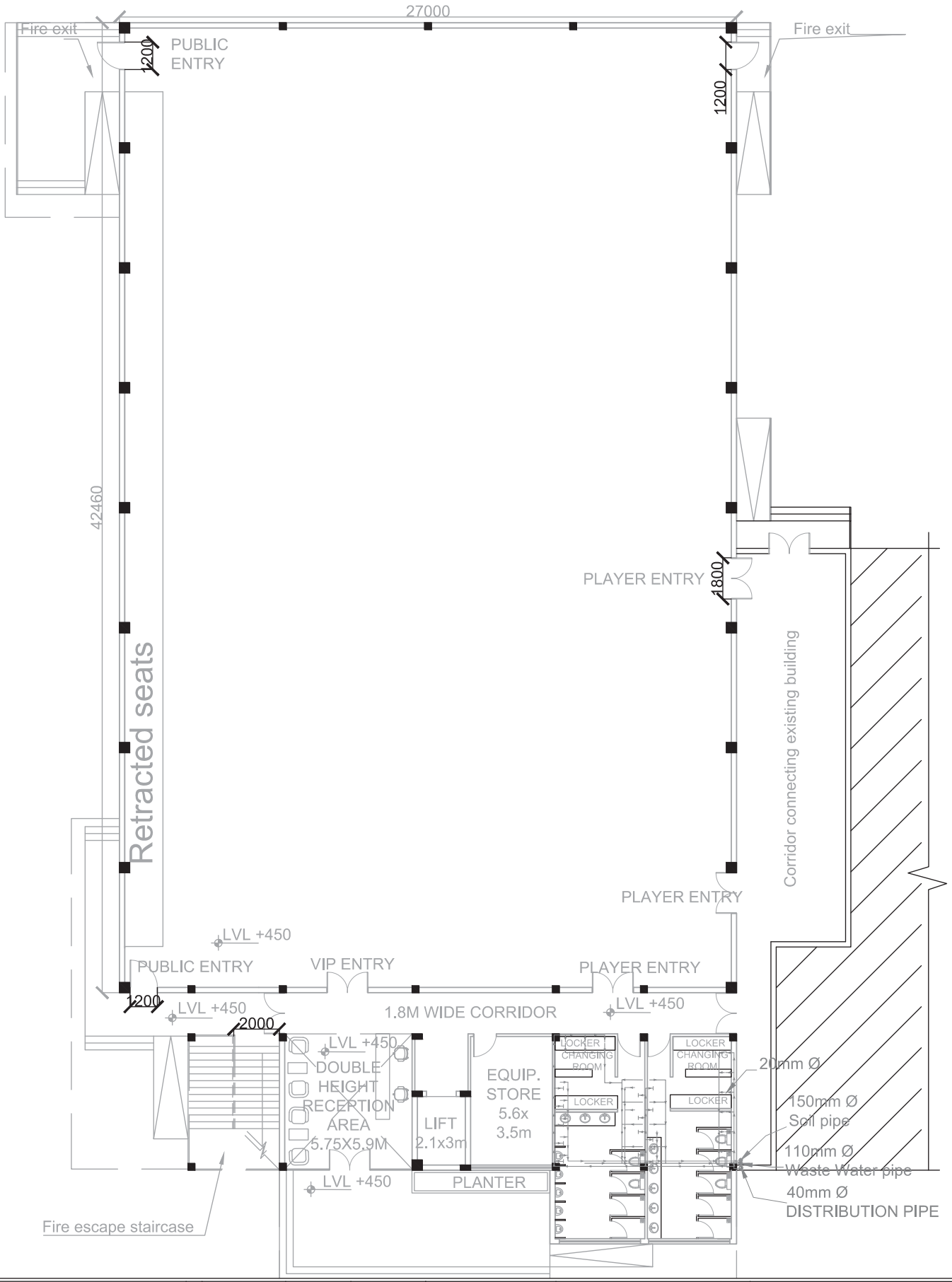
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor Firefighting Plan

SREI



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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: PL-01-01

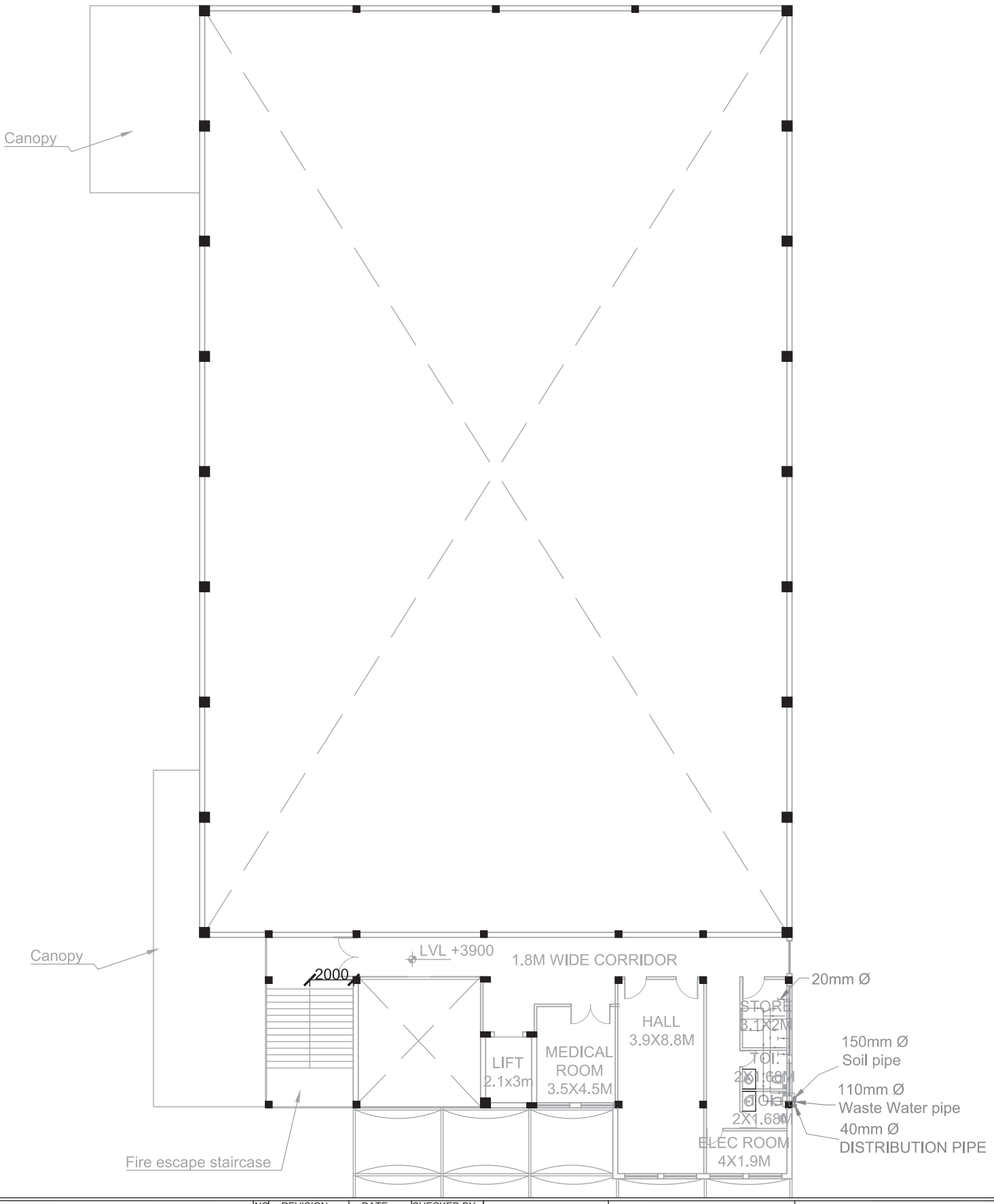
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor Plumbing Plan

SREI



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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A3

North:

Drg No: PL-01-02

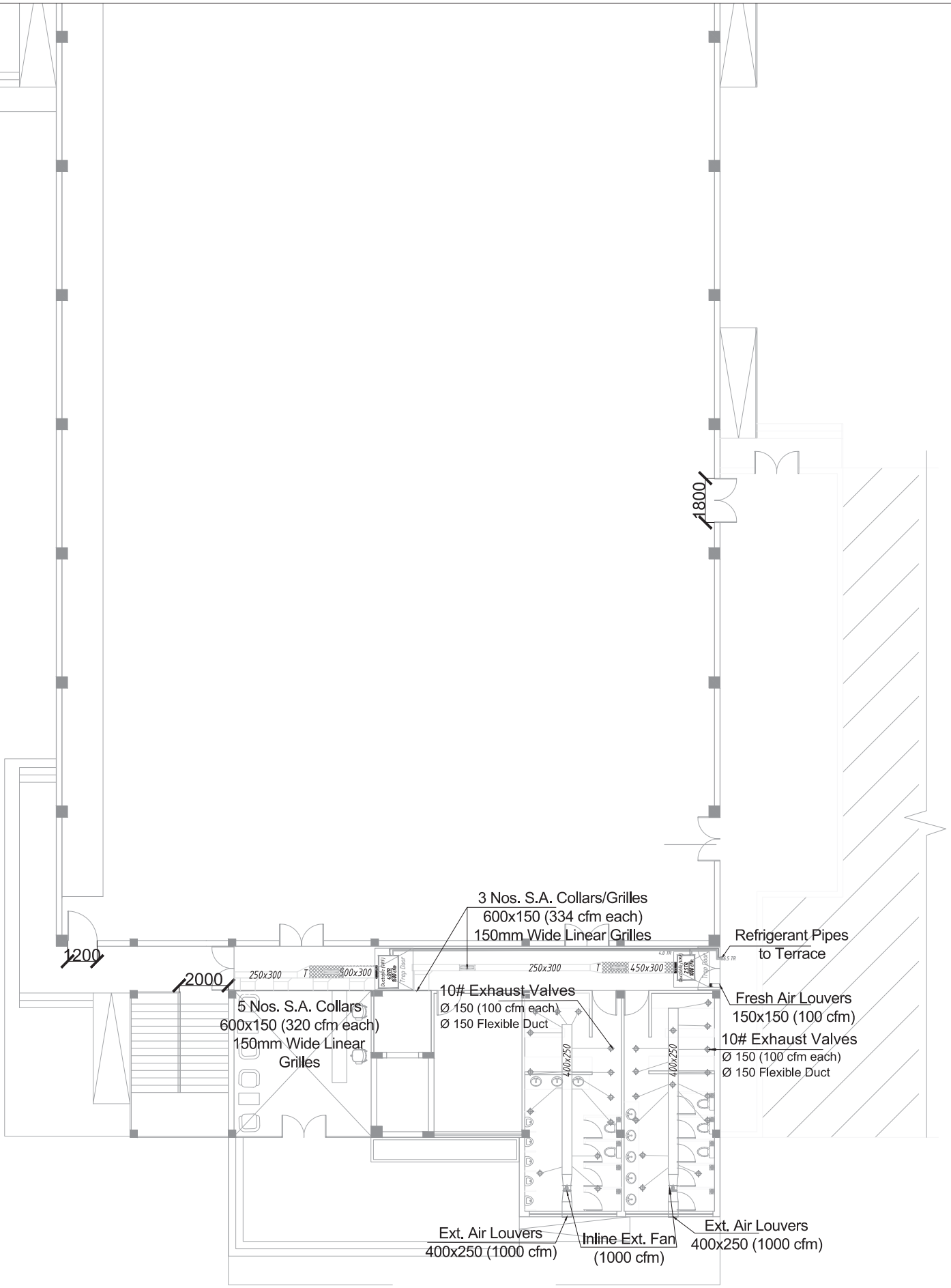
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor Plumbing Plan

SREI



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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A2

North:

