SOUTH DELHI MUNICIPAL CORPORATION

Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

(1) Date of Pre-bid Meeting 31.01.2018 At 02.00PM
(2) Last date of Tender Submission 14.02.2018 upto 02.00PM
(3) Date of Tender Opening 14.02.2018 at 02.30PM

Place of Per-bid Meeting, Tender Submission and Opening
Superintending Engineer (DEMS), SDMC,
2nd Floor, Dr. SPM Civic Centre, New Delhi- 110002
Tel:- +011-23722787 e-mail:- eep1mcd@gmail.com
NOTICE INVITING TENDERS

Executive Engineer (DEMS Store) SDMC, on behalf of the Commissioner, SDMC invites tenders in Double Bid system from the experienced/qualified agencies/organizations for the work of “Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla”

Estimated Cost: Rs. 46,73,44,600/-,
EMD: Rs. 93,50,000/-
Tender Fee Rs. 25,000/-.

The Eligibility Criteria:

1. The Bidder shall necessarily be a legally valid entity either in the form of a Proprietorship, Partnership, Limited Company, Private Limited Company registered under the Companies Act, 1956/Society registered under the Society’s Registration Act etc. **Bidder in the form of Joint Venture is permitted.**

2. The Bidder should have **satisfactorily completed civil works during the last seven years ending 31st March 2017, One work costing not less than Rs. 3739.00 Lacs Or Two works each costing not less than Rs. 2805.00 Lacs Or Three works each costing not less than Rs. 1870.00 Lacs**

   AND

   **Must have satisfactorily completed during the last seven years ending 31st March 2017, One work of supply and installation of minimum 90,400 sqm Geosynthetic Liner work of minimum 1.5 mm thickness Or Two works of supply and installation of minimum 67,800 sqm Geosynthetic Liner work of minimum 1.5 mm thickness Or Three works of supply and installation of minimum 45,200 sqm Geosynthetic Liner work of minimum 1.5 mm thickness.**

3. Average annual financial turnover of the bidder in the immediate last 3 consecutive financial years should be **Rs. 23.37 Crores.** The bidder/agency should not have incurred any loss in more than two year during the last five years ending 31st March 2017. The bidders shall submit the financial data in enclosed format.

4. The technical and financial requirement have to be met jointly by the JV partners in case of a JV.
S.D.M.C. shall hold a pre-bid meeting with the prospective bidders on **31.01.2018 at 02.00PM** in the office of **Suptd. Engineer (DEMS), SDMC, 2nd Floor, Dr. SPM Civic Centre, New Delhi-110002**. Clarifications on issues raised during this pre-bid discussion, would be uploaded on Corporation's web site [www.mcdonline.gov.in](http://www.mcdonline.gov.in) ONLY and shall not be communicated in any other form. Hence the prospective bidders are requested to regularly scan through said website for any update. The Tender document/RFP can be downloaded from SDMC’s website [www.mcdonline.gov.in](http://www.mcdonline.gov.in). The last date of submission of the bid document is **12.02.2018 till 02.00PM (IST)** in the office of **Suptd. Engineer (DEMS), South Delhi Municipal Corporation, 2nd Floor, SPM Civic Centre, New Delhi-110002**.

Ex. Engineer (DEMS Store)
SDMC
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CHAPTER-I  NOTICE INVITING TENDER

To,

The Prospective Bidders

Sub: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

Dear Sir,

1. The South Delhi Municipal Corporation (SDMC) invites item rate tenders (Two- bid system) from the eligible firms who qualify the eligibility criteria, as mentioned in the tender document for the above mentioned work.

2. A demand draft of Rs. 25,000/- for Tender fee drawn on Nationalized/Scheduled Bank in favour of Commissioner, South Delhi Municipal Corporation shall be attached with the Tender offer. Without tender fee, tender will not be considered.

3. Earnest Money : Rs. 93,50,000/- (Rs. 20 Lacs to be deposited in the form of bankers cheques/demand draft/ FDR of a Scheduled Bank & balance may be deposited as Bank Guarantee drawn on Nationalized/Scheduled Bank in favour of Commissioner, South Delhi Municipal Corporation) shall be attached with the Tender. Tenders not accompanied E.M.D. will not be considered.

4. After award of the work, the successful tenderer shall have to submit Performance Guarantee @ 5% of the contract value in the form of Bank Guarantee from any Nationalized/Scheduled Bank in favour of Commissioner, South Delhi Municipal Corporation, initially valid for a period of 20 months initially.

5. Apart from the performance guarantee, security deposit @ 5% shall be deducted from the each running bill payable to the contractor.

6. Two sets (One Original + One Xerox copy) of Technical Bid duly completed in all respects shall be submitted as described further, so as to reach at the following address on or before the last date and time mentioned in tender notice.

   Suptd. Engineer (DEMS)
   South Delhi Municipal Corporation
   2nd Floor, SPM Civic Centre, New Delhi- 110002

7. Earnest Money Deposit and Tender Fee in the form of Demand Draft should be sealed in separate envelope and the same shall be sealed alongwith Technical Bid envelope and Financial Bid envelope in the large container envelope.

8. S.D.M.C. reserves the right (i) to change, alter or to waive any technical or commercial terms, conditions and qualification (ii) to reject all the tenders or the lowest or any other tender in part or full without assigning any reason whatsoever (iii) for making changes / relaxation in eligibility criteria at any time (iv) to split the tender and award to more than one tenderer in the interest of public. The tenderers shall have no cause of action or claim against the corporation or its officers, employees, successors or assignee for rejection of his tender.
9. The S.D.M.C. reserves the right to terminate the contract at any stage after award of the contract without giving any reasons.

10. The Civil & Geosynthetic work of Sanitary Landfill would be executed concurrently. The Contractor’s quotation for the works shall include all the necessary equipment and skilled manpower to carry out the job satisfactorily in the stipulated time.

11. The tender submitted with any conditions will not be accepted and will be rejected outright.

12. The tenderer shall quote item rate both in figures and words in tender document (Price Bid). The tenderer shall also work out the total tender amount and shall write this tender amount in words and figures as per the quoted rates.

13. Incomplete tender which does not fulfill any of the above conditions will be liable for rejection. Tender will also be liable to be rejected if-
   a) The tenderer proposes any alteration in the work specified or in the time allowed in carrying out the works or make corrections in Schedule of Quantities.
   b) Any of the page or pages in the tender is / are removed or replaced.
   c) The item rate amount as per quoted is not entered in ink, in figures and words in Price Bid. As also amount is not written in word and figure and signed.
   d) All corrections, additions or pasted slips are not initialed by the tenderer.
   e) Any erasure is made in the tender.
   f) The tenderer or in the case of a firm, each partner or the person holding the power of attorney thereof does not sign or the signature(s) is (are) not attested by the witness, wherever it is required.
   g) Earnest money and Tender Fee for required amount are not submitted with the tender.
   h) The tenderer returns the tender document without signing each and every pages of the bid and amendments, if any.

14. It must be clearly and distinctly understood that the conditions of contract and specifications shall be rigidly enforced and no relaxation on any ground shall be allowed.

15. The rates given in the Price Bid are Inclusive of all types of taxes and no claim in this context shall be entertained. Contractor shall not be paid any extra due to increase in any type of Government Taxes. Any variations in taxes etc. shall be borne by the contractor.

16. The labour cess @ 1% shall be deducted from the bills payable to the contractor.

17. It is considered that the tenderer has visited the site of work, fully acquainted himself with the local situations regarding materials, labour and other factors pertaining to work and studied the plans and estimates before submitting the tender.

18. It will be the responsibility of the bidder to arrange for necessary import license and clearance of Govt. of India in time, if required, so that the imported plant or equipment could be utilized for the proposed work. The bidder has to assure SDMC that he is in a position to import the plant or equipment at the time of commencement of proposed work.
19. In the event of a discrepancy between description in words and figures in quoting rates as well as the total offered amount by the tenderer, the description in words shall prevail.

20. In case, a tenderer withdraws or modifies the offer on his own during the Tender validity period, SDMC reserves the right to forfeit in full the earnest money deposit apart from other action as deemed fit.

21. The tenderer shall strictly observe all the requirements laid down in the Contract Labor (Regulation and abolition) Act, 1970 and the Contract Labor (Regulation and Abolition) (Delhi) Rules, 1972 and other Labor Laws/Acts as amended from time to time so far as applicable. The tenderer should obtain necessary permission, license and registration from the labor commissioner, as per labor law.

22. The work is to be completed in all respects within 18 months inclusive of monsoon, reckoned from the 10 days for the date of issue the letter of acceptance/written order to commence the work. The contractor shall take approval of all documents & drawings from SDMC.

23. The tenderer is required to check the SDMC website for Addendum (if any) before the last date and time of tender submission. The tenderer who quotes the tender without attaching the addendum will be rejected.

24. S.D.M.C. shall hold a pre-bid meeting with the prospective bidders on 31.01.2018 at 02.00PM in the office of Suptd. Engineer (DEMS), South Delhi Municipal Corporation, 2nd Floor, SPM Civic Centre, New Delhi- 110002. The prospective bidders are requested to submit their queries related to various aspects of the tender documents. The bidders are further expected to give their suggestion on the technical specification related to the instant work. The queries/suggestion shall be preferred to be received by 30.01.2018 at 05.00PM in the office of Ex. Engineer (DEMS Store), South Delhi Municipal Corporation, Room No. 16, Ambedkar Stadium, Delhi Gate, New Delhi- 110002, email ID: eep1mcd@gmail.com. However, the same may be handed over in person during the pre-bid meeting.

Clarifications on issues raised during this pre-bid discussion, would be uploaded on Corporation's web site www.mcdonline.gov.in ONLY and shall not be communicated in any other form. Any clarification/addendum thus issued by SDMC would form part of the terms and conditions of this RFP/tender document. Hence the prospective bidders are requested to regularly scan through said website for any update. The last date of submission of the bid document is 12.02.2018 till 02.00PM (IST) in the office of Suptd. Engineer (DEMS), South Delhi Municipal Corporation, 2nd Floor, SPM Civic Centre, New Delhi- 110002.

Ex. Engineer (DEMS Store)
South Delhi Municipal Corporation
## CHAPTER-II  MEMORANDUM OF WORK IN BRIEF

1. **Name of Work**: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

2. **Earnest Money**: Rs. 93,50,000/- (Rs. 20 Lacs to be deposited in the form of bankers cheque/demand draft/ FDR of a Scheduled Bank & balance may be deposited as Bank Guarantee)

3. **Validity Period**: Validity of rates **180 days** from the submission of the bids.

4. **Security Deposit**: @ 5% of the running bill payable to the contractor

5. **Performance Guarantee Bond**: @5 % of the contract value in form of Bank Guarantee in favour of Commissioner/SDMC for a validity period of 20 months from the date of start of work (15 days after issue of LOA) with further clam period of 06 month for the validity Date. The performance guarantee shall submitted within 15 days from the issue of LOA.

6. **Time of completion**: 18 months.

7. **i) Last date of submission of the tender**: As mentioned in tender notice

   **ii) Mode of Sending**: a) Three sealed envelopes containing (i) Technical bid (original + copy), (ii) Financial bid and (iii) Earnest money deposit & Tender fee in the form of Demand Draft should be sealed in a large container envelope be send by Registered Post A.D. or Speed Post or Hand delivery.

   **iii) Description essential to be made on sealed cover**: a) Name of Work and Tender No., Name of Contractor b) Last date of receiving tender by the SDMC.

   **iv) Mode of quoting rates in SCHEDULE of rates**: Item Rates in figures as well as in words.
CHAPTER-III  SCOPE OF WORKS

Name of work: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

- The scope of work includes Construction of Sanitary Landfill facility with all required infrastructure facilities like leachate tank, leachate treatment plant, internal roads, etc. The scope includes (but not limited to) the following:
  - Field survey
  - Licensing procedure/ temporary office/ road for construction
  - Site clearance (Removing existing plants, shrubs, grass etc.)
  - Excavation in hard rock and taking away extra excavated material
  - Earthwork (excavation, soil layers, soil bund)
  - Groundwater collecting and drainage work
  - Leachate collecting and drainage work
  - Geo-synthetic work
  - Storm water drainage system
  - Leachate treatment facility
  - Other construction works: weighing bridge, ground water inspection well etc.
  - Construction of Road
  - Green belt development
  - After establishment of SLF, the Contractor/ Agency shall be required to obtain Consent to Operate (CoO) from DPCC Or/and any other such permission required from an Govt. agency/authority mandated under Law. However, any application fee payable to such authority shall be payable by SDMC.

General Quality of Work

1. The work shall be strictly executed in accordance with the CPWD specifications, Technical specifications, terms & Conditions of tender documents, drawings etc. Shall have to meet high standards of workmanship, safety and security.

2. Establishment of Landfill as per SWM Rules, 2016 and further amendments (if any)

3. Time of completion of the Construction of Sanitary Landfill facility will be 18 Months from 15th day of issuing letter of award.

4. The design of SLF Should be based on factors like quality, economy, pollution control, space requirement etc.

5. The design of SLF must be in accordance with Central Pollution Control Board, local air pollution control board and SWM 2016 rules and regulations (Government of Delhi, India) & it is responsibility of the successful bidder to get the clearance certificate from the above said statutory authorities such as D.P.C.C/C.P.C.B. etc. It is also the responsibility of the successful bidder to get the clearance certificates from all relevant
departments.

6. The establishment of the SLF shall be the conditions imposed by Ridge Management Board/Central Empowered Committee/Hon’ble Supreme Court while granting clearance for the said construction.

Ex. Engineer (DEMS Store)
SDMC
CHAPTER-IV INSTRUCTIONS TO BIDDERS

1. **Note**
   These instructions are provided to assist tenderers while preparing their tenders. They do not form part of the Contract and they shall not be taken into consideration in interpreting or construing the Contract.

2. **Invitation to Tender**
   (a) The Engineering Department, SDMC for and on behalf of the South Delhi Municipal Corporation, hereinafter referred to as the SDMC, will receive tenders for the work of Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla. Tenders will not be accepted after the hour and date fixed for receiving of tenders. Telegraphic tenders will not be accepted under any circumstance. Tenders received after the hour and date so fixed will not be considered. Tenders may be submitted either in person or through registered/speed post on or before due date and time as mentioned in tender notice. Tenderer’s authorized representatives are advised to attend the tender opening. The tenders shall be opened at the date and time as mentioned in tender notice.
   
   (b) However, the SDMC reserves the right to reject all the tenders or the lowest or any other tender which in the judgment of the SDMC does not appear to be in its best interest, and the tenderer shall have no cause of action or claim against the SDMC or its officers, employees, successors or assignee for rejection of its tender.
   
   (c) The S.D.M.C. does not bind himself to accept the lowest or any tender.
   
   (d) Tender documents are not transferable.

3. **Language & Currency**
   Tenders shall be submitted in English, and all information in the tender shall be in English. Information in any other language shall be accompanied by its translation in English. Failure to comply with this may disqualify a tender. Only English text shall be governing. The currency for the purpose of the proposal shall be the Indian Rupee Only.

4. **Earnest Money and Performance Security**
   (a) As notified in the NIT/bid notice, the earnest money shall be Rs. 93,50,000/- (Rs. 20 Lacs to be deposited in the form of bankers cheques/demand draft/ FDR of a Scheduled Bank & balance may be deposited as Bank Guarantee) payable at New Delhi in favour of Commissioner/SDMC. The bids without Earnest Money would not be considered for evaluation.
   
   (b) The earnest money submitted by all the tenderers except the lowest tenderer will be refunded without any interest immediately / or latest within one week from the date of opening of financial bids except in case of forfeiture.
   
   (c) After approval/acceptance of the bid of a particular bidder, a letter of award would be issued to the approved bidder. The approved bidder would be required to deposit 5% of the accepted bid amount as Performance Guarantee in the form of Bank Guarantee from Nationalized/Scheduled Bank in favour of Commissioner, SDMC initially valid for a period of 20 months with a further claim period of 06 months or in the form of Demand Draft/Bankers Cheque issued by Nationalized/Scheduled Bank payable at Delhi/New Delhi favoring Commissioner, SDMC. It must be deposited within 15 days
of issuance of the letter of award.

(d) The earnest money deposited by the successful bidder with its bid shall be refunded/returned back to the bidder immediately after receipt of the performance guarantee.

(e) If the approved bidder fails to deposit the required performance guarantee within stipulated period, the bid may be cancelled and the amount of earnest money shall be forfeited at the sole discretion of SDMC.

(f) No interest will be paid or any tender deposit.

5. Security Deposit.
   In addition to the performance guarantee as detailed above, Security Deposit @ 5% of the gross amount of bill shall be deductible from the each running bills payable to the contractor.

6. Agreement between the Parties:
   An agreement on non-judicial stamp paper for Rs.100/-will be signed by between the SDMC and approved bidder (Successful Bidder) for the work under this RFP process. The bid submitted by the successful bidder shall form part of the agreement.

7. Validity of Bid:
   (a) Validity of bids shall be 180 days from the submission of the bids. SDMC reserves its right to seek extension of bid validity from the bidder(s) beyond the original bid validity period mentioned in the RFP document.
   (b) It is clarified that the SDMC shall be free to reject any bid or a part of it (including the lowest one) without assigning reasons for it.
   (c) No bid received after the stipulated date & time shall be considered.
   (d) If any bidder chooses to send the bid by post and it does not reach in time, the SDMC shall not be responsible for it.
   (e) The RFP form(s) and ANNEXURE(s) etc attached to it must be filled in by ink/typed and they must be legible.
   (f) If some of the document/ANNEXURE(s) etc is/are missing, the SDMC has the right to reject the bid as INVALID.
   (g) Any conditional bid will be summarily rejected.

8. Confidentiality
   SDMC would treat all information submitted as part of the proposal in confidence and would not divulge any such information unless ordered to do so by any Govt. authority that has the power under law to require its disclosure.

9. Submission of Bids:
   (a) Every page of the tender document (Including addendum/clarification etc) shall be signed and stamped by the authorized signatory of the bidder and shall be submitted as part of the technical bid. Any paper/page shall not be pulled out of the tender document. If this is noticed at some stage, the same shall summarily lead to disqualification of the agency/bidder.
   (b) The bidder will submit the Technical Bid (One original + One copy) and Financial bid in two separate sealed envelopes.
      The technical Bid is to be marked as "Technical Bids for Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla. Name of Bidder: _____________” containing the following documents/ANNEXUREs/FORM etc.:-.---
(i) The Bid Submission form in application format (ANNEXURE-A) from bidder to the SDMC regarding submission of RFP for Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla.
(ii) Power of Attorney (on Rs. 100 Stamp Paper, duly notarised) in favour of the Authorised signatory, signing/submitting the bid.
(iii) Memorandum of Understanding (MoU)/Joint Venture (JV) Agreement, clearly defining/spelling out the roles and responsibilities of both the JV Partners in case the bid is being submitted by a Joint Venture of two parties.
(iv) ANNEXURE-B “Technical BID Form” duly filled in and signed by the Bidder.
(v) All documents/testimonials as per ANNEXURE C shall be submitted.
(vi) ANNEXURE-C “Check List” duly signed by the bidder.
(vii) As notified in the NIT/bid notice, The earnest money shall be Rs. 93,50,000/- (Rs. 20 Lacs to be deposited in the form of bankers cheques/demand draft/ FDR of a Scheduled Bank & balance may be deposited as Bank Guarantee) for a minimum period of nine (09) months from the date of receipt of the tender payable at New Delhi in favour of Commissioner/SDMC. The bids without Earnest Money would not be considered for evaluation. pledged in favour of Commissioner/SDMC.
(viii) Receipt of 25,000/- (Twenty Five Thousand Only) as cost of RFP document in the form of Demand Draft/Bankers Cheque payable at New Delhi/Delhi in favor of Commissioner, SDMC.
(vii) Solvency certificate from any scheduled Bank for a value of Min. Rs. 18.70 Crores for one year.
(viii) ANNEXURE-D “Deployment Plan” prepared and duly signed by the bidder.
(ix) FORM-4 “Details of Plant and Equipment” likely to be used duly signed by the bidder.
(viii) ANNEXURE-F “Anti collusion certificate “duly signed by the bidder
(ix) Self attested copies of all the documents & Certificates required vide technical RFP form (ANNEXURE-B).
(x) Self attested copies of all the documents & Certificates required vide (ANNEXURE-B &C).
(xi) Signed copies of filled ANNEXURE-E.
(xii) Documents in support of minimum eligibility criteria and documents as required for technical evaluation.
(xi) The bidder shall also submit a self-attested copy of its constitution (MOA).
(xii) Any other document, which the bidder wishes to enclose in support of its bid.

(c) The second envelop will also be sealed and marked as “Financial Bid for Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla.” Name of Bidder ___________” which will contain ONLY ANNEXURE-H 'Financial bid Form” duly filled in and signed by the Bidder. NO OTHER DOCUMENT would be placed in this envelope.
(d) The third envelop will also be sealed and marked as "Earnest Money & Tender Fee for Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla.” Name of Bidder ___________” which will contain ONLY Earnest Money & Tender Fee of the work in the form of demand draft or as specified. NO OTHER DOCUMENT would be placed in this envelope.

All of these sealed envelopes will be placed in a fourth one (bigger one) envelope, which may be called the container envelope, and it will also be sealed, marked as "RFP for Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla." Name of Bidder ___________ and addressed to Office of the Superintending
Engineer (DEMS) 2nd Floor, SPM Civic Centre, New Delhi- 110002. should reach not later than 14.02.2018, 1400 Hrs (IST)

(e) The big one envelope (container envelope) will be opened on the date & time and place mentioned in the notice inviting RFP.

(f) Willing bidders may also be present at the time of opening this container envelop as well as at the time of opening of technical bids.

(g) After opening the big one or the container envelop, all the three envelopes will be taken out and envelope containing Technical Bid (One original+ One copy) & earnest money will be opened in the presence of bidders or their representatives if any.

(h) Envelops of Financial bids will be kept intact and safe for opening after evaluation of technical bids.

(i) Technical bids of the bidders who do not fulfill the minimum eligibility qualifications as laid down in the tender document will not be considered for technical evaluation.

(j) Thereafter, technical bids of qualified bidders will be evaluated.

(k) Tenders will not be considered if the required documents are not provided or are considered to be unsatisfactory.

10. Signing of Tender Document

(a) Tenderers are requested to quote the item rates and their total offered amount of the work and also signed (Price Bid) after making appropriate inquiries wherever necessary.

(b) If the tender is made by an individual, it shall be signed with his full name above his current address.

(c) If the tender is submitted by a proprietary firm, it shall be signed by the proprietor above his name and the name of his firm with its current address.

(d) If the tender is made by a firm in partnership, it shall be signed by all the partners of the firm above their full names and current addresses on each and every page, or by a partner holding the power of attorney for the firm signing the tender in which case a certified copy of the power of attorney shall accompany the tender. A certified copy of the partnership deed, current address of the firm and the full name and the current address of all the partners of the firm shall also accompany the tender. In event of the absence of any partner it shall be signed on his behalf of person holding a power of attorney authorizing him to do so. Details of each partner will be furnished in FORM-VIII along with the copy of partnership deed.

(e) If the tender is made by a limited company or a limited Corporation, it shall be signed by a duly authorized person holding the power of attorney for signing the tender, in which case a certified copy of the power of attorney shall accompany the tender. Such limited Company or Corporation may be required to furnish satisfactory evidence of its existence before the contract is awarded.

(f) All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signatures. All signatures in the tender documents shall be dated.

11. Interpretation of Documents

Tenderers shall carefully examine the Tender Documents and fully inform themselves as to all the conditions and matters, which may in any way affect the work or the cost thereof. Should a tenderer find discrepancies in or omission from the specification or other documents, or should be in doubt as to their meaning, he should at once address a query to the Engineering Department, SDMC. Any resulting interpretation of the Tender Documents will be issued to all tenderers as an Addendum. Verbal clarification
and/or information given by the Engineering Department, SDMC shall not be binding on the SDMC.

12. **Errors and Discrepancies in Tenders**

   If the schedule of quantities and Rates (Financial Bid) submitted with the tender be found to contain errors, or discrepancies, the owner/engineer will not permit any bidder to change the substance or price of his bid after the bid opening. In case of discrepancy in the quoted rate and the corresponding amount the rate quoted in words in all cases shall govern. Also the bidder will not be permitted to correct or withdraw material deviations or reservations once bids have been opened.

13. **Modification of Documents**

   Modifications of specifications and extension of the closing date of the tender, if required, will be made by an Addendum and/or press note. The tenderer is required to check the SDMC website for **Addendum if any before 48 Hrs.** of tender submission last date and time. The tenderer who quotes the tender without attaching the addendum will be rejected. **Addendum shall be signed by tenderer.**

   The tenderer shall not add to or amend the text of any of the documents except in so far as may be necessary to comply with the Addenda.

14. **Policy for tenders under consideration**

   (a) Tenders shall be deemed to be under consideration from the opening of tenders, until such time as an official announcement of award is made. While tenders are under consideration, tenderers and their representatives, or other interested parties, are advised to **refrain from contacting by any means any SDMC personnel or representatives on matters relative to the tenders under study.**

   (b) The Engineer’s Representative, if necessary, will obtain clarification of tenders by requesting such information from any or all the tenderers either in writing or through personal contact, as may be necessary. **The tenderer will not be permitted to change the substance of his tender after tenders have been opened. Non-compliance with this provision is a cause for disqualification.**

15. **Cost of Tendering**

   The SDMC will not defray the expenses incurred by tenderers in tendering and will not be bound to accept the lowest or any tender.

16. **Award of Contract**

   (a) Notification of award will be made in writing to the successful tenderer.

   (b) The contract will be awarded to the technically and financially qualified and responsive tenderer offering the lowest overall evaluated tender or tenders in conformance with specifications subject to the provisions in RFP.

   (c) A responsive tender is one which accepts all the terms and conditions of the Tender Documents without any major modifications. A major modification is one which affects in any way the price, quality, quantity or completion of works or which limits in any way, any responsibilities or liabilities of the tenderer or any rights of the SDMC, as specified in the Tender Documents. The SDMC may waive any minor informality in a tender which does not constitute a major modification. **However, the failure of**
successful bidder to deposit “Performance Guarantee” and signing the contract shall constitute sufficient grounds for annulment of the award of contract and forfeiture of the earnest money deposit and any other action permissible under the Law of the Land, in which case the SDMC may award the contract to the next lowest evaluated responsive bidder. In the event of not finding any such bidders, the employer is empowered to call for new bids.

