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Name of Work: - Up-gradatio/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.

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PART-A

CPWD-6, CPWD 7 i/c Schedule A to F for the work, standard CPWD, G.C.C. 2023 for maintenance works as amended/modified up to the last date of submission of bid including extension, if any

DTU

NOTICE INVITING TENDER

N.I.T. No.	**DTU/Engg.Cell/0060/2026-27/Civil**
Name of work	Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.
Estimated Cost	**Rs.71,84,602/-**
Earnest Money	**Rs.1,43,692/- (in favour of Registrar DTU, Delhi.), (2% of Estimate Cost)**
Performance Guarantee	5% of Contract value plus additional P.G. as per clause 1 and schedule E of GCC 2023 maintenance work modified vide order No. DG/CON/ Maintenance 2023/18 dated 27.02.2026.
Security Deposit	2.5% of the tendered cost.
Time Allowed	06 (Six) Months

This NIT amounting to **Rs.71,84,602/-** (Rupees Seventy-One Lakh Eighty-Four Thousand Six Hundred and Two only) contains pages from 1 to 101(One to One hundred and One).

J.E. (Civil) **A.E. (Civil)** **E.E. DTU/Chief Project Officer (DTU)**

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR E-TENDERING FORMING PART OF BID DOCUMENT AND TO BE POSTED ON WEBSITE

The Chief Project Officer, Delhi Technological University, Bawana Road, Delhi on behalf of DTU invites online percentage rate bids in two bid system from approved and eligible contractors of CPWD enlisted in appropriate category/class and those of appropriate list of M.E.S., BSNL, Railway, DDA and State PWD (B&R) in appropriate category/class who full fill the edibility criteria for the following work (s):

S. No.	NIT No.	Name of work & Location	Estimated cost put to tender	Earnest money	Period of completion	Last date & time of submission of bid. EMD, e-tender processing fee and other documents as specified in the Press Notice.	Time & date of opening of bid
1	2	3	4	5	6	7	8
1.	DTU/Engg.Cell/0060/2026-27/Civil	**Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.**	**Rs.71,84,602/-**	**Rs.1,43,692/-**	06 (Six) months	Up to 03.00 PM On 21.10.2026	At 03.30 PM On 21.10.2026

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
2. Information and Instructions for bidders posted on website shall form part of bid document.
3. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website http://govtprocurement.delhi.gov.in free of cost.
4. Those contractors are required to get registered themselves on website mentioned above for tendering. If needed they can be imparted training on online bidding process as per details available on the website.
5. The intending bidder must have valid digital signature to submit the bid.
6. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the comparative bid sheets.
7. Contractor can upload documents in the form of **JPG** format and **PDF** format.

List of Documents to be scanned and uploaded within the period of bid submission:

1. Payment of Bid Security (Earnest Money Deposit): The EMD may be submitted through FDR/ECS/RTGS/NEFT direct to receipt account of Registrar, DTU as detail given below and receipt of proof of FDR/ECS/RTGS/NEFT shall be uploaded with documents.

DTU EMD Account No.	30875679275 (Registrar, DTU)
Name of Bank	State Bank of India
Bank Address	DCE Campus, Shahabad Daulatpur, Bawana Road, Delhi- 110042.
IFSC CODE	SBIN0010446
BRANCH CODE	10446
MICR CODE	110002438
SWIFT CODE	SBININBB544

This amount shall be refunded in case of rejection of the bid. Photocopy of proof of FDR/ECS/RTGS/NEFT shall be sent to DTU up to Last Date and Time for receipt of tenders through e-procurement solution.

2. Scanned copy of valid CPWD enlisted in appropriate category/class and those of appropriate list of M.E.S., BSNL, Railway, DDA and State PWD (B&R) in appropriate category/class.

3. Scanned copy of performance certificate from the client for successfully completed similar works preferably in educational university/PSU's, Govt./semi-govt. for reckoning towards works experience during last seven years ending previous day of last date of submission of bid. Similar work means **"Construction/ Renovation/ Up-gradation/ Repair work (Civil Works)."**

   Three similar work each costing not less than 40% of estimated cost put to tender.

   OR

   Two similar work each costing not less than 60% of estimated cost put to tender.

   OR

   One similar work each costing not less than 80% of estimated cost put to tender.

   The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid.

4. Scanned copy of average annual financial turnover during the immediate last three consecutive financial years ending March-2025 (Scanned copy of Certificate from CA to be uploaded) should not be less than 50% of Estimated Cost.

5. Scanned copy of Solvency or Net Worth Certificate: -

   (a) Solvency of the amount equal to 50% of Estimated Cost put to tender (ECPT)

   OR

   (b) Net Worth Certificate of 10% the Estimated Cost put to tender issued by certified by Chartered Accountant.

6. Certificate of Registration for G.S.T. and acknowledgement of up to date filed return.
7. Scanned copy of PAN Card issued by Income Tax Department.
8. Scanned copy of EPFO/ESIC certificate.
9. Scanned copy of Affidavit as given in this NIT (page no.06) (To be executed in presence of Public notary on non- judicial stamp paper of the value of Rs.100/-. The stamp paper has to be in the name of the tenderer)
10. Scanned Copy of site inspection form duly stamped and signed by the main as well as associate contractor.

Further details can be seen at **https://dtu.ac.in**

Chief Project Officer/DTU

CPWD-6 FOR e-TENDERING

The Chief Project Officer, Delhi Technological University, Bawana Road, Delhi on behalf of DTU invites online percentage rate bids in two bid system from approved and eligible contractors of CPWD enlisted in appropriate category/class and those of appropriate list of M.E.S., BSNL, Railway, DDA and State PWD (B&R) in appropriate category/class who fulfil the eligibility criteria for the work:- **Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.** The enlistment of the contractors should be valid on the last date of submission of bids.

In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

1.1 The work is estimated to cost **Rs.71,84,602/-**

1.1.1 Intending bidder is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below: - Criteria of eligibility for submission of bid documents

1.2.1 a) Three similar works each of value not less than 40% of estimated cost put to tender or two similar works of value not less than 60% of estimated cost put to tender or one similar work of value not less than 80% of estimated cost put to tender in last year ending previous day of last date of submission of bids.

Similar work means "Construction/ Renovation/ Upgradation/ Repair work (Civil Works)"

b) Average annual financial turnover during the immediate last three consecutive financial years ending March-2024 should not be less than 50% of Estimated Cost.

c) Solvency or net worth certificate.

i Solvency of the amount equal to 50% of Estimated Cost put to tender (ECPT)

OR

ii Net Worth Certificate of the Estimated Cost put to tender issued by certified by Chartered Accountant.

d) Certificate of Registration for G.S.T. and acknowledgement of up to date filed return.

e) PAN Card issued by Income Tax Department.

f) CPWD enlisted in appropriate category/class and those of appropriate list of M.E.S., BSNL, Railway, DDA and State PWD (B&R) in appropriate category/class.

g) Scanned copy of ESIC/ EPFO

h) Affidavit

i) Certificate of site visit

1.2.2 To become eligible for bid, the bidders shall have to furnish an affidavit as under: -

1 I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in DTU in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid).

Bidder's pre-qualification terms:

S.No.	PQ requirement
1.	Bidder should have a registered office in India for last 5 years. Copy of Certificate of Incorporation to be submitted along with other documents for technical evaluation.
2.	Bidder should not be blacklisted by any State Govt./Central Govt./PSU in INDIA for any reason on the date of bid submission. Undertaking for the same to be submitted along with other documents for technical evaluation.
3.	Bidder must have valid ESI & EPF registration. Certificate for the same to be submitted along with other documents for technical evaluation.

2 Agreement shall be drawn with the successful bidders on prescribed Form No. **CPWD-7** (or other Standard Form as Mentioned) which is available as a Govt. of India Publication and also available on website **www.cpwd.gov.in.** Bidders Shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

3. The time allowed for carrying out the work will be **06 (Six)** months from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.

4. **(**i) The site for the work is available.

(ii)***The necessary structural, architectural, connection details, Sections, Elevations and/or any other drawings required at any stage of work required for the completion of this work shall be submitted by the contractor without any extra cost to the department. It is deemed to be inclusive in contractors quoted rate. These drawings shall get be approved by the department once submitted by the contractor. The contractor is bound to make changes in these drawings at any no of times as and when directed by Engineer-In-Charge and contractor shall obtain prior approvals before executing the work***

based on these drawings. The drawings shall be prepared by the contractor strictly in accordance with the items take in NIT schedule of work. Hence, it is advisable to the contractors to quote their rates considering these aspects accordingly.

5 The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website **http://govtprocurement.delhi.gov.in** free of cost.

6. After submission of the bid, the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. Bids are invited in under two bid system i.e. technical bid and financial bid.

9. Earnest Money shall be deposited through FDR/ECS/RTGS/NEFT mode only as mentioned in page no. 5. The original receipt of EMD deposited with all original documents should be deposited in the office of Chief Project Office, DTU by all bidders within the period of submission.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission.

However, all bidder shall submit certified copy of all the scanned and uploaded documents as specified in press notice in the office of Chief Project Officer, DTU before last date of submission of time and date.

Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD in the office of CPO/DTU and other documents scanned and uploaded are found in order.

The bid submitted shall be opened on **21.10.2026** at **03:30 PM**

10. The bid submitted shall become invalid if:

(i) The bidder is found ineligible.

(ii) The bidder does not deposit original EMD in office of EE/CPO, DTU.

(iii) The bidder does not upload all the documents (including G.S.T. etc.) as stipulated in the bid document.

(iv) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the entire bidder in the office of bid opening authority.

(v) If a tenderer quotes NIL rates against each items in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

11. The contractor whose bid is accepted will be required to **performance guarantee of 5% (Five Percent)** of the **tendered or estimated cost of the work amount whichever is higher** within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/ Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/registrations or and program chart (Time & progress) with in the period specified in Schedule F. ***Apart from this P.G., the accepted bidder is required to submit enhanced performance guarantee/ additional EPG along with the original performance guarantee of 5% with respect to Schedule E of GCC 2023 maintenance work modified vide order No. DG/CON/ maintenance 2023/18 dated 27.02.2026.*** In case the contractor fails to deposit the said performance guarantee and EPG within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.

12. **The description of the work is as follows:**
Name of Work:- Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise

specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the Delhi Technological University does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

15. The competent authority on behalf of the Delhi Technological University reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

16. The contractor shall not be permitted to bid for works in the DTU (Division in case of contractors of Horticulture/Nursery category) responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of C.P.O, A.E. and Junior Engineer. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Delhi Technological University or in the Govt. of NCT of Delhi. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.

17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.

18. **The bid for the works shall remain open for acceptance for a period of Seventy-Five/ (75) days from the date of opening of technical bids.** If any bidders withdraw his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the rebidding process of the work.

19. This notice inviting bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of: -

(a) The Notice Inviting bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

(b) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

20. **For Bids**

The bid document will include following two components:

Part A: - CPWD-6, CPWD-7 including schedule A to F for the work, Standard General Conditions of Contract for CPWD 2020 as amended/modified up to the last date of submission of bid, including extension, if any.

Part B: - General / specific conditions, specifications and schedule of quantities of the work.

20.1 The eligible bidders shall quote rates for all items of work.

20.2 After acceptance of the bid by competent authority, the CPO of the work shall issue letter of award on behalf of the Delhi Technological University. After the work is awarded, the contractor will have to enter into an agreement with CPO.

20.3 Security Deposit will be worked out on the basis of tendered amount of work.

20.4 There should be no subletting of work except for any specialized work. In case of any subletting of specialized work, the approval of Engineer-In-Charge shall be obtained.

GUIDELINES REGARDING SIGNING OF INTEGRITY PACT BY THE BIDDER AT THE TIME OF SUBMISSION of BID (Vide No. DG/CON/255A dated 10.08.2011)

Sub: Clarification regarding Introduction of Integrity Pact:

A new provision of Integrity Pact (IP) was introduced in GCC-2023. In the OM it is mentioned that at the time of submission of bid, it shall be mandatory to sign the pact by the bidder failing which the bidder will stand disqualified from the tendering process and such bid would be summarily rejected.

Some field Units has raised their doubts regarding submission of duly signed Integrity Pact by the bidder at the time of submission of bid. In this regard it is clarified that: -

1. Submission of duly signed Integrity Pact by the bidder is applicable in case of manual tendering where e-tendering is not followed.

2. In case of manual tendering Chief Project Officer, DTU should sign the first page addressed to the intending bidder at the time of issue of tender form and before submission of the bid, each bidder shall sign IP at respective places and submit the bid. If duly signed IP is not submitted by the bidder, such bid shall not be considered.

3. In case of e-tendering, Integrity Pact shall be treated in the same manner as other components of the bid document. In e-tendering, the intending bidder does not sign any document physically and entire bid document is submitted through digital signature. Since IP is a part of bid document no separate physical submission is required with other documents to be submitted in the office of tender opening authority. In addition to other component of bid document, the Integrity Pact shall also be signed between Executive Engineer and successful bidder after acceptance of bid.

CPWD -7	*DTU*

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, of 2023 for maintenance work with amendments up to the last date of submission of tenders, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the **Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.** I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the General Conditions of contract 2023-Maintenance Works with amendments up to the last date of submission of tender and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for **Seventy-Five (75)** days from the date of opening of technical bid and not to make any modification in its terms and conditions.

A sum of **Rs.1,43,692/-** is hereby forwarded in fixed deposit receipt of scheduled bank/demand draft of a scheduled bank as earnest money. If I/We fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said DTU or his successors representatives, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that DTU or the successors representatives in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said the performance guarantee absolutely. The said performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in **Clause 12.2 and 12.3** of the tender form. Further, I/We agree that in case of forfeiture of Earnest Money & Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in DTU in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/ Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated: ……. **……. **Signature of Contractor ****

Witness: **

Address: ** **Postal Address ****

Occupation: **

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for an on behalf of the **Delhi Technological University** for a sum of Rs. ……..…… * ……..…….. (Rupee……...……*…….... ……...).

The letters referred to below shall form part of this contract agreement: -

(a)
(b)
(c)

For & on behalf of Delhi Technological University

Signature ……

Dated: …….. **Designation ……**

PROFORMA OF SCHEDULES

SCHEDULE 'A'

Schedule of quantities as per Page No.92 to 115.

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

S. No.	Description of item	Quantity	Rates in figures & words at Which the material will be charged to the contractor	Place of issue
NIL				

SCHEDULE 'C'

Tools and plants to be hired to the contractor

S. No.	Description	Hire charges per day	Place of Issue
NIL			

SCHEDULE 'D'

Extra schedule for specific requirements /document for the work, if any Not Applicable

SCHEDULE 'E'

Reference to General Conditions of Contract: General Conditions of Contract-2023 for maintenance works read along with correction slips/amendments issued up to the last date of submission of tender including extension, if any.

Name of work	**Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.**

Estimated cost of work

I.	Estimated Cost	**Rs.71,84,602/-**
II.	Earnest Money	**Rs.1,43,692/-**

I.	Performance Guarantee :	5% of contract value plus additional P.G. as per clause 1 and schedule E of GCC 2023 maintenance work modified vide order No. DG/CON/ Maintenance 2023/18 dated 27.02.2026.
II.	Security Deposit	2.5% of tendered amount.

SCHEDULE 'F' (GENERAL RULES & DIRECTIONS)

Officer inviting tender: Chief Project Officer, DTU, Bawana Road Delhi,
Email id: cpo@dtu.ac.in

Definitions:

1.	**Engineer-in-Charge**	The Chief Project Officer, DTU, Bawana Road, Delhi.
2.	Accepting Authority	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**
3.	Percentage on cost of materials and Labour cover all to overheads and profits	**15%**
4.	Standard Schedule of Rates	CPWD DSR 2023 (Civil) Vol-I & Vol-II, read along with correction slips/amendments issued up to the last date of submission of tender including extension, if any,
5.	Department	**Delhi Technological University.**
6.	Standard CPWD Contract Form:	**CPWD Form 7 & GCC 2023 for maintenance work** read along with correction slips/amendments issued up to the last date of submission of tender including extension, if any.

Clause 1

1.	Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance	**07 (Seven) days**
2.	Maximum allowable extension beyond the period provided in (i) above	**3 (Three) days with late fee @ 0.1% per day of the PG amount on written request of contractor stating the reason of delay in procuring performance guarantee to the satisfaction of Engineer-in-Charge.**

Clause 2

Authority for fixing compensation under clause 2	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**

Clause 2A

Whether Clause 2A shall be applicable	**Not Applicable**

Clause 5: - **Applicable**

Number of days from the date of issue of letter of acceptance for reckoning date of start	**10 (Ten) days or date of handing over of site whichever is later**

Clause-5
Mile stones for Civil work

S. No	**Description of Milestone (Financial)**	**Time allowed in months (from date of start)**	**Amount to be with-held in case of non-achievement of each mile stone (% of contract amount of Civil component)**
1.	1/8th of Contract amount.	1/4th time	In the event of non-achieving the necessary progress as assessed from the running payment, 1% of the tendered value of work will be withheld for failure of each milestone.
2.	3/8th of Contract amount.	1/2th time	
3.	3/4th of Contract amount.	3/4th time	
4.	100% of Contract amount & completion of work.	Full time	

Withheld amount shall be released if and when subsequent milestone is achieved within respective time specified. The main contractor will ensure that all electrical components of the work are executed in time without giving any chance for slippage of milestone an account of delay in execution of associated electrical works by him. However, in case milestones are not achieved by the contractor for the work, the amount shown against milestone shall be withheld by the Engineer-In-Charge of the respective components.

Note: Intending tenderer may submit phasing of activities / milestones on the basis of their resources and methodology at the time of tendering corresponding to physical milestones / stages indicated in the above table. These shall form part of the agreement after approval of the accepting authority; otherwise, it would be assumed that agency agrees with the above-mentioned physical milestones.

Time allowed for execution of work- **06 (Six) Months**

Authority to decide:

(i)	Extension of time:-	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**
(ii)	Re-scheduling of mile stones:-	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**
(iii)	Shifting of date of start in case of delay in handing over of site:	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**
(iv)	EOT to keep the contract alive	**Chief Project Officer/ Executive Engineer.**

Clause 6,

Clause applicable - (6)	**(computerized measurement book to be submitted by agency)**

Clause 7

Gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.	**Rs. 20 lacs**

Clause 7A

No running Account Bill shall be paid for the work till the applicable registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.	As Applicable

Clause 10A

List of testing equipment to be provided by the contractor in the lab at each site of work as per [TABLE-1] of Annexure-I attached.

Clause 10 B (ii)

Whether Clause 10 B (ii) shall be applicable	Not Applicable

Clause 10 C

Component of labour expressed as percent of value of work	**Not-Applicable**

Clause 10 CA: - Not-Applicable

Clause 10 CC: - Not-Applicable

Clause 11: - As applicable

Clause 12

Type of work: It is a maintenance work. The completion cost shall, in no case exceed 1.50 times the contract amount. Contractor will devise a system to keep a watch on quantum of work taken up vis-à-vis balance items required to complete defined scope of work and will give the alerts to Engineer-in-charge before taking up extra item(s), deviation(s) so- that completion cost does not exceed above limit. Work executed beyond above limit will neither be recorded nor be paid.

Authority to decide deviation up to 1.5 times the tendered cost: **Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2, 12.3: Please refer below

12.2. & 12.3	Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work (except earth work)	No Limit.
12.5	(1) Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except earth work) (ii) Deviation Limit for items in earth work or related items	

Clause 16

Competent Authority for deciding reduced rates.	**Hon'ble Vice Chancellor, DTU, Bawana Road, Delhi.**

Clause 18

List of mandatory machinery, tools & plants to be deployed by the contractor at site: - All plants, equipment and machinery required for smooth and efficient progress of work as per direction of Engineer-in-Charge.

Clause 19:- (C,D,G,K) (To deciding the penalty) :- Applicable Hon'ble Vice Chancellor, DTU.

Clause 25: Deleted vide order no. 4309-17 dated 21.04.2025 of PWD secretariat.
However, "Any dispute arising between the parties to this agreement/ contract shall be subject to the exclusive jurisdiction of courts in Delhi only."

Clause: 36

S. No.	Minimum qualification of Technical Representative	Discipline	Designation (Principa technical / Technical representative)	Minimum experience	Number	Rate at which recovery shall be made from the contractor I the event of not fulfilling provision of Clause 36(I)	
						Figures	Words
1.	Graduate Engineer Or Diploma Engineer	Civil Civil	Project/Site Engineer and Project Planning/billing Engineer	2 Years 5 Years	1 1	Rs. 15,000/- (Per month)	Rs. Fifteen thousand per month

Assistant Engineer retired from Government services that are holding Diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 10 years' relevant experience with a reputed construction co. can be treated at par with

Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause: 38

(i)	(a)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates	**DSR 2023 (Vol-I & Vol-II) for Civil works will** read along with correction slips/amendments issued up to the last date of submission of tender including extension, if any.
(ii)		Variations permissible on theoretical quantities:	
	(a)	Cement	
		For works with estimated cost put to tender more than Rs. 5 lakh.	**2% (Two percent) plus / minus .**
		Bitumen for all works	**2.5% (Two-point five percent) plus only and nil on minus side.**
	(b)	Steel Reinforcement and structural steel sections for each diameter, section and	**2% (Two percent) plus / minus**
	(c)	All other materials	**Nil**

ANNEXURE – I

(TABLE-1)

Equipment's for Testing of Materials & Concrete at Site Laboratory (on each site of work)

Note: individual site shall be considered as a separate site of work.

All necessary equipment for conducting all necessary tests shall be provided at the site in the well-furnished site laboratory of minimum size 25 feet X 15 feet by the contractor at his own cost The following minimum laboratory equipment shall be set up at site office laboratory: -

Sl. No.	Equipment	Numbers (Minimum)
1.	100 MT compression testing machine, electrical-cum-manually operated)	1
2.	Slump cone, steel plate, tamping rod, steel scale, scoop	3
3.	Vicat's apparatus with Desk pot	1
4.	Weighing scale platform type 100 Kg capacity	1
5.	Graduated glass measuring cylinder	As per requirement
6.	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm; 20mm; 12.5mm, 10mm; 4.75mm complete with lid and pan]	1
7.	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm; 2.36mm; 1.18mm; 600 microns; 300 microns & 150 micron , with lid and pan]	1
8.	Sieve Brushes and sieve shaker capable of 200mm and 300mm dia sieves , manually operated with timing switch assembly	1
9.	Cube moulds size 70mmx70mmx70mm	6
10.	Cube moulds size 150mmx150mmx150mm	30
11.	Hot air oven temp. Range 50OC to 300OC- sensitivity 1 degree	1
12.	Electronic balance 600gx0.1g., 10 kg and 50 kg each	1 Each
13.	Physical balance weight upto 5 kg	1
14.	Air Content of concrete testing machine	1
15.	Measuring jars 100ml, 200ml, 500ml	3 nos each size
16.	Gauging trowels 100mm & 200mm with wooden handle	2
17.	Spatula 100mm & 200mm with long blade wooden handle	2
18.	Vernier calipers 12" & 6" size	1 each
19.	Digital PH meter least count 0.01mm	1each
20.	Digital Micrometre least count. 0.01mm	1 each
21.	Digital paint thickness meter for steel 500 micron range	1
22.	GI tray 600x450x50mm, 450x300x40mm,300x250x40mm	1 no each
23.	Electric Motor mixer 0.25 cum capacity	1
24.	Screw gauge 0.1mm-10mm, least count 0.05	2
25.	Water testing kit	1
26.	Motorized sieve shaker	1
27.	Pruning Rods 2 Kg weight length 40 cm and ramming face 25 mm2	1
28.	Extra Bottom plates for 15 cm cube mould	4
29.	Standard Vibration Table for gauging the cubes	1
30.	Pocket concrete penetrometer 0 to 50kg/ sq.cm	1

31.	Concrete temperature measuring thermometer with Brass protection sheath 0- 100 degree centigrade	1
32.	Mortar Cube vibrator	1
33.	Dial type spring balance preferable with zero correction knob capacity 100 kgs reading to ½ kg.	1
34.	Counter scale capacity 1 kg and 10 kg	1
35.	Iron Weight of 5 kg, 2 kg, 1 kg, 500 gm, 200 gm, 100 gm	1 each
36.	Brass Weight of 50 gm, 20 gm, 10 gm, 5 gm, 2 gm, 1 gm	1 each
37.	Measuring cylinder TPX or Poly propylene capacity 100 ml, 500 ml, 250 ml, 100 ml	1 each
38.	Pyrex, corning or Borosil beakers with cover capacity 500 ml, 200 ml, 50 ml	1 each
39.	Wash Bottles capacity 500 ml	1
40.	Thermometers 1-100 degree centigrade/ max. and Min/ Dry and wet with table	1
41.	Set of box spanner ratchet	1
42.	Hammer 1lb& 2lb	2 each
43.	Rubber Hammer	2
44.	Hacksaw with 6 blades	2
45.	Measuring tape 2 mtr	5
46.	Depth gauge 20cm	3
47.	Shovels& Spade	3
48.	Steel plates 5 mm thick 75x75 cm	2
49.	Plastic or G.I. Buckets 15 ltr, 10 ltr, 5 ltr	1 each
50.	Wheel Barrow	1
51.	Floor Brushes, hair dusters, scrappers, wire brush, paint brushes, shutter steel plat oil, kerosene with stove etc.	2 each
52.	Any other equipment for site tests as outlined in BIS codes and as directed by the Engineer-in-charge.	

List of mandatory machinery, tools & plants to be deployed by the contractor at site

Table -2

All plants, equipment's and machinery required for smooth and efficient progress of work as per direction of Engineer-in-Charge.

(TABLE- 3)

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

S. No.	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Cement (OPC)	Nil	**Not permitted**
2.	Steel Reinforcement TMT Bar of all diameters	Nil	**Not permitted**
3.	Structural Sections	Nil	**Not permitted**

PART-B

CONDITIONS & SPECIFICATIONS OF CONTRACT AND SCHEDULE OF QUANTITIES OF MAJOR COMPONENT OF WORK

GENERAL CONDITIONS

1.0 GENERAL

1.1 The Contractors are advised to inspect and examine the site and its surroundings and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material / machinery, labour etc. constraints put by local regulations, if any, weather conditions at site, general ground / subsoil conditions etc. or any other circumstances which may affect or influence their tenders The Contractor shall carry out survey of the work area, at his own cost, setting out the layout and fixing of alignment of the building as per architectural and Structural drawings in consultation with the Engineer-in-Charge. Any discrepancy between the architectural drawings and actual layout at site shall be brought to the notice of the Engineer-in-charge. It shall be responsibility of the Contractor to ensure correct setting out of alignment. Nothing extra shall be payable on this account. No claims, whatsoever, shall be entertained at a later date for any errors found, on plea that the information supplied by the Department in the tender is insufficient or is at variance with the actual site conditions.

1.2 The Contractor shall, if required by him, before submission of the tender, inspect the drawings (as available) in the Office of the Chief Project Officer, DTU, Bawana, road Delhi. Department shall not bear any responsibility for the lack of knowledge and also the consequences, thereof to the Contractor. The information and data shown in the drawings and mentioned in the tender documents have been furnished, in good faith, for general information and guidance only. The Engineer-in-Charge, in no case, shall be held responsible for the accuracy thereof and/or interpretations or conclusions drawn there from by the Contractor and all consequences shall be borne by the Contractor. No claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different or in-correct otherwise or actual working drawings are at variance with the drawings available for inspection or attached to the tender documents. It is presumed that the Contractor shall satisfy himself for all possible contingencies, incidental charges, wastage's, bottlenecks etc. likely during execution of work and acts of coordination, which may be required between different agencies. Nothing extra shall be payable on this account.

1.3 The nomenclature of the item given in the schedule of quantities gives in general of the work content but is not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/or described in the specifications, provided that the same can be reasonably inferred there from may be several incidental works, which are not mentioned in the nomenclature of each item but will be necessary to complete the item in all respect. All these incidental works / costs which are not mentioned in item nomenclature but are necessary to complete the item shall be deemed to have been included in the rates quoted by the contractor for various items in the schedule of quantities. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation / change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of Engineer-in-Charge. Nothing extra shall be payable on this account.

1.4 The contractor(s) shall give to the local body, police and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be available on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.

1.5 The contractor(s) shall execute the work simultaneously at all sites. He has to establish site office along with all necessary arrangements at all sites simultaneously.

1.6 The contractor(s) shall cordon off the area suitably so that the college remains functional during execution of the work.

1.7 Staff/labour shall be deployed for each site of work independently by the contractor.

1.7.1 The contractor shall quote his rates for the work inclusive of all taxes including Goods and services tax (G.S.T.) etc. Nothing extra shall be paid on any account over and above the quoted rates.