Drg No: UT-01-01

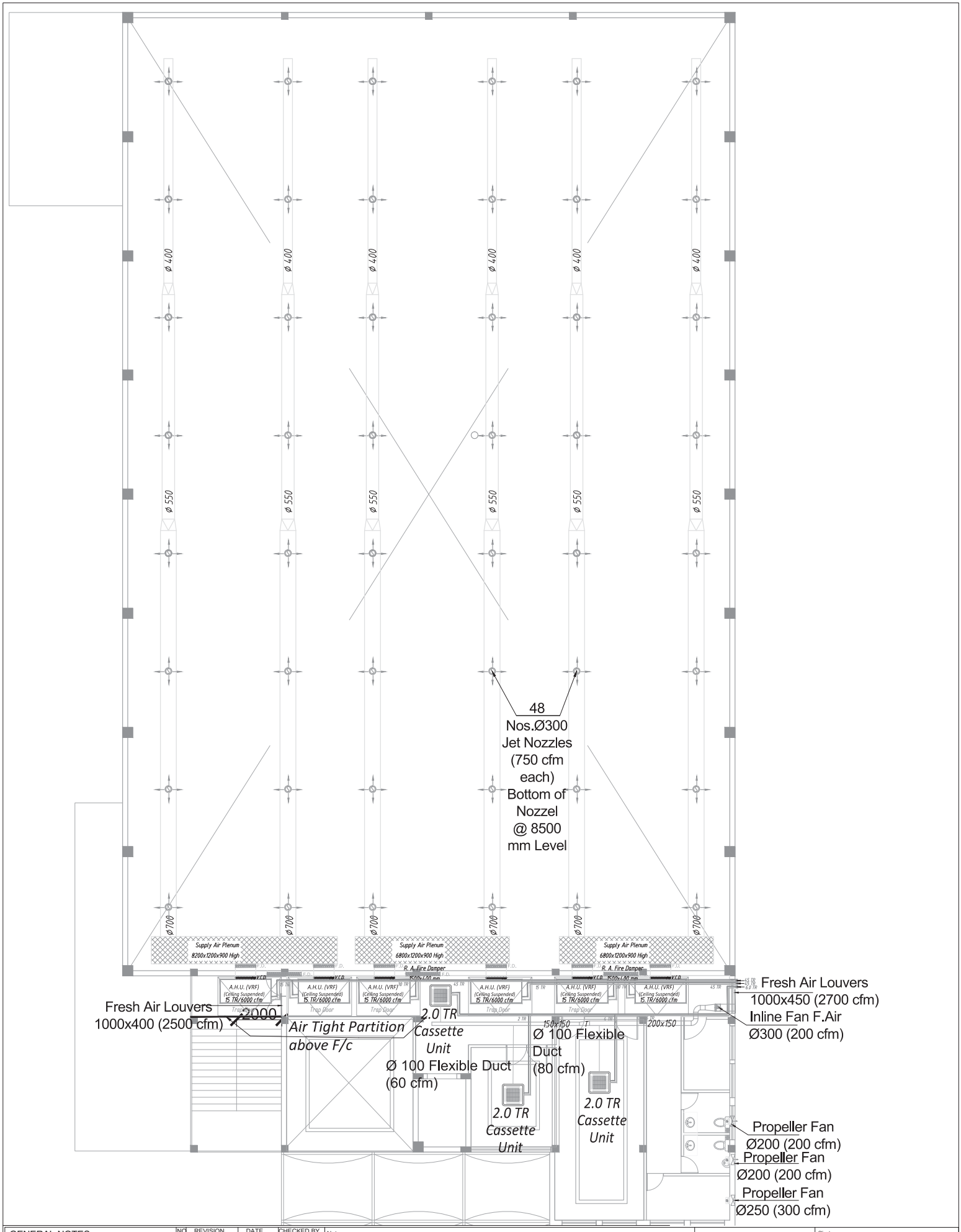
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Ground Floor HVAC Plan

SREI



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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A2

North:

Drg No: UT-01-02

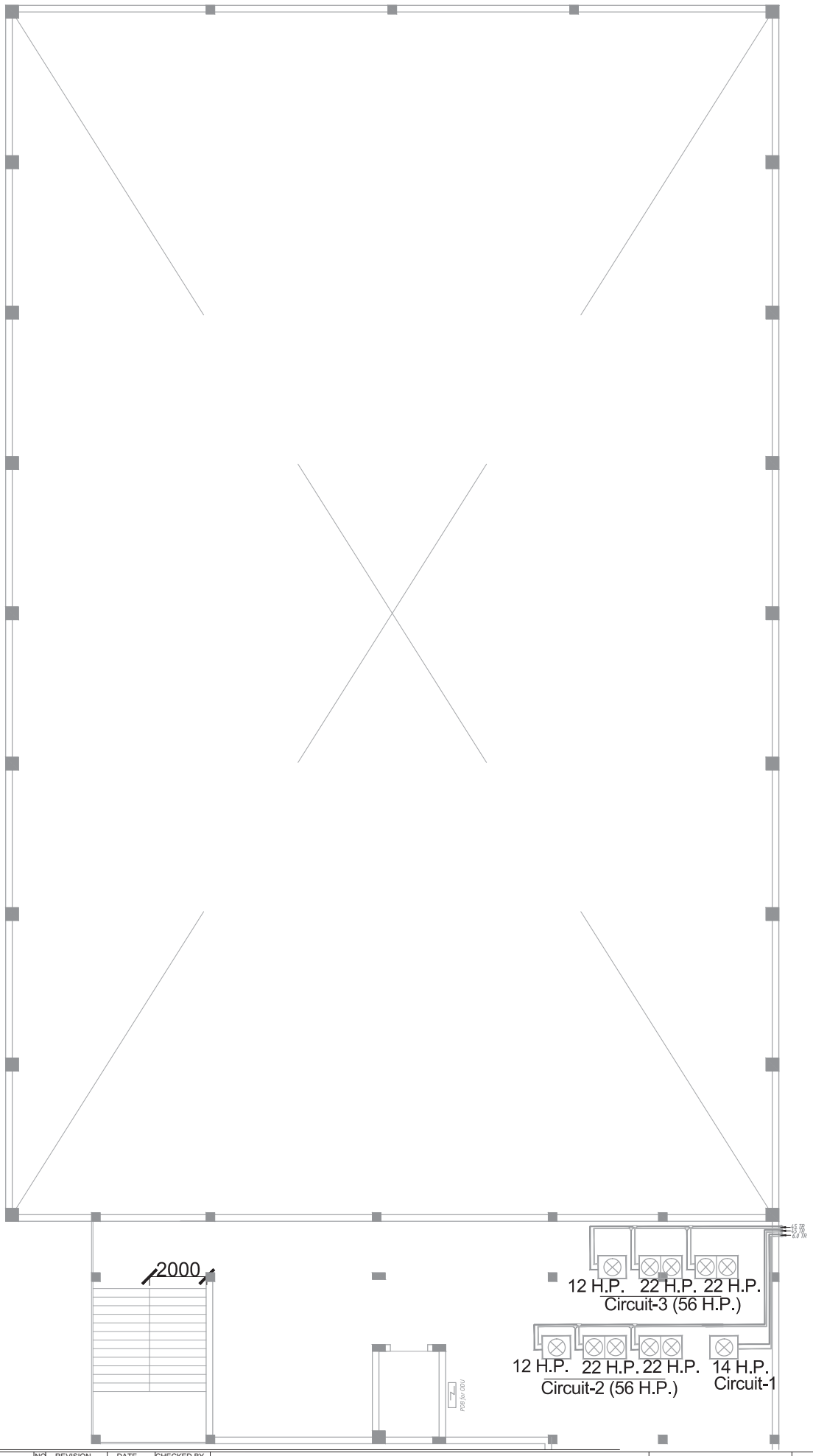
Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: First Floor HVAC Plan

SREI



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NO.	REVISION	DATE	CHECKED BY

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Purpose :

TENDER DRAWING

Client- BAREILLY SMART CITY LTD.

Project- Indoor Stadium

Scale: Not to Scale @ A2

North:

Drg No: UT-01-03

Checked by: NG

Date: 28.01.20

Dealt by : KG

Title: Terrace Floor HVAC Plan

SREI

Electrical Load of HVAC System for Indoor Stadium

S. No.	Equipment	Power (Kw)	Quantity (Nos)	Total Power (Kw)
	Location: Terrace			
1	ODU 22 HP	21.5	4	86
2	ODU 12 HP	11.7	2	23.4
3	ODU 14 HP	13.7	1	13.7
4	AHU 15 TR / 6000 cfm	3.7	6	22.2
			Total A	**145.3**
	Note:-			
	In addition to the above, there Indoor Units, prrpeller fans, Inline fans etc. for which 15 amp single phase a.c. supply (switch socket) is required.			
	100 watt	0.10	8	0.8
	670 watt	0.67	8	5.36
			Total B	**5.36**
			Total (A+B)	**151**

HEAT LOAD SUMMERY : Indoor Stadium_Bareilly

Room Description	Name of	Unit	Stadium Hall Double Height	Hall FF	Medical Room FF	Reception Area Double Height	Lift Lobby & Corridor GF	Lift Lobby & Corridor FF	Total
	Sheet Name		1	2	3	4	5	6	
	L	Ft.	139	11	11	19			
	W	Ft.	89	18	18	19			
	Area	Ft.	12334	210	210	365	445	445	**14008**
	Ht. (Slab)	Ft.	33	13	13	26	13	13	
	Ht. (F/ C)	Ft.	30	11	11	24	10	10	
	Area (A/C)	Sq.Ft.	12334	210	210	365	445	445	**14008**
	Volume	Cu.Ft.	368135	2306	2306	8759	4451	4451	**390409**
Glass	**N**	Sq.Ft.							**0**
	NE	Sq.Ft.							**0**
	E	Sq.Ft.							**0**
	SE	Sq.Ft.						29	**29**
	S	Sq.Ft.							**0**
	SW	Sq.Ft.		48	48	46			**143**
	W	Sq.Ft.							**0**
	NW	Sq.Ft.							**0**
	Sky Light	Sq.Ft.							**0**
Wall	**N**	Sq.Ft.							**0**
	NE	Sq.Ft.	2905						**2905**
	E	Sq.Ft.							**0**
	SE	Sq.Ft.	4568				77	48	**4694**
	S	Sq.Ft.							**0**
	SW	Sq.Ft.	891	101	101				**1094**
	W	Sq.Ft.							**0**
	NW	Sq.Ft.	4568					77	**4645**
Roof Sun		Sq.Ft.							**0**
Roof Insulated		Sq.Ft.	12334	210	210	365		445	**13563**
Partition glass		Sq.Ft.							**0**
Partition wall		Sq.Ft.		391	289	1296	899	405	**3280**
Ceiling		Sq.Ft.							**0**
Floor		Sq.Ft.	12334			365	445		**13144**
Occupancy		No.	500	8	6	8	2	2	**526**
Light @ W/sqft	**1.0**	Watt	12334	210	210	365	445	445	**14008**
Equipment Load		Kw	2.0						**2**
Fresh Air		cfm	5000	80	60	80	70	70	**5360**
Calulated TR		Ton	**89.50**	**2.19**	**1.87**	**3.86**	**2.37**	**1.81**	**101.60**
Calculated Dehum. cfm		cfm	**29611**	**769**	**677**	**1454**	**926**	**678**	**34115**
Selected TR		Ton	**90.0**	**2.0**	**2.0**	**4.0**	**2.5**	**2.0**	**102.50**
Selected Dehum. cfm		cfm	**36000**	**800**	**800**	**1600**	**1000**	**800**	**41000**
		sqft/TR	137.0	104.8	104.8	91.2	178.1	222.6	136.7
		cfm/Sqf	2.9	3.8	3.8	4.4	2.2	1.8	2.9

ROOM DATA SHEET : INDOOR STADIUM_BAREILLY													
S. No.	Room Name	Room Area	Room Height	F/ C Height	Occupancy	Lighting Load	Equip. Load	Fresh Air	Calculated Cooling Load		Selected Cooling Load		Selected Equipment
		(Sq.Ft.)	(Ft.)	(Ft.)	Nos.	(Watt)	(KW)	(CFM)	(TR)	(CFM)	(TR)	(CFM)	
1	Reception Area (Double Height)	365	26	24	8	365	0	80	3.86	1454	4.0	1600	1 # 4.0 TR (VRF) Ductable Unit
2	Lift Lobby & Corridor G.F.	445	13	10	2	445	0	70	2.37	936	2.5	1000	1 # 2.5 TR (VRF) Ductable Unit
3	Hall (First Floor)	210	13	11	8	210	0	80	2.19	769	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
4	Medical Room (First Floor)	210	13	11	6	210	0	60	1.87	677	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
5	Lift Lobby & Corridor F.F.	445	13	10	2	445	0	70	1.81	678	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
	SUB TOTAL - A	**1675**			**26**	**1675**	**0**	**360**	**12.1**	**4514**	**12.5**	**5000**	
	PROPOSED	**Total IDU Capacity = 12.5 TR**					**Total ODU Capacity= 14 H.P. (1 Circuit of 14 HP)**						
3	Stadium Hall (Double Height)	12334	33	30	500	12334	2.0	5000	89.50	29611	90.0	36000	6 # 15.0 TR AHU (VRF)
	SUB TOTAL - B	**12334**			**500**	**12334**	**2.0**	**5000**	**89.50**	**29611**	**90.0**	**36000**	
	PROPOSED	**Total IDU Capacity = 90.0 TR**					**Total ODU Capacity= 112 H.P. (2 Circuits of 56 HP each)**						
	TOTAL (A + B)	**14009**			**526**	**14009**	**2.0**	**5360**	**101.6**	**34125**	**102.5**	**41000**	

ENGINEERING DESIGN BASIS

1. GENERAL:

The engineering design basis for HVAC system is meant for loading functional requirements, quality standards, applicable codes and design parameters etc. to be adopted as a basis for design calculations and preparation of drawings and as guidelines for erection, testing and commissioning of the works.