17. **Signing of Contract**

   The successful tenderer shall be required to execute the Contract within **15 days** of issuing the letter of acceptance. If the contractor does not submit the performance guaranty within 15 days and does not sign agreement within 15 days after issuing the letter of acceptance his EMD may be forfeited and such tenderer shall be considered for disqualification for getting further any work in SDMC.

18. **Solvency Certificate.**

   Solvency certificate from any scheduled Bank for a value of Min. **Rs. 18.70 Crores** for one year has to be submitted by the bidder / tenderer.

19. Bidders not submitting the required information along with their tenders above, the tender will not be considered for evaluation and the bid will be outright rejected.

20. **Definitions and explanations:**

   Unless the context requires otherwise, with reference to this all other documents in pursuance to this RFP process:

   (a) “Sanitary Landfill site” means site selected for construction of sanitary Landfill in Tehkhand Okhla within the jurisdiction of SDMC.

   (b) “Agency” or "Successful Bidder" shall mean the Company/ Agency/Firm/Institution, whose bid/tender has been accepted for **Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla** and it includes its legal heirs, representatives, administrators, successors and permitted assigns.

   (c) "Agreement” shall mean the Agreement to be signed by and between the SDMC and the Agency(Successful Bidder) for providing Services in pursuance to this RFP process.

   (d) "Bidder“ shall mean company/agency/firm/institution which submits its bids for under this RFP.

   (e) "SDMC” shall mean South Municipal Corporation of Delhi

   (f) “Engineer in charge”/ “Nodal Officer” shall mean SDMC or its authorized representative.

   (g) "Effective Date” shall mean the date from which the Agreement in pursuance to this RFP process comes into force.

   (h) "Party” shall mean any party to the Agreement under this RFP process and “Parties” shall mean both the parties to the Agreement.

   (i) "Successful Bidder Personnel” shall mean and include all the employees, agents of Successful Bidder who may be engaged by the Successful Bidder (directly or indirectly) for providing the Services under the Agreement in pursuance to this RFP process.

   (j) If there is any dispute between the parties about interpretation of any term, any clause or any other issue regarding this RFP or Agreement in pursuance of this RFP as well as during operation and maintenance period, the matter will be referred to Nodal Officer and the decision given by him/her would be binding on both the parties. All the disputes / court cases shall be subjected to jurisdiction of appropriate courts in Delhi only.
21. **Area/Locations for which instant proposal is invited:**

(a) The South Delhi Municipal Corporation wants to develop **Sanitary Landfill site at Tehkhand, Okhla, New Delhi, compliant with SWM Rules, 2016.** Accordingly, the instant proposal for "Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla." is being initiated.

(b) Location of the SLF to be constructed is at Tehkhand, Okhla, New Delhi, adjacent to existing landfill Okhla.

(c) Willing Bidders are advised to inspect the site thoroughly, understand it before submitting the RFP at their own cost.

22. **Services to Be Outsourced: Scope of work for the bidder**

Solid Waste Management in the city is one of the obligatory functions of the Municipal Corporation. SDMC therefore proposes to invite proposals from specialized agency to provide the requisite services for setting up of Engineering landfill, compliant with SWM Rules, 2016 and amendments if any. It is proposed to construct the landfill in two stages/phases. In the first phase / stage, small landfill of about 8 to 10 acres shall be developed and in the second phase the balance area available shall be developed as landfill.

23. **Minimum eligibility for the Bidder/ Agency:**

A. Bidder/s must have minimum experience in following and under as: For technical Qualification,

The Bidder should have satisfactorily completed civil works during the last seven years ending 31st March 2017.

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| i) | Completed *Three* civil works each costing not less than **Rs. 1870.00 Lacs**  
Or   |
| ii) | Completed *Two* civil works each costing not less than **Rs. 2805.00 Lacs**  
Or   |
| iii) | Completed *One* civil work costing not less than **Rs. 3739.00 Lacs**  
AND   |

B. Must have minimum experience of Geo-synthetic liner works of (at least):

i) One completed work of supply and installation of minimum **90,400 sqm**  
Geosynthetic Liner work of minimum 1.5 mm thickness in the last seven years ending 31st March 2017.  
Or   

ii) Two completed work of supply and installation of minimum **67,800 sqm**  
Geosynthetic Liner work of minimum 1.5 mm thickness in the last seven years ending 31st March 2017.  
Or   

iii) Three completed work of supply and installation of minimum **45,200 sqm**  
Geosynthetic Liner work of minimum 1.5 mm thickness in the last seven years ending 31st March 2017.
The value of executed works shall be brought to current costing level by enhancing the actual value of work @ simple rate of 7% per annum, calculated from date of completion to last date of …….tenders.

**Conflict of Interest:** Tenderers (as a bidder/ a member of JV an OEM in MoU with bidder) shall be eligible only if they not have a conflict of interest. All Tenderers found to have a conflict of interest in this tender process shall be disqualified. Tenderers shall be considered to have a conflict of interest, if:

i. One firm applies for tender both as an individual firm and in a Group.

ii. If Tenderers in two different applications have controlling shareholders in common.

iii. Submit more than one application in this tender process.

iv. If the Tenderer has participated as a Consultant(s) engaged by SDMC in the preparation of the design or technical specifications of the works that are the subject of this tender.

v. The applicant has either participated or lent or temporarily seconded their personnel to a separate Bidder or group involved in the preparation of the design or technical specifications of the said separate bid document(s)/credential(s).

vi. Any bidder(s) as an individual or as (a part of JV) a group which has been blacklisted or de-registered by any government agency(s) or public sector undertaking during the last 4 years.

24. The bidders shall submit the list of all works of similar nature completed during last 7 years in the enclosed format at FORM-1 duly supported by experience certificate. The bidder shall also submit performance of work certificate from the client clearly indicating rating as outstanding / Very good/ Good / poor As per FORM-7.

(1) The Bidder should be registered with the Income Tax and also registered under the labour laws, Employees Provident Fund Organization, Employees State Insurance Corporation etc. The bidder/agency should be in existence for a minimum of last 5 years from 31/03/2017. The Bidder should have a valid-

ii) **PAN/TAN No.**

iii) **GST No.**

iv) Insurance/worker compensation cover of the company’s workers.

v) Requisite license from Labour department.

vi) **EPF account No.**

In case of JV bidder, the JV partners have to submit the aforesaid documents individual also.

The Bidder must submit Anti Collusion Certificate in format **ANNEXURE F.**

The bidder shall submit Authorization letter in the Name of company’s Representative if bid document is submitted by some representative other than Director/Prop., if applicable.

**The firm should not have been black listed by any Govt. Organization as on date.**

25. **Personnel and Establishment**

(a) The bidder shall submit organization chart with assignment of each key staff member (identified by name) to be deployed for this project within the overall work program. The details proposed deployment of Man Power shall be submitted in the format enclosed at **ANNEXURE-D.**
(b) The name, background and professional experience of each key staff member to be assigned to the project with particular reference to his experience of a nature similar to that of the proposed assignment.

26. **Check List for Submission of Technical Bid**
The bidders are required to fill the check list as per **ANNEXURE-C** and enclosed the same alongwith the Technical Bid.

27. **Evaluation of Technical Bids:**
The technical bids shall be evaluated based on the available documents submitted by the bidder. To assist in the examination, evaluation, and comparison of the bids, and qualification of the bidders, the SDMC may, at its discretion, ask any bidder for a clarification of its bid. Any clarification submitted by a bidder that is not in response to a request by the SDMC shall not be considered. The SDMC’s request for clarification and the response shall be in writing. If a bidder does not provide clarifications of its bid by the date and time set in the SDMC’s request for clarification, its bid may be rejected.

28. **Bid Evaluation Criteria**
   (a) The SDMC shall follow two bid system where the technical bid and financial bid shall be evaluated separately.
   (b) The Financial Bids of all the technically qualified Bidders shall be opened on the appointed date and time in presence of the qualified bidders/their authorized representatives, who choose to be present at the time of opening of the financial bids.
   (c) The weightage of financial evaluation for tendering evaluation shall be 100%.
   (d) During the technical evaluation stage, each bidder shall be assigned different marks out of a total of 100 marks, as per the criteria/marking **ANNEXURE** specified below:
   (e) **A Bidder should secure mandatorily a minimum of 60% marks** (i.e. 60 marks out of total 100 marks as per **ANNEXURE-G**) in Technical Evaluation in order to be a qualified bidder for being eligible for opening of financial bids.
   (f) The Bidder shall be required to produce attested copies of the relevant documents in support relevant para(s) in addition to the documentary evidences for being considered during technical evaluation.
   (g) A substantially **responsive bid** shall be one that meets the requirements of the bidding document in totality i.e. by following the procedures of technical evaluation procedure enumerated above. The technical bid not meeting the minimum requirements as per the tender documents shall be rejected and their financial proposals will be returned unopened.
      (i) The responsiveness of the bid, i.e; receipts of duly filled, signed and accepted bid documents in complete form, including Authorization letter.
      (ii) Receipt of valid EMD with requisite amount in acceptable format.
      (iii) Documents in proof of meeting the minimum eligibility criteria.
      (iv) Any other documents as required to support the responsiveness of the bidder, as per tender.
(h) The bidder who qualified in the technical evaluation stage shall only be called for opening of financial bids. SDMC shall intimate the bidders, the time/ venue for the financial Bid opening in written communication.

(i) Date of opening of financial bids will be communicated to eligible bidders.

29. OPENING OF FINANCIAL BID

(a) The Financial Bids of all the technically qualified Bidders shall be opened on the fixed date and time in presence of the qualified bidders/their authorized representatives, who choose to be present at the time of opening of the financial bids.

(b) All the technically qualified bidders/their authorized representatives present at the time of opening of the Financial Bids shall be required to submit the Authorization letter from their Companies and shall be asked to sign on all the sealed envelopes containing the Financial Bid.

(c) Any bidder objecting to the same shall be disqualified and his financial bid shall be returned on the spot.

(d) Absence of bidders or their authorized representatives shall not impair the legality of the process.

(e) The financial bid price, as indicated in the financial bid submission form of each bidder shall be read out on the spot, however, it shall be clearly stated that the final financial bid prices would be arrived at after detailed scrutiny/correction of arithmetical error in the financial bid.

(f) Mere becoming the lowest bidder, prior to financial bid scrutiny will not give any right to the lowest bidder to claim that he is successful in the bidding process. The successful bidder (L-1) shall be decided only after following due procedure.

30. FINANCIAL BID EVALUATION AND DETERMINATION OF THE SUCCESSFUL BIDDER

(a) The technically qualified bidder meeting the minimum eligibility criteria with the lowest quoted/offered rates/amount in financial bid shall be deemed as the successful Bidder and shall be considered eligible L-1 Bidder for further process.

(b) If there is a discrepancy between words and figures, the amount in words shall prevail.

31. Other Important Instructions

(a) The tenderers shall read all instructions, terms & conditions, contract clauses, nomenclature of items, specifications etc. contained in the tender document, very carefully before quoting the rates.

(b) Throughout these bidding documents, the term “bid” and “tender” and their derivatives (bidder/tenderer, bid/tender, bidding/tendering, etc.) are synonymous.

(c) Tender should be signed on all page including drawings of tender documents indicating full Names and address of signatory.

(d) Any person who submits a tender shall fill up format for “Financial Bid” of tender document stating at what rate he is willing to execute the work along with items and quantities to be executed, based on his design.
(e) Tenderers, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other condition of any sort including any condition or a conditional rebate, will be summarily rejected.

(f) Rates must be filled both in words and figures. In case of ambiguity between the two rates, those filled up in words shall be accepted.

(g) The rate(s) must be quoted in decimal coinage. Amount must be quoted in full rupees by ignoring up to fifty paisa and considering more than fifty paisa as rupee one.

(h) The contractor shall quote his rates keeping in mind the specifications, instructions to bidders, terms and conditions, additional and special conditions, site conditions etc. and nothing shall be payable extra, whatsoever, unless otherwise specified in the tender document.

(i) In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so such power of attorney should be produced with the tender and it must be disclosed that the firm is duly registered under the Indian Partnership Act 1952.

(j) The bidder should designate one person (“Contact Person” and “Authorized representative and Signatory”) authorized to represent the bidder in its dealings with South Delhi Municipal Corporation. The “contact person” and Authorized representative and signatory shall sign the Acknowledgement of Receipt of request of proposal document. This designated person should hold the Power of Attorney and be authorized to perform all tasks including but not limited to providing information, responding to enquiries, entering into contractual commitments on behalf of the bidder, tenderer etc. The covering letter submitted by the bidder shall be signed by the Authorized Signatory and shall bear the stamp of the entity thereof. It will be better that the contact person should have Delhi address to avoid delay in communication/response.

(k) Education cess, Labour Cess, GST or any other tax etc. as applicable on date of submission of tender shall be paid by the contractor himself. The contractor shall quote his rates considering all such Taxes.

(l) The bidder shall ensure that he has valid registration with Income tax department/GST.

(m) The tender, which is submitted without earnest money or is not duly signed by authorized signatory or is conditional shall be treated as non-responsive and shall be summarily rejected.

(n) Tenderers seeking any clarification or pointing out any ambiguity in tender document shall make a reference in writing to Executive Engineer (DEMS Store)/SDMC, Room No. 16. Ambedkar Stadium, Delhi Gate, Delhi- 110002 by 05:00 PM on 30.01.2018 positively.

(o) Similarly, ESI/EPF (employer contribution only) shall be reimbursed to the agency after submission of proof of deposition of the same with the concerned authorities.

(p) No other levy/tax paid/payable by agency shall be considered for reimbursement.

(q) A pre-bid meeting will be taken by the Suptd. Engineer (DEMS) on 31.01.2018 at 02:00 PM to apprise the bidders. The tenderers are free to make any suggestion during the pre-bid meeting for the consideration of SDMC. In case SDMC feels appropriate to incorporate suitable modifications including any additions and/or deletions, the same shall be affected by issue of addendum. The addendum shall form part of the agreement. The prospective bidders are advised to attend the pre-bid meeting for better appreciation of the project.

(r) Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to ascertain the nature of the ground, 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 tender. A
tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity, access facilities for all workers and all other services such as material testing lab, site office required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer 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 / local conditions and other factors having a bearing on the execution of the work.

(s) The competent authority on behalf of South Delhi Municipal Corporation (herein after referred as SDMC) does not bind him to accept the lowest or any other tender and reserves to him the authority to reject any or all of the tenders received without the assignment of any reason. All tenders in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

(t) Canvassing, whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

(u) The contractor shall not be permitted to tender for works in SDMC (responsible for award and execution of contracts) in which his near relative is posted as Accounts Officer or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). 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 SDMC. Any breach of this condition by the contractor would render him liable to be removed from the tender process.

(v) No Engineer of gazetted rank or other gazetted officer employed in Engineering or Administrative duties in the Engineering Department of the SDMC is allowed to work as a contractor for a period of one year after his retirement from service, without the prior written permission of the SDMC 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 SDMC as aforesaid before submission of the tender or engagement in the contractor’s service.

(w) The tender for the works shall remain open for acceptance for a period of 180 days from the date of submission of Bid. If any tenderer withdraws his tender before the said period or issue of letter of acceptance, which-ever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the SDMC shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid and take any other action permissible under the Law and as deemed fit.

(x) The tenderer is not allowed to make any modifications in the terms and conditions of the tender documents, which are not acceptable to the department, after submission of tender.

(y) This Notice Inviting Tender shall form a part of the contract document. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the issue of letter of acceptance, sign the contract consisting of Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, reply/addendum forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

(z) Technical Bid and Tender Document including Price Bid shall be submitted simultaneously on due date and time. Only Technical Bid shall be opened on that date of all the tenderers. Price Bid shall be kept sealed. The price bid of only those successful tenderers, who will qualify in the technical bid on the basis of their technical proposal and along with other details given in the technical bid. The sealed price bid of
unsuccessful bidder in technical bid shall be duly returned unopened.

(aa) Technical Bid and Tender Document shall be placed in one sealed envelope clearly marked as TECHNICAL BID. Financial Bid shall be placed in separate sealed envelope clearly marked as FINANCIAL BID.

(bb) The Earnest money and the Tender Document fees shall be placed in one envelope and clearly marked as EARNEST MONEY.

(cc) All the three sealed envelopes i.e. Technical Bid, Earnest Money and Financial Bid then shall be placed in another one sealed envelope marked as Proposal for “Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla”.

(dd) The Tenderer shall work out their own structural details, keeping in view the provisions given in the Technical Bid portion of the Tender Documents. The proposal should be acceptable to SDMC. The Tenderer shall quote their rates in price Bid accordingly. Tender document as downloaded for SDMC site shall be required to be submitted duly signed and sealed on all the pages of all the Sections along with their proposal.

(ee) If it is found that the tender is not submitted in proper manner or contains too many corrections or absurd rates or amount, it would be open for the SDMC to take suitable action against the tenderer including rejection of tender.

(ff) The department shall deduct Income Tax and education cess as on the value of work done from each bill of the contractor as per prevailing Government instruction / orders. In lieu, the department shall issue a certificate of deduction of the tax at source to the contractor, in relevant forms. Engineer-in-Charge shall deduct TDS for DVAT as per prevailing Government instructions / orders from the total payment made to contractor in pursuance of this contract. This TDS shall also be deducted on advance payment to be adjusted in future bills amount. The TDS certificate shall be issued by the Engineer-in-Charge to the contractor in the prescribed form within 28 days from the end of the month in which tax has been deducted. The department shall deduct building and other construction workers welfare cess @ 1% on the value of work done from each bill of the contractor.

(gg) In the tender documents the word “SDMC” shall mean South Delhi Municipal Corporation wherever exists.

(hh) In the tender documents the word “Department” shall mean “SDMC” wherever exists.

(ii) The successful tenderer shall indemnify the South Delhi Municipal Corporation against all losses and claims in respect of death or injury to any person, loss and damage to any property including works arising out of any consequences of the execution by submitting the “Indemnity Bond” on a stamp paper of value Rs.100.

(jj) The Display boards as per requirement of department are to provided at site and nothing extra shall be payable.

(kk) The successful bidder shall provide necessary number of drawings & Design document to the SDMC as per the direction of Engineer in charge for checking. The same may be got proof checked from any outside agency/person/consultant, appointed by SDMC. Any changes in design and drawing documents as suggested by the proof consultant shall be binding upon the bidder and accordingly revised design calculations and good for construction drawings shall be submitted in the desired numbers and no claim on this account will be entertained. Proof checking charges if any shall be borne by the SDMC.

(ll) All communication and information should be provided in writing and in English will be addressed to Executive Engineer.

(mm) The work shall be allowed to be carried out 24X7 basis except on National Holidays.

(nn) All statutory Govt. instructions related to the work shall be binding to the contractor.

(oo) IS system of measurements shall be followed.

(pp) Site lab for testing facilities of the materials in accordance with the requirement as per IRC/MORTH/CPWD specifications/MOEF/CPCB/DPCC guidelines shall be
provided by the contractor for use by SDMC or its representatives/consultants.

(qq) Time is Essence of work.

Ex. Engineer (DEMS Store)
SDMC
CHAPTER-V SPECIAL INSTRUCTIONS TO TENDERERS

1. General
   a) Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specification of the work to be done and of conditions and local conditions and other factors bearing on the execution of the works.
   b) A tenderer should quote in figures as well as in words. The amount for each item should be worked out and the requisite total given. Special care shall be taken to write in figures as well as in words and the amounts in figures only and in such a way that interpolation is not possible. The total amount shall be written both in figures and in words. In case of figures the words Rs. should be written before the figure of rupees and followed by the word ‘only’.
   c) All rates shall be quoted on the tender form.
   d) A tenderer shall submit the tender which satisfies each and every condition laid down in this notice and tender documents, failing which, the tender will be liable to be rejected.

2. ADDITIONAL INSTRUCTIONS TO PERSONS TENDERING
   a) Competency of Tenderer
      (i) No contract will be awarded except to responsible bidders capable of performing the class of work contemplated. Before the award of the contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work in satisfactory manner within the time stipulated. Contractor may be asked to present the original documents regarding their experience, financial status and other necessary tender related documents to the competent authority of South Delhi Municipal Corporation.
      (ii) Tenderer will be deemed to have inspected the site and to have satisfied himself as to the nature of all works, all roads, water-way and other means of communication and access to and from the site and work and the building that may be required for temporary purpose in connection with the construction, & completion of the works and must make his own enquiries as to work, yard sites and depot, and dumps and as to acquisition of such additional sites and areas as may be necessary for temporary purpose for constructing, completing and maintaining the works.
      (iii) The tender will not be accepted under the following circumstances when delivered by Registered A.D./Speed post /in Person
         A. Late tenders (i.e. tender delivered after the specified date and time of opening), delayed tenders (i.e. tenders delivered before the time of opening but after due date and time of receipt of tenders) and post tender offers shall not be opened and considered at all.
         B. The tenders delivered after the date and time specified in the tender notice shall not be received by the concerned office from the postmen/in person for which date and time may be recorded on the cover of the tender so for the justification to tenderer as to why tender was refused by the Engineering Department or Administrative Head or any other person in charge.
         C. Necessary records shall be maintained for refusal of such tenders in the registers for receiving tenders and shall be initialed by the concerned person of Engineering Department or Administrative head.
   b) Payment -
      The tenderer must understand clearly that the rates quoted are for completed works and include all costs due to labour, scaffolding plant, supervision, service work, power, royalties, indirect and
direct taxes and octroi etc. and to include all extras to cover the cost of night work if and when required and no claim for additional payment beyond the price or rates quoted will be entertained and the tenderers will not be entitled subsequently to make any claim on the ground of misrepresentation or on the ground that he was supplied with information given by any person (whether the member is the employee of South Delhi Municipal Corporation or not). Any failure on his part to obtain all necessary information for the purpose of making his tender and filling the several prices and rates therein shall not relieve him from any risks or liabilities arising out of or consequent upon the submission of the tender.

c) **Tender Forms**
Every ‘blank’ in the form of tender and in the ANNEXURE must be filled up by the tenderer and must return the document sent herewith.

d) **Erasures**
Persons tendering are informed that no erasures or alterations by them in the text of the document sent herewith will be allowed and any such erasures or alterations will be disregard. If there is any error in writing, no overwriting should be done, the wrong word or a figure should be struck out and the correct one written above or near it in unambiguous way. Each correction should be initialed.

3. **DECLARATION FORM**
   a) I/We hereby declare that I/We have visited the site and fully acquainted myself / ourselves with the local situations regarding materials, labour and other factors pertaining to the work before submitting this tender.
   b) I/We hereby declare that I/We carefully studied the conditions of contract, specifications and other documents of this work and agree to execute the same accordingly.
   c) I/We hereby declare that my / our near relatives are not working in South Delhi Municipal Corporation in any capacity as on today. (As an Concerned Dy. Municipal Commissioner, Additional City Engineer, Dy. City Engineer, Assistant City Engineer, Assistant Engineer, Additional Assistant Engineer, Supervisor, Overseer, Divisional Accountant, Store Keeper, Manager etc.)

4. **GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS**
   a) All works proposed to be executed by the contractor has been indicated to the Bid documents tender.
      This form will state work to be carried out as well as the date of submitting and opening tenders and the time allowed for carrying out the work also the amount of earnest money to be deposited with the tender and the amount of the performance guarantee/security deposit to be paid by the successful tenderer and percentage, if any, to be deducted from bill. Copies of the specifications, designs and drawings and estimated rates, and any other documents required in connection with work which shall be signed by the concerned authority of Engineering Department for the purpose of identification, shall also be open for inspection by contractors at the office of the concerned authority of Engineering Department during office hours. Where the works are proposed to executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the South Delhi Municipal Corporation, such specifications with designs and drawings shall form part of the accepted tender.
   b) Receipts for payment made on account of any work, when executed by a firm, shall also be signed by all the partners except where the contractors are described in their tender as a firm in which case the receipts shall be signed in the name of the firm by one of the partners or by some
other person having authority to give effectual receipts for the firm.

c) Any person who submits a tender shall fill up the usual printed form of Price bid he is willing to undertake the work. Tenderer who proposes any alternation in works specified in the said form of invitation to tender or in the time allowed for carrying out the work or which contain any other condition of any sort, will be liable to rejection.

d) The Concerned authority of Engineering Department or his duly authorized. Assistant shall open tenders in the presence of any intending contractors who have submitted tenders or their representatives who may be present at the time of opening and he will allow to enter the amounts of the several tenders in a comparative statement in a suitable form.

e) No receipt for any payment alleged to have been made by a contractor in regard to any matter relating to this tender of the contract shall be valid and binding on Corporation unless it is signed by the Concerned authority of Engineering Department.

f) All works shall be measured net by standard measure and according to the rules and customs of the South Delhi Municipal Corporation without reference to any local custom and no proposals to adopt alternative methods will be accepted. The Concerned authority of Engineering Department’s decision as to what is ‘the usual method in use in the South Delhi Municipal Corporation’ will be final.

g) The Insurance Company's bond will not be accepted against the security deposit.

h) No foreign exchange will be released by the Corporation for the purpose of plant and machinery required for the execution of the work contracted for.

i) Controlled materials (Essentiality Certificate)

   (i) As regards controlled materials, the South Delhi Municipal Corporation will help to arrange for the permit as far as possible and help the Contractor in securing the same. All incidental charges met with in procuring these materials shall be borne by the Contractor himself. Though the South Delhi Municipal Corporation will help to arrange for the permit as far as possible and help the Contractor in obtaining the materials, it shall not accept any responsibility for any delay or loss on account of delay caused to the Contractor while obtaining the same.

   (ii) The contractor shall submit to the concerned authority of Engineering Department on close of every calendar month, the monthly returns in the prescribed forms as to the receipts and actual use of the controlled materials during the month.

j) The tender for the work shall remain open for a period of 180 days from the date of submission of bid for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own after handing over the tender to the postal authorities for dispatch during this period. If any tenderer withdraws or makes any modifications, or additions in the terms and conditions of this tender not acceptable to the South Delhi Municipal Corporation then the Corporation shall, without prejudice to any right remedy, be at liberty to forfeit in full the said earnest money absolutely.

k) The buildings under the contract will not be occupied by the contractor for use of the laborers, staff or for any other purpose. In case of breach of this condition market rent will be recovered for the area unauthorized occupied.