BY-LAWS AND REGULATIONS

All work shall conform to the statutory Bye-laws and Regulations of the concerned authority/Municipality, Delhi Fire Services as applicable to the Project. If the tender specifications and drawings are more stringent than required as per the Local Authorities, then the tender specifications and drawings shall be followed. In the other case, if the local authorities more stringent specifications than those specified in the tender specifications, then the set by-laws and regulations shall be followed at no extra cost.

Proper temporary barricading by fencing with G.I. sheets, shall be carried out by the Contractor at the start of work to physically define the boundaries of the plot for restricted entry to only those involved in the work and also to prevent any accidents, at the same time without causing any inconvenience to the traffic and the users of the buildings in the adjacent plots. It shall be done by providing, erecting, maintaining temporary protective barricading of minimum 2.0 meters in height, made in panels, with each panel having MS frames / MS scaffolding pipes of suitable size and stiffness, with 24-gauge thick GI corrugated sheet or suitably stiffened plain GI sheet fixed on frames. Such panels shall be suitably connected to each other for stability with nuts and bolts, hooks, clamps etc. and fixed firmly to the ground at about 2 meters spacing, for the entire duration till completion of the work. He shall also provide and erect temporary protective barricades within the plot, if required, to prevent any accident. Temporary protective roofing near the Entrance to the building, under construction, shall be made to protect the visiting officials from getting hurt by falling debris etc. Also, one or more coat of enamel paint of shade as approved and directed by the Engineer-in-Charge shall be applied on the panels and "DTU" shall be painted over that in suitable sizes, shapes and numbers as directed by the Engineer-in-Charge. It shall be dismantled and taken away by the Contractor after the completion of work at his own cost with the approval of the Engineer-in- Charge. Nothing extra shall be payable on this account.

1.8 The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night. In case of any accident of labours/ contractual staffs the entire responsibility will rest on the part of the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.

1.9 The work shall generally be carried out in accordance with the “CPWD Specifications 2009 Vol. I & II” with correction slips issued up to the last date of submission of tender, additional/Particular Specifications, architectural/Structural drawings, mechanical, electrical, plumbing and as per instructions of Engineer-in-Charge. Any additional item of the work, if taken up subsequently, shall also confirm to the relevant CPWD specifications as mentioned above.

1.10 The several documents forming the tender are to be taken as mutually complementary to one another. Detailed drawings shall be followed in preference to small scale drawings and figured dimensions in preference to scale dimensions.

1.11 There be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work (including special conditions) and I.S. Codes etc., the following order of preference shall be observed.

Description of items as given in Schedule of quantities.
Particular specifications.
Special conditions.
Additional Condition.
Tender drawings attached.
CPWD Specifications including correction slips issued up to the last date of uploading/submission of tender.
General Conditions of Contract for CPWD work including correction slips issued up to the last date of submission of tender.
Indian Standards Specifications of B.I.S.
ASTM, BS, or other foreign origin code mentioned in tender document.
Manufacturer’s specifications and as decided by the Engineer-in-Charge.

Sound Engineering practices or well established local construction practices.

1.12 The works to be governed by this contract shall cover delivery and transportation up to destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.

The works to be undertaken by the contractor shall inter-alia include the following:

Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.
Obtaining of Statutory permissions where-ever applicable and required.
Pte-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
Warranty obligation for the equipment and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the coordinated services before starting any work or placing any order of any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the contractor. The contractor shall submit material submittals along with material sample for approval of Engineer-in-Charge prior to delivery of material at site.

1.13 The work shall be carried out in accordance with the approved architectural drawings, structural drawings, MEP services drawings to be issued from time to time, by the Engineer-in-Charge, and approved shop drawings prepared by the Contractor. Before commencement of any item of work the contractor shall correlate all the relevant architectural and structural drawings, nomenclature of items and specifications etc. issued for the work and satisfy himself that the information available from there is complete and unambiguous. The figure and written dimension of the drawings shall be superseding the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in- charge before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information and no claim whatsoever shall be entertained by the department on this account.

1.14 Unless otherwise provided in the Schedule of quantities the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account.

1.15 The Contractor(s) shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. The stacking shall take place as per stacking plan however, if any change is required, the same shall be done with the approval of Engineer-in-Charge.

1.16 The contractor shall engage specialized agency for carrying out specialized items as listed in para 1.48 below, covered in the schedule of Quantity Immediately after award of work, the contractor shall submit for the approval of NIT approving authority, the name of the agency along with their working experience and credentials, presentation on method statement and materials being used for execution of such items etc. Delay on the part of contractor in submitting the proposal for approval of competent authority shall be his responsibility and no extension of time shall the granted on this account.

1.17 The Contractor shall bear all incidental charges for cartage, storage and safe custody of materials, if any, issued by department as well as to those materials also arranged by the contractor.

1.18 Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been built in the items and nothing extra shall be payable or extra cement considered in consumption on this account.

1.19 The contractor shall give performance test of the entire installation(s) as per the specifications in the presence of the Engineer-in-charge or his authorized representative before the work is finally accepted and nothing extra what-so-ever shall be payable to the contractor for such test.

1.20 Water tanks, taps, sanitary, water supply & drainage pipes, fittings & accessories should conform to bye-laws of local body/corporation, where CPWD specifications are not available. The Contractor should engage approved, licensed plumbers for the work and get the materials (fixtures/fittings) tested, by the municipal Body/ Corporation authorities wherever required at his own cost. The Contractor shall submit for the approval of the NIT approving authority, the name of the plumbing agency (along with their working experience in recent past) proposed to be engaged by him.

1.21 The contractor shall make his own arrangements for water and for obtaining electric connections if required and make necessary payments directly to the State Govt. departments concerned. Contractor shall get the water tested from laboratory approved by the Engineer-in-charge at regular interval as per the CPWD Specifications 2019. All expenses towards collection of samples, packing, transportation and testing charges etc. shall be borne by the contractor. Agency shall neither be allowed to use existing bore well, if any. **They may have to arrange water through tankers from any outside source after taking due permission from concerned authority. The water charges of 1% shall be deducted from the gross amount of RA/final bill irrespective of items executed in this work if water not arranged by the contractor**.

1.22 PREVENTION OF NUISANCE AND POLLUTION CONTROL

The contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties from pollutants like smoke, dust, noise. The contractor shall use such methodology and equipment so as to cause minimum environmental pollution of any kind during and minimum hindrance to road users and to occupants of the adjacent properties or other services running adjacent/near vicinity. The contractor shall make good at his cost and to the satisfaction of the Engineer-in-Charge, any damage to roads, paths, cross drainage works or public or private property whatsoever caused due to the execution of the work or by traffic brought thereon by the contractor. All waste or superfluous materials shall be carried away by the contractor, without any reservation, entirely to the satisfaction of the Engineer-in-Charge.

Control on Air Pollution of dust from construction and demolition activities: Guidelines of National Green Delhi and DPCC, Delhi issued time to time shall be followed by the agency for which nothing extra shall be paid.

1.23 Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the nearby occupants/users of building(s), if any.

1.24 SECURITY AND TRAFFIC ARRANGEMENTS

In the event of any restrictions being imposed by the Security agency, CPWD, Traffic or any other authority having jurisdiction in the area on the working or movement of labour /material, the contractor shall strictly follow such restrictions and nothing extra shall be payable to the contractor on such accounts. The loss of time on these accounts, if any, shall have to be made up by augmenting additional resources whatever required.

1.25 If as per the rules of the local authority, the huts for labour are not to be erected at the site of work by the contractors, the contractors are required to provide such accommodation as is acceptable to local bodies and nothing extra shall be paid on this account. No accommodation is available at the site of work. The labour huts shall not be erected on the plot and the Contractor shall make his own arrangements to provide such accommodation as per the rules of the local bodies. He shall make his own arrangements for stores, field office etc. Before tendering, he shall visit the site and assess the manner in which he is able to arrange the above facilities. The Engineer-in-Charge shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained.

1.26 No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and the work for which payment has been advanced to him under the contract and he shall make good the same at his risk and cost. The contractor shall be fully responsible for safety and security of his material, T&P/Machinery brought to the site by him.

1.27 The contractor shall construct suitable godowns, yard at the site of work for storing all other materials so as to be safe against damage by sun, rain, damages, fire, theft etc. at his own cost and also employ necessary watch and ward establishment for the purpose at his cost.

1.28 All materials obtained from contractor shall be got checked by the representative of Engineer-in-Charge on receipt of the same at site before use.

1.29 Royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle sand and bajri etc. collected by him for the execution of the work, direct to the Revenue authority or authorized agent of the State Government concerned or Central Government.

1.30 The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including all equipment's, services provided by him against pilferage and breakage during the period of Installations and thereafter till the building is physically handed over to the Engineering Cell of DTU, New Delhi – the Client Department. No extra payment shall be made on this account and no claim shall be admissible on this account.

1.31 The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector / DDA / MCD and any other statutory bodies shall be adhered to, by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities. The extra sewerage charges (one time charges for commencement of work) required to be paid to the Municipal Corporation/ other statutory bodies shall be paid by the department and need not be considered by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor. The water charges (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the municipal authorities or any other statutory body, the consequent sewerage charges shall be borne by the contractor. The General conditions of contract for CPWD works are applicable to the tender. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts. The fee payable to statutory authorities for obtaining the various permanent service connections and Occupancy Certificate for the building shall be borne by the Department.

1.32 For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required, the contractor shall do the same at his own cost and nothing extra shall be paid except otherwise provided in the items of Schedule of Quantities.

1.33 The Contractor shall make all necessary arrangements for protecting from rains, fog or likewise extreme weather conditions, the work already executed and for carrying out further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account and also no claims for hindrance shall be entertained on this account.

1.34 In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any. Further, no claims for hindrance shall be entertained on this account.

1.35 The contractor will take reasonable precautions to prevent his workman and employees from removing and damaging any flora (plant/vegetation) from the project area.

1.36 SETTING OUT

(i) The Contractor shall carry out survey of the work area, at his own cost, setting out the layout of building in consultation with the Engineer -in-Charge & proceed further. Any discrepancy between the Engineer-in-charge, architectural drawings and actual layout at site shall be brought to the notice of the Engineer -in-charge. It shall be responsibility of the Contractor to ensure correct setting out of alignment. Total station survey instruments only shall be used for layout, fixing boundaries, and centre lines, etc., Nothing extra shall be payable on this account.

(ii). The Contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions etc. to the Engineer -in-Charge before commencing work. Commencement of work shall be regarded as the Contractor's acceptance of such grades, lines, levels, and dimensions and no claim shall be entertained at a later date for any errors found.

(iii). If at any time, any error appears due to grades, lines, levels and benchmarks during the progress of the work, the Contractor shall, at his own expense rectify such error, if so required, to the satisfaction of the Engineer -in-Charge. Nothing extra shall be payable on this account.

(iv). Though the site levels are indicated in the drawings the Contractor shall ascertain and confirm the site levels with respect to benchmark from the concerned authorities. The Contractor shall protect and maintain temporary/ permanent benchmarks at the site of work throughout the execution of work. These benchmarks shall be got checked by the Engineer-in-Charge or his authorized representatives. The work at different stages shall be checked with reference to bench marks maintained for the said purpose. Nothing extra shall be payable on this account.

(v). The approval by the Engineer-in-Charge, of the setting out by the Contractor, shall not relieve the Contractor of any of his responsibilities and obligation to rectify the errors/ defects, if any, which may be found at any stage during the progress of the work or after the completion of the work.

(vi). The Contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignments, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the Contractor at his own cost to the entire satisfaction of the Engineer - in-Charge.

(vii). The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work (including marking of reference points, centre lines of buildings), construction and maintenance of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, barricading, signage, labour safety, labour welfare and labour training measures, preparatory works, working during monsoon, working at all depths, height and location etc. and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

(viii) The contractor(s) shall study the soil investigation report for the site, available in the office of the Engineer-in-Charge and satisfy himself about complete characteristics of soil and other parameters at site. However, no claim on the alleged inadequacy or incorrectness of the soil data supplied by the department shall be entertained.

1.37 A site laboratory with the minimum equipment's as specified in CPWD specifications/in this agreement shall be established, made functional and maintained within a week from the award of work as per without any extra cost to the department. In case of noncompliance / delay in compliance in this, a recovery @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

1.38 COORDINATED DRAWINGS

Before taking up the work, the contractor shall prepare shop drawings for the works listed below for various civil and electrical services showing details of lay out in plan including sections & elevations & large-scale details and contractor shall plan and mobilize his resources as per these drawings and as per actual site conditions to facilitate convenient execution, installation as well as maintenance of these items. Nothing extra shall be payable on this account.

SHOP DRAWINGS

The bill of quantities, technical specifications and drawings together shall be considered as a tender requirement and the work shall be carried out as per good for construction (GFC) drawings, issued by Engineer-in-charge. The contractor shall study the GFC drawings and taking into account actual site conditions and selected material and requirements shall prepare shop drawings for the following works, as fully coordinated drawings, as given above.
For Civil:

The shop drawings shall be prepared timely by contractor and submitted for approval to achieve the milestones provided.

Within the time frame agreed with the Engineer-in-charge, the contractor shall prepare shop drawings using latest version of Auto CAD. Shop drawings shall show all layouts, details in plans & sections showing all connections, junctions, bends, supports, clearances. Fixing arrangements with dimensions' room, etc shall be prepared by the contractor on AutoCAD based on the architectural drawings and site measurements. All measurable items quantities shall be mentioned on each shop drawing being submitted for approval by the contractor. 3 sets of shop drawings (soft copy also) shall be submitted for approval and Seven sets of final shop drawings after approval by Engineer-in-charge shall be submitted by the contractor along with the soft copy. The shop drawings, shall be prepared as per schedule given in CPM/PERT Chart.
Technical submittals of manufacturer's catalogues and technical data shall be submitted for approval. The contractor shall designate an Engineer responsible for issue and preparation of shop drawings and control of GFC drawings.

1.39 TOOLS AND PLANTS

The bidder should have own constructions equipment required for the proper and timely execution of the work. Nothing extra shall be paid on this account.

No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.

1.40 SCAFFOLDING

For the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. It shall be provided strictly with steel double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. Nothing extra shall be payable on this account. It shall be ensured that no damage is caused to any structure due to the scaffolding except for the work of vertical extension where vertical & horizontal scaffolding along with screen to prevent pollution and debris from following along with proper access to be provided for which payment shall be made.

1.41 The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency to deploy adequate equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also ancillary facilities shall be provided by contractor commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants, machineries etc. provided by him are maintained in proper working conditions at all times during the progress of the work and till the completion of the work. Further, all the constructional tools, plants, equipment and machineries provided by the Contractor, on site of work or his workshop for this work, shall be exclusively intended for use in the construction of this work and they shall not be shifted/ removed from site without the permission of the Engineer-in-Charge.

1.42 The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire,

rain, traffic, floods or any other causes. The Engineer-in-Charge shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the Contractor or of any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

1.43 ROYALTY

Royalty at the prevalent rates shall be paid by the Contractor to the RMC supplier as per the terms of supply between them, on all materials such as boulders, metals, all sizes stone aggregates, brick aggregates, coarse and fine sand, moorum, river sand, gravels and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned. Further, contractor needs to submit proof of submission of full royalty to the state government or local authority. Nothing extra shall be payable on this account.

1.44 PRESERVATION AND CONSERVATION MEASURES

(i) Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services, if any, encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. In case the same are to be removed and diverted, expenditure incurred in doing so shall be payable to the contractor. The contractor shall work out the cost, get the same approved by Engineer-in-Charge before taking up actual execution. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

(ii) All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on project location during excavation/construction shall be the property of the Government, and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precaution to prevent his work men or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the Engineer-in-charge of such discovery and carry out the official instructions of Engineer-in- charge for dealing with the same, till then all work shall be carried out in a way so as not to disturb/damage such article or thing.

1.45 RESPONSIBILITY

(i) He shall protect and indemnify the Department / DTU and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

(ii) The fee payable to statutory authorities for obtaining the various permanent service connections and Building Use Certificate for the building shall be borne by the DTU.

(iii) The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from any and all damages and claims that may arise on any account. The Contractor shall indemnify the Department against all claims in respect of patent rights, royalties, design, trademarks- of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the Department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account.

1.46 CO-OPERATION WITH OTHER CONTRACTORS/SPECIALIZED AGENCIES/ SUB-CONTRACTORS

(i) The Contractor shall take all precautions to abide by the environmental related restrictions imposed by any statutory body having jurisdiction in Delhi as well as prevent any pollution of streams, ravines, river bed and waterways. All waste or superfluous materials shall be transported by the Contractor, entirely to the satisfaction of the Engineer- in-Charge and disposed at designated places only. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim what so ever on account of site constraints mentioned above or any other site constraints, lack of public transport, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-

availability of construction machinery spare parts and any other constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Tenderers are advised to visit site and get first-hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

(ii) The Contractor shall cooperate with and provide the facilities to the sub-Contractors and other agencies working at site for smooth execution of the work. The contractor shall indemnify the Department (DTU) against any claim(s) arising out of such disputes. The Contractor shall:

(a) Allow use of scaffolding, toilets, sheds etc.
(b) Properly co-ordinate their work with the work of other Contractors.
(c) Provide control lines and benchmarks to his Sub-Contractors and the other Contractors.
(d) Provide electricity and water at mutually agreed rates.
(e) Provide hoist and crane facilities for lifting material at mutually agreed rates.
(f) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
(g) Adjust work schedule and site activities in consultation with the Engineer-in- Charge and other Contractors to suit the overall schedule completion.

(h) Resolve the disputes with other Contractors/ sub-contractors amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator.

(iii) The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines viz. sanitary & water supply, drainage, rain water harvesting, electrical, firefighting, information technology, communication & electronics and any other services.

(iv) Other agencies as employed by the contractor, will also simultaneously execute and install the works of sub-station / generating sets, air-conditioning, lifts, etc. for the work and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings trenches etc. as may be required for such related works and includes provision of inserts and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

(v) The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-In-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and in a proper co -ordination manner and shall perform it in proper sequence to the complete satisfaction of others.

1.47 SUPERVISION OF WORK

The Contractor shall depute Site Engineer & skilled workers as required for the work. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision-making powers shall be available to the representatives of the Contractor at New Delhi itself to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced; the Contractor shall deploy more staff or better-experienced staff at site to complete the work with quality and in stipulated time limit.

1.48 Specialized Agencies

(i) The composite tender comprises of main component: viz. civil work. The list of specialized agencies for civil works is as below:

For Civil:

1. Water proofing work.
2. Steel work.

3. Furniture work.

The contractor shall submit the credential of specialized agency well in advance for the approval of NIT Approving Authority as per the direction of Engineer-in-charge. After verification of the same, written approval will be conveyed to main contractor in this regard. The quantum of credentials will be broadly in line with CPWD guidelines. The main contractor shall not change the specialized agency. However, if the change is warranted, he may do so, with permission of NIT approving authority. However before making any such change he has to enter into similar agreement as with previous agency & submit the same to Engineer - in – Charge for approval. This shall however be without any change in the accepted rates of the contract agreement and without any cost implications to the Department.

(ii) It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub- contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies or any dispute amongst them.

1.49 RATES

The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, setting lay out on ground, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station, construction of all safety and protection devices, compulsory use of helmet and safety shoes, and other appropriate safety gadgets by workers, imparting continuous training for all the workers, barriers, preparatory works, construction of clean, hygienic and well ventilated workers housings in sufficient numbers as per drawing supplied by Engineer in charge, working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location, implementation of green building norms to achieve desired GRIHA Rating etc. and any other unforeseen but essential incidental works required to complete this work. Nothing extra shall be payable on this account and no extension of time for completion of work shall be granted on these accounts.

The contractor shall quote his rates for the work inclusive of all taxes including Goods and services tax (G.S.T.) etc. Nothing extra shall be paid on any account over and above the quoted rates.

No foreign exchange shall be made available by the Department for importing (purchase) of equipment, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.

Ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc.

For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.

All material shall only be brought at site as per program finalized with the Engineer-in- Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

1.50 SAFETY PRACTICES

i) WARNING/ CAUTION BOARDS: All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", “No Parking”, Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in-Charge. These glow signage and red lights shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. This signage shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.

ii) SIGN BOARDS: The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, Client/Owner, Engineer-in-charges, Structural Consultants, Department etc. besides providing space for names of other Contractors, Sub-Contractors and specialized agencies within 15 days from issue of award letter. Nothing extra shall be payable on this account. In case of noncompliance/delay in compliance in this, a penalty @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

iii) Necessary protective and safety equipment’s shall be provided to the Site Engineer, Supervisory staff, labour and technical staff of the contractor by the Contractor at his own cost and to be used at site.

iv) No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities and as per the direction of Engineer -in- Charge in this regard. Also all precautions and safety measures shall be taken by the Contractor for safe handling of the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the Contractor.

1.51 QUALITY ASSURANCE

The proposed building/work is a prestigious project and quality of work is of paramount importance. Contractor shall have to engage well-experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like specialized flooring work, Polysulphide sealant and backer rod fixing in expansion joints, factory made door- window shutters, proper slope maintaining in toilet units, sanitary- water supply installation, textured finishing, grit plastering with aluminium channel insertions, water proofing treatment with APP Extruded Polystyrene insulation boards, will specially require engagement of skilled workers having experience particularly in execution of such items.

The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material / work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.

In addition to the supervision of work by DTU engineers, the Consultants deployed by the DTU shall also be carrying out regular and periodic inspection of the ongoing activities in the work and deficiencies, shortcomings, inferior workmanship pointed out by them shall be communicated by DTU engineers to the contractor. Upon receipt of instructions from Engineer in Charge these are also to be made good by necessary improvement, rectification, replacement upto his complete satisfaction. Special attention shall be paid towards line and level of internal and external plastering, exposed smooth surface of RCC members by providing fresh shuttering plates, rubberized linings to all the shuttering joints, accurate joinery work in wooden doors and windows, thinnest joints

in stone/ tiling / cladding work, non-hollowness in floor and dado tiles work, protection of scratches over flooring by impounding layer of plaster of Paris, water tight pipe linings, absence of hollow vertical joints in brick masonry, proper compaction of filled up earth etc. to achieve an Institution of International standards and up keeping of quality assurance shall be of paramount importance, as such.

The Contractor shall submit, within 07 (Seven) days after the date of award of work, a detailed and complete method statement for the execution, testing and Quality Assurance, of such items of works, as directed by the Engineer-in-Charge. All the materials to be used in the work, to give the finished work complete in all respects, shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the Engineer-in- Charge. However, keeping the Quality Assurance in mind, the Contractor shall submit, on request from the Engineer-in- Charge, his own Quality Assurance procedures for basic materials and such items, to be followed during the execution of the work, for approval of the Engineer-in-Charge.

All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per suggested list of brand names given in the tender document / particular specifications for approval of Engineer-In-Charge. For all other items, materials and fittings of ISI Marked shall be used with the prior approval of Engineer-In-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.

The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when the specified makes are not available. This is, however, subject to documentary evidence produced by the contactor for non-availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in-Charge as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account. Also, the material shall be procured only after written approval of the Engineer-in-Charge.

All materials whether obtained from Govt. stores or otherwise shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site before use.

The tests, as necessary, shall be conducted in the following laboratory. The samples shall be taken for carrying out all or any of the tests stipulated in the particular specifications and as directed by the Engineer-in-Charge or his authorized representative.

Delhi Technological University (Formerly known as Delhi College of Engineering).
IIT Delhi
CRRI, Delhi.
National Council for Cement and Building Materials, Ballabh Garh.
CPWD Lab, Delhi.
Shree Ram Testing Laboratories Delhi
Any other NABL approved lab as approved by the NIT approving authority.

All the registers of tests carried out at Construction Site or in outside laboratories and all material at site (MAS) registers including cement register shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-charge. All the entries in the registers will be made by the designated Engineering Staff of the contractor and same should be regularly reviewed by J.E/A.E./CPO. Contractor shall be responsible for safe custody of all the registers.

The Contractor shall at his own risk and cost make all arrangements and shall provide all such facilities including material and labour, the Engineer-in-Charge may require for collecting, preparing, forwarding the required number of samples for testing as per the frequency of test stipulated in the contract specifications or as considered necessary by the Engineer-in-Charge, at such time and to such places, as directed by the Engineer-in-Charge. Nothing extra shall be payable for the above.

The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of such tests and consequences thereon shall be binding on the Contractor. The Contractor or his authorized representative shall remain in contact with the Engineer-in–Charge or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.

All the testing charges shall be borne by the contractor: -

(a) The contractor shall get the water tested with regard to its suitability and conforming to the relevant I.S. Code. The contractor shall obtain written approval from the Engineer-in-Charge before proceeds by using the same for execution of work. The testing charges shall be borne by the contractor.

All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before covering and their measurements in computerized measurement book duly test checked shall be deposited with Engineer in charge or his authorized representative, prior to hiding these items.

Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should confirm to bylaws and municipal body / corporation where CPWD Specifications are not available. The contractor should engage licensed plumbers for the work and get the materials (fixtures/fittings) tested by the Municipal Body/Corporation authorities wherever required at his own cost.

The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.

The contractor shall have to execute guarantee bonds in respect of water proofing works and other specialized works as per Performa enclosed.

The Contractor shall arrange electricity at his own cost for testing of the various electrical installations as directed by Engineer-in-Charge and for the consumption by the contractor for executing the work. Also, all the water required for testing various electrical installations, fire pumps, firefighting/ firefighting equipment's, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, overhead tanks, water proofing treatment etc. shall be arranged by the contractor at his own cost. Nothing extra shall be payable on this account.

1.52 SUBMISSION AND DOCUMENTATION

(i) The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc under various labour laws and other regulations applicable to the works, at his site office. He should also keep at site at least one set of BIS Codes and other relevant codes at site and produce the same if asked for by Engineer-In-Charge. In case of noncompliance, these codes will be purchased from the Market and actual cost of purchase will be recovered from the next RA Bill of the Contractor.
(ii) The Contractor shall make available four (04) sets of completed Building Drawings, "As Built Drawings" along with literatures, manuals, warranty certificates etc. of various installed fittings, fixtures and equipment for the completed projects. This shall be the prerequisite for payment of final bill.

(iii) The Contractor shall make available three (03) sets of all services drawings including Electrical & HVAC work internal and external services i.e. Water Supply, Sanitary line and Drainage lines. This shall be the prerequisite for payment of final bill. These drawings shall have the following information:

(iv) Run off for all piping and their diameters including soil, waste pipes and vertical stacks.

(v) Ground and invert level of all drainage pipes together with locations of all manholes and connections, up to outfall.

(vi) Run off for all water supply lines with diameters location of control valves, access panels etc.
(vii) The contractor shall make available four (04) sets of computerized Standard Measurement Books (SMBs) having measurement of all the permanent standing in a building.

(viii) The Performance Guarantee shall not be released to the contractor until the aforesaid drawings are submitted to the Engineer-in-Charge.

(ix) The contractor will submit computerized measurement sheet for the work carried out by him for making payment as per Clause – 6A of the CPWD General Conditions of Contract 2020 (with correction slips up to the last date of submission of tender). For casting of RCC members and other hidden items the corrected and duly test checked measurement sheets of reinforcement or that of other hidden items shall be deposited with Engineer in charge or his authorized representative, before casting of RCC or other hidden items. The delay in submission of corrected and duly checked measurement sheet may, therefore, delay casting of RCC or execution of hidden item for which no hindrance shall be recorded.

(x) To avoid delay, contractor should submit all samples well in advance so as to give timely orders for procurement.

1.53 Program Chart:

The Contractor shall prepare an integrated program chart within seven days of issue of award letter including civil as well as E & M activities for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the program within the stipulated period and submit the same for approval of the Engineer-In-Charge within seven days of the award of the work. These shall be submitted by the contractor through electronic media besides forwarding hard copies of the same. The integrated program chart so submitted should not have any discrepancy with the physical milestones attached in the contract agreement. The program chart should include the following: -

(i) Descriptive note explaining sequence of various activities.

(ii) Construction Program prepared on PRIMAVERA Software or any other equivalent software decided by the Engineer-in-Charge, which will indicate resources in financial terms, manpower and specialized equipment for every important stage.

(iii) Program for procurement of materials by the contractor.

(iv) Program for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress.

(v) Program of procurement of machinery/equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

(vi) Program for achieving fortnightly micro milestones and periodic milestones.

(vii) If at any time, it appears to the Engineer-In-Charge that the actual progress of work does not conform to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program by additional inputs to ensure completion of the work within the stipulated time.
(viii) The submission for approval by the Engineer-In-Charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer-In-Charge to take action against the contractor as per terms and conditions of the agreement.

