

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS
IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**



**SHAHEED BHAGAT SINGH COLLEGE
UNIVERSITY OF DELHI**

Tender No.	SBSC/1888
Project Name	CONSTRUCTION OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI -110017

**ARCHITECT:
DEARCH ENGINEERS**

SD/-

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signature of the bidder with company seal.

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**TENDER FORWARDING LETTER INCLUDING INSTRUCTIONS TO
TENDERERS.**

Tenders are invited in two bid system from reputed contractors as per eligibility criteria listed below for carrying out **CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI -110017**

1	NIT No.	: SBSC/1888
2	Name of Work & Sub Head	: CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI -110017
3	Estimated Cost put to bid	: NA
4	Earnest Money	: Rs.5,00,000.00
5	Tender Fee	: Rs. 1,000.00
6	Period of Completion of work	: 180 days
7	Publish Date (uploading)	: 12.03.2024
8	Document Download / sale start date	: NA
9	Document Download / sale end date	: NA
10	Date and time of Pre –Bid (if applicable)	: 26.03.2024 at 11:00 AM (In the Committee Room, Shaheed Bhagat Singh College)
11	Bid submission start date & time, scanning & uploading UTR of RTGS / NEFT against EMD, proof of payment for processing fee & other documents.	: 12.03.2024 at 09:00 AM
12	Bid submission end date & time, scanning & uploading UTR of RTGS / NEFT against EMD, proof of payment for processing fee & other documents.	: 02.04.2024 at 03:00 PM
13	Bid Opening date & time	: 03.04.2024 at 3:30 PM
14	Eligibility Criteria	: Refer Eligibility Criteria under Technical bid
	Existing Conditions of Site	: To be examined by the Contractor

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TENDER NOTICE

The following are the eligibility criteria for the contractors to participate in the tender bid:

- a) Average annual financial turnover during the last three Years ending 31st March, 2023 should be at least Rs 5 crores.** The contractor/ firm should also have earned net profit for the last 3 years.
- b)** The bidder/agency/firm should have Turnover exceeding Rs 8 Crores in the preceding Financial Year 2022-23.
- c)** The bidder/agency/firm should have a solvency certificate of **Rs 5 crores issued by only Commercial/Nationalised Bank**
- d)** The bidder/agency/firm should have experience of having successfully completed similar works of value as indicated below during the last 7 years ending 31.03.2023 in multistoried modern buildings (office /residential) in Delhi University or its colleges OR central /state government departments/institutions/PSUs/Govt. Autonomous Bodies.

Details of Work	Value of Work
Three similar completed works costing not less than the amount equal OR	Rs. 2 Crore each
Two similar completed works costing not less than the amount equal to OR	Rs. 2.5 Crores each
One similar completed works costing not less than the amount equal to	Rs. 4 Crores

- e)** The contractor should have a Registered Office in Delhi/NCR at least for the last 3 years.
- f)** The bidder shall attach authenticated documentary proof in support of financial turnover Certificates/annual audited reports of last 3 years certified by Chartered Accountant/Statutory Auditors and Financial Solvency Certificate of **Rs 5 crores issued by only Commercial/Nationalised Bank**.
- g)** Similar work means carrying out and successful completion of Construction of RCC Framed structure (office/ residential) including internal water supply, sewage and electrical works executed under one agreement/ work order for Delhi University or its colleges OR central /state government departments/institutions/ PSUs/ Govt. Autonomous Bodies.

The bidder should attach work order copies/PO Copies/Completion Certificate/Performance Certificate from the employer clearly Indicating the nature, magnitude, date of starting and date of completion of work, indicating whether the works are completed within the

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stipulated time in respect of qualifying works.

h) The bidder should provide proper documentary proof supporting their claim in respect of all the above criteria from point no. a to g.

1. The entire tendering process is online through CPPP (Central Public Procurement Portal) and all the technical and financial bids have to be submitted **online only** through <http://eprocuregov.in> and no tender in physical form would be accepted. The Notice inviting tender can also be downloaded from college website www.sbsc.in. The tender fee of **Rs 1000/- (Rs. One Thousand only)** which is **non-refundable should be submitted in physical form by way of DD / Pay order (PO) drawn in favour of The Principal, Shaheed Bhagat Singh College**, payable at New Delhi accompanying the tender documents at the time of submission of duly filled tender documents failing which their tender bid would be summarily rejected. **Physical Purchase of tender is not permitted.**
2. The tender documents should accompany an **Earnest Money Deposit (EMD) of Rs. 5,00,000/- (Rs. Five Lacs Only)** should be submitted in physical form by way of **DD / Pay order (PO) drawn on drawn in favour of The Principal, Shaheed Bhagat Singh College**, payable at New Delhi. The EMD shall not bear any **interest. Tender documents not accompanied by such EMD would be summarily rejected.** Time is the essence of contract. The work should be completed in **180 days including monsoon period** from the date of issue of LOI/work order.
3. The last date of filing the tender is **31/03/2024 at 4:00 PM.**
4. The documents required to qualify the Technical Bid is to be submitted online duly filled in and signed on all the pages and stamped by the bidder accompanied by details of the Company Profile, audited balance sheet for last 3 years along with other relevant documents in pdf form. Only tender fee and EMD drafts are to be submitted in physical form at the college office on or before the closing date and time of the tender.
5. The documentary proof in respect of Income tax returns, PAN No., GST registration no., proof of **Work Experience** of similar works during the last 3 years should also be submitted online in pdf form.
6. The tender shall be opened on **02/04/2024 at 11:30 A.M.**
7. The Price bid of the Bidder who satisfies the eligibility criteria and qualifies in the Technical bid in all respects only will be opened.
8. The College reserves the right to accept any Tender or accept Tenders in part or to reject any or all Tenders without assigning any reasons thereof and will not be liable to Offer any explanation whatsoever.
9. The EMD of the successful bidder would be retained with **Shaheed Bhagat Singh College**, while the EMDs of the unsuccessful bidders would be returned after the placing of work order with the successful bidder. The unsuccessful bidders can collect their DDs of EMD within 10 days of placing work order with the successful bidder.
10. In case if the Bidder after being declared successful L-1 bidder withdraws from the bid or fails to execute the work within the prescribed time his EMD would be forfeited.
11. The bidder must carefully read and examine the whole tender document visit the site at his own expenses, study the technical specifications, drawings etc., before submitting the tender and financial bid.
12. No consideration shall be given to a tender received after the expiry of time as stipulated above and no extension of time will normally be allowed for submission of the tender.

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13. The Notice inviting tenders, the conditions of tender and duly completed form of tender, Specifications etc will inter alia form part of the contract agreement to be executed by the Successful bidder with the College.
14. **Pre-bid Meeting will be held on 26.03.2024 at 11:00 a.m. in the College.** For any clarification on the Bidding Document queries may be sent through physical form to The Principal Office, Shaheed Bhagat Singh College at Sheikh Sarai Phase II, New Delhi OR through email at principal@sbs.du.ac.in on or before **27.03.2024 at 04:00 PM.**
15. The college **may** appoint an Engineer / Consultant for PMC who will supervise the said work @Rs30000 to 40000 per month. The Contractor, who will be awarded the work, will pay PMC charges to the Engineer / Consultant at the aforesaid rate. The amount paid to Engineer / Consultant will be reimbursed to the contractor along-with running bills by the College, hence the cost of PMC charges need not to be part of financial bid.
16. Agency / contractor must follow safety and security guidelines and protocols for his labours & staff and students of the college. No relaxation will be given with respect to safety and security measures. If any mishappening / accident occur at the site, the contractor will be solely responsible for the same.
17. Any damage done to the College property while carrying out the construction work will be the responsibility of the contractor and the same will be liable for damages.
18. Registration Certificate PAN, GST, ESIC and EPFO are required to be submitted.
19. Registration Certificate of contractor is required to be submitted issued by local authority.
20. If there is any delay in completion of the work or specifications of material are not followed as per tender document and if contractor doesn't follow the instruction / direction of the college authority, the college will have right to impose penalty on the contractor as it may deem fit.
21. Conditional bids would be summarily rejected. Only one bid would be considered from one firm.
22. Tenderers are required to read and understand the requirements in the work and conditions and specifications given in tender documents. Tenderer are required to submit duly signed and stamped tender documents alongwith all necessary / required document / certificates.
23. **Execution of Contract Agreement:** Bidder is required to execute contract agreement for the said work as per the prescribed Performa on a non-judicial stamp paper of Rs.100/- within 15 days from the issue of LOI/Award Letter. The bidder shall pay for all stamps duty and legal charges, incidental expenses, if any.
24. The bids are invited **only for construction of structure** of Block A and Block B. Where Block A will have only one roof at the height of 30 feet and Block B will have two floors of height 15 feet each, so that the roof top of Block A and B are at the same level. This includes only casting of slabs, columns, beams, construction of side walls, stairs, plastering, basic electrical points with conduit pipes on the roofs and walls, and plumbing pipes for washrooms. (Note: The Tender is for **structure work only** and **it doesn't include** sanitary fittings, electrical switches, wirings, furnishing, painting, flooring etc.) Bidders to refer detailed scope of work before quoting the financial bid.

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MEMORANDUM

Name of work	:	CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI -110017
Earnest Money Deposit	:	Rs. 5,00,000/- (Rs. Five Lakhs only)
Date of Commencement of work	:	From the date of issue of LOI/ Work order
Period of Completion of commencement	:	180 Days including monsoon period from the date of issues of LOI/work order
Payment Terms	:	<p>a) 80% payment of total value of work can be claimed through running bill as per progress of work after satisfaction and certification of the authorized person/Architect Shaheed Bhagat Singh College.</p> <p>b) Minimum amount of value of work to be taken for issue of Interim Certificate for payment: Rs.25, 00,000/- .</p> <p>c) 10% to be released after successful completion of work and handing over to the satisfaction and certification of the authorized person/Architect Shaheed Bhagat Singh College.</p>
Retention percentage to be deducted From running Bills as Security Deposit (SD)	:	5% of the gross value of the bill
Defects Liability period (DLP)	:	1 year from the date of completion
Refund of Security Deposit (SD)	:	Security Deposit shall be refunded after expiry of Defects Liability Period (DLP)
Liquidated Damages (LD)	:	0.5% of the Contract value per week or part thereof delays subject to a maximum of 10% of the contract value.
Time within which the payment is to be made	:	15 days

THE CONDITIONS OF TENDER

1. Online Tender:

The bidders have to participate in e-tendering only and no bid in physical form whatsoever would be accepted. Only tender fee and EMD demand draft would be accepted in physical form.

2. Amendment to Bid documents:

At any time prior to the deadline for submission of Bids, **Shaheed Bhagat Singh College** may, for any reason, whether at its own initiative or in response to a clarification sought by any prospective bidder, modify the bidding documents by amendment / addendum/corrigendum.

i) The amendment will be issued on the CPPP only (i.e. <http://eprocure.gov.in>). Those bidders shall be solely responsible to check the web site for the amendment issued in shape of Corrigendum and/or Addendum up to last date of submission of bid.

3. Clarification on Bids:

i) To assist in the examination, evaluation and comparison of the technical bids, **Shaheed Bhagat Singh College** may, at its discretion, ask the Bidder for a clarification on its Bid. No change in price of the SD/-

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Bid shall be sought, offered or permitted. If required, the **Shaheed Bhagat Singh College** reserves the right to ask the bidders to submit supplementary documents to support the documents already submitted by the bidder.

- ii) **Shaheed Bhagat Singh College** reserves the right to conduct joint post bid discussion after opening the technical bids, for clarification on technical bid and may amend the technical bid requirements so as to bring all the bidders on to a common platform.

4. Abnormal Rates:

The bidder is expected to quote rate for each subsection after careful analysis of cost involved for the performance of the completed sub-section considering all specifications and conditions of contract. In case it is noticed that the rates quoted by the bidder for any items are unusually high or unusually low, it will be sufficient case for the rejection of the tender unless the reasonableness of the rates is convincing. For scrutiny, the analysis for such rates is to be furnished by the bidder on demand.

5. Change Orders:

At any time during the execution of the contract, changes may be made in the specifications, scope of contract by given a written notice to the contractor by **Shaheed Bhagat Singh College** may make any changes in the quality and/or quantity of the work or any part thereof that may, in its opinion, be necessary and for that purpose the **Shaheed Bhagat Singh College** shall have the power to order the Contractor to do and the Contractor shall do any of the following:-

- i) Increase or decrease or split the quantity of work include in the contract,
- ii) Omit any such work,
- iii) Change the character, quality or kind of any such work,
- iv) Change the dimensions of any such work,
- v) Execute additional work of any kind necessary for completion of the work under the contract, and no such change shall in any way vitiate or invalidate the contract but the cost, if any, arising out of all such changes shall be taken into account in ascertaining the total amount of the contract price. Where the rate is available in the contract and the same is applicable to the additional work, in the opinion of the **Shaheed Bhagat Singh College**, the cost of the additional work shall be determined as per this available rate. But, if the rate for additional work is not available in the contract, the same shall be determined by the **Shaheed Bhagat Singh College** taking into account the market rate and labour cost at the site for similar works and shall be final.

6. Acceptance / Rejection of Bid:

- i) **Shaheed Bhagat Singh College** does not bind itself to accept the lowest tender.
- ii) **Shaheed Bhagat Singh College** also reserves the right to accept or reject any tender in part or full without assigning any reason whatsoever.
- iii) **Shaheed Bhagat Singh College** also reserves the absolute right to reject any or all the Bids at any time solely based on the past unsatisfactory performance by the bidder(s). The opinion/decision of **Shaheed Bhagat Singh College** regarding the same shall be final and conclusive.

- 7. Each and every page of the tender document must be signed by an authorized person.

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8. The tenders must be submitted in the prescribed format only.
9. The Bidder must include these charges in the rates quoted, if applicable. No separate claim on this account will be entertained under any circumstances whatsoever. The bidder shall quote his rates inclusive of cost of materials, corresponding wastages, labour, octroi, and cost of transportation of materials to work site etc.
10. Errors in the rates and amount shall be dealt with in the following manner:
 - a. In the event of a discrepancy between the rates quoted in words and the rates in figures, lowest rate will be taken into consideration.
 - b. In the event of an error occurring in the amount column as a result of wrong calculation the per square feet rate shall be regarded as firm and the amount shall be amended accordingly based on the area given.
 - c. All errors in totaling in the amount column and in carrying forward, the totals shall be corrected.
11. The quantities indicated in the schedule of quantities are only probable quantities and are liable to alteration by omission, reduction or addition. Payment shall be made on the basis of per square feet rate quoted in the tender.
12. No alterations which are made by the bidder in the drawings, specifications or in probable quantities accompanying the tender will be recognized and if any such alterations are made the tender is likely to be rejected and invalidated.
13. The bidder must have site visit his own expenses for gathering all the information related to work. **The site can be inspected on any working day** from 10:00 a.m. to 3:00 p.m
14. The bidder shall also bear all expenses in connection with the preparation and submission of this tender.

15. **EARNEST MONEY DEPOSIT (E.M.D) :**

The bidder shall also deposit an amount of **Rs. 5,00,000/- (Rs Five Lacs Only) should be submitted in physical form by the way of** Demand Draft/pay order drawn on any Nationalized/scheduled Bank in **favour of The “Shaheed Bhagat Singh College”**, Payable at **New Delhi** at the time of submission of the tender as Earnest Money. **Shaheed Bhagat Singh College** is not liable to pay any interest on Earnest Money.

The EMD of unsuccessful bidder shall be refunded to them without any interest after the decision to award the work is taken. The EMD of the successful bidder shall be retained as part of security deposit and for the due fulfillment of the contract.

The Earnest Money Deposit submitted by the bidder will be forfeited if,

- a) If successful bidder fails to execute an Agreement within specified time as per intimation/request of the **Shaheed Bhagat Singh College**,
- b) He withdraws his tender or backs out after acceptance,
- c) He withdraws his tender before the expiry of validity period stipulated in the bidding document,
- d) He violates any of the terms and conditions of the tender,
- e) He revises any of the items quoted during the validity period,
- f) Evidences are found to be fraudulent/non-genuine.

16. **SECURITY DEPOSIT (S.D) :**

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Security Deposit shall be deducted from running/progressive bill(s) of the contractor @ 5% of the gross value of each bill. Security Deposit shall be refunded after expiry of Defects Liability Period (DLP).

17. COMPLETION PERIOD :

The time is the essence of contract. The entire work shall be completed by the contractor within **180 DAYS including monsoon period** from the date of issue of the work order. The work shall be commenced immediately after the issue of LOI. The work is of urgent nature and the completion time schedule should be strictly adhered to by the contractor.

18. The tenders submitted shall remain valid for acceptance for a period of **90 days** from the date of their opening. Should any bidder after being declared as successful bidder withdraws his tender or makes any modifications to his tender, the tender shall be treated as having been rejected or abandoned and his EMD will be forfeited.

19. It is not binding on **Shaheed Bhagat Singh College** to accept the lowest tender and reserves the rights to reject any or all the tenders received without assigning any reasons thereof. Further **Shaheed Bhagat Singh College** reserves the right to award any portion of the work or portions of the work to different bidders or to award the entire work to one bidder.

20. The bidder whose tender is accepted is bound to execute a formal agreement with **Shaheed Bhagat Singh College** in accordance with the draft agreement which will include the notice inviting tender, tender conditions, other papers herein, special conditions, drawings and specifications etc. Irrespective of whether a formal agreement is drawn or not the contractor on being awarded the contract is liable based on acceptance of his tender. The contractor shall bear all expenses in connection with the execution of the said agreement including fees for stamps and registration of documents as required.

21. The work shall be carried out under the directions and supervision of and subject to the approval in all respects by the Architect/ **Consultant/ Authorized person of Shaheed Bhagat Singh College**.

22. On acceptance of the tender the contractor shall in writing inform **Shaheed Bhagat Singh College** and the Consultants the names of his accredited representatives who will be responsible to take instructions from the Architect/ **Consultant/ Authorized person of Shaheed Bhagat Singh College**.

23. The work or any part of it shall not be transferred assigned or subject without the consent of the **Shaheed Bhagat Singh College**.

24. The contractor shall be required to co-operate and work in accordance with and afford reasonable facilities for such other agencies/specialists as may be employed by **Shaheed Bhagat Singh College** on other works / sub works in connection with the work.

25. The contractor will be required to insure the work and keep it insured until one month after the date of taking over the works by **Shaheed Bhagat Singh College** or otherwise as per the terms of the contract, against loss or damage by fire and other usual risks other than the risks accepted in the terms of the contract with an approved in **Shaheed Bhagat Singh College**.

26. The contractor is required to comply with all relevant Acts of Govt. relating to labour rules and regulations made thereunder from time to time submit at the proper times all particulars and statements required to be furnished to the labour authorities.

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27. For all the items of work executed by him, the contractor will be required to supply, at his own expenses, to the Consultants, copies of post card size photographs in triplicate for each of the works, taken from two approved portions of each item of work at intervals of not more than two weeks during the progress of the work and also at every important stages of the work or as directed by the Consultants/ **Shaheed Bhagat Singh College**.
28. In carrying out the work, the contractor shall comply with the provisions of the safety code, annexed to these papers.
29. The bidder shall furnish an undertaking duly attested by notary in a non-judicial stamp paper of value Rs.100/- (Rupees Hundred Only) regarding their non-blacklisting/Left any work abandoned in any of the government department and public sector undertaking/enterprise in India and central vigilance commission during the last five financial years as per Annexure-X.

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signature of the bidder with company seal.

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FORM OF TENDER FOR WORKS

To,
The Principal
Shaheed Bhagat Singh College,
Sheikh Sarai Phase II,
New Delhi,
Delhi-110017.

Dear Sir,

1. Having duly examined the tender documents including the drawings, specifications, designs, schedule of quantities relating to the works specified in the underwritten memorandum and having visited the site of the said work and having acquired all the requisite information relating thereto as affecting this tender. I/We hereby offer to execute the works specified in the underwritten memorandum within the time specified there in at the **per square foot rates (lump sum rates)** quoted in the tender for Block A and Block B, in all respects with the specifications, designs, drawings and instructions in writing referred to in the conditions of the tender, the articles of agreement, special conditions, the schedule of quantities, and conditions of the contract and with such conditions of the contract and with such materials as are specified, by and in all other respects in accordance with such conditions in the schedule of quantities and conditions of contract so far as applicable.
2. Should this tender be accepted, in whole or in part, I/We hereby agree (I) to abide by and fulfill all the terms and provisions of the said conditions of the contract annexed hereto and the conditions of tender so far as applicable or in default thereof to forfeit and pay to **Shaheed Bhagat Singh College, Sheikh Sarai Phase II, New Delhi-110017**, the sums of money mentioned in the said conditions.
 - a. A sum of **Rs. 5,00,000/- (Rs Five Lacs only)** is hereby forwarded as Earnest Money Deposit in form of Demand Draft /pay order drawn on any Nationalized/schedule bank in favor of "**Shaheed Bhagat Singh College**", payable at New Delhi.
 - b. I/We agree (i) that should I/We fail to commence the work specified in the above mentioned memorandum **Shaheed Bhagat Singh College** shall without prejudice to any other right or remedy be the liberty to forfeit the Earnest Money, otherwise shall be retained by **Shaheed Bhagat Singh College** towards security deposit mentioned in the above memorandum. (ii) to execute all the works referred to in the tender document upon the terms and conditions contained or referred to therein and to carry out authorized variations as directed by the Consultants/ **Shaheed Bhagat Singh College** and as per said conditions of the contract.