5. TENDER FOR WORKS

RFP for Engineering SLF, Tehkhand, Okhla
I/We hereby tender for the execution for the South Delhi Municipal Corporation (hereinbefore and hereinafter referred to as SDMC) of the work specified in the underwritten memorandum within the time specified in such memorandum at tendered amount (memorandum showing item of works to be carried out) and in accordance in all respects with the specifications, designs, drawings and instructions conditions etc. in writing referred to in this tender.

Signature of the Authorized Person with date
Name & Status/Post of the Signatory
Name of the bidder Company/Agency/Institution
CLAUSE 1

Performance Guarantee

(i) The contractor shall submit an irrevocable Performance Guarantee of 5% (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule ‘F’ from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule ‘F’ on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Cash (in case guarantee amount is less than Rs. 10,000/-) 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 (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 form annexed hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to the Government as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the SDMC to make good the deficit.

(ii) The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Guarantee extended to cover such enlarged time for completion of work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest. However, in case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned yearwise proportionately.

(iii) The Engineer-in-Charge shall not make a claim under the performance guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee. Failure by the contractor to pay President of India any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-Charge.

(iv) In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the President of India.

CLAUSE 1 A

Recovery of Security Deposit

The person/persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit SDMC at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running and final bill till the sum deducted will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by SDMC by way of Security Deposit unless he/they has/have deposited the amount of Security at the rate mentioned above in cash or in the form of SDMC Securities or fixed deposit receipts. In case a fixed deposit receipt of any Bank is furnished by the contractor to the SDMC as part of the security deposit and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the SDMC to make good the deficit.

All compensations or the other sums of money payable by the contractor under the terms of this contract may
be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising therefrom, or from any sums which may be due to or may become due to the contractor by SDMC on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by Scheduled Banks or Government Securities (if deposited for more than 12 months) endorsed in favour of the Engineer-in-Charge, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills and the final bill of the contractor at the rates mentioned above.

The security deposit as deducted above can be released against bank guarantee issued by a scheduled bank, on its accumulations to a minimum of Rs. 5 lac subject to the condition that amount of such bank guarantee, except last one, shall not be less than Rs. 5 lac. Provided further that the validity of bank guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.

In case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned yearwise proportionately.

Note-1: Government papers tendered as security will be taken at 5% (five per cent) below its market price or at its face value, whichever is less. The market price of Government paper would be ascertained by the Divisional Officer at the time of collection of interest and the amount of interest to the extent of deficiency in value of the Government paper will be withheld if necessary.

Note-2: Government Securities will include all forms of Securities mentioned in Rule No. 274 of the G.F. Rules except fidelity bond. This will be subject to the observance of the condition mentioned under the rule against each form of security.

Note-3: Note 1 & 2 above shall be applicable for both clause 1 and 1A

**CLAUSE 2**

**Compensation for Delay**

If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or justified extended date of completion as per clause 5 (excluding any extension under Clause 5.5) as well as any extension granted under clauses 12 and 15, he shall, without prejudice to any other right or remedy available under the law to the SDMC on account of such breach, pay as compensation the amount calculated at the rates stipulated below as the authority specified in schedule ‘F’ may decide on the amount of Tendered Value of the work for every completed day/month (as determined) that the progress remains below that specified in Clause 5 or that the work remains incomplete.

(i) Compensation @ 1% per month of delay to be computed work on per day basis

Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the Sectional part of work as mentioned in Schedule ‘F’ for which a separate period of completion is originally given.

In case no compensation has been decided by the authority in Schedule ‘F’ during the progress of work, this shall be no waiver of right to levy compensation by the said authority if the work remains incomplete on final justified extended date of completion. If the Engineer in Charge decides to give further extension of time allowing performance of work beyond the justified extended date, the contractor shall be liable to pay compensation for such extended period. If any variation in amount of contract takes place during such extended period beyond justified extended date and the contractor becomes entitled to additional time under clause 12, the net period for such variation shall be accounted for while deciding the period for levy of compensation. However, during such further extended period beyond the justified extended period, if any delay occurs by events under sub clause 5.2, the contractor shall be liable to pay compensation for such delay.

Provided that compensation during the progress of work before the justified extended date of
completion for delay under this clause shall be for non-achievement of sectional completion or part handing over of work on stipulated/justified extended date for such part work or if delay affects any other works/services. This is without prejudice to right of action by the Engineer in Charge under clause 3 for delay in performance and claim of compensation under that clause.

In case action under clause 2 has not been finalized and the work has been determined under clause 3, the right of action under this clause shall remain post determination of contract but levy of compensation shall be for days the progress is behind the schedule on date of determination, as assessed by the authority in Schedule F, after due consideration of justified extension. The compensation for delay, if not decided before the determination of contract, shall be decided after of determination of contract.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the SDMC. In case, the contractor does not achieve a particular milestone mentioned in schedule F, or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied as above. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE 2A
Incentive for early completion (Not Applicable)

In case, the contractor completes the work ahead of stipulated date of completion or justified extended date of completion as determined under clauses 5.3, 12 & 15, a bonus @ 1% (one per cent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the tendered value. Provided that justified time for extra work shall be calculated on pro-rata basis as cost of extra work X stipulated period/tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in ‘Schedule F’.

CLAUSE 3
When Contract can be Determined

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damage and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

(i) If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.

(ii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.

(iii) If the contractor fails to complete the work or section of work with individual date of completion on or before the stipulated or justified extended date, on or before such date of completion; and the Engineer in Charge without any prejudice to any other right or remedy under any other provision in the contract has given further reasonable time in a notice given in writing in that behalf as either mutually agreed or in absence of such mutual agreement by his own assessment making such time essence of contract and in the opinion of Engineer-in-Charge the contractor will be unable to complete the same or does not
complete the same within the period specified.

(iv) If the contractor persistently neglects to carry out his obligations under the contract and/ or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

(v) If the contractor shall offer or give or agree to give to any person in SDMC service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for SDMC.

(vi) If the contractor shall enter into a contract with SDMC in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.

(vii) If the contractor had secured the contract with SDMC as a result of wrong tendering or other non-bona fide methods of competitive tendering or commits breach of Integrity Agreement.

(viii) If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.

(ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

(x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.

(xi) If the contractor assigns (excluding part(s) of work assigned to other agency(s) by the contractor as per terms of contract), transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge. When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the President of India shall have powers:

(a) To determine the contract as aforesaid so far as performance of work by the Contractor is concerned (of which determination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the SDMC.

(b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work. In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.
CLAUSE 3A

In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract by giving notice to the other party stating the reasons. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits:

(i) If the Tendered value of work is up to Rs. 45 lac : 15 days.
(ii) If the Tendered value of work is more than Rs. 45 lac and up to Rs. 2.5 Crore : 21 days.
(iii) If the Tendered value of work exceeds Rs. 2.5 Crore : 30 days.

Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party.

CLAUSE 4

Contractor liable to pay Compensation even if action not taken under clause 3

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding being exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor’s expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

CLAUSE 5

Time and Extension for Delay

The time allowed for execution of the Works as specified in the Schedule ‘F’ or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the work shall commence from such time period as mentioned in schedule ‘F’ or from the date of handing over of the site, notified by the Engineer-in-Charge, whichever is later. However, the handing over of site by the Engineer in Charge, in full or in part (if so provided in contract), shall be completed within two months from issue of acceptance letter. If the Contractor commits default in commencing the execution of the work as aforesaid, the performance guarantee shall be forfeited by the Engineer in Charge and shall be absolutely at the disposal of the SDMC without prejudice to any other right or remedy available in law.

9.1 As soon as possible but within twenty one days of award of work and in consideration of:
(i) Schedule of handing over of site as specified in the Schedule ‘F’.
(ii) Schedule of issue of designs as specified in the Schedule ‘F’.
(i) The Contractor shall submit a Time and Progress Chart for each milestone. The Engineer-in-Charge may within 30 days thereafter, if required modify, and communicate the program approved to the contractor failing which the program submitted by the contractor shall be deemed to be approved by the Engineer-in-Charge. The work programme shall include all details of balance drawings and decisions required to complete the contract with specific dates by which these details are required by contractor without causing any delay in execution of the work. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per milestones given in Schedule ‘F’.

(ii) In case of non submission of construction programme by the contractor the program approved by the Engineer-in-Charge shall be deemed to be final.

(iii) The approval by the Engineer-in-Charge of such programme shall not relieve the contractor of any of the obligations under the contract.

(iv) The contractor shall submit the Time and Progress Chart and progress report using the mutually agreed software or in other format decided by Engineer-in-Charge for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs. 2500/- (for works costing upto Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per week or part basis in case of delay in submission of the monthly progress report.

5.2 If the work(s) be delayed by:

(i) force majeure, or

(ii) abnormally bad weather, or

(iii) serious loss or damage by fire, or

(iv) civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or

(v) delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or

(vi) non-availability of stores, which are the responsibility of SDMC to supply or

(vii) non-availability or break down of tools and Plant to be supplied or supplied by SDMC or

(viii) any other cause like above which, in the reasoned opinion of the Engineer-in-Charge is beyond the Contractor’s control. then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge for entry in the hindrance register (physical or web-based as prescribed in schedule F) but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works. The contractor shall have no claim of damages for extension of time granted or rescheduling of milestone/s for events listed in sub clause 5.2.

5.3 In case the work is hindered by any reasons, in the opinion of the contractor, by the Department or for someone for whose action the Department is responsible, the contractor may immediately give notice thereof in writing to the Engineer-in-Charge in the same manner as prescribed under subClause 5.2 seeking extension of time or rescheduling of milestone/s. The authority as indicated in Schedule ‘F’ shall, if justified, give a fair and reasonable extension of time and reschedule the milestones for completion of work after due consideration of the same within 30 days of receipt of such request. In event of non application by the contractor for extension of time E-in-C after affording opportunity to the contractor may give, supported with a programme, a fair and reasonable extension within a reasonable period of occurrence of the event. Such extension of time or rescheduling of milestone/s shall be without prejudice to any other right or remedy of the parties in contract or in law; provided further that for concurrent delays under this sub clause and sub clause 5.2 to the extent the delay is covered under sub clause 5.2 the contractor shall be
entitled to only extension of time and no damages

5.4 Request for rescheduling of Milestones or extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed forms i.e. Form of application by the contractor for seeking rescheduling of milestones (Appendix-XVI) or Form of application by the contractor for seeking extension of time(Appendix –XVII) respectively to the authority as indicated in Schedule ‘F’. The Contractor shall indicate in such a request the period by which rescheduling of milestone/s or extension of time is desired. With every request for rescheduling of milestones, or if at any time the actual progress of work falls behind the approved programme by more than 10% of the stipulated period of completion of contract, the contractor shall produce a revised programme which shall include all details of pending drawings and decisions required to complete the contract and also the target dates by which these details should be available without causing any delay in execution of the work. A recovery as specified in Schedule ‘F’ shall be made on per day basis in case of delay in submission of the revised programme.

5.4.1 In any such case the authority as indicated in Schedule ‘F’ may give a fair and reasonable extension of time for completion of work or reschedule the mile stones. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Schedule ‘F’ in writing, within 30 days of the date of receipt of such request from the Contractor in prescribed form. In event of non application by the contractor for extension of time E-in-C after affording opportunity to the contractor, may give, supported with a programme (as specified under 5.4 above), a fair and reasonable extension within a reasonable period of occurrence of the event.

5.5 In case the work is delayed by any reasons, in the opinion of the Engineer-in-Charge, by the contractor for reasons beyond the events mentioned in clause 5.2 or clause 5.3 or clause 5.4 and beyond the justified extended date; without prejudice to right to take action under Clause 3, the Engineer-in-Charge may grant extension of time required for completion of work without rescheduling of milestones. The contractor shall be liable for levy of compensation for delay for such extension of time.

CLAUSE 6

Measurements of Work Done

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract of work done.

All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.

If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a
mutually agreed method shall be followed.

The contractor shall give, not less than seven days’ notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge’s consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 6A

Computerized Measurement Book

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the department so that a complete record is obtained of all the items of works performed under the contract.

All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the department a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and/or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.

The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the department. Thereafter, the MB shall be taken in the Divisional Office records, and allotted a number as per the Register of Computerised MBs. This should be done before the corresponding bill is submitted to the Division Office for payment. The contractor shall submit two spare copies of such computerized MB’s for the purpose of reference and record by the various officers of the department.

The contractor shall also submit to the department separately his computerized Abstract of Cost and the bill.
based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the “bill. Thereafter, this bill will be processed by the Division Office and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements/levels by the Engineer-in-Charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give not less than seven days’ notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge’s consent being obtained in writing the same shall be uncovered at the Contractor’s expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 7
Payment on Intermediate Certificate to be Regarded as advances

No payment shall be made for work, estimated to cost Rs. One lac or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs. One lac, the interim or running count bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Department in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule ‘F’, in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The amount admissible shall be paid by 10th working day after the day of presentation of the bill by
the Contractor to the Engineer-in-Charge or his Asstt. Engineer together with the account of the material issued by the department, or dismantled materials, if any. In the case of works outside the headquarters of the Engineer-in-Charge, the period of ten working days will be extended to fifteen working days. In case of delay in payment of intermediate bills after 45 days of submission of bill by the contractor provided the bill submitted by the contractor found to be in order, a simple interest @ 10% per annum shall be paid to the contractor from the date of expiry of prescribed time limit which will be compounded on yearly basis.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken way and reconstructed or reerected. Any certificate given by the Engineer-in-charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specification. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the department to take action under the terms of this contract for delay in the completion of work, it the extension of date of completion is not granted by the competent authority.

The Engineer-in-Charge in his sole discretion on the basis of a certificate from the Asstt. Engineer to the effect that the work has been completed up to the level in question make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) up to lintel level (including sunshade etc.) and slab level, for each floor working out at 75% of the assessed value.

The advance payments so allowed shall be adjusted in the subsequent interim bill to be submitted by the contractor within 10 days of the interim payment. In case of delay in submission of bill by the contractor a simple interest @ 10% per annum shall be paid to the SDMC from the date of expiry of prescribed time limit which will be compounded on yearly basis.

Payments in composite contracts

In case of composite tenders, running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor component shall made by the Engineer-in-Charge of the discipline of minor component directly to the main contractor.

In case main contractor fails to make the payment to the contractor associated by him within 15 days of receipt of each running account payment, then on the written complaint of contractor associated for such minor component shall serve the show cause to the main contractor and if reply of main contractor either not received or found unsatisfactory, he may make the payment directly to the contractor associated for minor component, as per the terms and conditions of the agreement drawn between main contractor and associate contractor fixed by him. Such payment made to the associate contractor shall be recovered by Engineer-in-Charge of major or minor component from the next R/A/ final bill due to main contractor as the case may be.

CLAUSE 7A

No Running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge.

CLAUSE 8

Completion Certificate and Completion Plans

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion,
otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE 8A
Contractor to Keep Site Clean

When the annual repairs and maintenance of works are carried out, the splashes and droppings from white washing, colour washing, painting etc., on walls, floor, windows, etc shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done: without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days notice in writing to the contractor.

CLAUSE 8B
Completion Plans to be Submitted by the Contractor

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 2005 and (Part-II External) 1994 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum of 0.1 % of Tendered Value or limit prescribed in Schedule F whichever is more as may be fixed by the Superintending Engineer concerned and in this respect the decision of the Superintending Engineer shall be final and binding on the contractor.

The contractor shall submit completion plans for Internal and External Civil, Electrical and Mechanical Services within thirty days of the completion of the work, provided that the service plans having been issued for execution by the Engineer-in-Charge, unless the contractor, by virtue of any other provision in the contract, is required to prepare such plans.

CLAUSE 9
Payment of Final Bill

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified hereunder, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized Asstt. Engineer, complete with account of materials issued by the Department and dismantled materials.
(i) If the Tendered value of work is up to Rs. 45 lac : 2 months
(ii) If the Tendered value of work is more than Rs.45 lac and up to Rs. 2.5 Crore : 3 months
(iii) If the Tendered value of work exceeds Rs. 2.5 Crore : 6 months

In case of delay in payment of final bills after prescribed time limit, a simple interest @ 10% per annum shall be paid to the contractor from the date of expiry of prescribed time limit which will be compounded on yearly basis, provided the final bill submitted by the contractor found to be in order.

CLAUSE 9A
Payment of Contractor’s Bills to Banks

Payments due to the contractor may, if so desired by him, be made to his bank, registered financial, co-operative or thrift societies or recognized financial institutions instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank; registered financial, co-operative or thrift societies or recognized financial institutions to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by SDMC or his signature on the bill or other claim preferred against SDMC before settlement by the Engineer-in-Charge of the account or claim by payment to the bank, registered financial, co-operative or thrift societies or recognized financial institutions. While the receipt given by such banks; registered financial, co-operative or thrift societies or recognized financial institutions shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible present his bills duly receipted and discharged through his bank, registered financial, co-operative or thrift societies or recognized financial institutions.

Nothing herein contained shall operate to create in favour of the bank; registered financial, co-operative or thrift societies or recognized financial institutions any rights or equities visa-vis the President of India.

CLAUSE 10

Materials supplied by SDMC Materials which SDMC will supply are shown in Schedule ‘B’ which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof. The contractor shall be bound to procure them from the Engineer-in-Charge. As soon as the work is awarded, the contractor shall finalise the programme for the completion of work as per clause 5 of this contract and shall give his estimates of materials required on the basis of drawings/or schedule of quantities of the work. The Contractor shall give in writing his requirement to the Engineer-in-Charge which shall be issued to him keeping in view the progress of work as assessed by the Engineer-in-Charge, in accordance with the agreed phased programme of work indicating monthly requirements of various materials. The contractor shall place his indent in writing for issue of such materials at least 7 days in advance of his requirement.

Such materials shall be supplied for the purpose of the contract only and the value of the materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as and when materials are consumed in items of work (including normal wastage) for which payment is being made to the contractor, from any sum then due or which may therefore become due to the contractor under the contract or otherwise or from the security deposit. At the time of submission of bills, the contractor shall certify that balance of materials supplied is available at site in original good condition. The contractor shall submit along with every running bill (on account or interim bill) materialwise reconciliation statements supported by complete calculations reconciling total issue, total consumption and certified balance (diameter/section-wise in the case of steel) and resulting variations and reasons therefore. Engineer-in-Charge shall (whose decision shall be final and binding on the contractor) be within his rights to follow the procedure of recovery in clause 42 at any stage of the work if reconciliation is not found to be satisfactory.

The contractor shall bear the cost of getting the material issued, loading, transporting to site, unloading, storing under cover as required, cutting assembling and joining the several parts together as necessary. Notwithstanding anything to the contrary contained in any other clause of the contract and (or the CPWA Code) all stores/materials so supplied to the contractor or procured with the assistance of the SDMC shall remain the absolute property of SDMC and the
The contractor shall be the trustee of the stores/materials, and the said stores/materials shall not be removed/disposed off from the site of the work on any account and shall be at all times open to inspection by the Engineer-in-Charge or his authorized agent. Any such stores/materials remaining unused shall be returned to the Engineer-in-Charge in as good a condition in which they were originally supplied at a place directed by him, at a place of issue or any other place specified by him as he shall require, but in case it is decided not to take back the stores/materials the contractor shall have no claim for compensation on any account of such stores/materials so supplied to him as aforesaid and not used by him or for any wastage in or damage to in such stores/materials.

On being required to return the stores/materials, the contractor shall hand over the stores/materials on being paid or credited such price as the Engineer-in-Charge shall determine, having due regard to the condition of the stores/materials. The price allowed for credit to the contractor, however, shall be at the prevailing market rate not exceeding the amount charged to him, excluding the storage charge, if any. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to account for contravention of the terms of the licences or permit and/or for criminal breach of trust, be liable to SDMC for all advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach. Provided that the contractor shall in no case be entitled to any compensation or damages on account of any delay in supply or non-supply thereof all or any such materials and stores provided further that the contractor shall be bound to execute the entire work if the materials are supplied by the SDMC within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months, but if a part of the materials only has been supplied within the aforesaid period, then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such extension of time as may be determined by the Engineer-in-Charge whose decision in this regard shall be final and binding on the contractor.

The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/original condition at the time of completion or determination of the contract shall be returned to the Engineer-in-Charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading, transporting, unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue.

**CLAUSE 10A**

**Materials to be provided by the Contractor**

The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the SDMC.

The contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnishing proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall determine, having due regard to the condition of the materials so complied, all or any such materials and stores provided further that the Contractor shall be bound to execute the entire work if the materials are supplied by the SDMC within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months, but if a part of the materials only has been supplied within the aforesaid period, then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such extension of time as may be determined by the Engineer-in-Charge whose decision in this regard shall be final and binding on the contractor.

The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/original condition at the time of completion or determination of the contract shall be returned to the Engineer-in-Charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading, transporting, unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue.
Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.

The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in schedule F.

**CLAUSE 10B**

**Secured Advance on Non-perishable Materials**

(i) The contractor, on signing an indenture in the form in Annexure XVIII by the Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 75% of the assessed value of any materials which are in the opinion of the Engineer-in-Charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/deducted from the next payment made under any of the clause or clauses of this contract.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

**Mobilisation Advance**

(ii) Mobilization advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work. Such advance shall be in two or more installments to be determined by the Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Before any installment of advance is released, the contractor shall execute a Bank Guarantee Bond not more than 6 in number from Scheduled Bank for the amount equal to 110% of the amount of advance and valid for till recovery of advance. This Bank Guarantee from Scheduled Bank for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery. Provided always that provision of Clause 10 B (ii) shall be applicable only when so provided in ‘Schedule F’

**Plant Machinery & Shuttering Material Advance**

(iii) An advance for plant, machinery & shuttering material required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and
Such advance shall be given on such plant and machinery which in the opinion of the Engineer-in-Charge will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 5% percent of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income-Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs. 50,000/- Seventy five per cent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:

1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.
2. Engineer in Charge, and
3. The contractor.

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in working order and are maintained in working order; (c) hypothecated to the SDMC as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and form work shall be treated as plant and equipment.

The contractor shall insure the Plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

1. **Interest & Recovery**

The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest at the rate of 10 per cent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractors bills commencing after first ten per cent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty per cent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

2. If the circumstances are considered reasonable by the Engineer-in-Charge, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended in the discretion of the Engineer-in-Charge.

**CLAUSE 10C**

**Payment on Account of Increase in Prices/Wages due to Statutory Order(s)**

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge’s stores in accordance with Clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any variation of rates in GST applicable on such material(s) being considered under this clause) beyond the prices/wages prevailing at the time of the last stipulated date of receipt of tenders...
including extensions, if any, for the work during contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied.

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge’s stores in accordance with Clause 10 thereof) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty), Government shall in respect of materials incorporated in the works (excluding the materials covered under Clause 10CA and not being material supplied from the Engineer-in-Charge’s stores in accordance with Clause 10 hereof) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge shall call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages.

The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

For this purpose, the labour component of 85% of the value of the work executed during period under consideration shall not exceed the percentage as specified in Schedule F, of the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

**CLAUSE 10 CA**

**Payment due to variation in prices of materials after receipt of tender**

If after submission of the tender, the price of materials specified in Schedule F increases/ decreases beyond the base price(s) as indicated in Schedule F for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of Contract including the justified period extended under the provisions of Clause 5 of the Contract without any action under Clause 2.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost).

The increase/decrease in prices of cement, steel reinforcement, structural steel and POL shall be determined by the Price indices issued by the Director General, CPWD For other items provided in the Schedule ‘F’, this shall be determined by the All India Wholesale Price Indices of materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry. Base price for cement, steel reinforcement, structural steel and POL shall be as issued under the authority of Director General CPWD applicable for Delhi including Noida, Gurgaon, Faridabad & Ghaziabad and for other places as issued under the authority of Zonal Chief Engineer, CPWD and base price of other materials issued by concerned Zonal Chief Engineer and as indicated in Schedule ‘F’. In case, price index of a particular material is not issued by Ministry of Commerce and Industry, then the price index of nearest similar material as indicated in Schedule ‘F’ shall be followed.

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the formula given below for individual material:

\[ V = P \times Q \times \left( \frac{C_i - C_0}{C_0} \right) \]

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where,

\[
V = \text{Variation in material cost i.e. increase or decrease in the amount ofF}
\]

\[
P = \text{Base Price of material as issued under authority of DG, CPWD or concerned Zonal Chief Engineer and as indicated in Schedule } "F".
\]

For Projects and Original Works

\[
Q = \text{Quantity of material brought at site for bonafide use in the works since previous bill excluding any such quantity consumed in the deviated quantity of items beyond deviation limit and extra /substituted item, paid/to be paid at rates derived on the basis of market rate under clause 12.2.}
\]

For Maintenance Works

\[
Q = \text{Quantity of material brought at site for bonafide use in the works since previous bill including any such quantity consumed in the deviated quantity of items beyond deviation limit paid at agreement rate and extra /substituted item being scheduled items, but excluding non schedule extra /substituted item paid/to be paid at market rate under clause 12.2.}
\]

\[
CI_0 = \text{Price index for cement, steel reinforcement bars structural steel and POL as issued by the DG, CPWD and corresponding to the time of base price of respective material indicated in Schedule 'F'. For other items, if any, provided in Schedule 'F', All India Wholesale Price Index for the material as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce and corresponding to the time of base price of respective material indicated in Schedule 'F'.}
\]

\[
CI = \text{Price index for cement, steel reinforcement bars, structural steel and POL as issued under the authority of DG, CPWD for period under consideration. For other items, if any, provided in Schedule 'F', All India Wholesale Price Index for the material for period under consideration as published by Economic Advisor to Government of India, Ministry of Industry and Commerce.}
\]
Note: (i) In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on prorata basis only as cost of extra work x stipulated period/tendered cost) shall be considered.

Provided always that provisions of the preceding Clause 10 C shall not be applicable in respect of Materials covered in this Clause.

(ii) If during progress of work or at the time of completion of work, it is noticed that any material brought at site is in excess of requirement, then amount of escalation if paid earlier on such excess quantity of material shall be recovered on the basis of cost indices as applied at the time of payment of escalation or as prevailing at the time of effecting recovery, whichever is higher.

(iii) Cement mentioned wherever in this clause includes Cement component used in RMC brought at site from outside approved RMC plants, if any.

(iv) The date wise record of ready mix concrete shall be kept in a register and the cement consumption for the same shall be calculated accordingly.

(v) If built-up steel items are brought at site from workshop, then the variation shall be paid for the structural steel up to the period when the built up item/finished product is brought at site.