(ix) Apart from the above integrated program chart, the contractor shall be required to submit fortnightly progress report of the work in a computerized form on 1st and 16th of every month. The progress report shall contain the following, apart from whatever else may be required as specified above:

(a) Construction schedule of the various components of the work through a bar chart for the next fortnight (or as may be specified), showing the micro- milestone/milestones, targeted tasks (including material and labour requirement) and up to date progress. At least 10 digital photographs showing all the parts of construction site along with at least 5 minutes video of executions of different items in soft copy has to be submitted in every fortnightly progress report.

(b) Progress chart of the various components of the work that are planned and achieved, for the fortnight as well as cumulative up to the fortnight under reckoning, with reason for deviations, if any in a tabular format.

(c) Plant and machinery statement, indicating those deployed in the work.

(d) Manpower statement indicating Individually the names of all the staff deployed on the work, along with their designations.
No. of skilled workers (trade wise) and total no. of unskilled workers deployed on the work and their location of deployment i.e. blocks.

(e) Financial statement, indicating the broad details of all the running account payment received up to date, such as gross value of work done, advances taken, recoveries effected, amount withheld, net payments details of cheque payment received, extra/substituted/deviation items if any, etc.

(x) In case of noncompliance / delay in compliance in submission of fortnightly, a penalty @ Rs. 1000/- per fortnightly report will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

1.54 TEMPORARY WATER/ ELECTRICITY/ TELEPHONE CONNECTION

Arrangement of temporary telephone connection, water and electricity required by Contractor, shall be made by him at his own cost and also necessary permissions shall be obtained by him directly from concerned authorities, under intimation to the Department. Also, all initial cost and running charges, and security deposit, if any, in this regard shall be borne by him. The Contractor shall abide by all the rules/ bye laws applicable in this regard and he shall be solely responsible for any penalty on account of violation of any of the rules/byelaws in this regard. Nothing extra shall be payable on this account.

The Contractor shall be responsible for maintenance and watch and ward of the complete installation and water / electricity meter and shall also be responsible for any pilferage, theft, damage, penalty etc. in this regard. The Contractor shall indemnify the Department against any claim arising out of pilferage, theft, damage, penalty etc. whatsoever on this account. Security deposit for the work shall be released only after No Dues Certificates are obtained from the local Authorities from whom temporary electric/ water / telephone connection have been obtained by the Contractor. Nothing extra shall be payable on this account.

The Department shall in no way be responsible for either any delay in getting electric and/or water and/or telephone connections for carrying out the work or not getting connections at all. No claim of delay or any other kind, whatsoever, on this account shall be entertained from the Contractor. Also, contingency arrangement of stand-by water & electric supply shall be made by the Contractor for commencement and smooth progress of the work so that work does not suffer on account of power failure or disconnection or not getting connection at all. No claim of any kind whatsoever shall be entertained on this account from the Contractor. Nothing extra shall be payable on this account

1.55 CLEANLINESS OF SITE

i) The Contractor shall not stack building material/malba/muck on the land or road of the local development authority or on the land owned by the others, as the case may be. So the muck, rubbish etc. shall be removed

periodically as directed by the Engineer-in-Charge, from the site of work to the approved dumping grounds as per the local byelaws and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material/malba as stated above, the Contractor shall be liable to pay the stacking charges/penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such body or authority. The Engineer –in-Charge shall be at liberty to recover, such sums due but not paid to the concerned authorities on the above counts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

ii) The contractor shall take instructions from the Engineer-In-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed.

iii) The site of work shall be always kept clean due to constraints of space and to avoid any nuisance to the users of buildings in the adjacent plots. The Contractor shall take all care to prevent any water- logging at site. The waste water, slush etc. shall not be allowed to be collected at site. It may be directly pumped into the creek with prior approval of the concerned authorities. For discharge into public drainage system, necessary permission shall be obtained from relevant authorities after paying the necessary charges, if any, directly to the authorities. The work shall be carried out in such a way that the area is kept clean and tidy. All the fees/charges in this regard shall be borne by the Contractor. Nothing extra shall be payable on this account.

1.56 INSPECTION OF WORK

i) In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by Senior Officers of DTU & the representative of the Consultants .The contractor shall at times during the usual working hours and at all times at which reasonable notices of the intention of the Engineer-in-charge or other officers as stated above to visit the works shall have been given to the contractor, either himself be present to receive the orders and instructions or have a responsible representative duly accredited in writing, to be present for that purpose.

ii) Inspection of the work by consultant appointed by the DTU.

The consultant appointed by DTU, shall be inspecting the works including workshops and fabrication factory to ensure that the works are in general being executed according to the design, drawings and specifications laid down in the contract. His observations shall be communicated by DTU engineering staff and compliance is to be reported to DTU.

The consultant appointed by DTU shall certify on completion of particular building that it has been constructed according to the approved drawings design and specifications.

iii) Senior Officers of DTU, Dignitaries from Central Ministry / Department, Client Authorities shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor shall, therefore, keep updated the following requirements and detailing.

Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.
Entrance and area surrounding to be kept cleaned.
Display layout plan key plan, building drawings including plans, elevations and sections.
Upto date displays of Bar chart, CPM and PERT etc.
Keep details of quantities executed, balance quantities, deviations, possible Extra item, substituted Item etc.
Keep plastic / cloth mounted one sets of building drawings.
Set of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

1.57 FINAL TESTING OF THE INSTALLATION

The Contractor shall demonstrate trouble free functioning of all the Civil and E & M installations and services. The Engineer-in-Charge or his authorized representatives shall carry out final inspection of the various Civil and E & M services and installations. Any defect(s) noticed during demonstration shall be rectified by the Contractor at his own cost to the entire satisfaction of the Engineer-in-Charge. Nothing extra shall be payable on this account.

1.58 SUBMISSION OF AS-BUILT DRAWINGS AND OBTAINING OCCUPATION CERTIFICATE

The contractor shall coordinate and facilitate consultant for obtaining occupation certificate / completion certificate from local bodies including getting the required site visits conducted by such authorities with a view to obtain the same.

1.59 REFUND OF PERFORMANCE GAURENTEE

The performance guarantee shall be refunded to the contractor soon after the completion of work and recording of the completion certificate by the competent authority.

1.60 DEALING WITH INCONSISTENT RATES

i) The Contractors shall quote same rates for the identical items which may inadvertently appear in more than one place if different rates are quoted by the tenderers for such identical items, the same shall be rationalized by considering the lowest quoted rate for such items, for evaluation and acceptance of tender.

ii) Wherever any reference to any Indian Standards occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued thereto or revisions thereof, if any, up to the date of receipt of tenders.

iii) Unless otherwise specified in the schedule of quantities, the rates for all items of work shall be considered, as inclusive of pumping out or bailing out water, if required throughout the construction period for which no extra payment shall be made. This shall also include water encountered from any source such as rains, floods, sub soil water table being high and/or due to any other cause whatsoever.

iv) All stone aggregate and stone ballast shall be of hard stone variety to be obtained from approved quarries.

v) Coarse sand should be obtained from approved sources. The same shall be clean and sharp angular grit type. The coarse sand shall be screened before using, if required. If the sand brought to site is dirty, it must be washed in clean water to bring the sand to the required specifications. Nothing extra shall be payable on this account.

vi) The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T & P, scaffolding, wastages, watch and ward, other inputs, all incidental charges, all taxes GST etc. required for execution of the work.

1.61 PRODUCT DELIVERY, STORAGE AND HANDLING OF CHEMICALS

The contractor shall construct storage space for Chemicals materials to ensure that the storage conditions are as recommended by the manufactures.

All the materials shall be procured and delivered in sealed containers with labels legible and intact.

All the chemicals {polymers, epoxy, water proofing compound, plasticizer, Polysulphide, SBR based elastomeric, APP (Atactic Polypropylene Polymer), all exterior and interior paints, polish etc.) shall be procured in convenient packs say 20 litres/Kgs.} capacity packing only or as approved by the Engineer-in-Charge, and not in bigger capacity containers, say 200 litres (Kgs.) drums unless otherwise specifically permitted by the Engineer-in-Charge. One sample from each lot of the chemical procured by the contractor shall be tested in a laboratory as approved by the Engineer-in-charge

All material required for the execution of the work shall be got approved, procured and deposited with the Departmental supervisory staff. The materials shall be kept in joint custody of the contractor and the Department. The watch and ward of such material shall, however, remain to be the responsibility of the contractor and no claim, whatsoever, on this account shall be entertained. Different containers of each chemical shall be serially numbered on packing and also consumed in that order. Day-to-Day account of receipt, issue and balance shall be regulated by the Department and proper account shall be maintained at site of work in the prescribed form as per the standard practice.

All the chemicals shall be procured by the contractor directly from the manufacturer. In exceptional circumstances, the contractor may be allowed to procure the materials from the authorized dealers of the manufacturers, if specifically permitted by the Engineer-in-Charge.

The original copies of challan/cash memos and manufacturer's test reports towards the quantity of various chemicals procured shall be made available by the contractor to the Engineer-in- Charge before making payments for work consuming the said material and a copy of the same shall be kept in record.
The Name of manufacturers, manufacturer's product identification, and manufacturer's mixing instructions, warning for handling and toxicity and date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of each container.
The contractor shall submit for the chemicals procured, manufacturer's and / or authorized dealer's certificate regarding supplying and verifying conformance to the material specifications, as specified.
All filled containers shall be handled in safe manner and in a way to avoid breaking container seals.
Empty containers of the chemicals should not be removed from site till the completion of work and shall be removed only with the written approval of the Engineer-in-Charge.
All arrangements for measuring, dosing and mixing of material / chemicals at site have to be made by the contractor.
Contractor shall suitably advise his site Engineer and all the workers as regards safe handling of chemicals. Necessary protective and safety equipment's in form of hand gloves, goggles etc. shall be provided by the contractor and be also used at site.
All incidental charges of any kind including cartage, storage and wastage and safe custody of material etc. shall be borne by the contractor and no claim, whatsoever, shall be entertained on this account.
The chemicals shall be tested in an independent laboratory as approved by the Engineer-in-charge at the frequency as specified. If required, more samples may have to be tested as per the directions of the Engineer-in-Charge. Nothing extra shall be payable on this account. However, testing charges shall be borne by the department for the samples satisfying the requirements specified in the tender.

1.62 De-watering

(i) De-watering required, if any, shall be done conforming to BIS Code IS: 9759 (guide lines for de-watering during construction) and / or as per the specifications approved by the Engineer-in-Charge. Design of an appropriate and suitable dewatering system shall be the Contractor's responsibility. Such scheme shall be modified / augmented as the work proceeds based on fresh information discovered during the progress of work, at no extra cost. At all times during the construction work, efficient drainage of the site shall be carried out by the Contractor and especially during the laying of plain cement concrete, taking levels etc. The Contractor shall also ensure that there is no danger to the nearby properties and installations on account of such lowering of water table. If needed, suitable precautionary measures shall be taken by the Contractor. Also, the scheme of dewatering adopted shall have adequate built-in arrangement to serve as stand-bye to attend to repair of pumps etc. and disruption of power / fuel supply. Nothing extra shall be payable on this account.
(ii) In trenches where surface water is likely to get into cut / trench during monsoons, a ring bund of puddle clay or by any other means shall be formed outside, to the required height, and maintained by the Contractor. Also, suitable steps shall be taken by the Contractor to prevent back flow of pumped water into the trench. Nothing extra shall be payable on this account.

1.63 INSURANCE POLICIES

Before commencing the execution of work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work. The Contractor shall obtain and submit to the Engineer-in-Charge proper Contractor All Risk Insurance Policy for an amount 1.25 times the contract amount for this work, with Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the Contractor (who shall be second beneficiary). Also, he shall indemnify the Department from any liability during the execution of the work. Further, he shall obtain and submit to the Engineer-in-Charge, a third-party insurance policy for maximum Rs.10 lakh for each accident, with the Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the Contractor (who shall be second beneficiary). The Contractor shall, from time to time, provide documentary evidence as regards payment of premium for all the Insurance Policies for keeping them valid till the completion of the work. The Contractor shall ensure that Insurance Policies are also taken for the workers of his Sub-Contractors / specialized agencies also. Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall within 10 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to

the Department giving details of the Insurance Policies along with Certificate of these insurance policies being valid, along with documentary evidences as required by the Engineer-in-Charge. No work shall be commenced by the Contractor unless he obtains the Insurance Policies as mentioned above. Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by the Contractor. Nothing extra shall be payable on this account. No claim of hindrance (or any other claim) shall be entertained from the contractor on these accounts.

1.64 Training of the Personnel

The contractor shall arrange at no extra cost to the Department to train two persons from the department (DTU) one each for civil and electrical works, on how to operate and carryout preventive maintenance of the systems (both civil and electrical) . The contractor shall arrange this training from well qualified and experience personnel for at least seven days.

1.65 The Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixings involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer-in-Charge.

1.66 Recording of Hindrance & Maintenance of Hindrance Register –

i) Whenever any hindrance whether on part of department or on part of contractor, comes to the notice of the Assistant Engineer, he shall at once make a note of such hindrance in the register kept at site, and immediately make a report to the Chief Project Officer within a week.

ii) The following points shall be kept in mind while entering the hindrances in the Hindrance Register:

The entry of date of start of hindrance and date of removal of hindrance shall be made on the same day as the hindrance takes place or the cause of the hindrance is removed, respectively.

The Chief Project Officer shall work out the over lapping period, net if hindrance and of each hindrance within 15 days of removal of the cause of hindrance. For work outside headquarters, this shall be done as and when he visits the site.

The items of work affected due to any hindrance shall be clearly mentioned in the Hindrance Register by the Assistant Engineer, and the weightage shall be allowed on this basis.

Each hindrance shall be entered in the hindrance Register, which shall be authenticated by the Chief Project Officer and Contractor.

The hindrance on part of contractor shall also to be entered in the Hindrance Register.

The hindrance shall be recorded carefully in the Hindrance Register after considering its effect on completion of work.

Review of hindrance register shall be compulsory in division office by EE and AAO at the time of payment of each Running Account Bill and final bill and certificate shall be recorded that all up to date hindrances on part of department and contractor have been recorded in the hindrance register.

The net delay on part of department or contractor shall be worked out after considering all the hindrances recorded in the hindrance register.

The Superintending Engineer shall review the hindrance Register whenever he visits site of work.

1.67 Safety, Health and Environment

Over and above the provisions made in CPWD Safety Code (part of General Conditions of contract for CPWD works 2014) the following will also be applicable:

In respect of all workmen directly or indirectly employed in the work for the performance of the contractor's part of this agreement, the contractor shall at his expense arrange for the safety provisions as per Indian Standard Safety codes shown below and shall at his own expense provide for all facilities in connection there with. In case the contractor fails to make arrangement and provide necessary facilities, he shall be liable to pay compensations prescribed under Workmen’s Compensation Act 1923 as amended from time to time for each default and in addition the Engineer-in-charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the cost incurred on that behalf from the contractor, and no claims what so ever shall be entertained.

Details regarding some special provisions to be followed by contractor are as follows:

a) Usage of quality Personal Protection Equipment's (PPEs) through approved vendors. PPEs would include amongst others the following items:

Safety Helmets.
Hearing Protection.
Respiratory Protection.
Eye Protection.
Protective Gloves.
Safety Footwear.
High Visibility Clothing (Jacket) with approved Logo

All the items should be got approved before issued to the use in the work. Safety Jacket should have DTU Logo as per the size approved.

The contractor shall provide all the PPE (Personnel Protective Equipment) and safety appliances required to carry out the job to all the workmen deployed by the contractor and also ensure that his workmen use those PPE and safety appliances while on the job. The contractor shall not pay any cash amount in lieu of PPE to the workers/sub-contractors and expect them to buy and use during work. If the contractor fails to ensure provision of safety appliances and its workmen do not use the PPE and safety appliances as needed for safe working, the owner may ask the contractor to stop the work and comply with safety requirements first. The contractor shall at all time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Employer during the inspections. Failing to do so shall invite appropriate compensations as per the provisions of under Workmen's Compensation Act 1923 as amended from time to time.

It is always the duty of the contractor to provide required PPEs for all visitors. Towards this required quantity of PPEs shall be kept always at the security post.

Colour coding for helmets

Safety Helmet Color Code (Every Helmet should have the LOGO* affixed /painted)	Person to use
White	DTU staffs, All Designers, Architect, Consultants, etc.
Violet	Main Contractors (Engineers / Supervisors)
Blue	All Sub-contractors (Engineers / Supervisors)
Red	Electricians (Both Contractor and Sub-contractor)
Green	Safety Professionals (Both Contractor and Sub-contractor)
Orange	Security Guards / Traffic marshals
Yellow	All workmen
White (with "VISITOR" sticker)	Visitors

Note: LOGO*

i) Logo shall have its outer dimension 2"X2" and shall be conspicuous.
ii) Logo shall be either painted or affixed.
iii) No words shall come either on Top / Bottom of Logo.

b) Working at Heights

Contractor shall ensure that work at height is properly planned for any emergencies and rescue appropriately supervised, and carried out in a manner, which is reasonably practicable safe. Contractor shall ensure that work at height is carried out only when the weather conditions do not jeopardize the health or safety of persons involved in the work. Guardrail, Toe-board, Barrier or similar collective means of protection shall be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable.

Working Platform shall be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area-having regard to the work being carried out there. Possess a suitable surface and, in particular, be so constructed that the surface of the working platform has no gap through which a person, material or object could fall and injure a person. A working platform and any

supporting structure shall not be loaded so as to give rise to a risk of collapse or to any deformation, which could affect its safe use. Strength and stability calculations for scaffolding shall be carried out by the contractor. The dimension's form and layout of scaffolding decks shall be appropriate to the nature of the work to be performed and suitable for the loads to be carried and permit work and passage in safety.
A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of supporting any foreseeable loading. Suitable and sufficient steps shall be taken to prevent any person falling or slipping from a personal fall protection system. Any other steps in the opinion of engineer-in-charge suggested will also be taken in Protection system
Only metal ladders shall be allowed. Any surface upon which a ladder rests shall be stable, firm, of sufficient strength and of suitable composition safely to support the ladder so that its rungs or steps remain horizontal, and any loading intended to be placed on it. A ladder shall be so positioned as to ensure its stability during use. A suspended ladder shall be attached in a secure manner and so that, with the exception of a flexible ladder, it cannot be displaced and swinging is prevented. No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.

c) Lifting appliances and gears.
The contractor shall maintain a register for record of examinations and test details of all lifting appliances. This register should also contain a system of identification of all tools and tackles, its date of purchase, safe working load etc. Contractors can utilize the services of any competent person as defined in Factories Act, 1948 and approved by Chief Inspector of Factories with the permission of the Employer.

d) Automatic safe load indicators
All lifting appliances and gears like cranes, hydras etc, if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise shall be attached with an automatic indicator of safe working loads approved by Bureau of Indian standards/ International certifying bodies which gives a warning to the operator and arrests further movements of the lifting parts.

e) Qualification of operator of lifting appliances and of signaller etc.
The contractor shall not employ any person to drive or operate a lifting machine like crane, hydra etc whether driven by mechanical power or otherwise or to give signals to work as a operator of a rigger or derricks unless he is above twenty-one years of age and possesses a valid heavy transport vehicle driving license as per Motor Vehicle Act and Rules, is absolutely competent and reliable, possesses the knowledge of the inherent risks involved in the operation of lifting appliances by undergoing a formal training at any institution of national importance, is medically examined periodically.

1.68 Existing Services:
Existing drains, pipes, electricity cables, overhead wires and telephone cables, sewer lines, water lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the contractor. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. In case temporary shifting/supporting of such services is required to facilitate the work, the contractor at no extra cost shall do the same. The decision of the Engineer-in-Charge in this regard shall be final and binding.

1.69 All works pertaining to services including rerouting/diversion of services, routine testing, installation etc., completed in one or more than one process shall be subject to examination and approval to each stage thereof by the Engineer-in-charge or concerned department as would be notified by the Engineer-in-charge or his authorized representative when such stage is ready. In default of such notice the Engineer-in-Charge shall be entitled to appraise the quantity and extent thereof and the decision of Engineer-in-Charge or his authorized representative in this regard shall be final and binding.
1.70 For utilities which are required to be removed or permanently shifted to new position, in the opinion of the Engineer-in-charge, shall be removed / shifted by the contractor in consultation with the service provider agency. Payment for this shall be made as per terms and conditions of the contract. No claim for delay or otherwise due to above reasons shall be entertained on this account.

1.71 The contractor shall make his own arrangement for the disposal of the spoils, waste of bentonite, all dismantled material, slush and foul materials, surplus earth to such place where the same shall not cause nuisance or any environmental problems anywhere and should be acceptable to the authorities concerned. No extra claim whatsoever shall be entertained due to above. The road connected to site should be kept nuisance or environmental problem free.

1.72 The contractor shall make his own arrangement at his own cost for the provision of telephone facilities at the site of works or at any other place.

1.73 The contractor shall make his own arrangements for obtaining electric & water connection(s) if required and make necessary payment directly to department concerned. The department will however make all reasonable recommendations to the authority concerned in this regard.

1.74 The contractor shall bear all incidental charges for cartage, storage and safe custody of materials brought to site.

1.75 The work shall be carried out in accordance with the Architectural drawings, structural and services drawings, to be issued from time to time, by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural, structural drawing and services issued for the work, nomenclature of items, specifications etc. and satisfy himself that the information available there from is complete and unambiguous. The figures & the written dimensions of the drawing shall super cede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-In-Charge for immediate decision before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information and no claim, whatsoever shall be entertained on this account.

The contractor shall have registration with EPFO and ESIC. The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis.

No payment shall be made to the contractor for cutting holes in 40 mm thick sand stone slab for electric installations and fixtures such as electric MCB DB's and firefighting pipes as well as civil plumbing work being the new work unless otherwise provided in schedule of quantity.

The payment for shuttering at the edges of slab at all levels shall be made under schedule item of centering and shuttering.

1.76 One percent (01%) labour cess shall be deducted from gross amount of bill.

2.0 SPECIAL CONDITIONS FOR GREEN BUILDING

2.1 Pre-construction Stage

Construction Vehicles, Equipment and Machinery

All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms.

Emission from the vehicles must conform to environmental norms.

Dust produced from the vehicular movement and other site activities is to be mitigated by sprinkling of water.

Noise limits for construction equipment's shall not exceed 75 dB(A), measured at one meter from the edge of the equipment in free area, as specified in the Environment Protection Act,1986, schedule VI part E, as amended on 9th May,1993. The maximum noise levels near the construction site should be limited to 65 dB (A) Leq (5 min) in project area.

2.2 Construction Stage

Construction Wastes Disposal

(i) The pre-identified dump locations will be a part of solid waste management plan to be prepared by the Contractor in consultation with Engineer -in-charge.

(ii) Contractor shall get approved the location of disposal site prior to commencement of the excavation on any section of the project location.
(iii) Contractor shall ensure that any spoils of material will not be disposed off in any municipality solid waste collection bins.

2.3 Procurement of Construction Materials

(i) All vehicles delivering construction materials to the site shall be covered to avoid spillage of materials and maintain cleanliness of the roads.
(ii) Wheel Tyres of all vehicles used by of the contractor, or any of his sub-contractor or materials supplies shall be cleaned and washed clear of all dust/mud before leaving the project premises. This shall be done by routing the vehicles through tyre washing tracks.
(iii) Contractor shall arrange for regular water sprinkling at least twice a day (i.e. morning and evening) for dust suppression of the construction sites and unpaved roads used by his construction vehicles.

2.4 Water Pollution
(i) The Contractor shall take all precautionary measures to prevent the wastewater during construction to accumulate anywhere.
(ii) The wastewater arising from the project is to be disposed of in the manner that is acceptable to the Engineer -in-charge.
2.5 Air and Noise Pollution
Contractor shall use dust screens and sprinkle water around the construction site to arrest spreading of dust in the air and surrounding areas.
(i) Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that emission levels comply with environmental emission standards/norms.
(i) For controlling the noise from Vehicles, Plants and Equipment's, the Contractor shall confirm the following:
(iii) All vehicles and equipment used in construction will be fitted with exhaust silencers.
(iv) Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.
(v) Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).
(vi) As per the standards/guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) sets, noise emission i n dB(A) from DG Set (15-500 KVA) should be less than 94+10 log 10 (KVA). The standards also suggest construction of acoustic enclosure around the DG Set and provision of proper exhaust muffler with insertion loss of minimum 25 dB(A) as mandatory.
(vii) Control of Air Pollution of Dust from construction and demolition activities as per NGT guidelines.
2.6 Personal Safety Measures for Labour
Contractor will provide the following items for safety of workers employed by contractor and associate agencies:
Protective footwear and gloves to all workers employed for the work on mixing, cement, lime mortars, concrete etc. and openings in water pipeline/sewer line.
Welder's protective eye-shields to workers who are engaged in welding works.
Safety helmet and Safety harness/ belt. Provide adequate sanitation/safety facilities for construction workers to ensure the health and safety of the workers during construction, with effective provisions for the basic facilities such as sanitation, drinking water and safety equipment's or machinery.
All the workers should be wearing helmet and shoes all the time on site.
Masks and gloves should be worn whenever and wherever required.
Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.
Full time workers residing on site should be provided with clean and adequate temporary hutment.
First aid facility should also be provided.
Overhead lifting of heavy materials should be avoided. Barrow wheel and hand-lift boxes should be used to transport materials onsite.
Tobacco and cigarette smoking should be prohibited onsite.
All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken.

Maintain hoists and lifts, lifting machines, chains, ropes and other lifting tackles in good condition. Provide safety net of adequate strength to arrest falling material down below.
Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
Ensure that walking surfaces or boards at height are of sound construction and are provided with safety rails and belts. Provide protective equipment's such as helmets.
Provide measure to prevent fire. Fire extinguisher and buckets of sand to be provided in fire-prone area and elsewhere.
Provide sufficient and suitable light for working during night.
Ensure that measures to protect workers from materials of construction, transportation, storage and other dangers and health hazards are taken
Ensure that the construction firm/division/company have sound safety policies.
Comply with the safety procedure, norms and guidelines (as applicable) as outlined in NBC 2005 (BIS 2005c).
Adopt additional best practices and prescribed norms as in NBC 2005 (BIS2005).

2.7 Identify roads on-site that would be used for vehicular traffic. Update vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral type that make up the surface base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 -20%. Limit vehicular speed on site 10km/h. Nothing extra will be payable for this.
2.8 All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust/particulate emissions.
2.9 Spills of dirt or dusty materials shall be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean - up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained/cleaned up immediately before they can infiltrate into the soil/ground or runoff in nearby areas.
2.10 Ensure that water spraying is carried out by wetting the surface by spraying water on:
(i) Any dusty material.
(ii) Areas where demolition work is carried out.
(iii) Any unpaved main-haul road and.
(iv) Areas where excavation or earth moving activities are to be carried out.
2.11 The contractor shall ensure the following:
(i) Cover and enclose the site by providing dust screen, sheeting or netting to scaffold along the perimeter of a building.
(ii) Covering stockpiles of dusty material with impervious sheeting.
(iii) Covering dusty load on vehicles by impervious sheeting before they leave the site.
(iv) Transferring, handling/storing dry loose materials like bulk cement and dry pulverized fly ash inside a totally enclosed system.
(v) Spills of dirt or dusty materials shall be cleaned up promptly so that the spilled material does not become a source of fugitive dust and also to prevent seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil/ground or runoff in nearby areas.
(vi) Clear vegetation only from areas where work will start right away.
(vii) Vegetate/mulch areas where vehicles do not ply.
(viii) Apply gravel / landscaping rock to the areas where mulching/paving is impractical.

2.12 Adopt measures to prevent air pollution in the vicinity of the site due to construction activities. There is no standard reference for this. The best practices should be followed (as adopted from international best practice documents and codes)
2.13 Provide sheet covering/barricading of site of not less than 3m height along the site boundary, next to a road or other public area. Nothing extra will be paid for this.
2.14 The contractor shall provide experienced personnel with suitable training to ensure that these methods are implemented. Prior to the commencement of any work, the method of working, plant equipment and air pollution control system to be used on -site should be made available for the inspection and approval of the Engineer -in-Charge to ensure that these are suitable for the project.