2. DESIGN PHILOSOPHY:

The intent of the HVAC design is to provide a functional, economical, environment friendly and sustainable design that will provide comfort working conditions of the building occupants. The design approach shall be sensitive to environmental issues. The main thrust shall be laid on energy conservation, safety and ease of maintenance.

3. LOCATION:

The site is located at Bareilly U. P., India. The HVAC system shall be designed to provide air conditioning for ground & first floor Indoor Stadium Building Bareilly. Winter heating is not required.

4. DESIGN PARAMETERS:

The following design parameters are assumed for designing the HVAC system of the proposed building:-

a) OUTDOOR DESIGN CONDITIONS:

Reference: ISHRAE Hand Book	
Summer	
Dry Bulb Temp.	43.0 deg. C (110 deg. F)
Wet Bulb Temp.	23.9 deg. C (75 deg. F)
Monsoon	
Dry Bulb Temp.	35.0 deg. C (95 deg. F)
Wet Bulb Temp.	28.3 deg. C (83 deg. F)
Winter	
Dry Bulb Temp.	7.2 deg. C (45 deg. F)
Wet Bulb Temp.	5.0 deg. C (41 deg. F)
Daily Range	25 deg. F

b) INSIDE DESIGN CONDITIONS:

Summer , Monsoon	
Dry Bulb Temp.	24 ± 1 deg. C (75 ± 2 deg F)
Relative Humidity (RH)	55± 5%

c) FRESH AIR REQUIREMENTS:

- For air-conditioning : 10 cfm per person outside air.
- For toilet ventilation : 20 air changes per hour.

d) LIGHTING & EQUIPMENT LOAD:

- Lighting Load : 1.0 watt/Sq.Ft
- Equipment Load : As per Room Data Sheet

e) AIR FILTERATION:

Pre-filters with efficiency of 90% down to 10 microns will be used.
Filtered fresh air shall be supplied to the space directly and mixed with return air.

f) GENERAL ASSUMPTIONS:

- Building Orientation is considered as marked on the drawings.
- Exposed roofs are considered with under deck insulation with 16 mm thick closed cell elastomeric insulation material.

g) HEAT TRANSFER VALUES (U- FACTORS):

- For exposed wall : 0.36 BTU/hr-sqft-°F
- For Roof (insulated) : 0.15 BTU/hr-sqft-°F
- For transmission thru glass : 1.13 BTU/hr-sqft-°F
- Overall factor for external glazing : 0.56

h) DESIGN PARAMETERS FOR SELECTING A.H.U. & DUCTABLE UNITS :

The Air Handling Units (AHU) shall be of double skin construction and Ductable Units shall be of Single skin construction, draw-thru type, comprising of filter section, coil section, fan section. AHU shall be selected for the lowest operating noise level. For selecting the air handling units, the following design parameters shall be considered: -

Maximum face velocity across pre-filters	:	500 fpm (2.5 m/sec)
Maximum face velocity across cooling coil	:	500 fpm (2.5 m/sec)
Maximum fan outlet velocity	:	2000 fpm (10.2 m/sec)
Maximum fan speed Fans up to 300 mm dia Fans above 300 mm dia	 : :	 1440 rpm. 900 rpm.
Maximum fan motor speed	:	1440 rpm.

i) DESIGN PARAMETERS FOR DUCT DESIGN:

The ducts shall be fabricated from galvanized steel sheets. Galvanized steel sheet shall be of lock forming quality. All ducts shall be fabricated as per SMACNA standard or BIS specifications. Ducts shall be fabricated in rectangular/round profile with the aspect ratio not more than 4. If space available, bends shall be made with radius not less than one-half the width of the duct. Changes in dimensions and shapes of ducts shall be gradual. Tapering angles shall not be more than 30 degrees (tapering ratio shall be between 1:4 and 1:7). The following design parameters shall be considered designing: -

Maximum flow velocity thru ducts	:	1500 fpm (7.5 m/sec)
Maximum friction	:	0.1 inch WG/100 Ft.Run (1 cm WG/100 m run)
Maximum velocity at supply air grilles	:	500 fpm (2.5 m/sec)

5. ROOM DATA SHEET:

Based on the above design conditions the estimated cooling loads and air condoning equipment selection are as under:

ROOM DATA SHEET : INDOOR STADIUM_BAREILLY													
S. No.	Room Name	Room Area	Room Height	F/ C Height	Occupancy	Lighting Load	Equip. Load	Fresh Air	Calculated Cooling Load		Selected Cooling Load		Selected Equipment
		(Sq.Ft.)	(Ft.)	(Ft.)	Nos.	(Watt)	(KW)	(CFM)	(TR)	(CFM)	(TR)	(CFM)	
1	Reception Area (Double Height)	365	26	24	8	365	0	80	3.86	1454	4.0	1600	1 # 4.0 TR (VRF) Ductable Unit
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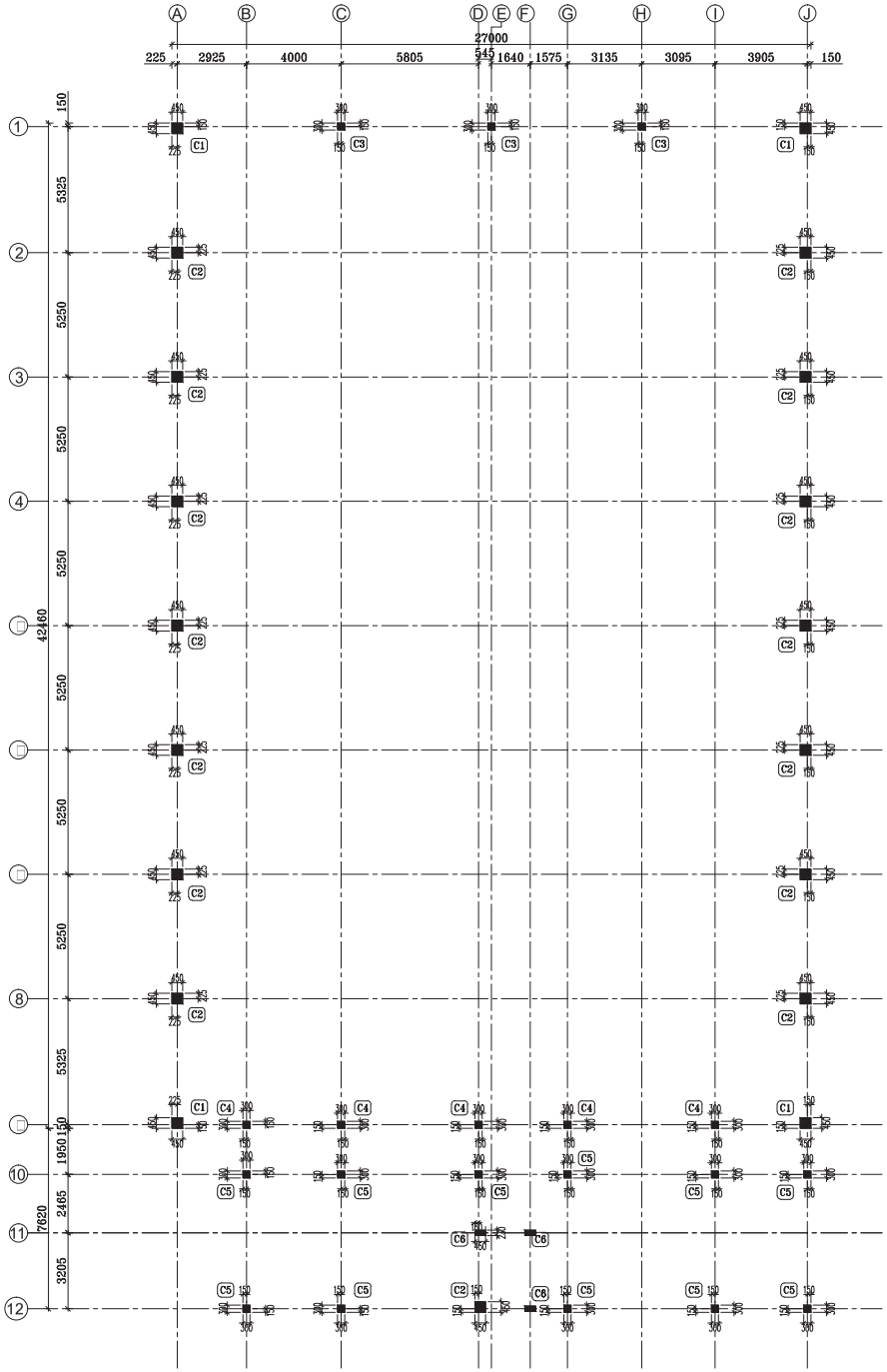
3	Hall (First Floor)	210	13	11	8	210	0	80	2.19	769	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
4	Medical Room (First Floor)	210	13	11	6	210	0	60	1.87	677	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
5	Lift Lobby & Corridor F.F.	445	13	10	2	445	0	70	1.81	678	2.0	800	1 # 2.0 TR (VRF) Cassette Unit
	SUB TOTAL - A	**1675**			**26**	**1675**	**0**	**360**	**12.1**	**4514**	**12.5**	**5000**	
	PROPOSED	**Total IDU Capacity = 12.5 TR**					**Total ODU Capacity= 14 H.P. (1 Circuit of 14 HP)**						
3	Stadium Hall (Double Height)	12334	33	30	500	12334	2.0	5000	89.50	29611	90.0	36000	6 # 15.0 TR AHU (VRF)
	SUB TOTAL - B	**12334**			**500**	**12334**	**2.0**	**5000**	**89.50**	**29611**	**90.0**	**36000**	
	PROPOSED	**Total IDU Capacity = 90.0 TR**					**Total ODU Capacity= 112 H.P. (2 Circuits of 56 HP each)**						
	TOTAL (A + B)	**14009**			**526**	**14009**	**2.0**	**5360**	**101.6**	**34125**	**102.5**	**41000**	

6. SYSTEM PROPOSED:

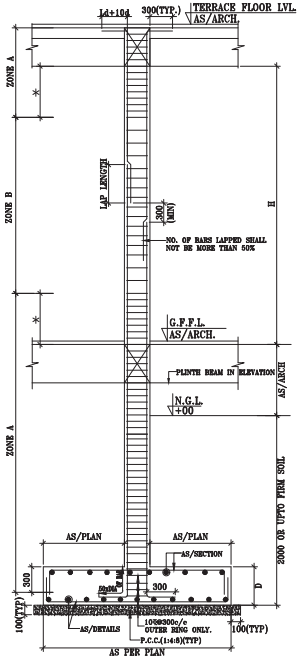
We propose to install inverter driven variable refrigerant flow (VRF) system because diversity of occupants is high and also VRF system is energy efficient and environment friendly. We propose to install 6x15 TR ceiling suspended Air Handling Units (AHU) with DX cooling coil as indoor units for Stadium Hall (Double Height), 1x4 TR Duct-able for Reception Area, 1x2.5 TR Duct-able for Lift Lobby & Corridor at ground floor and 3x2 TR Cassette Units for Hall, Medical Room & Lift Lobby at first floor. We propose to install two circuits of 56 HP each for stadium hall and one circuit of 14 HP Heat Pumps (cooling only)for remaining area as VRF outdoor units. All these units shall work collectively and give a total capacity of **102.5 TR**. The VRF system shall be provided with advanced and intelligent controllers and shall use R-410A as refrigerant with zero ozone depletion factors, which have the least impact on ozone layer as well as global warming. No use of CFC.