The name of the Proprietor /Partners/Directors
of our firm are:

Signature of bidder with seal

Dated theday of2024

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(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

PERFORMA -I

BIDDER TECHNICAL DETAILS

S. No.	Particulars/Details	
1.	Name of the Bidders/ Firm	
2.	Year of establishment	
3.	Communication Address	
4.	Telephone No. Office	
	Mobile	
	Fax	
	E-Mail	
	Website	
5.	Authorised Person - Name	
	Designation	
	Mobile	
	E-Mail ID	
6.	Alternate Authorised Person - Name	
	Designation	
	Mobile	
	E-Mail ID	
7.	PAN No.	
8.	GST. Registration	
9.	Beneficiary Bank Details	
	Bank Account No	
	IFSC/NEFT Code	
	Name of Bank	
	Address of Branch	

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10.	Beneficiary Bank Details	
	Bank Account No	
/NEFT Code	
	Name of the Bank	
	Address of Bank	
11.	Particular of Earnest Money Deposit (EMD)	
	Amount	Rs.
	(DD/PO) No.	
	Date	
	Name of the Bank	
	Address of Bank	
12.	Name of Directors / Partners/ proprietor(s) (Please enclose relevant document/deed)	
13	Status of the firm (Company / Firm/ Proprietary)	
14	Whether registered with the registrar of companies / registrar of firms. If so, mention number and, date.	
15	Whether the bidder is income tax assessee, If so, please mention permanent account number. Furnish copies of income tax returns for three years duly certified	
16.	Furnish the names with address & telephone nos. of three responsible persons who will be in a position to certify about the services/quality as well as the past performance of your organization.	
17.	Whether you accept all the terms and conditions of the tender; Yes/No	

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(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

DETAIL OF EXPERIENCE – **PERFORMA-II**

1. Details of Similar Experience: Details of Similar works executed during the last 3 years

Sl. No.	Name & Address of the client, Concerned Person and contact/ Mobile No	Location of work	Value of Work (In lakh)	Stipulated Time of Completion	Actual time completion with date of start & completion	Completion/ Performance Certificate enclosed 'Yes' or 'No'	Any other information you would like to give

(Fill up the above table & Enclose legible copies of the supporting documents)

2. Financial Capability: Average Annual Financial Turnover of the bidder in the last 3 years

SL. No.	Financial Year	Turnover (Rs. in crore)
1.	2020-21	
2.	2021-22	
3.	2022-23	
	Average	

(Fill up the above table and Enclose copy of Turnover certificates, profit/loss statement certified by any Chartered Accountant.)

SD/-

SBSC, UNIVERSITY OF DELHI

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

PERFORMA -III

NON DISCLOSURE UNDERTAKING (INTEGRITY PACT)

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

NON DISCLOSURE UNDERTAKING (INTEGRITY PACT)

I/We understand that **Shaheed Bhagat Singh College** is committed to privacy and non-disclosure of sensitive information as per the relevant rules.

Hence, I/We M/s _____

who are submitting bid offer for construction at **Shaheed Bhagat Singh College** against Tender No. _____ hereby undertake to comply with the following in line with Information Security/Privacy Policy of **Shaheed Bhagat Singh College** _____

- To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
- The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of **Shaheed Bhagat Singh College**

(Signature, date & seal of Authorized
Signatory of the bidder)

Date:

SD/-

SBSC, UNIVERSITY OF DELHI

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

DECLARATION

(TO BE TYPED ON A LETTER HEAD OF THE COMPANY/ FIRM)

Dated: ____, 2024.

**To,
The Principal
Shaheed Bhagat Singh College,
Sheikh Sarai Phase II,
New Delhi,
Delhi-110017.**

Dear Sir,

1. We have carefully read and understood all the terms and conditions of the tender and hereby convey our acceptance to the same.
2. The information / documents furnished along with the above offer are true and authentic to the best of my knowledge and belief. We are well aware of the fact that furnishing of any false information / fabricated document would lead to rejection of our tender at any stage besides liabilities towards prosecution under appropriate law.
3. We have apprised our self fully about the job to be done during the currency of the period of agreement and also acknowledge to bear consequences to of nonperformance or deficiencies in the services on our part.
4. We have no objection, if enquiries are made about the work listed by us.
5. We have not been blacklisted by **Shaheed Bhagat Singh College** or any other organization where we have worked. Further, if any of the partners/directors of the organization /firm is blacklisted or having any criminal case against them, our bid shall not be considered. At any later point of time, if this information is found to be false, **Shaheed Bhagat Singh College** may terminate the assigned contract immediately.
6. We have not been found guilty by a court of law in India for fraud, dishonesty or moral turpitude.
7. We agree that the decision of **Shaheed Bhagat Singh College** in selection of Bidders will be final and binding to us.

Date:

Signature of authorized person

Place:

Full Name & Designation:

Company's Seal:

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signature of the bidder with company seal.

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

TENDER FORM

(TO BE TYPED ON A LETTER HEAD OF THE COMPANY/ FIRM)

**To,
The Principal
Shaheed Bhagat Singh College,
Sheikh Sarai Phase II,
New Delhi,
Delhi-110017.**

Dear Sir,

I/We, the undersigned having carefully gone through and clearly understood the Specifications, with conditions of contract for the above mentioned work, do hereby tender to execute and complete the whole of the works strictly in accordance with the said specifications, etc. at the per square feet rates quoted by us for Block A and Block B in BOQ

I/We am/are sending you herewith an amount of Rs. 5,00,000/- **(Rs. Five Lakh Only)** as Earnest Money by Demand Draft / Pay Order which amount is not to bear any interest and I/We do hereby agree that the same may be forfeited by you in the event of your accepting my/our tender and I/We fail to execute the contract when called upon to do so.

It is understood that the lowest or any tender will not necessarily be accepted and **Shaheed Bhagat Singh College** reserves the right to accept or reject any or all the tenders and that **Shaheed Bhagat Singh College** is not bound to assign any reason for the same.

I/We agree to keep our offer open for a period of 90 days from the date of opening of tenders.

Thanking you,

Yours faithfully,

Date:

Place:

(Contractor's signature with seal)

SD/-

SBSC, UNIVERSITY OF DELHI

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

SPECIMEN COPY

Not to be filled. To be executed at the time of award of contract

ARTICLES OF AGREEMENT

Stamped Paper of Appropriate Value

This Agreement entered into on this the _____ day of _____ Two Thousand and (____/____/_____) at _____ Between SHAHEED BHAGAT SINGH COLLEGE., a constituent college of University of Delhi, at **Sheikh Sarai Phase II, New Delhi, Delhi-110017.**

, represented herein by its.....(hereafter referred to as "THE COLLEGE" which expression shall mean and include, wherever the context so requires or admits, its assigns, nominees, successors-in-interest and administrators)

and

....., a contractor having office at (Address) (hereafter referred to as "the Contractor" which expression shall mean and include, wherever the context so requires or admits, its successors-in-interest, administrators and executors).

WITNESSES AS FOLLOWS:

- I. WHEREAS the College is a constituent College of university of Delhi
- II. WHEREAS the College is desirous of engaging the services of (name of contractor) in respect of (name of work) for consideration to be mutually agreed upon by the parties. Whereas the College desirous of appointing (name of contractor) as its Contractor to carry out works specified in the Tender documents and the Contractor is desirous of being appointed thus

NOW THIS AGREEMENT WITNESSES THAT in consideration of the above and of the covenants of the parties contained herein, The College hereby engages (name of contractor) as its Contractor for performing work, the scope of which is specified in tender documents, which appointment is hereby accepted by the Contractor, on the mutual terms and conditions contained below:

1. ENGAGEMENT

The College hereby engage the Contractor above named for performing the works specified in the tender documents and employing labour to perform the said works in respect of (name of work).

2. DURATION/TENURE OF CONTRACT AGREEMENT

The engagement of the Contractor by the college under this Agreement shall be for a period of months, certain, commencing from This Agreement shall automatically stand terminated upon expiry thereof unless extended by mutual agreement.

3. FUNCTIONS, DUTIES AND RESPONSIBILITIES OF THE CONTRACTOR

- 3.1 The contractor shall perform all the works specified in Conditions of contract to this agreement and may engage contract labour for the said purpose, the minimum number to be specified by the College.
- 3.2 The contractor shall and hereby agrees and confirms to comply with all the provisions of Labour laws and industrial laws in respect of the labour employed thereof.
- 3.3 The Contractor shall apply for and obtain license as provided for under Section 12 of the Contract Labour (Regulation and Abolition) Act, 1970 whenever it employs 20 or more workmen on any day in a year and also obtain renewal from time to time.
- 3.4 The contractor shall apply for and obtain license as provided under section 12 of contract Labour (Regulation and Abolition) Act, 1970 for each branch or office as a separate unit.

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SBSC, UNIVERSITY OF DELHI

CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017

- 3.5 The Contractor shall strictly comply with all the terms and conditions that the licensing authority may impose at the time of grant of license and the College shall not be responsible for the same.
- 3.6 The Contractor shall be solely responsible for the payment of wages, including overtime wages to the workmen and ensure its timely payment thereof.
- 3.7 The Contractor shall duly maintain a register giving particulars of the contract labour employed, nature of work, rate of wages, etc.
- 3.8 The Contractor shall also ensure the compliance of the following labour legislations:
 - (i) Minimum Wages Act, 1984;
 - (ii) Employees Provident Fund;
 - (iii) Employees State Insurance Act, 1948
 - (iv) Workmen's compensation Act, if the ESI Act does not apply.
- 3.9 The contractor shall obtain an independent code number under the Employees State Insurance Act, 1948 and the Employees Provident Fund.
- 3.10 The Contractor shall ensure that the compliance with the provisions of the Contract Labour (Regulation and Abolition) Act 1970 and other labour legislations is current and up to date at all times during the performance of the works specified in the tender document.
- 3.11 The Contractor shall be solely responsible to adhere to all the rules and regulations relating to labour practices and service conditions of its workmen and at no time it shall be the responsibility of the College.
- 3.12 The Contractor or its workmen shall not at any point of time have any claim whatsoever against the College.
- 3.13 The Contractor shall indemnify the College in so far as liability incurred by the College on account of any default by the contractor.
- 3.14 Neither the Contractor nor his workmen can be treated as employees of the College for any purposes. They are not entitled for any claim, right, preference etc over any job/regular employment of the College.
- 3.15 If the contractor fails to discharge his duties or neglects to perform the work agreed to be done under the agreement, the College is entitled to terminate this agreement as per Clause 6 and get the work done by/through others and claim reimbursement of actual expenses incurred and also damages for the loss incurred on account of failure on the part of the contractor to discharge the duties or to perform the work under the agreement.

4. Payment

- 4.1 The College shall make the payment to the Contractor, as per the terms of payment mentioned in the tender and under the provisions of this Agreement. Provided however, that such payment shall be made only if the Contractor has duly performed all its obligations and covenants under this Agreement and has discharged all its functions and responsibilities to the satisfaction of the College.
- 4.2 The payment shall be subject to deduction of tax at source and other statutory deductions.

5. MISCELLANEOUS

- 5.1 The College shall not assign, delegate, transfer etc., any of their right/s and/or obligation/s under this Agreement to any third person/s, concern/s, firm/s, company/ies or entity/ies;
- 5.2 The Contractor shall at all times during this Agreement and thereafter, indemnify and keep indemnified the College, its officers, employees and representatives, from all or any claims, losses, demands, damages, etc, which the College, its officers, employees and representatives may or are likely to suffer by reason of acts, defaults, deeds, things, omissions and commissions committed by the Contractor, while performing the conditions of this Agreement;
- 5.3 Any amendment and/or modifications to this Agreement shall be valid and binding on either party, only if such amendment/modification is mutually agreed to in writing and executed by both parties;
- 5.4 If any provision contained herein should be held unlawful, becomes incapable of performance by either Party, is rendered void or unenforceable for any reason, that provision shall be severed from this Agreement and the other provisions shall continue to be valid and performed, as if the severed provision was never a part of this Agreement.

6. TERMINATION

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SBSC, UNIVERSITY OF DELHI

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

If the Contractor, in the opinion of the College, fails or neglects to fulfill any or all terms and conditions of the Agreement, the College shall be entitled to terminate this Agreement, without assigning any reason, by a written notice of thirty (30) days to the Contractor and the Contractor shall not have any right to claim any damage/compensation from the College for the same.

7. NOTICES

All notices required to be given under this Agreement shall be deemed to be sufficiently given if they are forwarded by registered post A.D./hand delivery with acknowledgement to:

The College at:

To,
The Principal
Shaheed Bhagat Singh College,
Sheikh Sarai Phase II,
New Delhi,
Delhi-110017.

The contractor at:

8. GOVERNING LAW AND JURISDICTION

This Agreement shall be construed and interpreted in accordance with the laws of India. The Courts in New Delhi City alone, to the exclusion of all other courts elsewhere in India, shall have jurisdiction to try any dispute arising out of this Agreement.

9. DISPUTE RESOLUTION

In case any dispute/s or difference/s arises between the Parties in connection with any matter relating to this Agreement including termination thereof then at the option of the College, the same shall be referred to Arbitration by a sole Arbitrator appointed by the College. The decision of the sole arbitrator shall be final and binding on the Parties. The provisions of the Arbitration and Conciliation Act, 1996 and amendments, if any, thereto shall be applicable to such arbitration. The place of Arbitration shall be New Delhi and the language of arbitration shall be in English.

10. The original of this agreement shall be with the College and the signed duplicate or Photocopy of the agreement shall be handed over to the Contractor.

**(Signature of the Authorized Representative
of Shaheed Bhagat Singh College with Seal)**

(Signature of the Contractor with seal)

IN WITNESS WHEREOF THE PARTIES ABOVE NAMED HAVE EXECUTED THESE PRESENTS ON THE DAY, DATE, MONTH AND YEAR WRITTEN HEREINABOVE IN THE PRESENCE OF THE WITNESSES ATTESTING HEREUNDER:

**CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN
SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017**

<u>WITNESSES:</u> 1.	For Shaheed Bhagat Singh College
2.	For Contractors

CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017

CONDITIONS OF CONTRACT

1. Interpretation Clauses:

- a. In constructing these conditions, the specifications, schedule of quantities and contract agreement, the following words shall have the meanings here in assigned to them except where the subject or context other requires.
- b. Headings and marginal notes to the conditions of contract shall not be deemed to form part thereof or be taken in to consideration in the interpretation or construction there of or of the contract.
- c. Where the context so requires (i) words importing persons include firms and corporations and (ii) words importing the singular only also include the plural and vice versa.
- d. Employer shall mean **Shaheed Bhagat Singh College**, having its office for **Shaheed Bhagat Singh College at Sheikh Sarai Phase II, New delhi**.
- e. **Consultant:** Shall mean **architects** and engineers, Project Management or in the event of their ceasing to be Consultant for the purposes of this contract such other person or persons as shall be nominated for that purpose by the Employer subject to such qualifying provisions as may be agreed upon.
- f. **Contractor** shall mean the execution agency/firm/Company and include his/their legal representatives, permitted assigns, or successors.
- g. **Site:** The site shall mean the site where the works are to be executed (**Shaheed Bhagat Singh College, at Sheikh Sarai, New Delhi**) including any building and erections there on allotted by the Employer for the Contractor's use.
- h. **The Contract:** Shall mean the tender documents comprising the notice inviting tender, form of tender conditions, the drawings and bill of quantities with their preamble, the acceptance thereof, and the articles of agreement, together with the conditions of contract with its appendix and special conditions, if any, the specifications referred to in the conditions, designs, drawings and instructions issued from time to time by the **Consultants/ Shaheed Bhagat Singh College** and all these documents taken together are deemed to form one contract and shall be complementary to one another.
- i. **Bills of Quantities:** Various also termed bill of quantities, schedule of quantities shall means the schedule of quantities originally furnished with the notice inviting tender, by the bidder and accepted by the Employer for Inclusion as a part of the contract for determining the consideration payable to the contractor for executing the work and as part of the contract agreement it is also referred to as the contract scheduled.
- j. **Notice in writing** or written notice shall mean a notice in written, typed or printed characters sent (Unless delivered personally or otherwise proved to have been received) by registered post to the last known private or business address or to the registered office of the addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.
- k. **Act of Insolvency:** Shall mean any act of Insolvency as defined by the presidency towns Insolvency Act. Or the provincial Insolvency Act or any is amending such original.

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signature of the bidder with company seal.

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- l. **Net Prices:** If in arriving at the contract amount the contractor shall have added to or deducted from the total of the items in the tender any sum, either as a percentage or otherwise, then the net price of any item in the tender shall be the sum arrived at by adding to or deducting from the actual figure appearing in a tender as the price of that item a similar percentage or proportion of the sum so added or deducted by the contractor, the total amount of any price cost items and provisional sums of money shall be deducted from the total amount or the tender. The expression "net prices" when used with reference to the contract or accounts shall be held to mean rates or prices so arrived at.
 - m. **The works** (or the work) shall unless there by something either in the subject or context repugnant to such construction, be considered and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or addition. Wherever the word "works" is used it shall cover "installation" also under the same definition.
 - n. **Executed Risks** are risks due to riots (otherwise than among contractors Employees) and civil commotion (in so far as both these are uninsurable war (whether declared or not) invasion, act of foreign enemies, civil war, rebellion, revolution, insurrection, military or usurped power, any acts of Government, damage from air craft, acts of God such as earthquake, lighting and unprecedented floods and other causes over which the contractor has no control and accepted as such by the Employer or causes solely due to use of occupation in manner for which the woks/installations in respect of which a certificate of completion has been issued or a cause solely due to faulty design of works.
 - o. Provisional **Items** shall mean items for which only very approximate quantities have been included in the tender documents.
 - p. **Virtual Completion** of works / installations shall mean the substantial Completion of the works / installations in accordance with the contract enabling the employer to take over the same.
2. **Consultant/ Shaheed Bhagat Singh College Instructions :** The contractor shall execute the whole and every part of the work in the most substantial and workmanship like manner and both as regards materials and otherwise in every respect in strict accordance with the specifications, conforming exactly, fully and faithfully, to the designs, drawings and instructions in respect of the work given by the **Consultants/ Shaheed Bhagat Singh College** and under the directions of and under the supervision of and subject to the approved in all respects by the Consultant/ **Shaheed Bhagat Singh College** who may in their discretion and from time to time issue further drawings, and/or written instructions, directions and/or written instructions, details and explanations which are hereafter collectively referred to as Consultant/ **Shaheed Bhagat Singh College** in regard to:
- a. Variation or modification of the design quality or quantity of works of the addition or omission or substitution of any work.
 - b. Any discrepancy in the drawings or between the schedule of quantities and/or drawings and/or specifications.
 - c. The removal from the site of any materials brought thereon by the contractor and the substitution of any other materials therefor.

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CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017

- d. The dismissal from the works of any persons employed there upon.
- e. The opening up for inspection of any work covered up.
- f. The amending and making good of any defects under clause 19.
- g. The removal and/or re-execution of any works executed by the contractors, on account of defects under clause 18.

The contractor shall forthwith comply with and duly execute any work comprised in such **Consultants/ Shaheed Bhagat Singh College** instructions provided always that verbal instructions, directions and explanations given to the contractor or his representative upon the works by the Consultant/ **Shaheed Bhagat Singh College** shall if involving a variation, be confirmed in writing by the contractor within seven days by and if not dissented from writing within a further seven days by the Consultants/ **Shaheed Bhagat Singh College**, such shall be deemed to be the Consultant/ **Shaheed Bhagat Singh College** instructions within the scope of the contract.

Manner of Execution of work: The **Consultant/ Shaheed Bhagat Singh College** shall be entitled to, direct at what point or points and in what manner the works are to be commenced, and from time carried on.

Variation to be approved by Employer : Notwithstanding anything herein contained, the **Consultant/ Shaheed Bhagat Singh College** or its representative shall not, without prior concurrence in writing which will result in the Employer having to pay the contractor any additional sum greater than **Rs. 2500/-** and all such instructions issued to the employer. The contractor shall submit through the **Consultant/ Shaheed Bhagat Singh College** a statement of analysis of rates, vouchers, etc. The rates on scrutiny and final acceptance of the Employer under the terms and clauses 16 hereof shall form a supplementary schedule of quantities.

3. **Agreement copies to be supplied:** The contract Document shall remain in the custody of the Consultant/ **Shaheed Bhagat Singh College** (Employer) and shall be produced by him at his office as and when required by the **Employer/Consultant/ Shaheed Bhagat Singh College** or the contractor. The contractor on the signing hereof shall be furnished by the **Consultant/ Shaheed Bhagat Singh College (Employer)** free of cost with a certified copy of the agreement and one copy each of all drawings on the works and the **Consultants/ Shaheed Bhagat Singh College** or his representatives shall at all reasonable times have access to the same. Before the issue of the final certificate to the contractor he shall, if so required, forth with return to the Consultant/ **Shaheed Bhagat Singh College** all drawings and specifications.
4. **The contractor to provide everything necessary:** The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and amounts shall except as otherwise provided cover all his obligations under the contract, and all matters and things necessary for the proper completion of the works.
The contractor shall provide at his own cost all materials (except such, materials if any, as may in accordance with the contract be supplied by the Employer) machinery, plant, tools, appliances, implements, ladders cordage, tackle, scaffolding, in fact everything necessary or proper for the proper execution of the work, whether original, altered or substituted according to the true

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intent and meaning of the or substituted taken together whether the same may or may not be reasonably inferred there from, and if the contractor finds any discrepancy in the drawings, or between the drawings, schedule of quantities and specifications, or between the drawings, schedule of quantities and specifications, he shall immediately and in writing refer to the Consultant/ **Shaheed Bhagat Singh College** who shall decide which is to be followed, subject to:

- i. Anything shown or contained in any one or other of (a) the drawings. (b) Specifications and (c) the contract schedule and not shown in the others shall be equally binding as if it were contained in each of them.
 - ii. Figured dimensions are to be followed in preference to the scale, and large scale details in preference to small scale drawings.
 - iii. The following orders of preference shall apply:
 - (a) The drawings, (b) specifications, covered by bill of quantities, (c) Technical specifications.
5. **Contractor to confirm to legal regulations** : The contractor shall confirm to the provisions any Act of the Legislature relating to the works and to the regulations and Bye - laws of any authority and if any water, lighting and other companies and/or authorities with whose system the structure is proposed to be constructed, and shall , before making any variations from the drawings or specifications that may be necessitated by so conforming give to the **Consultant/ Shaheed Bhagat Singh College** written notice, specifying the variation proposed to be made and the reason for it, and apply for instructions thereon. In case the contractor shall not within ten days receive such instructions he shall proceed with the work, confirming to the provisions, Regulations or bye-laws in question and any variations so necessitated shall be dealt with under clause 12 & 16.