2.15 Employ measures to segregate the waste on-site into inert, chemical or hazardous wastes. Recycle the unused chemical/hazardous wastes such as oil, paint, batteries and asbestos. The inert waste is to be disposed off to Municipal Corporation/local bodies dump yard and landfill sites.
2.16 To preserve the existing landscape and protect it from degradation during the process of construction. Select proper timing for construction activity to minimize the disturbance such as soil pollution due to spilling of the construction material and its mixing with rainwater. The construction management plan including soil erosion control management plan shall be prepared accordingly for each month. The application of erosion control measures includes construction of gravel pits and tier washing bays of approved size and specification for all vehicular site entry/exits, protection of slopes greater than 10%. Sedimentation Collection System and run-off diversion systems shall be in place before the commencement of construction activity. Preserve and protect the existing vegetation by not-disturbing or damaging to specified site areas during construction.
2.17 The Contractor should follow the construction plan as proposed by the Engineer-in-charge / landscape consultant to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site.
2.18 Spill prevention and control plans should clearly state measures to stop the source of the spill. Measures to contain the spill and measures to dispose the contaminated material and hazardous wastes. It should also state the designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners and petroleum products.
2.19 A soil Erosion and Sedimentation Control Plan (ESCP) should be prepared prior to construction and should be applied effectively.
2.20 The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.
2.21 The contractor shall ensure that no construction leaches (Ex: cement slurry) is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant -laden water directly to the treatment device or facility (municipal sewer line).
2.22 All lighting installed by the contractor around the site and at the labour quarters during construction shall be CFL bulbs of the appropriate illumination levels. This condition is a must, unless specifically prescribed otherwise.
2.23 All paints, adhesives and sealants should comply with the VOC limits prescribed by GRIHA, as follows:

Table 1- VOC limits for paints, adhesives and sealants

Paints	VOC Limit (g/l)	Adhesives	VOC Limit (g/l)
Non-flat paints	150	Wood flooring Adhesive	100
Flat (Mat) paints	50	Tile Adhesive	65
Anti-corrosive/anti- rust paints	250	Indoor Carpet Adhesive	50
Varnish	350	Wood	30
Lacquer	550	Stains Water proofing sealer	250 250

2.24 All the building materials and systems used on site must be as per the specifications and approved makes by the Engineer-In-Charge.2.25Nothing extra shall be payable for above provisions unless otherwise specified in Schedule of Quantity

ADDITIONAL CONDITION AND PARTICULAR SPECIFICATION FOR STEEL WORK

STRUCTURAL STEEL

3.1 This specification covers the fabrication and transportation to site and erection on prepared foundations and structural steel work consisting of beams, columns, purlins, vertical trusses, bracings, shear connections etc.

3.2 Fabrication, erection and approval of steel structures shall be in compliance with:

General Specifications mentioned in CPWD specifications and IS : 800 – 1984. For the guidance on general fabrication and erection of structural steel work, Chapter 11 of IS: 800 (1984) must be followed. As far as safety is concerned guidance could be obtained from Indian safety code for structural steel work IS:7205(1974). Before the commencement of the erection, all the erection equipment tools, shackles, ropes etc. should be tested for their load carrying capacity. Such tests if needed may be repeated at intermediate stages also.

Drawings and supplementary drawings to be supplied to the contractors during execution of the work.

3.3 Providing shop primer coat for steel structures. Grouting of holding-down bolt pockets and below base plates where required.

3.4 In case of conflict between the Clauses mentioned here and the Indian Standards, those expressed in this specification shall govern.

3.5 Scope

The fabrication and erection of the steel work consists of accomplishing of all jobs here-in enumerated including providing all labour, tools and plant all materials and consumables such as welding electrodes, bolts and nuts, oxygen and acetylene gases, oils for cleaning etc. of approved quality as per relevant IS. The work shall be executed according to the drawings, specifications, relevant codes etc. in an expeditious and workman like manner, as detailed in the specifications and the relevant Indian Standard Codes and Standard Practice and to the complete satisfaction of the Engineer-in-charge.

3.6 Fabrication Drawings

(i) The contractor shall prepare all fabrication and erection drawings on the basis of design drawings supplied to him and submit the same in triplicate to the Engineer-in-charge for review, Engineer-in-charge shall review and comment, if any, on the same. Such review, if any, by the Engineer-in-charge, does not relieve the contractor of any of his required guarantees and responsibilities. The contractor shall however be responsible to fabricate the structural strictly conforming to specifications and reviewed drawings.

(ii) Fabrication drawings shall include but not limited to the following:

- Member sizes and details
- Types and dimensions of welds and bolts
- Shapes and sizes of edge preparation for welding
- Details of shop and field joints included in assemblies.

(iii) Bill of material

Quality of structural steels, welding electrodes, bolts, nuts and washers etc. to be used.

Erection assemblies, identifying all transportable parts and sub-assemblies, associated with special erection instructions, if required.

Calculations were asked for approval.

(iv) Connections, splices etc. other details not specifically detailed in design drawings shall be suitably given on fabrication drawings considering normal detailing practices and developing full member strengths. Where asked for calculations for the merit shall also be submitted for approval.

(v) Any alternate design or change in section is allowed when approved in writing by the Engineer-in-charge.

However, if any variation in the scheme is found necessary later, the contractor will be supplied with revised drawings. The contractor shall incorporate these changes in his drawings at no extra cost and resubmit for review.

(vii) Engineer-in-charge review shall not absolve the contractor of his responsibility for the correctness of dimensions, adequacy of details and connections. One copy will be returned reviewed with or without comments to the contractor for necessary action. In the former case further three copies of amended drawings shall be submitted by the contractor for final review.

(viii) The contractor shall supply three prints each of the final reviewed drawings to the Engineer-in-charge within a week since final review, at no extra cost for reference and records.

(ix) The Engineer-in-charge will verify the correct interpretation of their requirements.

(x) If any modification is made in the design drawing during the course of execution of the job, revised design drawings will be issued to the contractor. Further changes arising out of these shall be incorporated by the contractor in the fabrication drawings already prepared at no extra cost and the revised fabrication drawings shall be duly got reviewed as per the above Clauses.

3.7 Materials

All structural steel shall be procured from primary producers.

(i) Rolled Sections

The following grades of steel shall be used for steel structures:

Structural steel will generally be of standard quality conforming to IS: 226/IS:2062. Whenever welded construction is specified plates of more than 20 mm thickness will generally conform to IS: 2062.

(ii) Welding Materials
Welding electrodes shall conform to IS: 814.
Approval of welding procedures shall be as per IS: 823.

(iii) Bolts, Nuts & Washers
Bolts and nuts shall be as per IS: 1367 and tested as per IS:1608. It shall have a minimum tensile strength of 44 Kg/mm2 and minimum elongation of 23% on a gauge length of 5.65 (A- Original cross sectional area of the gauge length). Washers shall be as per IS: 2016.

(iv) All materials shall conform to their respective specifications. The use of equivalent or higher grade or alternate materials will be considered only in very special cases subject to the approval of the Engineer-in-charge in writing.

(v) Receipt & Storing of Materials

Steel materials supplied by the contractor must be marked for identification and each lot should be accompanied by manufacturer's quality certificate, conforming chemical analysis and mechanical characteristics.

All steel parts furnished by supplier shall be checked, sorted out, straightened, and arranged by grades and qualities in stores.

Structural with surface defects such as pitting, cracks, laminations etc. shall be rejected if the defects exceed the allowable tolerances specified in relevant standards or as directed by the chief Engineer-in-charge.

Welding wire and electrodes shall be stored separately by qualities and lots inside a dry and enclosed room, in compliance with IS: 816 - 1969 and as per instructions given by the Engineer-in-charge. Electrodes shall be perfectly dry and drawn from an electrode even, if required.

(vi) Checking of quality bolts of any kind as well as storage of same shall be made conforming to relevant standards.

Each lot of electrodes, bolts, nuts, etc. shall be accompanied by manufacturer's test certificate.

The contractor may use alternative materials as compared to design specification only with the written approval of the chief Engineer-in-charge.

(vii) Material Tests

The contractor shall be required to produce manufacturer's quality certificates for the materials supplied by the contractor. Notwithstanding the manufacturer's certificates, the Engineer-in-charge may ask for testing of materials in approved test houses. The test results shall satisfy the requirements of the relevant Indian Standards.

Whenever quality certificates are missing or incomplete or when material quality differs from standard specifications the contractor shall conduct all appropriate tests as directed by the Engineer-in-charge at no extra cost.

Materials for which test certificates are not available or for which test results do not tally with relevant standard specifications, shall not be used.

3.8 Fabrication

The Contractor will submit the credential with full particulars about work completed by fabricator to be deployed for this work for approval of Engineer-in-charge. After written approval is communicated in respect of fabricator, then only the jobs should be a signed to him. Fabrication shall be in accordance with IS: 800 Section V in addition to the following:

Fabrication shall be done as per approved fabrication drawings adhering strictly to work points and work lines on the same. The connections shall be welded or bolted as per design drawings. Work shall also include fabricating built up sections.

Any defective material used shall be replaced by the contractor at his own expense, care being taken to prevent any damage to the structure during removal.

All the fabricated and delivered items shall be suitably packed to be protected from any damage during transportation and handling. Any damage caused at any time shall be made good by the Contractor at his own cost.

Any faulty fabrication pointed out at any stage of work shall be made good by the contractor at his own cost.

(i) Preparation of Materials

Prior to release for fabrication, all rolled sections warped beyond allowable limit shall be pressed or rolled straight and freed from twists, taking care that an uniform pressure is applied.

Minor warping, corrugations etc. in rolled sections shall be rectified by cold working.

The sections shall be straightened by hot working where the Engineer-in-charge so direct and shall cooled slowly after straightening.

Warped members like plates and flats may be used as such only if wave like deformation does not exceed L/1000 but limited to 10 mm (L-Length).

Surface of members that are to be joined by lap or fillet welding or bolting shall be even so that there is no gap between overlapping surfaces.

(ii) Marking

Marking of members shall be made on horizontal pads, of an appropriate racks or supports in order to ensure horizontal and straight placement of such members. Marking accuracy shall be at least + 1 mm.

(iii) Cutting

Members shall be cut mechanically (by saw or shear or by oxyacetylene flame).

All sharp, rough, or broken edges, and all edges of joints which are subjected to tensile or oscillating stresses, shall be ground.

No electric metal arc cutting shall be allowed.

All edges cut by oxyacetylene process shall be cleaned of impurities prior to assembly.

Cutting tolerances shall be as follows:

a) For members connected at both ends + 1 mm.
b) Elsewhere + 3 mm.

The edge preparation for welding of members more than 12 mm thick shall be done by flame cutting and grinding. Cut faces shall not have cracks or be rough.

Edge preparation shall be as per IS: 823 - 1964.

(iv) Drilling

Bolts holes shall be drilled.

Drilling shall be made to the diameter specified in drawings.

No enlarging of holes filling, by man rolling or oxyacetylene flame shall be allowed.

Allowed variations for holes (out-of-roundness, eccentricity, plumb-line deviation) shall be as per IS:800.

- Maximum deviation for spacing of two holes on the same axis shall be +1 mm.
- Two perpendicular diameters of any oval hole shall not differ by more than 1 mm.

(v) Drilling faults in holes may be rectified by reaming the holes to the next upper diameter, provided that spacing of new hole centers and distance of hole centers to the edges of members are not less than allowed and that the increase of hole diameter does not impair the structural strength. Hole reaming shall be allowed if the number of faulty holes does not exceed 15% of the total number of holes for one joint.

Welding:

Preparation of Members for Welding

All welding in mild steel work shall be done with electrodes and / or by methods recommended by the suppliers of the metals being welded in accordance with corresponding Indian Standards. Type, size and spacing of welds, shall be as specified. All welding consumables shall be in accordance with the I.S. standards.

Welds behind finished mild steel surfaces shall be so done as to eliminate distortion and / or discoloration on the finished side.

Weld spatter and welding oxides on finished surfaces shall be removed by descaling and / or grinding. Plug, puddle or spot welding shall not be permitted. If weld beads are visible on exposed finished surfaces, the surfaces shall be ground and polished to match and blend with finish on adjacent parent metal.

Structural welds shall be made by certified welders and shall conform to I.S. code. The welds shall be tested by the Contractor to ensure quality and integrity of the structural welds. However, welding tests shall be carried out as below: and the contractor shall maintain records for Visual testing – 100 % of the welds for size and quality. Fillet weld testing- 30 % of the welds for MPI or Dye penetration test

Dirt grease, lubricant, or other organic material shall be removed by vapor de-greasing or suitable solvent.

Joints rejected because of welding defects may be repaired only by re welding. Defective welds shall be removed by chipping or machining. Flame cutting shall not be allowed.

Assembly of structural members shall be made with proper jigs and fixtures to ensure correct positioning of members (angles, axes nodes etc.)
Sharp edges, rust of cut edges, notches, irregularities and fissures due to faulty cutting shall be chipped or ground or filled over the length of the affected area, deep enough to remove faults completely.
Edge preparation for welding shall be carefully and accurately made so as to facilitate a good joint.
Generally, no special edge preparation shall be required for members under 8 mm thick.
Edge preparation (bevelling) denotes cutting of the same so as to result in V, X K or U seam shapes as per IS: 823.
The members to be assembled shall be clean and dry on the welding edges. Under no circumstances shall wet, greasy, rust or dirt covered parts be assembled. Joints shall be kept free from any foreign matter likely to get in to the gaps between members to be welded.
Before assembly the edges to be welded as well as adjacent areas extending for at least 20 mm shall be cleaned (until metallic polish is achieved).

When assembling members, proper care shall be taken of welding shrinkage and distortions, as the drawing dimensions' cover finished dimensions of the structure.

The elements shall be got checked and approved by the Engineer-in-charge or their authorized representative before assembly.

The permissible tolerances for assembly of members preparatory to welding shall be as per IS: 823-1964.

After the assemble has been checked, temporary tack welding in position shall be done by electric welding, keeping in view finished dimensions of the structure.

(vii) Welding procedures

Welding shall be carried out only by fully trained and experienced welders as tested and approved by the Engineer-in-charge. Any test carried out either by the Engineer-in-charge or their representative or the inspectors shall constitute a right by them for such tests and the cost involved thereon shall be borne by the contractor himself.

Qualification tests for welders as well as tests for approval of electrodes will be carried out as per IS: 823. The nature of test for performance qualification of welders shall be commensurate with the quality of welding required on this job as judged by the Engineer-in-charge.
The steel structures shall be automatically, semi-automatically or manually welded as per direction of Engineer-in-charge.
Welding shall begin only after the checks mentioned in Clause herein have been carried out.
The welder shall mark with his identification mark on each element welded by him.
When welding is carried out in open air, steps shall be taken to protect the face of welding against wind or rain.
The electrodes, wire and parts being welded shall be dry.
Before beginning the welding operation, each joint shall be checked to ensure that the parts to be welded are clean and root gaps provided as per IS: 823.
For continuing the welding of seems discontinued due to some reason, the end of the discontinued seem shall be melted in order to obtain a good continuity. Before resuming the welding operation, the groove as well as the adjacent parts shall be well cleaned for a length of approx. 50 mm.
For single butt welds (in V, 1/2 V or U) and double butt welds (in K, double U etc.) the re-welding of the root is mandatory but only the metal deposit on the root has been cleaned by back gouging or chipping.
The welding seams shall be left to cool slowly. The contractor shall not be allowed to cool the welds quickly by any other method.

For multi-layer welding, before welding the following layer, the formerly welded layer shall be cleaned metal bright by light chipping and wire brushing. Backing strips shall not be allowed.

The order and method of welding shall be so that -

- No unacceptable deformation appears in the welded parts.
- Due margin is provided to compensate for contraction due to welding in order to avoid any high permanent stresses.

The defects in welds must be rectified according to IS: 823 and as per instruction of Engineer-in-charge.

(viii) Weld Inspection

The weld seams shall satisfy the following:

- Shall correspond to design shapes and dimensions.
- Shall not have any defects such as cracks, incomplete penetration and fusion, under-cuts, rough surfaces, burns, blow holes and porosity etc. beyond permissible limits.

During the welding operation and approval of finished elements, inspections and tests shall be made as shown in Annexure-B. The mechanical characteristics of the welded joints shall be as in IS: 823.

(ix) Preparation of Members for Bolting

The members shall be assembled for bolting with proper jigs and fixtures to sustain the assemblies without deformation and bending. Before assembly, all sharp edges, shavings, rust dirt, etc. shall be removed. Before assembly, the contacting surfaces of the members shall be cleaned and given a coat of primer as per IS: 2074.The members which are bolt assembled shall be set according to drawings and temporarily fastened with erection bolts (minimum 4 pieces) to check the coaxially of the holes. The members shall be finally bolted after the deviations have been corrected, after which there shall not be gaps. Before assembly, the members shall be checked and got approved by the Engineer-in-charge. The difference in thickness of the sections that are butt assembled shall not be more than 3% or maximum 0.8 mm whichever is less. If the difference is larger, it shall be corrected by grinding or filling. Reaming of holes to final diameter or cleaning of these shall be done only after the parts have been check assembled. As each hole is finished to final dimensions (reamed if necessary) it shall be set and bolted up. Erection bolts shall not be removed before other bolts are set.

(x) Bolting up

Final bolting of the members shall be done after the defects have been rectified and approval of joints obtained. The bolts shall be tightened starting from the centre of joint towards the edge.

(xi) Planning of Ends

Planning of ends of members like column ends shall be done by grinding when so specified in the design. Planning of butt welded members shall be done after these have been assembled, the spare edges shall be removed with grinding machines or files. The following tolerances shall be permitted on member that have been planned.

- On the length of the member having both ends planed, maximum + 2 mm with respect to design.
- Level differences of planed surfaces, maximum 0.3 mm.
- Deviation between planed surface and member's axis maximum 1/1500.

(xii) Holes for Field Joints

Holes for field joints shall be drilled in the shop to final diameters and tested in t he shop, with trial assemblies. When three-dimensional assembly is not possible in the shop, the holes for field joints may be drilled in shop and reamed on site after erection, on approval by the Engineer-in-charge. For bolted steel structures, trial assembly in shop is mandatory. The tolerance for spacing of holes shall be + 1 mm.

(xiii) Tolerances

All tolerances regarding dimensions, geometrical shapes and sections of steel structures, shall be as per Annexure B, if not specified in the drawing.

(xiv) Marking for Identification

All elements and members prior to dispatch for erection shall be shop marked. The members shall be visibly marked with a weather proof light coloured paint. The size and thickness of the numbers shall be chosen as to facilitate the identification of members. For the small members that are delivered in bundles or crates, the required marking shall be done on small metal tags securely tied to the bundle, while the crates shall be marked directly. Each bundle or crate shall be packed with members for one and the same assembly; in the same bundle or crate, general utility members such as bolts, quests etc. may be packed. All bill of materials showing weight, quality and dimension of contents shall be placed in the crates.

The members shall be marked with a durable paint, in a visible location, preferably at one end of the member so that these may be easily checked during storage and erection. All members shall be marked in the shop before inspection and acceptance. When the member is being painted, the marking area shall not be painted but

bordered with white paint. The marking and job symbol shall be registered in all shop delivery documents (transportation, for erection etc.)

(xv) Shop Test Pre-assembly

For steel structures that have the same type of welding the shop test pre-assembly shall be performed on one out of every 10 member's minimum. For bolted steel structures, shop test pre-assembly is mandatory for all elements as well as for the entire structure in conformity with previous Clause.

3.9 Shop Inspection and Approval

(i) General

The Engineer-in-charge or their representative shall have free access at all responsible times to the contractor's fabrication shop and shall be afforded all reasonable facilities for satisfying himself that the fabrication is being undertaken in accordance with drawings and specifications. Technical approval of the steel structure in the shop by the Engineer-in-charge is mandatory. The contractor shall not limit the number and kinds of tests, final as well as intermediate once, or extra tests required by the Engineer-in-charge. The contractor shall furnish necessary tools, gauges, instruments etc. and technical non-technical personnel for shop tests by the Engineer-in-charge, free of cost.

(ii) Shop Acceptance

The Engineer-in-charge shall inspect and approve at the following stages:

The following approvals may give in shop:

- Intermediate approvals of work that cannot be inspected later.
- Partial approvals
- Final approvals

Intermediate approval of work shall be given when a part of the work is preformed later:

- Cannot be inspected later
- Inspection would be difficult to perform and results would not be satisfactory.

Partial approval in the shop is given on members and assemblies of steel structures before the primer coat is applied and includes:

- Approval of materials
- Approval of field joints
- Approval of parts with planed surfaces
- Test erection
- Approval of members
- Approval of markings
- Inspections and approvals of special features, like Rollers, loading platform mechanism etc.

During the partial approval, intermediate approvals as well as all former approvals, shall be taken in to consideration.

(iii) Final approval in the Shop

The final approval refers to all elements and assemblies of the steel structures, with shop primer coat, ready for delivery from shop to be loaded for transportation, or stored.

The final approval comprises of:

- Partial approvals
- Approval of shop primer coat
- Approval of mode of loading and transport - Approval of storage (for materials stored)

3.10 Painting and Delivery

(i) Preparation of parts for shop painting: Painting shall consist of providing at least one coat of red oxide zinc chromate primer to steel members before despatch from shop. Primer coat shall not be applied unless:

- Surface have been wire brushed, cleaned of dust, oil, rust or sand blasted as per the requirement and direction of Engineer-in-charge etc.
- Erection gaps between members, spots that cannot be painted or where moisture or other aggressive agents may penetrate, have been filled with an approved type of oil and putty.
- The surface to be painted are completely dry.
- The parts where water of aggressive agents may collect (during transportation, storage, erection and operation) are filled with putty and provided with holes for drainage of water.
- Members and parts have been inspected and accepted
- Welds have been accepted.

The following are not to be painted or protected by any other product:

- Surface which are in the vicinity of joints to be welded at site.
- Surfaces bearing markings
- Other surfaces indicated in the design.

The following shall be given a coat of hot oil or any approved resistant lubricant only.

- Planed surfaces
- Holes for links

The surfaces that are to be embedded or in contact with the concrete shall be given a coat of cement wash. The surfaces which are in contact with the ground, gravel or brick work and subject to moisture, shall be given bituminous coat. The other surfaces shall be given a primer coating.

Special attention shall be given to locations not easily accessible, where water can collect and which after assembly and erection cannot be inspected, painted and maintained. Holes shall be provided for water drainage and in accessible box type sections shall be hermetically sealed by welds.

If specified elsewhere, in the schedule of quantities, the contractor shall paint further coats of red-oxide after erection and placing in position of the steel structures.

(ii) Packing, transportation, delivery

After final shop acceptance and marking, the item shall be packed and loaded for transportation. Packing must be adequate to protect item against warping during loading and unloading. Proper lifting devices shall be used for loading, in order to protect items against warping. Slender projecting parts shall be braced with additional steel bars, before loading, for protection against warping during transportation. Loading and transportation shall be done in compliance with transportation rules. If certain parts cannot be transported in the lengths stipulated in the design, the position and type of additional splice joints shall be approved by the Engineer-in-charge. Items must be carefully loaded on platforms of transportation means to prevent warping, bending or falling during transportation. The small parts such as fish-plates, quests etc. shall be securely tied with wire to their respective parts. Bolts, nuts and washers shall be packed and transported in crates. The parts shall be delivered in the order stipulated by the Engineer-in-charge and shall be accompanied by document showing:

- Quality and quantity of structure or members
- Position of member in the structure
- Particulars of structure
- Identification number job symbol.

3.11 Field Erection

The erection work shall be permitted only after the foundation or other structure over which the steel work will be erected is approved and is ready for erection.
The contractor shall satisfy himself about the levels, alignment etc. for the foundations well in advance, before starting the erection. Minor chipping etc. shall be carried out by the contractor on his expense.
Any faulty erection done by the contractor shall be made good at his own cost.
Approval by the Engineer-in-charge or their representatives at any stage of work does not relieve the contractor of any of his required guarantees of the contract.
Storage and preparation of parts prior to erection

The storage place for steel parts shall be prepared in advance and got approved by the Engineer-in-charge before the steel structures start arriving from the hop. A platform shall be provided by the Contractor near the erection site for preliminary erection work. The contractor shall make the following verifications upon receipt of material at site.

- For quality certificates regarding materials and workmanship according to these general specifications and drawings.
- Whether parts received are complete without defects due to transportation, loading and unloading and defects, if any, are well within the admissible limit.

For the above work sufficient space must be allotted in the storage area which will be arranged by the contractor without any extra cost to the department. Steps shall be taken to prevent warping of items during unloading. The parts shall be unloaded, stored and stored so as to be easily identified. The parts shall be stored according to construction symbol and markings so that these may be taken out in order or erection. The parts shall be at least 150 mm clear from ground on wooden or steel blocks for protection against direct contact with ground and to permit drainage of water. If rectification of members like straightening etc. are required, these shall be done in a special place allotted which shall be adequately equipped. The parts shall be clean when delivered for erection.

(vi) Erection & Tolerances

Erection in general shall be carried out as required and approved by the Engineer-in-charge. Positioning and levelling of the structure, alignment and plumbing of the stanchion and fixing every member of the structure shall be in accordance with the relevant drawings and to the complete satisfaction of the Engineer-in-charge.

The following checks and inspection shall be carried out before during and after erection.

- damage during transportation
- accuracy of alignment of structures
- erection according to drawings and specifications
- progress and workmanship.

In case there be any deviations regarding positions of foundations or anchor bolts, which would lead to erection deviations, the Engineer-in-charge shall be informed immediately. Minor rectifications in foundations, orientation of bolts holes etc. shall be carried out as part of the work, at no extra cost. The various parts of the steel structure shall be so erected so to ensure stability against inherent weight, wind and erection stresses. The structure shall be anchored and final erection joints completed after plan and elevation positions of the structural members have been verified with corresponding drawings and approved by the Engineer-in-charge. The bolted joints shall be tightened so that the entire surface of the bolt heads and nuts shall rest on the member. For parts with sloping surfaces tapered washers shall be used.

3.12 Final acceptance and handing over the structure

(i) At acceptance, the contractor shall submit the following documents:

- Shop and erection drawings – four sets soft copy and hard copies
  4 copies of each of the following:
- Shop acceptance documents quality certificate for structural, plates, etc. (electrodes, welding wire, bolts, nuts, washers etc.)

- List of certified welders who worked on erection of structures.
- Acceptance and intermediate control procedure of erection operations.

(ii) Approval by the Engineer-in-charge at any stage of work does not relieve the contractor of any of his required guarantees of the contract.

3.13 Method of Payments

Payment for steel work shall be made on basis of admissible weight of the structure accepted, the weight being determined as described below:

The rate for supply, fabrication and erection, shall include cost of all handling and transportation to Owner's store/site of work where supply and fabrication only are involved, trimming, straightening, edge preparation, preparation and getting reviewed of fabrication drawings, and providing one or more coat of Red-oxide zinc chromate primer as specified in the schedule of quantity.

In the case, Owner supplies materials the rate shall include cost of steel materials taking delivery of the materials, from owner's store all handling and rehandling, loading and unloading, transport to site or work, returning of surplus materials to owner's stores etc. complete as well as the cost of all handling and transport, scaffolding, temporary supports, tools and tackles, touching up primer coat, grouting etc.

The actual lengths installed shall be measured and the weight of structural material/plate shall be calculated wherever necessary on the basis of IS handbook. If sections are different from IS section, then manufacturers handbook shall be adopted. No allowance in weights shall be made for rolling tolerance.

Sections built out of plates, structural shall be paid on the actual weight incorporated except for gussets which will be paid on the weight of the smallest rectangle enclosing the shape. No deductions shall be made for skew cuts in rolled steel sections.

Welds, bolts, nuts, washers, etc. shall not be measured. Rate for structural steel work shall be deemed to include the same.

No other payment either for temporary works connected with this contract or for any other item such as welds, shims, pacing plates etc. shall be made. Such item shall be deemed to have been allowed for in the rate quoted for steel work.

3.14 Grouting of Pockets

(i) Grouting of pockets and under base plates will be done only after the steel work has been levelled and plumbed and the bases of stanchions are supported by steel shims. The space below the base plate and pockets shall be thoroughly cleaned.

(ii) The mortar used for grouting shall not be leaner than 1:2 (1 cement: 2 sand) (grade 300 in case of concrete) or as is specified and shall be mixed to the minimum consistency required. It shall be poured under suitable head and tamped until the space has been completely filled.

3.15 Tolerances allowed in the erection of building without cranes

The maximum tolerances for line and level of the steel work shall be + 3.00 mm on any part of the structure. The structure shall not be out of plumb more than 3.5 mm on each 10 M. section of height and not more than 7.0 mm per 30 M. section. These tolerances shall apply to all parts of the structure unless the drawings issued for erection purposes state otherwise.

3.16. Contractor to submit shop drawing for all structural steel work for approval. The work at site should commence only after getting the shop approved.

3.17. Contractor to get erection scheme approved before commencement of erection of trusses.

B. REINFORCEMENT BARS:

3.1 The contractor shall procure TMT bars of Fe500D grade from primary producers such as SAIL, Tata Steel Ltd., RINL, JSPL & JSW. The TMT bars procured from primary producers shall confirm to manufacture’s specifications/ BIS specifications.