COLUMN LAYOUT PLAN

COLUMN SCHEDULES:-

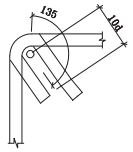
COLUMN MARK	COLUMN SIZE	FOUNDATION TO GROUND FLOOR LVL. M-25	GROUND FLOOR LVL TO FIRST FLOOR LVL. M-25	FIRST FLOOR LVL TO TERMINATION LVL. M-25	TIES
C1	450 × 450	A= 4-16ϕ B= 4-16ϕ C= 4-16ϕ	A= 4-16ϕ B= 4-16ϕ C= 4-16ϕ	A= 4-16ϕ B= 4-16ϕ C= 4-16ϕ	
C2	450 × 450	A= 4-20ϕ B= 4-16ϕ C= 4-16ϕ	A= 4-20ϕ B= 4-16ϕ C= 4-16ϕ	A= 4-20ϕ B= 4-16ϕ C= 4-16ϕ	
C3	300 × 300	A= 4-16ϕ B= 4-16ϕ	A= 4-16ϕ B= 4-16ϕ	A= 4-16ϕ B= 4-16ϕ	
C4	300 × 300	A= 4-16ϕ B= 4-12ϕ	A= 4-16ϕ B= 4-12ϕ	A= 4-16ϕ B= 4-12ϕ	
C5	300 × 300	A= 4-16ϕ B= 4-12ϕ	A= 4-16ϕ B= 4-12ϕ	A= 4-16ϕ B= 4-12ϕ	
C6	450 × 250	A= 4-16ϕ B= 4-12ϕ C= 2-12ϕ	A= 4-16ϕ B= 4-12ϕ C= 2-12ϕ	A= 4-16ϕ B= 4-12ϕ C= 2-12ϕ	



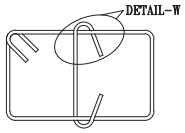
TYP. COLUMN & FOOTING ELEVATION FOR (SECTION- X-X)

FOR COLUMN WIDTH UPTO 300mm	- ZONE A - 8ϕ@75c/c (OUTER TIES) + 8ϕ@75c/c (INNER TIES) - ZONE B - 8ϕ@200c/c (OUTER TIES) + 8ϕ@200c/c (INNER TIES) - IN LAP PORTION STIRRUPS SPACING SHALL BE 150mmc/c (MIN.)
FOR COLUMN WIDTH 450mm	- ZONE A - 8ϕ@100c/c (OUTER TIES) + 8ϕ@100c/c (INNER TIES) - ZONE B - 8ϕ@200c/c (OUTER TIES) + 8ϕ@200c/c (INNER TIES) - IN LAP PORTION STIRRUPS SPACING SHALL BE 150mmc/c (MIN.)

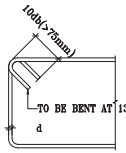
* H/4
OR LARGEST DIM. OF COLUMN OR 450 MM WHICHEVER IS MAXIMUM.



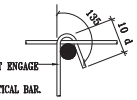
TYP. HOOK DETAIL



TYPICAL DETAIL OF LINK



DETAILS OF 135° HOOK TO BE PROVIDED TO ALL RINGS



CROSS TIE MUST ENGAGE PERIPHERAL TIE ALONGWITH VERTICAL BAR.

DETAIL -W

GENERAL NOTES –

NOTES & REFERENCES

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3. DO NOT SCALE ANY DIMENSION.
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5. CONCRETE GRADE IS AS PER SHEDULE .
6. THE REINFORCEMENT SHALL BE SOLDTWISTED DEFORMED BARS (S.T.D) OR T.M.T. BARS HAVING YIELD. STRENGTH NOT LESS THAN 500 N/mm^2 AND CONFORMING TO I.S. 1786 – 2006.
7. THE CLEAR COVER TO THE REINFORCEMENT SHALL BE AS FOLLOWS:–
   (a) FOUNDATION : 50 MM
   (b) COLUMNS : 40 MM
   (S) BEAMS (top & bottom) 30 MM side Cover 25mm
   (d) SLABS : 25 MM
   (e) CHAJJAS/CANOPY : 30 MM
   (f) R.C.C. WALL 30 MM(EARTH FACE) & 25MM(INNER FACE)
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9. ---------- INDICATES TOP BARS
   ———— INDICATES BOTTOM BARS
   Opening in strucStural element
   p.C.C work
   BrICk work
10. ALL R.C.C. TO BE MACHINE MIXED, VIBRATED AND SURED THOROUGHLY AS PER I.S 456–LATEST.
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12. REINFORCEMENT SHALL BE PROVIDED IN TWO LAYERS WHEREVER FOUND NECESSARY WITH SPACER BAR TO BE PROVIDED BETWEEN TWO LAYERS OF REINFORCEMENTS AS PER IS:456. SPACER BAR 50 40
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16. THE FIRST STIRRUPS IN BEAMS SHALL BE AT A DISTANCE OF 50MM FROM THE JOINT FACE THE SPECIAL CONFINING REINFORCEMENT SHALL BE PROVIDED THROUGH THE JOINT AT THE GIVEN SPACING IN COLUMNS.
17. All ANGLES ARE RIGHT ANGLES UNLESS OTHERWISE SPECIFIED.
18. PROVIDE DIST STEEL OVER EXTRA TOP BARS IS:8 8ϕ@200 C/C (8")
    8ϕ@200 C/C (8")
19. BLACK COTTON SOIL IF ENCOUNTERED IN FN PITS, SHALL BE FULLY REMOVED.
20. ALL LOOSE POCKETS OF SOIL BELOW FOUNDATION SHALL BE FILLED WITH P.C.C1:4:8

REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–
BAREILLY SMART CITY LTD.
INDOOR STADIUM

DRAWING TITLE :	DWG NO.
COLUMN LAYOUT PLAN & DETAILS FOR (PHACE-1)	ST-01-01

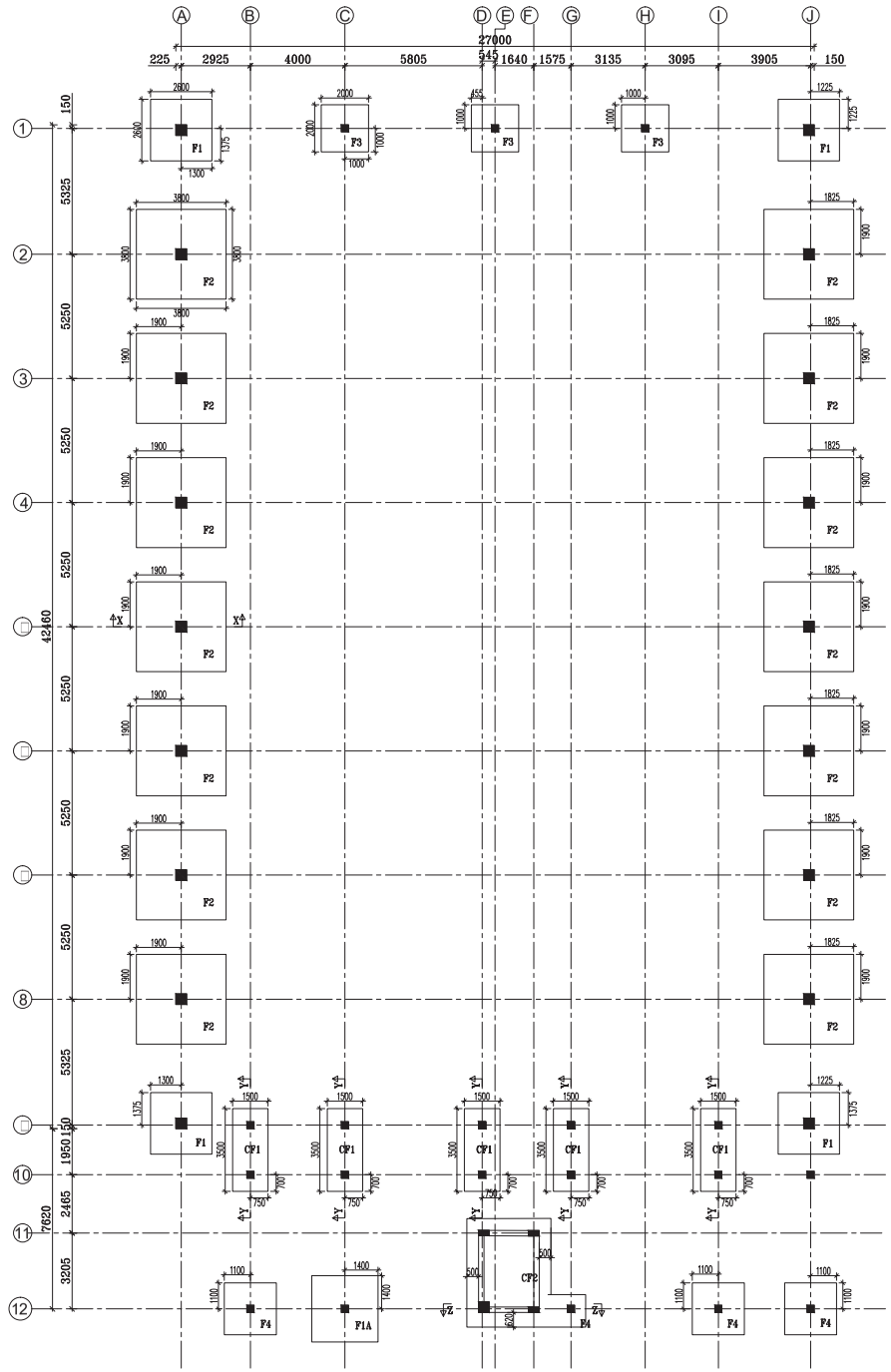
SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

ARCHITECTS:

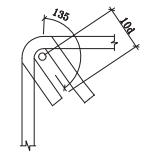
DRAWING RELEASED FOR:

☐ APPROVAL ☐ FOR TENDER
☐ ADVANCE COPY ■ CONSTRUCTION

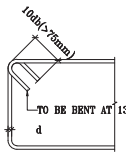
ARCHITECT'S SIGN | OWNER'S SIGN



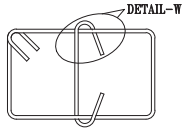
FOUNDATION PLAN



TYP. HOOK DETAIL

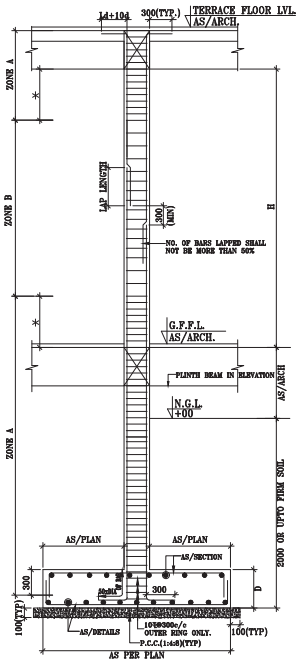


DETAILS OF 135° HOOK
TO BE PROVIDED TO ALL RINGS



TYPICAL DETAIL OF LINK

DETAIL -W



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* H/4
OR LARGEST DIM. OF
COLUMN OR 450 MM
WHICHEVER IS MAXIMUM.

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REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–
BAREILLY SMART CITY LTD.
INDOOR STADIUM

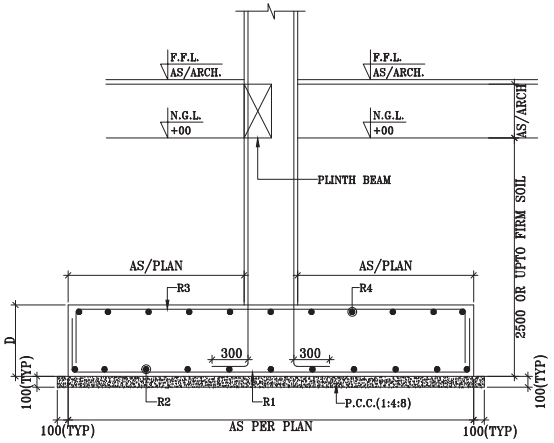
DRAWING TITLE :	DWG NO.
FOUNDATION PLAN FOR (PHACE-1)	ST-01-02

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

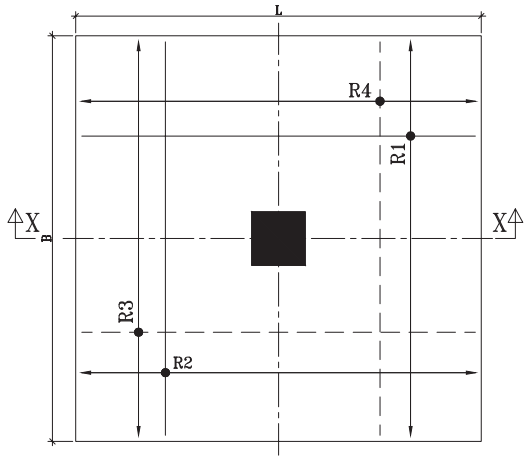
DRAWING RELEASED FOR:

- ☐ APPROVAL
- ☐ FOR TENDER
- ☐ ADVANCE COPY
- ■ CONSTRUCTION

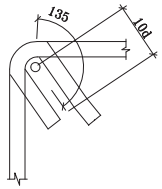
ARCHITECT'S SIGN | OWNER'S SIGN



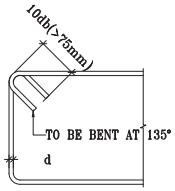
TYPICAL ISOLATED FOOTING FOR (SECTION X-X)