CLAUSE 10 CC
Payment due to Increase/Decrease in Prices/Wages (excluding materials covered under clause 10 CA) after Receipt of Tender for Works

If the prices of materials (not being materials supplied or services rendered at fixed prices by the department in accordance with clause 10 & 34 thereof) and/or wages of labour required for execution of the work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2. However, for the work done during the justified period extended as above, the compensation as detailed below will be limited to prices/wages prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost). No such compensation shall be payable for a work for which the stipulated period of completion is equal to or less than the time as specified in Schedule F. Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the following provisions:-

(i) The base date for working out such escalation shall be the last stipulated date of receipt of tenders including extension, if any.
(ii) The cost of work on which escalation will be payable shall be reckoned as below:

(a) Gross value of work done up to this quarter: (A)
(b) Gross value of work done up to the last quarter: (B)
(c) Gross value of work done since previous quarter (A-B): (C)
(d) Full assessed value of Secured Advance (excluding materials Covered under Clause 10 CA) fresh paid in this quarter: (D)
(e) Full assessed value of Secured Advance (excluding materials Covered under Clause 10 CA) recovered in this quarter: (E)
(f) Full assessed value of Secured Advance for which escalation Payable in this quarter (D-E): (F)
(g) Advance payment made during this quarter: (G)
(h) Advance payment recovered during this quarter: (H)
(i) Advance payment for which escalation is payable in this Quarter (G-H): (I)
(j) Extra items/deviated quantities of items paid as per Clause 12 (J)
  Based on prevailing market rates during this quarter:
  
  Then, \( M = C + F + I - J \)
  
  \( N = 0.85 M \)

(k) Less cost of material supplied by the department as per Clause 10 and recovered during the quarter: (K)

(l) Less cost of services rendered at fixed charges as per Clause 34 and recovered during the quarter: (L)

Cost of work for which escalation is applicable:

\[ W = N - (K + L) \]

(iii) Components for materials (except cement, reinforcement bars, structural steel, POL or other materials covered under clause 10 CA) labour, etc. shall be pre-determined for every work and incorporated in the conditions of contract attached to the tender papers included in Schedule 'F'. The decision of the Engineer-in-Charge in working out such percentage shall be binding on the contractors.

(iv) The compensation for escalation for other materials (excluding cement, reinforcement bars, structural steel, POL or other materials covered under clause 10 CA) shall be worked as per the formula given below:-

(a) Adjustment for civil component (except cement, structural steel, reinforcement bars, POL and other materials covered under clause 10 CA) / electrical component of construction 'Materials'

\[ V_m = \frac{X_m (M_I - M_{I_0})}{100 M_{I_0}} \]

\[ V_m = \text{Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.} \]

\[ W = \text{Cost of Work done worked out as indicated in sub-para (ii) of Clause 10CC.} \]

\[ X_m = \text{Component of ‘materials’ (except cement, structural steel, reinforcement bars POL and other materials covered under clause 10CA) expressed as percent of the total value of work.} \]

\[ M_I = \text{All India Wholesale Price Index for civil component/electrical component of construction material as worked out on the basis of All India Wholesale} \]
Price Index for Individual Commodities/Group Items for the period under consideration as published by Economic Advisor to Govt. of India, Ministry of Industry & Commerce and applying weightages to the Individual Commodities/Group Items. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on prorata basis only as cost of extra work x stipulated period/tendered cost, shall be considered.)

\[ M_{I_{0}} = \text{All India Wholesale Price Index for civil component/electrical component of construction material as worked out on the basis of All India Wholesale Price Index for Individual Commodities/Group Items valid on the last stipulated date of receipt of tender including extension, if any, as published by the Economic Advisor to Govt. of India, Ministry of Industry & Commerce and applying weightages to the Individual Commodities/Group items.} \]

*Note: relevant component only will be applicable.

(v) The following principles shall be followed while working out the indices mentioned in para (iv) above.

(a) The compensation for escalation shall be worked out at quarterly intervals and shall be with respect to the cost of work done as per bills paid during the three calendar months of the said quarter. The dates of preparation of bills as finally entered in the Measurement Book by the Assistant Engineer/date of submission of bill finally by the contractor to the department in case of computerised measurement books shall be the guiding factor to decide the bills relevant to the quarterly interval. The first such payment shall be made at the end of three months after the month (excluding the month in which tender was accepted) and thereafter at three months’ interval. At the time of completion of the work, the last period for payment might become less than 3 months, depending on the actual date of completion.

(b) The index (MI/FI etc.) relevant to any quarter/period for which such compensation is paid shall be the arithmetical average of the indices relevant to the three calendar months. If the period up to date of completion after the quarter covered by the last such installment of payment, is less than three months, the index MI and FI shall be the average of the indices for the months falling within that period.

(vi) The compensation for escalation for labour shall be worked out as per the formula given below:

\[ VL = W \times \frac{Y \times (L_{I} - L_{I_{0}})}{100 L_{I_{0}}} \]

- **VL**: Variation in labour cost i.e. amount of increase or decrease in rupees to be paid or recovered.
- **W**: Value of work done, worked out as indicated in sub-para (ii) above.
- **Y**: Component of labour expressed as a percentage of the total value of the work.
- **L_{I}**: Minimum wage in rupees of an unskilled adult male mazdoor, fixed under any law, statutory rule or order as applicable on the last date of the quarter previous to the one under consideration. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the minimum wage prevailing on the last date of quarter previous to the quarter pertaining to updated stipulated date of Completion considering the effect of extra work (extra time to be calculated on prorata basis only as cost of extra work x stipulated period/tendered cost, shall be considered.)
- **L_{I_{0}}**: Minimum daily wage in rupees of an unskilled adult male mazdoor, fixed under any law, statutory rule or
order as on the last stipulated date of receipt of tender including extension, if any.

(vii) The following principles will be followed while working out the compensation as per sub-para (vi) above.

(a) The minimum wage of an unskilled male mazdoor mentioned in sub-para (vi) above shall be the higher of the wage notified by Government of India, Ministry of Labour and that notified by the local administration both relevant to the place of work and the period of reckoning.

(b) The escalation for labour also shall be paid at the same quarterly intervals when escalation due to increase in cost of materials is paid under this clause. If such revision of minimum wages takes place during any such quarterly intervals, the escalation compensation shall be payable at revised rates only for work done in subsequent quarters;

(c) Irrespective of variations in minimum wages of any category of labour, for the purpose of this clause, the variation in the rate for an unskilled adult male mazdoor alone shall form the basis for working out the escalation compensation payable on the labour component.

(viii) In the event the price of materials and/or wages of labour required for execution of the work decrease/s, there shall be a downward adjustment of the cost of work so that such price of materials and/or wages of labour shall be deductible from the cost of work under this contract and in this regard the formula herein before stated under this Clause 10CC shall mutatis mutandis apply, provided that:

(a) no such adjustment for the decrease in the price of materials and/or wages of labour aforementioned would be made in case of contracts in which the stipulated period of completion of the work is equal to or less than the time as specified in Schedule ‘F’.

(b) the Engineer-in-Charge shall otherwise be entitled to lay down the procedure by which the provision of this sub-clause shall be implemented from time to time and the decision of the Engineer-in-Charge in this behalf shall be final and binding on the contractor.

(ix) Provided always that:-

(a) Where provisions of clause 10CC are applicable, provisions of clause 10C will not be applicable but provisions of clause 10CA will be applicable.

(b) Where provisions of clause 10CC are not applicable, provisions of clause 10C and 10CA will become applicable.

Note: Updated stipulated date of completion (period of completion plus extra time for extra work for compensation under clause 10C, 10CA and 10CC, the factor of 1.25 taken into account for calculating the extra time under clause 12.1 for extra time shall not be considered while calculating the updated stipulated date of completion for this purpose in clause 10C, clause 10CA, and clause 10CC.

CLAUSE 10 D
Dismantled Material Govt. Property

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as SDMC’s property and such materials shall be disposed off to the best advantage of SDMC according to the instructions in writing issued by the Engineer-in-Charge.

CLAUSE 11
Work to be Executed in Accordance with Specifications, Drawings, Orders etc.

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications.

The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule ‘F’ or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.
The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE 12:
Deviations/ Variations Extent and Pricing

The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

The completion cost of any agreement for Maintenance works including works of upgradation, aesthetic, special repair, addition/ alteration shall not exceed 1.25 times of Tendered amount.

a) The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the contractor, as follows:

1. In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus
2. 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

b) A. For Project and original works:

Deviation, Extra Items and Pricing

In the case of extra item(s) (items that are completely new, and are in addition to the items contained in the contract), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis which shall include invoices, vouchers etc. and Manufacturer's specification for the work failing which the rate approved later by the Engineer-in-Charge shall be binding and the Engineer-in-Charge shall within prescribed time limit of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined, failing which it will be deemed to have been approved.

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/ alteration:

In the case of Extra Item(s) being the schedule items (Delhi Schedule of Rates items), these shall be paid as per the schedule rate plus cost index (at the time of tender) plus/minus percentage above/ below quoted contract amount.

Payment of Extra items in case of non-schedule items (Non-DSR items) shall be made as per the prevailing market rate.

A. For Project and original works:

Deviation, Substituted Items, Pricing

In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in
the manner as mentioned in the following para.

(a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

(b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/alteration:

In the case of Substitute Item(s) being the schedule items (Delhi Schedule of Rates items), these shall be paid as per the schedule rate plus cost index (at the time of tender) plus/minus percentage above/below quoted contract amount. Payment of Substitute in case of non-schedule items (Non-DSR items) shall be made as per the prevailing market rate.

A. For Project and original works:

**Deviation, Deviated Quantities, Pricing**

In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in schedule F, the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/alteration:

In the case of contract items, which exceed the limits laid down in schedule F, the contractor shall be paid rates specified in the schedule of quantities.

The prescribed time limits for finalising rates for Extra Item(s), Substitute Item(s) and Deviated Quantities of contract is within 30 days after submission of proposal by the contractor without observation of the Engineer-in-charge.

12.3 A. For Project and original works:

The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in schedule F, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

B. For Maintenance works including works of upgradation, aesthetic, special repair, addition/alteration:

In case of decrease in the rates prevailing in the market of items for the work in excess of the limits laid down in Schedule F, the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

12.4 The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Superintending Engineer may authorise consideration of such claims on merits.

12.5 For the purpose of operation of Schedule “F”, the following works shall be treated as works relating to
foundation unless & otherwise defined in the contract:

(i) For Buildings: All works up to 1.2 metres above ground level or up to floor 1 level whichever is lower.
(ii) For abutments, piers and well staining: All works up to 1.2 m above the bed level.
(iii) For retaining walls, wing walls, compound walls, chimneys, over head reservoirs/ tanks and other elevated structures: All works up to 1.2 metres above the ground level.
(iv) For reservoirs/tanks (other than overhead reservoirs/tanks): All works up to 1.2 metres above the ground level.
(v) For basement: All works up to 1.2 m above ground level or up to floor 1 level whichever is lower.
(vi) For Roads, all items of excavation and filling including treatment of sub base.

12.6 Any operation incidental to or necessarily has to be in contemplation of tenderer while filing, tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations

**CLAUSE 13:**
**Foreclosure of contract due to Abandonment or Reduction in Scope of Work**

If at any time after acceptance of the tender or during the progress of work, the purpose or object for which the work is being done changes due to any supervening cause and as a result of which the work has to be abandoned or reduced in scope the Engineer-in-Charge shall give notice in writing to that effect to the contractor stating the decision as well as the cause for such decision and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

(i) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.

(ii) SDMC shall have the option to take over contractor’s materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however SDMC shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by SDMC, cost of such materials as detailed by Engineer-in-Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

(iii) If any materials supplied by SDMC are rendered surplus, the same except normal wastage shall be returned by the contractor to SDMC at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to SDMC stores, if so required by SDMC, shall be paid.

(iv) Reasonable compensation for transfer of T & P from site to contractor’s permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.

(v) Reasonable compensation for repatriation of contractor’s site staff and imported labour to the extent necessary.

The contractor shall, if required by the Engineer-in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.
The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor’s materials at site taken over by the SDMC as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the SDMC from the contractor under the terms of the contract.

In the event of action being taken under Clause 13 to reduce the scope of work, the contractor may furnish fresh Performance Guarantee on the same conditions, in the same manner and at the same rate for the balance tendered amount and initially valid up to the extended date of completion or stipulated date of completion if no extension has been granted plus 60 days beyond that. Wherever such a fresh Performance Guarantee is furnished by the contractor the Engineer-in-Charge may return the previous Performance Guarantee.

Clause 14
Carrying out part work at Risk and cost of contractor

If contractor:
(i) At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or

(ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or

Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.

The Engineer-in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to SDMC, by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to:

(a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

(b) Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by SDMC because of action under this clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor’s materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by SDMC in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by SDMC as aforesaid after allowing
such credit shall without prejudice to any other right or remedy available to SDMC in law or per as agreement
be recovered from any money due to the contractor on any account, and if such money is insufficient, the
contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge
shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements,
temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the
contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in
accordance with the provisions of the contract.

In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to
compensation for any loss sustained by him by reason of his having purchased or procured any materials or
entered into any engagements or made any advance on any account or with a view to the execution of the work
or the performance of the contract.

CLAUSE 15
Suspension of Work

(i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be
final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in
such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to
the work already done or endanger the safety thereof for any of the following reasons:

(a) on account of any default on the part of the contractor or;
(b) for proper execution of the works or part thereof for reasons other than the default of the contractor; or
(c) for safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary
and carry out the instructions given in that behalf by the Engineer-in-Charge.

(ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

(a) the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS
25%, for completion of the item or group of items of work for which a separate period of completion is specified
in the contract and of which the suspended work forms a part, and;

(b) If the total period of all such suspensions in respect of an item or group of items or work for which a
separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition,
be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries
and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of
suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his
claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at
a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt
of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from
receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which
progress has been suspended and if such permission is not granted within that time, the contractor, if he
intends to treat the suspension, where it affects only a part of the works as an omission of such part by SDMC
or where it affects whole of the works, as an abandonment of the works by SDMC, shall within ten days of
expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of
the contractor treating the suspension as an abandonment of the contract by Government, he shall have no
claim to payment of any compensation on account of any profit or advantage which he might have derived from
the execution of the work in full but which he could not derive in consequence of the abandonment. He shall,
however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of
salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

CLAUSE 15 A
Compensation in case of Delay of Supply of Material by Govt.

The contractor shall not be entitled to claim any compensation from SDMC for the loss suffered by him on account of delay by SDMC in the supply of materials in schedule 'B' where such delay is covered by the difficulties relating to the supply of wagons, force majeure or any reasonable cause beyond the control of the SDMC. This clause 15 A will not be applicable for works where no material is stipulated.

CLAUSE 16
Action in case work not done as per Specifications

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the Department or any organization engaged by the Department for Quality Assurance and of the Chief Technical Examiner’s Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor’s agent shall be considered to have the same force as if they had been given to the contractor himself. If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or to the Chief Engineer in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the Department for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in the case of work costing Rs. 10 Lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in schedule ‘F’ may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE 17
Contractor Liable for Damages, defects during defect liability period

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains,
electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later. Provided that in the case of road work, if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

In case of Maintenance and Operation works of E&M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.

**CLAUSE 18**

**Contractor to Supply Tools & Plants etc.**

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants as specified in schedule F. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

**CLAUSE 18 A**

**Recovery of Compensation paid to Workmen**

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensation Act, 1923, SDMC is obliged to pay compensation to a workman employed by the contractor, in execution of the works, SDMC will recover from the contractor, the amount of the compensation so paid; and, without prejudice to the rights of the SDMC under sub-section (2) of Section 12, of the said Act, SDMC shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by SDMC to the contractor whether under this contract or otherwise. SDMC shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to SDMC full security for all costs for which SDMC might become liable in consequence of contesting such claim.

**CLAUSE 18 B**

**Ensuring Payment and Amenities to Workers if Contractor fails**

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970,
and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, SDMC is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the SDMC. Contractor's Labour Regulations, or under the Rules framed by SDMC from time to time for the protection of health and sanitary arrangements for workers employed by SDMC. Contractors, SDMC will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the SDMC under sub-section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, SDMC shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by SDMC to the contractor whether under this contract or otherwise SDMC shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the SDMC full security for all costs for which SDMC might become liable in contesting such claim.

**CLAUSE 19**

**Labour Laws to be complied by the Contractor**

The contractor shall obtain a valid licence under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

**The contractor shall also comply with the provisions of the inter-state Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979.**

**CLAUSE 19A**

No labour below the age of fourteen years shall be employed on the work.

**CLAUSE 19 B**

**Payment of Wages**

Payment of wages:
(i) The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in the SDMC. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

(ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

(iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor’s part of this contract, the contractor shall comply with or cause to be complied with the Central Public Works Department contractor’s Labour Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorizedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

(iv) (a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or
of deductions made from his or their wages which are not justified by their terms of the contract or non-
observance of the Regulations.

(b) Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours
directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same
rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums
not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled
thereto from any money due to the contractor by the Engineer-in-Charge concerned.

In the case of Union Territory of Delhi, however, as the all inclusive minimum daily wages fixed under
Notification of the Delhi Administration No.F.12(162)MWO/DAB/43884-91, dated 31-12-1979 as amended from
time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday
would not arise.

(v) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act,
1948, Employees Liability Act, 1938, Workmen’s Compensation Act, 1923, Industrial Disputes Act, 1947,
Maternity Benefits Act, 1961, and the Contractor’s Labour (Regulation and Abolition) Act 1970, or the
modifications thereof or any other laws relating thereto and the rules made thereunder from time to time.

(vi) The contractor shall indemnify and keep indemnified SDMC against payments to be made under and for the
observance of the laws aforesaid and the SDMC. Contractor’s Labour Regulations without prejudice to his right
to claim indemnity from his sub-contractors.

(vii) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to
be a breach of this contract.

(viii) Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such
wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that
Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen
as and by way of commission or otherwise.

(ix) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by
the Jamadar from the wage of workmen.

CLAUSE 19C
In respect of all labour directly or indirectly employed in the work for the performance of the contractor’s part of
this contract, the contractor shall at his own expense arrange for the safety provisions as per SDMC. Safety
Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In
case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to
pay a penalty of Rs.200/- 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 costs incurred in that behalf from the contractor.

CLAUSE 19 D
The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge, a true statement
showing in respect of the second half of the preceding month and the first half of the current month
respectively:-

(1) the number of labourers employed by him on the work,
(2) their working yours,
(3) the wages paid to them,
(4) the accidents that occurred during the said fortnight showing the circumstances under which they happened
and the extent of damage and injury caused by them, and
(5) the number of female workers who have been allowed maternity benefit according to Clause 19F and the
amount paid to them.

Failing which the contractor shall be liable to pay to SDMC, a sum not exceeding Rs.200/- for each default or
materially incorrect statement. The decision of the Divisional Officer shall be final in deducting from any bill due
to the contractor, the amount levied as fine and be binding on the contractor.

**CLAUSE 19 E**
In respect of all labour directly or indirectly employed in the works for the performance of the contractor’s part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by the Central Public Works Department and its contractors.

**CLAUSE 19 F**
Leave and pay during leave shall be regulated as follows:-

1. **Leave:**
   (i) in the case of delivery - maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day,
   (ii) in the case of miscarriage - upto 3 weeks from the date of miscarriage.

2. **Pay:**
   (i) in the case of delivery - leave pay during maternity leave will be at the rate of the women’s average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.
   (ii) in the case of miscarriage - leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.

3. **Conditions for the grant of Maternity Leave:**
   No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave.

4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in appendix -I and II, and the same shall be kept at the place of work.
CLAUSE 19 G

In the event of the contractor(s) committing a default or breach of any of the provisions of the Central Public Works Department, Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the Government a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 per cent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the provisions of the SDMC. Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R & A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities hereinbefore mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodelled and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19 H

The contractor(s) shall at his/their own cost provide his/their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.

(i) (a) The minimum height of each hut at the eaves level shall be 2.10m (7 ft.) and the floor area to be provided will be at the rate of 2.7 sq.m. (30 sq.ft.) for each member of the worker's family staying with the labourer.

(b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.80m x 1.50m (6'x5') adjacent to the hut for each family.

(c) The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.

(d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.
(ii) (a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15 cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight.

(b) The contractor(s) shall provide each hut with proper ventilation.

(c) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.

(d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed.

(iii) Water Supply - The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/ their own cost make arrangements for laying pipe lines for water supply to his/ their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.

(iv) The site selected for the camp shall be high ground, removed from jungle.

(v) Disposal of Excreta - The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for the removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.

(vi) Drainage - The contractor(s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy.

(vii) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.

(viii) Sanitation - The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19 I
The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors’ employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/repair or renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour. AE/JE will display a list of contractors working in the colony/Blocks on the notice board in the colony and also at the service centre, to apprise the residents about the same.

CLAUSE 19J
It shall be the responsibility of the contractor to see that the building under construction is not occupied by any body unauthorizedly during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy upto 5% of tendered value of work
may be imposed by the Superintending Engineer whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Superintending Engineer, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

**CLAUSE 19K**  
**Employment of skilled/semi skilled workers**

The contractor shall, at all stages of work, deploy skilled/semi skilled tradesmen who are qualified and possess certificate in particular trade from SDMC Training Institute/Industrial Training Institute/National Institute of construction Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs. 100 per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

Provided always, that the provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than Rs. 5 crores.

**CLAUSE 19L**  
**Contribution of EPF and ESI**

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. The applicable and eligible amount of EPF&ESI shall be reimbursed preferable within 7 days but not later than 30 days of submission of documentary proof of payment provided same are in order.

**CLAUSE 20**  
**Minimum Wages Act to be complied with**

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed thereunder and other labour laws affecting contract labour that may be brought into force from time to time.

**CLAUSE 21**  
**Work not to be sublet. Action in case of insolvency**

The contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the President of India shall have power to adopt the course specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.
CLAUSE 22

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of SDMC without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

CLAUSE 23
Changes in firm’s Constitution to be intimated

Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

CLAUSE 24

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25
Settlement of Disputes & Arbitration

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

(i) If either party considers any work demanded of or denied to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge or if the Engineer in Charge considers any act or decision of the contractor on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable and is disputed, such party shall promptly within 15 days of the arising of the disputes request the Engineer-in-Chief, SDMC who shall refer the disputes to Dispute Redressal Committee (DRC) within 15 days along with a list of disputes with amounts claimed if any in respect of each such dispute. The Dispute Redressal Committee (DRC) shall give the opposing party two weeks for a written response, and, give its decision within a period of 60 days extendable by 30 days by consent of both the parties from the receipt of reference from Engineer-in-Chief, SDMC. The constitution of Dispute Redressal Committee (DRC) shall be as indicated in Schedule ‘F’. Provided that no party shall be represented before the Dispute Redressal Committee by an advocate/legal counsel etc. If the Dispute Redressal Committee (DRC) fails to give its decision within the aforesaid period or any party is dissatisfied with the decision of Dispute Redressal Committee (DRC) or expiry of time limit given above, then either party may within a period of 30 days from the receipt of the decision of Dispute Redressal Committee (DRC), give notice to the Commissioner, SDMC, for appointment of arbitrator on prescribed proforma as per Appendix XV under intimation to the other party.

It is a term of contract that each party invoking arbitration must exhaust the aforesaid mechanism of settlement of claims/disputes prior to invoking arbitration. The Commissioner, SDMC shall in such case appoint the sole arbitrator or one of the three arbitrators as the case may be within 30 days of receipt of such a request and refer such disputes to arbitration.
Wherever the Arbitral Tribunal consists of three Arbitrators, the contractor shall appoint one arbitrator within 30 days of making request for arbitration or of receipt of request by Engineer-in-charge to Commissioner, SDMC for appointment of arbitrator, as the case may be, and two appointed arbitrators shall appoint the third arbitrator who shall act as the Presiding Arbitrator. In the event of
a. A party fails to appoint the second Arbitrator, or
b. The two appointed Arbitrators fail to appoint the Presiding Arbitrator, then
The Commissioner, SDMC shall appoint the second or Presiding Arbitrator as the case may be.

(ii) Disputes or difference shall be referred for adjudication through arbitration by a Tribunal having sole arbitrator where Tendered amount is Rs. 100 Crore or less. Where Tendered Value is more than Rs. 100 Crore, Tribunal shall consist of three Arbitrators as above. The requirements of the Arbitration and Conciliation Act, 1996 (26 of 1996) and any further statutory modifications or re-enactment thereof and the rules made thereunder and for the time being in force shall be applicable.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed, if any, in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the decision of the DRC.

It is also a term of this contract that any member of the Arbitration Tribunal shall be a Graduate Engineer with experience in handling public works engineering contracts at a level not lower than Chief Engineer (Joint Secretary level of Government of India). This shall be treated as a mandatory qualification to be appointed as arbitrator.

Parties, before or at the time of appointment of Arbitral Tribunal may agree in writing for fast track arbitration as per the Arbitration and Conciliation Act, 1996 (26 of 1996) as amended in 2015. Subject to provision in the Arbitration and Conciliation Act, 1996 (26 of 1996) as amended in 2015 whereby the counter claims if any can be directly filed before the arbitrator without any requirement of reference by the appointing authority, the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds Rs. 1,00,000/-, the arbitrator shall give reasons for the award.

It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid as per the Act.

The place of arbitration shall be as mentioned in Schedule F. In case there is no mention of place of arbitration, the arbitral tribunal shall determine the place of arbitration.

The venue of the arbitration shall be such place as may be fixed by the Arbitral Tribunal in consultation with both the parties. Failing any such agreement, then the Arbitral Tribunal shall decide the venue.

CLAUSE 26
Contractor to indemnify Govt. against Patent Rights
The contractor shall fully indemnify and keep indemnified the President of India against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against SDMC in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the President of India if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27
Lampsum Provisions in Tender
When the estimate on which a tender is made includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lump-sum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of the clause.

**CLAUSE 28**

**Action where no Specifications are specified**

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers’ specifications, if not available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

**CLAUSE 29**

**Withholding and lien in respect of sum due from contractor**

Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the SDMC shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-Charge or the SDMC shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalisation or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the SDMC shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge of the SDMC or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or SDMC will be kept withheld or retained as such by the Engineer-in-Charge or SDMC till the claim arising out of or under the contract is determined by the arbitrator(if the contract is governed by the arbitration clause) by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the SDMC shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.