3.2 The specifications of TMT bars procured from primary producers shall meet the provisions of IS 1786 : 2008 pertaining Fe 500D grade of steel as specified in the tender.
3.3 The contractor shall have to obtain and furnish factory test certificates to the Engineer - in-charge in respect of all supplies of steel brought by him to the site of work.
3.4 Samples shall also be taken and got tested by the Engineer -in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications as defined, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so. Else the department shall remove it and recover double the cost of removal from the contractor.
3.5 The steel reinforcement bars shall be brought to the site in bulk supply of 20 tonnes or more, or as decided by the Engineer -in-charge.
3.6 The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
3.7 Coating of aqueous exhibitor.
3.8 For physical and chemical test, specimens of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified below:

Size of Bar	or Consignment below 100 tonnes	For consignments above 100 tonnes
Under 10 mm dia bars	One sample (Three specimen) for each 25 tonnes or part thereof	One sample for each 40 tonnes or part thereof
10 mm to 16 mm dia bars	One sample (Three specimen) for each 35 tonnes or part thereof	One sample for each 45 tonnes or part thereof
Over 16 mm dia bars	One sample (Three specimen) for each 45 tonnes or part thereof	One sample for each 50 tonnes or part thereof

3.8 The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. The cost of tests shall be borne by the contractor:

3.9 The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption, no adjustment shall to be made.

3.10 The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

3.11 For the purpose of payment, the actual weight of steel reinforcement / structural steel sections/ plates / bolts and nuts shall be measured as below:

(i) Unit weight for reinforcement bars: The actual weight per meter of the reinforcement of various diameters shall be measured for three random samples collected (for each diameter of steel reinforcement) from each lot of particular diameter of steel reinforcement brought to the site for use in the work. For this, each sample (one sample consisting of three specimens) for each diameter of steel reinforcement shall be cut to require lengths and weighed and average weight calculated and recorded. The average weight for each type of steel section and steel reinforcement of each diameter shall be taken as the actual weight per metre for that steel section and that diameter of steel reinforcement.
(ii) In case actual unit weight is less than standard unit weights mentioned in CPWD Specifications 2009 Volume 1, but within variation, in such cases payment shall be made on the basis of actual unit weight. However, if actual unit weight is more than standard unit weights mentioned in CPWD Specifications 2009

Volume 1, then payment shall be made on the basis of standard unit weight in such cases. In such case nothing extra shall be paid for difference in actual weight and standard weight.

3.12 Contractor to submit Bar Bending Schedule (BBS) for reinforcement steel work for approval. The RCC work should commence only after getting the BBS approved and signing of pour card by Engineer-in-charge.

3.13 The work shall be carried out as per the CPWD specifications.

4.0 ADDITIONAL CONDITIONS AND PARTICULAR SPECIFICATION FOR CEMENT

4.1 The contractor shall procure 43 grade (conforming to IS:8112) ordinary Portland cement as required in the work, from reputed manufacturers of grey cement having a production capacity of one million tonnes or more per annum holding licence to use ISI certification mark for their product. Supply of cement shall be taken in 50 Kg. bags bearing manufacturer's name and ISI marking.

4.2 Every delivery of cement shall be accompanied by producer's certificate confirming that the supplied cement conforms to relevant specifications. These certificates should be endorsed to Engineer-in-charge for his record.

4.3 For each grade, cement bags shall be stored in two separate godowns, one for tested cement and the other for fresh cement (under testing) constructed by the contractor at his own cost as per sketch given in General Conditions of Contract for CPWD 2010 with weather proof roofs and walls. The actual size of godown shall be as per site requirements and as per the direction of the Engineer in charge and nothing extra shall be paid for the same. The decision of the Engineer-in-charge regarding the capacity required/needed will be final. However, the capacity of each godown shall not be less than 100 tonnes or as decided by Engineer-In-Charge.

4.4 Each godown shall be provided with a single door with two locks. The keys of one lock shall remain with CPWD Engineer-in-charge or his authorized person and that of other lock with the authorized agent of the contractor at the site of work so that the cement is issued from godown according to the daily requirement with the knowledge of both the parties. The account of daily receipt and issue of cement shall be maintained in a register in the prescribed Performa and signed daily by the contractor or his authorized agent in token of its correctness. The contractor shall be responsible for the watch & ward and the safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-charge any time.

4.5 The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS codes. The cement shall be used on the work only after satisfactory test results have been received. In case the test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected, and it shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer- in-charge to do so.

4.6 The cost of tests shall be borne by the contractor.

4.7 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions therein. No payment for excess consumption of cement will be allowed. However, for consumption lesser than permissible theoretical variation, a recovery shall be made in accordance with conditions of contract of schedule A to F without prejudice to action for acceptance of work/item of reduced rate or rejection, as the case may be.

4.8. For non-schedule items, the decision of the Engineer-in-charge or successor thereof regarding theoretical quantity of cement which should have been actually used shall be final and binding on the contractor.

4.9 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

4.10. Damaged /settled/expired cement shall be removed from site immediately by the contractor on receipt of notice in writing from the Engineer-in-charge. If he does not do so within three days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.

5.0 ADDITIONAL conditions and particular specification for R.C.C. WORK (DESIGN MIX CONCRETE)

GENERAL: -

5.1 The RCC work shall be done with RMC Of Design Mix Concrete, unless otherwise specified in the nomenclature of items, wherever letter M has been indicated, the same shall imply for the Design Mix Concrete. The Ready Mix Concrete shall be as per IS : 4926 and as per CPWD Specification and guide lines. For the nominal mix in RCC, CPWD specification shall be followed. The Design Mix Concrete will be designed based on the principles given in IS : 456, 10262 and SP 23. The contractor shall carry out design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. The cement shall be actually weighed as presumption of each bag having 50 kg shall not be allowed. In case of use of admixture, the mix shall be designed with these ingredients as well. The specification mentioned herein below shall be followed for Design Mix Concrete.

INGREDIENTS

i) Coarse Aggregate: - As per CPWD Specifications

ii) Fine Aggregate: - As per CPWD Specifications.

iii) Water: - As per requirements laid down in IS 456-2000 and CPWD specifications.

iv) Cement: Cement arranged by the contractor will be OPC (in bags) conforming to IS : 8112.

5.2 Admixture:- Admixtures shall not be used without approval of Engineer-in-Charge. Wherever required, admixtures of approved quality shall be mixed with concrete to achieve the desired workability within specified water cement ratio. The admixture shall conform to IS:9103. The chloride content in the admixture shall satisfy the requirement of BS : 5075. The total amount of chlorides in the admixture mixed concrete shall also satisfy the requirements of IS : 456-2000

5.3 The contractor shall not be paid anything extra for admixture required for achieving desired workability without any change in specified water cement ratio for RCC / CC work.

5.4 Grade of concrete:- The characteristic compressive strength of various grades of concrete shall be given as below :-

Sl. No	Grade Designation	Compressive strength on 15cm cubes min 7 days (N/mm2)	Specified characteristic compressive strength at 28 days (N/mm2)	Minimum cement content * (Kg per cum)	Maximum water cement ratio
(i)	M-15	As per Design	15	240	0.5
(ii)	M-25	As per Design	25	330	0.4
(iii)	M-30	As per Design	30	340	0.4

5.5 The Concrete mix will be designed for minimum workability as specified in para 7 of IS–456-2000

5.6 WORKABILITY OF CONCRETE (UNLESS OTHERWISE SPECIFIED ELSEWHERE OR AS DECIDED BY ENGINEER IN CHARGE.

Placing Conditions	Degree of Workability	Slump (mm)
(1)	(2)	(3)
Lightly reinforced sections in slabs, beams, walls, columns	Low	25-75
Heavily reinforced section in slabs, beams, walls, columns.	Medium	50-100
Pumped concrete	Medium	75-100

5.7 The recommended values of slump for various members to confirm IS 456

5.8 In the designation of concrete mix letter M refers to the mix and the number to the specified characteristic compressive strength of 15 cm – Cube at 28 days expressed in N/mm2. It is specifically highlighted that in addition to above requirement the maximum cement concrete for any grade shall not exceed 430 kg/cum.

5.9 The concrete design mix with or without admixture will be carried out by the contractor through IIT Delhi or NCBM Ballabhgarh and as per direction of Engineer-In-Charge.

5.10 The various ingredients for mix design/laboratory tests shall be sent to the lab / test houses through the Engineer-In-Charge of the project and got it tested in approved laboratories as may be decided by the Engineer-in-chargeEngineer-in-chargeEngineer-in-chargeimmediately after award of work and the samples of such aggregate sent shall be preserved at site by the department. The admixture if used by contractor shall be at his own cost without any extra payment.

5.11 * Note : The Cement content means OPC Cement.

5.12 The contractor shall submit the mix design report from any of above approved laboratories like IIT Delhi, NCCBM Ballabhgarh PEC Chandigarh, Shree Ram Testing Lab Delhi for approval of Engineer in charge within 30 days from the date of issue of letter of acceptance of the bid. No concreting shall be done until the mix design is approved.

5.13 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted in approved by Engineer-In-Charge shall be submitted by the contractor as per the direction of the Engineer in charge.

APPROVAL OF DESIGN MIX

(i) The mix design for a specified grade of concrete shall be done for a target mean compressive strength Fck = Fck + 1.65s

Where Fck = Characteristic Compressive Strength at 28 days
s = Standard deviation which depends on degree of quality control.

(ii) The degree of quality control for this work is “good” for which the standard deviation (s) obtained for different grades of concrete shall be as per IS relevant IS Standards/ Codes.
(iii) Out of the six specimen of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days.

5.15 CHARGES FOR DESIGN MIX

(i) All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.

5.16 DESIGN MIX CONCRETE FROM FULLY AUTOMATIC COMPUTERISED CONCRETE BATCHING AND MIXING PLANT

(i) Proportioning Concrete

In proportioning cement concrete, the quantity of both cement and aggregates shall be determined by weight. The cement shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean and serviceable condition. The amount of mixing water shall be adjusted to compensate for moisture content in both coarse and fine aggregates. The moisture content of aggregates shall be determined in accordance with IS: 2386 (Part III). Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weight of aggregates due to variation in moisture content.

(ii) Production of Concrete

The concrete shall be RMC produced in a central batching and mixing plant with, computerized printing for contents and admixture dosage. The batching plant shall be fully automatic. Automatic batcher shall be charged by devices which, when actuated by a Single starter switch will automatically start the weighing operation of each material and stop automatically, when the designated weight of each material has been reached. The batching plant shall have automatic arrangement for dispensing the admixture and shall also be capable of discharging water in more than one stage. A print out from the batching plant for every lot shall be submitted. A batching plant essentially shall consist of the following components: Separate storage bins for different sizes of aggregates, silo for cement; and water storage tank.

Batching equipment
Mixers
Control panels
Mechanical material feeding and elevating arrangements
The Contractor shall arrange for inspection of automatic batching plant within seven days of issue of letter of award to facilitate inspection and approval of same by Engineer-In-Charge. Nothing extra will be paid for this.

(iii) The compartments of storage bins for aggregates shall be approximately of equal size. The cement compartment shall be centrally located in the batching plant. It shall be watertight and provided with necessary air vent, aeration fittings for proper flow of cement & emergency cement cut off gate. The aggregate and sand shall be charged by power operated centrally revolving chute. The entire plant from mixer floor upward shall be enclosed and insulated. The batch bins shall be constructed so as to by self-cleansing during drawdown. The batch bins shall in general conform to the requirements of IS :4925.

(iv) The batching equipment shall be capable of determining and controlling the prescribed amounts of various constituent materials for concrete accurately i.e. water, cement, sand, individual size of coarse aggregates etc. The accuracy of the measuring devices shall fall within the following limits.

Measurement of Cement	±2% of the quantity of cement in each
Measurement of Water	±3% of the quantity of water in each batch
Measurement of Aggregate	±3% of the quantity of aggregate in each
Measurement of Admixture	±3% of the quantity of admixture in each

5.17 Mixing Concrete

The mixer in the batching plant shall be so arranged that mixing action in the mixers can be observed from the operator's station. The mixer shall be equipped with a mechanically or electrically operated timing, signalling and metering device which will indicate and assure completion of the required mixing period. The mixer shall have all other components as specified in IS : 4925.

5.18 Transportation, Placing and Compaction of Concrete

(i) Mixed concrete from the batching plant shall be transported to the point of placement by transit mixers or through concrete pumps or steel closed bottom buckets capable of carrying 6 cum concrete. In case the concrete is proposed to be transported by transit mixer, the mixer speed shall not be less than 4 rev/ min. of the drum nor

greater than a speed resulting in a peripheral velocity of the drum as 70 m / minute at its largest diameter. The agitating speed of the agitator shall be not less than 2 rev / min. nor more than 6 rev / min. of the drum. The number of revolutions of the mixing drum or blades at mixing speed shall be between 70 to 100 revolutions for a uniform mix, after all ingredients, have been charged into the drum. Unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of 2 to 6 rev / min. and the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirements shall conform to IS : 5892.

(ii) In case concrete is to be transported by pumping, the conduit shall be primed by pumping a batch of mortar / thick cement slurry through the line to lubricate it. Once the pumping is started, it shall not be interrupted (if at all possible) as concrete standing idle in the line is liable to cause a plug. The operator shall ensure that some concrete is always there in the pump-receiving hopper during operation. The lines shall always be maintained clean and shall be free of dents.

(iii) Materials for pumped concrete shall be batched consistently and uniformly. Maximum size of aggregate shall not exceed one-third of the internal diameter of the pipe. Grading of aggregate shall be continuous and shall have sufficient ultra fine materials (materials finer than 0.25mm). Proportion of fine aggregates passing through 0.25mm shall be between15 & 30% and that passing through 0.125 mm sieve shall not be less than 5% of the total volume of aggregate. When pumping long distances and through hot weather, set- retarding admixtures may be used. Admixtures to improve workability can be added. Suitability of concrete shall be through pumping shall be verified by trial mixes and by performing pumping tests.

5.19 PREPARATION OF MIXES AS PER APPROVED DESIGN MIX AND CONDUCTING CONFIRMATORY TEST AT FIELD LAB.

(i) The contractor shall make the cubes of trial mixes as per approved Mix design at site laboratory for all grades, in presence of Engineer in charge using sample of approved materials proposed to be used in the work prior to commencement of concreting and get them tested in his presence to his entire satisfaction for 7 days and 28 days. Test cubes shall be taken from trial mixes as follows.

For each mix, a set of six cubes shall be made from each of the three consecutive batches. Three cubes from each set of six shall be tested at age of 7 days and remaining three cubes at age of 28 days. The cubes shall be made, cured, transported and tested strictly in accordance with specifications. The average strength of nine cubes at age of 28 days shall exceed the specified target mean strength for which design mix has been approved, the evaluation of test results will be done as per IS: 456-2000.

5.20 WORK STRENGTH TEST

TEST SPECIMEN

Work strength test shall be conducted in accordance with IS: 516 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days. Additional samples shall be prepared, if required, as per direction of Engineer in charge for testing samples cured by accelerated method as described in IS: 9103.

TEST RESULTS OF SAMPLE

The test results of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than + - 15 percent of the average. If more, the test results of the sample are invalid. 90% of the total tests shall be done at the laboratory established at site by the contractor and remaining 10% in the laboratory of Government Engineering colleges, or in any other approved laboratory as directed by the Engineer-in-charge.

5.21 STANDARD FOR ACCEPTANCE

i) Standard of acceptance shall be same as specified in clause 16 of IS 456-2000.

ii) In order to keep the floor finish as per direction of Engineer-in-charge and as per Architectural drawings and to provide required thickness of the flooring as per specification, the level of top surface of RCC shall be

accordingly adjusted at the time of its centring, shuttering and casting for which nothing extra shall be paid to the contractor.

5.22 Ultrasonic Pulse Velocity Method of Test for RCC

i) The underlying principle of assessing the quality of concrete is that comparatively higher velocities are obtained when the quality of concrete in terms of density, homogeneity and uniformly is good. The consistency of the concrete as regards its general quality gets established. In case of poorer quality lower velocities are obtained. If there are cracks, voids or flaws inside the concrete which come in the way of transmission of pulse, lower velocities are obtained.

ii) The quality of concrete in terms of uniformity, incidence or absence of internal flaws, cracks and segregation etc. indicative of the level of workmanship employed, can thus be assessed using the guidance given in table below, which have been evolved for characterizing the quality concrete in structure in term of the ultrasonic pulse velocity.

Velocity criterion for Concrete Quality Grading.

Sl. No.	Pulse velocity by Cross Probing (km/sec)	Concrete Quality Grading
1	Above 4.5	Excellent
2	4.5 to 3.5	Good
3	3.5 to 3.0	Medium
4	Below 3.0	Doubtful

Note : In Case of “doubtful” quality it may be necessary to carry further tests.

iii) Pulse velocity method of test of concrete is to be conducted for CPWD works as a routine test. The acceptance criteria as per the above table will be applicable which is as per IS 13311 (part-1): 1992. From the above “Good” and “Excellent” grading are acceptable and below these grading the concrete will not be acceptable.

iv) 5% of the total number of RCC members in each category i.e. beam, column, slab and footing may be tested by UPV test method for establishing quality of concrete. It is suggested that test be conducted on RCC beam near joint with column, on RCC column near joint with beam, on RCC footings and rafts. On RCC rafts a suitable grid can be worked out for determining number of tests. In addition, doubtful areas such as honeycombed locations, locations, where continuous seepage is observed, construction joints and visible loose pockets will also be tested.

v) The test results are to be examined in view of the above acceptance criteria “Good” and “Excellent” and wherever concrete is found with less than required quality as per acceptance criteria, repairs to concrete will be made. Honeycombed areas and loose pockets will be repaired by grouting using Portland Cement Mortar/Polymer Modifies Cement Mortar /Epoxy Mortar, etc. after chipping loose concrete in appropriate manner. In areas where concrete is found below acceptance criteria and defects are not apparently visible on surface ,injecting approved grout in appropriate proportion using epoxy grout /acrylic Polymer modified cements slurry made with shrinkage compensating cement / plain cement slurry etc will be resorted to for repairs.(refer relevant chapters from CPWD Hand Book on Repairs and Rehabilitation of RCC Buildings).Repair to concrete will be done till satisfactory results are obtained as per the acceptance criteria by retesting of the repaired area. If satisfactory results are not obtained dismantling and relaying of concrete will be done.

5.23 MEASUREMENT

As per CPWD specifications.

5.24 TOLERANCES

As per CPWD specifications

5.25 RATE: -

i) The rate includes the cost of materials and labour involved in all the operations described above except for the cost of centering, shuttering and reinforcement, which will be paid separately.
ii) In case of actual average compressive, strength being less than specified strength which shall be governed by para 'Standard of Acceptance" as above the rate payable shall be worked out accordingly on prorate basis.
iii) In case of rejection of concrete on account of unacceptable compressive strength, governed by para 'Standard of Acceptance' as above, the work for which samples have failed shall be redone at the cost of contractors. However, the Engineer in charge may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test on structure or part of structure etc) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer in charge without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube test results and reduced rates shall be regulated in accordance with para 5.4.13 of Revised CPWD specification 2019, Vol.-I.
iv) As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 12 to 20mm or as required, lower than general floors shuttering should be adjusted accordingly. The landing level of mumti / Staircase cabin shall be Kept one riser level higher than adjoining slab level so as to accommodate water proofing treatment over terrace slab. In case of kitchen slab the portion of floor trap below kitchen platform be kept at lower level as per drawings. Nothing extra is payable on this account.
v) For the execution of centering and shuttering, the contractor shall use propriety "Reebole" chemical mould release agent of FOSROC or equivalent as shuttering oil as approved by Engineer-in-charge and nothing extra shall be paid on this account.

5.26 COVER/SPACER BLOCK

The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as called for in the drawings, spacer blocks of required shape and size. Chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement. Spacer blocks shall be cast well in advance with approved proprietary pre-packed free flowing mortars (Conbextra as manufactured by M/S Fosroc Chemicals India Ltd. or equivalent as approved by the Engineer-in-charge at his discretion)of high early strength and same colour as surrounding concrete, Pre-cast cement mortar/concrete blocks/blocks of polymer shall not be used as spacer blocks unless specially approved by the Engineer-in-charge, rate of RCC items is inclusive of cost of such cover blocks.

6.1 FALSE CEILING
(i) General
Work shall in general be carried out as per the CPWD specification. Modular and acoustical false ceiling shall be provided and installed in all areas. All ceilings in the office areas, pantry and all service areas shall be openable, where provided in drawing and nothing extra shall be payable for provision for access panels.

The false ceiling material shall be of Gyp board, metal, acoustic modular tiles or calcium silicate mineral fibre ceiling tiles. The technical assistance and guidance are to be taken from the respective approved manufacturers and work shall be done strictly according to the manufacturer's specifications and manuals. Material from original source shall only be used.

The false ceiling shall be got executed through authorized applicator of approved manufacturer only.

A sample of each finish shall be got approved before proceeding for bulk production. GI framing shall be erected as per recommendation of the manufacturer specification and approval of CPWD

No sagging, unlevelled stretch of work or chipped tiles shall be accepted. Contractor shall take full responsibility for its firmness with the structure.

The false ceiling comprises of Gypsum board, Acoustical Ceiling Tiles and Metallic Tiles. The Gypsum board false ceiling is to be in different shapes. Such as Vaults, Coffers, cove's and Plain in unison with Acoustical

Ceiling Tiles and Metallic Tiles Ceiling. The technical assistance and guidance is to be taken from manufacturers and work has to be done according to the manufacturer's specifications and manuals. A sample of each finish shall be got approved before proceeding for bulk production. GI

framing shall be erected as per recommendation of the manufacturer specification and approval of the Engineer-in-charge. The main contractor shall engage specialized agency and submit its credentials to Engineer-in-charge for approval. The criteria for setting the terms and conditions shall be broadly in line with CPWD criteria for similar works. The work shall be taken up only when specialized agency is approved in writing by Engineer-in-charge.

False ceiling work shall be carried out in accordance with the actual site conditions at different /split-levels. Any sagging, unlevelled stretch of work shall be redone /replaced and made good, at no extra charge, to the satisfaction of Engineer-in-charge. No compensation shall be paid on account of provision /coverage of openings for lighting fixtures, air-conditioning ducts and the likes as detailed in drawings and /or directed.

6.2 GLASS AND GLAZING WORK

GENERAL

A sensitive use of clear glass and glass with frosted 3M film shall be used in the interiors to admit natural light and give privacy to areas. All glass above 300mm x 300mm should be tempered/ toughened. Frameless glass used should be highly polished edges using CNC machines.

a) Glazing

The contractor shall furnish all labour, material and equipment required completing the installation of all glass and related items. A glass shall be of the type, quality, and substance specified in the schedule of quantities. The contractor shall cut glass sizes by field measurements or dimensions of the approved shop drawings. The responsibility for correct glass sizes shall rest with the contractor. No cracked, chipped or disfigured glass shall have accepted, and the contractor shall replace all breakages or faulty installation without extra cost.

The glass shall be set in wood or metal glazing straps and metal sash with elastic glazing and compound. The glass shall be beaded first and so installed as to achieve a completely watertight result. The opaque glass, where called for, shall be set with the smooth surface outside. At the completion of the work all glass shall be thoroughly cleaned off paint and other marks removed. No cracked, chipped or disfigured glass shall be accepted, and the contractor shall replace all breakage or faulty installation without extra cost to the owner before acceptance of fit-out.

All vision glasses shall be float glass of specified thickness. The edges shall be bevelled as indicated in drawings and shall be done at approved source.

The Etching wherever specified in drawings, shall be done at approved sources as per full-scale drawing approved by Engineer-in-charge / Project Manager. The etched panel shall be chemically washed /treated as per specialist specifications to have a permanent dust free surface.

The Contractor shall be responsible for protecting all mirrors and glasses fixed by him and shall replace at his own expense any broken or damaged mirror / glass caused through lack of adequate protection or care in installation or handling.

b) Tempered / Toughened Glass:

Tempered /Toughened glass shall be examined by the glass manufacturer to detect and discard any glass which exceeds the following tolerance: 1.5mm bow in 600mm: 3mm bow in 1500mm; 6mm bow in 3000mm; 9 mm bow in 4500mm. Where the strengthening process results in essentially parallel ripples or waves, the deviation from flatness at any peak shall not exceed 0.13 mm and the difference between adjacent peaks shall not exceed 0.13mm. Where bow tolerance and wave tolerance differ, the stricter requirements shall govern. Direction of ripples shall be consistent and in conformance with architectural design.

Following test shall be also carried out by the contractor at his own cost as per following provisions.

Thickness	Impact Strength	Fragmentation	Surface Compression	Bending Strength
IS-2835-1987	IS-2553-PART-I	IS-2553-PART-I	ASTM C-1048-90	DIN 1249-PART – 12

c) Float Glass

Glass that gives distorted reflections will not be accepted. Reflections due to pressure, paints poor manufacturing process, uneven thickness or poor storage are some of the reasons for distortion. All clear float glass quality should conform to BS – 952 and ASTM C 1036 – 90.

d) Mirrors

Mirrors shall be fabricated from best clear plate or float glass of approved quality in imported variety and shall match the International Standards. All fixed panel mirrors shall be +/- 0.30mm tolerance. The edges of mirrors shall be polished and bevelled and mitered as per I.S. specifications wherever, it's indicated in the drawing.

6.3 FLOORING: -

All work in general shall be carried out as per CPWD Specification. Only machine cut stone slabs of marble, granite, kota, Jaisalmer etc. shall be used for flooring work.

Wherever flooring is to be done in patterns of tiles/stone, the contractor shall get samples of each pattern laid and approved by the Engineer-in-charge before final laying of such flooring for which nothing extra shall be paid.

Different stones/tiles used in pattern flooring shall be measured separately as defined in the nomenclature of the item and nothing extra for laying pattern flooring shall be paid over and above the quoted rate. No additional wastage, if any, shall be accounted for any extra payment.

Nothing extra shall be payable for using combination of marble, granite, kota, sand stone slabs & ceramic tiles in the required pattern at various locations.

Nothing extra will be paid for the additional thickness of bed mortar that will be required to achieve uniform finished surface on account of difference in specified thickness of marble, granite, kota stone, sand stone & ceramic tiles.

Flooring in toilets, veranda, kitchen, courtyard etc. shall be laid to the required slope/gradient as per the directions of the Engineer-in-charge.

Samples of the materials shall be got approved form the Engineer-in-charge well in time and kept in safe custody at the site till completion of work.

The pattern, spacing and locations of joints shall be as per drawings and direction of the Engineer-in-charge. Nothing extra on this account shall be payable.

Projections shall be rounded at the edges or half rounded as per drawings and directions of Engineer-in-charge for which payment shall be made separately if necessary.

The samples of flooring dado & skirting as per approved pattern shall be prepared and got approved form the Engineer-in-charge before execution of work.

Kota/ marble/granite stone used over the treads/risers of the stair cases shall be as per pattern approved by Engineer-in-charge. Nothing extra on this account shall be payable.

Whenever the Kota stone/marble/granite stone flooring are to be provided in treads of staircase. It should be provided in one piece with pre finished nosing and pre polished exposed surfaces and edges.

Whenever Kota stone 25mm thick is used in skirting. It should be executed by making shallow chase in wall to given flush surface.

6.4 FINISHING

1 General

a) The work shall be done in accordance with CPWD Specifications -2009 Vol. I to Vol. II with upto date correction slips and the manufacturer's specifications where CPWD specifications are not available.

b) The quantity of paint required as per the theoretical consumption including wastages, if any, shall be procured from the approved manufacturer or his authorized dealers and deposited with the representative of the Engineer-in-Charge at site.

c) The paint shall be obtained in smaller packing (around 20 litre).

d) The paint shall be kept in the joint custody of the Department and the Contractor and day- to-day account of receipt and issue shall be maintained. However, the safe custody and watch and ward shall remain to be the responsibility of the Contractor. Nothing extra shall be payable on this account.

e) The name of the manufacturer, manufacturer's product identification, manufacturer's mixing instructions, warnings and instructions for handling and application, toxicity and date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of each container. These details shall be kept in record. The material shall be consumed in the order of material brought to site, first come first consume basis. The Contractor shall obtain and submit to the Department the manufacturer's certificate for compliance of the various characteristics of the materials as per the manufacturer's specifications and also copy of the manufacturer's test report for the record.

f) Empty containers of the paints shall not be removed from site till the completion of the work unless otherwise permitted and shall be removed only with the permission of the Engineer-in-Charge or his authorized representative at site of work.

g) All arrangements for measuring, dosing etc. at site shall be made by the Contractor. Nothing extra shall be payable on this account.

h) The Contractor shall apply samples of each kind of paint for the approval of shade and colour as per the directions of the Engineer-in-Charge before procuring the paint in mass.

i) All incidental charges of cartage, storage, wastage, safe custody, scaffolding, cost of samples and mock ups etc. shall be borne by the Contractor and no claim, whatsoever, shall be entertained on this account.

j) For the item of Epoxy paint, it is clarified that the surface for painting shall be prepared by shot blasting. The metal surface shall be cleaned off any rust using sand/ emery paper and also by mechanical brush / power tool cleaning using grinder as required as per the manufacturer's specifications etc. The sand blasting as such is not required to be carried out on the surface. However, the epoxy primer shall be applied immediately after the surface preparation.

k) For the item of melamine polish, the item includes all the sand papering required to be carried out and wiped properly for cleaning all the loose dust particles. Necessary masking tapes are to be provided where different finishing work is to be carried out, so that the melamine polish does not spread to the other surfaces. Care should be taken while removing the masking tape, so that the surface is not damaged. Cost of melamine polish includes the cost of providing and removing the masking tapes wherever required. The surface shall be sand papered using emery paper no. 180, 320 and 400 as required. Any staining required shall be carried out by applying Apcolite Wood Stain or equivalent, to achieve the required colour and shade as directed by the Engineer-in-Charge. The item of melamine polish is deemed to include cost of such staining. Where French spirit polish is to be carried out the rate is inclusive of cost of staining and wood filler (Apcolite wood filler of Asian Paints or Asian NC Clear Wood filler or equivalent of other brands ICI and Pidilite Industries) if required. Nothing extra shall be payable on this account.