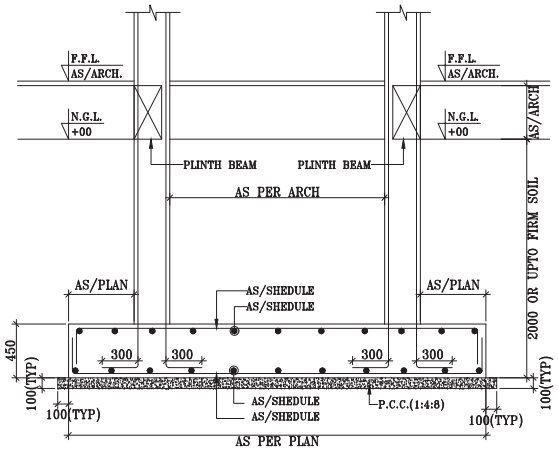
TYPICAL ISOLATED FOOTING PLAN



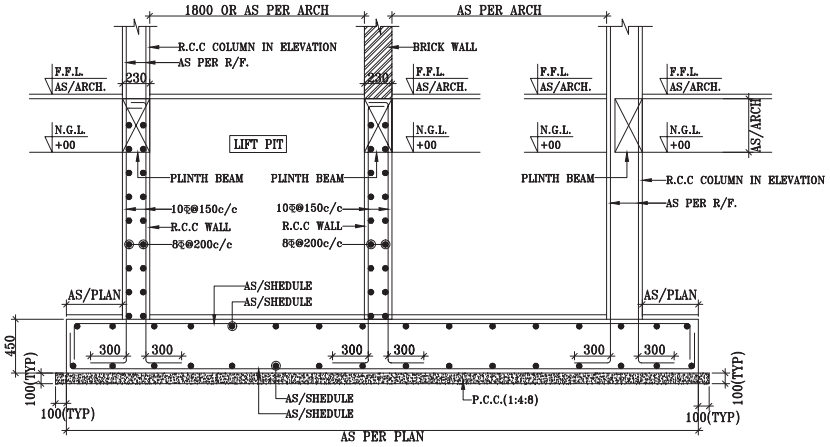
TYP. HOOK DETAIL



DETAILS OF 135° HOOK
TO BE PROVIDED TO ALL RINGS



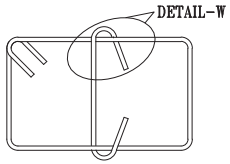
TYPICAL COMBINED FOOTING FOR (CF1)
(SECTION Y-Y)



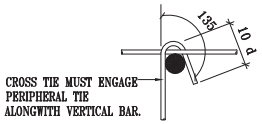
TYPICAL COMBINED FOOTING FOR (CF2)
(SECTION Z-Z)

FOOTING SCHEDULES:-

FOOTING MARK	SIZE				BOTTOM REINFORCEMENT		TOP REINFORCEMENT		REF. SEC.
	L	B	D	d	ALONG THE LENGTH (R1)	ALONG THE WIDTH (R2)	ALONG THE LENGTH (R3)	ALONG THE WIDTH (R4)	
F1	2600	2600	600	--	12ϕ@125c/c	12ϕ@125c/c	12ϕ@125c/c	12ϕ@125c/c	X-X
F2	3800	3800	600	--	12ϕ@100c/c	12ϕ@100c/c	12ϕ@150c/c	12ϕ@100c/c	X-X
F3	2000	2000	450	--	10ϕ@125c/c	10ϕ@125c/c	10ϕ@125c/c	10ϕ@125c/c	X-X
F4	2200	2200	450	--	10ϕ@100c/c	10ϕ@100c/c	10ϕ@200c/c	10ϕ@200c/c	X-X
CF1	3500	1500	450	--	12ϕ@100c/c	12ϕ@150c/c	12ϕ@150c/c	10ϕ@200c/c	Y-Y
CF2	AS PER PLAN		450	--	12ϕ@100c/c	12ϕ@100c/c	12ϕ@150c/c	12ϕ@150c/c	Z-Z
F1A	2800	2800	600	--	12ϕ@125c/c	12ϕ@125c/c	10ϕ@125c/c	10ϕ@125c/c	X-X



TYPICAL DETAIL OF LINK



DETAIL -W

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   ———— INDICATES BOTTOM BARS
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   BrICk work
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20. ALL LOOSE POCKETS OF SOIL BELOW FOUNDATION SHALL BE FILLED WITH P.C.C1:4:8

REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–
BAREILLY SMART CITY LTD.
INDOOR STADIUM

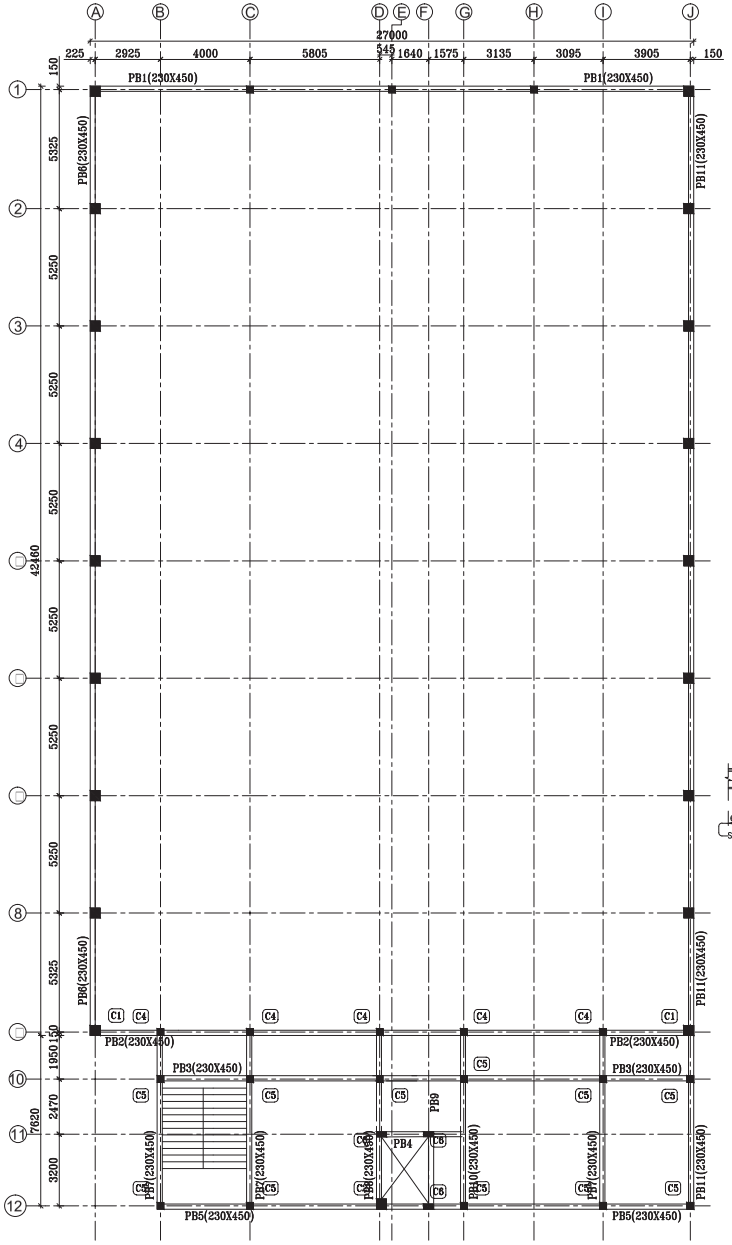
DRAWING TITLE :	DWG NO.
FOOTINGS SECTION & DETAILS FOR (PHACE-1)	ST-01-03

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:

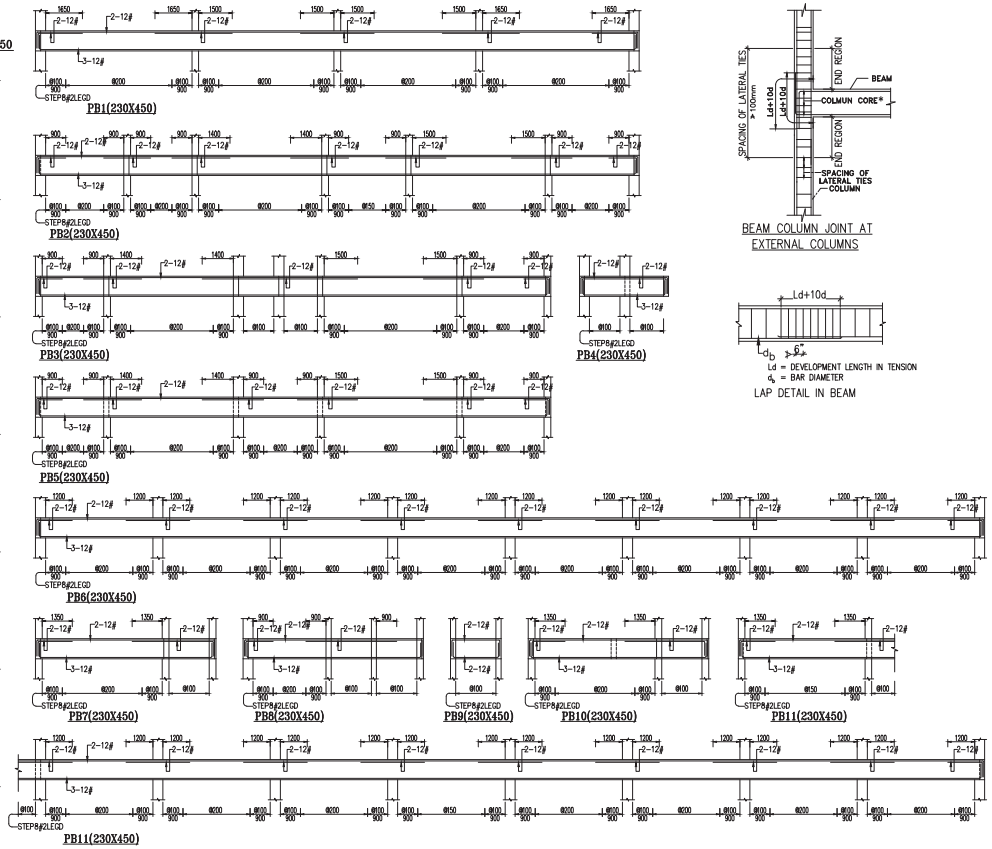
- ☐ APPROVAL
- ☐ FOR TENDER
- ☐ ADVANCE COPY
- ■ CONSTRUCTION

ARCHITECT'S SIGN | OWNER'S SIGN



FRAMING PLAN AT PLINTH/GROUND FLOOR LVL.

ALL BEAMS SIZE ARE (230X450) UNO.