The contractor shall bring to the attention of **the Consultant/ Shaheed Bhagat Singh College** all notices required by the said Acts, regulations or bye-laws to be given to any authority and pay to such authority , or to any public office all fees that may be properly chargeable in respect of the works and lodge the receipts with the **Consultant/ Shaheed Bhagat Singh College**.

The contractor shall indemnify the Employer against all claims in respect of patent rights and shall define all actions arising from such claims to and himself pay all royalties, license fee, damage, cost and charges of all and every sort that may legitimately be incurred in respect thereof.

The Employer is entitled to deduct all taxes and rates as per existing laws and rules, from any money due or that may become due to the contractor.

The contractor shall indemnify the Employer from and against all claims, demands, proceedings damages, or to which it may put by reason not confirming to or complying with any of the provisions or requirements of any act or sanction, central or state, rules, regulations, Bye-laws of local authorities, panchayats, collector or any other companies relating to or in water, light or other amenities at the site.

6. **Contractor Responsible for setting out work** : The contractor shall on the basis of dimensioned drawings and information necessary for the purpose furnished by the Consultants/ **Shaheed Bhagat Singh College** set out the works on site at his own expense and responsible for the correctness of the positions, levels, dimension and setting out by the representative of the consultant or of the Employer shall not in any SD/-

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way he shall amend at his own cost and to the satisfaction of the **Consultant/ Shaheed Bhagat Singh College**, any error in the setting out or consequential to wrong setting out, found at any stage during the progress of the work or during the defects liability period after completion of the work.

7. The contractor shall maintain at the site comprehensive registers, posted up-to-date, showing the nature of the materials/articles/goods their identification marks, dates and the results of the tests, etc. such registers shall be got countersigned by the representatives of the Consultant/Employer at site and extracts from the Consultant and the Employer. The form of the registers shall be mutually set.

The costs of the sets and of the materials and labour and equipment if any, involved in the testing operations shall be borne by the Contractor in all cases except as otherwise provided for in the contract.

8. **Supervision by Contractor:** The contractor shall give all necessary personal superintendence during the execution of works, and thereafter as long as the **Consultants / Shaheed Bhagat Singh College** may consider necessary until the expiration of the "Defects Liability Period" satisfied in clause 19 herein. The contractor shall also during the whole time the works are in progress, employ a competent and qualified representative whose name shall be approved by the Consultant/ **Shaheed Bhagat Singh College** and who shall be Consultancy in attendance at the works while the men are at work. Any directions, explanations, instructions, or notices given by the Consultant/Employer to such representative shall be held to have been given to the contractor. If the contractor fails to appoint and keep on the works a competent and qualified representative as aforesaid the **Consultant/ Shaheed Bhagat Singh College** shall have powers to suspend the works till such time a competent qualified representative as aforesaid is posted and the contractor shall not be entitled to claim extension of time on the plea of such suspension of the works.

9. **Dismissal of workman:** The contractor shall on the request of the Consultant/Employer immediately dismiss from the works any person employed thereon by him who may, in the opinion of the person shall not be again employed on the works without the permission of Consultant/Employer.

10. **Access to works:** The Employer, the consultant and his respective representatives shall at all reasonable times have free access to the works and /or to the workshops, factories or other places where materials are laying or from which they are being obtained and his respective representative, all reasonable facilities necessary for inspection and examination and tests of the materials and workmanship. No person unauthorized by the Employer or the consultant except the representatives of public Authorities shall be allowed on the works at any time.

11. **Work not to be sublet:** The whole of the works included in the contract shall be executed by the Contractor who shall not directly or indirectly transfer, assign or sublet the contract or any part share thereof or interest therein without the written consent of the Employer, and no undertaking shall relieve the contractor from active superintendence of the works during their progress.

12. **Variation not to vitiate the contract:** No alteration, omission or variation shall vitiate SD/-

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this contract but in case if the **Consultant/ Shaheed Bhagat Singh College** thinks proper at any time during the progress of the works to make any alterations in or additions to or omission from or substitutions for the original drawings, specifications, designs and instructions or any alterations in the kind or quality of the materials to be used in the work and shall give notice thereof to the contractor, in writing the contractor shall alter, add to or omit from or substitute for as the case may require, in accordance with such notice and carry out the amended work on the same conditions in all respects on which he agreed to do the main work, but the contractor shall not do any work extra to or make any alterations or additions to or omissions from or substitutions in the works or any deviation from any of the provisions of the contract stipulations, specifications or contract drawings without the previous consent in writing of the **Consultant/ Shaheed Bhagat Singh College** and the value of such extra, alteration, additions or omissions or substitutions shall in all cases be determined by the Consultant/ **Shaheed Bhagat Singh College** with the prior approval in writing of the Employer in accordance with the provisions of Clause 16 hereof, and shall be added to or deducted from the contract amount accordingly.

12.1 The supply and execution of any part of the carrying out of any works incidental to the execution of any item or class of work shown in the tender shall not constitute a variation entitling the contractor to extra paying providing that the said item or class of work cannot be executed satisfactorily according to the true intent and meaning of the drawings and specifications without the said part thereof or the said work incidental thereto whether the same may or may not be particularly shown or described in the drawings, specifications and schedule of quantities and provided the same may be reasonably inferred thereof.

12.2 In the event of extra item/excess quantity including authorized variations result in an addition to the contract sum in excess of 10% be extended on payment by the contractor as follows:

- i) In the proportion which the total executed contract value including authorized variations bears to the original contract value, the certificate of the **consultant/ Shaheed Bhagat Singh College** being conclusive as to such proportion:
- ii) 10% of the additional value calculated way of i) above or such further value as may be considered to be reasonable by the consultant/ **Shaheed Bhagat Singh College**.

12.3 Similarly, the changing the position of the work from one to another or to a more difficult position than shown in the drawings or described in the specifications or the contract schedule, or the carrying out of work under circumstances not contemplated in the specification or the contractor to extra payment.

13. **a) No compensation for alteration in or restriction of work :** If at any time after the commencement of the work the Employer for any reason whatsoever does not require the whole or part or parts thereof as specified in the tender to be carried out, the **Consultant / Shaheed Bhagat Singh College** shall give notice in writing of the fact to the contractor who shall not claim for any compensation whatsoever on account of any profit which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out. Nor shall have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions which shall involve curtailment of the work originally contemplated.

b) Schedule of quantities on standard of measurement: The schedule of quantities unless SD/-

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otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurement.

14. **Errors in Bill of Quantities:** No error in description or in quantity or by way of omission of items from the schedule of quantities shall vitiate this contract but shall be rectified and the value thereof as ascertained under clause 16 herein shall be added to or deducted (as the case may be) from the contract amount provided that there shall be no rectification of errors in the contractor's quoted rates.

15. **Measurement of works:** The **Consultant/ Shaheed Bhagat Singh College** may from time to time intimate to the contractor and the Employer that he required the works to be measured, the contractor shall fore with attend or send a qualified agent to assist the **Consultant/ Shaheed Bhagat Singh College** or the **Consultant/ Shaheed Bhagat Singh College** representative in taking such measurements and calculations and to furnish all particulars or to give all assistance required either of them.

Provided that the contractor shall give notice of not less than ten clear days to the **Consultant/ Shaheed Bhagat Singh College** or his representative in charge of the work before covering up or placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered or placed beyond reach of measurement any work without the consent of the **Consultant/ Shaheed Bhagat Singh College** and his representative in ten days inspect the work and cause the measurements to be made if any work be so covered up without the consent of the **Consultant/ Shaheed Bhagat Singh College** or his representative-in- charge of the work, the same shall be uncovered at the contractor expense, or in default thereof no payment or allowance shall made for such work or materials with which the same was executed.

Should the contractor not attend or neglect or omit to send such agent then the measurements taken by the **Consultant/ Shaheed Bhagat Singh College** or person approved by him shall be taken to be correct measurement of the works. Such measurements shall be taken in accordance with the Indian Standard Method of Measurement, unless otherwise provided for elsewhere in this contract.

The contractor or his agent may at the time of measurement taken such notes and details as he may require.

All authorized extra works, omission and all variations made without **Consultant/ Shaheed Bhagat Singh College** knowledge, if subsequently sanctioned by him in writing (with the prior approval in writing of the Employer) shall be included in such measurement.

16. Price of variation:

(i) The total lump sum quote of Block A and Block B will be considered as financial bid for the tender. Any extra work variation in the measurement will be done and paid as per square feet rate quoted in the tender for Block A and Block B respectively. The extra work shall not exceed 10% of the total contract value.

(ii) In the case of additional, altered or submitted (deviate) work for which amount cannot reasonably be derived as at (i) above, the rates shall be worked out adopting market prices substantiated by purchase bills/vouchers, using factors and constants for quantum's of material, labour, T&P and sundries from NBO/CPWD/Standard materials, labour, T&P and sundries from NBO/CPWD/Standard PWD/data analysis in the order thus written, adding 10% towards profits and overheads. When called upon to do so the contractor shall submit his

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purchase bills/vouchers, to the **Consultant/ Shaheed Bhagat Singh College**.

- (iii) The question as to what particular items, being similar or near similar to the additional, altered or substituted (deviated) work in the contract schedule are to be adopted for variation of rates for the additions, altered or substituted (deviated) work and whether the said rates cannot be derived from similar or near to similar items in the contract schedule will be decided by the Consultant/ **Shaheed Bhagat Singh College**.
- (iv). In case (ii) the contractor is required to submit his analysis of rates adopting the principals enunciated and the Consultant/ **Shaheed Bhagat Singh College** after scrutinizing the analysis and other paper furnished, will allow such rates as he considers reasonable.
- (v). Where extra work is of such a nature that it cannot be properly measured or valued the contractor shall be allowed day work prices or in accordance with the minimum local day work rates and wages for the district, notified by the concerned authority, provided that in either case if required by the **Consultant/ Shaheed Bhagat Singh College** vouchers, muster rolls and other documents required for proper verification of the labour employed and the materials developed on the said work and the costs thereof be delivered to the **Consultant/ Shaheed Bhagat Singh College** or his representatives at or before the end of the week following that in which the work has been executed.

The question as to whether extra work is of such nature that it cannot be properly measured or valued will be decided by the **Consultant/ Shaheed Bhagat Singh College**. The margin to be allowed on actual costs to the contractor towards profits and overheads shall be 10%.

- Viii **variation Limit** : It is the value of which the total executed contract value including authorized variation in excess of the original contract value, expressed as a percentage and shall be adjusted on the sum total of all additions, omissions, reductions, alterations or substitutions (deviations) covered by authorized variations under clause 2 and 13 of the conditions of contract. The values of prime cost sums shall not be included in calculating the above percentage.
- ix There shall be no escalation in the price once the price is fixed and agreed by Shaheed Bhagat Singh College with the contractor, but the contractor should agree to pass on to Shaheed Bhagat Singh College any benefit arising out of any subsequent reduction in the price due to reduction in duties and levies so after the prices are fixed, but before delivery of the goods.

17. **Unfixed Materials:** Wherein any certificate (of which the contractor has received payment) the **Consultant/ Shaheed Bhagat Singh College** has included the value of any unfixed materials intended for and/or placed on or adjacent to the works such materials shall become the property of the Employer and they shall not be removed except for use upon the works, without the written authority of the Consultant/ **Shaheed Bhagat Singh College** . The contractor shall be liable for any loss or damage to such materials.

18. **Removal of Improper work, material, etc., :** The **Consultant/ Shaheed Bhagat Singh College** shall, during the progress of the work, have full powers to order in writing from time to time, removal from the works within such reasonable in the opinion specified in the order, of any materials which in the opinion specified in the order, of any materials which in the opinion of the **Consultant/ Shaheed Bhagat Singh College** are not in accordance with the specifications or the instructions of the Consultant/
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Shaheed Bhagat Singh College or do not confirm to approved samples, the substitution of the rejected materials by proper other materials, and the removal and proper re-execution of any work executed with unsound, imperfect or skilled workmanship or with materials not in accordance with the contract, notwithstanding that the same may have been passed or certified or, and paid for and the contractor shall fore with carry out such order at his own cost.

In case of default on the part of the contractor to carry out such order, the Employer shall have the power to being answerable or accountable for any loss or damage that may happen or arise to such materials removed and all expenses consequent on or incidental thereto as certified by the **Consultant/ Shaheed Bhagat Singh College** shall be borne by the contractor, or may be deducted by the Employer from money due or that may become due to the contractor.

In lieu of re-execution of any work not in accordance with the contract **Consultant/ Shaheed Bhagat Singh College** may in their option allow it to remain but will allow for such work reduce rates. The decision of Consultant/ **Shaheed Bhagat Singh College** to exercise his option in this regard and the quantum of reduction to be made in the rate for the item in question shall be final and binding on the contractor.

19. **Defects Liability Period:** Any defect, shrinkage, settlement or other faults which may appear within the Defects Liability Period stated in the appendix hereto or if none so stated, within 12 months after the completion of the works arising in the option of the Consultant/ **Shaheed Bhagat Singh College** from materials or workmanship not in accordance with the contract, shall on demand which shall be made within the defects liability period, in writing by the Consultant/ **Shaheed Bhagat Singh College** and within such reasonable time as shall be stated therein specifying the work, materials or articles complied of notwithstanding that the same may have been passed or/and certified, paid for, be amended and made good by the contractor, at his own proper charges and cost and incase of default. The Employer may employ and pay other person or persons to amend and make good such defects, shrinkage, settlements or other faults and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages loss and expenses shall upon the Consultant/ **Shaheed Bhagat Singh College** certificate in writing be recoverable from the contractor by the Employer or may be deducted by the Employer from any money due or that may become due to the contractor or the Employer may in lieu of such amending and making and by the contractor deduct from any money due to or that may become due to the contractor a sum to be determined by the Consultant/ **Shaheed Bhagat Singh College** equivalent to the cost of the amending and making good such work and in the event of the amount retained under clause 27 being insufficient, recover the balance from the contractor, together with any expenses the Employer may have incurred in connection therewith, should any defective work have been done or material supplied by any sub-contractor employed on the works who has been nominated or approved by the Consultant/ **Shaheed Bhagat Singh College** /Employer as provided in clause 11 the contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the contractor himself and been subject to the provisions of clause 2 thereof. The contractor shall remain liable under the provisions of this clause notwithstanding the signing by the Consultant/ **Shaheed Bhagat Singh College** of any certificate including the final certificate, or the passing of any accounts.

20. Completion certificate: The works shall not be considered as completed until the

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Consultant/ **Shaheed Bhagat Singh College** has certified in writing that they have been virtually completed and the defects liability period shall commence from such certified date of virtual completion of work. Within ten days of the completion of work, the contractor shall give notice of such completion to the Consultant/ **Shaheed Bhagat Singh College** shall inspect the work and if there is no defect in the work shall furnish the contractor with certificate of completion otherwise a provisional certificate of completion indicating defects (a) to be rectified by the contractor and / or (b) for which payment will be made at reduced rates, shall be issued but no certificate of shall the work considered to be complete until the work as executed, all scaffolding, surplus materials, rubbish and cleaned off the dirt from all woodwork, doors, windows, walls, floors or other parts of any building, in upon or about which the work was executed, or of which he may have had possession for the purpose of execution thereof, and not until the work shall have been measured by the Consultant/ **Shaheed Bhagat Singh College** . If the contractor fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and rubbish as aforesaid and cleaning off dirt on or before the date fixed for the completion of the work, original or extended in terms of clause 24 herein, the employer after issuing due to notice, may at the expense of the contractor remove such scaffolding, surplus materials and rubbish, etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof. And the expense, if any, so incurred may be recovered from any money due or that may become due to the contractor by the Employer.

21. Contractor Liable for Damage done:

- 21.1. The contractor shall be responsible for all injury to persons, animals or things, and for all structural and decorative damage to the property which may arise from the operation or neglect of himself or if any nominated sub-contractor's employee whether such injury of damage arise from careless, accident or any other cause whatever in anyway connected with the carrying out of the contract. This clause shall be held to include, inter-alia, any damage to building, whether immediately adjacent or otherwise, and any damage to roads, streets, foot-paths, bridges or ways as all damage caused to the buildings and works forming the subject of this contractor by frost or other inclemency of weather. The contractor shall indemnify the employer and hold him harmless in respect of all and any acts of Government or otherwise and also in respect of any awards of compensation or damages consequent upon such claims.
- 21.2. The contractor shall reinstate all damages of every sort mentioned in this clause, so as to deliver up the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damage to the property of third party.
- 21.3 The contractor shall indemnify the employer against all claims which may be made against the employer by any member of the public or other third party in respect of anything which may arise in respect of the works or in consequence thereof and shall at his own expense arrange to effect and maintain, until the virtual completion of the contract, with an approved insurer a policy of insurance in the joint names of the employer and contractor against such a risks and deposits such policy or policies with the employer from time to time during the currency of this contract. The contractor shall also similarly indemnify the employer against all claims which may be made upon the

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employer whether under the workmen's compensation act or any other statute in force during the currency of this contract or at common law in respect of any employee of the contractor or sub-contractor and shall at his own expenses effect and maintain, until the virtual completion of the contract, with an approved insurer a policy of insurance in the joint names of the employer and the contractor against such risks and deposit such policy or policies with the employer from time to time during the currency of the contract. The contractor shall be responsible for anything which may be excluded from the insurance policies above referred to and also for all other damages to any property arising out of and incidental to the negligent or defective carrying out of this contract. He shall also indemnify the employer in respect of any costs, charges or expenses arising out of claim or proceeding and also in respect of award of compensation for damage arising there from.

The Employer with the concurrence of the consultant/ **Shaheed Bhagat Singh College** shall be at liberty and is hereby empowered to deduct the amount of any damage, compensation, costs, charges and expenses arising or occurring from or in respect of any such claims or damage from any or all sums due or to become due to the contractor.

22. Responsibility for safety of building: The contractor shall be responsible for the safety of the works (including the materials, temporary buildings and plant) until they are taken over by the employer and they shall stand at their risk, and be in the sole charge of the contractor, who shall be responsible for and must with all possible speed make good all damage from whatever cause.

22. a) **Insurance of the works:** The contractor shall within 7 days from the date of commencement of the work insure the works at his cost and keep them insured until one month after the works are taken over by the Employer or three months after the date of completion whichever is earlier against laws or damage by fire and unusual risks other than fire against which insurers generally provide cover in a **CONTRACTORS ALL RISK POLICY**, with names of the employer and contractor (the name of former being placed first in the policy), for the full amount of the contract. Such policy shall cover the property of amount of the employer only and Consultant and surveyor's fees for assessing the claim and in connection with his services generally in re-instatement sub-contractor or employee.

The contractor shall deposit the policy and receipts for the premium paid with the consultant within a week of the date of commencement of the work unless otherwise instructed by the consultant/ **Shaheed Bhagat Singh College**. In default of the consultant/ **Shaheed Bhagat Singh College** on his behalf may be due or that may become due to the contractor. The contractor shall as soon as claim under the policy is settled, or the work reinstated by the insurers should they elect to do so, proceed with all due diligence with the completions of the works in the same manner as though the fire or other such risk had not occurred and in all respects under the same conditions of contract. The contractor in case of rebuilding or reinstatement after fire or other such usual risk shall be entitled to such extension of time for completion as the consultant/ **Shaheed Bhagat Singh College** decides.

23. Liquidated damages: If the contractor fails to complete the works by the date stated in the Memorandum or within any extended time under clause 24 herein below the contractor shall pay or allow the employer the sum named in the appendix as "Liquidated damages" for period during completion of the work as defined in the contract, and the employer may deduct such damages from any money due or that become due to the contractor.

24. Extension of time: If the contractor shall desire of time for completion of the work on

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the grounds of his having been unavoidably hindered by such causes as (a) force majeure or (b) any an act of God or (c) proceedings taken or threatened by or dispute with adjoining or neighboring owners or public owners or public authorities arising otherwise than through the contractors or (d) the work or delays of other contractors or the consultant/ **Shaheed Bhagat Singh College** and not referred to in the schedule of quantities and or specifications or (e) strike or lockout affecting any of the building trades or directly the work or (f) delays in the supply of materials stipulated to be supplied by the employer or any other valid ground, he shall apply in writing to the consultant/ **Shaheed Bhagat Singh College** within 15 days of the date of such hindrance an account of which he desires such extension as aforesaid and the consultant/ **Shaheed Bhagat Singh College**, if in his opinion reasonable grounds have been shown thereof, may with the previous approval in writing of the employer make a fair and reasonable extension of time for completion of contract works, but the contractor shall nevertheless the constantly use his Endeavour's to prevent delay and shall do all that may reasonable be required of him to proceed with the work expeditiously provided.

- a. That the contractor shall have no claim other than extension of time for the delay in completion of the work due to such hindrance and
- b. That the contractor shall suspend the works whenever called upon to do so in writing by the **consultant/ Shaheed Bhagat Singh College** and shall be allowed reasonable extension of time for completion of work due to such suspension of work and nothing else.

25. **Failure of contractor to comply with consultant/ Shaheed Bhagat Singh College**

Instruction: If the contractor, after receipt of written notice from the consultant/ **Shaheed Bhagat Singh College** requiring compliance within a week fails to comply with such further drawings/and/or consultant/ **Shaheed Bhagat Singh College** instructions, the employer may employ and pay other persons to execute any such work whatsoever that may employ and pay other persons to execute any such work whatsoever that may necessary to give effect thereto, and all costs incurred in connection there with shall be recoverable from the contractor by the employer on the certificate of **the consultant/ Shaheed Bhagat Singh College** as a debt or may be deducted by him from any money due or to become due to the contractor.