QUALITY ASSURANCE

For Quality Assurance the Contractor shall ensure that color and texture of finish coats, shall match the approved sample. Also,
Color of priming coat shall be lighter than body coat.
Color of body coat shall be lighter than finish coat.

Color prime and body coats as required so as not to show through the finish coat and to mask surface imperfections.
Before starting application of each type of paint, the Contractor shall apply the paint to a specimen area, not to exceed 10 square meter and get finish and texture approved and shall use it as a sample for the remainder of the work.

6.5 STAINLESS STEEL HAND RAIL

The work shall be got executed as per CPWD Specifications and as per the manufacturer's specification through specialized agency as approved by the Engineer-in-Charge.

i) Providing, fabricating and fixing in position welded built –up section using stainless steel section/pipes and connecting plates, of Grade S.S 304 (SS 316 Grade shall be used for exterior applications) and of required diameter & thickness as per the Engineer-in-chargeural Drawings and details, at the junctions of doors, on walls, other locations as directed etc. including cutting, welding, grinding, bending to required profile and shape, finish, hoisting, buffing and polishing, cutting chase / embedding in RCC / Masonry, fixing using stainless steel screws, nuts, bolts and washers or stainless steel fasteners as required to make it rigidly fixed & stable and making good the plaster/ flooring etc. all complete, at all floors and all levels as directed by the Engineer-in – Charge. Prototype samples to be approved by Engineer-in-charge before mass fabrication.

ii) Rate includes cost of all inputs of materials, labour, T&P, etc. involved in the work and all incidental charges to execute this item. However, for the purpose of payment only the actual weight of the stainless pipes and stainless steel plates provided and fixed shall be measured in kg.

7 PARTICULAR SPECIFICATION AND ADDITIONAL CONDITIONS FOR WATER PROOFING WORK

7.1. The work shall be got executed as per CPWD Specifications and as per the manufacturer's specification through specialized agency as approved by the Engineer-in-Charge.

The contractor shall furnish the following particulars immediately after the issue of letter of acceptance by the Department.
The name of the specialized firm.
The trade names of the product, which would be used.
List of works where the treatment has been used.
Quantity of chlorides and sulphides used in the product.

7.2.1 GENERAL

All the water proofing treatment shall be got executed through the specialized agencies. The specialized agencies shall be got approved from the Chief Engineer. The contractor shall furnish the following particulars immediately after the issue of letter of acceptance by the Department.
The name of the specialized firm.
The trade names of the product, which would be used.
List of works where the treatment has been used.
Quantity of chlorides and sulphides used in the product.

7.2.2 The water proofing treatment for the U.G. sump, terrace tank etc. shall be tested by filling the tanks completely with potable water and observing for leakage for minimum 72 hours. All the arrangements for testing including supplying water, closing all the outlets temporarily and restoring after the test etc. shall be made by the contractor at his own cost. The contractor at his own cost rectify any leakage noticed.
7.2.3 The specialist agency for waterproofing shall also grout the Nothing extra shall be payable on this account.
7.2.4 The water proofing treatment over the terrace slab, in the sunk / depressed slabs shall be tested by ponding water as specified for curing as well as observing for leakage for minimum 2 weeks. All the arrangements for testing including supplying water, making temporary bunds using mortar, removing bunds after testing etc. shall be made by the contractor at his own cost. The contractor at his own cost shall rectify any leakage noticed. Nothing extra shall be payable on this account.

7.3 Water proofing treatment for the basement walls and rafts.

7.3.1 The water proofing items shall be got executed through one of the approved agencies as per the list of approved agencies attached with the tender. The integral cement based water proofing treatment shall be as per the item description and as directed by Engineer-in-Charge.

7.3.2 The specialist agency for water proofing work shall provide necessary sleeves made out of G.I pipes / M.S. puddle flanges (payment for which shall be made under relevant item) in the water proofing treatment at base and the raft for release of uplift pressure till the pressure is taken by the rock anchors and the dead weight of the building. The necessary provisions shall be made for filling these sleeves with cement concrete of same grade and then pressure grouting these holes with polymer modified cement slurry using aluminium nipples etc. at a later date. However, the agency shall ensure complete watertight ness of the raft and the water proofing treatment below raft. Junctions of the rock anchors with the concrete of the basement raft. Nothing extra shall be payable on this account and shall not be measured separately for payment.

7.3.3 The specialist agency for water proofing work shall also grout the junctions of the various service lines entering or coming out through the basement wall. Nothing extra shall be payable on this account and shall not be measured separately for payment.

7.3.4 The reinforced cement concrete provided in the base and walls of underground tanks shall be admixed with water proofing compound confirming to IS 2645. The guarantee for the water proofing treatment shall include dismantling and relaying the Reinforced cement concrete, if required for rectifying any defect in the water proofing treatment. Nothing extra shall be payable on this account and shall not be measured separately for payment.

7.3.5 Layout and Design: The layout and design of raft foundation shall be as per structural design / drawing to be supplied by the Engineer-in-Charge. The structural drawing shall be properly correlated with the architectural drawing of the work before actual execution. The discrepancy if any, thus notice shall be brought to the notice of Engineer-in-Charge for necessary correction.

7.3.6 The work shall be in general carried out in accordance with CPWD specifications with up-to-date correction slips. However, if the said specifications differ from those detailed in the specifications of the particular item in the schedule of quantities attached or from the particular specifications given here under the later shall prevail.

7.3.7 The water proofing compound used in integral water proofing treatment shall satisfy all the performance requirements indicated in IS: 2645 and shall be got tested before its use. The compound shall be used @ 2% by weight of cement used or as recommended by the manufacturer.

7.3.8 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approved of the Engineer-in-Charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.

GUARANTEE FOR WATER PROOFING TREATMENT

7.4 The contractor shall be fully responsible for and shall guarantee proper performance of the entire waterproofing system for a period of 10 (Ten) years from the final completion of works. In addition, specific 10 years written guarantee (to be furnished in a non-judicial stamp paper of value not less than Rs.100/-) in approved proforma shall be submitted for the performance of the system, before final payment and shall not in any way limit any other rights the Employer may have under the contract. Guarantee for water proofing shall comprises of all the items described above in particular specification.

7.5 All water-proofing work shall be carried out through approved specialist agency as per method of working approved by the Engineer-in-charge. However, the Contractors shall be solely responsible for waterproofing treatment until the expiry of the above guarantee period.

7.6 Ten years guarantee in prescribed proforma attached shall be given by the contractor for the water proofing treatment. In addition, 10% (ten percent) of the cost of these items of water proofing under this sub head shall be retained as guarantee to watch the performance of the work executed. However, half of this amount (withheld) would be released after five years from the date of completion of the work, if the performance of the waterproofing works is satisfactory. The remaining withheld amount shall be released after completion of ten years from the date of completion of work, if the performance of the waterproofing work is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing

of notice by the Engineer-in-Charge and, if not attended to, the same shall be got done through other agency at the risk and cost of the contractor and recovery shall be effected from the amount retained towards guarantee. In any case, the contractor and the specialist agency, during the guarantee period, shall inspect and examine the treatment once in every year and make good any defect observed and confirm the same in writing. The security deposit can be released in full, if bank guarantee of equivalent amount, valid for the duration of guarantee period, is produced and deposited with the Department.

8 PARTICULAR SPECIFICATIONS – ALUMINIUM WORK FOR DOORS, WINDOWS AND PARTITIONS

8.1 The material for the work shall be procured from the approved manufacturer as per the list attached with the tender documents. The Contractor shall procure and submit samples of various materials to be used in the work for the approval of Engineer-in-Charge and no work shall commence before such samples are approved. Samples of un-anodized as well as anodized aluminium sections, neoprene gaskets, glass, stainless steel screws, anchor fasteners, hardware and any other material or components requiring approval of samples, in opinion of Engineer-in-Charge, shall be submitted for the approval as mentioned above. The above samples shall be retained as standards of materials and workmanship. The cost of the above samples shall be borne by the Contractor.

8.2 The Contractor shall prepare the shop drawings for the aluminium windows giving details of the various aluminium sections, neoprene gaskets, cleats, anchor fasteners, hardware, sealants, glass etc. and submit the same for the approval of Engineer-in-Charge. Nothing extra shall be payable on this account.

8.3 Only after the approval of the samples and the shop drawings by the Engineer-in-Charge, the Contractor shall procure the material for the work. All materials brought to the site by the Contractor, for use in the work, as well as fabricated components shall be subject to inspection and approval by Engineer-in-Charge. The Contractor shall, if required by the Engineer-in-Charge, produce manufacturer's test certificates for any material or particular batch of materials supplied by him.

8.4 The Contractor shall prepare a finished sample of the aluminium window along with glazing panel and fittings etc. for approval of workmanship and material. Nothing extra shall be payable on this account.

8.5 The Contractor shall get the necessary tests carried out in an approved laboratory, as specified. The tests carried out shall be as per relevant specifications / Standard Codes. One test for each lot of anodized aluminium section of each type shall be carried out. However, this is subject to at least one test for every 1,000 Kg or part thereof, for each type of section.

8.6 Aluminium sections to be used for doors, windows, ventilators and fixed glazing, partitions, false ceiling etc. shall be appropriate to meet technical, structural, functional and aesthetic considerations. The anodizing shall be carried out in an approved factory / workshop as specified in the tender documents.

8.7 The aluminium extruded sections shall conform to I.S. Designations HEIWP / HVIWP alloy, with chemical composition and technical properties as per I.S. 733 and I.S. 1285.

For sectional weight tolerance limits shall be (-) 0.5%. However, payment for extruded aluminium sections on weight basis shall be as per paras 10.25 (I) & (II).

FABRICATION

All joints shall be accurately fabricated and be hairline in appearance. The finished surface shall be free from visible defects.

8.11 Taking into consideration varying profiles of aluminium sections being extruded by approved manufacturers, the Contractor shall prepare detailed shop drawings of his proposal using suitable sections based on architectural design / drawings, adequate to meet the requirements / specifications laid down and as proposed by the manufacturer and these detailed shop drawings shall be subject to approval of the Engineer – in – Charge.

8.12 All hardware used shall conform to the relevant specifications and as per samples approved by the Engineer-in-Charge. Design, quality, type, number and fixing of hardware shall be generally in accordance with architectural drawings and as approved by the Engineer-in-Charge before use.

8.13 All doors, windows, ventilators and glazing etc. shall be made water tight with neoprene gaskets and weather silicone sealants to the satisfaction of the Engineer-in-Charge, for which nothing extra shall be payable.

8.14 The frames shall be strictly as per Architectural drawings; the corners of the frame being fabricated to the true right angles. Both the fixed frames and openable shutter frames shall be fabricated out of sections cut to

required length, mitered and mechanically jointed for satisfactory performance. All members shall be accurately machine milled and fitted to form hairline joints. The jointing accessories such as aluminium cleats, stainless steel screws etc. shall not to cause any bi-metallic reaction by providing separators, wherever required. Nothing extra shall be payable for jointing accessories.

8.15 Mitered joints of the doors, windows, ventilators shutters and frames shall be either corner crimped or fixed with self-tapping stainless-steel screws of approved make and quality to heavy duty extruded aluminium cleats and sealed with weather silicone sealant, for which nothing extra shall be payable.

8.16 Vertical members of the aluminium frame work shall be embedded in the floors, wherever required, by cutting and making good of the floor. Nothing extra shall be payable on this account.

8.17 FIXING OF ALUMINIUM FRAME WORK

8.18 The screws used for fixing fixed aluminium frames of the aluminium windows to masonry walls / RCC members and aluminium members to other aluminium members shall be of stainless steel of approved make and quality and of stainless-steel grade 304. Threads of machine screws used shall conform to requirement of I.S. 4218.

8.19 The aluminium frames of the gypsum board partition and the wooden rafter ceiling shall be fixed to masonry walls / RCC members using stainless steel anchor fasteners of grade 316, of Kundan or Arrow make and aluminium members to other aluminium members shall be fixed using stainless steel screws of approved make and quality and of stainless-steel grade 304.

8.20 For the aluminium windows, the gap between the aluminium frames and the R.C.C / Masonry and also any gaps in the various sections shall be filled with weather silicone sealant DC 795 of Dow Corning or equivalent in the required bite size, to ensure water tightness including providing and fixing backer rod, wherever required. The weather silicone sealant shall be of such approved colour and composition that it would not stain or streak the masonry / R.C.C. work. It should not sag or flow and shall not set hard or dry out under any conditions of weather and shall be tooled properly. The weather silicone sealant shall be used as per the manufacturer's specifications and shall be of approved colour and shade. Any excess sealant shall be removed / cleared. Nothing extra shall be payable for the above.

8.21 Fixing of glass panes shall be designed in such a way that replacing damaged / broken glass panes is easily possible without having to remove or damage any members or interior finishing materials.

ANODIZING

(I) Aluminium sections shall be anodized as per I.S. 7088 – 1973. Anodizing to be as per grade AC 20 and not less than 20 microns thick when measured as per I.S. 6012, in colour and shade as approved by the Engineer-in-charge.

(II) The anodic coating shall be properly sealed by steam or dipping in de-ionized water as per I.S. 1868-1982 and / or I.S. 6057. Sealing quality shall be tested in accordance with the relevant standards. Nothing extra shall be payable on this account.

(III) The Contractor shall satisfy himself by checking in the factory that the thickness of the anodic coating is found to be minimum 20 microns and sealing quality is appropriate everywhere. The testing shall be done in an approved laboratory by EDDY CURRENT METHOD as per I.S. 6012 for thickness. For testing the thickness of anodic coating of the anodized aluminium sections, the calibration shall be done on bare (un-anodized) aluminium sections of same type. If any material is found sub-standard, it shall be rejected.

(IV) All anodized aluminium works shall conform to relevant I.S. Codes relating to materials, workmanship, fabrications, finishing, erection, installations etc. In this connection I.S. Codes including I.S. 1868 – 1982, I.S. 733 – 1983, I.S. 1948-1961, I.S. 7088-1973, I.S. 6012-1970, I.S. 1285 – 1975, I.S. 740-1975 are considered relevant and applicable.

The exposed surface of the aluminium sections shall be protected against surface damage, dents, scratches etc. It shall, therefore, be provided with protective tape. After fixing and assuring of proper functioning of doors, windows, frame work for partitions / false ceiling etc. such protective tape shall be cleaned out / removed as per the directions of Engineer-in-Charge. Nothing extra shall be payable for above.

8.23 Glazing

(I) All glass panes shall be retained within aluminium framing by use of exterior grade neoprene gaskets. Use of glazing or caulking compounds around the perimeter of glass will not be permitted. There shall be no whistling or rattling. Before installation of glass, Contractor shall ensure the following:

All glazing rebates shall be square, to plumb, true to plane, dry and free from dust.

Glass edge shall be clean and cut to exact size and grounded

Annealed float glass in doors, windows, ventilators and fixed glazing etc. shall be of approved make and standard quality conforming to C.P.W.D. Specifications.

4 mm thick glass panes shall be provided for openings not exceeding 0.5 sqm. For openings exceeding 0.5 sqm in area, 5.0 mm thick glass panes shall be provided unless specified otherwise.

8.24 PROTECTIONS AND CLEANING:

(I) After erection and removal of protective layer, all aluminium works including glass panes shall be moist cleaned with a de-ionized water to clean all marks, stains and blemishes.

8.25 MEASUREMENT AND RATES:

(I) For aluminium framework, the length of each member of the frame shall be measured correct to half a centimetre. The weight shall then be calculated on the basis of unit weight specified in the manufacturer's catalogue.

(II) The actual weight per metre of the respective aluminium sections shall be measured for three random samples collected for each type of aluminium section used in the work, cut to required lengths and weighed and average weight calculated and recorded. The average weight for each type of aluminium section shall be taken as the actual weight per metre for that aluminium section. The decision of the Engineer-in-Charge as regards the random samples and average weight shall be final and binding on the Contractor and no claim of any kind shall be entertained from the Contractor in this regard.

(III) The quantity of the aluminium, to be paid for, shall be the least of the two weights calculated on the basis of above two paras – 11.25 (I) & (II).

(IV) For glazing, the actual area of the glass panels excluding the portion in the beading shall be measured in sqm upto two decimal places, for payment.

(V) Stainless steel adjustable friction hinges and the aluminium handles for the openable side-hung windows shall be of "Earl Bihari", make or equivalent as approved by the Engineer-in-Charge. 2 nos. friction hinges shall be provided per shutter.

(VI) The cost of designing and preparation of shop drawings, all the samples, mock-up of window etc. is deemed to be included in the cost of the relevant items. Nothing extra shall be payable on this account.

(VII) The item for aluminium for fixed portions for aluminium windows, frame work for partitions and wooden rafter ceiling shall include cost of all inputs of labour, material (anodized aluminium sections, including cleats, other fixtures, weather silicone sealants, stainless steel screws, nuts, bolts, rawl plugs, backer rods, polyethylene tapes etc. which shall be required for fabrication and erection of aluminium work) T & P, all incidental charges, wastages etc. involved in the work. However, for the purpose of payment, the weight of aluminium sections for the fixed window frame, frame work for partitions and wooden rafter ceiling, shall be measured in Kg. The aluminium cleats, stainless steel screws, nuts, bolts, separators etc. shall not be measured separately for payment and their cost is deemed to be included in the cost of this item. The item for aluminium for frame work for fixed partitions and wooden rafter ceiling shall also include cost of providing and fixing stainless steel anchor fasteners as required.

(IX) The item of aluminium for the openable aluminium shutters for windows and doors etc., shall include cost of all inputs of labour, material (anodized aluminium sections, including such as cleats / angles, other fixtures, stainless steel screws nuts, bolts, stainless steel hinges, weather silicone sealant etc. which shall be required for fabrication of aluminium work) T & P, all incidental charges, wastages etc. involved in the work. However, for the purpose of payment, the weight of aluminium sections for the window shutter (sash frame) shall be measured in Kg. The aluminium cleats, stainless steel anchor fasteners, screws, nuts, bolts, separators, stainless steel hinges, etc. shall not be measured separately for payment and their cost is deemed to be included in the cost of this item. The anodized aluminium snap beading for fixing glass panels in the openable shutters of the windows shall be measured separately (on weight basis) and paid under this item of aluminium frame work for window shutters.

(X) The glass shall be paid for separately under relevant item. The cost providing and fixing neoprene gasket, felt etc. is included in the cost of this item and shall not be measured separately for payment.

The item for the aluminium frame work includes cost of making provision for fixing fittings, wherever required, as per the item description (The cost for providing fitting (handle and buffer) shall be paid for separately under relevant item).

9. PARTICULAR SPECIFICATIONS FOR ROAD WORK

Roadwork shall, in general, be carried out as per the CPWD Specifications.

TREMIX FLOORING

The work in general shall be carried out as per the CPWD specifications for CC pavements. The work shall be got executed through specialized applicators having similar experience in executing tremix flooring using vacuum dewatering system. Before taking up the work, the Contractor shall, therefore, submit the credentials of the applicators along with the details of the similar works executed by them for the approval of Engineer-in-Charge.

The Contractor or their applicators shall have adequate machinery for laying and vibrating concrete including vacuum dewatering system etc.

The concrete shall be of specified grade ready mix cement concrete with specified cement content per cubic metre of concrete with slump 70 to 80 mm. The concrete shall not have air-entrainment more than 2%. The concrete shall be levelled to required slope using bull float. The excess water shall be removed using vacuum dewatering process. After the concrete has stiffened to the point of supporting floating operation the surface shall be power floated using IRONITE no. 9.3.

The flooring shall be done in panels of sizes not more than 20 x 4 metre. The construction joints shall, therefore, be formed with square edges using the steel formwork. Each panel shall then be divided into smaller panels of size not more than 3 x 2 metre by providing contraction joints by cutting grooves of size 3 mm x 20 mm deep using mechanical saw. The cutting of the grooves shall be done as soon as the concrete is set.

The top surface of the flooring shall be sprinkled with IRONITE no. 3 (non coloured) @ 3 kg. per sqm. It shall be sprinkled when the concrete is green, before troweling. Two-third quantity of the dry shake (metallic floor hardener) shall be sprinkled in the first pass and floated with power trowel and one third of the dry shakes shall be sprinkled in the 2nd pass and floated with power trowel to smooth finish. The first shake shall be allowed to remain unworked until it has absorbed moisture and then power floated. Similar operation shall be done for the 2nd shake. The surface then shall be textured to brush finish in a workman like manner with uniform grains generally in one direction.

The surface shall then be cured for minimum 10 days.

All precautions shall be taken to avoid any marks, impressions, scratches, stains etc. to the finished surface.

One test for wear resistance (abrasion test) as per IS 1237 shall be carried out on the sample (3 specimen) core cut from the pavement. One core sample shall be tested for every 10,000 sqm or part thereof. The average wear shall not exceed 2 mm and 2.5 mm for individual specimen. Besides, other tests for concrete shall be carried out as per the CPWD specifications. All arrangements for taking out core samples and other samples shall be made by the Contractor. The core holes shall then be filled properly with the concrete of the same mix in a workman like manner and cured properly. Nothing extra shall be paid on this account.

The joints (expansion and contraction) / grooves shall then be filled with joint sealing compound conforming to grade B of IS 1834 or equivalent in workmanlike manner. It shall not be measured separately for payment.

10. The item includes cost of all inputs of material, labour, T & P, all incidental charges, wastages and testing etc. involved in the work.

10.0 PARTICULAR SPECIFICATIONS FOR BACK UP RODS, JOINTS SEALING COMPOUNDS, INSERTS AND EMBEDMENTS

10.1 BACK UP RODS / WATERBARS

I. Where water-bars are shown on the drawings, the joints shall incorporate an approved PVC external type water-bar complete with all necessary moulded or prefabricated intersection pieces assembled in accordance with the drawings with bends and butt joints in running lengths made by heat welding in an electrically heated jig.

II. Jointing and fixing of water-bars shall be carried out strictly in accordance with the manufacturer's instructions.

III. The water-bars shall be installed so that they are securely held in their correct position during the placing and compacting of the concrete.

IV. Where reinforcement present adjacent to water-bars, adequate clearance shall be left between the reinforcement and water-bars to facilitate compaction of the concrete.
V. Double headed nails may be used in the edge of the water-bar outside the line of the external grooves for fixing purposes, but no other holes shall be permitted through the water-bar.

10.2 Joint Sealing Compounds
I. Joint sealing compounds shall seal joints in concrete against the 40 passage of water, prevent the ingress of grit or other foreign material and protect the joint filler. The compound shall have good extensibility and adhesion to concrete surfaces and shall be resistant to flow and weathering.
II. Poly sulphide joints where specified on the drawings shall be sealed with polysulphide liquid polymer, stored, mixed, handled applied and cured strictly in accordance with the manufacturer's written instructions, such joints shall be formed to the correct dimensions, thoroughly cleaned and treated with recommended primer strictly in accordance with the manufacturer's written instructions prior to sealing. The Contractor shall use only competent personnel experienced in the application of polysulphide for such work.
III. Where specified in the drawings, rubber/bituminous based sealants shall be of an approved manufacture. The treatment of the joint and the use of sealing compound shall be strictly in accordance with the manufacturer's written instructions. The entire work shall be carried out as per is: 3414, is: 6509, is: 11433.

10.3 INSERTS AND EMBEDMENTSHIP

Various steel inserts and embedment's are required under the contract to be fabricated, positioned and secured firmly into place inside the formwork prior to concrete being poured. There are also requirements of jointing, threading, bolting and welding inserts and embedment of different concrete and structural steel elements in order to establish structural continuity and connection. Great care shall be exercised by the contractor in executing all aspects of the work related to inserts and embedment, including tolerances, so that the final assembly of the concrete elements can meet satisfactorily the continuity and contiguity requirements intended in the structure.

11.0 PARTICULAR SPECIFICATION FOR ACOUSTICS

11.1 Acoustical Treatment

Acoustical treatment to ceilings and walls shall be carried out using very low, medium and high frequency absorption materials, as specified in the Schedule of Quantities. The work shall be carried out generally as per CPWD specifications-2019 Vol I & Vol. II with upto date correction slips, with additional recommendations of specialist manufacturers.

11.2 The work of acoustical treatment shall be got executed through authorized applicator of approved manufacturer only.

12.0 PLUMBING

The work shall be carried out generally as per CPWD specifications-2019 Vol I & Vol. II with upto date correction slips, with additional recommendations of specialist manufacturers.

13.00 GUARANTEE FOR GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK.

13.01 The contractor shall be fully responsible for and shall guarantee proper performance of the entire GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK for a period of 05 (Five) years from the final completion of works. In addition, specific 05 years written guarantee (to be furnished in a non-judicial stamp paper of value not less than Rs.100/-) in approved proforma shall be submitted for the performance of the system, before final payment and shall not in any way limit any other rights the employer may have under the contract. Guarantee for GRIT WASH, SBR POLYMER, GRANITE, TILES, M.S WORKS AND ALUMINIUM WORKS, shall comprises of all the items described above in particular specification.

13.02 All GUARANTEE FOR GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK shall be carried out through approved specialist agency as per method of working approved by the Engineer-in-charge. However, the Contractors shall be solely responsible for waterproofing treatment until the expiry of the above guarantee period, if applicable.

13.03 Five years guarantee in prescribed proforma attached shall be given by the contractor for the water proofing treatment, if applicable. In addition, 05% (five percent) of the cost of these items of GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK under this sub head shall be retained as guarantee to watch the performance of the work executed. However, same would be released after five years from the date of completion of the work, if the performance of the GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK is satisfactory. If any defect is noticed during the guarantee period i.e. 05 years, it should be rectified by the contractor within seven days of issuing of notice by the Engineer-in-Charge and if not attended to, the same shall be got done through other agency at the risk and cost of the contractor and recovery shall be effected from the amount retained towards guarantee. In any case, the contractor and the specialist agency, during the guarantee period, shall inspect and examine the treatment once in every year and make good any defect observed and confirm the same in writing. The security deposit can be released in full, if bank guarantee of equivalent amount, valid for the duration of guarantee period, is produced and deposited with the Department.

SPECIAL CONDITIONS

1. Work shall be carried out as per CPWD specification-2019, Volume-I & II and as per direction of Engineer-in-Charge.
2. Contractor shall bring the 100% quantity of Acrylic Distemper, Exterior Paint, Synthetic Enamel Paint, primer etc. required for the work of approved before start of the work and submit to concerned J.E. in-charge along with original invoice.
3. Samples of various materials required for the work shall be got approved before supply of materials by the Engineer-in-Charge.
4. Various furniture, computers, machineries, equipment, carpet, curtains, records, documents photos, books etc. are lying in rooms/hall/laboratories. Contractor shall cover up properly with polyethylene/ tarpaulin etc and protect all these items from splashes and dust.
5. All the splashes after painting work shall be removed on same day otherwise penalty shall be imposed as decided by the Engineer-in-Charge.
6. Scrapped materials shall be removed immediately after the scrapping work.
7. Contractor shall engage manpower for shifting and re-arrange of furniture and other articles lying in room/labs during the work whenever required at his own cost and nothing shall be paid extra on this account.
8. One percent labour cess shall be recovered from the bills.
9. Empty container shall be kept at site and shall be removed only after completion of work with prior permission of Engineer-in-Charge.
10. Classrooms/ offices/ labs/ workshops and other premises shall be cleaned soon after the painting work failing which recovery @1500/- per room shall be made from the bill.
11. Contractor or his authorized representative shall be available at site who will be in contact with concerned J.E. of work.
12. Programme of white washing/ painting work shall be prepared in consultation with J.E. & concerned department of DTU.
13. Prior intimation shall be given to the respective in charge of classrooms/labs/workshops/offices etc.
14. Necessary bill/invoice and manufacturer test certificate shall be submitted by the agency at the time of supply of materials.
15. All the materials shall be stored in DTU campus under double lock. A proper day today account of paints/ distemper/primer shall be maintained in paint register.
16. Distemper/ Exterior paints/ Synthetic Paints/ primer etc supplied at site shall be got verified by the manufacturer before consuming in the work and contractor should submit the report of manufacturer to department before starting the work.
17. All works shall be executed under the supervision and to the satisfaction of the Engineer-in-Charge.