(ii) SDMC shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of overpayment and it shall be lawful for SDMC to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by SDMC to the contractor, without any interest thereon whatsoever.

Provided that the SDMC shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to
payment of any sum paid short where such payment has been agreed upon between the Superintending Engineer or Executive Engineer on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Superintending Engineer or the Executive Engineer.

**CLAUSE 29A**  
**Lien in respect of claims in other Contracts**

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the SDMC or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or SDMC or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or the SDMC or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge or the SDMC will be kept withheld or retained as such by the Engineer-in-Charge or the SDMC or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

**CLAUSE 30**  
**Employment of coal mining or controlled area labour not permissible**

The contractor shall not employ coal mining or controlled area labour falling under any category whatsoever on or in connection with the work or recruit labour from area within a radius of 32 km (20 miles) of the controlled area. Subject as above the contractor shall employ imported labour only i.e., deposit imported labour or labour imported by contractors from area, from which import is permitted.

Where ceiling price for imported labour has been fixed by State or Regional Labour Committees not more than that ceiling price shall be paid to the labour by the contractor.

The contractor shall immediately remove any labourer who may be pointed out by the Engineer-in-Charge as being a coal mining or controlled area labourer. Failure to do so shall render the contractor liable to pay to SDMC a sum calculated at the rate of Rs.10/- per day per labourer. The certificate of the Engineer-in-Charge about the number of coal mining or controlled area labourer and the number of days for which they worked shall be final and binding upon all parties to this contract.

It is declared and agreed between the parties that the aforesaid stipulation in this clause is one in which the public are interested within the meaning of the exception in Section 74 of Indian Contract Act, 1872.

**Explanation:** Controlled Area means the following areas:

Districts of Dhanbad, Hazaribagh, Jamtara - a Sub-Division under Santhal Pargana Commissionery, Districts of Bankuara, Birbhum, Burdwan, District of Bilaspur.

Any other area which may be declared a Controlled Area by or with the approval of the Central Government.

**CLAUSE 31**  
**Unfiltered water supply**

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the
Engineer-in-Charge, unsatisfactory.

**CLAUSE 31 A**

**Departmental water supply, if available**

Water if available may be supplied to the contractor by the department subject to the following conditions:

(i) The water charges @ 1% shall be recovered on gross amount of the work done.

(ii) The contractor(s) shall make his/their own arrangement of water connection and laying of pipelines from existing main of source of supply.

(iii) The Department do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/their own cost in the event of any temporary break down in the Government water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

**CLAUSE 32**

**Alternate water arrangements**

(i) Where there is no piped water supply arrangement and the water is taken by the contractor from the wells or hand pump constructed by the Government/SDMC, no charge shall be recovered from the contractor on that account. The contractor shall, however, draw water at such hours of the day that it does not interfere with the normal use for which the hand pumps and wells are intended. He will also be responsible for all damage and abnormal repairs arising out of his use, the cost of which shall be recoverable from him. The Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor.

(ii) The contractor shall be allowed to construct temporary wells in SDMC land for taking water for construction purposes only after he has got permission of the Engineer-in-Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.

**CLAUSE 33**

**Return of Surplus materials**

Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of SDMC either by issue from Government stocks or purchase made under orders or permits or licences issued by Government, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose of them without the written permission of the SDMC and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the licence or permit and/or for criminal breach of trust, be liable to SDMC for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

**CLAUSE 34**

**Hire of Plant & Machinery**

(i) The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter

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referred to as T&P) required for execution of the work except for the Plant & Machinery listed in Schedule ‘C’ and stipulated for issue to the contractor. If the contractor requires any item of T&P on hire from the T&P available with the SDMC over and above the T&P stipulated for issue, the SDMC will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-Charge. In such a case, all the conditions hereunder for issue of T&P shall also be applicable to such T&P as is agreed to be issued.

Plant and Machinery when supplied on hire charges shown in Schedule ‘C’ shall be made over and taken back at the departmental equipment yard/shed shown in Schedule ‘C’ and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery with condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

(iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the Department.

(iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over upto and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer-in-Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown before lunch period or major breakdown will be computed considering half a day’s breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major breakdown will be computed starting from the next working day. In case of any dispute under this clause, the decision of the Superintending Engineer shall be final and binding on the contractor.

(v) The hire charges shown above are for each day of 8 hours (inclusive of the one hour lunch break) or part thereof.

(vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the Department against any loss or damage caused to the plant and machinery either during transit or at site of work.

(vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one hour lunch break. In case of an urgent work however, the Engineer-in-Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period of 8 hours a day. In that case, the hourly hire charges for overtime to be borne by the contractor shall be 50% more than the normal proportionate hourly charges (1/8th of the daily charges) subject to a minimum of half day’s normal charges on any particular day. For working out hire charges for over time, a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored.

(viii) The contractor shall release the plant and machinery every seventh day for periodical servicing and/or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing/ wash out irrespective of the period employed in servicing.

The plant and machinery once issued to the contractor shall not be returned by him on account of lack of
arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer-in-Charge, the work or a portion of work for which the same was issued is completed.

(x) Log Book for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the Department and will be countersigned by the contractor or his authorized agent daily. In case the contractor contests the correctness of the entries and/or fails to sign the Log Book, the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure).

(xi) In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or each occasion.

(a) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of departmental rollers, maximum quantity of any items to be consolidated for each roller-day shall also be same as in Annexure to Clause 34(x). For less use of rollers, recovery for the less roller days shall be made at the stipulated issue rate.

(xii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

(xiii) The contractor will be exempted from levy of any hire charges for the number of days he is called upon in writing by the Engineer-in-Charge to suspend execution of the work, provided SDMC plant and machinery in question have, in fact, remained idle with the contractor because of the suspension.

(xiv) In the event of the contractor not requiring any item of plant and machinery issued by SDMC though not stipulated for issue in Schedule ‘C’ any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without, in any way, affecting the right of the Engineer-in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

CLAUSE 35
Condition relating to use of asphaltic materials
(i) The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the tar or bitumen used.

The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before the process of painting is started and shall hypothecate it to the Engineer-in-Charge. If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material return to the contractors. Although the materials are hypothecated to SDMC, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Engineer-in-Charge in writing.

(iii) The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of the security deposit relating to asphaltic work shall be refunded after the expiry of this period.

CLAUSE 36
Employment of Technical Staff and Employees
Contractors Superintendence, Supervision, Technical Staff & Employees

(i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work. Minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Schedule ‘F’. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-Charge and shall be available at site before start of work.

All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording/checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative(s) in the site order book and shall affix his/his signature in token of noting down the instructions and in token of acceptance of measurements/ checked measurements/ test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/ are effectively appointed or is/ are effectively attending or fulfilling the provision of this clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule ‘F’ and the decision of the Engineer-In-Charge as recorded in the site order book and measurement recorded checked/test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/ are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Engineers employed by him) alongwith every on account bill final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

(ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any
person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

**CLAUSE 37**

**Levy/Taxes payable by Contractor**

(i) GST, Building and other Construction Workers Welfare Cess or any other tax or Cess in respect of this contract shall be payable by the contractor and SDMC shall not entertain any claim whatsoever in this respect.

(ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.

If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the Government of India and does not any time become payable by the contractor to the State Government, Local authorities in respect of any material used by the contractor in the works, then in such a case, it shall be lawful to the Government of India and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.

**CLAUSE 38**

**Conditions for reimbursement of levy/taxes if levied after receipt of tenders**

(i) All tendered rates shall be inclusive of all taxes and levies (except Service Tax) payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Superintending engineer (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.

(ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Government and/or the Engineer-in-Charge and shall also furnish such other information/document as the Engineer-in-Charge may require from time to time.

(iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

(iv) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

**CLAUSE 39**

**Termination of contract on death of contractor**

Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Divisional Officer on behalf of the SDMC shall have the option of terminating the contract without compensation to the contractor.

**CLAUSE 40**

**If relative working in SDMC then the contractor not allowed to tender**

The contractor shall not be permitted to tender for works in the SDMC circle (Division in case of contractors of Horticulture/Nursery categories) responsible for award and execution of contracts in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of the Superintending Engineer and Junior Engineer (both inclusive). 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 SDMC. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department. If however the contractor is registered in any other department, he shall be debarred from tendering in SDMC for any breach of this condition.

**NOTE:** By the term “near relatives” is meant wife, husband, parents and grandparents, children and grand
children, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

**CLAUSE 41**
**No gazetted Engineer to work as Contractor within one year of retirement**
No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the SDMC shall work as a contractor or employee of a contractor for a period of one year after his retirement from government service without the previous permission of SDMC in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of SDMC as aforesaid, before submission of the tender or engagement in the contractor’s service, as the case may be.

**CLAUSE 42**
**Return of material & recovery for excess material issued**
(i) After completion of the work and also at any intermediate stage in the event of no reconciliation of materials issued, consumed and in balance - (see Clause 10), theoretical quantity of materials issued by the SDMC for use in the work shall be calculated on the basis and method given hereunder:

(a) Quantity of cement & bitumen shall be calculated on the basis of quantity of cement & bitumen required for different items of work as shown in the Schedule of Rates mentioned in Schedule ‘F’. In case any item is executed for which standard constants for the consumption of cement or bitumen are not available in the above mentioned schedule/statement or cannot be derived from the same shall be calculated on the basis of standard formula to be laid down by the Engineer-
in-Charge.

(b) Theoretical quantity of steel reinforcement or structural steel sections shall be taken as the quantity required as per design or as authorized by Engineer-in-Charge, including authorized lappages, chairs etc. plus 3% wastage due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter wise, section wise and category wise separately.

(c) Theoretical quantity of G.I. & C.I. or other pipes, conduits, wires and cables, pig lead and G.I./M.S. sheets shall be taken as quantity actually required and measured plus 5% for wastage due to cutting into pieces (except in the case of G.I./M.S. sheets it shall be 10%), such determination & comparison being made diameter wise & category wise.

(d) For any other material as per actual requirements.

(ii) Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Schedule ‘F’. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorized variation, if not returned by the contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within fifteen days of the issue of written notice by the Engineer-in-charge to this effect shall be recovered at the rates specified in Schedule ‘F’, without prejudice to the provision of the relevant conditions regarding return of materials governing the contract. Decision of Engineer-in-Charge in regard to theoretical quantities of materials, which should have been actually used as per the Annexure of the standard schedule of rates and recovery at rates specified in Schedule ‘F’, shall be final & binding on the contractor.

For non scheduled items, the decision of the Superintending Engineer regarding theoretical Quantities of materials which should have been actually used, shall be final and binding on the contractor.

(iii) The said action under this clause is without prejudice to the right of the Government to take action against the contractor under any other conditions of contract for not doing the work according to the prescribed specifications.

**CLAUSE 43**
**Compensation during warlike situations**
The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in

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consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Divisional Officer up to Rs.5,000/- and by the Superintending Engineer concerned for a higher amount. The contractor shall be paid for the damages/ destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in-Charge
(b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work.
In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Divisional Officer.

**CLAUSE 44**

Apprentices Act provisions to be complied with
The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Superintending Engineer may, in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

**CLAUSE 45**

Release of Security deposit after labour clearance
Release of Security Deposit of the work shall not be refunded till the contractor produces a clearance deposit after labour certificate from the Labour Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the Labour Officer under intimation to the Engineer-in-Charge. The Engineer-in-Charge, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, on record till after 3 months after completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released if otherwise due.
S.D.M.C. SAFETY CODE

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1(¼ horizontal and 1 vertical.)

2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.)

5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least ¼" for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment.

6. (a) Excavation and Trenching - All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100 ft.) in length or fraction thereof. Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or undercutting shall be done.

(b) Safety Measures for digging bore holes:-
   (i). If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;
   (ii). During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer in-charge of the work;
   (iii). Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50m around the point of drilling to avoid entry of people;
(iv). After drilling the borewell, a cement platform (0.50m x 0.50m x 1.20m) 0.60m above ground level and 0.60m below ground level should be constructed around the well casing;

(v). After the completion of the borewell, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;

(vi). After the borewell is drilled the entire site should be brought to the ground level.

7. Demolition - Before any demolition work is commenced and also during the progress of the work,

(i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.

(ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

(iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned:-- The following safety equipment shall invariably be provided.

(i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

(ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective goggles.

(iii) Those engaged in welding works shall be provided with welder’s protective eyeshields.

(iv) Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

(v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated atleast for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measure are adhered to :-

(a) Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.

(b) At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.

(c) Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

(d) Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.

(e) Safety belt with rope should be provided to the workers. While working inside the manholes, such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

(f) The area should be barricaded or cordoned of by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
(g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.

(h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.

(i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.

(j) Gas masks with Oxygen Cylinder should be kept at site for use in emergency.

(k) Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

(l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.

(m) The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

(n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

(o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

(p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

(vi) The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:

(a) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.

(b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.

(c) Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.

9. An additional clause (viii)(i) of Central Public Works Department Safety Code (iv) the Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use:

(i) White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.

(ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.

(iii) Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.

(iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.

(v) Overall shall be worn by working painters during the whole of working period.

(vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
(vii) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by competent authority of SDMC.

(viii) SDMC may require, when necessary medical examination of workers.

(ix) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

10. When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions:

(i) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.

(ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

(iii) Every crane driver or hoisting appliance operator, shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

(iv) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

13. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in-Charge of the department or their representatives.

16. Notwithstanding the above clauses from (1) to (15), there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.
Model Rules for the Protection of Health and Sanitary Arrangements for Workers Employed by S.D.M.C. or its Contractors

1. APPLICATION

These rules shall apply to all buildings and construction works in charge of SOUTH DELHI MUNICIPAL CORPORATION in which twenty or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the contract work is in progress.

2. DEFINITION

Work place means a place where twenty or more workers are ordinarily employed in connection with construction work on any day during the period during which the contract work is in progress.

3. FIRST-AID FACILITIES

(i) At every work place, there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

(ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:

(a) For work places in which the number of contract labour employed does not exceed 50. Each first-aid box shall contain the following equipments:

1. 6 small sterilised dressings.
2. 3 medium size sterilised dressings.
3. 3 large size sterilised dressings.
4. 3 large sterilised burn dressings.
5. 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
6. 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7. 1 snakebite lancet.
8. 1 (30 gms.) bottle of potassium permanganate crystals.
9. 1 pair scissors.
10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
11. 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
12. Ointment for burns.

(b) For work places in which the number of contract labour exceed 50. Each first-aid box shall contain the following equipments:

1. 12 small sterilised dressings.
2. 6 medium size sterilised dressings.
3. 6 large size sterilised dressings.
4. 6 large size sterilised burn dressings.
5. 6 (15 gms.) packets sterilised cotton wool.
6. 1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.
7. 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
8. 1 roll of adhesive plaster.
9. 1 snake bite lancet.
10. 1 (30 gms.) bottle of potassium permanganate crystals.
11. 1 pair scissors.
12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes /Government of India.
13. A bottle containing 100 tablets (each of 5 gms.) of aspirin.
15. A bottle of suitable surgical antiseptic solution.

(iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.

(iv) Nothing except the prescribed contents shall be kept in the First-aid box.

(v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

(vi) A person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.

(vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.

(viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

(i) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

(ii) Where drinking water is obtained from an Intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

(iii) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.

(iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

(i) In every work place adequate and suitable facilities for washing shall be provided and
maintained for the use of contract labour employed therein.

(ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.

(iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES AND URINALS

(i) Latrines shall be provided in every work place on the following scale namely:

(a) Where female are employed, there shall be at least one latrine for every 25 females.

(b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that, where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be up to the first 100, and one for every 50 thereafter.

(ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.

(iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year. Latrines shall not be of a standard lower than borehole system.

(iv) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers “For Men only” or “For Women Only” as the case may be.

(b) The notice shall also bear the figure of a man or of a woman, as the case may be.

(v) There shall be at least one urinal for male workers up to 50 and one for female workers up to fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 and one for every 100 or part thereof.

(vi) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

(b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.

(vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

(viii) Disposal of excreta: Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

(ix) The contractor shall at his own expense, carry out all instructions issued to him by the Engineer-in-Charge to effect proper disposal of night soil and other conservancy work in respect of the contractor’s workmen or employees on the site. The contractor shall be responsible for payment of any charges which may be levied by Municipal or Cantonment Authority for execution of such on his behalf.
7. **PROVISION OF SHELTER DURING REST**

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 sft) per head.

Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. **CRECHES**

(i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a,b & c.

(ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

(iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.

(iv) The contractor shall provide one ayaa to look after the children in the creche when the number of women workers does not exceed 50 and two when the number of women workers exceed 50.

(v) The use of the rooms earmarked as creches shall be restricted to children, their attendants and mothers of the children.

9. **CANTEENS**

(i) In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.

(ii) The canteen shall be maintained by the contractor in an efficient manner.

(iii) The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

(iv) The canteen shall be sufficiently lighted at all times when any person has access to it.

(v) The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colour washed at least once in each year.

Provided that the inside walls of the kitchen shall be lime-washed every four months.

(vi) The premises of the canteen shall be maintained in a clean and sanitary condition.

(vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

(viii) Suitable arrangements shall be made for the collection and disposal of garbage.

(ix) The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.

(x) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square metre (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.
(xi) (a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.

(b) Washing places for women shall be separate and screened to secure privacy.

(xii) Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.

(xiii) (a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipments necessary for the efficient running of the canteen.

2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

2. A service counter, if provided, shall have top of smooth and impervious material.

3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipments.

(xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

(xv) The charges for food stuffs, beverages and any other items served in the canteen shall be based on ‘No profit, No loss’ and shall be conspicuously displayed in the canteen.

(xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:-

(a) The rent of land and building.

(b) The depreciation and maintenance charges for the building and equipments provided for the canteen.

(c) The cost of purchase, repairs and replacement of equipments including furniture, crockery, cutlery and utensils.

(d) The water charges and other charges incurred for lighting and ventilation.

(e) The interest and amounts spent on the provision and maintenance of equipments provided for the canteen.

(xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. ANTI-MALARIAL PRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge including the filling up of any borrow pits which may have been dug by him.

11. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

Government may, from time to time, add to or amend these rules and issue directions - it may consider necessary for the purpose of removing any difficulty which may arise in the administration thereof.
S.D.M.C. Contractor’s Labour Regulations

1. SHORT TITLE

These regulations may be called the SDMC Contractors Labour Regulations.

2. DEFINITIONS

i) Workman means any person employed by SDMC or its contractor directly or indirectly through a subcontractor with or without the knowledge of the SOUTH DELHI MUNICIPAL CORPORATION to do any skilled, semiskilled or unskilled manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment are expressed or implied but does not include any person:

a) Who is employed mainly in a managerial or administrative capacity; or

b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature; or

c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the principal employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of the principal employers and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal employer.

No person below the age of 14 years shall be employed to act as a workman.

Fair Wages means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.

Contractors shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.

Wages shall have the same meaning as defined in the Payment of Wages Act.

3. i) Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week, he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages.

iii) a) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time irrespective of whether such worker is governed by the Minimum Wages Act or not.

b) Where the minimum wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker
shall be entitled to rest day wages at the rate applicable to the next preceding
day, provided he has worked under the same contractor for a continuous period
of not less than 6 days.

c) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to
work on a normal weekly holiday, he shall grant a substituted holiday to him for
the whole day on one of the five days immediately before or after the normal
weekly holiday and pay wages to such worker for the work performed on the
normal weekly holiday at overtime rate.

4. DISPLAY OF NOTICE REGARDING WAGES ETC.
The contractor shall before he commences his work on contract, display and correctly
maintain and continue to display and correctly maintain in a clear and legible condition in
conspicuous places on the work, notices in English and in the local Indian languages spoken
by the majority of the workers giving the minimum rates of wages fixed under Minimum
Wages Act, the actual wages being paid, the hours of work for which such wage are earned,
wages periods, dates of payments of wages and other relevant information as per Appendix
‘III’.

5. PAYMENT OF WAGES
i) The contractor shall fix wage periods in respect of which wages shall be payable.
ii) No wage period shall exceed one month.
iii) The wages of every person employed as contract labour in an establishment or by a
contractor where less than one thousand such persons are employed shall be paid
before the expiry of seventh day and in other cases before the expiry of tenth day after
the last day of the wage period in respect of which the wages are payable.
iv) Where the employment of any worker is terminated by or on behalf of the contractor
the wages earned by him shall be paid before the expiry of the second working day
from the date on which his employment is terminated.
v) All payment of wages shall be made on a working day at the work premises and
during the working time and on a date notified in advance and in case the work is
completed before the expiry of the wage period, final payment shall be made within
48 hours of the last working day.
vi) Wages due to every worker shall be paid to him direct or to other person authorised by
him in this behalf.
vii) All wages shall be paid in current coin or currency or in both.
viii) Wages shall be paid without any deductions of any kind except those specified by the
Central Government by general or special order in this behalf or permissible under the
Payment of Wages Act 1956.
ix) A notice showing the wages period and the place and time of disbursement of wages
shall be displayed at the place of work and a copy sent by the contractor to the
Engineer-in-Charge under acknowledgment.
x) It shall be the duty of the contractor to ensure the disbursement of wages in the
presence of the Junior Engineer or any other authorised representative of the Engineer-
in-Charge who will be required to be present at the place and time of disbursement of
wages by the contractor to workmen.
xi) The contractor shall obtain from the Junior Engineer or any other authorised
representative of the Engineer-in-Charge as the case may be, a certificate under his
signature at the end of the entries in the “Register of Wages” or the “Wage-cum-
Muster Roll” as the case may be in the following form:-
“Certified that the amount shown in column No .......................has been paid to the
workman concerned in my presence on ......................... at .......................“
6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

(i) The wages of a worker shall be paid to him without any deduction of any kind except the following:-
   (a) Fines
   (b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
   (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.
   (d) Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.
   (e) Any other deduction which the Central Government may from time to time allow.

(ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.

   Note :- An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-X

(iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

(iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the total wages, payable to him in respect of that wage period.

(v) No fine imposed on any worker shall be recovered from him by instalment, or after the expiry of sixty days from the date on which it was imposed.

(vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

7. LABOUR RECORDS

(i) The contractor shall maintain a Register of persons employed on work on contract in Form XIII of the CL (R&A) Central Rules 1971 (Appendix IV)

(ii) The contractor shall maintain a Muster Roll register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).

(iii) The contractor shall maintain a Wage Register in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI).

(iv) Register of accident - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
   b) Full particulars of the labourers who met with accident.
   c) Rate of Wages.
   d) Sex
e) Age
f) Nature of accident and cause of accident.
g) Time and date of accident.
h) Date and time when admitted in Hospital,
i) Date of discharge from the Hospital.
j) Period of treatment and result of treatment.
k) Percentage of loss of earning capacity and disability as assessed by Medical Officer.
l) Claim required to be paid under Workmen’s Compensation Act.
m) Date of payment of compensation.
n) Amount paid with details of the person to whom the same was paid.
o) Authority by whom the compensation was assessed.
p) Remarks

v) The contractor shall maintain a Register of Fines in the Form XII of the CL (R&A) Rules 1971 (Appendix-XI)

vi) The contractor shall maintain a Register of deductions for damage or loss in Form XX of the CL (R&A) Rules 1971 (Appendix-XII)

vii) The contractor shall maintain a Register of Advances in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII)

viii) The contractor shall maintain a Register of Overtime in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV)

8. ATTENDANCE CARD-CUM-WAGE SLIP

i) The contractor shall issue an Attendance card-cum-wage slip to each workman employed by him in the specimen form at (Appendix-VII)

ii) The card shall be valid for each wage period.

iii) The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.

iv) The card shall remain in possession of the worker during the wage period under reference.

v) The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.

vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

9. EMPLOYMENT CARD

The contractor shall issue an Employment Card in Form XIV of the CL (R&A) Central Rules 1971 to each worker within three days of the employment of the worker (Appendix-VIII).

10. SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a Service certificate in Form XV of the CL (R&A) Central Rules 1971 (Appendix-IX)
11. PRESERVATION OF LABOUR RECORDS
All records required to be maintained under Regulations Nos. 6 & 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-in-Charge or Labour Officer or any other officers authorised by the Ministry of Urban Development in this behalf.

12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY
The Labour Officer or any person authorised by Central Government on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of Fair Wage Clauses and the Provisions of these Regulations. He shall investigate into any complaint regarding the default made by the contractor or subcontractor in regard to such provision.

13. REPORT OF LABOUR OFFICER
The Labour Officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Executive Engineer concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor’s bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under Clause 13 of these regulations, actual payment to labourers will be made by the Executive Engineer after the Superintending Engineer has given his decision on such appeal.

   i) The Executive Engineer shall arrange payments to the labour concerned within 45 days from the receipt of the report form the Labour Officer or the Superintending Engineer as the case may be.

14. APPEAL AGAINST THE DECISION OF LABOUR OFFICER
Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Superintending Engineer concerned within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Executive Engineer concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER
   i) A workman shall be entitled to be represented in any investigation or enquiry under these regulations by:-

      a) An officer of a registered trade union of which he is a member.
      b) An officer of a federation of trade unions to which the trade union referred to in clause (a) is affiliated.
      c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.

   ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by:-

      a) An officer of an association of employers of which he is a member.
      b) An officer of a federation of associations of employers to which association referred to in clause (a) is affiliated.
      c) Where the employers is not a member of any association of employers, by an
officer of association of employer connected with the industry in which the employer is engaged or by any other employer, engaged in the industry in which the employer is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

16. **INSPECTION OF BOOKS AND SLIPS**
   The contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Officer or any other person, authorised by the Central Government on his behalf.

17. **SUBMISSIONS OF RETURNS**
   The contractor shall submit periodical returns as may be specified from time to time.

18. **AMENDMENTS**
   The Central Government may from time to time add to or amend the regulations and on any question as to the application/Interpretation or effect of those regulations the decision of the Superintending Engineer concerned shall be final.
Chapter - VII

SPECIAL CONDITIONS OF CONTRACT

1. In case of discrepancy between the nomenclature of items, specifications, and/or the drawings or in case no specifications are specified (Refer clause 28 of the General Conditions of the Contract), the following order of preference shall be observed:

   i) Nomenclature of items
   ii) Particular Specifications
   iii) Special Conditions of Contract
   iv) Other provisions in the tender
   v) Approved Drawings & Design
   vi) IRC codes (with all latest corrections up to the date of submission of tender)
   vii) MoE&F/CPCB/DPCC Norms/specifications
   viii) MORTH specifications for Road & Bridge works (Fourth revision), published by IRC
   ix) CPWD specifications, (the latest edition) with up to date correction slips
   x) All relevant BIS Codes with latest revisions
   xi) Manufacturer’s Specifications
   xii) International standards and accepted international practices as approved by Engineer-in-Charge
   xiii) Sound Engineering Practice as per directions of the Engineer-in-Charge.