26. **Termination of contract by Employer:** If the contractor being an individual or a firm commits any "Act of Insolvency", or college shall have an order for compulsory/voluntarily or be subject to the supervision of the court and of official assignee or the liquidator in such acts of insolvency or winding up, as the case may be and shall be unable within 7 days after notice to him requiring him to do so, to show to the reasonable satisfaction of the consultant/ **Shaheed Bhagat Singh College** that he is able to carry out and fulfill the contract and to give security therefore, if so required by the **consultant/ Shaheed Bhagat Singh College** OR if the contractor (whether an individual, firm of incorporated company) shall suffer execution to be issued. OR shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor. OR shall assign or subject this contract without the consent in writing of the employer first obtained. OR shall charge or encumber this contract or any payments due or which may become due to the contractors there under; OR if the **consultant/ Shaheed Bhagat Singh College** shall certify in writing to the employer that the contractor.

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- i) Has abandoned the contract, or
- ii) Has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon or
- iii) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving the consultant/ **Shaheed Bhagat Singh College** notice to proceed.
- iv) Has failed to remove the materials from the site or to pull down and replace work for seven days after receiving from the consultant/ **Shaheed Bhagat Singh College** written notice that the said materials or work were condemned and rejected by the consultant/ **Shaheed Bhagat Singh College** under these conditions, or
- v) Has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor requiring the contractor to observe or perform the same, or
- vi) Has to determine of good workmanship or without the consent if writing of the employer sublet any part of the contract.

Then and in any of the said causes the employer may not withstanding any previous waiver, after giving seven day's notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the **Consultant/ Shaheed Bhagat Singh College** or the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently executed had been executed by or behalf of the contractor. And further the employer by his agents or servants may enter upon and take possessions of the works and all plant, tools, scaffolding, sheds, machinery, steam or other power utensils and materials laying upon the premises or the adjoining lands or roads, and use the same as his own property or may deploy the same by means of his own servants and workmen in carrying on and completing the works or by employing other contractor or persons to complete the work and the contractor shall not in any way interrupt do not act, matter, or thing to prevent or hinder such other contractor/s or other person or persons employed for completing and finishing or using the materials as soon thereafter as convenient the Consultant/ **Shaheed Bhagat Singh College** shall give notice in writing to the contractor to remove his surplus materials and plant, and should be contractor fail to do so within a period of 14 days after receipt thereof by him the employer shall be entitled to sell the same by public auction and give credit to the contractor for the amount realized.

The contractor's account shall also be credited with the amount that would have been payable to him, for uncompleted work (completed by the Employer through other contractor/s or person as aforesaid) in terms of his agreement as if the contractor had not been determined and he (the contractor) had continued to execute the work to its completion. The actual gross expense to the employer including incidental charges in completing the uncompleted work through other contractor/s or person or persons shall be debited to the contractor's accountant if it be not less than the credit for the uncompleted work as above referred if however, the said debit to be made less than the said credit then the amount to be debited shall be less than the said credit, then the amount to be debited shall be equal to the value of the credit given as above referred.

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The consultant/ **Shaheed Bhagat Singh College** shall thereafter as certain and certify in writing what (if anything) in the final accounting is due to payable to the contractor for the sale of the surplus materials and plant and loss the employer shall have been put any owing, to the contractor and vice versa, and the certificate of the Consultant/ **Shaheed Bhagat Singh College** in this regard shall be final and conclusive between the parties.

27. **Certificate and payment:** All bills in triplicate shall be submitted by the contractor along with detailed measurements of the work completed at site provided. The consultant shall check/take the measurements or cause the measurements to be checked/taken for the purpose of having some to be verified and to the extent work has been executed in accordance with the contract, issue interim certificate and the employer shall make payment to the contractor (as per payment terms mentioned in Memorandum) on the basis of such certificates within the period specified for honoring interim certificates) subject to retention of SD at the percentage mentioned in the said Memorandum till the whole SD is collected.

And when the works have been virtually completed and the **Consultant/ Shaheed Bhagat Singh College** shall have certified in writing that they have been so completed, the contractor shall submit the final bill in respect of the contract work within one month thereafter and in accordance with the certificate to be issued by the **Consultant/ Shaheed Bhagat Singh College** payment shall be made by the employer with in the time named in the Memorandum as "Installment after virtual completion". And the contractor shall be entitled to the payment of the final balance in accordance with the final certificate to be issued in writing by the **Consultant/ Shaheed Bhagat Singh College** after the expiration of the period to as "the defects liability period" in the appendix hereto from the date of virtual completion or as soon after the expiry of such period as the works shall have been finally completed and all made good according to the true intent and meaning thereof whichever shall last happen. Provided always that the issue by the **consultant/ Shaheed Bhagat Singh College** of any certificate during the progress relive the contractor from his liability in case of fraud, dishonesty, or fraudulent concealment relating to the works or material or to any matter dealt with in the certificate and in case of all defects and insufficiencies in the work or materials which is reasonable examination would not have disclosed. No certificate of the **consultant/ Shaheed Bhagat Singh College** shall itself be conclusive evidence that any work or materials to which it relates are in accordance with the contract neither will be contractors have a claim for any amounts which the consultant/ **Shaheed Bhagat Singh College** might subsequently be discovered as not payable and in this respect the employer's decision shall be final and binding.

The **Consultant/ Shaheed Bhagat Singh College** shall have power to withhold any certificate if the works or any parts thereof are not being carried out to his satisfaction. The **Consultant/ Shaheed Bhagat Singh College**, may, in any certificate make any correction in any previous certificate which shall have been issued by him. No certificate of payment will be issued by **the Consultant/ Shaheed Bhagat Singh College** if the contractor fails to insure the works and keep them insured till the issue of the virtual completion certificate of payment may be refused if the contractor fails to execute the formal agreement within two weeks of his being called upon to do so.

28. **Security Deposit / Retention moneys bear no interest:**

Return money/security deposit, or the balance of it available with the employer, shall be refunded to the contractor in the manner specified in the Appendix to the conditions of contract and shall bear no interest whatsoever until the date of its return, notwithstanding any provision to the contrary elsewhere in this contract.

29. **Matters accepted from Arbitration:** The decision, opinion, direction certificates
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(except for payment) with respect to all or any of the matters under clauses 2,4,7,9,12,16,18,19,24,26 hereof (which matters are herein referred to as the excepted matters) shall be final and conclusive and binding on the parties hereto and shall be without appeal. Any other decision, opinion, direction, certificate or valuation of the **Consultant/ Shaheed Bhagat Singh College** or any refusal of the **Consultant/ Shaheed Bhagat Singh College** to give any of the same shall be subject to the right of Arbitration and review in the same way in all respect (including the provisions as to opening the reference) as if it were a decision of the Consultant/ **Shaheed Bhagat Singh College** under the following clause.

30. Arbitration Clause:

- i. All disputes or differences of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof on this contract or the rights touching or concerning the works or the execution or maintenance operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract or after determination, for closure or breach of the contract to the contract either of them and to the appointing authority who shall be appointed for this purpose by the employer (NIC) be referred for adjudication to a sole arbitrator to be appointed as herein after provided.
- ii. For the purpose of appointing the sole arbitrator referred to above, the appointment authority will send within thirty days of receipt by him of the written notice aforesaid to the contractor a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.
- iii. The contractor shall on receipt by him of the names as aforesaid, select any one of the persons named to be appointed as a sole arbitrator and communicate his name to the appointing authority within thirty days of receipt of him of the names. The appointing authority shall there upon without any delay appoint the said person and the sole arbitrator. If the Contractor fails to communicate such selection as provided above within the period specified, the appointing authority shall make the selection and appoint the selected person as the sole arbitrator.
- iv. If the appointing authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the appointing authority a panel of three names of persons who shall be unconnected with either party. The appointing authority shall on receipt by him of the names as aforesaid select any one of the persons named and appoint him as the sole person and appoint him as the sole arbitrator within 30 days of receipt by him of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the sole arbitrator and communicate his name to the appointing authority.
- v. If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed as aforesaid.
- vi. The work under the contract shall however, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceeding.

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- vii. The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing.
 - viii. The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be such place as may be fixed by the arbitrator in his sole discretion.
 - ix. The arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.
 - x. The fees, if any of the arbitrators shall, if required to be paid before the award is made and published, be paid half by each of the parties. The costs of the reference and of the award including the fees, if any of the arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix or settle the amount of costs to be paid.
 - xi. The award of the arbitrator shall be final and binding on both the parties.
 - xii. Subject to aforesaid the provisions of the arbitration and Conciliation Act, 1996 or any statutory modifications or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the arbitration proceedings under this clause.
31. **Right of technical scrutiny of final bill:** The employer shall have a right to cause a technical examination of the works and the final bill of the contractor including all supporting vouchers, abstract etc., to be made at the time of payment of the final bill. If as a result of this examination or otherwise any sum is found to have been over paid or over certified it shall be lawful for the employer to recover the sum.
32. **Employer entitled to recover compensation paid to workmen:** If, for any reason the employer is obliged, by virtue of the provisions of sub-section (1) of section 12 of the Workmen Compensation Act 1923, to pay compensation to a workmen employed by the contractor, in the execution of the works the employer will recover from the contractor the amount of compensation so paid, and without prejudice, to the right of the employer under sub-section (2) of section 12 of the said Act, the employer will be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by the employer shall not be bound to contest any claim made against him under sub-section (1) of section 12, of the said act, except on the written request of the contractor and upon his giving to the employer full security for all cost for which the employer might become liable in consequence of contesting such claim.
33. **Labor laws/Regulations:** The contractor shall employ labor in sufficient numbers directly through sub-contractors to maintain throughout the period of the contract the rate of progress required according to approved program of work and of quality to ensure proper workmanship in accordance with the specifications and drawings and the Consultant/ **Shaheed Bhagat Singh College** instructions.

The contractor will comply with the provisions of all Acts of Government relating to labor and the rules and regulations made there under from time to time. He shall also submit at the proper time all particulars statements required to be furnished to the labor authorities on being directed to do so by the Consultant/ **Shaheed Bhagat Singh College**.

The contractor shall register and obtain necessary licenses, maintain all registers, records, notices and documents and submit returns as prescribed by various enactments required under various

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CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017

statutes including the contract labour (Regulation and abolition) Act, 1970 and rules made there of all the statutory regulations that are in time in all matters concerning this contract. The contractor will also comply with all the rules and regulations stated in the minimum wages Act 1948 and the subsequent amendments. The contractor shall indemnify the employer against any liability that may arise due to the noncompliance of any provisions under minimum wages act 1948 or any enactment affecting the work contemplated under this contract.

34. **Apprentice Act:** The contractor shall comply with the provisions of the Apprentice Act 1961 and the Rules and Orders issued there under from time to time. Failure to do so will amount to a breach of contract and the employer may in his discretion terminate the contract. The contractor shall also be liable for any or other liabilities arising on account of any violation by him of the provisions of the Act.
35. **When Contractor Dies:** Without prejudice to any or remedies under this contract, if the contractor dies, the employer shall have the option of terminating the contract and the contractor would be compensated to the extent of work done and duly certified by the **consultant/Architect. & Employer**
36. **General Indemnity :**The contractor shall indemnify the employer from and against all claims, demands, proceedings, damages, costs and expenses which may be brought or made against employer or to which it may be put by reason of the contractor not conforming to or complying with any of the provisions or requirements of any Act or Status, Central or State, Rules, Regulations, Bye laws of Local Authorities, Panchayat, Collector or any companies relating to or in connection with the works or to labour or for supply of water, light or other amenities at the site.

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**TECHNICAL SPECIFICATIONS & SPECIAL CONDITIONS IN
RELATION TO CONSTRUCTION OF STRUCTURE OF
MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS.**

SAFETY CODE

1. The contractor shall maintain in a readily accessible place “ **FIRST AID APPLIANCES**” Including adequate sterilized dressings and cotton wool.
2. The injured person shall be taken to public Hospital without loss of time, in case where the injury necessitates hospitalization.
3. Suitable and strong and scaffolds should be provided for workmen for all works that cannot safety be done from ground.
4. No portable single, ladder shall be over 9 meters in length. The width between the side rails shall not be less than 30cm (clear) and the distance between two adjacent rungs not more than 30 cm. When a ladder is used an extra helper shall be engaged for holding the ladder.
5. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing, the minimum height of which shall be one meter.
6. No floor, roof or any other part of the structure shall be so loaded with materials as to render it unsafe.
7. Workers shall be provided with protective glasses, footwear, headwear and rubber hand gloves wherever required.
8. Those engaged in welding works shall be provided with welder’s protective eye and gloves.
9. I) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.

II) Suitable facemasks should be supplied for use by the workers when the paint is applied in the form of spray or surface having lead paint if dry rubbed and scraped.
10. Overalls shall be supplied by the contractor to the painter and adequate facilities shall be provided to enable the working painters to wash themselves during the period of cessation of work.
11. Hoisting machines and tackle used in the works including their attachments anchorage and supports shall be maintained in perfect conditions.
12. Ropes used in hoisting or lowering materials or as a means suspension Shall be of durable quality and of adequate strength and free from defects.

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SPECIAL CONDITIONS

1. These specifications are for the work to be done. Items to be supplied and materials to be used in the works as shown and defined on the drawings and described herein all under the supervision and to the satisfaction of the Consultant/ **Shaheed Bhagat Singh College**.
2. The workmanship is to the best available and of a high standard, use must be made of Specialist tradesman in all aspects of the work and allowance must be made in the rates for doing so.
3. The materials and items to be provided by the contractor shall be the best of their respective kinds and as approved by the Consultants/ **Shaheed Bhagat Singh College** in accordance with the samples which may be submitted for approval and generally in accordance with the specifications.
4. Samples of all materials including those specified by name of the manufacturer or the brands, trades name or by the reference to catalogue Nos. are to be submitted to the either orders delivers in the bulk to site. Samples together with their packing are to be provided by the contractor free of any charge and should any materials are rejected, the same will be removed from the site at the expense of the contractor.
5. It should be necessary to prepare shop drawings, the contractor at his own expense prepare and submit at least four sets of such drawings to Consultant/ **Shaheed Bhagat Singh College** for approval.
6. The contractor shall produce all invoices, vouchers or receipts account of all purchases done by him for materials if called upon to do so either by consultants or the **Shaheed Bhagat Singh College**.
7. The contractor should verify all measurements given in the drawings at the site before commencing the work. Any difference should be clarified with the Consultant before commencing the work.
8. Partition line out shall be done at the site before starting the work and got approved from the Consultants.
9. The contractor shall submit Bar chart (CPM method) for the complete work within one week of letter of acceptance of tender and get the same approved from Consultant/ **Shaheed Bhagat Singh College** in advance to co-ordinate the work with other agencies.
10. The contractor shall make necessary security arrangements at the site for the safety of his tools, materials and equipment etc, his own cost.
11. GST will be paid separately. All other taxes will be inclusive and the bidder should quote accordingly.

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12. The rates are firm and no escalation on any account shall be allowed on accepted rates.
13. During working at site, some restrictions may be imposed by **Shaheed Bhagat Singh College** /Security staff of **Shaheed Bhagat Singh College** or Local Authorities regarding safety and security etc., the bidder shall be bound to follow all such restrictions/instruction & nothing extra shall be payable on this account.
14. No compensation shall be payable to the bidder for any damage caused by rains, lightning, wind, storm, floods Tornado, earth quakes or other natural calamities during the execution of work. He shall make good all such damages at his own cost; and no claim on this account will be entertained.
15. If the bidder fails to proceed with the work within the stipulated time as specified from the date of issue of letter of intent/ Award Letter to proceed with the work, **Shaheed Bhagat Singh College** shall forfeit the earnest money deposited by him along with the tender.
16. All the works to be carried out in accordance with latest CPWD/ IS Specifications and as per the directions of **Shaheed Bhagat Singh College** .
17. The work has to be carried out in neat and tidy manner to the satisfaction of the **Shaheed Bhagat Singh College** and all care has to be taken to ensure that no part of the building gets damaged during execution of works. Materials used for carrying out the work shall be of standard quality as per technical specifications. Work has to be completed in all respect within **180 days including monsoon period** from the date of issue of LOI/Award Letter to the contractor.
18. If the bidder fails to undertake the job satisfactorily or violates the terms conditions or not attending the work effectively, **Shaheed Bhagat Singh College** has every right to cancel the contract and forfeit the EMD/security deposit without assigning any reason whatsoever.
19. The contractor has to comply with all the norms of municipal and other authorities as per regulations. Clearance from all local authorities for carry out the work shall be scope of bidder without any extra cost.
20. The bidder shall have to remove all 'malba/debris' if any from the site on same day at his own cost and cleaning of the site has to be done on daily basis. No assistance for cleaning work shall be provided by **Shaheed Bhagat Singh College** .

21. COST OF TESTS

The bidder is bound to carry out the tests, if any, as per the CPWD guidelines for ascertaining the quality of the works executed/ materials used as and when directed by the **Shaheed Bhagat Singh College /Consultants**. The cost of preparing samples and carrying out tests for quality of material or workmanship will be borne by the bidder except for such exclusions as are specifically mentioned in the specifications laid down

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in the contract. The cost of all test carried out in Laboratories as directed by the **Shaheed Bhagat Singh College** will be borne by the contractor.

22. DRAWING AND SPECIFICATIONS

A copy of tender documents and all relevant drawings and specifications shall be available at site for reference. All as built drawings both soft and hard copy has to be submitted by the contractor along with final bill.

23. SHOP DRAWINGS

The Contractor will submit Shop Drawings of Lift to the Consultant and after its approval only the purchase order for supply and installation of the same shall be given.

24. APPROVAL OF MATERIALS

Sample of all the materials shall be submitted and get it approved before giving the Purchase Order.

25. SUBSTITUTION

If the approved is not available in the market, the contractor shall take prior approval from Consultant for Substitute Brand.

26. Material Test Lab

Contractor will set up a field testing lab at his own expense as a part the contract and will maintain necessary testing machines or as advised by Architect/ Consultant/ Owner for conducting day to day tests. Reports of the same will be shared with Architect/ Consultant/ Owner.

27. MANPOWER DEPLOYMENT

Contractor shall ensure to deploy a minimum of following key personnel's on the project:

- Project Manager: Btech having a minimum experience of 10 years.
- Site Engineer: Btech having a minimum experience of 3 years.
- Quality/ Safety Engineer: Btech having a minimum experience of 3 years as quality/ safety engineer.

CV's of the above key personnel's to be priorly approved by the Architect/ Consultant/ Owner. Any negligence in the deployment of above will be recovered from contractors bill amounting Rs. 50,000/- for PM, Rs. 35,000 for Site Engineer and Rs. 35,000 for Quality/Safety Engineer.

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Annexure – X

UNDERTAKING

This is to confirm that we M/s _____ (give full address) have not been blacklisted/left any work abandoned in any of the government department and public sector undertaking / enterprise in India and central Vigilance commission, in last five year before release of advertisement. If the above information found false at any stage after the placement of Purchase/work Order, **Shaheed Bhagat Singh College, at Sheikh Sarai Phase II, New Delhi**. Rein after called Procurement Consultant) will have full right to cancel the Purchase/work Order and forfeit the Performance Guarantee. All the direct and indirect cost related to the cancellation of the order will be borne by us besides any legal action by, which may be deemed, fit at that point of time.

Signatory

Authorized

SD/-

TECHNICAL SPECIFICATIONS

1. PROJECT BRIEF

1. The scope of work under this contract includes **only construction of structure** of Block A and Block B.
2. Block A is a single storey RCC Framed structure having height of about 30 feet (refer Architectural drawings) and whereas Block B is G+1 storey RCC Framed structure whereas the height of both the floors is 15 feet (refer Architectural drawings).
3. Both the blocks will be developed as per the detailed Architectural, Structural, Electrical, Plumbing, etc drawings issued by the Architect. Any deviation of any manner will not be accepted.
4. The tenderer has to carefully analyse the scope of work, structural drawings, area etc., and accordingly quote the per square feet rate (lumpsum rate) separately for Block A and Block B. Block A is considered as structure of one floor of 30 feet height and Block B is considered as structure of 2 floors of 15 feet height each from plinth. The total lump sum quote of Block A and Block B will be considered as financial bid for the tender. Any variation in the measurement will be done and paid as per square feet rate quoted in the tender for Block A and Block B respectively.

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2. SCOPE OF WORK

1. Setting out of the works in respect of position, level dimensions, alignments, etc. including establishment of bench marks, survey reference points, etc.
2. Clearance of the site.
3. Demolishing of any build up structure/ flooring/ any hinderance on site for start of construction activities.
4. Site levelling /terracing within the limits as shown in the drawings or as directed by the Architect/ Consultant/ Owner.
5. Disposal of debris, excavated materials, etc. as per the instructions of the Architect/ Consultant/ Owner.
6. Testing of water,soil and concrete. And any other test as required by CPWD norms.
7. Pumping out rain water/underground water from foundations, excavations and drainage of surface water from worksite without extra cost.
8. All scaffolding, shorting, centering, shuttering works,etc.
9. Running and maintenance of all construction plants and equipment, tools and tackles, etc.
10. All temporary /enabling works such as approach road to the site, water supply, drainage and sewerage, power supply including diesel generator set, temporary offices, stores, construction yard, canteens, toilet blocks, labour camp, fencing, etc.
11. Contractor to ensure complete barricading/ fencing of construction site to ensure complete safety for the occupants in the premises.
12. Protection and maintenance of trees, shrubs, green and other surfaces as instructed by the Architect/ Consultant/ Owner.
13. Any other work required in connection with the execution and successful completion of the contract work.
14. Detailed SOW includes casting of complete RCC framed structure in accordance with the drawings issued by the Architect including the following but not limited to:
 - Excavation of footing and foundations.
 - Erection and casting of footings and foundations with all necessary shuttering and centering supports.
 - Erection and casting columns of desired height as per drawings.
 - Casting of Plinth and support beams of sub structure.
 - Pre and Post construction anti termite treatment.
 - Backfilling as required for raising plinth up to desired height as per drawings
 - Erection and casting columns of desired height as per drawings for super structure with all necessary shuttering and centering supports.
 - Erection and Castin of slabs at required height along with necessary stairs and other services as shown in drawings with all necessary shuttering and centering supports.
 - Laying and embedding of all the necessary Electrical and Public heath conduits/ pipes and testing of same post completion.
 - Erection of plinth protection.
 - Erection of the required brick wall and various partitions as per drawings.
 - Fixing of all the necessary door,s windows, ventilators as per drawings
 - Finishing the brick work with appropriate grade of cement palster as per details/ technical specifications.
 - Erection of stairs, elevation features, railing, ledge walls, parapet walls, mumty and fixing of all the necessary doors, windows, ventilators as per architectural drawings and designs.