GUARANTEE BOND

**GUARANTEE TO BE EXECUTED BY THE CONTRACTOR
FOR REMOVAL OF DEFECTS AFTER COMPLETION
IN RESPECT OF GRIT WASH, GRANITE & KOTA STONE, STRUCTURAL STEEL WORKS AND PUF ROOFING WORK**

The agreement made this..... day of ..... Two Thousand ..... between .....S/o .....(hereinafter called the GUARANTOR on the one part) and the PRESIDENT OF INDIA (hereinafter called the Government on the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated ..... and made between the GUARANTOR ON THE ONE PART AND the Government on the other part, whereby the contractor inter alia, undertook to render the work in the said contract structurally stable, leak proof and sound material, workmanship, anodizing, colouring, sealing etc.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, defective anodizing /pre-painting/ Powder coating/ colouring and finishing for 5 (Five) years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any leakage, seepage, cracks in pipes and guaranteed against faulty material and workmanship, defective galvanising for five years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-in-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect to satisfaction of Engineer-in-Charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all defects or commits breach thereunder, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator.....
.....and ..... by ..... for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of :-

1. ..... 2. .....

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY..... in the presence of :-

1. ..... 2. .....

APPROVED MAKES OF MATERIALS (CIVIL)

The Contractor shall obtain prior approval from the Engineer-in-charge before placing order for any specific material or engaging any of the specialized agencies. The Contractor shall make a detailed submission with catalogues and proposed specifications, as well as full details of the works executed by the specialized agency, as specified. Unless otherwise specified, the brands/makes of the material as specified in the item nomenclature, in the list of approved materials attached in the tender and in the particular specifications shall be used in the work. In case of non-availability of the brands specified in the contract the Contractor may be allowed to use alternate equivalent brand of the material by Engineer-in-Charge with the prior approval of NIT Approving Authority subject to submission of documentary evidence of non - availability of the specified brands by contractor. The necessary cost adjustments on account of above change shall be made for the same. The contractor would submit copy of original bills and manufacturer's test certificate for all lots of material procured for the work; payments would be released only for the items for which original bills & manufacturer's test report for the material consumed has been submitted to Engineer-in-Charge. Department shall also get random testing of material from testing Laboratory of its choice.

LIST OF APPROVED MAKES OF MATERIALS [CIVIL WORK]

S.NO.	MATERIAL	MANUFACTURERS NAME
	CIVIL ITEMS	
1.	CEMENT	ACC, ULTRATECH, AMBUJA, J.K., LAFARGE, BIRLA, CCI.
2.	REINFORCEMENT STEEL-TMT BARS-FE-500D GRADE	SAIL, TATA STEEL, RINL, JSW, JSPL
3.	STRUCTURAL STEEL SECTIONS	SAIL, TATA, TISCO, RINL, JSW, JINDAL STEEL & POWER, JINDAL,
4.	STRUCTURAL STEEL TUBES/PIPES	JINDAL, TATA, APL APOLLO
6.	READY MIXED CEMENT CONCRETE	ACC, LAFARGE, ULTRATECH, L&T GRASIM, NSCONCRETE, RMC READYMIX (INDIA), VK READY MIX CONCRETE, ASHTECH, SHRI RAM READY MIX CONCRETE
8.	SHUTTERING PLY	GREENPLY SHUTTERING PLY, ARCHID SHUTTERING PLY, EURO SHUTTERING PLY
9.	SUPERPLASTICIZERS	MC BAUCHEMIE/FOSROC/SIKA/BASF/ CHRYSO/VELOSIT/PIDILITE
10.	WHITE CEMENT	BIRLA WHITE, J.K. WHITE
11.	AAC BLOCK	SHREE, INSTABLOCK, BILTECH, MAGICRETE, SIPROX, BIRLA AEROCON, J.K., CLAVECON INDIA PVT. LTD., J.K. LAKSHMI, B.G. SHIRKE/ INDO BHUTANCONSTRUCTION SOLUTION, ULTRATECH XTRALITE,
12.	BLOCK JOINTING MORTAR	JK LAKSHMI, BIRLA AEROCON SMARTFIX, MYK SCHOMBURG, ULTRATECH, FERROUSCRETE, ARDEX
13.	GLAZED CERAMIC TILES	RAK CERAMICS, SOMANY, KAJARIA, ORIENT BELL, JOHNSON
14.	VITRIFIED TILES	RAK CERAMICS, SOMANY, KAJARIA, ORIENT BELL, JOHNSON

15.	WALL PUTTY	JK WHITE, BIRLA WHITE, ASIAN, BERGER
16.	PLASTER OF PARIS	JK LAKSHMI, SAKARNI, SHRIRAM, NIRMAN
17.	GYPSUM PLASTER	SAINT GOBAIN, SAKARNI, J.K. LAKSHMI
18.	ANCHOR PLUG SOIL/ ROCK ANCHOR	BBR, VSL, FREYSSINET
19.	PORCELAIN TILES	JOHNSON, ASIAN(AGL)
20.	CHEQUERED TILE	NITCO, ULTRA, UNISTNOE, MODERN
21.	CC PAVERS, PRECAST CC KERB STONE, CC TILES, RCC SLAB	NITCO, BHARAT, HINDUSTAN, ULTRA, KJS CONCRETE, DURACRETE, KK MANHOLE & COVERS, TERRA FIRMA, PAVER INDIA, DALAL, UNISTONE, CECO, S&S, MOON LIGHT, SWASTIK, ECOCRETE
22.	GRASS PAVER	UNISTONE, ULTRA, HINDUSTAN, KK, KJS
23.	SFRC/PRECAST C.C. COVERS	KK MANHOLE & COVERS, JAIN, PRAGATI, HINDUSTAN
24.	FLYASH BRICKS	POWER BRICK, YBW PROJECT, ASHTECH INDUSTRIES PVT. LTD.
25.	GLASS MOSAIC TILES	PALLADIO, CORAL, MRIDUL, BISAZZA, MMG TILES
26.	INSULATION FOR PIPE, RUBBER INSULATION	KAIFLEX, ARMAFLEX, CAREFLEX, VIDEOFLEX AFLEX
27.	COPPER TUBES/ PIPES	RAJCO, MEXFLOW, DELHI METAL, ABC
28.	READY MIX PLASTER	BIRLA AEROCON, ULTRATECH, RAMCO, WEBER, LATICRETE
29.	RAISED / CAVITY FLOORING	UNI FLOOR, UNITILE INDIA, TATE, ZTFLOOR, ACCESS FLOOR SYSTEMS
30.	DECK SHEET	JSW, TATA BLUESCOPE, INTERARCH, JSPL, ROOFCLAD
31.	SELF-DRILLING SCREWS	TW BUILDEX & BOUSTED, CORROSHIELD, ATUL FATERNERS LTD.
	CONSTRUCTION CHEMICALS	
1	WATERPROOFING COMPOUND	VELOSIT, FOSROC, PIDILITE, SIKA, SUNANDA SPECIALITY COATINGS, MYK SCHOMBERG, STP LTD, X-CALIBUR CONSTRUCTION SYSTEMS INC, SUPREME BITUCHEM INDIA PVTLTD, MC BAUCHEMIE, RACHTR CHEMICALS, CHOWGULE, FIRESTONE, ARDEX ENDURA
2	ADMIXTURES	FOSROC, SIKA, VELOSIT, CICO, BASF, STP LTD., SUNANDA SPECIALITY COATINGS, MYK SCHOMBURG, HEADWAY CHEMICALS INDIA PVT LTD, SUPREME BITUCHEM INDIA PVT. LTD, MC BAUCHEMIE, CHOWGULE, ARDEX ENDURA
3	TILE ADHESIVE	ARDEX ENDURA, LATICRETE, FOSROC, SUNANDA SPECIALITY COATINGS, MAGICRETE, VELOSIT, HEADWAY CHEMICALS INDIAPVT LTD, SUPREME BITUCHEM INDIA PVT LTD, RACHTR CHEMICALS, CHOWGULE, STP LTD.

4	GROUTING COMPOUND	ARDEX ENDURA, PIDILITE, LATICRETE, SUNANDA SPECIALITY COATINGS, FOSROC, CICO, STP LTD. VELOSIT, WEBBER, MYK SCHOMBURG, HEADWAY CHEMICALS INDIA PVT LTD, SUPREMEBITUCHEM INDIA PVT. LTD, RACHTR CHEMICALS, CHOWGULE, STP LTD.
5	EPOXY MORTAR	FOSROC, VELOSIT, SIKA, SUNANDA SPECIALITY COATINGS, CICO, HEADWAY CHEMICALS INDIA PVT LTD, SUPREME BITUCHEM INDIA PVT LTD, MYK SCHOMBURG, RACHTR CHEMICALS, CHOWGULE, STP LTD.
6	HIGH-PERFORMANCE EPOXY BASED RESIN ANCHORSYSTEM	BASF, FOSROC, HILTI, SUNANDA SPECIALITY COATINGS, X CALIBUR CONSTRUCTION SYSTEMS INC, SUPREME BITU CHEMINDIA PVT LTD, RACHTR CHEMICALS, CHOWGULE, STP LTD.
7	POLYSULPHIDE / SILICON SEALANT	GE, DOW CORNING, PIDILITE, WACKER, SUNANDA SPECIALITY COATINGS, CONSTRUCTION PRODUCTS INDIA LTD, HEADWAY CHEMICALS INDIA PVT LTD, SUPREME BITUCHEM INDIA PVT. LTD, BENGAL BITUMEN, MYK SCHOMBURG, STP LTD.
8	SOLVENT BASED SILICONE REPELLENT COATING	PIDILITE, GE, MC BAUCHEMIE, WACKER, VELOSIT, SUNANDA SPECIALITY COATINGS, X CALIBUR CONSTRUCTION SYSTEMS INC, RACHTR CHEMICALS, CHOWGULE, MYK SCHOMBURG, STP LTD.
9	FLOOR HARDENER	PIDILITE, FOSROC, SIKA, MC BAUCHEMIE, VELOSIT, MYK SCHOMBURG, X CALIBUR CONSTRUCTION SYSTEMS INC, SUPREME BITUCHEM INDIA PVT LTD, RACHTR CHEMICALS, STP LTD, ARDEX ENDURA
10	FIRE RETARDANT PAINT	SUNANDA SPECIALITY COATINGS, AKZONOBEL, PROMAT
11	APP MEMBRANE WATERPROOFING	PIDILITE, SIKA, STP LTD., TEXSA BITUMAT CO. LTD., SUNANDASPECIALITY COATINGS, HEADWAY CHEMICALS INDIA PVT LTD, SUPREME BITUCHEM INDIA PVT LTD, BENGAL BITUMEN, CHOWGULE, MYK SCHOMBURG
12	A. INTEGRAL CRYSTALLINE ADMIXTURE FORCONCRETE WATERPROOFING TREATMENT	VELOSIT, PENETRON, KRYTON, SUNANDA SPECIALITY COATINGS, X CALIBUR CONSTRUCTION SYSTEMS INC, MC BAUCHEMIE, CHOWGULE, MYK SCHOMBURG, STP LTD, ARDEX ENDURA
13	ADHESIVES	FEVICOL, ANCHOR, DUNLOP, 3M, PIDILITE, SIKA, THERMOSHIELD, VAMORGANIC, MYK SCHOMBURG, VELOSIT, XCALIBUR CONSTRUCTION SYSTEMS INC, RACHTR CHEMICALS, CHOWGULE, STP LTD.
14	WEATHER SILICON SEALANT	WACKER, DOW CORNING, MCCOY, SOUDAL, SUNANDASPECIALITY COATINGS, RACHTR

		CHEMICALS, STP LTD.
15	BACKER ROD	SUPREME IND.LTD., SYSTRANS POLYMERS, RACHTR CHEMICALS
16	BITUMEN, CRMB-55, CRMB-60, PMB	INDIAN OIL, HINDUSTAN PETROLEUM, BHARAT, PETROLEUM, SWASTIK, SHIVA ASPHALT, OOMS PMR PVT LTD, BENGAL BITUMEN, STP LTD.
17	NON METALIC SURFACE HARDNER	FORSOC, SIKA, VELOSIT, MC BAUCHEMIE, SUNANDA SPECIALITY COATINGS, X CALIBUR CONSTRUCTION SYSTEMS INC, SUPREME BITUCHEM INDIA PVT LTD, MYK SCHOMBURG, RACHTR CHEMICALS, STP LTD.
18	SUNKEN PORTION / TERRACE WATERPROOFINGCEMENTITIOUS TREATMENT	VELOSIT, FORSOC, SIKA, MC BAUCHEMIE, SUNANDA SPECIALITY COATINGS, X CALIBUR CONSTRUCTION SYSTEMS INC, SUPREME BITUCHEM INDIA PVT LTD, MYK SCHOMBURG, BENGAL BITUMEN, CHOWGULE, FIRESTONE, STP LTD.
19	PVDF COATING	RADIANT, ANODIZERS, AKZONOBLE, VALSPAR
20	CURING COMPOUND	FORSOC, VELOSIT, SUNANDA SPECIALITY COATINGS, SIKA, BASF, MC BAUCHEMIE, SUPREME BITUCHEM INDIA PVT LTD, MYK SCHOMBURG, RACHTR CHEMICALS, STP LTD, ARDEX ENDURA
21	ACCESS FLOOR SYSTEM	KEBAO, COMFLOOR, M-FLOOR, MC BAUCHEMIE
22	PVC WATER STOPS	FOXOPAM, MARUTI RUBBER, VELOSIT, X CALIBUR CONSTRUCTION SYSTEMS INC.
23	CORROSION INHIBITING ADMIXTURE (ASTM G1,ASTM G3, ASTM G 109)	SUNANDA SPECIALITY COATINGS, BASF, FOSROC, SIKA, MYKSCHOMBURG, VELOSIT, STP LTD.
24	LIQUID APPLIED MODIFIED PU WATERPROOFING MEMBRANE FOR BRIDGE DECK WATERPROOFING /TERRACE WATERPROOFING	VELOSIT, SUNANDA SPECIALITY COATINGS, BASF, X CALIBUR CONSTRUCTION SYSTEMS INC, BENGAL BITUMEN, CHOWGULE, MYK SCHOMBURG, FIRESTONE, STP LTD, ARDEX ENDURA
27	EPOXY FLOORING	SUNANDA SPECIALITY COATINGS, SIKA, BASF, RACHTR CHEMICALS, CHOWGULE, MYK SCHOMBURG, STP LTD, ARDEX ENDURA
28	PU FLOORING	SUNANDA SPECIALITY COATINGS, SIKA, BASF, VELOSIT, X CALIBUR CONSTRUCTION SYSTEMS INC, RACHTR CHEMICALS, CHOWGULE, MYK SCHOMBURG, STP LTD, ARDEX ENDURA
29	INTUMESCENT FIRE COATINGS FOR STEEL STRUCTURE	SUKRI, NEWCHEM, SAPC INDIA, PROMAT, AKZO NOBEL, FSI LTD,
30	PU COATINGS FOR STRUCTURAL STEEL	SUNANDA SPECIALITY COATINGS, SIKA, VELOSIT, X CALIBURCONSTRUCTION SYSTEMS INC, CHOWGULE, STP LTD
31	EPOXY COATINGS FOR STRUCTURAL STEEL	SUNANDA SPECIALITY COATINGS, SIKA, X CALIBUR CONSTRUCTION SYSTEMS INC, RACHTR CHEMICALS, STP LTD.
32	EPDM & SILICON GASKET	HANU, ANAND, RAVEN, ZERO, ROOP, LESCUYER, BENGAL BITUMEN, AMEE

		RUBBER, OSAKA, ELTECH, AVIGIRI
	PAINTS	
1	WATER-PROOFING CEMENT PAINT	ASIAN, ICI LTD, BERGER, NEROLAC, SNOWCEM, RACHTR CHEMICALS, CHOWGULE, STP LTD
2	TEXTURED EXTERIOR PAINT	ASIAN, BERGER, NEROLAC, SUNANDA SPECIALITY COATINGS, ICI, CHOWGULE, STP LTD
3	SYNTHETIC ENAMEL PAINT	ASIAN, ICI LTD, BERGER, NEROLAC
4	PLASTIC/ACRYLIC EMULSION PAINT	ASIAN, ICI LTD, BERGER, NEROLAC, SUNANDA SPECIALITYCOATINGS, MYK SCHOMBURG, STP LTD
5	OIL BOUND DISTEMPER/ACRYLIC DISMTEMPER	ASIAN, ICI LTD, BERGER, NEROLAC, DULEX, INDIGO
6	CEMENT PRIMER	ASIAN, ICI LTD, BERGER, NEROLAC, SNOWCEM INDIA LTD.
7	PREMIUM ACRYLIC SMOOTH EXTERIOR PAINTEMULSION	BERGER, ASIAN, SUNANDA SPECIALITY COATINGS, NEROLAC, ICILTD
8	STEEL/ WOOD PRIMER	ASIAN, ICI LTD, BERGER, NEROLAC,
9	EPOXY PAINT	ASIAN, ICI LTD, BERGER, NEROLAC, SNOWCEM INDIA LTD, SUNANDA SPECIALITY COATINGS, RACHTR CHEMICALS
10	WOOD FINISH (MELAMINE & PU POLISH)	ASIAN, ICI LTD, BERGER, NEROLAC, PIDILITE, WEMBLEY, STP LTD.
11	THERMOPLASTIC PAINTS	ASIAN PAINTS, BERGER, RELIANCE THERMOPLAST, S.N. IND.OSCAR, AUTOMARK (INDIA) INDUSTRIES LTD, STP LTD
12	ROAD MARKING PAINT	NEROLAC, ASIAN, SHALIMAR, BERGER, STP LTD.
13	VACUUM DEWATERING SYSTEM	SWITECH INDIA PVT LTD, TREMIX FLOORING,
	WOOD WORK	
1	PLY BOARD, PLYWOOD	GREEN PLY/ GREEN PANEL, DURO, CENTURY, ARCHID, MERINO, NATIONAL, KITLAM
2	LAMINATE	ARCHID, MERINO, GREEN, CENTURY, KITLAM, FORMICA, NATIONAL
3	VENEER PLY, NATURAL WOOD VENEERS	MERINO, GREEN LAM, DURO, CENTURY, SONEAR, TRU-WOOD, MAYUR, ARCHID, KITLAM
4	PRELAMINATED PARTICLE BOARD	CENTURY, KITLAM, MERINO, ACTION TESA, ARCHID, NATIONAL, ECOBOARD, ANCHOR, BHUTAN BOARD, GREEN LAM
5	FLUSH DOOR	CENTURY, ARCHID, MERINO, KITLAM, NATIONAL, SWASTIK, CORBETT, KUTTY FLUSHDOOR, DURO, GREEN
6	GYPSUM BOARD	LAFARGE, SAINT GOBAIN GYPROC INDIA PVT. LTD, USG BORAL, AMF
7	LOCKS, LETCH	GODREJ, HARRISON, PLAZA, YALE, HETTICH, HARDWYN, DORMA

8	FRICTION STAY HINGES, BALL BEARING HINGES &SPRING HINGES	EARL-BIHARI, EBCO, GODREJ, DORMA, HAFELE, GEZE
9	NUTS, BOLTS & SCREWS	GKW, KUNDAN, PRIYA, ATUL, PUJA
10	DASH, ANCHORING FASTENERS & CRAMP	HILTI, FISCHER, TRIXEL FROM AXELINDIA, CANON, BOSCH
11	MDF/HDF BOARD	NIJWOOD, DURATUFE BAJAJ, MERINO, CENTURY, GREENPANEL
12	FRAME SYSTEM FOR INTERAL PARTITION	SAINT GOBAIN GYPROC INDIA PVT. LTD, GYPROC, USG BORAL, AMF
13	WALL PAPER	ROSELLE, EGOWALL PAPERE VESCOM
14	ACOUSTIC MINERAL FIBRE CEILING AND GRIDSYSTEM	USG BORAL, AMF, ARMSTRONG
15	THERMAL INSULATION BOARDS	U.P TWIGA FIBERGLASS LTD, LLOYD, ROCKWOOL INDIA, TWIGAINSULATING INDIA
17	IPE WOOD PANELS	TIMBER TRENDZ, KBJ INTERIORS, GRID FLOORS PVT LTD
18	PU POLISH FOR WOOD WORKS	ICA, ASIAN PAINTS, DULUX
19	TOILET CUBICLES	GREENLAM, MERINO, CENTURY
	ALUMINIUM, STEEL, FALSE CEILING, ROOF AND GLASS WORK	
1.	STAINLESS STEEL HARDWARE FITTINGS (HEAVYDUTY)	DORMA, OZONE, GODREJ, GEZE, HAFELE, BLUM, DORSET, PERGO
2.	ALUMINIUM SECTIONS FOR DOORS, WINDOWS&PARTITIONS ETC.	JINDAL, HINDALCO, INDALCO, NALCO, BHORUKA, INDAL,
3.	ALUMINUM SHEET	NOVELIS, EURAMAX
4.	ANODISED/POWDER COATED ALUMINIUM HARDWARE (HEAVY DUTY)	NU-LITE, SARGENT, EVERITE, GODREJ, HARDIMA, HARDWARE, CLASSIC, ALKA, JINDAL, PULSE
5.	CLEAR/FLOAT/ FROSTED GLASS	MODI, SAINT GOBAIN, ASAHI, PILKINGTON, GOLD PLUS, GLAVERBEL (BELGIUM)
6.	FIRE RETARDANT ALUMINIUM COMPOSITE PANEL	ALSTRONG, REYNOBOND, ALPOLIC, ALUDECOR, ALUCOBOND, ALSTONE, CROSS BOND, ALUBOND DACS
7.	STAINLESS STEEL SECTION	JINDAL, KICH, ESSAR, NSTYLE-D-LINE, FABRINOX, SALES STEEL, DORMA, GEZE, OZONE
8.	HIGH-PERFORMANCE SOLAR TOUGHENED GLASS	SAINT GOBAIN, ASAHI, PILKINGTON
9.	REFLECTIVE GLASS/LACQUE RED GLASS	SAINT GOBAIN, ASAHI, PILKINGTON, GLAVERBEL (BELGIUM), MODIGUARD, ATUL
10.	FALSE CEILING- GYPSUM	SAINT GOBAIN GYPROC INDIA PVT. LTD., LAFARGE, GYROC/BORAL
11.	FALSE CEILING- METAL WITH SUPPORTING GRID	SAINT GOBAIN, ARMSTRONG, DEXUNE, USG BORAL, ECOPHONE, DECOSONIC, DAIKEN, UNI-MAT
12.	ACOUSTICAL FALSE CEILING SYSTEM	ARMSTRONG, AMF, USG BORAL, SAINT GOBAIN, KNAUF DANOLINE

13.	AXIOMS	ARMSTRONG, AMF, USG BORAL, SAINT GOBAIN
14.	METAL MODULAR FALSE CEILING SYSTEM	ARMSTRONG, HUNTER DOUGLAS, TECHNO ACOUSTICS
15.	WOODEN METAL BAFFLE CEILING SYSTEM	ARMSTRONG, HUNTER DOUGLAS, TECHNO ACOUSTICS, DURLUM
16.	CALCIUM SILICATE FALSE CEILING SYSTEM	RAMCO HILUX, AEROLITE
17.	FIRE RATED GLASS/ HARDWARE	ST. GOBAIN, PILKINGTON, SCHOTT, SUKRITI
18.	TWO HOUR FIRE RATED METAL GLASS DOOR/HARDWARE	ST. GOBAIN, PILKINGTON, SCHOTT, SUKRITI
19.	UPVC WINDOW/DOORS	FENESTA, REHAU, ALUPLAST, PRIZMA, DUROPLAST, WINTECH, VEKA INDIA, KOMMERLING, APARNA PROFILES PVT LTD (OKOTECH)
20.	FIRE DOOR/HARDWARE	GODREJ, SHAKTI, NAVAIR, SUKRITI, PROMAT, KUTTY DOOR, BECKER FIRE SOLUTION
21.	PVC DOORS	RAJSHREE, FINOLEX PLASTICS, E-PLANTA, POLYLINE, DUROPLAST, SINTEX, FIBREWAYS, JAYNA
22.	FRP DOOR	FIBREWAYS, ASHOO MODEL ARTS, NAVIER, SUKARI PROMAT, KUTTY, JINDAL STAINLESS, BHATT FIBREWAYS, JAYNA, SELECTED
23.	FACTORY MADE SECTION WINDOW	M/S UNITED ENGG. WORKS, RAM NAGAR M/S METAL WINDOW CORP. ROHTAK M/S SKS STEEL INDUSTRIES PIRGARHI ANY OTHER ISI MARKED FACTORY MADE JANGID ENGINEERING WORKS (JAIPUR)
24.	PUFF INSULATED PANEL	LIOYD INSULATION, JINDAL, METECNO, SYNERGY, ROOFCLAD
25.	ANTI STATIC HIGH PRESSURE LAMINATE	FORMICA, MERINO, ANALCO, CENTURY, BAKELITE HYLAM, DECOLAM, SUNMICA (AICA)
26.	MIRROR	SAINT GOBAIN, MODIGUARD, AIS, ATUL, GOLDEN, PILKINGTON
27.	ROCKWOOL/GLASSWOOL INSULATION	TWIGAFIBER, LLYOD INSULATION, SUPREME, SIPLA, UNIFEB
28.	FRAME SYSTEM FOR INTERNAL	SAINT GOBAIN GYPROC, BOROL, AMS
29.	WIRE MESH	HAVER STANDARD, GRAND METAL, STRELING, TRIMURTYWELDED MESH, TIGER
30.	HYDRAULIC DOOR CLOSURE/FLOOR SPRING	HARDWYN, GODREJ, YALE, EVERITE, DOORKING, KELWIN, DORMA HAFELE, GEZE, DORSET, BECKER FIRE SOLUTION
31.	S.S. RAILING	JINDAL, ICICH, ESSAL, DORMA, CONNECT ARCHT., FABRINOX, STEEL N STYLE
32.	G.I. SHEET	SAIL, TATA, JINDAL, ISPAT, ROOFCLAD
33.	FIBRE GLASS SHEET	SIMCRYL(SIMBA), FIBREWAYS, ADVANCE FIBRE, ROOFCLAD
34.	ROLLING SHUTER	RAMA ROLLING SHUTTER, JYOTI ROLLING SHUTTER, ANANDINDST.SHRI RAM

		ROLLING SHUTTER
35.	M.S. DOOR, FITTINGS	ASHISH, OFFORD, GRAG, ADARSH
36.	SMOKE SEAL STRIP	IMPORTED PROMAT, ASTRO FLAME
37.	DOOR CLOSE LOCK	INGEROLL RAND, DORMA, DORSET, BECKER FIRE SOLUTION
38.	PANIC EXIT DEVICE	INGEROLL RAND, MONARCH, BECKER FIRE SOLUTION
39.	DOOR COORDINATOR	UL-LISTED, MONARCH
40.	TEMPERED GLASS	MODIFLOAT, SAINT GOBAIN, ASAHI, GLAVERBEL
41.	DOORS & WINDOW FIXTURE	EVERITE, GODREJ, HARDIMA, HARDWARE, KLASSIC, ALKA, JINDAL
42.	METAL FIRE CHECK DOORS	NAVAIR, SHAKTI-MET, GODREJ
43.	STEEL WINDOW	M/S UNITED ENGG. WORKS, RAM NAGAR M/S METAL WINDOW CORP. ROHTAK M/S SKS STEEL INDUSTRIES PIRGARHI ANY OTHER ISI MARKED FACTORY MADE JANGID ENGINEERING WORKS (JAIPUR)
44.	MS PRECOATED ROOFING SHEET	TATA BLUESCOPE, INTERRARCH MULTICOLOR STEEL, LLYODSTEEL, ISPAT STEEL, ROOFCLAD, FIBREWAYS, JSW
45.	FIBRE CEMENT BOARD (FLEX-O-BOARD)	HYDERABAD INDUSTRY LTD., VISHAKHA, EVEREST INDUSTRYLTD., JAMES HARDIE, SHERA
46.	LGSF FRAME	TATA BLUE SCOPE, J.S.W, ESSAR, ISPAT STEEL
47.	FABRICATORS FOR ALUMINIUM GLAZING, STRUCTURAL GLAZING, ALUMINIUM DOOR&WINDOWS, ACP WORK.	ALUMAX, WINDORZ INDIA PVT. LTD, JANGID ENGINEERINGWORKS (JAIPUR)
48.	STAINLESS STEEL FABRICATORS	VETERAN INDUSTRIES (INDIA), KANZ, D LINE, EARL BEHARI, ANAND
49.	GALVANISING	JENCO/STEEL LINE, LITE, KARAMTARA
50.	LAMINATE FLOORING	ARMSTRONG, PERGO, FLORENCE, ACTION TESA
51.	PVC FLOORING & VINYL WALL	ARMSTRONG, FORBO, GERELOR, INPROCORP
52.	WELDING ELECTRODE	RAAJRATNA ELECTRODES, ESAB INDIA, ADORE WELD LTD, HONAVAR ELECTRODE
53.	GLASS DOOR FITTINGS	DORSET, OZONE, HARDWYN, DORMA, HETTICH
54.	PVB OR SGP LAMINATION	DUPONT KURARRAY, SOLUTIA
55.	SPACER TAPE (OPEN PU CELL)	NORTON, TREMCO, BOW
56.	SPANDREL INSULATION	U.P TWIGA FIBERGLASS LTD, LLOYD, ROCKWOOL INDIA, TWIGA INSULATING INDIA
57.	ROCK WOOL (FIRE STOP)	ROCKWOOL INDIA, ROXUL ROCKWOOL.
58.	SMOKE SEAL INTUMUSCENT	HILTI, SIKA
59.	SMOKE SEAL SEALANT	HILTI, SIKA, DOW CORNING
60.	REVOLVING DOORS	DORMA, GEZE, KONE, BOONEDAM