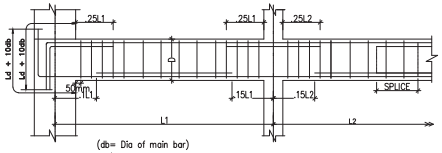


BEAM COLUMN JOINT AT EXTERNAL COLUMNS

Ld = DEVELOPMENT LENGTH IN TENSION

d_b = BAR DIAMETER

LAP DETAIL IN BEAM



TYP. BEAM/COLUMN JUNCTION DETAILS

GENERAL NOTES –

NOTES & REFERENCES

1. READ THIS DRAWING IN CONJUNCTION WITH RELEVANT ARCHITECTURAL DRAWINGS. ANY DISCREPANCY IF FOUND SHALL BE BROUGHT TO THE NOTICE OF CONSULTANT
2. ALL DIMENSIONS ARE IN MM & LEVELS IN MILLIMETERS.
3. DO NOT SCALE ANY DIMENSION.
4. CONFIRM LOCATION OF WALLS WITH RELEVANT ARCH. DRG.S
5. CONCRETE GRADE IS AS PER SHEDULE .
6. THE REINFORCEMENT SHALL BE SOLDTWISTED DEFORMED BARS (S.T.D) OR T.M.T. BARS HAVING YIELD. STRENGTH NOT LESS THAN 500 N/mm^2 AND CONFORMING TO I.S. 1786 – 2006.
7. THE CLEAR COVER TO THE REINFORCEMENT SHALL BE AS FOLLOWS:–
   - (a) FOUNDATION : 50 MM
   - (b) COLUMNS : 40 MM
   - (S) BEAMS (top & bottom) 30 MM side Cover 25mm
   - (d) SLABS : 25 MM
   - (e) CHAJJAS/CANOPY : 30 MM
   - (f) R.C.C. WALL 30 MM(EARTH FACE) & 25MM(INNER FACE)
8. NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED AT ANY SECTION. LAPS CLOSE TO THE MID SPAN IN BOTTOM BARS & CLOSE TO SUPPORTS IN TOP BARS SHALL BE AVOIDED.
9. ---------- INDICATES TOP BARS
   ——— INDICATES BOTTOM BARS
   Opening in structural element
   p.C.C work
   Brick work
10. ALL R.C.C. TO BE MACHINE MIXED, VIBRATED AND SURED THOROUGHLY AS PER I.S 456–LATEST.
11. ALL FOOTING ARE CENTRALLY PLACED WITH RESPECTED TO THE CENTER LINE OF COLUMN
12. REINFORCEMENT SHALL BE PROVIDED IN TWO LAYERS WHEREVER FOUND NECESSARY WITH SPACER BAR TO BE PROVIDED BETWEEN TWO LAYERS OF REINFORCEMENTS AS PER IS:456. SPACER BAR 50 ϕ 16
13. ALL DIMENSIONS MUST BE CHECKED WITH ARCHITECT'S DRG.S & IN CASE OF ANY DISCREPANCY ARCHITECTS DRG.S SHALL PREVAIL.
14. ALL CONSTRUCTION JOINTS SHALL BE APPROVED BY CONSULTANT ON THE BASIC OF SCHEME PREPARED BY CONTRACTOR.
15. TOP AND BOTTOM EXTRA BARS IN BEAMS TO EXTEND BEYOND THE FACE OF SUPPORT AS SHOWN IN DWG UNLESS OTHERWISE SHOWN.
16. THE FIRST STIRRUPS IN BEAMS SHALL BE AT A DISTANCE OF 50MM FROM THE JOINT FACE THE SPECIAL CONFINING REINFORCEMENT SHALL BE PROVIDED THROUGH THE JOINT AT THE GIVEN SPACING IN COLUMNS.
17. All ANGLES ARE RIGHT ANGLES UNLESS OTHERWISE SPECIFIED.
18. PROVIDE DIST STEEL OVER EXTRA TOP BARS IS:8 @200 C/C (8") 8@200 C/C (8")
19. BLACK COTTON SOIL IF ENCOUNTERED IN FN PITS, SHALL BE FULLY REMOVED.
20. ALL LOOSE POCKETS OF SOIL BELOW FOUNDATION SHALL BE FILLED WITH P.C.C1:4:8

REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–

BAREILLY SMART CITY LTD.
INDOOR STADIUM

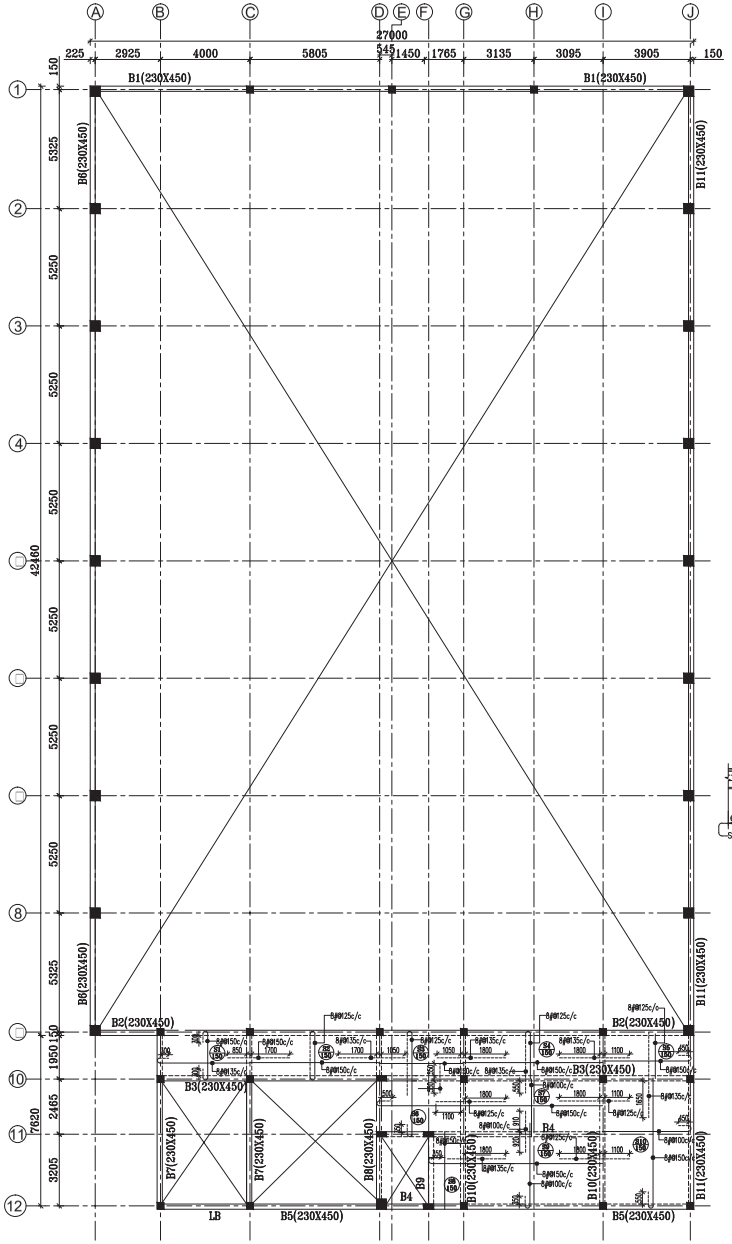
DRAWING TITLE :	DWG NO.
FRAMING PLAN & BEAM DETAILS AT PLINTH/GROUND FLOOR LVL. (PHACE-1)	ST-01-04

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:

- ☐ APPROVAL
- ☐ FOR TENDER
- ☐ ADVANCE COPY
- ■ CONSTRUCTION

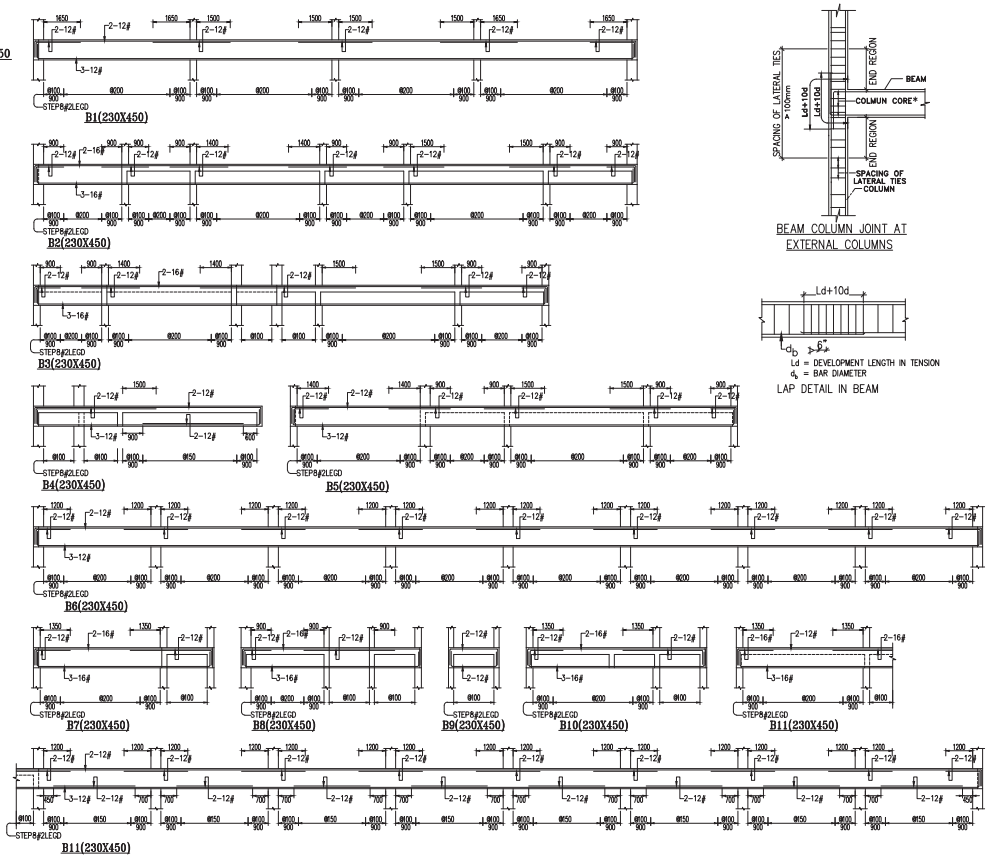
ARCHITECT'S SIGN | OWNER'S SIGN



FRAMING PLAN AT FIRST FLOOR LVL./(GROUND FLOOR ROOF LVL.)

ALL BEAMS SIZE ARE (230X450) UNO.

ALL SLABS THICKNESS IS 150MM (UNO.)

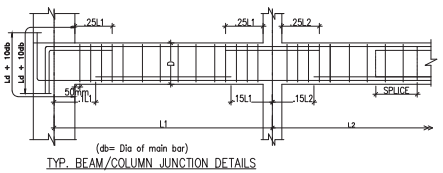


BEAM COLUMN JOINT AT EXTERNAL COLUMNS

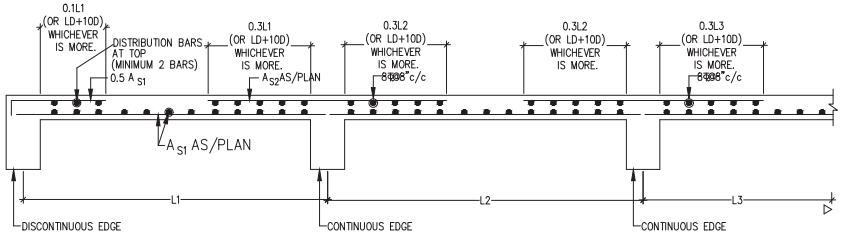
Ld = DEVELOPMENT LENGTH IN TENSION

d_b = BAR DIAMETER

LAP DETAIL IN BEAM



TYP. BEAM/COLUMN JUNCTION DETAILS



TYP. SLAB REINF. DETAIL

NOTE: 1. SPACING OR REINFORCEMENT (MAIN) IN ANY CASE, SHOULD NOT BE MORE THEN '3d' WHERE 'd' IS EFFECTIVE DEPTH OF SLAB.

GENERAL NOTES –

NOTES & REFERENCES

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REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–

BAREILLY SMART CITY LTD.
INDOOR STADIUM

DRAWING TITLE :	DWG NO.
FRAMING PLAN & BEAM DETAILS AT FIRST FLOOR LVL./(GROUND FLOOR ROOF LVL.) (PHACE–1)	ST-01-05

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:

- ☐ APPROVAL
- ☐ FOR TENDER
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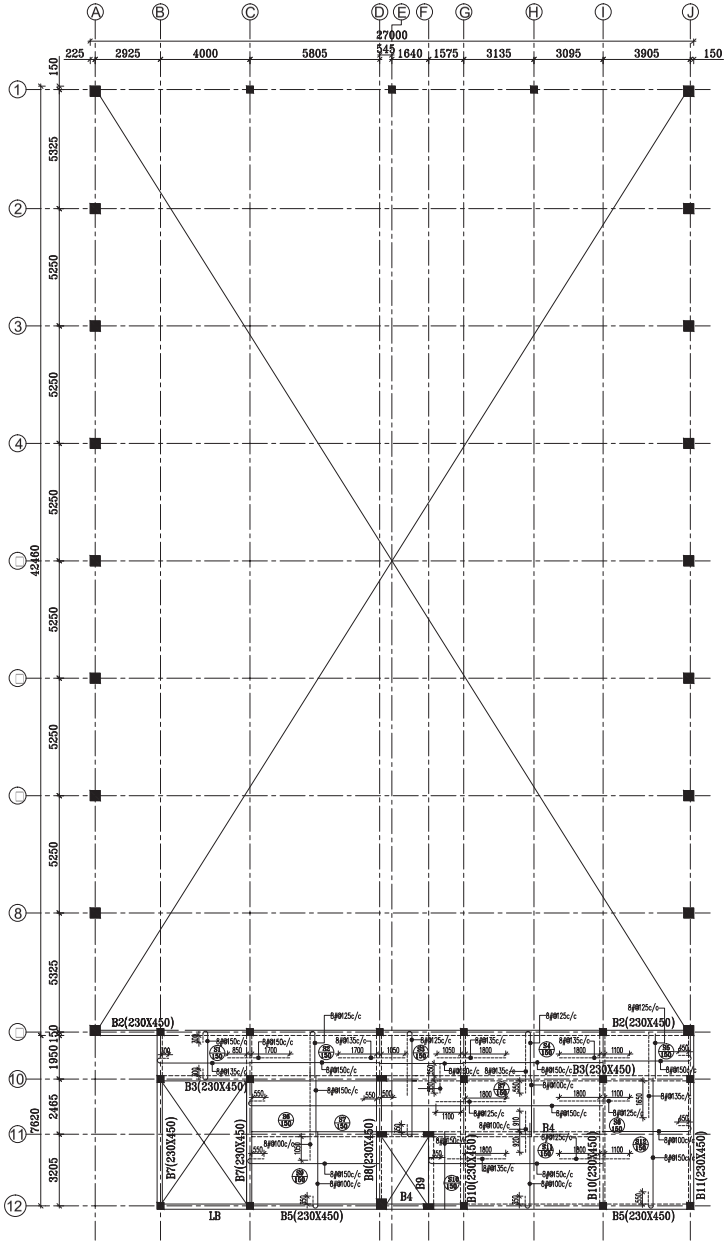
- ■ CONSTRUCTION

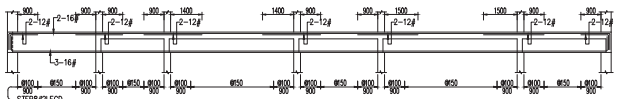
ARCHITECT'S SIGN | OWNER'S SIGN

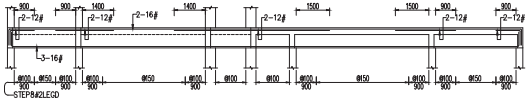


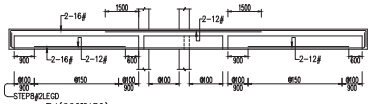
FRAMING PLAN AT TERRACE FLOOR LVL./(FIRST FLOOR ROOF LVL.)