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15. Installation and laying of various wall and slab conduits at the time of erection and slab casting. Note, work only includes laying and installation of conduits whereas the installation of wires and any fixtures/ fittings in not in the current scope of work.
16. Installation and laying of various wall and slab plumbing/ sewage of pvc/cpvc pipes at the time of erection and slab casting. Note, work only includes laying and installation of pipes whereas the installation of any fixtures/ fittings in not in the current scope of work.
17. Making various necessary Electrical/ Public Health connections to the existing laid services of the campus.
18. Disposal of all the malba as specified by Architect/ Consultant/ Owner.
19. Clearance of all the necessary malba, machinery, etc for handing over of the site to Owner.
20. Any other works as necessary for the completion of both the blocks

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1. REINFORCED CEMENT CONCRETE WORKS

LIST OF BUREAU OF INDIAN STANDARDS CODES

<i>Sl. No.</i>	<i>I.S. No.</i>	<i>Subject</i>
1.	IS 226	Structural Steel
2.	IS 2285	Methods for chemical analysis of steel (Issues in various parts)
3.	IS 432 (Part I)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement part-I mild steel and medium tensile steel bars.
4.	IS 432 (Part II)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement – Part-II hard drawn steel wire.
5.	IS 456	Code of Practices for plain and Reinforced concrete.
6.	IS 516	Method of test for strength of concrete.
7.	IS 716	Specification for pentachlorophenol
8.	IS 1199	Method of sampling and analysis of concrete.
9.	IS 1200 (Part II)	Method of measurement of building and civil engineering work – concrete work
10.	IS 1200 (Part V)	Method of measurement of building and civil engineering work – concrete work (Part 5-Form work)
11.	IS 1566	Specification for hard drawn steel wire fabric for concrete requirement.
12.	IS 1599	Method for bend test
13.	IS 1343	Code of Practice for Prestressed Concrete
14.	IS 1387:1993	General requirements for the supply of metallurgical materials
15.	IS 14687	Guidelines for falsework for concrete structures
16.	IS 1608	Method for tensile testing of steel products
17.	IS 1786	Specification for high strength deformed steel and wires for concrete reinforcement.
18.	IS 1791	Specification for batch type concrete mixes
19.	IS 2502	Code of practice for bending and fixing of bars for concrete reinforcement.
20.	IS 2751	Recommended practice for welding of mild steel plain and deformed bars for reinforced construction.
21.	IS 4925	Batch plants specification for concrete batching and mixing plant

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22.	IS 4926	Ready – Mixed Concrete
23.	IS 5522:2014	Specification for Indian Standard Stainless Steel sheet and strips for utensils
24.	IS 6523	Specification for precast reinforced concrete door, window frames
25.	IS 10262	Recommended guidelines for concrete mix design
26.	IS 13311 (Part I)	Indian standard for non-destructive testing of concrete. Method of test for ultrasonic pulse velocity
27.	IS 13311 (Part II)	Indian standard for non-destructive testing of concrete. Method of testing by rebound hammer.
28.	IS 14276:1995	Indian standard for Cement bonded particle boards
29.	IS 16172:2014	Specification for Reinforcement couplers for mechanical splices of bars in concrete

2.0 GENERAL

Reinforced cement concrete work may be cast-in-situ or Precast as may be directed by Engineer-in-Charge according to the nature of work. Reinforced cement concrete work shall comprise of the following which may be paid separately or collectively as per the description of the item of work.

- (a) Form work (Centering and Shuttering)
- (b) Reinforcement
- (c) Concreting: (1- Cast-in-situ), (2 - Precast)

Note: The rate to be quoted by the tenderer shall be per square feet rate for block A and block b separately will include all cost of casting RCC ceiling slabs, columns, beams walls, conduit piping in ceiling and plumbing piping for washroom area etc. Block A will have only floor of 30 feet height and Block B will have two floors of 15 feet each so that the roof top level is same of both the floors. No rate will be paid item wise. Any deviation will

2.1 MATERIALS

2.1.1 Water, cement, fine and coarse aggregate shall be as specified under respective clauses of chapter 03 mortars and chapter 04 concrete work as applicable.

2.1.2 Steel for Reinforcement

2.1.2.1 The steel used for reinforcement shall be any of the following types:

- (a) Mild steel and medium tensile bars conforming to IS 432 (Part I)
- (b) High strength deformed steel bars conforming to IS 1786
- (c) Hard drawn steel wire fabric conforming to IS 1566
- (d) Structural steel conforming to Grade A of IS 2062
- (e) Thermo-mechanically treated (TMT) Bars.

2.1.2.2 Elongation percent on guage length is 5.65 A where A is the cross sectional areas of the test piece.

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2.1.2.3 Mild steel is not recommended for the use in structures located in earthquake zone subjected to severe damage and for structures subjected to dynamic loading (other than wind loading) such as railway and highway bridges.

2.1.2.4 Welding of reinforcement bars covered in this specification shall be done in accordance with the requirement of IS 2751.

Nominal mass/weight : the tolerance on mass/weight for round and square bars shall be the percentage given in Table 2.1 of the mass/ weight calculated on the basis that the masses of the bar/wire of nominal diameter and of density 7.85 kg/ cm³ or 0.00785 kg/mm³.

TABLE 2.1
Tolerance on Nominal Mass

Nominal size in mm	Tolerance on the Nominal Mass per cent		
	Batch	Individual sample +	Individual sample for coil (x)
(a) Upto and including 10	±7	-8	±8
(b) Over 10, upto and including 16	±5	-6	±6
Over 16	±3	-4	±4

+ for individual sample plus tolerance is not specified

(x) for coil batch tolerance is not applicable

Tolerance shall be determined in accordance with method given in IS 1786.

2.1.2.5 High strength deformed bars & wires shall conform to IS 1786. The physical properties for all sizes of steel bars are mentioned below in Table 2.2.

TABLE 2.2

Sl. No	Property	Fe 415	Fe 415D	Fe 500D	Fe 550 D
(i)	0.2 Per cent Proof stress/ yield stress, Min, N/mm	415.0	415.0	500.0	550.0
(ii)	elongation, per cent, min. on gauge length 5.65 a, where a is the corss-sectional area of the test piece.	14.5	18.0	16.0	14.5
(iii)	Tensile strength, Min	10 Per cent more than the	12 Per cent more than the	10 Per cent more than the	8 Per cent more than the actual

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		actual 0.2 per cent proof stress/ yield stress but not less than 485.0 N/mm ²	actual 0.2 percent proof stress/yield stress but not less than 500.0 N/mm ²	actual 0.2 per cent proof stress/ yield stress but not less than 565.0 N/mm ²	0.2 per cent proof stress/yield stress but not less than 600.0 N/mm ²
(iv)	Total elongation at maximum force, percent, Min on gauge length 5.65 A, where A is the cross-sectional area of the test piece.	-	5	5	5

Tests: Selection and preparation of Test sample. All the tests pieces shall be selected by the Engineer in-Charge or his authorized representative either-

(a) From cutting of bars

Or

(b) If he so desires, from any bar after it has been cut to the required or specified size and the test piece taken from and any part of it.

In neither case, the test pieces shall be detached from the bar or coil except in the presence of the Engineer-in-Charge or his authorized representative.

The test pieces obtained in accordance with as above shall be full sections of the bars as rolled and subsequently cold worked and shall be subjected to physical tests without any further modifications. No deduction in size by machining or otherwise shall be permissible. No test piece shall be enacted or otherwise subject to heat treatment. Any straightening which a test piece may require shall be done cold.

Tensile Test: 0.2% proof stress and percentage elongation -

This shall be done as per IS 1608, read in conjunction with IS 226.

RE- test: This shall be done as per IS 1786.

Rebend test: This shall be done as per IS 1786.

2.1.2.6 Chemical composition of reinforcement bars shall be as per Table 2.3 as follows:-

TABLE 2.3

Constituent	Maximum Per cent			
	Fe 415	Fe 415D	Fe 500D	Fe 550 D
Carbon	0.30	0.25	0.25	0.25
Sulphur	0.060	0.045	0.040	0.040
Phosphorus	0.060	0.045	0.040	0.040

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Sulphur and Phosphorus	0.110	0.085	0.075	0.075
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2.1.2.7 Thermo Mechanically treated reinforcement bars:

- (a) There is no BIS code for TMT bars. The available code BIS 1786 pertains to HSD Bars. Therefore there should be no stipulation that TMT bars should conform to relevant BIS code.
- (b) The TMT bars are being produced under valid licence from either of the firms namely Tempcore, Thermex Evcon Turbo & Turbo Quench. These firms have acquired patents and are giving licences to various producers to produce TMT Bars.
- (c) The TMT bars shall conform to IS 1786 pertaining to Fe 415 D or Fe 500 D or Fe grade of steel as specified.
- (d) In design and construction of reinforced concrete building in seismic zone III and above, steel reinforcement of Grade Fe 415 D shall be used. However, high strength deformed steel bars, produced by thermo mechanical treatment process of grade Fe 415, Fe 500 and Fe 550 having elongation more than 14.5. % and conform to other requirements of Fe 415 D, Fe 500 D and Fe 550 D respectively of IS 1786 may also be used for reinforcement. In future, latest provision of IS 456 and IS 13920 or any other relevant code as modified from time to time shall be applicable.

2.1.3 Stacking and Storage Steel for reinforcement shall be stored in such a way as to prevent distorting and corrosion. Care shall be taken to protect the reinforcement from exposure to saline atmosphere during storage, fabrication and use. It may be achieved by treating the surface of reinforcement with cement wash or by suitable methods. Bars of different classifications, sizes and lengths shall be stored separately to facilitate issue in such sizes and lengths to cause minimum wastage in cutting from standard length.

2.1.4 Identification Care shall also be taken to properly identify these bars at site. The staff shall be specially trained for looking for identification marks on these bars given by the manufacturers which are generally given colour code. It will be advisable to see that only one type/grade of bars are brought to site and used in the project after conducting tests for each lot.

2.2 FORM WORK (CENTRING & SHUTTERING)

2.2.1 Form Work Form work shall include all temporary or permanent forms or moulds required for forming the concrete which is cast-in-situ, together with all temporary construction required for their support.

2.2.2 Design & Tolerance in Construction Form work shall be designed and constructed to the shapes, lines and dimensions shown on the drawings with the tolerance given below.

(a)	Deviation from specified dimension of cross section of columns and beams	+10 mm -5 mm
(b)	Deviation from dimensions of footings	
	(i) Dimension in Plan	(+ 50 mm (-10 mm
	(ii) Eccentricity in plan	0.02 times the width of the footing in the direction of

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		deviation but not more than 50 mm.
	(iii) Thickness	+50mm Or ± 0.05 times the specified thickness Whichever is less

(Note- These tolerance apply to concrete dimensions only, and not to positioning of vertical steel or dowels).

2.2.3 General Requirement

It shall be strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete. It shall be made sufficiently rigid by using adequate number of ties and braces, screw jacks or hard board wedges where required shall be provided to make up any settlement in the form work either before or during the placing of concrete. Form shall be so constructed as to be removable in sections in the desired sequence, without damaging the surface of concrete or disturbing other sections, care shall be taken to see that no piece is keyed into the concrete.

2.2.3.1 Material for Form Work (a) Propping and Centering : All propping and centering should be either of steel tubes with extension pieces or built up sections of rolled steel.

2.2.3.2 (a) Centering/Staging : Staging should be as designed with required extension pieces as approved by Engineer-in-Charge to ensure proper slopes, as per design for slabs/ beams etc. and as per levels as shown in drawing. All the staging to be either of Tubular steel structure with adequate bracings as approved or made of built up structural sections made form rolled structural steel sections.

(b) In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor below the top most floor already cast.

(c) Form work and concreting of upper floor shall not be done until concrete of lower floor has set at least for 14 days.

2.2.3.3 Shuttering: Shuttering used shall be of sufficient stiffness to avoid excessive deflection and joints shall be tightly butted to avoid leakage of slurry. If required, rubberized lining of material as approved by the Engineer-in-Charge shall be provided in the joints. Steel shuttering used or concreting should be sufficiently stiffened. The steel shuttering should also be properly repaired before use and properly cleaned to avoid stains, honey combing, seepage of slurry through joints etc.

(a) Runner Joists: RSJ, MS Channel or any other suitable section of the required size shall be used as runners.

(b) Assembly of beam head over props. Beam head is an adopter that fits snugly on the head plates of props to provide wider support under beam bottoms.

(c) Only steel shuttering shall be used, except for unavoidable portions and very small works for which 12 mm thick water proofing ply of approved quality may be used.

2.2.3.4 Form work shall be properly designed for self weight, weight of reinforcement, weight of fresh concrete, and in addition, the various live loads likely to be imposed during the construction process (such as

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workmen, materials and equipment). In case the height of centering exceeds 3.50 metres, the prop may be provided in multi-stages. A typical detail of multistage shuttering is given in Fig. 5.9.

2.2.3.5 Camber: Suitable camber shall be provided in horizontal members of structure, especially in cantilever spans to counteract the effect of deflection. The form work shall be so assembled as to provide for camber. The camber for beams and slabs shall be 4 mm per metre (1 to 250) or as directed by the Engineer-in-Charge, so as to offset the subsequent deflection, For cantilevers the camber at free end shall be 1/50th of the projected length or as directed by the Engineer-in-Charge.

2.2.3.5.1 Typical arrangement of form work for 'beams, columns and walls' are shown in Figures 5.1 to 5.8 and form secured by wall ties is shown in Fig. 5.3.

2.2.3.6 Walls : The form faces have to be kept at fixed distance apart and an arrangement of wall ties with spacer tubes or bolts is considered best. A typical wall form with the components identified is given in Fig. 5.1, 5.2 & 5.3. The two shutters of the wall are to be kept in place by appropriate ties, braces and studs, some of the accessories used for wall form are shown in Fig. 5.3.

2.2.3.7 Removal of Form work (Stripping Time) : In normal circumstance and where various types of cements are used, forms, may generally be removed after the expiry of the following periods:

Type of Form work	Minimum period Before Striking Form work for OPC 33 grade	Minimum period Before Striking Form work for OPC 43 grade	Minimum period Before Striking Form work for PPC
(a) Vertical form work to columns, walls, beams	16-24 h	16-24 h	16-24 h
(b) Soffit form work to slabs (Props to be refixed immediately after removal of formwork)	3 days	3 days	4 days
(c) Soffit form work to beams (Props to be refixed immediately after removal of formwork)	7 days	7 days	10 days
(d) Props to slabs: upto 4.5m (1) Spanning 4.5m (2) Spanning over	7 days 14 days	7 days 14 days	10 days 20 days
(e) Props to beams and arches: upto 6m (1) Spanning 6m (2) Spanning over	14 days 21 days	14 days 21 days	20 days 30 days

Note 1: For other types of cement, the stripping time recommended for ordinary Portland cement may be suitably modified. Generally If Portland Pozzolana or low heat cement or OPC with direct addition of fly ash has been used for concrete, the stripping time will be 10/7 of the period stated for OPC with 43 grade cement above.

Note 2: The number of props left under, their sizes and disposition shall be such as to be able to safely carry the full dead load of the slabs, beam or arch as the case may be together with any live load likely to occur during curing or further construction.

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- Note 3:** For rapid hardening cement, 3/7 of above periods for OPC 33 grade will be sufficient in all cases except for vertical side of slabs, beams and columns which should be retained for at least 24 hours.
- Note 4:** In case of cantilever slabs and beams, the centering shall remain till structures for counter acting or bearing down have been erected and have attained sufficient strength.
- Note 5:** Proper precautions should be taken to allow for the decrease in the rate of hardening that occurs with all types of cement in cold weather and accordingly stripping time shall be increased.
- Note 6:** Work damaged through premature or careless removal of forms shall be reconstructed within 24 hrs. 5.2.4 Surface Treatment.

2.2.4.1 Oiling the Surface : Shuttering gives much longer service life if the surfaces are coated with suitable mould oil which acts both as a parting agent and also gives surface protections. A typical mould oil is heavy mineral oil or purified cylinder oil containing not less than 5% pentachlorophenol conforming to IS 716 well mixed to a viscosity of 70-80 centipoises. After 3-4 uses and also in cases when shuttering has been stored for a long time, it should be recoated with mould oil before the next use. The second categories of shuttering oils / leavening agents are Polymer based water soluble Compounds. They are available as concentrates and when used diluted with water in the ratio of 1:20 or as per manufacturer specifications. The diluted solution is applied by brush applications on the shuttering both of steel as well as ply wood. The solution is applied after every use.

2.2.4.2 The design of form work shall conform to sound Engineering practices and relevant IS codes.

2.2.5 Inspection of Form Work

The completed form work shall be inspected and approved by the Engineer-in-Charge before the reinforcement bars are placed in position. Proper form work should be adopted for concreting so as to avoid honey combing, blow holes, grout loss, stains or discoloration of concrete etc. Proper and accurate alignment and profile of finished concrete surface will be ensured by proper designing and erection of form work which will be approved by Engineer-in-Charge. Shuttering surface before concreting should be free from any defect/ deposits and full cleaned so as to give perfectly straight smooth concrete surface. Shuttering surface should be therefore checked for any damage to its surface and excessive roughness before use.

2.2.5.1 Erection of Form Work (Centering and shuttering): Following points shall be borne in mind while checking during erection.

- (a) Any member which is to remain in position after the general dismantling is done should be clearly marked.
- (b) Material used should be checked to ensure that, wrong items/ rejects are not used.
- (c) If there are any excavations nearby which may influence the safety of form works, corrective and strengthening action must be taken.
- (d)
 - (i) The bearing soil must be sound and well prepared and the sole plates shall bear well on the ground.
 - (ii) Sole plates shall be properly seated on their bearing pads or sleepers.
 - (iii) The bearing plates of steel props shall not be distorted.
 - (iv) The steel parts on the bearing members shall have adequate bearing areas.
- (e) Safety measures to prevent impact of traffic, scour due to water etc. should be taken. Adequate precautionary measures shall be taken to prevent accidental impacts etc.

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- (f) Bracing, struts and ties shall be installed along with the progress of form work to ensure strength and stability of form work at intermediate stage. Steel sections (especially deep sections) shall be adequately restrained against tilting, overturning and form work should be restrained against horizontal loads. All the securing devices and bracing shall be tightened.
- (g) The stacked materials shall be placed as catered for, in the design.
- (h) When adjustable steel props are used. They should: 1. be undamaged and not visibly bent. 2. have the steel pins provided by the manufacturers for use. 3. be restrained laterally near each end. 4. have means for centralizing beams placed in the fork heads.
- (i) Screw adjustment of adjustable props shall not be over extended.
- (j) Double wedges shall be provided for adjustment of the form to the required position wherever any settlement/ elastic shorting of props occurs. Wedges should be used only at the bottom end of single prop. Wedges should not be too steep and one of the pair should be tightened/ clamped down after adjustment to prevent shifting.
- (k) No member shall be eccentric upon vertical member.
- (l) The number of nuts and bolts shall be adequate.
- (m) All provisions of the design and/or drawings shall be complied with.
- (n) Cantilever supports shall be adequate.
- (o) Props shall be directly under one another in multistage constructions as far as possible.
- (p) Guy ropes or stays shall be tensioned properly.
- (q) There shall be adequate provision for the movements and operation of vibrators and other construction plant and equipment.
- (r) Required camber shall be provided over long spans.
- (s) Supports shall be adequate, and in plumb within the specified tolerances.

2.2.5.2 Guidelines for Multistage Centering: The proper handling the situation of multistage centering in buildings or where height of casting of concrete is higher than normal height of 3.5M or where higher loadings are coming during casting of concrete or large span structures and in situations of casting of some special structures like Domes, Vaults etc. In all situations, centering/scaffolding/staging for casting of these structures should be properly designed by a qualified and experienced person/agency having past experience in design of false work (centering) for concrete structures and should be proof checked by similar experienced person/ agency and it should be properly approved and issued to contractor by Engineer-In-Charge. The provisions of clause 7 of IS:14687 may be referred for design of false work (centering). A method statement for erection and dismantling of the centering/scaffolding/staging and process of concreting shall be prepared by contractor and submitted to Engineer-in-Charge for approval and the work shall be commenced only after approval of method statement by Engineer-in-Charge. The provisions of clause 9 of IS:14687 may be referred for erection of false work (centering), safety precautions and other site operations, pertaining to false work (centering). Experienced form watcher shall be engaged during erection, concreting and dismantling for early detection of any movement or instability in the system. The field engineers shall ensure that CPWD specifications and provisions of BIS codes are strictly followed. A detailed programme of field safety inspection of centering /scaffolding/form work of such structures during different stages should be chalked out and strictly followed. Provision of safety net, fall arresting system including other safety gears, for workers, working over these structures shall be made in contract and should be followed strictly.