61.	GLASS RAILING	Q RAIL, NEKI, KICH, FAÇADE ONE, ALLY DZINE SERVICES PVT. LTD
62.	CASEMENT WINDOW HINGES	GIESSE, ALUALPHA, LAVAL, SAVIO
63.	SS FRICTION HINGES	GIESSE, COTSWOLD, SECURISTYLE
64.	MULTIPOINT LOCKING SETS	GIESSE, ALUALPHA, LAVAL, SAVIO
65.	FLUSH LOCK FOR SLIDING'S	GIESSE, LAVAL, SOTRALU, ROTO, SAVIO
66.	ROLLERS FOR SLIDING'S WINDOWS / DOORS	GIESSE, LAVAL, SOTRALU, ROTO, SAVIO
67.	GLASS REINFORCE FIBRE CONCRETE MANUFACTURES AND INSTALLERS	SHENISHA CORPORATION, ARK INTERIOR AND CONSTRUCTION SOLUTIONS, YOGI GRC PRODUCTS PVT LTD
68.	FAÇADE CLEANING SYSTEM	CRADLE RUNWAYS INDIA PVT. LTD, APPLETREE
69.	GYPSUM PARTITION SYSTEM	SAINT GOBAIN GYPROC, USG BORAL
70.	INSULATION	U.P TWIGA FIBERGLASS LTD, LLOYD, ROCKWOOL INDIA
71.	MODULAR GLASS INTERIOR PARTITION SYSTEM	JEB, OTIC PARTITION, KUBIK, CETTERIO, DAMIAN
72.	TOUGHENED GLASS FOR PARTITIONS	SAINT GOBAIN, ASAHI INDIA GLASS, SCHOTT
73.	2HR FIRE RATED GLASS AND PARTITION SYSTEM	VETROTECH SAINT GOBAIN, SCHOTT TGS FIRE-RATED GLASS
74.	FIRE COATING FOR STEEL STRUCTURE	SUKRI. NEWCHEM
75.	WOODEN DOOR FRAME (FACTORY MADE)	KUTTY, DS DOOR, JAYNA, GOYALA INDUSTRIAL, GREEN
	WATER SUPPLY AND SANITARY WORKS	
1	FIRECLAY SINKS & DRAIN BOARDS	PARRY, SANFIRE
2	G.I. FITTING (MALLAEBLE CAST IRON)	UNIK, ICS, AMCO, KS, NVR
3	C.I. DOUBLE FLANGED NON-RETURN VALVES	KIRLOSKAR, SANT, KARTAR
4	PTMT FITTINGS	PRYAG, POLYTUF
5	KITCHEN LOFT TANK	SINTEX, TIRUPATI, KMS, PLANET, SRI KAMAKSHI, SREYAH NOVEL
6	PLASTIC SEAT COVER	HINDWARE, CERA, PARRYWARE, KOHLER, NYCER, JOHNSON PEDDAR, JAQUAR, ESSCO
7	PVC CISTERN	HINDWARE, CERA, PARRYWARE, KOHLER, NYCER, JOHNSON PEDDAR, JAQUAR, ESSCO
8	C.I. MANHOLES COVERS	BIC, KAPILANSH DHATU UDHYOG, NEECO, RIF, BCM, SKF, HIF
9	BRASS STOP & BIB COCK	ZOLOT, SANT, L&K, JAQUAR, ESSCO
10	BRASS BALL VALVE WITH FLOATS	ZOLOTO, LEADER, SANT
11	SS HINGED GRATING	GMGR, NEER, CHILLY
12	SANITARY ACCESSORIES	JAQUAR, KIMBERLY, CLARKE, DLINE, EURONICS, CARL-F, KOHLERSNEARLING, KEROVIT, PARKO, KINGSTON, PARK, PRAYAG, HINDWARE, ESSCO
13	BACK UP ROD	SUPREME INDUSTRIES
14	MASKING TAPES	SUNCONTROL, WONDER POLYMER
15	TREATMENT ON MS BRACKETS	GALVANISED BRACKETS AS PER IS :4759-1996,610
16	PVC CONTINUOUS FILLET FOR PERIPHERY PACKINGOF GLAZING CURTAIN WALL	ROOP, ANAND, FOREX PLASTIC

17	C.P. ACCESSORIES	GEM, PARKO, KINGSTON, HINDWARE, CERA, JAQUAR, ESSCO,
18	MOISTURE RESISTANT BOARD	ST-GOBAIN, GYPROC, USG BORAL,
19	STAINLESS STEEL MESH	GKD/WMW/TIGER/BALAJI MESH
20	FLOOR TRAP	JAINA, CHILLY, NIRALE
21	VITREOUS CHINA SANITARYWARE AND FITTINGS	HINDWARE, CERA, PARRYWARE, KOHLER, NYCER, JOHNSONPEDDAR, SOMANY, JAQUAR, ESSCO
22	STAINLESS STEEL SINKS	NEELKANTH, JAYNA, FRANKE, ANUPAM, NIRALI, COBRA, ALEX, JAYNA, AMC, PRAYAG, CERA, KINGSTONE
23	C.P. BRASS FITTINGS	JAQUAR, SOMANY, PARRYWARE, GROHE, KOHLER, GEM, PARKO, KINGSTON, PARK, PRAYAG, HINDWARE, JOHNSON, ESSCO
24	CENTRIFUGALLY CAST (SPUN) IRON PIPES & FITTINGS	NECO, RIF, SKF, ACL, HEPCO, MARC, GEM, BIC, HIF, JAISWAL, BC
25	CENTRIFUGALLY CAST (SPUN) IRON PIPES (CLASS LA)	RIF, NECO, SKF, ACL, HIF
26	CPVC PIPES & FITTINGS	ASTRAL, PRINCE, SUPREME, FINOLEX, PRAKASH, AJAY, ASHIRWAD, BIRLA AEROCON, KISAN, APL APOLLO
27	G. I. PIPES	TATA, JINDAL (HISSAR), ZENITH, PRAKASH SURYA, G.S.T., KALINGA,
28	G. I. FITTINGS	UNIK, ZOLOTO, KS, ICS, R, K.S, NVR, JINDAL, R BRAND, AMCO
29	UPVC PIPES & FITTINGS	ASTRAL, PRINCE, SUPREME, FINOLEX, PRAKASH, AJAY, ASHIRWAD, BIRLA AEROCON, KISAN, APL APOLLO
30	GUNMETAL VALVES	LEADER, SANT, ZOLOTO, KIRLOSKAR, CASTLE, KARTAR, KILBURN
31	BALL VALVES	LEADER, SANT, ZOLOTO, CASTLE, IBP, ARCO
32	BUTTERFLY VALVES	LEADER, SANT, ZOLOTO
33	C.I. SLUICE VALVES	KIRLOSKAR, IVC, BURN
34	SFRC MANHOLE COVER	KK, JAIN, PRAGATI, BIC, KAPILANSH DHATU UDHYOG, NECO, RIF, BCM, S.S. & CO.
35	RCC PIPES	JAIN, PRAGATI, KK, LAKSHMI, SOOD & SOOD, JAIN & CO., USHA, DIWAN SPUN PIPE,
36	LA (CI) PIPES	RIF, NEECO, ELECTRO STEEL, IISCO, NEECO, KAPLANSH
37	PPR PIPES	SFMC, SAFE, PIONEER INDST., SUPREME, RELIANCE
38	DUCTILE IRON PIPE (WATER SUPPLY)	ELECRO STEEL, KESSO, KDUPL, ELECTRO SPUN
39	SEWERAGE & DRAINAGE PUMPS	KIRLOSKAR, KSB, CROMPTON GREARES
40	HDPE PIPES & FITTINGS	JAIN, ORIPLAST, KISAN
41	G.I. PIPE JOINTING MATERIALS	LOCTITE 55/DR. FIXIT, MC BAUCHEMIE
42	STONWARE PIPES AND GULLY TRAPS	PERFECT, BURN, ANAND, PARRY, SKINS GROHE, HIND
43	WATER PUMPS	KIRLOSKAR, KSB, HARRISON

44	ELECTRICAL MOTORS	SIEMENS, KIRLOSKAR, NGEF
45	PVC WATER TANK	SFMC/SINTEX/SPL, UNITEK, SHEETAL, POLYCON ELECTRO PLAST, STAR, LOTUS
46	SEWAGE WATER/RAIN WATER PIPES	ASTRAL, PRINCE, SUPREME, FINOLEX, PRAKASH, AJAY, ASHIRWAD, BIRLA AEROCON, KISAN
47	FURNITRUE	GODREJ, DELITE, GEEKAN, FEDRELITE.
	STONE AND OTHER WORKS	
1	CLAMP SYSTEM FOR DRYSTONE CLADDING	HILTI, FISCHER, BOSCH, TRIXEL FROM AXEL INDIA
2	FRP CHAJJA, SHEET & DOORS, FRP SHUTTERS, RAILINGS, COVERS	FIBREWAYS, ASHOO MODEL ARTS, NAVIER, SUKARI PROMAT, KUTTY, JINDAL STAINLESS, BHATT FIBREWAYS
3	GRC/FRP SCREENS/RAILING/JALI/ CORNICES/STATUES/PANELS/MOULDING	TERRA FIRMA, JINDAL STAINLESS
4	POLY CARBONATE SHEET	SABIC LEXAN, BAYER, COXABELL, ROOFCLAD, MNF METALS, PCLITE

The Agency is required to get prior approval of Engineer-in-charge for the make of the material to be used in the work. In case of non-availability of material from these manufacturers, the Hon'ble Vice Chancellor, DTU may allow use of alternative BIS approved manufacturer makes.

Chief Project Officer

FORM 'A'

FINANCIAL INFORMATION

I. Financial Analysis –

(c) Details to be furnished duly supported by figures in balances sheet / profit & loss account for the last three years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached).

Financial Year	**2022-23**	**2023-24**	**2024-25**
Gross Annual turnover on Renovation and upgradation works of buildings.			
Profit / Loss after tax **			

(d) The information supplied shall be the annual turnover on construction work of the bidder in term of the amount billed to client for each year for work in progress or completed.

II. Financial arrangements for carrying out the proposed work.

* Amount to be filled in all columns ** Loss to be shown in with (-) sign

Signature of Bidder(s).

Signature of Chartered Accountant with Seal.

FORM 'B'

FORM OF BANKER'S CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that ..... M/s / Sh having marginally noted address, as a customer of our bank are/is respectable and ..... can be treated as good for any engagement upto a limit of Rs…….....…(Rupees.....).

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature) For the Bank

NOTE:

(1) Banker's certificates should be on the letter head of the Bank, address to tendering authority.
(2) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

OR

FORM "B–1"

Form of Certificate of Net Worth from Chartered Accountant

"It is to certify that as per the audited balance sheet and profit & loss account during the financial year....., the net worth of Shri/M/s ……..……... (Name & Registered Address of individual/firm/company), as on ……..… (the relevant date) is Rs. ……after considering all liabilities. It is further certified that the Net Worth of the individual/firm/company has not eroded by more than 30% during the last three years ending on (the relevant date)".

(Signature of Chartered Accountant)
(Name of Chartered Accountant)
Membership No. of ICAI
Date and seal

ANEEXURE-A

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST SEVEN YEARS ENDING PREVIOUS DAY OF LAST DAY OF SUBMISSION OF TENDERS

S. No.	Name of work / project and location	Owner or sponsoring organizatio n	Cost of work in crore of rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation / Arbitration cases pending / in progress with details *	Name and address / telephone number of officer to whom reference may be made	Whether similar works have been executed on back to back basis (Yes/No)
1	2	3	4	5	6	7	8	9	10

* Indicate gross amount claimed and amount awarded by the Arbitrator

SIGNATURE OF BIDDER(S)

Correction……..
Deletion…….
Insertion…….

Schedule of Quantities of Civil Works

J.E(E)/J.E.(C)

Correction……..
Deletion…….
Insertion…….

Schedule of Work (Civil)

Name of work:- Up-gradation/renovation and furniture work in Autonomous Underwater Vehicle (AUV Lab) Lab located at backside of Wind Tunnel at DTU campus.

Sr. No	Description	Qty	Unit	Rate (Rs.)	Amount (Rs)
1	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 metres lead.	15.00	Sqm	266.45	3,996.75
2	Dismantling steel work in built up sections in angles, tees, flats, bars and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within 50 metres lead.	100.00	kg	5.65	565.00
3	Dismantling cement asbestos, aluminium section or other hard board ceiling or partition walls including stacking of serviceable materials and disposal of unserviceable materials within 50 metres lead.	50.00	Sqm	56.35	2,817.50
4	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge. In cement mortar.	1.00	Cum	2,060.20	2,060.20
5	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in- charge	1.50	Cum	3,551.25	5,326.88
6	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to openings /wooden frames with Rawl plugs screws etc	150.00	kg	238.35	35,752.50
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete up to plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	300.00	kg	107.85	32,355.00
8	Mirror polishing on marble work/Granite work/stone work where ever required to give high gloss finish complete	130.00	Sqm	506.70	65,871.00

J.E(E)/J.E.(C)

Correction……..
Deletion…….
Insertion…….

9	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : 25 mm thick	20.00	Sqm	1,948.25	38,965.00
10	Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	10.00	Sqm	2,354.70	23,547.00
11	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15 cm deep and disposal of rubbish, lead up to 50 m and lift up to 1.5 m. All kinds of soil	100.00	Sqm	34.15	3,415.00
12	Providing and laying 60 mm thick factory-made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50 mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.	545.00	Sqm	972.00	5,29,740.00
13	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and for all lift, as directed by Engineer-in-charge. All kinds of soil	25.00	cum	117.50	2,937.50
14	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
14.1	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).	27.00	cum	6,812.00	1,83,924.00
14.2	1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)	25.00	cum	7,878.50	1,96,962.50
15	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	80.00	sqm	374.05	29,924.00
16	Repair to plaster of thickness 12 mm to 20 mm in patches of area 2.5 sqm and under, including cutting the patch in proper shape, raking out joints and preparing plastering the wall surface with white cement based polymer modified self-curing mortar, including disposal	50.00	sqm	670.95	33,547.50

	of rubbish, all complete as per the direction of Engineer-In-Charge.				
17	Providing and fixing double scaffolding system (cup lock type) on the exterior side, up to seven story height made with 40 mm dia M.S. tube 1.5 m centre to centre, horizontal & vertical tubes joining with cup & lock system with M.S. tubes, M.S. tube challies, M.S. clamps and M.S. staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for the required duration as approved and removing it thereafter. The scaffolding system shall be stiffened with bracings, runners, connection with the building etc wherever required for inspection of work at required locations with essential safety features for the workmen etc. complete as per directions and approval of Engineer-in-charge. The elevational area of the scaffolding shall be measured for payment purpose. The payment will be made once irrespective of duration of scaffolding. Note: - This item to be used for maintenance work judicially, necessary deduction for scaffolding in the existing item to be done.	200.00	sqm	338.25	67,650.00
18	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	45.00	metre	78.40	3,528.00
19	Providing and fixing mild steel round holding down bolts with nuts and washer plates complete.	100.00	kg	97.20	9,720.00
20	Supply and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	405.00	sqm	156.05	63,200.25
21	Finishing walls with textured exterior paint of required shade: New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	300.00	sqm	223.60	67,080.00
22	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two or more coats on new work	400.00	Sqm	155.90	62,360.00
23	Removing dry or oil bound distemper, putty, water proofing cement paint and the like by scrapping, sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete.	650.00	Sqm	25.15	16,347.50
24	Distempering with 1st quality acrylic distemper (ready mixed) having VOC content less than 50 gram/litre, of approved manufacturer and of required shade and	350.00	Sqm	185.65	64,977.50

	colour all complete to achieve even shade and colour: New work (two or more coats) over and including water thinnable priming coat with cement primer having VOC content less than 50 gram/litre				
25	Providing and fixing fly proof stainless steel grade 304 wire gauge, to windows and clerestory windows using wire gauge with average width of aperture 1.4 mm in both directions with wire of dia. 0.50 mm all complete. With 12 mm mild steel flat beading (M.S. Flat shall be paid extra)	10.00	Sqm	1228.00	12,280.00
26	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	8.00	cum	7,370.65	58,965.20
27	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:4 (1 cement : 4 coarse sand)	10.00	cum	9,344.35	93,443.50
28	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 and for all lift.	25.00	cum	196.00	4,900.00
29	Centering and shuttering including strutting, propping etc. and removal of form work for:				
29.1	Foundations, footings, bases for columns and coping work.	10.00	sqm	392.15	3,921.50
29.2	Columns, Pillars, Piers, Abutments, Posts and Struts	25.00	sqm	961.30	24,032.50
29.3	Suspended floors, roofs, landings, balconies and access platform	12.00	sqm	927.25	11,127.00
30	Washed stone grit plaster on exterior walls height up to 10 metre above ground level, in two layers, under layer 12 mm cement plaster 1:4 (1 cement : 4 coarse sand), furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per square metre, top layer 15 mm cement plaster 1:1/ 2:2 (1 cement: 1/2 coarse sand : 2 stone chipping 10 mm nominal size), in panels with groove all around as per approved pattern, including scrubbing and washing the top layer with brushes and water to expose the stone chippings ,complete as per specification and direction of Engineer-in-charge (payment for providing grooves shall be made separately).	140.00	sqm	1162.25	1,62,715.00

31	Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer, including removal of wooden battens, repair to the edges of panels and finishing the groove complete as per specifications and direction of the Engineer-in-charge: 15 mm wide and 15 mm deep groove	80.00	Mtr	75.15	6,012.00
32	Providing and fixing of steel tubular section in built up work (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes	14500.00	Kg	194.40	28,18,800.00
33	Providing and fixing up to floor five level precast cement concrete string or lacing courses, copings, bed plates, anchor blocks, plain window sills, shelves, louvers, steps, stair cases, etc., including hoisting and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand), cost of required Centering complete. 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)	1.00	Cum	10105.10	10,105.10
34	Providing and fixing hard drawn steel wire fabric of suitable size to window frame, M.S. Covering of Balcony for all height with M.S. flat/ beading (to be paid extra in basic item of built-up section work) etc. including priming coat with approved steel primer all complete as per the directions of Engineer-in-Charge.	1240.00	kg	138.24	1,71,417.60
35	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	2000.00	kg	133.70	2,67,400.00
36	Providing and fixing 18 mm thick gang saw cut, mirror polished, pre moulded and pre polished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) or fix with adhesive/ aerolite materials whereever required, joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing of edges to give high gloss finish etc. complete at all levels.				
36.1	Granite stone slab of colour black, Cherry/Ruby red. Area of slab over 0.50 sqm	20.00	Sqm	5136.30	1,02,726.00

37	Raising manhole cover and frame slab to required level including dismantling existing slab and making good the damage as required (Raising depth of manhole to be paid separately) :				
37.1	Rectangular manhole 90x80 cm with rectangular cover 600 x 450 mm of grade LD - 2.5	6.00	Each	2625.50	15,753.00
38	Providing and placing in position 100 mm thick factory made machine batched & machine mixed Precast RCC Rectangular Covers on drains of footpath of various sizes, of M-25 grade cement concrete for RCC work, including cost of centering, shuttering, reinforcement of 8 mm dia TMT bars of Fe 500 grade @ maximum 100 mm c/c on both ways, neat cement punning on finished surface, properly encased on all edges with 1.6 mm thick, 100 mm wide MS sheet duly painted over priming coat, reinforcement to be welded at edges with MS sheet and providing 2 Nos. 12 mm dia bar for hooks etc including cost of cartage, all leads & lift, handling at site etc. all complete as per direction of Engineer-in-Charge.	10.00	Sqm	3081.95	30,819.50
39	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge. Nominal concrete 1:3:6 or richer mix (including equivalent design mix)	5.00	Cum	2434.25	12,171.25
40	Extra for depth for manholes : Size 90x80 cm. With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4.00	Mtr	8825.40	35,301.60
41	Extra for depth beyond 45 cm of brick masonry chamber : For 455x610 mm size. With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	3.00	Mtr	6117.00	18,351.00
42	Supply and placing in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 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)	8.00	Cum	9045.75	72,366.00
43	Welding by gas or electric plant including transportation of plant at site etc. complete.	500.00	Mtr	3.70	1,850.00

44	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	100.00	Sqm	54.65	5,465.00
				Total Rs.	**54,86,493.33**
				Multiplying factor (0.973) on DSR 2023 items	**53,38,358.01**
				Add cost Index @3%	**1,60,150.74**
				Total (A)	**54,98,509.00**
NSR Items					
45	Providing & fixing UV stabilised fiberglass reinforced plastic (FRP) sheet roofing up to any pitch, including fixing with polymer coated 'J' or 'L' hooks, bolts & nuts 8mm dia. G.I plain/bitumen washers complete but excluding the cost of purlins, rafters, trusses etc. The sheets shall be manufactured out of 2400 TEX panel rovings incorporating minimum 0.3% ultra-violet stabiliser in resin system under approximately 2400 psi and hot cured. They shall be of uniform pigmentation and thickness without air pockets and shall conform to IS 10192 and IS 12866. The sheets shall be opaque or translucent, clear or pigmented, textured or smooth as specified.	50.00	Sqm.	883.60	44,180.00
46	Providing and fixing aluminium casement/ sliding doors/windows /ventilator partition in powder coating of required colour like ivory, brown, white of required sections i.e. 100 mm on fixed portion and 80 mm on shutters and thickness (18 gauge) along with float glass- 5.50 mm thickness with the provision of window Air-Conditioners with necessary fittings like tower bolt-4", Handle-4", floor spring, door closer etc. all complete as per direction of Engineer-in-charge.	250.00	Sq. ft	680.00	1,70,000.00
47	Extra for transforming M.S bars into M.S Spikes to be fixed over railing/fencing of suitable size and shape including priming coat as where ever required as per the directions of Engineer-In-Charge (Payment of M.S bar for spike shall be made in basic item of built up sections)	180.00	Each	35.50	6,390.00

48	Providing and fixing of composite factory-made continuous line prefabricated sandwich LP-PUF 40 roofing panel comprising of two sides facing of colour coated Galvalume steel sheet and sandwiched between them N-Pantene blown CRC & HCFC free Zero ODP (Zone Depletion Potential) close cell high density rigid Polyurethane (PUF) foam insulation of 40+2 kg/m3, having a thermal conductivity volume of 0.023 w/mk. The outer sheet is profiles sheet of 0.5mm TCT PPGTL (Pre painted Galvalume sheet) sheet of 150gsm Al-Zinc Alloy Coating, minimum 550 Mpa yield strength having a crest depth of 41mm at a pitch of 333 mm Centre. The cover width of panel shall be 1000mm. (Flashing with G.I. sheet is included in this item) nothing shall be paid extra for any accessories.	300.00	Sqm	2642.00	7,92,600.00
Furniture work					
49	Supply and placing in position of wooden Overhead storage for storage duly made of 18mm thick pressed ply/ Commercial board both side laminated with laminated sunmica sheet 1.0mm thick (Merino, century) having doo(double leaf) with locking arrangement and fittings like handle, magnetic catcher etc. with shelves as per requirement as per the design and drawing including fixing of fixture and fitting all complete as per sample approved and as per direction of Engineer-in-Charge. Size: 4' X 2' X 2.6' mm. (make of board / veneer Green, Duro, Century).	12.00	Each	16500.00	1,98,000.00
50	Supply and placing of wooden Workstation duly made of 18 mm thick pressed ply board having fixed pedestal consisting of 2 drawer and one filing drawer of size 450 x675 x700mm (WxDxH) made up of 19mm thick commercial board (ISI Mark water proof) teak wood beading/design moulding on all edges 4 mm thick teak veneer of approved quality, colour and shade fixed on all outer and inner surfaces half round beading, having with fine quality PU polish in desired colour and shade (as per drawing) with all electricity PowerPoint sockets all complete as per direction and sample approved by Engineer-in-Charge (make of board / veneer Green, Duro, Century). (Size: 1200x900x750mm Dimension)	12.00	Each	18500.00	2,22,000.00

51	Supply and placing of Medium back revolving chair / visitor chair ck fabric chair with synchronist mechanism, 12mm thick hot pressed ply covered with moulded PU foam in seat & back, ABS cover in seat & back, PU arm rest, steel inserted base all complete as per direction and sample approved by Engineer-in-Charge. The overall dimensions of the chair shall be 65.0cm x 62.3cm x 90.50cm. The seat height shall be 70.00cm. The cushioned seat and back is made of injection moulded Plastic outer and Inner. Plaster inner is upholstered with stitched cover and moulded high Resilience Polyurethane foam of density 45kg per meter cube. The stitched cover is made from spacer fabric and leatherette. Seat size shall be 60.5cm x 50cm. The Back size shall be 62cm x 55.00cm. The armrests top is moulded from PU and mounted on to a drop lift adjustment type tubular armrest support made of 3.8cm diameter x 0.2cm thick MS ERW tube. The tubular frame shall be powder coated DFT 40-60 microns and is cantilever type and made of 2.54cm X 0.2cm thick MS ERW tube. The back is connected to frame through powder coated high pressure die cast connector piece all complete as per direction and sample approved by Engineer-in-Charge.	15.00	Each	8300.00	1,24,500.00
52	Supply and fixing Pin Board duly made from superior quality fabric/cloth of approved colour and fixed on MDF board of 18 mm thickness, as per the design and drawing including of fixture and fitting all complete as per direction of Engineer-in-Charge.	20.00	Sqm	2800.00	56,000.00
53	Supply of wooden Meeting Table (Capsule/Oval/ Rectangular/Square shape) as desired made of 18mm thick commercial pressed ply teak wood beading/design moulding on all edges 4.00mm thick teak veneer/1.00 mm thick sunmica of approved quality, colour and shade fixed on all outer surfaces i.e. top, sides and legs etc. and 18mm thick commercial press ply and finished with teak wood design/ half round beading, with electrical pop of box having with fine quality lacquer/melamine polish in desired colour and shade all complete as per direction of Engineer-In-Charge. (12 ft X 4 Ft) (make of board / veneer Green, Duro, Century).	1.00	Each	45423.00	45,423.00
54	Supply and fixing Magnetic White Board, as per the design and drawing including of fixture and fitting all complete as per direction of Engineer-In-Charge. (Size: 1800x1200mm)	2.00	Each	13500.00	27,000.00
				Total (B)	**16,86,093.00**
				Total (A+B)	**71,84,602.00**

J.E (Civil) **A.E (Civil)** **Executive Engineer**

J.E(E)/J.E.(C)

Correction……..
Deletion…….
Insertion…….

CORRIGENDUM TO FORM-7 (CPWD)

S.No.	FOR	READ
1.	Govt. of India	Govt. of National Capital Territory of Delhi.
2.	President of India	Board of management, DTU
3.	Superintending Engineer/ Chief Engineer	Hon'ble, V.C. Delhi Technological University
4.	Department	Delhi Technological University
5.	Administrative Head	Hon'ble, V.C. Delhi Technological University
6.	Ministry of Works & Housing	Govt. of National Capital Territory of Delhi.
7.	Engineer-in-Charge	Chief Project Officer/ Executive Engineer, DTU

J.E(E)/J.E.(C)

Correction……..
Addition……..
Deletion……..

Digitally signed by Bimal Jain
Date: 2026.10.31 14:24:35 IST
Location: NCD of Delhi-DL