   If there are varying or conflicting provisions made in any document forming part of the contract, the Engineer-in-Charge shall be the deciding authority with regard to the intention/interpretation of the tender and his decision shall be binding.

2. The work shall be carried out in two phases. The contractor will have to complete first face within four months & second face within fourteen months.

3. The contractor is not to vary or deviate from the drawings, specifications, stipulation, conditions of tender document or instructions to execute any work of any kind whatsoever unless so authorized by the Engineer-in-Charge in writing. For any extra work involved in consequence of some breach of this contract on the part of the contractor(s), no extra payment will be admissible to the contractor.

4. Setting Out

   If the survey of the work area & fixing of the alignment has already been done, the contractor shall check the same & modify, if necessary, in consultation with Engineer-in-charge & proceed further. It will be his responsibility to ensure correct setting out & alignment. Total Station Survey instruments only shall be allowed to be used for transferring & fixing levels along with theodolites.

5. The contractor shall be responsible for making a detailed schedule in the shape of PERT/CPM chart on MS Project, for all the activities within 25 days of the issue of letter of award.

6. On the basis of project scheduling (PERT/CPM), the contractor shall also indicate month wise requirements of materials to be procured by him under the terms and conditions of the contract. The contractor shall suitably update, the above mentioned detailed program month wise, keeping in view the actual progress of work vis-à-vis the original scheduling, if necessary in order to control the duration of time for the activities falling in the critical path.
The approval of the above program by the Engineer-in-Charge shall not absolve or relieve the contractor of any of his responsibilities to complete the whole of the works by the prescribed time or extended time, if any.

The right to carry out the work either in conformity with or in a manner entirely different from the terms of this tender document that may be considered the most suitable before or subsequent to the receipt of tenders due to exigencies of work is reserved with the Engineer-in-Charge.

Progress of Work

Contractor shall give the Engineer-in-Charge on the 10th day of each month, 4 copies of progress report of the work done during the previous month. Such progress report will include the quantum of work done, important materials consumed, and materials at site at the beginning of the month of report, materials consumed during the month and the balance quantities at the end of month & Digital photographs of important activities as well as showing progress of the work. For delay in submission of the progress report, a compensation @ Two thousand (Rs. 2000/-) only per day of delay will be recovered from the dues of the contractor.

Drawings to be kept at Site

Four complete sets of the drawings as checked by the agency appointed by SDMC/department shall be kept by the contractor at the site out of which one set shall be lined with cloth or laminate and same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge and the representative of the Engineer-in-Charge and any other person authorized by the Engineer-in-Charge in writing.

Foreign Exchange

No foreign exchange shall be made available for the purpose of equipment, plants, machinery or materials of any kind or any other items/purpose required to be carried out in execution of work. Also no foreign exchange required for importing equipments, materials for tools, plants and machinery etc. that may be required in carrying out the work, will be made available by the department.

Night Work

For completing the work in time, the contractor might be required to work in two or more shifts (including night work) and no claim whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay to the laborers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and /or extra amounts for any other reason.

Existing Services

Existing drains, pipes, cables, overhead wires, sewer lines, water lines and similar services encountered in the course of the execution of the work shall be protected/ maintained against the damage by the 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 supporting/shifting of such services is required to facilitate the work, the same shall be done by the contractor at no extra cost. For any permanent shifting, SDMC shall arrange to shift the underground services as and when required. However in the interest of work, if SDMC decides to get it shifted by the contractor, then contractor shall be paid separately at the rates as decided by the Engineer-in-
charge based on the actual observations of the work involved in shifting such utilities/services. The decision of the Engineer-in-Charge in this regard shall be final and binding.

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

15 The contractor will not have any claim in case of any delay by the Engineer-in-Charge in removal of trees or shifting, raising, removing of telegraph, telephone or electric lines (over head or underground), water and sewer lines and other structures etc., if any, which may come in the way of the work. However, suitable extension of time will be granted to cover such delays.

16 The contractor shall make his own arrangement for the disposal of the spoils from the works to such place where the same shall not cause nuisance and should be acceptable to the authorities concerned.

17 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.

18 The electric connection shall be obtained by the contractor for use in the work under the contract subject to the following conditions:

(a) The charges pertaining to electric supply including installation of temporary connection, including the cost of making electric sub-station if needed, laying cables wherever necessary up to the meter from the BSES Pole and from meter up to actual consumption point, and the cost of electricity shall be borne by the contractor. The contractor shall also bear the entire cost of reconnection charges in case electric connection is discontinued by BSES for any reasons.

(b) The application shall be made by the contractor through the department for temporary electric connection on the basis of the load (to be certified by the contractor). The amount equal to the security deposit, to be deposited with the application, shall be deposited by the contractor with the BSES. The contractor shall be responsible for maintenance and watch & ward of the complete installation and meter and shall also be responsible for any pilferage/theft, damage, penalty, etc from the date of installation to the disconnection after performance of the contract. The contractor shall indemnify the department against any claim arising out of pilferage/theft, damage, penalty etc. whatsoever on this account.

(c) The cost of electricity consumed shall be recovered on monthly basis from the running bills of the contractor @ Rs.50, 000/- per month or on the basis of actual consumption whichever is more. However, these recoveries shall be interim and in case any lump sum bill is received from BSES, the amount of the same shall be recovered from the next bill after making due adjustments of the recoveries already made. It is clarified that interim recoveries in respect of electricity charges as stated above shall be adjusted against the final bill received from BSES.

(d) The Contractor shall at all times observe the Indian electricity rules and any other rules/bye laws applicable at the time and any damage/penalty on account of violation of any of the rules/bye laws shall be the responsibility of the contractor.
(e) The amount on account of this security deposit made by the contractor with the department shall be refunded only when the same is released by BSES after observing all necessary formalities. Any charges recovered by BSES from security deposit or billed subsequently during/after completion of the work shall be adjusted from the running/final bills and in case no payment is due, from the security amount deposited by the contractor on this account and/or the security deposit made by the contractor under main contract.

(f) The department shall in no way be responsible for either any delay in getting the electric connection or not getting the connection at all and no claim on this account whatsoever shall be entertained. It should be clearly understood that the contractor has to make his own arrangement for generators for use if the electrical connection from BSES could not be obtained or delay has occurred in obtaining the connection. It is to be used as a stand by arrangement in case of power failure etc. or in the case of disconnections of electric supply by BSES for any reason, whatsoever it may be.

19 The contractor shall maintain in good condition all work till the completion of entire work allotted to him. The contractor is to be held responsible for and to make good all injuries, damages and repairs, rendered necessary by fire, rain, traffic, floods or other causes. Engineer-in-Charge shall not be held responsible for any claims for injuries to persons/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 authorized 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.

20. The contractor will take all necessary measures for the safety of traffic and workers during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagman, as necessary, all around the excavation/construction area and at such intermediate points, as directed by the Engineer-in-charge including the proper identification of the construction areas. Arrangement of the temporary barricading shall strictly be as per the direction of Engineer-in-charge & site requirements throughout the period of construction at no extra cost to SDMC. The contractor shall be responsible for all damages and accidents on account of construction and other relevant activities. Nothing shall be paid extra on account of above.

The temporary warning signs/lamps shall be installed wherever necessary during the hours of darkness and kept lit there at all times during these hours and nothing shall be paid extra on this account. The contractor shall provide signages for guiding the traffic. However traffic signals shall not be the responsibility of the contractor.

The barricading arrangement shall be approved by the Engineer-in-Charge. Barricading and safety requirements are very important aspects keeping in view the safety of the public as well as workers. The above provisions shall be followed strictly and at no time the construction/excavation areas are to be left un-barricaded or without red lamps during the hours of darkness. Failure to comply with the requirements mentioned in the preceding paragraphs shall be deemed to be breach of the contract on the part of the contractor for which the contractor shall be liable to action under relevant clauses/conditions of the agreement.

In addition to other actions being taken for such breach of contract, the contractor shall be liable to pay compensation @ Rs.400/- per meter of the length left un-barricaded, per day of the period of default.

The Engineer-in-Charge shall give notice to the contractor for such barricading and the contractor shall comply with the same within one day of such notice failing which he shall be liable to pay
the above compensation and actions for the said breach of contract. The decision of Engineer-in-Charge in respect of the above shall be final and binding.

21 All arrangements for traffic diversion during construction including maintenance thereof shall be considered as incidental to the work and contractor’s responsibility and nothing extra shall be payable to him in this respect. The contractor shall at his own cost obtain necessary approval of the diversion plans from the concerned authorities. Nothing extra shall be payable on the account.

22. Safety of Workers

Over and above the provisions made in SDMC Safety Code 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 as aforesaid, he shall be liable to pay penalty prescribed under relevant clauses of these tender documents 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 on this account whatsoever shall be entertained.

1. IS: 3696(part I) Safety code for scaffolds and ladders.
2. IS: 3696(part II) Safety code for scaffolds and ladders Part II ladders.
3. IS: 3764 Safety code for excavation work.
4. IS: 4081 Safety code for blasting and drilling operations.
5. IS: 5121 Safety code for piling and other deep foundations.
6. IS: 5916 Safety codes for construction involving use of hot bituminous materials.
7. IS: 7293 Safety code for working with construction machinery.
8. IS: 7969 Safety code for storage and handling of building materials.
9. Any other code and/or as per directions of Engineer-in-charge.

23 Engineer-in-Charge shall have full powers to send workmen and employ on the premises to execute fittings and other work not included in the contract. For whole operations the contractor is to afford every reasonable facility during ordinary working hours.

24 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 contractors, piece workers or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose the operations of the other contractor’s, piece workers, or of the Engineer-in-Charge. Contractor shall arrange his work with that of the others in an acceptable manner and shall perform it in proper sequence to the complete satisfaction of the Engineer-in-Charge.

25 The contractor shall assume all liability, financial or otherwise in connection with his contract and shall protect and indemnify Engineer-in-charge from any and all damages and claims that may arise because of the presence and operations of others working on or near the site. Contractor shall assume all responsibility for all work not completed or accepted because of the presence and operations of other contractors or piece workers or of the Engineer-in-Charge.

26 For execution of any items of work where incidental works such as bailing out water, shoring etc. are actually required but not specifically stated in the tender, it is to be understood that the rates quoted by the contractor shall cover such charges also and nothing extra on account of such incidental charges, if any, shall be paid. For the designation of such additional work whether
 incidental to the item or payable separately as extra item the decision of Engineer-in-Charge based on the intention of the contract and scope of work specified for the item shall be final and binding on the contractor.

27 Compliance of Laws

The contractor shall keep himself fully informed of all acts and laws of the Central and state govt. (i.e. Govt. of National Capital Territory of Delhi) all local bye laws, ordinances, rules and regulations and all orders and decree of bodies or, tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the works. Contractor shall at all times, observe and comply with all such laws, ordinances, rules, regulations, orders and decrees, and shall give all notices and pay out of his own money any fees or charges to which he may be liable. He shall protect and indemnify the Department and its officers and employees against any claim or liability arising out of violations of any such law, ordinances, legislations, order or decree, whether by himself or by his employees & authorized representatives. In this respect the contractor will submit an affidavit enclosed.

28 Prevention of Nuisance and Pollution

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 and any pollution. He shall make good at his own cost and to the satisfaction of the Engineer-in-charge, any damage to roads, paths, drainage works or public or private property whatsoever caused by the execution of the work or by traffic brought thereon by the contractor. All waste or superfluous materials shall be cleaned away by the contractor without any reservations entirely to the satisfaction of the Engineer-in-charge at no extra cost.

29. No Waiving of Legal Rights and Powers

The Engineer-in-Charge shall not be precluded or stopped from taking any measurements, and framing of estimates or detaining any certificates made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the works performed and materials furnished by the contractor and from showing that any such measurements, estimates or certificates untrue or incorrectly made and that Engineer-in-charge shall not be precluded or stopped from recovering from the contractor such damages as it may be sustained by reasons of his failure to comply with the terms and conditions of the contract.

Neither the acceptance by the Engineer-in-Charge nor any payment for acceptance of the whole or any part of the work nor any extension of time nor any possession taken by the Engineer-in-Charge shall operate as a waiver of any portion of the contract or any power here in reserved or of any risk to damage. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

30. The contractor shall provide and bear all expense and charges for special or temporary service roads required by him in connections with access to the site (except for the purposes of diversion of traffic as directed by the Engineer-in-Charge), at no extra charges and his item rate or tendered cost shall deem to include the same. He shall alter, adopt or maintain the same as required from time to time or as directed by the Engineer-in-Charge. The Department shall have right of way to this at all times and will not entitle the contractor to claim extra on this account. After completion of the work the contractor shall restore the site as provided to him at his own cost.
31 The program of work submitted by the tenderer along with the tender documents and during the execution of the work by successful tenderer shall have specific reference to the quantum of shuttering/staging etc. to be deployed by him. In furnishing such details, the tenderer shall specify the type and quantum of such items available with him and type and quantum of such items to be purchased by him for the above mentioned work separately.

32 In case of Plant & Equipments the advance mentioned in clause 10 B (iii) may be granted to the contractor on production of non-refundable bank guarantee in the standard form along with prescribed affidavit form appended with the tender documents as form of Hypothetical Deed.

33 The contractor shall take into account the element of wastage/wastages those are likely to be there in all elements of the work and quote his price, taking that into account. The contractor shall study all the items including that of diaphragm wall and its drawings enclosed with the tender documents, from the point of view of wastage/wastages, which are likely to take place. It is hereby clarified that minimum number of laps, duly staggered, shall be provided and no claim for any wastage shall be entertained.

34 Contractor shall maintain temporary/permanent benchmarks at the site of work after carrying out the initial lay out. These benchmarks shall be got checked by the Engineer-in-Charge or his authorized representative. The work at different stages shall be checked with reference to permanent bench marks maintained for said purpose. Nothing extra shall be paid for the above work as the cost of lay out at all stages including construction/ maintenance of said bench marks shall be deemed to be included in quoted rates.

35 The contractor shall ensure all safety/protection measures required for deep excavation in accordance with standards approved by Engineer-in-Charge to protect the adjacent buildings and to keep the road traffic in operation in accordance with the requirements of traffic police and any other authority which has jurisdiction over the area. In the case of any loss/damage of any kind, responsibilities of such loss/damage shall be that of the contractor, which shall be recovered from subsequent RA bills.

36 The drawings listed in the tender documents and placed in the tender documents are indicative. The work has to be executed on the basis of design & drawings (checked by the agency appointed by SDMC/ approved by SDMC) to be submitted by the contractor, which may undergo changes and no claim shall be entertained on account of these changes in execution drawings.

37 In case any repair etc., is necessitated to the nearby roads or elsewhere due to execution of work or damage done by the contractor, the same shall not be payable. The contractor is bound to do such repairs. In case of failure on the part of contract, the same shall be got done by SDMC at contractor’s risk and cost.

38 **Quality System for the Project**

For the purpose of quality assurance, this project is to be treated as ‘Extra High Assurance class’ as per relevant IRC code, involving quality assurance both at the project site level of the contractor/department as well as independent quality audit by the management of the contractor/department. In addition department/contractor shall get the quality assurance tests and if required, inspections done from independent/external agency/agencies. The contractor will submit a Quality Assurance Manual including typical method statements and formats of documents to clearly indicate the methodology, he proposes to follow for achieving this level of extra high quality assurance level. All independent or third party inspection and testing charges, to be got done by the contractor, shall be at contractor’s expenses. The cost of independent third party inspections, to be got done by the department, shall be borne by the department, if the results meet the requirements laid down in the tender document, or otherwise laid down in same other...
acceptable standards. Failing which cost of such tests shall be borne by the contractor. In all the cases, the cost of materials for such tests shall be borne by the contractor.

Immediately after the award of the work the successful tenderer shall submit his detailed quality assurance plan/quality assurance manual with detailed method statements/detailed Performa commensurating with the specifications of the work and get it approved by the department within a fortnight of award of the work. The Lump sum amount quoted by the tenderer should include all these aspects of “Extra High Quality Assurance system.”

For the guidance of contractor, a quality control requirement for the items and activities likely to be involved in the project is included in the Tender. This plan indicates the material, level of testing and the frequency of the testing of the different materials and the site activities. The items covered in the plan are only indicative. Some more items may be cropped up during the execution, which shall also be tested. For all the items including those uncovered, contractor will submit the QAP as said in the preceding para for the approval of the department.

39. **IIIrd party checking**

The 3rd party quality assurance/audit will be carried out by the SDMC consultants/ any other agency as decided by the SDMC for the purpose. The design drawings submitted by the contractor will be proof checked by the SDMC consultants. The 100% of the work carried out by the contractor shall be subjected to checking by the consultants apart from the SDMC officers. All necessary field/Lab test(s) as per MORT&H/IRC/CPWD/International specifications shall be got carried by the consultants, for which duly equipped Lab shall be provided by the contractor at his own cost.

For any specific test(s) for which testing facility may not be made available at the Site Lab, the same may be got tested at the outside Lab at the discretion of the Engineer-in-Charge/consultant.

All 3rd party quality assurance/testing material charges shall be borne by the SDMC however, the contractor shall be responsible for providing samples at his own cost.

All the measurements at site shall be 100% test checked by the SDMC Consultants/SDMC officers and bills (IPC/Final) shall be dully scrutinized by the consultants and shall be considered for payment by SDMC only after receipt of recommendation from the consultants.

40. The contractor shall issue identity cards to its labours and supply the list of names of all labourers engaged at the site along with their home addresses to the local police station. Failure to do so may result in suspension of work by the authority.

41 The Contractor shall be required to submit and get approved from the Engineer-in-Charge, the shop drawings for each major activity at least in advance of their use so that necessary amendments, if required, can be done in advance. Wherever required the Contractor shall be obliged to carry out suitable mock ups of activities to check feasibility and efficacy of the scheme proposed by him. Decision of the Engineer-in-Charge shall be final and binding in these matters.

42 **Measurements of the Work Done**

All measurement of all the items having financial value shall be entered by the contractor and shall be submitted to the department in duplicate in a computerised format.
If there is any conflict between a general provision/condition of the contract and a special provision/condition of the contract, then the provisions given in special conditions shall prevail over the general provision or general conditions of the contract.

1% as labour cess on the contractual cost shall be payable to the labour welfare department. The contractor should quote the rate accordingly, as 1% as a labour cess shall be deducted from each running bills.

The contractor will provide fully furnished Air Conditioned site office and conference room for SDMC officials/consultants including telephone, Fax, necessary furniture and electricity etc. All the capital and running expenditure will be borne by the contractor and nothing extra will be paid on this account.

Against the item of excavation of Hard Rock, the contractor shall be allowed to take away the excavated Hard Rock from the site at his own expense. For this, he shall be liable to pay the cost of the hard rock material assuming quantity @ 80% of the excavated quantity. The unit recovery rate for Hard Rock shall have to be quoted by the contractor against Item No. 38 of BOQ.

Extant policy circulars issued by CPWD & SDMC shall be followed.
CHAPTER-VIII GENERAL SPECIFICATIONS

1. TIME FOR COMPLETION
The time limit for this Contract is 18 months inclusive of monsoon period. The Contractor shall commence the works on site when ordered by the Engineer and shall proceed with the same with due expedition and without delay except as may be expressly sanctioned or ordered by the Engineer or be wholly beyond the Contractor’s control.

2. PATENTS, RIGHTS AND ROYALTIES
The Contractor shall save harmless and indemnify the Engineering Department and the SDMC from and against all claims and proceedings for or on account of infringement of any patents, rights, design, trade mark or name of other protected rights on respect of any Constructional plant, machine, work or material used for or in connection with the works or temporary works or any of them and from and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto. Except where otherwise specified, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensation if any for getting stone, sand, gravel, clay or other materials required for the works or temporary works or any of them.

3. THE SITE
a) Tenderer must visit the work site and see for himself the site and ground conditions in all respects including availability of labour (skilled and unskilled), approaches, availability of water, electricity, materials, and all other matters affecting the work before submitting the tender.
b) The submission of the tender by Tenderer implies that he had visited the work site, read the entire tender document and has made himself aware of the scope of specification of work to be performed and of the conditions and rates at which materials will be issued to him and local conditions and other factors which have a bearing on the execution of work.
c) Owner will not, therefore, after acceptance of the tender, pay any extra charges for any reason whatsoever in case Contractor find later on to have misjudged the site and other conditions.

4. ACCESS TO THE SITE
The Contractor shall arrange to construct, maintain and afterwards remove and reinstate any temporary access required for and in connection with the execution of the works. Reinstatement shall include restoring the area of the access route to at least the degree of safety, stability, drainage and appearance that existed before the Contractor entered the site.

5. SETTING OUT THE WORKS
a) The Contractor shall be responsible for the true and proper setting out of the works in relation to original points, lines and levels of reference given by the Engineer in writing or shown on the Drawings and for correctness, subject as above mentioned in the position, levels, dimensions and alignment of all parts of the works and for the provision of all necessary instruments, appliances and labour in connection therewith.
b) The checking of any setting out of any line or level by the Engineer’s Representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof.

6. AMENITIES TO BE PRESERVED
The Contractor shall cause the least possible interference with the amenities, whether natural or man-made. No tree shall be felled without permission of the Engineer’s Representative and clearance of the site shall generally be kept to the minimum necessary for the works and temporary works. Temporary works shall be sited so as minimize the number of trees to be felled.

7. EFFECTS OF WEATHER
Contractor shall ensure that no damage occurs to the works during construction by arranging adequate protection for excavation or building work against the effects of drought, sunshine, wind or rainfall (including erosion and flooding). No work shall be performed when in the opinion of the Engineer’s
Representative such work is liable to be injuriously affected by the weather. Contractor shall have no claim against the SDMC on account of loss alleged to have been sustained directly or indirectly by reason of the Engineer’s Representative declining to permit such work to start or continue, or ordering work damaged by the weather to be made good or removed and re-executed.

8. SAFETY MEASURES AND SERVICES

a) The Contractor shall be responsible for the safety of all workmen and other persons entering or in the works and shall take all measures necessary to their safety to the approval of the Engineer’s Representative. Reference in these respects shall also be made to the Conditions of Contract and safety in particular, such measures shall include the following:
   (i) Provision of proper safety and emergency regulations’ fire, gas and electric shock precautions, stretchers and first-aid box together with rescue facilities generally for each place of working;
   (ii) Provision and Comprehensive maintenance of suitable lighting to provide adequate illumination of works with appropriate spares and standby equipment;
   (iii) Provision and Comprehensive maintenance of safe, sound, ropes, slings, pulleys and other lifting tackle, each appliance having an up-to-date testing certificate where appropriate;

b) The Contractor shall ensure that all his employee are fully conversant with the regulation, emergency and rescue procedures, etc. and the Contractor shall the rule that any employee committing a serious breach of such a regulations be instantly dismissed and shall no be re-employed.

c) Contractor shall provide and maintain at his own expenses all lights, guards, fencing and necessary watchmen when and where necessary or additional SDMC for the protection of the works or for the safety and convenience of those employed on the works and the public.

d) Contractor shall take the necessary permission and clearance of all the authorities like department of Roads, traffic, Water Supply and Drainage; Electricity Telephone Company, etc. Wherever necessary and observe the regulations regarding the execution of work in congested areas, heavy traffic areas, etc.

9. CLAIMS FOR DAMAGE TO PERSONS OR PROPERTY

a) Any claim received by the SDMC or the Engineer’s Representative in respect of matters in which the Contractor is required under the Contract to indemnify SDMC will be passed to the Contractor who shall likewise inform the SDMC and Engineer’s Representative of any such claim which is submitted directly a claimant. The Contractor shall do everything necessary, including insures of claims received, to ensure that all claims are settled properly expeditiously and shall keep the SDMC and the Engineer’s representative informed as to the progress made towards settlement, failing which the SDMC shall be entitled to make direct payment to claimants of all outstanding amounts due to them in the SDMC. Opinion and without prejudice to any other method of recovery to deduct by way of offset the amounts so paid from any sums due or become due from the SDMC to the Contract.

b) If the Contractor receives a claim, which he considers to be in respect of matters in which he is indemnified by the SDMC under the Contract, he shall pass such claims to the SDMC.

c) Contractor will be solely responsible for any loss to life or limbs of workmen or the public arising out of inadequate protective and/or safety measures taken Contractor and irrespective of whether or not Engineer has ordered take protective and safety measures.

10. ASSISTANCE FOR THE ENGINEER’S STAFF

The Contractor shall provide all necessary assistance to the Engineer’s Representative and his staff in carrying out their duties of checking the setting out, inspecting and measuring the work. The Contractor shall provide necessary assistance including labourers as may be needed from time to time by the Engineer’s Representative.

11. CLEARING SITE ON COMPLETION
On completion of the Works, the Contractor shall clear away and remove from the site all Constructional Plant, surplus materials, rubbish, Temporary Works of every kind and leave the whole of the site and the works clean and in a workmanlike condition to the satisfaction of the Engineer.

12. DEFECTS IN WORK
If any subsidence or breakdown or any defects take place in any part of the mechanical & electrical work whatsoever during defects liability period from the completion of the contracted work, Contractor shall make good the same at his own cost, or SDMC may without notice to Contractor make good the same in any and with any material that he may think proper and at the expense of Contractor.

13. INFORMATION FURNISHED
The information given to Tenderers in this tender document comprising of all parts is given in good faith and meant to serve only as a guide. Owner / Engineer will not hold himself responsible if any such information given for the guidance of Contractor is found to be incorrect, partly or in whole and or any deductions, conclusions or interpretation drawn by Contractor. It is, therefore, imperative that Tenderer must obtain and examine for himself all data, information and particulars required for the satisfactory execution of the work.

14. PAYMENT TERMS
Payment to the contractor shall be made after the bill is passed by the Officers concerned within 15 days subject to the availability of the funds. SDMC shall not be liable to any claim/interest in the event of delay making payment due to shortage of funds.

15. BRAND NAMES
The make of equipments shall be as per BOQ / Specification. If make of a particular item is not given in the tender, it shall as approved by SDMC.