2.2.6 FORM WORK

2.2.6.1 General : The form work shall include the following:

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- (a) Splayed edges, notching, allowance for overlaps and passing at angles, sheathing battens, strutting, bolting, nailing, wedging, easing, striking and removal.
- (b) All supports, struts, braces, wedges as well as mud sills, piles or other suitable arrangements to support the form work.
- (c) Bolts, wire, ties, clamps, spreaders, nails or any other items to hold the sheathing together.
- (d) Working scaffolds, ladders, gangways, and similar items.
- (e) Filletting to form stop chamfered edges of splayed external angles not exceeding 20 mm wide to beams, columns and the like.
- (f) Where required, the temporary openings provided in the forms for pouring concrete, inserting vibrators, and cleaning holes for removing rubbish from the interior of the sheathing before pouring concrete.
- (g) Dressing with oil to prevent adhesion and
- (h) Raking or circular cutting

2.3 REINFORCEMENTS

2.3.1 General Requirements Steel conforming to para 2.1.3 for reinforcement shall be clear and free from loose mill scales, dust, loose rust, coats of paints, oil or other coating which may destroy or reduce bond. It shall be stored in such a way as to avoid distortion and to prevent deterioration and corrosion. Prior to assembly of reinforcement on no account any oily substance shall be used for removing the rust.

2.3.1.1 Assembly of Reinforcement: Bars shall be bent correctly and accurately to the size and shape as shown in the detailed drawing or as directed by Engineer- in-Charge. Preferably bars of full length shall be used. Necessary cutting and straightening is also included. Overlapping of bars, where necessary shall be done as directed by the Engineer-in-Charge. The overlapping bars shall not touch each other and these shall be kept apart with concrete between them by 25mm or $11 / 4$ times the maximum size of the coarse aggregate whichever is greater. But where this is not possible, the overlapping bars shall be bound together at intervals not exceeding twice the dia. of such bars with two strands annealed steel wire of 0.90 mm to 1.6 mm twisted tight. The overlaps/ splices shall be staggered as per directions of the Engineer-in-Charge. But in no case the overlapping shall be provided in more than 50% of cross sectional area at one section. 4.3.1.2 Bonds and Hooks Forming End Anchorages: Reinforcement shall be bent and fixed in accordance with procedure specified in IS 2502, code of practice of bending and fixing of bars for concrete reinforcement. The details of bends and hooks are shown below for guidance.

- (a) U-Type Hook In case of mild steel plain bars standard U type hook shall be provided by bending ends of rod into semicircular hooks having clear diameter equal to four times the diameter of the bar. Note: In case of work in seismic zone, the size of hooks at the end of the rod shall be eight times the diameter of bar or as given in the structural drawings.
- (b) Bends Bend forming anchorage to a M.S. plain bar shall be bent with and internal radius equal to two times the diameter of the bar with a minimum length beyond the bend equal to four times the diameter of the bar.

2.3.1.3 Anchoring Bars in Tension: Deformed bars may be used without end anchorages provided, development length equipment is satisfied. Hooks should normally be provided for plain bars in tension. Development length of bars will be determined as per IS: 456.

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2.3.1.4 Anchoring Bars in Compression: The anchorage length of straight bar in compression shall be equal to the 'Development length' of bars in compression as specified in IS: 456. The projected length of hooks, bend and straight lengths beyond bend, if provided for a bar in compression, shall be considered for development length.

2.3.1.5 Binders, stirrups, links etc. : In case of binders, stirrups, links etc. the straight portion beyond the curve at the end shall be not less than eight times the nominal size of bar.

2.3.2 Welding of Bars Wherever facility for electric arc welding or gas pressure welding is available, welding of bars shall be done in lieu of overlap. The location and type of welding shall be got approved by the Engineer-in-Charge. Welding shall be as per IS 2751 and 9417.

2.3.3 Placing in Position

2.3.3.1 Fabricated reinforcement bars shall be placed in position as shown in the drawings or as directed by the Engineer -in -charge. The bars crossing one another shall be tied together at every intersection with two strands of annealed steel wire 0.9 to 1.6 mm thickness twisted tight to make the skeleton of the steel work rigid so that the reinforcement does not get displaced during deposition of concrete. Tack welding in crossing bars shall also be permitted in lieu of binding with steel wire if approved by Engineer-in-Charge.

2.3.3.2 The bars shall be kept in correct position by the following methods:

- (a) In case of beam and slab construction pre-cast cover blocks in cement mortar 1:2 (1 cement : 2 coarse sand) about 4x4 cm section and of thickness equal to the specified cover shall be placed between the bars and shuttering, so as to secure and maintain the requisite cover of concrete over reinforcements.
- (b) In case of cantilevered and doubly reinforced beams of slabs, the vertical distance between the horizontal bars shall be maintained by introducing chairs, spacers or support bars of steel at 1.0 m or at shorter spacing to avoid sagging.
- (c) In case of columns and walls, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them: or with block of cement mortar 1:2 (1 cement: 2 coarse sand) of required size suitable tied to the reinforcement to ensure that they are in correct position during concreting.
- (d) In case of other R.C.C. structure such as arches, domes, shells, storage tanks etc. a combination of cover blocks, spacers and templates shall be used as directed by Engineer-in-Charge.

2.3.3.3 Tolerance on Placing of Reinforcement: Unless otherwise specified by the Engineer-in Charge, reinforcement shall be placed within the following tolerances: Tolerance in spacing

- (a) For effective depth, 200 mm or less +10 mm
- (b) For effective depth, more than 200 mm + 15 mm

2.3.3.4 Bending at Construction Joints: Where reinforcement bars are bent aside at construction joints and afterwards bent back into their original position care should be taken to ensure that at no time the radius of the bend is less than 4 bar diameters for plain mild steel or 6 bar diameter for deformed bars. Care shall also be taken when bending back bars to ensure that the concrete around the bar is not damaged.

2.3.3.5 Cover : The minimum nominal cover to meet durability requirements shall be as under:-

Exposure	Nominal Concrete cover in mm not less than
Mild	20
Moderate	30
Severe	45
Very severe	50
Extreme	75

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Notes :

1. For main reinforcement upto 12 mm diameter bar for mild exposure the nominal cover may be reduced by 5 mm.
2. Unless specified otherwise, actual concrete cover should not deviate from the required nominal cover by + 10 mm.
3. For exposure condition 'severe' and 'very severe' reduction of 5mm may be made, where concrete grade is M35 and above.
4. Nominal cover to meet specified period of fire resistance shall not be less than as given in Table 16A of IS 456.

2.3.4 Measurement

Reinforcement including authorized spacer bars and lappages shall be measured in length of different diameter, as actually (not more than as specified in the drawings.) used in the work nearest to a centimetre and their weight calculated on the basis of standard weight given in Table 2.4 below. In case actual unit weight of the bars is less than standard unit weight, but within variation, in such cases weight of reinforcement shall be calculated on the basis of actual unit weight. Wastage and unauthorized overlaps shall not be paid for. Annealed steel wire required for binding or tack welding shall not be measured, its cost being included in the rate of reinforcement.

Where tack welding is used in lieu of binding, such welds shall not be measured. Chairs separators etc. shall be provided as directed by the Engineer-in-Charge and measured separately and paid for.

TABLE 2.4
Cross Sections Area and Mass of Steel Bar

Nominal Size mm	Cross sectional Area Sq.mm	Mass per metre Run Kg.
6	28.3	0.222
8	50.3	0.395
10	78.6	0.617
12	113.1	0.888
16	201.2	1.58
20	314.3	2.47
25	491.1	3.85
28	615.8	4.83
32	804.6	6.31
36	1018.3	7.99
40	1257.2	9.86

Note: These are as per clause 6.2 of IS 1786.

2.3A STEEL FOR REINFORCEMENT READY TO USE "CUT & BEND"

2.3A.1 Cut and bend rebars are customised reinforced steel bars required at construction sites. These shall be made from specialized machinery ensuring exact precision, ready to use pre-cut and pre-bent as per approval drawings. The steel used for reinforcement shall be the following types. (a) Thermo-mechanically treated (TMT) Bars.

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2.3A.2 Elongation percent on gauge length is $5.65A$, where A is the cross sectional area of the test piece. **2.3A.3** Welding of reinforcement bars covered in this specification shall be done in accordance with the requirement of IS 2751. Nominal mass/weight:- The tolerance on mass/weight for round and square bars shall be the percentage given in Table 2.4A of the mass/weight calculated on the basis that the masses of the bar/wire of nominal diameter and of density 7.85 Kg/cm^3 or 0.00785 kg/mm^3 .

TABLE 2.4A

Tolerance on Nominal Mass

Nominal size in mm	Tolerance on the Nominal Mass per cent		
	Batch	Individual sample+	Individual sample for coil (x)
(a) Upto and including 10	+7	-8	+8
(b) Over 10, upto and including 16	+5	-6	+6
(c) Over 16	+3	-4	+4

+ for individual sample plus tolerance is not specified

(x) for coil batch tolerance is not applicable Tolerance shall be determined in accordance with method given in IS 1786.

2.3A.3 High strength deformed bars & wires shall conform to IS 1786. The physical properties for all sizes of steel bars are mentioned below in Table 2.4B

TABLE 2.4B

Sl. No.	Property	Fe 500 D	Fe 550 D
(i)	0.2 Per cent Proof stress/yield stress, Min, N/mm^2	500.0	550.0
(ii)	Elongation per cent, Min. on gauge length $5.65\sqrt{A}$, where A is the cross-sectional area of the test piece.	16.0	14.5
(iii)	Tensile strength, Min	10 Per cent more than the actual 0.2 per cent proof stress/yield stress but not less than 565.0 N/mm^2 .	8 Per cent more than the actual 0.2 per cent proof stress/yield stress but not less than 600.0 N/mm^2 .
(iv)	Total elongation at maximum force, percent, Min on gauge length $5.65\sqrt{A}$, where A is the cross-sectional area of the test piece.	5	5

3. BRICK WORK

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3.0. TERMINOLOGY

Bond: The arrangement of the bricks in successive courses to tie the brick work together both longitudinally and transversely. The arrangement is usually designed to ensure that no vertical joint of one course is exactly over the one in the next course above or below it, and there is greatest possible amount of lap.

Bed Joint: Horizontal joint in brick work or masonry.

3.1 The Common Burnt Clay Bricks shall conform to IS:1077 and shall be hand moulded or machine moulded. They shall be free from nodules of free lime, visible cracks, flaws warpage and organic matter, have a frog 100 mm in length 40 mm in width and 10 mm to 20 mm deep on one of its flat sides. Bricks made by extrusion process and brick tiles may not be provided with frogs. Each brick shall be marked (in the frog where provided) with the manufacturer's identification mark or initials.

3.1.1 Dimensions The brick may be modular or non-modular. Sizes for both types of bricks/tiles shall be as per Table 6.1. While use of modular bricks/tiles is recommended, non-modular (FPS) bricks/tiles can also be used where so specified. Non-modular bricks/tiles of sizes other than the sizes mentioned in Table 3.1 may also be used where specified.

TABLE 3.1

Type of Bricks/ Tiles	Nominal Size mm	Actual Size mm
Modular Bricks	200 × 100 × 100 mm	190 × 90 × 90 mm
Modular tile bricks	200 × 100 × 40 mm	190 × 90 × 40 mm
Non-modular tile bricks	229 × 114 × 44 mm	225 × 111 × 44 mm
Non-modular bricks	229 × 114 × 70 mm	225 × 111 × 70 mm

3.1.2 Classification

Bricks/Brick tiles shall be classified on the basis of their minimum compressive strength as given below :

TABLE 3.2

Class Designation	Average compressive strength			
	Not less than		Less than	
	N/mm ²	(kgf/cm ²)	N/mm ²	(kgf/cm ²)
12.5 (125)	12.5	125	15.0	150
10 (100)	10.0	100	12.5	125
7.5 (75)	7.5	75	10.0	100
5 (50)	5.0	50	7.5	75
3.5 (35)	3.5	35	5.0	50

The bricks shall have smooth rectangular faces with sharp corner and shall be uniform in colour and emit clear ringing sound when struck.

3.1.3 Sampling and Tests

Samples of bricks shall be subjected to the following tests :

- (a) Dimensional tolerance.
- (b) Water absorption.
- (c) Efflorescence.
- (d) Compressive strength.

3.1.3.1 Sampling: For carrying out compressive strength, water absorption, efflorescence and dimensional tests, the samples of bricks shall be taken at random according to the size of lot as given in Table 5.3 below. The sample thus taken shall be stored in a dry place until tests are made. For the purpose of sampling, the following definition shall apply.

- (a) **Lot:** A collection of bricks of same class and size, manufactured under relatively similar conditions of production. For the purpose of sampling a lot shall contain a maximum, of 50,000 bricks. In case a

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consignment has bricks more than 50,000 of the same classification and size and manufactured under relatively similar conditions of production, it shall be divided into lots of 50,000 bricks or part thereof.

- (b) **Sample:** A collection of bricks selected for inspection and/or testing from a lot to reach the decision regarding the acceptance or rejection of the lot.
- (c) **Defective:** A brick failing to meet one or more of the specified requirements.

3.1.3.2 The samples shall be taken as below:

- (i) **Sampling from a Stack:** When it is necessary to take a sample from a stack, the stack shall be divided into a number of real or imaginary sections and the required number of bricks drawn from each section. For this purpose bricks in the upper layers of the stack shall be removed to enable units to be sampled from places within the stack.

Note: For other methods of sampling i.e. sampling in motion and sampling from lorries or trucks, IS :5454 may be referred.

Scale of sampling and criteria for conformity for visual and dimensional characteristics:—

Visual characteristics: The bricks shall be selected and inspected for ascertaining their conformity to the requirements of the relevant specification. The number of bricks to be selected from a lot shall depend on the size of lot and shall be in accordance of Col. 1 and 2 of Table 5.3 for visual characteristics in all cases and dimensional characteristics if specified for individual bricks.

- (ii) **Visual Characteristics:** All the bricks selected above in accordance with Col. 1 and 2 of Table 6.3 shall be examined for visual characteristics. If the number of defective bricks found in the sample is less than or equal to the corresponding number as specified in Col. 3 of Table 6.3 the lot shall be considered as satisfying the requirements of visual characteristics, otherwise the lot shall be deemed as not having met the visual requirements.

- (iii) **Dimensional Characteristics:** The number of bricks to be selected for inspecting the dimensions and tolerance shall be in accordance with Col. 1 and 4 of Table 6.3. These bricks will be divided into groups of 20 bricks at random and each of the group of 20 bricks thus formed will be tested for all the dimensions and tolerances. A lot shall be considered having found meeting the requirements of dimensions and tolerance if none of the groups of bricks inspected fails to meet the specified requirements.

TABLE 3.3

Scale of Sampling and Permissible Number of Defectives for Visual and Dimensional Characteristics

No. of bricks in the lot	For characteristics specified for individual bricks		For dimensional characteristics for group of 20 bricks
	No. of bricks to be selected	Permissible no. of defective in the sample	No. of bricks to be selected
(1)	(2)	(3)	(4)
2001—10000	20	1	40
10001—35000	32	2	60
35001—50000	50	3	80

- (iv) **Scale of Sampling and Criteria for Physical Characteristics:** The lot which has been found satisfactory in respect of visual and dimensional requirements shall be next tested for physical characteristics like compressive strength, water absorption, efflorescence as specified in relevant material specification. The bricks for this purpose shall be taken at random from those already selected above. The number of bricks to be selected for each of these characteristics shall be in accordance with relevant columns of Table 5.4.

TABLE 3.4

Scale of Sampling for Physical Characteristics

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Lot size	Sample size for compressive strength, water absorption and efflorescence	Permissible No. of defectives for efflorescence	Warpage Sample Size	Permissible No of defects
(1)	(2)	(3)	(4)	(5)
2001—10000	5	0	10	0
10001—35000	10	0	20	1
35001—50000	15	1	30	2

Note: In case the lot contains 2000 or less bricks, the sampling shall be as per decision of Engineer-in-Charge.

- (v) A lot shall be considered having satisfied the requirements of physical characteristics if the condition stipulated here in are all satisfied.
- (a) From the test results for compressive strength, the average shall be calculated and shall satisfy the requirements specified in relevant material specification. Note: In case any of the test results for compressive strength exceeds the upper limit for the class of bricks, the same shall be limited to the upper limit of the class for the purpose of averaging.
- (b) Wherever specified in the material specification, the compressive strength of any individual bricks tested in the sample shall not fall below the minimum average compressive strength specified for the corresponding class of brick by more than 20 per cent.
- (c) From the test results for water absorption, the average for the bricks in the sample shall be calculated and shall satisfy the relevant requirements specification in material specification.
- (d) The number of bricks failing to satisfy the requirements of the efflorescence specified in the relevant specification should not be more than the permissible no. of defectives given in Col. 3 of Table 5.4.

3.1.3.3 Dimensional Tolerances: The dimensions of, modular bricks when tested as described above as per procedure described in Appendix A of Chapter 6 shall be within the following limits per 20 bricks or locally available size as approved by Engineer-in-charge.

- (a) For modular size
Length 7320 to 3880 mm (3800 ± 80 mm)
Width 1760 to 1840 mm (1800 ± 40 mm)
Height 1760 to 1840 mm (1800 ± 40 mm) for 90 mm high bricks
760 to 840 mm (800 ± 40 mm) for 40 mm high bricks
- (b) For non modular bricks
Length 4520 to 4680 mm (4600 ± 80 mm)
Width 2240 to 2160 mm (2200 ± 40 cm)
Height 1440 to 1360 mm (1400 ± 40 mm) for 70 mm high bricks
640 to 560 mm (600 ± 40 mm) for 30 mm high bricks

Brick Tiles

760 to 840 mm (800 ± 40 mm) for 40 mm high brick tiles
In case of non-modular bricks, % age tolerance will be $\pm 2\%$ for group of 20 numbers of class 10 bricks, and $\pm 4\%$ for other class of bricks.

3.1.3.4 Compressive Strength: The bricks, when tested in accordance with the procedure laid down in Appendix B of Chapter 6 shall have a minimum average compressive strength for various classes as given in Table 5.2. The compressive strength of any individual brick tested shall not fall below the min. average compressive strength specified for the corresponding class of brick by more than 20%. In case compressive strength of any individual brick tested exceeds the upper limit specified in Table 5.2 for the corresponding class of bricks, the same shall be limited to upper limit of the class as specified in Table 5.2 for the purpose of calculating the average compressive strength.

3.1.3.5 Water Absorption: The average water absorption of bricks when tested in accordance with the procedure laid down in Appendix C of Chapter 6 shall be not more than 20% by weight.

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3.1.3.6 Efflorescence: The rating of efflorescence of bricks when tested in accordance with the procedure laid down in Appendix D of Chapter 6 shall be not more than moderate.

3.2. Mortar: The mortar for the brick work shall be as specified, and conform to accepted standards. Lime shall not be used where reinforcement is provided in brick work.

3.3 Soaking of Bricks: Bricks shall be soaked in water before use for a period for the water to just penetrate the whole depth of the bricks. Alternatively bricks may be adequately soaked in stacks by profusely spraying with clean water at regular intervals for a period not less than six hours. The bricks required for masonry work using mud mortar shall not be soaked. When the bricks are soaked they shall be removed from the tank sufficiently early so that at the time of laying they are skin -dry. Such soaked bricks shall be stacked on a clean place where they are not again spoiled by dirt earth etc.

Note I: The period of soaking may be easily found at site by a field test in which the bricks are soaked in water for different periods and then broken to find the extent of water penetration. The least period that corresponds to complete soaking will be the one to be allowed for in construction work.

Note II: If the bricks are soaked for the required time in water that is frequently changed the soluble salt in the bricks will be leached out, and subsequently efflorescence will be reduced.

3.4 Laying

3.4.1 Bricks shall be laid in English Bond unless otherwise specified. For brick work in half brick wall, bricks shall be laid in stretcher bond. Half or cut bricks shall not be used except as closer where necessary to complete the bond. Closers in such cases, shall be cut to the required size and used near the ends of the wall. Header bond shall be used preferably in all courses in curved plan for ensuring better alignment. Note: Header bond shall also be used in foundation footings unless thickness of walls (width of footing) makes the use of headers impracticable. Where thickness of footing is uniform for a number of courses, the top course of footing shall be headers.

3.4.2 All loose materials, dirt and set lumps of mortar which may be lying over the surface on which brick work is to be freshly started, shall be removed with a wire brush and surface wetted. Bricks shall be laid on a full bed of mortar, when laying, each brick shall, be properly bedded and set in position by gently pressing with the handle of a trowel. Its inside face shall be buttered with mortar before the next brick is laid and pressed against it. Joints shall be fully filled and packed with mortar such that no hollow space are left inside the joints.

3.4.3 The walls shall be taken up truly in plumb or true to the required batter where specified. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in the alternate course shall come directly one over the other. Quoin, Jambs and other angles shall be properly plumbed as the work proceeds. Care shall be taken to keep the perpend properly aligned within following maximum permissible tolerances:

- (a) Deviation from vertical within a storey shall not exceed 6 mm per 3 m height.
- (b) Deviation in verticality in total height of any wall of building more than one storey in height shall not exceed 12.5 mm.
- (c) Deviation from position shown on plan of any brick work shall not exceed 12.5 mm.
- (d) Relative displacement between load bearing wall in adjacent storeys intended to be vertical alignments shall not exceed 6 mm.
- (e) A set of tools comprising of wooden straight edge, masonic spirit levels, square, 1 metre rule line and plumb shall be kept on the site of work for every 3 masons for proper check during the progress of work.