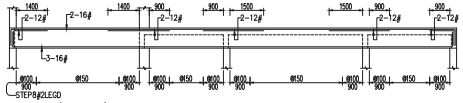
ALL BEAMS SIZE ARE (230X450) UNO.

ALL SLABS THICKNESS IS 150MM (UNO.)

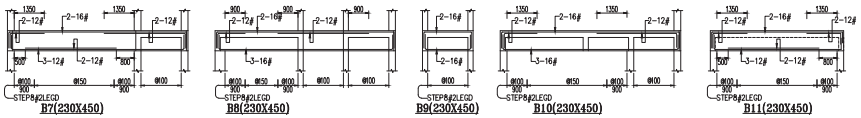


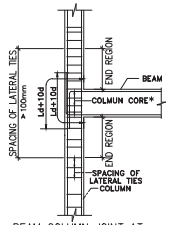




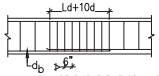


B6(230X450)





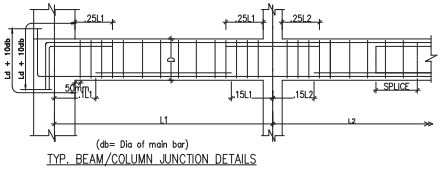
BEAM COLUMN JOINT AT EXTERNAL COLUMNS



Ld = DEVELOPMENT LENGTH IN TENSION

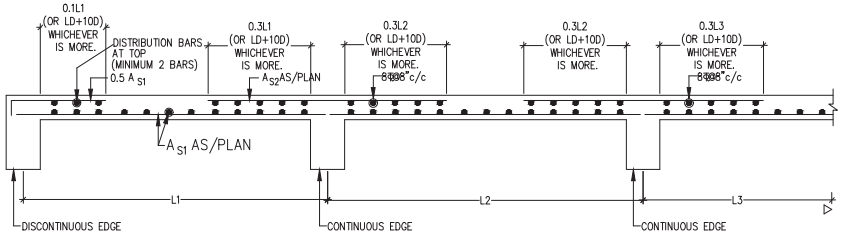
d_b = BAR DIAMETER

LAP DETAIL IN BEAM



(db= Dia of main bar)

TYP. BEAM/COLUMN JUNCTION DETAILS



TYP. SLAB REINF. DETAIL

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GENERAL NOTES –

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REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–

BAREILLY SMART CITY LTD.
INDOOR STADIUM

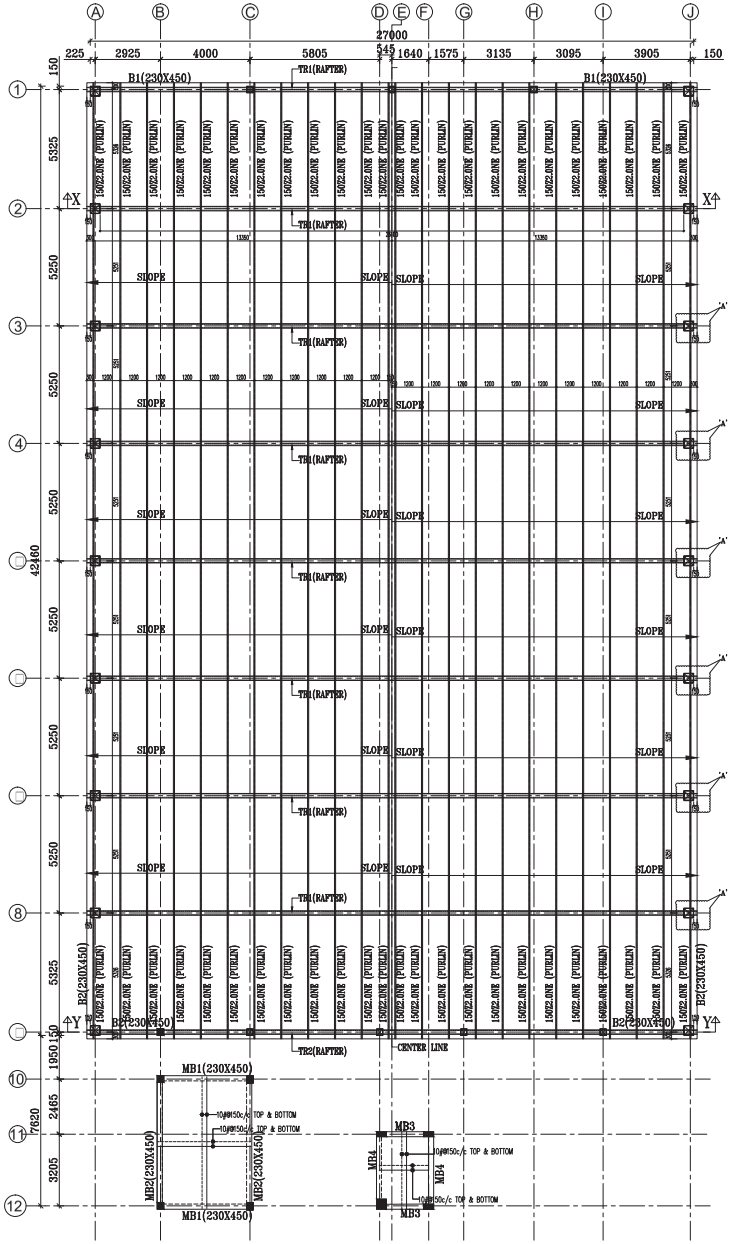
DRAWING TITLE :	DWG NO.
FRAMING PLAN & BEAM DETAILS AT TERRACE FLOOR LVL./(FIRST FLOOR ROOF LVL.) (PHACE–1)	ST-01-06

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:

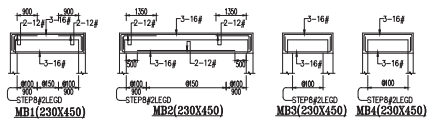
- ☐ APPROVAL
- ☐ FOR TENDER
- ☐ ADVANCE COPY
- ■ CONSTRUCTION

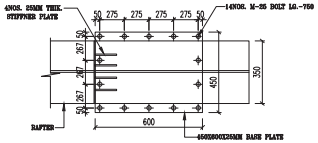
ARCHITECT'S SIGN | OWNER'S SIGN



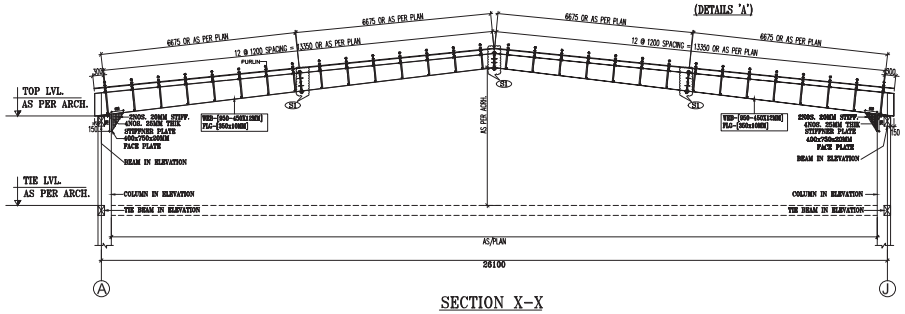
FRAMING PLAN AT TOP ROOF LVL.

ALL BEAMS SIZE ARE (230X450) UNO.
ALL SLABS THICKNESS IS 150MM (UNO.)

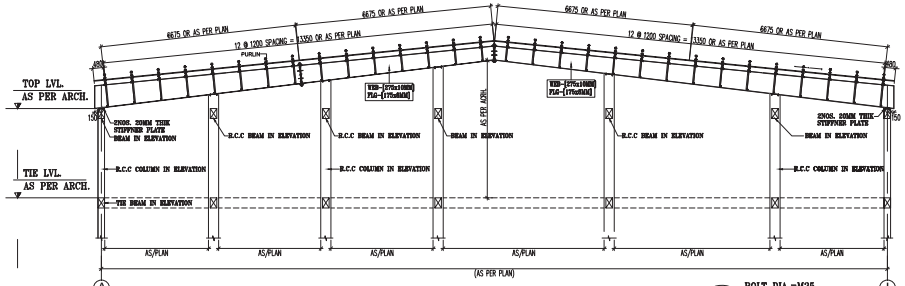




TOP PLAN OF R.C.C COLUMN & STEEL RAFTER JUNCTION
(DETAILS 'A')

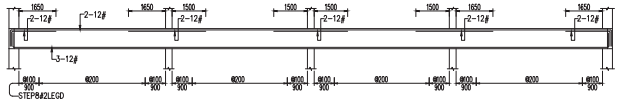


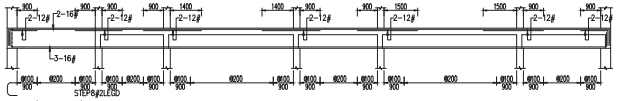
SECTION X-X

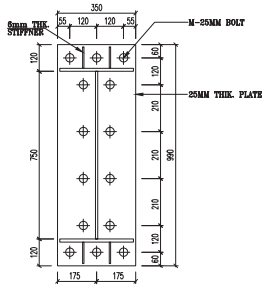


SECTION Y-Y

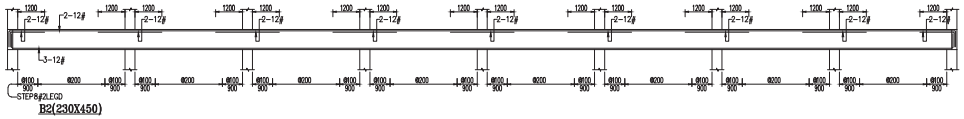
S1 BOLT DIA.=M25
PLATE SIZE=25mm THK.