16. INSPECTIONS AND TESTS :
a) SDMC or its representative shall have the right to inspect and / or to test the Goods to confirm their conformity to the Contract. The special conditions of contract and / or the Technical Specification shall specify what inspections and tests the SDMC requires and where they are to be conducted. SDMC shall notify the contractor in writing of the identify of any representatives retained for these purposes.
b) The inspections and tests may be conducted on the premises of the contractor or its subcontractor(s), at point of delivery and / or at the Good’s final destination. Where conducted on the premises of the Supplier or its subcontractor(s), all facilities, transportation, lodging & boarding and assistance (including access to drawings and production data) shall be furnished to the inspectors at no charge to the SDMC.
c) Should any inspected or tested Goods fail to conform to the Specifications, SDMC may reject them and the contractor shall either replace the rejected Goods or make all alterations necessary to meet specification requirements free of cost to the SDMC.
d) SDMC right to inspect, test and, where necessary, reject the Goods after the Good’s arrival in India shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the SDMC or its representative prior to the Goods’ shipment from the country of__________

17. PACKING :
a) The Contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and
weights shall take into consideration, where appropriate, the remoteness of the Good’s final destination and the absence of heavy handling facilities at all points in

b) The packing, marking and documentation within and outside the package shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to Clause 14, in any subsequent instructions ordered by the SDMC.

18 DELIVERY AND DOCUMENTS
Delivery of the Goods shall be made by the Contractor in accordance with the terms specified by the SDMC in its Scope of Work and the Special Conditions of Contract.

19. INSURANCE
The Goods supplied under the Contract shall be fully insured against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the Special Conditions of Contract.

20. WARRANTY
a) The Contractor warrants that the Goods supplied under the Contract are new, unused, of the most recent or current models & incorporate all recent improvements in design & materials unless provided otherwise in the Contractor. The Contractor further warrants that the Goods supplied under this Contract shall have no defect arising from design, materials or workmanship (except insofar as the design or material is required by the SDMC’s Specifications) or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods in the conditions obtaining in India.

b) This warranty shall remain valid for 24 months after the Goods, or any portion thereof as the case may be, have been delivered, erected and commissioned to the final destination indicated in the Contract, unless specified otherwise in the Special Conditions of Contractor.

c) The SDMC shall promptly notify the Contractor in writing of any claims arising under this warranty.

d) Upon receipt of such notice, the Contractor shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without additional costs to the SDMC other than, where applicable, the cost of inland delivery of the repaired or replaced Goods or parts from the port of entry to the final destination.

e) If the Contractor, having been notified, fails to remedy the defect(s) within a reasonable period, the SDMC may proceed to take such remedial action as may be necessary, at the Contractor’s risk and expense and without prejudice to any other rights which the SDMC may have against the Contractor under the Contract.

21. EXTRA ITEM OF WORK
The extra work beyond tender item, if required to be executed during course of execution of regular work, that shall have to be carried out by the contractor as per the instructions and satisfaction of the Engineer–in-charge. This will be paid separately as per detail rate analysis made by the department based on market rate or prevalent SOR whichever is less.
CHAPTER-IX :: BROAD TECHNICAL SPECIFICATION
Detail Specifications – Geosynthetic etc.

SECTION 1: EARTHWORK

1.1 Scope of Work:
Furnish all labour material, equipment and incidentals to perform all excavation work, grading, place and compact backfill and dispose off unsuitable waste and surplus materials as shown on the drawings and specified herein.

1.2 Reference Standards:
Note: The work items are mentioned with reference to ASTM codes. A list of IS Codes is given in Table No. 12 for reference. The work should be carried out according to the ASTM codes, a reference to the corresponding IS code could be used, whichever is more stricter. This is applicable to all relevant items.
American Society for Testing and Materials (ASTM)
1.2.1 ASTM D698 – Standard Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 5.5 lbs Rammer and 12in drop (also known as Standard Proctor Analysis)
1.2.2 ASTM D1557 – Standard Test Methods for Moisture-Density relations of Soils and Soil Aggregate Mixtures using 10lb (4.54kg) Rammer and 18-in (457mm) drop.

1.3 Project/Site Requirements:
1.3.1 Geotechnical Investigations
1.3.1.1 Geotechnical explorations of the site of the work have been made. This information should be available for inspection at the offices of the Engineer.
1.3.1.2 Designs for structures should be based on the information contained in the geotechnical investigations, with the assumptions of uniform variations in the soil layers and properties between borings. Provide immediate notification in accordance with the General Conditions, should any condition at variance with those indicated in the report be encountered.

1.4 General Filling and Backfilling procedures:
1.4.1 Fill and backfill materials shall be deposited to the lines and grades required, making due allowance for the settlement of the materials and the placement of cover materials. Surface shall be graded and compacted to smooth, true lines conforming to the grading plans. Soft spots or uncompacted areas shall be corrected by removing the unsatisfactory material, replacing with suitable material and regarding and recomposing.
1.4.2 Compaction in open areas may be accomplished by any of the following methods. Compaction equipment, fully loaded ten-wheel trucks, tractor dozers weighing at least 30,000 lbs and operated at full speed, or heavy vibratory rollers. Compaction in confined areas (including areas within a 45 degree angle extending upward and outward from the base of a wall) and in areas where the use of large equipment is impractical shall be accomplished by hand operated vibratory equipment or mechanical tampers. Lift thickness shall not exceed 150mm (measured before compaction) when hand operated equipment is used.
1.4.2 Fill and backfill material shall not be placed and compacted when the materials are too wet from rain or excess application of water. At such times, the material shall be allowed to dry sufficiently to permit proper compaction before proceeding further. Drying may be aided by aerating the soil.

1.5 Structural Filling and Backfilling Procedures:
1.5.1 Fill and backfill material placed immediately adjacent and within 10-ft of structures shall be select fill. Select fill material shall be placed in loose, even lifts having a maximum thickness (measured before compaction) of 150mm. Fill shall be placed uniformly and gradually such that the height of the fill is increased at approximately the same rate around the perimeter of the
structure. Moisture content shall be uniform throughout each lift. Select fill shall be compacted to 95% Standard Proctor Density at or near its optimum moisture content (minus 2 to plus 3 percent). Do not over compact fill material.

1.5.2 Common fill may be used in areas beyond those designed for select fill unless shown or specified otherwise. Common fill shall be placed in even lifts having a maximum thickness (measured before compaction) of 12-in. Common fill shall be compacted to at least 90% Standard Proctor Density at or near its optimum moisture content (minus 2 to plus 3 percent).

1.6 Embankment Fill procedures:

1.6.1 Prior to placing embankment fill materials, all organic materials (including peat and loam) and loose inorganic silt material (loess) shall be removed from areas beneath the embankments. If the sub grade slopes are excessive, the sub grade shall be stepped to produce a stable, horizontal surface for the placement of embankment materials. The natural sub grade shall then be scarified to a depth of at least 6-in and then re-compacted to at least 95% Standard Proctor Density at or near its optimum moisture content (Minus 1 to plus 4 percent).

1.6.2 Embankment fill material shall be placed in loose, even lifts having a maximum thickness (before compaction) of 8-in. Embankment fill material shall be compacted to at least 95% Standard Proctor Density at or near its optimum moisture content (Minus 1 to plus 4 percent.)

1.7 Impervious Fill:

1.7.1 Impervious fill shall be placed in controlled, even lifts having a maximum thickness (measured before compaction) of 6-in. Compaction shall be sufficient to attain a permeability of less than $1 \times 10^{-7}$ cm/sec.

1.7.2 Moisture content of impervious fill to be compacted shall be maintained at or near its optimum moisture content (minus 2 to plus 3 percent).

1.8 Safety

The contractor shall take adequate precautions to ensure complete safety and prevention of accidents at site. The safety precautions shall conform to the following IS codes wherever applicable.

IS:3764 Safety code for excavation work
IS:4081 Safety code for drilling and blasting operations
IS:4014 Safety regulations for scaffolding work
IS:7293 Safety code for working with construction machinery.

The contractor shall also abide by the safety regulations of the employer and other directives given by the Engineer from time to time.

SECTION 2: DRAINAGE

General

2.1 Statutory requirements:

2.1.1 Obtain and pay for all permits required for temporary drainage systems.

2.1.2 Original permits shall be prominently displayed at the work site prior to constructing drainage systems.

2.2 Scope of Work:

2.2.1 Furnish, install, operate, monitor and remove temporary drainage systems as necessary to prevent surface water runoff from entering or accumulating in excavations, to permit construction in the dry.

2.2.2 Collect and properly dispose of all discharge water from drainage systems in accordance with local requirement and permits.

2.2.3 Repair any damage caused by drainage system operations.

2.2.4 Remove temporary drainage systems when no longer needed, and restore all disturbed areas.
2.3 Related Work:
   2.3.1 Earthwork is included in section 1
   2.3.2 Trenching, backfilling and Compaction are included in section 3

2.4 General:
   2.4.1 Surface water shall be controlled such that excavation to final grade is made as soil conditions that are no more than 2 percent above the optimum moisture content for that soil, the bearing soils are maintained undisturbed, and softening or instability of, disturbance to, the subgrade due to the presence or seepage of water does not occur.
   2.4.2 All work shall be protected from flotation.
   2.4.3 The impact of anticipated subsurface soil/water conditions shall be factored into the selection of methods of excavation and proposed drainage systems.

2.5 Surface water control:
   Surface water control measures shall be constructed to prevent flow of surface waters into excavations. Such measures may include dikes, ditches and sumps. If runoff does enter the excavation, it shall be removed immediately and contaminated bedding material removed and replaced. Extent of the removal will be at the determination of the engineer.

2.6 Disposal of Drainage:
   All water discharged from temporary drainage systems shall be disposed of in accordance with approved sedimentation and control plans as specified.

SECTION 3: TRENCHING, BACKFILLING AND COMPACTION

General:
3.1 Scope of Work:
   3.1.1 Furnish all labour, materials, equipment and incidentals necessary to perform all trenching for pipe lines or appurtenances, including drainage, filling, backfilling, disposal of surplus material, and restoration of trench surfaces and easements.
   3.1.2 Excavation shall extend to the width and depth shown on the drawings or as specified and shall provide suitable room for installing pipe, structures and appurtenances.
   3.1.3 The CONTRACTOR shall furnish all sheeting, bracing, and supports and shall remove from the excavation all materials, which the ENGINEER may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, the CONTRACTOR may be ordered to deposit gravel for pile beddings, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatsoever. The length of open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.
   3.1.4 All excavation, trenching and related sheeting, bracing etc., shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and applicable State requirements.
   3.1.5 Wherever the requirement for 95 percent compaction is referred to herein it shall mean “at least 95 percent of maximum density as determined by ASTM D 1557, Method D.”
   3.1.6 Prior to the start of work the CONTRACTOR is required to submit his proposed method of backfilling and compaction to the ENGINEER for review.
3.2 Related Work:
   3.2.1 Granular fill materials are included in Section 4.
   3.2.2 Drainage is included in section 2.

3.3 Trench Excavation:
   3.3.1 Trench excavation shall include material of every description and of whatever substance encountered, except rock and boulders. Pavement shall be cut with a saw wheel or pneumatic chisel along straight lines before excavating.
   3.3.2 The CONTRACTOR shall strip and stockpile topsoil from grassed areas crossed by trenches. At the CONTRACTOR’s option, topsoil may be otherwise disposed of and replaced, when required with approved topsoil of equal quality.
   3.3.3 While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the general conditions and general requirements.
   3.3.4 Trenches shall be excavated to the depth indicated on the Drawings and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the OWNER. Trench width shall be practical minimum.
   3.3.5 Excavation and dewatering shall be accomplished by methods, which preserve the undisturbed state of sub grade soil. The trench may be excavated by machinery to, or just below, the designated sub grade, provided that the material remaining in the bottom of the trench is no more than slightly disturbed. Sub grade soil which become soft, loose, “quick” or otherwise unsatisfactory as a result of inadequate excavation, dewatering, or other construction methods shall be removed and replaced by screened gravel fill as required by the ENGINEER at the CONTRACTOR’s expense.
   3.3.6 Clay and inorganic soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, the CONTRACTOR shall use a smooth – edge bucket to excavate the last 1 – ft depth.
   3.3.7 Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
   3.3.8 Where pipe is to be laid directly on the trench bottom, final excavation of the bottom of the trench shall be performed manually, providing a flat-bottom true to grade upon undisturbed material. Bell holes shall be made as required.

3.4 Disposal of Materials:
   3.4.1 Excessive material shall be stacked without excessive surcharge on the trench bank or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.
   3.4.2 It is expressly understood that no excavated material shall be removed from the site of the work or disposed of by the CONTRACTOR except as directed by the ENGINEER, when removal of the surplus material in approved areas designated by the CONTRACTOR.
   3.4.3 Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the CONTRACTOR. When required, it shall be re-handled and used in backfilling the trench.
3.5 Sheeting and Bracing

3.5.1 Furnish, put in place and maintain sheeting and bracing required by State or local safety requirements to support the sides of the excavation and prevent loss of ground which could endanger personnel, damage or delay, the work and endanger adjacent structures. If the ENGINEER is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports placed at the expense of the CONTRACTOR. Compliance with such order shall not relieve the CONTRACTOR from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

3.5.2 Where sheeting and bracing is required to support the sides of the trenches, the CONTRACTOR shall engage a Professional Engineer to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this, shall be provided by the professional Engineer.

3.5.3 When movable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe bedding and screened gravel backfill.

3.5.3.1 When installing rigid pipe (R.C., V.C., A.C., etc.), any portion of the box extending below mid diameter shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.

3.5.3.2 When installing flexible pipe (PVC, etc.), trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be re-compacted to provide uniform side support for the pipe.

3.5.4 The CONTRACTOR will be permitted to use steel sheeting in lieu of wood sheeting for the entire job wherever the use of sheeting is necessary. The cost for use of sheeting will be included in the bid items for pipe and shall include full compensation for driving, bracing and later removal of sheeting.

3.5.5 All sheeting and bracing shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property, whether public or private, all voids left after withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering or otherwise directed.

3.5.6 The CONTRACTOR shall receive no payment for sheeting, which has actually been left in the trench for the convenience of the CONTRACTOR.

3.5.7 Sheet ing driven below mid-diameter of any pipe shall remain in place from the driven elevation to at least 1-ft above the top of the pipe.

3.6 Excavation Below Grade and Refill

3.6.1 Whatever the nature of unstable material encountered or the groundwater condition, trench drainage shall be complete and effective.

3.6.2 If the CONTRACTOR excavates below grade through error or for his own convenience, or through failure to properly dewater the trench or disturbs the sub-grade before dewatering is sufficiently complete, he may be directed by the ENGINEER to excavate below grade and furnishing and placing the refill shall be performed at his own expense.

3.6.3 If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into screened gravel notwithstanding effective drainage, the sub-grade
material shall be removed to the extend directed and the excavation refilled with 6-in layer of coarse sand, or a mixture graded from coarse sand to fine pea stone, as approved by the ENGINEER, to form a filter preserving the voids in the gravel bed of the pipe. If directed by the ENGINEER, bank run gravel shall be used to refill of excavation below grade.

3.6.4 Geotextile filter fabric may be substituted for filter layer if approved by the ENGINEER.

3.7 Backfilling.

3.7.1 As soon as practicable, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1-ft over the pipe.

3.7.2 An impervious dam or bulkhead cutoff clay or other impervious material shall be constructed in the trench as directed, to interrupt the unnatural flow of groundwater after construction is completed. The dam shall be effectively keyed into the trench bottom and sidewalls. Provide at least one (1) clay or impervious material, the pipe bedding between each manhole where directed or every 300 feet, whichever is less.

3.7.3 Where the pipes are laid cross country, the remainder of the trench shall be filled with common fill material in layers not to exceed 3-ft and mounded 6-in above the existing grade or as directed. Where a loam or gravel surface exists prior to cross country excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas, it may be necessary to remove the excess material during the clean-up process, so that the ground may be restored to its original and condition.

3.7.4 Where the pipes are laid in streets, the remainder of the trench up to a depth of 1-ft below the bottom the specified permanent paving shall be backfilled with common fill material in layers not to exceed one (1) foot and thoroughly compacted in 6-in layers.

3.7.5 To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until selected material or screened gravel has been placed and compacted to level one 1-ft over the pipe.

3.7.6 Backfill shall be brought up evenly on all sides. Each layer of backfill material shall be thoroughly compacted by rolling, tamping, or vibrating with mechanical compacting equipment or hand tamping, to 92 percent compaction. If rolling is employed, it shall be by use of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench.

3.7.7 Water jetting or puddling may be used unless the refill contains too great a proportion of clay or loam to permit satisfactory drying. Water jetting shall consist of using a suitable length of pipe at least 1-1/4inch in diameter fitted with quick acting valve and sufficient hose to connect to hydrant or pump having adequate pressure and capacity. The full depth of backfill shall be thoroughly inundated by thrusting the pipe into the fill at frequent intervals with the valve open until all slumping ceases. Where backfill is compacted by puddling, it shall be done by depositing in water. Water for jetting and puddling may be obtained from OWNER hydrants wherever possible. Water may be furnished by the OWNER from these hydrants if reasonable care is exercised in its use.

3.7.8 The CONTRACTOR shall obtain his own water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract.

3.7.9 Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material being spread and compacted in
layers not over 6-in thick. If necessary, sprinkling shall be employed in conjunction with rolling or ramming.

3.7.10 Backfill around structures shall be selected common fill material, may be compacted by puddling water approved by the ENGINEER. All backfill shall be compacted especially under and over pipes connected to the structures.

3.7.11 Subject to the approval of the ENGINEER, fragments of ledge and boulder smaller than 6-in may be used in trench backfill providing that the quantity in the opinion of the ENGINEER, is not excessive. Rock fragments shall not be placed until the pipe has at least 2-ft of earth cover. Small stones and rocks shall be placed in thin layers alternating with earth to insure that all voids are completely filled. Fill shall not be dropped into the trench in a manner to endanger the pipe.

3.7.12 Bituminous paving shall not be placed in backfilling unless specifically permitted, in which case it shall be broken up as directed. Frozen material shall not be used under any circumstances.

3.7.13 All road surfaces shall be broomed and hose cleaned immediately after backfilling. Dust control measures shall be adopted at all times.

3.7.14 Contractor must install tape marker for all pipelines and buried conduit.

3.7.15 Contractor must install location wire for all non metallic piping systems.

3.8 Restoring Trench Surface

Where the trench occurs adjacent to paved streets in shoulders, sidewalks or in cross-country areas, the CONTRACTOR shall thoroughly consolidate the backfill and shall maintain the surface as the work progress. If settlement takes place, he shall immediately deposit additional fill to restore the level of the ground.

SECTION 4: GRANULAR FILL MATERIALS

4.1 Scope of Work

Furnish all labor, materials, equipment and incidentals required and install granular fill materials as shown on the drawings and as specified herein. Associated work included testing, sample collection, excavation, shipping, delivering, stockpiling placement and installation of granular fill materials.

4.2 Reference Standards

Note: The work items are mentioned with reference to ASTM codes. A list of IS Codes is given in Table No. 12 for reference. The work should be carried out according to the ASTM codes, a reference to the corresponding IS code could be used, which ever is stricter. This is applicable to all relevant items.

American Society for Testing and Materials (ASTM)

1. ASTM D75 – Standard Practice for Sampling Aggregates
2. ASTM D422 – Standard Test method for Particle- Size Analysis of Soils
3. ASTM D698 – Standard Test Methods for Moisture – Density relations of Soil and Soil Aggregate Mixtures using 5.5-lb (2.49kg) Rammer and 12-in (305mm) Drop.
5. ASTM D2992 – Density of soils in place by nuclear methods (shallow depth)
6. ASTM D3017 – Standard Test Method for water contents of soil and rock in place by nuclear methods (Shallow depth)

4.3 Quality Assurance:
4.3.1 The Quality Control and Quality Assurance consists of laboratory conformance testing of samples supplied from each drainage sand and coarse aggregates source and quality control during installation.
4.3.2 The CONTRACTOR shall retain an Independent Testing Laboratory (ITL), that has specific permeability equipment to provide test results in a timely manner in accordance with the specifications. The CONTRACTOR shall coordinate and ANNEXURE all tests as required by the drawings and specification.
4.3.3 Conformance requirements are specified in Section 4.7. The purpose of conformance testing is to assure that the supplied soil samples from each source conform to the Specifications and specified permeability.
4.3.4 Field quality control requirements are specified in Section 4.9. The purpose of field quality control procedures is to assure that the drainage layer has been installed in accordance with the specifications meeting the specified hydraulic conductivity.

4.4 Qualifications:
4.4.1 The work will be performed by a firm that has experience in processing and installation of lateral drainage layers and protective soil cover on top of synthetic liners. The firm shall demonstrate proven experience as defined in qualifying criteria mentioned in Tender document with the following information:
4.4.1.1 Type and thickness of installed material and permeability.
4.4.1.2 Name and purpose of facility, its location and date of installation.
4.4.1.3 Name of OWNER and design ENGINEER. Name and telephone number of contact at the facility who can discuss the project.
4.4.2 The Contractor shall show evidence of an adequate supply of material which is relatively homogenous within a designated mine area which is properly permitted by the appropriate local and state agencies.

4.5 Delivery, Storage and Handling:
If granular fill materials are delivered to the site prior to placement approval, materials shall be stockpiled onsite in areas as shown on the Drawings. Provisions shall be implemented to minimize surface water impact on the stockpile. Removal and placement of granular fill material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.

4.6 Material:
4.6.1 Drainage media and Compacted Granular Fill
4.6.1.1 Material shall be of well-graded inorganic non-calcareous material, free from organic substance and other deleterious matter with minimum permeability (Kmin) of $1 \times 10^{-3}$ cm/sec at 90 percent of Standard Proctor Density, ASTMD698

4.6.1.2 Drainage media that will be in contact with geomembrane liners shall be well rounded particle shapes to avoid possible liner damage.

4.6.2 Coarse Aggregate (Gravel for Leachate Encasement)

4.6.2.1 Washed coarse aggregate shall be used for bedding material around the leachate collection pipes, wrapped with geotextile fabric as shown on the drawings and as specified herein. The coarse aggregate shall be sound, hard, durable, resistant to weathering, and shall be free of overburden, spoil, shale, limestone and organic material.

4.6.2.2 The coarse aggregate shall be rounded and shall have particle size gradation within the following limits (ASTM D422)

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent passing by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-in</td>
<td>100</td>
</tr>
<tr>
<td>1 ½-in</td>
<td>90-100</td>
</tr>
<tr>
<td>1-in</td>
<td>20-55</td>
</tr>
<tr>
<td>¾-in</td>
<td>0-15</td>
</tr>
<tr>
<td>5/8-in</td>
<td>0</td>
</tr>
</tbody>
</table>

4.6.3 On-site Road Aggregate Base and Road Course

Aggregates used as on-site road course shall conform to section 1150, AB-3 KDOT standard specification for state road and bridge construction.

4.6.4 Fill Materials

4.6.4.1 Backfill and fill materials shall be suitable excavated materials, natural or processed mineral soils obtained from off site source, or graded crushed stone or gravel, conforming to the specified gradations. Backfill and fill materials shall be free of all organic material, trash or other objectionable materials which may be compressible or which cannot be properly compacted. Soft, wet plastic soils which may be expansive, clay soils having a natural in-place water content in excess of 30%, soils containing more than 5% (by weight) fibrous organic material, and soils having a plasticity index greater than 30 shall be considered unsuitable for use as backfill and fill. Backfill and fill material shall have a maximum of 1% expansion when testing is performed on a sample remolded to 95% of maximum dry density at 2% below optimum moisture content under a 100 lbs/sq ft. surcharge.

4.6.4.2 Select Structural fill shall be an inactive sandy – clay or clayey sand. Material shall have a plasticity index between 10 and 18.

4.6.4.3 Common fill shall not contain granite blocks, broken concrete, masonry rubble, asphalt pavement, or any material larger than 6-inch in any dimension. Common Fill shall have a plasticity index less than 18.

4.7 Conformance testing

4.7.1 Drainage Media and Compacted Granular Fill Material
4.7.1.1 Conformance testing shall be performed by the ITL on samples from each source of granular fill material to assure compliance with the specifications. The following test shall be performed on the samples.

- Sieve Analysis (as given table)
- Specific Gravity
- Laboratory density – permeability Relationship

4.7.2 Coarse Aggregate (Gravel for Leachate Encasement)

Gradation analysis shall be performed by the ITL on samples from each source of the coarse aggregate to assure compliance with the specifications.

4.8 Drainage Media Placement:

4.8.1 After installation completion and acceptance of the liner system related work activities, place the granular fill material to thickness and area & extend as shown on the drawings.

4.8.2 During the placement of the granular fill material, no construction equipment shall be allowed directly on the geomembrane and any damage shall be repaired immediately in accordance with Section 8.18.7.

4.8.3 Care shall be taken to protect the geomembrane liner. Sand ramps shall be provided at down slopes and in other heavily traveled areas. All heavily traveled areas shall have a minimum of 3-ft of material above the liner. Only large radius turns by the loader and other equipment shall be permitted as sharp turns may damage the liner.

4.8.4 Drainage materials shall not be placed over a fold in the geomembrane.

4.8.5 The drainage media shall be compacted by proof rolling with a smooth drum roller. The final grade shall be as shown on the drawings. The drainage layer shall be compacted to a minimum of 90% of Standard Proctor Density (ASTM D698), to obtain a permeability equal to or greater than 1x10^{-3} cm/sec.

4.8.6 Drainage media shall be placed on the side slopes starting at the toe of the slope and working toward the top of the berm.

4.8.7 Drainage layer materials can only be spread when the geomembrane is taut or stretched evenly over the base of the landfill. The drainage layer material shall not be spread when the geomembrane is elongated due to higher daytime temperatures and exposure to sun. The CONTRACTOR shall make provisions to cover the geomembrane under non elongated conditions.

4.8.8 The moisture content of the material shall be at or slightly above the optimum moisture content for the sand being utilized during the entire time the roller is working on the media. If, in the opinion of the ENGINEER, the sand is too dry for compaction, the CONTRACTOR shall spray the sand with a sufficient quantity of clean water to bring the sand layer to the proper moisture content. No compaction effort shall be made if the sand is significantly saturated.

4.8.9 The sand surface must be made smooth and free from ruts or indentations at the end of any working day when significant precipitation is forecast and/or at the completion of the compaction operations in that area in order to prevent saturation of the sand material.