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- 3.4.4** All quoins shall be accurately constructed and the height of brick courses shall be kept uniform. This will be checked using graduated wooden straight edge or storey rod indicating height of each course including thickness of joints. The position of damp proof course, window sills, bottom of lintels, top of the wall etc. along the height of the wall shall be marked on the graduated straight edge or storey rod. Acute and obtuse quoins shall be bonded, where practicable in the same way as square quoins. Obtuse quoins shall be formed with squint showing three quarters brick on one face and quarter brick on the other.
- 3.4.5** The brick work shall be built in uniform layers. No part of the wall during its construction shall rise more than one metre above the general construction level. Parts of wall left at different levels shall be raked back at an angle of 45 degrees or less with the horizontal. Tothing shall not be permitted as an alternative to raking back. For half brick partition to be keyed into main walls, indents shall be left in the main walls.
- 3.4.6** All pipe fittings and specials, spouts, hold fasts and other fixtures which are required to be built into the walls shall be embedded, as specified, in their correct position as the work proceeds unless otherwise directed by the Engineer-in-Charge.
- 3.4.7** Top courses of all plinths, parapets, steps and top of walls below floor and roof slabs shall be laid with brick on edge, unless specified otherwise. Brick on edge laid in the top courses at corner of walls shall be properly radiated and keyed into position to form cut (maru) corners. Where bricks cannot be cut to the required shape to form cut (maru) corners, cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) equal to thickness of course shall be provided in lieu of cut bricks.
- 3.4.8** Bricks shall be laid with frog (where provided) up. However, when top course is exposed, bricks shall be laid with frog down. For the bricks to be laid with frog down, the frog shall be filled with mortar before placing the brick in position.
- 3.4.9** In case of walls one brick thick and under, one face shall be kept even and in proper plane, while the other face may be slightly rough. In case of walls more than one brick thick, both the faces shall be kept even and in proper plane.
- 3.4.10** To facilitate taking service lines later without excessive cutting of completed work, sleeves (to be paid separately) shall be provided, where specified, while raising the brick work. Such sleeves in external walls shall be sloped down outward so as to avoid passage of water inside.
- 3.4.11** Top of the brickwork in coping and sills in external walls shall be slightly tilted. Where brick coping and sills are projecting beyond the face of the wall, drip course/throating (to be paid separately) shall be provided where indicated.
- 3.4.12** Care shall be taken during construction that edges of jambs, sills and projections are not damaged in case of rain. New built work shall be covered with gunny bags or tarpoulin so as to prevent the mortar from being washed away. Damage, if any, shall be made good to the satisfaction of the Engineer-in-Charge.
- 3.4.13** Vertical reinforcement in the form of bars (MS or high strength deformed bars or thermo-mechanically treated bars as per direction of Engineer-in-Charge), considered necessary at the corners and junction of walls and jamb opening doors, windows etc. shall be encased with cement mortar not leaner than 1:4 (1 cement : 4 coarse sand), or cement concrete mix as specified. The reinforcement shall be suitably tied, properly embedded in the foundation and at roof level. The dia. of bars shall not be less than 8 mm and concrete grade shall be minimum 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size).
- 3.4.14** In retaining walls and the like, where water is likely to accumulate, weep holes, 50 to 75 mm square shall be provided at 2 m vertically and horizontally unless otherwise specified. The lowest weep hole shall be at about 30 cm above the ground level. All weep holes shall be surrounded by loose stones and shall have sufficient fall to drain out the water quickly.

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3.4.15 Work of cutting chases, wherever required to be made in the walls for housing G.I. pipe, CI pipe or any other fixtures shall be carried out in various locations as per guidelines given below :

(a) Cutting of chases in one brick thick and above load bearing walls.

- (i) As far as possible services should be planned with the help of vertical chases. Horizontal chases should be avoided.
- (ii) The depths of vertical chases and horizontal chases shall not exceed one-third and one-sixth of the thickness of the masonry respectively.
- (iii) When narrow stretches of masonry (or short length of walls) such as between doors and windows, cannot be avoided they should not be pierced with openings for soil pipes or waste pipes or timber joints, etc. Where there is a possibility of load concentration such narrow lengths of walls shall be checked for stresses and high strength bricks in mortar or concrete walls provided, if required.
- (iv) Horizontal chases when unavoidable should be located in the upper or lower one-third of height of storey and not more than three chases should be permitted in any stretch of a wall. No continuous horizontal chase shall exceed one metre in length. Where unavoidable, stresses in the affected area should be checked and kept within the permissible limits.

6. Vertical chases should not be closer than 2 m in any stretch of a wall. These shall be kept away from bearings of beams and lintels. If unavoidable, stresses in the affected area should be checked and kept within permissible limits.

7. Masonry directly above a recess, if wider than 30 cm horizontal dimension) should be supported on lintel. Holes in masonry may be provided upto 30 cm width and 30 cm height without any lintel. In the case of circular holes in the masonry, no lintel need be provided for holes upto 40 cm in diameter.

- (b) Cutting of chases in half brick load bearing walls. No chase shall be permitted in half brick load bearing walls and as such no recessed conduits and concealed pipes shall be provided with half brick thick load bearing walls.
- (c) Cutting of chases in half brick non-load bearing wall : Services should be planned with the help of vertical chases. Horizontal chase should be provided only when unavoidable.

3.5 Joints

The thickness of all types of joints including brick wall joints and cross joints shall be such that four course and three joints taken consecutively shall measure as follows:

- (i) In case of modular bricks conforming to IS 1077 specification for common burnt clay buildings bricks, equal to 39 cm.
- (ii) In case of non-modular bricks, it shall be equal to 31 cm. Note : Specified thickness of joints shall be of 1 cm. Deviation from the specified thickness of all joints shall not exceed one-fifth of specified thickness.

3.5.1 Finishing of Joints: The face of brick work may be finished flush or by pointing. In flush finishing either the face joints of the mortar shall be worked out while still green to give a finished surface flush with the face of the brick work or the joints shall be squarely raked out to a depth of 1 cm while the mortar is still green for subsequently plastering. The faces of brick work shall be cleaned with wire brush so as to remove any splashes of mortar during the course of raising the brick work. In pointing, the joints shall be squarely raked out to a depth of 1.5 cm while the mortar is still green and raked joints shall be brushed to remove dust and loose particles and well wetted, and shall be later refilled with mortar to give ruled finish. Some such finishes are 'flush', 'weathered', ruled, etc.

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3.6 Curing: The brick work shall be constantly kept moist on all faces for a minimum period of seven days. Brick work done during the day shall be suitably marked indicating the date on which the work is done so as to keep a watch on the curing period.

3.7 Scaffolding: Scaffolding shall be strong to withstand all dead, live and impact loads which are likely to come on them. Scaffolding shall be provided to allow easy approach to every part of the work.

3.7.1 Single Scaffolding: Where plastering, pointing or any other finishing has been indicated for brick work, single scaffolding may be provided, unless otherwise specified. In single scaffolding, one end of the putlogs/pole shall rest in the hole provided in the header course of brick masonry. Not more than one header for each put-log/pole shall be left out. Such holes shall not be allowed in the case of pillars, brick work less than one metre in length between the openings or near the skew backs of arches or immediately under or near the structural member supported by the walls. The holes for putlogs/poles shall be made good with brick work and wall finishing as specified.

3.7.2 Double Scaffolding: Where the brick work or tile work is to be exposed and not to be finished with plastering etc. double scaffolding having two independent supports, clear of the work, shall be provided.

3.8 Measurements

3.8.1 Brick work shall be measured in cubic metres unless otherwise specified. Any extra work over the specified dimensions shall be ignored. Dimensions shall be measured correct to the nearest 0.01 m i.e. 1 cm. Areas shall be calculated to the nearest 0.01 sq mtrs and the cubic contents shall be worked out to the nearest 0.01 cubic metres. 6.2.8.2 Brick work shall be measured separately in the following stages:

- (a) From foundation to floor one level (Plinth level)
- (b) Plinth (floor one) level to floor two level
- (c) Between two specified floor levels above floor two level

Note : (i) Brick work in parapet walls, mumty, lift machine room and water tanks constructed on the roof upto 1.2 m height above roof shall be measured together with the corresponding work of the floor next below.

3.8.3 No deductions or additions shall be done and no extra payment made for the following :

Note: Where minimum area is defined for deduction of an opening, void or both, such areas shall refer only to opening or void within the space measured.

- (a) Ends of dissimilar materials (that is, joists, beams, lintels, posts, girders, rafters, purlins, trusses, corbels, steps, etc.); up to 0.1 m² in section;
- (b) Opening up to 0.1 m² in area (see Note);
- (c) Wall plates, bed plates, and bearing of slabs, chajjas and the like, where thickness does not exceed 10 cm and bearing does not extend over the full thickness of wall;
- (d) Cement concrete blocks as for hold fasts and holding down bolts;
- (e) Iron fixtures, such as wall ties, pipes upto 300 mm diameter and hold fasts for doors and windows; and
- (f) Chases of section not exceeding 50 cm in girth.
- (g) Bearing portion of drip course, bearing of moulding and cornice.

Note : In calculating area of an opening, any separate lintel or sills shall be included with the size of the opening but end portions of lintel shall be excluded. Extra width of rebated reveals, if any, shall also be excluded.

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- 3.8.4** Walls half brick thick and less shall each be measured separately in square metres stating thickness.
- 3.8.5** Walls beyond half brick thickness shall be measured in multiples of half brick which shall be deemed to be inclusive of mortar joints. For the sizes of bricks specified in 5.1.1, half brick thickness shall mean 100 mm for modular and 115 mm for non-modular bricks. Where fractions of half brick occur due to architectural or other reasons, measurement shall be as follows :
- (a) upto 1/4th brick-actual measurements and
 - (b) exceeding 1/4 brick-full half bricks.
- 6.2.8.6** String courses, projecting pilasters, aprons, sills and other projections shall be fully described and measured separately in running metres stating dimensions of each projection.
- 3.8.7** Square or rectangular pillars shall be measured separately in cubic metres in multiple of half brick.
- 3.8.8** Circular pillars shall be measured separately in cubic metres as per actual dimensions.
- 3.8.9** Brick work curved on plan shall be measured like the brick work in straight walls and shall include all cutting and wastage of bricks, tapered vertical joints and use of extra mortar, if any. Brick work curved on plan to a mean radius not exceeding six metres shall be measured separately and extra shall be payable over the rates for brick work in straight walls. Nothing extra shall be payable if the mean radius of the brick work curved in plan exceeds six metres.
- 3.8.10** Tapered walls shall be measured net as walls and extra payment shall be allowed for making tapered surface for brick work in walls. **6.2.8.11** Brick work with brick tiles shall be measured and paid for separately. **6.2.9** Rate The rate shall include the cost of materials and labour required for all the operations described above except the vertical reinforcement and its encasement in cement mortar or cement concrete. The rate shall also include the following :
- (a) Raking out joints or finishing joints flush as the work proceeds;
 - (b) Preparing tops of existing walls and the like for raising further new brick work.
 - (c) Rough cutting and waste for forming gables, splays at eaves and the like.
 - (d) Leaving holes for pipes upto 150 mm dia. and encasing hold fasts etc.
 - (e) Rough cutting and waste for brick work curved in plan and for backing to stone or other types of facing.
 - (f) Embedding in ends of beams, joists, slabs, lintels, sills, trusses etc.
 - (g) Bedding wall plates, lintels, sills, roof tiles, corrugated sheets, etc. in or on walls if not covered in respective items and
 - (h) Leaving chases of section not exceeding 50 cm in girth or 350 sq cm in cross-section.
 - (i) Brick on edge courses, cut brick corners, splays reveals, cavity walls, brick works curved on plan to a mean radius exceeding six metres.

4. HALF BRICK WORK

Brick work in half brick walls shall be done in the same manner as described above in 5.4 except that the bricks shall be laid in stretcher bond. When the half brick work is to be reinforced, 2 Nos. M.S. bars of 6 mm dia., shall be embedded in every third course as given in the item (the dia of bars shall not exceed 8 mm). These shall be securely anchored at their end where the partitions end. The free ends of the reinforcement shall be keyed into the mortar of the main brick work to which the half brick work is joined. The mortar used for reinforced brick

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work shall be rich dense cement mortar of mix 1:4 (1 cement: 4 coarse sand). Lime mortar shall not be used. Over laps in reinforcement, if any shall not be less than 30 cm.

The mortar interposed between the reinforcement bars and the brick shall not be less than 5 mm.

The mortar covering in the direction of joints shall not be less than 15 mm.

5. JOINING OLD BRICK WORK WITH NEW BRICK WORK

- 5.1** In case the height of the bricks of old as well as new work is same, the old work shall be toothed to the full width of the new wall and to the depth of a quarter of brick in alternate courses. In case the height of the bricks is unequal, then the height of each course of new work shall be made equal to the height of the old work by adjusting thickness of horizontal mortar joints in the new wall. Where necessary, adjustment shall be made equal to thickness of old wall by adjusting the thickness of vertical joints.
- 5.2** For joining new cross wall to old main walls, a number of rectangular recesses of width equal to the thickness of cross wall, three courses in height and half a brick in depth shall be cut in the main walls. A space of the three courses shall be left between two consecutive recesses. The new cross wall shall be bonded into the recesses to avoid any settlement.
- 5.3** Joining of old brick work with the new brick work shall be done in such a way that there shall not be any hump or projection at the joint.

11. CEMENT CONCRETE GOLA

- 11.1** Cement Concrete The specifications for concrete shall be the same as described in subhead 4.0 of concrete work.

11.2 Gola

A chase of 75 mm wide and 75 mm deep shall be cut in the parapet wall just above the junction of mud phuska or lime concrete with parapet wall and it shall be filled with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge) the external face finish with a slope of 1 : 0.75 and the exposed surface of the gola shall be plastered with cement mortar 1 : 3 (1 cement : 3 fine sand).

Expansion joint at every 3.5 to 4.5 metres shall be provided and filled with bitumen filler. The bitumen filler shall be prepared by mixing bitumen, cement and coarse sand in the ratio of 80 : 1 : 0.25 (80 kg of hot bitumen : 1 kg of cement and 0.25 cum of coarse sand).

11.3 Curing

The finished surface shall be cured for at least 7 days.

12. KHURRAS

The khurras shall be constructed before the brick masonry work in parapet wall is taken up and it shall be of size 45 cm x 45 cm unless otherwise specified in the description of the item and shall be made of cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) or other mix as stipulated in the description of the item.

12.1 Laying

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- 12.1.1** A PVC sheet of size 1 m x 1 m x 400 micron (alternatively, aluminium foil of 32 SWG) shall be laid under the khurra and then cement concrete shall be laid over it to average thickness of 50 mm with its top surface lower than the level of adjoining roof surface by not less than 50 mm.
- 12.1.2** The concrete shall be laid to a size greater than the stipulated size of the khurra in such a way that the adjoining terracing shall overlap the concrete on its three edges by not less than 7.5 cm. The concrete will slope uniformly from the edges to the outlet, the slope being as much as possible and in no case less than 20 mm cement concrete at the outlet. The concrete shall be continued at the same slope through the width of the wall into the outlet opening to ensure a water tight joint.
- 12.1.3** The khurras and the sides of the outlet shall then be rendered with 12 mm coat of cement plaster 1:3 mix (1 cement : 3 coarse sand) or other mix as stipulated in the description of the item. This shall be done when the concrete is still green and shall be finished. The sides of the khurras and sides of the outlet opening shall be well rounded. The size of the finished outlet opening shall be 10 cm wide and by 20 cm high or as directed by the Engineer-in-Charge.
- 12.1.4** In cases where rain water is to be disposed off through rain water pipes, iron grating shall be provided at the outlet as a safeguard against choking, if so directed by the Engineer- in- Charge. Iron gratings, shall be of overall size 20 × 25 cm. with an outer frame of 15 × 3 mm M.S. flat to which 4 Nos M.S. bars of 10 mm dia shall be welded in a vertical direction keeping equal clear spacing of 2.5 cm. or as directed by the Engineer in Charge.

13. RAIN WATER SPOUTS

The sectional area of rain water spouts provided shall be generally at the rate of 1 square cm per 70 to 80 square decimetre of roof area drained. However in locations subject to excessive and high intensities of rainfalls, the area of spouts provided may be suitably increased to suit local conditions. No spout shall be less than 80 mm in diameter. The spacing of spouts shall be arranged to suit the position of openings in the wall.

14. UNPLASTICISED POLYVINYL CHLORIDE PIPES AND FITTINGS

14.1 UPVC Pipes

Pipes shall conform to Type A pipes of IS 13592. The internal and external surfaces of the pipes shall be smooth and clean and free from groovings and other defects. The end shall be clearly cut and shall be square with the axis of the pipe. The end may be chamfered on the plain sides. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible provided the wall thickness remains within the permissible limit.

14.2 Colour of Pipe

Surface colour of the pipes shall be dark shade of grey or as specified.

14.3 Marking

Each pipe shall be clearly and indelibly marked with the following informations at intervals not more than 3 meter.

- (a) Manufacturer's name or trade mark.
- (b) Nominal outside dia of pipe.
- (c) Type 'A' (d) Batch number.

14.4 Dimensions

- 14.4.1 Diameter and Wall Thickness:** Mean outside diameter, outside diameter at any point and wall thickness for type –A manufactured plain or with socket shall be as given in Table- 1 of IS 13592. UPVC rain water pipes shall be of the dia, specified in the description of the item and shall be in nominal lengths of 2,3,4 or 6 metres either

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signature of the bidder with company seal.

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plain or with sliding/grooved socket unless shorter lengths are required at junctions with fittings. Tolerances on specified length shall be + 10 mm and – 0 mm.

14.5 Fixing and Jointing

Pipes shall be either fixed on face of wall or embedded in masonry as required in the description of the item. Plain pipes shall be secured to the walls at all joints with PVC Pipes clips by means of 50 x 50 x 50 mm hard wood plugs, screwed with M.S. screws of required length i/c cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand). The clips shall be kept about 25 mm clear off finished face of wall, so as to facilitate cleaning of pipes. Pipes shall be fixed perfectly vertical or to the lines as directed. The pipes shall be fitted to fittings with seal ring conforming to IS 5382 allowing 10 mm gap for thermal expansion.

14.6 Installation in Wall/Concrete The walls/concrete slots should allow for a stress free installation. Pipes and fittings to be inserted into the slots without a cement base have to be applied first with a thin coat of PVC solvent cement followed by sprinkling of dry sand (medium size). Allow it to dry. The process gives a sound base for cement fixation. This process is repeated while joining PVC material to CI/AC materials.

14.7 Fittings

Fittings used shall be of the same make as that of the PVC pipes Injeciton moulded or fabricated by the manufacturer and shall have a minimum wall thickness of 3.2 mm. The fittings shall be supplied with grooved socketted ends with square grooves and provided with Rubber Gasket conforming to IS 5382. The plain ends of the fittings should be chamfered. The fittings shall be joined with the help of Rubber lubricant. The details of fittings refer IS 13592.

Note : These pipes shall be used only in shaft or unexposed location to avoid damage to these pipes due to willful act.

16. CEMENT PLASTER

The cement plaster shall be 12 mm, 15 mm or 20 mm thick as specified in the item.

16.1 Scaffolding

For all exposed brick work or tile work double scaffolding independent of the work having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed. For all other work in buildings, single scaffolding shall be permitted. In such cases the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/columns less than one metre in width or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purposes shall be filled and made good before plastering. Note : In case of special type of brick work, scaffolding shall be got approved from Engineer-incharge in advance.

16.2 Preparation of Surface

The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scrapping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced. In case of concrete surface if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface.

16.3 Mortar

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The mortar of the specified mix using the type of sand described in the item shall be used. It shall be as specified in CPWD Specification Subhead 3.0. For external work and under coat work, the fine aggregate shall conform to grading IV. For finishing coat work the fine aggregate conforming to grading zone V shall be used.

16.4 Application of Plaster

16.4.1 Plastering will be done only of walls not ceilings.

16.4.2 Plastering shall be started from the top and worked down towards the floor. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. To ensure even thickness and a true surface, plaster about 15 × 15 cm shall be first applied, horizontally and vertically, at not more than 2 metres intervals over the entire surface to serve as gauges. The surfaces of these gauged areas shall be truly in the plane of the finished plaster surface. The mortar shall then be laid on the wall, between the gauges with trowel. The mortar shall be applied in a uniform surface slightly more than the specified thickness. This shall be brought to a true surface, by working a wooden straight edge reaching across the gauges, with small upward and sideways movements at a time. Finally the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or over working the float shall be avoided.

16.4.3 All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises, provision of grooves at junctions etc. where required shall be done without any extra payment. Such rounding, chamfering or grooving shall be carried out with proper templates or battens to the sizes required.

16.4.4 When suspending work at the end of the day, the plaster shall be left, cut clean to line both horizontally and vertically. When recommencing the plastering, the edge of the old work shall be scrapped cleaned and wetted with cement slurry before plaster is applied to the adjacent areas, to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of wall and not nearer than 15 cm to any corners or arises. It shall not be closed on the body of the features such as plasters, bands and cornices, nor at the corners of arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakages. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar. No portion of the surface shall be left out initially to be patched up later on. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar.

16.5 Thickness

Where the thickness required as per description of the item is 20 mm the average thickness of the plaster shall not be less than 20 mm whether the wall treated is of brick or stone. In the case of brick work, the minimum thickness over any portion of the surface shall be not less than 15 mm while in case of stone work the minimum thickness over the bushings shall be not less than 12 mm.

16.6 Curing

Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages at the contractor's expense by such means as the Engineer-in-Charge may approve. The dates on which the plastering is done shall be legibly marked on the various sections plastered so that curing for the specified period thereafter can be watched.

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16.7 Finish

The plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required. The work shall be tested frequently as the work proceeds with a true straight edge not less than 2.5 m long and with plumb bobs. All horizontal lines and surfaces shall be tested with a level and all jambs and corners with a plumb bob as the work proceeds.

16.8 Precaution

Any cracks which appear in the surface and all portions which sound hollow when tapped, or are found to be soft or otherwise defective, shall be cut out in rectangular shape and redone as directed by the Engineer-in-Charge. (i) When ceiling plaster is done, it shall be finished to chamfered edge at an angle at its junction with a suitable tool when plaster is being done. Similarly when the wall plaster is being done, it shall be kept separate from the ceiling plaster by a thin straight groove not deeper than 6 mm drawn with any suitable method with the wall while the plaster is green. (ii) To prevent surface cracks appearing between junctions of column/beam and walls, 150 mm wide chicken wire mesh should be fixed with U nails 150 mm centre to centre before plastering the junction. The plastering of walls and beam/column in one vertical plane should be carried out in one go. For providing and fixing chicken wire mesh with U nails payment shall be made separately.