TYP. DETAILS FOR LAP



GENERAL NOTES –

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5. CONCRETE GRADE IS AS PER SHEDULE .
6. THE REINFORCEMENT SHALL BE SOLDTWISTED DEFORMED BARS (S.T.D) OR T.M.T. BARS HAVING YIELD. STRENGTH NOT LESS THAN 500 N/mm^2 AND CONFORMING TO I.S. 1786 – 2006.
7. THE CLEAR COVER TO THE REINFORCEMENT SHALL BE AS FOLLOWS:–
   (a) FOUNDATION : 50 MM
   (b) COLUMNS : 40 MM
   (S) BEAMS (top & bottom) 30 MM side Cover 25mm
   (d) SLABS : 25 MM
   (e) CHAJJAS/CANOPY : 30 MM
   (f) R.C.C. WALL 30 MM(EARTH FACE) & 25MM(INNER FACE)
8. NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED AT ANY SECTION. LAPS CLOSE TO THE MID SPAN IN BOTTOM BARS & CLOSE TO SUPPORTS IN TOP BARS SHALL BE AVOIDED.
9. ---------- INDICATES TOP BARS
   ———— INDICATES BOTTOM BARS
   Opening in structural element
   p.C.C work
   BrICk work
10. ALL R.C.C. TO BE MACHINE MIXED, VIBRATED AND SURED THOROUGHLY AS PER I.S 456–LATEST.
11. ALL FOOTING ARE CENTRALLY PLACED WITH RESPECTED TO THE CENTER LINE OF COLUMN
12. REINFORCEMENT SHALL BE PROVIDED IN TWO LAYERS WHEREVER FOUND NECESSARY WITH SPACER BAR TO BE PROVIDED BETWEEN TWO LAYERS OF REINFORCEMENTS AS PER IS:456. SPACER BAR
13. ALL DIMENSIONS MUST BE CHECKED WITH ARCHITECT'S DRG.S & IN CASE OF ANY DISCREPANCY ARCHITECTS DRG.S SHALL PREVAIL.
14. ALL CONSTRUCTION JOINTS SHALL BE APPROVED BY CONSULTANT ON THE BASIC OF SCHEME PREPARED BY CONTRACTOR.
15. TOP AND BOTTOM EXTRA BARS IN BEAMS TO EXTEND BEYOND THE FACE OF SUPPORT AS SHOWN IN DWG UNLESS OTHERWISE SHOWN.
16. THE FIRST STIRRUPS IN BEAMS SHALL BE AT A DISTANCE OF 50MM FROM THE JOINT FACE THE SPECIAL CONFINING REINFORCEMENT SHALL BE PROVIDED THROUGH THE JOINT AT THE GIVEN SPACING IN COLUMNS.
17. All ANGLES ARE RIGHT ANGLES UNLESS OTHERWISE SPECIFIED.
18. PROVIDE DIST STEEL OVER EXTRA TOP BARS IS:8 @200 C/C (8")
    8@200 C/C (8")
19. BLACK COTTON SOIL IF ENCOUNTERED IN FN PITS, SHALL BE FULLY REMOVED.
20. ALL LOOSE POCKETS OF SOIL BELOW FOUNDATION SHALL BE FILLED WITH P.C.C1:4:8

REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

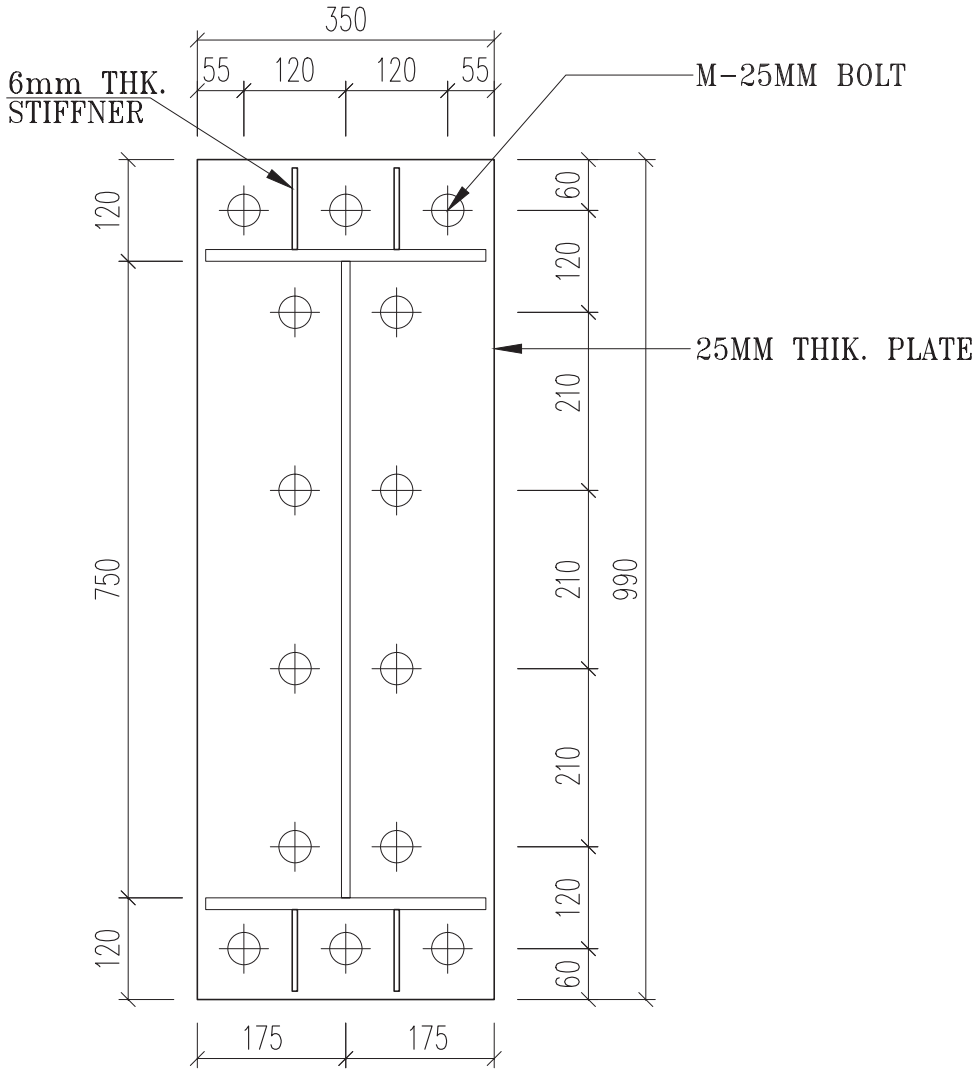
PROJECT NAME:–
BAREILLY SMART CITY LTD.
INDOOR STADIUM

DRAWING TITLE :	DWG NO.
FRAMING PLAN & DETAILS AT TOP ROOF LVL. (PHACE-1)	ST-01-07

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:
☐ APPROVAL ☐ FOR TENDER
☐ ADVANCE COPY ■ CONSTRUCTION

ARCHITECT'S SIGN | OWNER'S SIGN



TYP. DETAILS FOR LAP

GENERAL NOTES –

NOTES & REFERENCES

1. READ THIS DRAWING IN CONJUNCTION WITH RELEVANT ARCHITECTURAL DRAWINGS. ANY DISCREPANCY IF FOUND SHALL BE BROUGHT TO THE NOTICE OF CONSULTANT
2. ALL DIMENSIONS ARE IN MM & LEVELS IN MILLIMETERS.
3. DO NOT SCALE ANY DIMENSION.
4. CONFIRM LOCATION OF WALLS WITH RELEVANT ARCH. DRG.S
5. CONCRETE GRADE IS AS PER SHEDULE .
6. THE REINFORCEMENT SHALL BE SOLDTWISTED DEFORMED BARS (S.T.D) OR T.M.T. BARS HAVING YIELD. STRENGTH NOT LESS THAN 500 N/mm^2 AND CONFORMING TO I.S. 1786 – 2006.
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   Opening in struStural element
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20. ALL LOOSE POCKETS OF SOIL BELOW FOUNDATION SHALL BE FILLED WITH P.C.C1:4:8

REV.NO.	DATE	REVISION
R0	02-04-2020	FOR APPROVAL

CLIENT:–

PROJECT NAME:–

BAREILLY SMART CITY LTD.
INDOOR STADIUM

DRAWING TITLE :	DWG NO.
TYPICAL DETAILS FOR LAP	ST-01-08

SCALE:–	N.T.S
DRAWN BY:–	RAJESH
DESIGNED BY:–	ROSHAN
CHECKED BY:–	ROSHAN
DATE:–	02-04-2020

DRAWING RELEASED FOR:

- ☐ APPROVAL
- ☐ FOR TENDER
- ☐ ADVANCE COPY
- ■ CONSTRUCTION

ARCHITECT'S SIGN | OWNER'S SIGN

MEMBER NUMBER		7				
MAXIMUM AXIAL FORCE		56	KN	(TENSION)		
MAXIMUM SHEAR FORCE		766	KN			
MAXIMUM BENDING MOMENT		57.591	KN m			
DESIGN OF WELD FOR BEAM & SPLICE PLATE CONNECTION						
a)	Length of beam for welding				2820.00	mm
	Thickness of tube beam				12.00	mm
b)	Total Length of Weld available				2820.00	mm
	Additional Length available due to stiffener					
	Nos. of stiff. Plates		4			
	Length of Each Stiffener Plate		120	mm		
	length of splice plate		550	mm		
	Additional Length available due to stiffener				960.00	mm
	Total Length of Weld Available				3780.00	mm
c)	Yield strength of Plate				350.00	N/mm2
d)	Ultimate Strength of Plate				490.00	N/mm2
e)	Design Weld Strength					
		Size of Weld	10	mm		
		Weld Strength per mm length			1584.25	N/mm
f)	Total Strength of welded length				5988.46	KN
g)	Maximum Axial Force on member				56.00	KN
h)	Maximum Bending Moment				57.59	KN m
(j)	Additional Axial Force due to Mement on Weld				20.51	KN
(k)	Therefore Maximum Axial Force required to be resisted				76.51	KN
	CHECK FOR WELD LENGTH				WELD IS SAFE	
DESIGN OF SPLICE PLATE THICKNESS						
a)	Bolt Dia Assumed				24.00	mm
b)	Edge Distance				55.00	mm
c)	Fillet Weld Size				10.00	mm
d)	Distance from C/L of Bolt to Toe of Fillet Weld (l_v)				55.00	mm
e)	Minimum Thickness shall be maximum of following two criteria					
	(i) Central Moment on plate due to Moment applied					
	a.1	Moment Due to Tensile Force				
		Nos of Bolts			14	
		Grade of Bolt	8.8			
		Ultimate Strength of Bolt f_u =			800	N/mm2
		Yield Strength of Bolt			640	N/mm2
		Proof stress			560	N/mm2
		Tensile Stress Area on bolt			353	mm^2
		Fac. Tensile Force			56.00	KN
		Tension Per Bolt			4	KN
		Nos of Bolts for Moment Calculation			3	
		Tesile Force for Moment Calculation			12	KN
		C/C DISTANCE BETWEEN BOLTS			210	mm
		Member Moment			57591	KN mm
		Tensile force due to mement in member			274.2429	KN
		Therefore Te			286.2429	

		Moment M = $T_e l_v/2$				7871.679	KN mm
		Total Design Moment				7871.679	KN mm
		f_y for Plate Material				350	N/mm2
		Min. Thickness				13.41358	mm
		Adopt Thickness =				25.00	mm
	a.2	Check for Prying Force					
		Distance L_e from C/L of Bolt to the point where Prying Force acts is minimum of followings					
		(i)	Edge Distance		55.00	mm	
		(ii)	Le = 1.1t*Sqrt($\beta f_0/f_y$)				
			Where β =	1	For Pre Tensioned Bolts		
				2	For Non Tensioned Bolts		
			Therefore Le =		25.72389	mm	
		Therefore Le =			25.72	mm	
		PRYING FORCE Q =			$Q = \frac{l_v}{2l_e}\left[T_e - \frac{\beta\eta f_0 b_e t^4}{27 l_e l^2 v}\right]$		
		Te on 3 Bolts due to axial force			12	KN	
		Te on 3 Bolts due to Moment			274.2429	KN	
		Total Te =			286.2429	KN	
			Therefore Q =		122351.8	N	
					122.3518	KN	
		Therefore Total Tensile Force on 4 Bolts				408.59	KN
		Therefore Tensile force on one Bolt				102.15	KN
		Therefore Tension Capacity of One Bolt					
			$T = \frac{0.9 f_u A_{nb}}{\gamma_{m0}}$		=	203.33	KN
		CHECK FOR PLATE THICKNESS					
			Tensile Strength of Bolt is larger than Maximum Tension on a Bolt, Therefore Provided Thickness is sufficient				
		PLATE THICKNESS			25.00	mm	
CHECK FOR COMBINED SHEAR AND TENSION							
	IS:800-2007 CLAUSE 10.4.6						
	$(V_{sf}/V_{df})^2+(T_f/T_{df})^2$ < or = 1						
	Vsf =	Applied Factored Shear at Design Load					
	Vdf =	Design Shear Strength					
	Tf =	Externally applied factored Tension at Design Load					
	Tdf =	Design Tensile Strength					
	Total Shear Force		766	KN			
	Nos. of Bolts		12				
	Shear Force per Bolt V_{sf}		63.833333	KN			
	Design Shear Force of Bolt						
	Dia		24.00	mm			
	fu =		800	N/mm2			

	Tensile Atress Area		353	mm^2			
	V_{df} =		203.80465	KN			
	Tension per Bolt Tf =		102.15	KN			
	Tension Strength Tdf=		203.33	KN			
	CHECK:						
	$(V_{sf}/V_{df})^2+(T_f/T_{df})^2$ =			0.350489		<1, Therefore, Safe	

Signature Not Verified

Digitally signed by SANJAY CHAUHAN
Date: 2020.10.22 10:14:53 IST
Location: Uttar Pradesh-UP