55. APPLYING SBR POLYMER MODIFIED CEMENT CONCRETE FOR STRUCTURAL MEMBERS

55.1 Material:

SBR polymer or equivalent material shall be approved by Engineer-in-charge.

55.2 Preparation & application

After bonding coat pre fabricated shuttering shall then be erected immediately. Fresh concrete shall be placed /applied while the bond coat is still tacky and well within pot - life / setting period. If adhesive cures to the extent of losing its tack or has set before concrete is placed / applied, the same shall be removed or slightly abraded and another coat of adhesive / bond coat shall have to be applied by the contractor at his own cost. Freshly placed concrete shall be thoroughly consolidated to ensure full bonding of the fresh concrete with the parent concrete. If there is a failure of bond of fresh concrete with parent concrete surface and it sounds hollow on tapping, the repair work shall be dismantled and redone by the contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. Thickness and grade of concrete: As specified in the item with graded stone aggregate of 10 mm maximum size in proportion as per design criteria.

SPECIFICATIONS

FOR

BASIC ELECTRICAL CONDUIT

PIPING

WORK IN CIELINGS & WALLS

CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS IN SHAHEED BHAGAT SINGH COLLEGE AT SHEIKH SARAI, NEW DELHI – 110017

1 TECHNICAL SPECIFICATION FOR CONDUIT

1.1 PVC CONDUIT

Conduits shall be heavy gauge rigid PVC of minimum thickness of 2mm. Conduits shall be ISI marked confirming to IS: 9537 (Part-3)-1983. All conduit and conduit accessories shall be of PVC. Conduit shall be jointed together by vinyl type cement/solvents. Minimum size of conduit shall be 25mm unless otherwise mentioned in drawing. Conduit shall be fixed on ceiling or wall. All conduits shall be concealed in wall/ceiling etc. or fixed on surface of wall with clamps at regular interval as called for elsewhere. For termination of PVC conduits into switch outlet box, PVC female adopters shall be used. Wherever conduit run exceeds 10 metre, circular junction boxes shall be provided to facilitate pulling & inspection of wires. Inspection boxes shall be suitably located in co-ordination with the PM NBCC. Conduits shall be bended using suitable size springs. Long radius bends shall be provided. Heating shall not be used to bend the conduits. Size of conduit shall depend upon number and size of wires to be drawn.

1.2 M.S. CONDUIT (If required)

All conduit pipes shall be of approved gauge (not less than 16 SWG for conduits of sizes up to 32mm diameter and not less than 14 SWG for conduit of size above 32mm diameter) solid drawn or reamed by welding finished with stove enamelled surface. All conduit accessories shall be of threaded type and under no circumstances pin grip type accessories shall be used. The maximum number of PVC insulated 650/1100 volts grade copper conductor cable that can be drawn in conduit of various sizes shall be as per IS code. No steel conduit less than 20mm in diameter shall be used unless otherwise stated.

1.3 CONDUIT JOINTS

Conduit pipes shall be joined by means of threaded couplers, and threaded accessories only. In long distance straight run of conduits, inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam nuts shall be provided. In the later case the bare threaded portion shall be treated with anti-corrosive preservative. Threads on conduit pipes in all cases shall be between 13mm to 19mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipe shall have no sharp edges or any burrs left to avoid damage to the insulation of conductor while pulling them through such pipes.

Wherever conduit passes a building expansion joint, galvanized flexible metallic conduit shall be provided for connecting rigid M.S. Conduit in either slab.

1.4 PROTECTION AGAINST CONDENSATION

The layout of conduit should be such that any condensation or sweating inside the conduit is drained out. Suitable precaution should also be taken to prevent entry of insects inside the conduit.

1.5 PROTECTION OF CONDUIT AGAINST RUST

The outer surface of conduit including all bends, unions, tees, junction boxes etc forming part of conduit system shall be adequately protected against rust when such system is exposed to weather by being painted with two coats

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of oxide paint applied before they are fixed. In all cases, no bare threaded portion of conduit pipe shall be allowed. Unless such bare thread portion of conduit is treated with anticorrosive preservative or covered with approved plastic compound.

1.6 PAINTING OF CONDUIT AND ACCESSORIES

After installation, all accessible surface of conduit pipes, fittings, switch and regulator boxes etc. shall be painted with two coats of approved enameled paint or aluminium paint as required to match the finish of surrounding wall, trusses etc.

1.7 FIXING OF CONDUITS

1.7.1 SURFACE CONDUIT

Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or other approved plugs with screws in an approved manner at an interval of not more than one meter but on either side of the couplers or bends or similar fittings, saddles shall be fixed at a distance of 30cm from the centre of such fittings. The saddles should not be less than 24 gauge for conduits up to 25mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19mm & 25mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of MS. Whereas it is not possible to drill holes in the trusses members suitable clamps with bolts and nuts shall be used. All fixing arrangement like saddles, special purpose clamps, nuts, bolts etc. shall deemed to be included in quoted rates of conduit.

For 25mm diameter conduit width of clip shall be 19mm and of 20 SWG. For conduit of 32mm and above, width of clip shall be 25mm and of 18 SWG.

Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamp to false ceiling frame work or suspended with suitable supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the PM NBCC at site.

1.7.2 RECESS / CONCEALED CONDUIT

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and during the conduit in mortar before plastering shall form part of point wiring work. (For chase cutting-chase cutting machine shall be used and no manual cutting shall be allowed).

The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with the long radius which shall permit easy drawing in of conductors. All threaded joint of conduit pipe shall treated with some approved preservative compound to secure protection against rust. Suitable inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers.

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Wherever the length of conduit run is more than 10 metres, then circular junction box shall be provided to facilitate pulling of wires. The chicken wire mesh shall be provided by civil agency.

1.8 OUTLET BOXES:-

Switch/outlet boxes shall be made of metal on all sides except on the front. Boxes shall be hot dip galvanized mild steel. Up to 20 x 30cm size M.S. Box shall have wall thickness of 16 SWG and MS boxes above 20x30cm size shall be of 14 SWG. The metallic boxes shall be painted with anticorrosive paint before erection. Clear depth of the box shall not be less than 60mm. All fitting shall be fitted in flush pattern. Switch/outlet boxes shall be suitable to house modular type light and power accessories. Earthing stud to be provided for connection of earthing wire in side of box at near any corner. Nakka shall be 3 mm thick.

1.9 FAN BOX:-

Fan Box shall be made out of 14 gauge M.S. sheet in hexagonal shape. The dia of box shall be 150 mm and depth of box shall be 80 mm. A M.S. cover plate size 160 mm x 160mm x 16 gauge to be provided in the back of fan box. 12 mm dia M.S. Rod to be provided for fan hanging arrangement in the box. A 28 mm dia knockout To be made in all six hexagonal vertical part for conduit entry in the box. The box shall be painted with 2 coat of primer. A 180 mm dia, 2 mm thick hylam sheet Cover to be provided. (The sample to be approved before procurement / execution by owner / consultant.)

1.10 JUNCTION TEE / DEEP TEE :-

The tee shall be made out of C.I. material. The dia of tee shall be 60 mm and the Depth of tee shall be 70 mm. The thickness of deep tee wall shall be 1.3mm to 1.5mm. (The sample to be approved before procurement/execution by owner / consultant.)

1.11 ERECTION AND EARTHING OF CONDUITS:-

The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirement by means of special approved type of earthing clamp effectively fastened to conduit pipe in a workmen like manner for a perfect continuity between the earth and conduit. Gas, water pipe shall not be used as earth medium.

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LIST OF APPROVED BRAND NAMES

All material specified in the schedule of quantities, specifications and conditions of contract must conform to the following brand names, be factory made and be of first quality, BIS /IS marked wherever available. Fabricated items shall be manufactured in accordance with the CPWD / ISI specifications and be first quality. Samples of all materials to be used must be submitted and got approved before actual procurement and Owner / Architect reserves the right to select any of the brand names specified herein for use.

S. No:	MATERIAL DESCRIPTION	BRAND / TRADE NAME OR EQUIVALENT APPROVED BY ENGINEER IN CHARGE
1.	Ordinary Portland Cement (43/53 Grade)	ULTRATECH, ACC, JK, JAYPEE, EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
2.	Steel Reinforcement Bars	TATA TISCON, SAIL, RINL OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
3.	Structural steel sections	TISCO, SAIL, OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
4.	Stone Aggregate(Blue/Black)	LOCALLY APPROVED OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
5.	Blocks/ Bricks & Brick Tiles	LOCALLY BEST AVAILABLE OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
6.	Water Proof Shuttering Plywood	INDIAN PLYWOOD MFG.LTD, NATIONAL PLYWOOD, DURO, GREENPLY OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.
7.	PVC Conduit	SUPREME / ASTRALL / FINOLEX OR EQUIVALENT APPROVED BY ARCHITECT/CONSULTANT.

Note:- For any other item required to be incorporated in work , sample shall be got approved from the Owner / Architect before actual procurement and commencement of that item of work.

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signature of the bidder with company seal.

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SCHEDULE OF WORK

SI. No.	Item Description	Quantity	Units	RATE	AMOUNT
1	<u>CONSTRUCTION OF STRUCTURE OF MULTIPURPOSE HALLS-CUM-SPORTS BLOCKS</u>				
1.01	SUB HEAD: - EARTHWORK Earth work in excavation by mechanical means. All kinds of soil (Cum 834)				
1.02	SUB HEAD :- EARTHWORK Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. (Cum 640)				
1.03	SUB HEAD: - EARTHWORK Supplying chemical emulsion in sealed containers including delivery as specified, all complete as per direction of SBSC/ Consultant. Chlorpyriphos/ Lindane emulsifiable concentrate of 20% (Litre 1250)				

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1.04	<p>SUB HEAD :- EARTHWORK Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion) : Treatment of soil under existing floors using chemical emul sion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor, all complete as per direction of SBSC/ Consultant. With Chlorpyriphos/Lindane E.C. 20% with 1% concentration. (Sqm 1640)</p>				
1.05	<p>SUB HEAD ;- PCC & RCC WORK Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level, all complete as per direction of SBSC/ Consultant. 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources) (Cum 490)</p>				
1.06	<p>SUB HEAD ;- PCC & RCC WORK Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement, all complete as per direction of SBSC/ Consultant. 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources) Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources), all complete</p>				

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1.07	Casting of RCC Column Size 2'x2'X40' including Foundation,raft,Parafit etc. (Nos 90)				
1.08	Casting of RCC Tie Beam Size 2'x1.5' including Foundation Etc. (Mtr. 900)				
1.09	Casting of RCC Slab of 8"thick etc. (Sqm 3358)				
1.1	Reinforcement Steel 25mm,20mm,16mm,12mm,10mm & 8mm Rings etc. (Kg 52400)				
1.11	SUB HEAD ;- PCC & RCC WORK Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete (Sqm 120)				
1.12	SUB HEAD ;- PCC & RCC WORK Centering and shuttering including strutting, propping etc. and removal of form for Suspended floors, roofs, landings, balconies and access platform (Sqm 2560)				
1.13	SUB HEAD ;- PCC & RCC WORK Centering and shuttering including strutting, propping etc. and removal of form for Lintels, beams, plinth beams, girders, bressumers and cantilevers (Sqm 1850)				

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1.14	SUB HEAD ;- PCC & RCC WORK Centering and shuttering including strutting, propping etc. and removal of form for Columns, Pillars, Piers, Abutments, Posts and Struts (Sqm 930)				
1.15	SUB HEAD ;- BRICK WORK Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5in superstructure above Foundation level up to floor V level in all shapes and sizes in : Cement mortar 1:4 (1 cement : 4 coarse sand) (Cum 160)				
1.16	PLASTER (IN COARSE/FINE SAND) 06mm,12mm & 18mm cement plaster of mix : 1:5 (1 cement: 5 coarse sand) (Sqm 4230)				
1.17	providing and fixing 15 mm cpvc pipe for external use with gi sedal etc. (job 1)				
1.18	providing and fixing 20 mm cpvc pipe for internal use with cutting and chasing and repairs with same as old sarface etc. (job 1)				
1.19	providing and fixing 25 mm cpvc pipe for internal use with cutting and chasing and repairs with same as old sarface etc. (job 1)				
1.2	providing and fixing 50 mm cpvc pipe for external use with gi sedal etc. (job 1)				
1.21	providing and fixing 75 mm pvc pipe with cutting and chasing and repairs with same as old surface etc. (job 1)				
1.22	providing and fixing 110 mm pvc pipe with cutting and chasing and repairs with same as old surface etc. (job 1)				

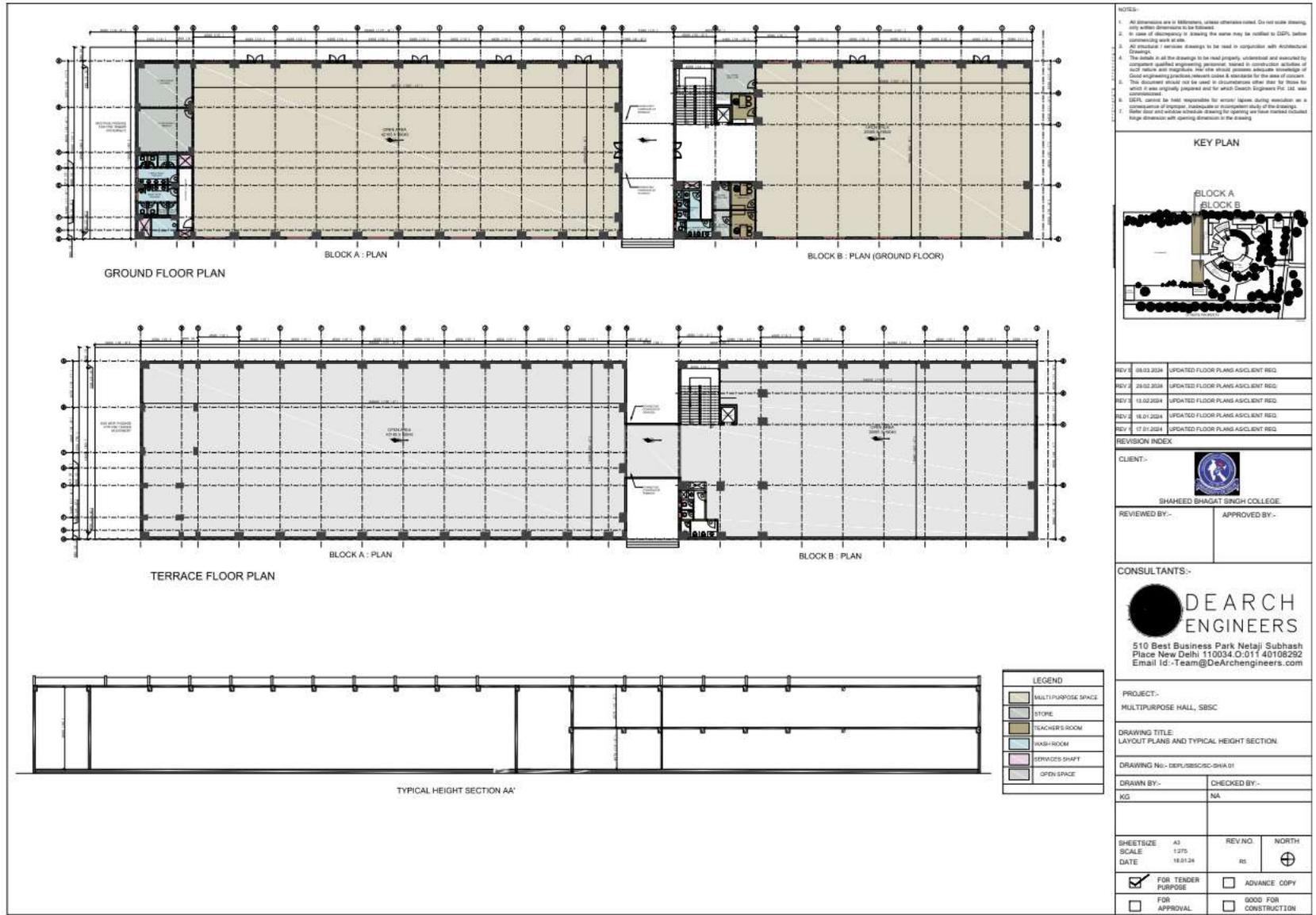
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1.23	providing and fixing 150 mm pvc pipe with cutting and chasing and repairs with same as old surface etc. (job 1)				
1.24	providing and fixing bricks manhole with RCC cover 120x90 cm external size and internal size 75x45 internal size with cement plaster and neat punning with cement etc. (job 1)				
1.25	providing and fixing electrical pvc conduit in slab and wall with ms box and ceilings fan box and gang box conduit work without wire etc. (job 1)				
2	BLOCK A: Construction of RCC Framed Ground floor structure having single slab height of 40 ft. including foundation, plinth (approx) as per the issued Architectural and Structural drawing. The scope of work includes only construction of the Framed structure along with laying of necessary Public Health Pipes and Electrical conduits and testing of the same. Whereas the Scope does not includes installation of any sort of wiring/cabels/ fixtures/ fittings. Bidder may refer to the detailed SOW as mentioned in tender documents better understanding. Bidder to submit the rates in per sqft manner measured upon thte total build up area of the building. The rates to be quoted in the same are to be of incluive of all the works relating to the successful completion of structure, handing over and commissioning of the blocks (except installation of any flooring, painting, wiring, switches, fixtures fittings). Rates to exclusive of GST.	12495	Sq.ft.		0.00
3	BLOCK B: Construction of G + 1 Storey RCC Framed structure having two slabs of height of 25 feet (including foundation, plinth) +15 feet (approx) total 40 feet as per the issued Architectural and Structural drawing. The scope of work includes only construction of the Framed structure along with laying of necessary Public Health Pipes and Electrical conduits and testing of the same. Whereas the Scope does not includes installation of any sort of wiring/cabels/ fixtures/ fittings. Bidder may refer to the detailed SOW as mentioned in tender documents better understanding. Bidder to submit the rates in per sqft manner measured upon thte total build up area of the building. The rates to be quoted in the same are to be of incluive of all the works relating to the successful completion of structure, handing over and commissioning of the blocks (except installation of any flooring, painting, wiring, switches, fixtures fittings). Rates to exclusive of GST.	16637.00	Sq.ft.		0.00

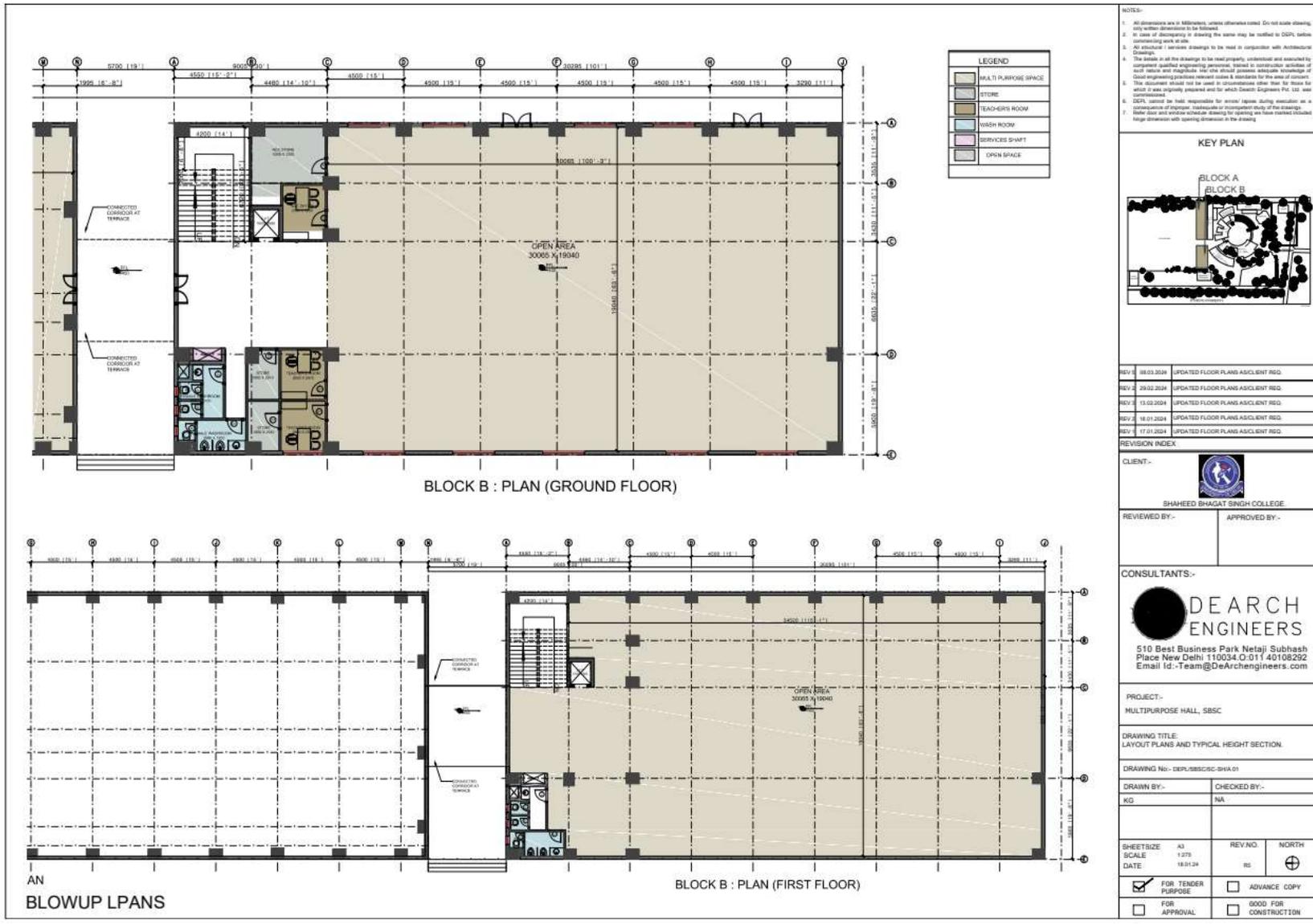
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SD/-