4.8.10 Trenches for the leachate collection pipes shall be excavated within the granular fill where shown on the drawing. The CONTRACTOR shall exercise special care not to disturb or damage the geomembrane. If a backhoe is used to construct the trench, a rubber modification section shall be installed on the bucket to protect the geomembrane. All areas of the liner damaged shall be immediately repaired as directed by the ENGINEER.

4.8.11 A 2-in minimum layer of drainage media material shall be placed in the bottom of the trench followed by a geotextile fabric. The leachate pumping shall be installed, and shall be
backfilled with coarse aggregate to the depth and width shown on the drawings. Care shall be taken during backfilling of the pipe to assure the pipe will not be crushed or otherwise damaged. The geotextile fabric shall be stitched at edges as per AASHTO M288.

4.8.12 The geotextile shall conform to the following parameters:

4.8.12.1 Nonwoven Geotextile Fabric

The geotextile fabric shall be a polypropylene (PP) nonwoven needle punched fabric consisting of continuous filaments formed into a stable network. The fabric shall be non-biodegradable, non-reactive within a pH range of three to eleven, resistant to ultraviolet light exposure and shall conform to the minimum average roll values (MARV) for the following properties.

Table No. 2 : Properties of Geotextile

<table>
<thead>
<tr>
<th>Properties</th>
<th>Test Method</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Properties</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass (g/m²)</td>
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<td>400</td>
<td>800</td>
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<tr>
<td>Thickness(mm)</td>
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<tr>
<td>Tensile Strength – CD (kN/m)</td>
<td>ASTM D 4595</td>
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<td>Tensile Strength – MD (kN/m)</td>
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<td>Elongation @ break %</td>
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<tr>
<td>Grab Tensile Strength – CD -(N)</td>
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<td>2200</td>
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<tr>
<td>Grab Tensile Strength – MD -(N)</td>
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<td>1100</td>
<td>2000</td>
</tr>
<tr>
<td>CBR Puncture Strength (N)</td>
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<td>Tear Strength (N)</td>
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<td><strong>Hydraulic Properties</strong></td>
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<td>Permeability (Lt/m²/sec)</td>
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<td>AOS (Apparent Opening Size)</td>
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<tr>
<td>UV Resistance (%)</td>
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<tr>
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<tr>
<td>Roll Weight</td>
<td></td>
<td>162.4</td>
<td>162.4</td>
</tr>
</tbody>
</table>

4.8.12.2 Nonwoven geotextile fabric shall be manufactured by reputed manufacturers. The list of approved companies are Mirafi; Polyfelt, Synthetics Industrires, Spunbound Business
Unit (Hoechst Celanese Corporation.), Amoco Fabrics, GSE, Naue, Huesker, Bonar etc. Geotextile complying similar specification can also be used from other manufacturing companies also.

4.8.13 Following construction of the leachate piping, the granular fill material shall be brought to final grade and compacted as specified herein.

4.9 Field Quality Control:

4.9.1 Samples shall be taken for every 2000 cubic yards of in-place granular fill material. The sand layer thickness shall be measured periodically throughout the day during construction to confirm that the thickness of the installed material is in accordance with the drawings. The samples shall be taken by the ITL and the following tests shall be performed on the samples.

4.9.1.1 Relative Density of Cohesion less Soils
4.9.1.2 Nuclear Density and Moisture Content.
4.9.1.3 Sand layer Thickness.
4.9.2 Any sample or area tested shall be rejected, removed and replaced if it does not meet the requirements of the technical specification. Reconstructed areas will have feathered, overlapping edges that into adjacent fill material.

SECTION 5: SUBGRADE PREPARATION

5.1 Scope of work
This section shall govern the preparation of natural or excavated areas prior to the placement of sub base material, pavement or structures.

5.2 Related work
Compacting and backfilling is included in Section 3

5.3 Preparation of Subgrade
In areas where new construction is required, the sub grade and surface thereof shall be prepared as noted on the plans or as specified in these Specifications.

5.4 Relative Compaction

5.4.1 All soft and unstable material and other portions of the sub-grade which will not compact readily or serve the intended purpose shall be removed and replaced with suitable material from excavation or borrow or suitable material shall be added and, by manipulation, be incorporated into the sub-grade to produce a material meeting sub-grade requirement.

5.4.2 The top portion of embankments and the bottom of excavations which for the sub-grade under all paved areas (asphalt, concrete, slab-on-grade, aggregate road course, etc.) shall be compacted to the following degrees and depths of compaction.

5.4.2.1 Each 12-in layer shall be compacted to a density of not less than 95 percent of maximum density or in soils containing less than 5 percent passing the #200 sieve a minimum relative density of 70%. In roadway areas the density of 300mm shall not be less than 95 % unless the material contains 35 % or more material passing the #200 sieve in which case the compaction shall be not less than 90% of maximum density.

5.4.2.2 Sub-grade compaction as specified shall extend a minimum of 300mm on either side of pavement and slab-on-grade.
5.5 Subgrade Modification
In areas designated for on-the-site roads, parking lots or asphalt-paved working areas, modification of subgrade soils is required to attain a CBR of 15 for the 95 percent (standard Proctor) compacted layer. The percentage of modifying agent to be used will be determined by testing samples of the modifying agent with the in-situ soils.

5.6 Subgrade Tolerances
Sub-grade upon which pavement and structures are to be placed shall not vary more than + ¼ in or −1/2 in per 10-ft. in any direction from the specified grade and cross section. Subgrade upon which sub-base or base material is to be placed shall not vary more than ½ - in or –1 in any direction from the specified grade and cross section. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

5.7 Grading of Areas not to be paved.
Areas where “grade only” is called for on the plan shall be graded to meet the tolerances for the sub grade where sub base or base material is to be placed. The surface shall be constructed to a straight grade from the finished pavement elevations shown on the plans to the elevation of the existing ground at the extremities or the area to be graded or to the property line or as directed by the Engineer, but in on case less than 4-in above pavement elevation.

SECTION 6: COMPACTED CLAY LINER:

6.1 Scope of Work
6.1.1 Furnish all labor, materials, equipment, and incidentals required to over-excavate and install compacted clay layer as shown on the drawings and as specified herein.
6.1.2 Associated work includes testing, sample collections, excavation, loading, shipping, delivering, stockpiling, grading, backfilling, placement, compaction, harrowing, drying, dewatering, watering and installation of clay materials for bottom layer.

6.2 Related Work
6.2.1 Granular Fill Materials are included in Section 4
6.2.2 High Density Polyethylene (HDPE) Geomembrane Liner is included in Section 8

6.3 Reference Standards
Note: The work items are mentioned with reference to ASTM codes. A list of IS Codes is given in Table No. 12 for reference. The work should be carried out according to the ASTM codes, a reference to the corresponding IS code could be used, whichever is more stricter. This is applicable to all relevant items.
2. ASTM D698 – Standard Test Method for Moisture-Density Relations of Soil and Soil Aggregate Mixtures using 5.5 lb(2.49kg) rammer and 12-in (305mm) Drop.
4. ASTM D1140 – standard test method for amount of Material in soils finer than number 200 (75 Micrometer) Sieve.
5. ASTM D1557 – standard test method for Moisture-Density Relations of soils Aggregate Mixtures using 10-lb (4.54kg) rammer and 18-in (457mm) Drop.
10. ASTM D2292 – Density of Soil in Place Nuclear method (Shallow Depth)

Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

6.4 Quality Assurance
6.4.1 The quality control and quality assurance consist of laboratory conformance testing of samples supplied from each clay source, test pad construction, and observation and quality control during installation.
6.4.2 The CONTRACTOR will retain an independent geotechnical independent testing laboratory (ITL) acceptable to the OWNER, who has specific permeability equipment to provide test result in a timely manner in accordance with specifications. The CONTRACTOR shall co-ordinate and ANNEXURE all tests as required by the drawings and specifications.
6.4.3 Conformance testing requirements are specified in Section 6.8. The purpose of conformance testing is to assure that the supplied soil samples from each clay source conform to the specifications and specified permeability.
6.4.4 A test strip shall be constructed on site using the same equipment and installation procedures that will be used during full scale liner installation. The purpose of the test strip is to assure that the construction procedures followed during liner installation will minimize the potential for an unacceptable compacted clay layer. Construction requirements and testing procedures are specified in Section 6.10
6.4.5 Field quality control requirements are specified in Section 6.12. The purpose of field quality control procedures is to assure that the compacted clay layer has been installed in accordance with the specifications and achieved the specific hydraulic conductivity.

6.5 Qualifications
The work shall be performed by personnel experienced in processing and installation of compacted clay layers.

6.6 Delivery, Storage and Handling
Provision shall be implemented to minimize surface water impact on the stockpile. Removal and placement of clay liner material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.
6.7 Materials

6.7.1 The Liner material shall conform to the following properties.
1. Passing the 1.5-in Sieve ASTM D1140 100 Percent
2. Passing the 200 Sieve ASTM D1140 50 Percent min
3. Liquid Limit ASTM D4318 30 Min
4. Plasticity Index ASTM D4318 20Min
5. Soil Classification ASTM D2488 CH-CL

6.7.2 Other material, such as natural calcium montmorillonite-sand blend, or soil bentonite mixture, can be used provided they will have similar properties and achieve the specified hydraulic conductivity.

6.7.3 The material used for layer construction shall be relatively uniform in character and after processing shall be capable of achieving an in-place saturated hydraulic conductivity not greater than 1x 10^-7 cm/ sec.

6.8 Conformance Testing
Conformance testing shall be performed by the ITL on samples from clay source to assure compliance with the specification. Minimum sample frequencies are listed in Table No. 3. The following tests shall be performed on the samples.

1. Soil Classification – ASTM (2488)
2. Sieve Analysis – ASTMD422 (Including hydrometer analysis)
3. Atterberg’s limits – ASTM4318
4. Moisture Density curves – ASTM 1557
5. Specific Gravity – ASTMD854
6. Laboratory permeability
7. Compaction permeability Curves

6.9 Sub-grade preparation

6.9.1 Preparation of the sub-base shall be as specified in Section III

6.9.2 The CONTRACTOR shall inspect and approve the sub-base before installation of the clay layer can proceed. It shall be CONTRACTOR’S responsibility to properly prepare and maintain the sub-grade in a smooth, uniform and compacted condition during the installation of the layer.

6.9.3 If the sub-grade is damaged during liner installation, the CONTRACTOR shall restore and re-compact the area and have the ITL retest the sub-grade prior to installing the layer. All the costs related to the retest and restoration of the sub-grade shall be paid for the CONTRACTOR.

6.9.4 The CONTRACTOR shall protect the material delivered to site for inclement weather conditions and any traffic that may occur near the stock piles.

6.10 Test Strip

6.10.1 A field test strip of a dimension of no less than 40 ft x 60 ft x 18 inch thickness shall be constructed on site using the same equipment and processing procedures that will be used during the full scale layer construction. If the initial test strip does not give the specified result, additional test strips shall be performed until the specified results are obtained. Any additional test strips are at the sole expense of the CONTRACTOR. Placement moisture
content and compaction shall be recorded to determine the effort required to achieve the specified hydraulic conductivity.

6.10.2 The clay to be used shall be the same material that the CONTRACTOR proposes to use during construction.

6.10.3 Two (2) axial type permeability tests, ASTM D 5084, shall be performed on the test strip. All tests shall be taken within the middle of the test strip at locations selected by the ENGINEER. These tests shall be performed on 3-in diameter (o.d.) undisturbed samples obtained from a Shelby tube or drive cylinder, trimmed if needed, encapsulated within a flexible latex membrane and mounted in triaxial type permeameters. The test specimen shall be consolidated under an effective stress of 5 to 10 psi and permeated under a back pressure of 80 to 90 psi to achieve saturation. The hydraulic gradient used for hydraulic conductivity measurements shall be established in the laboratory which will provide for accelerated testing and final result within 7 days. The maximum hydraulic gradient shall not exceed 90. The hydraulic gradient shall be increased slowly in increments with careful observation of the test samples for consolidation, piping, etc. The test sample that are consolidated by more than 5% shall be voided. The inflow and outflow from the sample shall then be monitored and the coefficient or permeability calculated for each recorded flow increment. The test will continue until steady state flow is achieved as evidenced by values of inflow and outflow that do not differ by more than 10% for the last six (6) readings and by stable values of the coefficient of permeability.

6.10.4 The layer thickness shall be determined from four (4) locations per test strip.

6.10.5 A minimum of two (2) random samples of the clay soil material delivered to the site for test strip construction shall be tested for moisture-content, particle size analysis (hydrometer), and Atterberg limits.

6.10.6 If the CONTRACTOR changes the source of clay or if the characteristics of the clay within the selected source changes sufficiently, the ENGINEER may order the construction of additional test fill areas as may be necessary to evaluate the performance of the compacted clay liner.

6.11 Clay Liner Placement

6.11.1 The placement moisture content shall be wet of the modified proctor optimum moisture content (ASTM D 1557) and no greater then the standard proctor optimum moisture content (ASTM D 698) plus 5%

6.11.2 Clay soil material shall be disked, harrowed and kneaded as necessary to break down all clods and produce a uniform material that is free from clods. If the ENGINEER is not satisfied that all the clods have been broken down, then the CONTRACTOR shall remove or rework the clay material to the satisfaction of the ENGINEER. Clay materials which have been contaminated with clusters of rock or gravel, sand lenses or other deleterious material shall be removed and replaced with uncontaminated clay materials.

6.11.3 The clay materials shall be uniformly compacted to no less than 90 percent of the modified proctor dry density corresponding to the molding moisture content. The minimum density shall be uniformly obtained throughout the entire thickness of the liner. The liner shall be constructed in a minimum of three (3) eight (8) inch lift to assure achievement of the specified compaction in the lower part of the liner. The surface of the lower lift shall be scarified prior to placement and compaction of upper two lifts. The direction of equipment movement during spreading and compaction of the upper lift shall be perpendicular to that carried out on the lower lift. To achieve the specified compaction, the CONTRACTOR shall use a self-propelled compactor such as the Caterpillar 815, or an equivalent, which
provides steel kneading feet, in spreading and kneading those materials. Finally, a smooth wheel compactor such as Caterpillar CS553 shall be used with sufficient number of passes to smooth the surface of the liner. This type of compactor shall be used only for smoothing the surface. It shall not be used for achieving the specified compaction. Rubber tired rollers and vibrator rollers also will not be allowed for use in the compaction of the clayey materials.

6.11.4 Water for Compaction

6.11.4.1 The CONTRACTOR shall provide water as required to guarantee constructability and protection of the in-place and stored clay soil.

6.11.4.2 The water shall be of potable quality

6.11.4.3 Prior to laying down the clay soil, the CONTRACTOR shall inspect the sub-grade to ensure that it has been sufficiently wetted to prevent excessive absorption of moisture from clayey material.

6.11.4.4 Should the clay soil be stockpiled for any length of time the CONTRACTOR shall slope the stockpile and condition it with a track vehicle or light roller to prevent over saturation

6.11.4.5 Should the material become over saturated, the CONTRACTOR shall spread and dry the material as needed to adjust the moisture to the proper level.

6.11.5 The compacted liner shall not be less than the specified thickness after any finish grading. Areas not meeting the thickness requirement shall be augmented with additional clay material. The added material shall be reworked within the clay liner to ensure homogeneity and proper bonding. This shall be done by scarification of the surface prior to addition of new material. As a minimum, the top 4-in of the liner shall be wetted, kneaded, compacted and reworked with the additional material to obtain the required thickness.

6.11.6 Work shall be limited to an area that can be completed in one working day. The area shall be left in a manner to promote surface water run-off and continuously protected from excessive moisture, desiccation or other activity which may compromise the integrity of the clay liner, until the HDPE geomembrane is installed.

6.11.7 Each clay lift shall be covered immediately after the list passes testing requirements and at the end of each day’s work to protect the liner from desiccation. Should desiccation cracks develop, the clay liner shall be rewetted rehomogenized and re-compact the specifications to the depth of any such cracks.

6.11.8 During construction, the CONTRACTOR shall make all necessary provisions to deal with inclement weather conditions. The CONTRACTOR shall be fully responsible for control of storm water during installation of the liner system and for moisture control and protection of the clay liner.

6.11.9 The CONTRACTOR shall provide onsite supervision during all periods of installation. At no time shall any work be performed by the CONTRACTOR without his supervisor onsite.

6.11.10 The clay surface must be made smooth and free from ruts or indentations at the end of any working day when significant precipitation is forecast and/or the completion of the compaction operations in that area in order to prevent saturation of the clay material.

6.12 Field Quality Control

6.12.1 Sieve analyses shall be conducted on samples from every 4000 M2 of each lift of installed clay liner. Test shall be conducted in accordance with ASTM D1140 to determine the percentage of dry weight passing the number 200 standard sieve size. In addition, particle size analysis will be conducted on samples from every 4000 M2 of lift of installed clay
liner or as determined by the ENGINEER. Tests shall be in accordance with ASTM D422, to determine the percent clay.

6.12.2 Atterberg limits ASTM D4318 shall also be performed on samples from every 4000 M2 of each lift of installed clay liner.

6.12.3 Field density and moisture content shall be determined on every 4000 M2 of each lift of installed clay liner. Nuclear density determinations shall not be used unless a product-specific correlation has been established at the job site with more accurate methods, i.e. drive cylinder ASTM D 2937, sand cone ASTM D1558, and oven drying ASTM D2216 methods.

6.12.4 Depth measurement to determine the thickness of the liner shall be conducted every 4000 M2 of installed clay liner. All voids shall be repaired by filling with pure, dry bentonite tamped firm into place.

6.12.5 Hydraulic material conductivity testing shall be performed for the compacted clay soil at a minimum frequency of one (1) test per acre per lift. The ENGINEER shall have the authority to request the additional permeability tests in areas which, in his judgement, may be suspect or deficient. Hydraulic conductivity tests shall be conducted in accordance with ASTM D5084 except as modified in point Section 6.10.3. The hydraulic gradient used for hydraulic conductivity measurements shall be approved by the ENGINEER. Pure bentonite powder shall be used to backfill the hole in the clay liner where hydraulic conductivity samples were obtained.

6.12.6 Any sample or area tested shall be rejected, removed and replaced if it does not meet the requirements of the technical specifications. Reconstructed areas shall have feathered, overlapping edges that tie into adjacent liner areas.

6.12.7 Test results which do not meet the permeability requirements of this section shall be considered a failing test. The liner within the limits represented by the failing test shall be removed and reinstalled until a passing test is achieved. Additional tests may be performed by the CONTRACTOR, at his expense, to limit the area requiring repair.

Table No. 3: Recommended Testing Frequency For Clay Liner

<table>
<thead>
<tr>
<th>Item</th>
<th>Testing</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay borrow source testing</td>
<td>1. Grain Size</td>
<td>1,000 cu yd</td>
</tr>
<tr>
<td></td>
<td>2. Moisture content</td>
<td>1,000 cu yd</td>
</tr>
<tr>
<td></td>
<td>3. Att. Limits</td>
<td>5,000 cy</td>
</tr>
<tr>
<td></td>
<td>4. Moisture-Density Curves</td>
<td>5,000 cy (and all change in materials)</td>
</tr>
<tr>
<td></td>
<td>5. Lab. Permeability</td>
<td>10,000 cy (remolded Sample)</td>
</tr>
<tr>
<td></td>
<td>6. Specific Gravity</td>
<td>5,000 cy</td>
</tr>
<tr>
<td>Clay Liner Testing</td>
<td>1. Density (Nuclear or sand Cone)</td>
<td>5 test/acre/lift</td>
</tr>
<tr>
<td></td>
<td>2. Moisture Content</td>
<td>5 test/acre/lift</td>
</tr>
<tr>
<td></td>
<td>3. Undisturbed Permeability</td>
<td>1 test/acre</td>
</tr>
<tr>
<td></td>
<td>4. Dry Density (undisturbed Sample)</td>
<td>1 test/acre</td>
</tr>
<tr>
<td></td>
<td>5. Moisture Content</td>
<td>5 test/acre (undisturbed sample in place)</td>
</tr>
<tr>
<td></td>
<td>6. Atterberg Limits</td>
<td>5 test/acre/lift</td>
</tr>
<tr>
<td></td>
<td>7. Grain Size</td>
<td>5 test/acre/lift</td>
</tr>
</tbody>
</table>
SECTION 7 SECTION 7: GEOSYNTHETIC CLAY LINERS (GCL)

7.1 Introduction
7.1.1 The performance of the GCL is wholly dependent on the quality of its installation. It is the installer's responsibility to adhere to the guidelines, and to the project specifications and drawings, as closely as possible. It is the engineer's and owner's responsibility to provide construction quality assurance (CQA) for the installation, to ensure that the installation has been executed properly.

7.2 Equipment Required
7.2.1 GCLs are delivered in rolls weighing 2,500-2,700 lbs. (1,140 - 1,225 kg). It is necessary to support this weight using an appropriate core pipe. For the installation, the core pipe must not deflect more than 3 inches (75 mm) as measured from end to midpoint when a full GCL roll is lifted.

7.2.2 Lifting chains or straps appropriately rated, should be used in combination with a spreader bar made from an I-beam. The spreader bar ensures that the lifting chains or straps do not chafe against the ends of the GCL roll, allowing it to rotate freely during installation.

7.2.3 A front end-Loader, backhoe, dozer, or other equipment can be utilized with the spreader bar. Alternatively, a forklift with a "stinger" attachment may be used for on-site handling and, in certain cases, installation. A forklift without a stinger attachment should not be used to lift or handle the GCL rolls. Stinger attachments specially fabricated to fit various forklift makes and models should be made available at site.

7.2.4 When installing over certain geosynthetic materials, a 4-wheel, all-terrain vehicle (ATV) can be used to deploy the GCL from behind. An ATV can be driven directly on the GCL provided that no sudden stops, starts, or turns are made.

7.2.5 Additional equipment needed for installation of GCLs includes:
- Utility knife and spare blades (for cutting the GCL).
- Granular bentonite or bentonite mastic (for overlapped seams of GCLs with needle-punched, non-woven geotextiles and for sealing around structures and details).
- Waterproof tarpaulins (for temporary cover on installed material as well as for stockpiled rolls).
- Optional chalk line marker to simplify bentonite placement at seams (when installing a GCL with needlepunched, non-woven geotextile components).
- Optional flat-bladed vise grips (for positioning the GCL panel by hand).

7.3 Materials
7.3.1 General
7.3.1.1 The GCL shall be manufactured of new, prime first quality products designed and manufactured especially for the purpose of liquid containment in hydraulic structures and chemically resistant to leachate.

7.3.1.2 The sheets shall meet the specifications and shall be manufactured in a minimum 13-ft seamless width. Labels on the roll shall identify the thickness, length, width and manufacturer’s lot number. The liners shall be from a reputed manufacturer adhering to all the latest norms. The approved companies are CETCO, Ashapura Volclay, Laviosa, GSE, Naue, Hueskar. GCL complying similar specification can also be used from other manufacturing companies also.
7.4 Quality Control Documentation
Prior to installation commencement of any GCL materials, the CONTRACTOR shall provide the following information certified by the manufacturer for the delivered Geomembrane.

7.4.1 Origin, identification and production of the Bentonite (supplier’s name, brand name and production plant.)
7.4.2 Copies of quality control certificate issued by the resin supplier.
7.4.3 Manufacturer’s certification, verifying that the quality of the material used to manufacture the GCL meets the international norms
7.4.4 Each roll delivered to the project site shall have the following identification.
   - Manufacturer’s name
   - Product identification
   - Thickness
   - Roll number
   - Roll dimensions
7.4.5 Quality control certificates, signed by the manufacturer’s quality assurance manager. Each certificate shall have roll identification number, sampling procedures, frequency and test results, at the minimum the following test results shall be provided in accordance with test requirement given below in table

7.5 Conformance Testing
7.5.1 Conformance testing shall be performed by independent Quality Assurance laboratory (QAL) approved by the OWNER. The list of conformance test that shall be conducted at the laboratory are given in table
7.5.2 All conformance test results shall be reviewed by ENGINEER and accepted or rejected prior to the placement of the GCL. All test results shall meet, or exceed, the property value listed in table. In case of failing test result the manufacturer may request that another sample be retested by an independent laboratory with manufacture’s technical representative present during the testing procedure. This retesting shall be paid for by the manufacturer. The manufacturer may also have the sample retested at two (2) different laboratories approved by the OWNER. If both laboratories report passing results, the materials shall be accepted. If both laboratories do no report passing results, all GCL from the lot representing the failing sample will be considered out of specification and rejected.

7.6 Subgrade Preparation
7.6.1 Subgrade surfaces consisting of granular soils or gravel may not be acceptable due to their large void fraction and puncture potential. In high head (greater than one foot) applications subgrade soils should possess a particle size distribution such that at least 80 percent of the soil is finer than a #60 sieve (0.250 mm).
7.6.2 When the GCL is placed over an earthen subgrade, the subgrade surface must be in accordance with the project specifications. Engineer's approval of the subgrade must be obtained prior to installation. The finished surface should be firm and unyielding without abrupt elevation changes, voids, cracks, or standing water.
7.6.3 The subgrade surface must be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade should be rolled with a smooth-drum compactor to remove any wheel ruts, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall either be removed, crushed, or pushed into the surface with a smooth-drum compactor.
7.7 Shipping, Unloading and Storage

7.7.1 All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and marked.

7.7.2 Major damage suspected to have occurred during transit should be reported immediately to the carrier and to the manufacturer. The nature of the damage should also be indicated on the bill of lading with the specific lot and roll numbers.

7.7.3 The party directly responsible for unloading the GCL should refer to the manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised to ensure these goals are achieved. Roll dimensions and weights will vary with the dimensions of the product ordered.

7.7.4 In most cases, GCLs are delivered on flatbed trucks. There are 3 methods of unloading - Core pipe, Spreader bar and Slings or Stringer bar. To unload the rolls from the flatbed, insert the core pipe through the roll. This may require removal of the core plug, which should be replaced after the roll is unloaded. Secure the lifting straps or chains to each end of the core pipe, and to the spreader bar mounted on the Lifting equipment. Hoist the roll straight up; make sure its weight is evenly distributed so that it does not tilt or sway when lifted.

7.7.5 GCLs are also delivered in closed shipping containers. To remove the roll from the container, it is best to utilize a forklift mounted with a "stinger" attachment. Guide the stinger as far as possible through the core and lift the roll up and out of the container.

7.7.6 Rolls should be stacked in a manner that prevents them from sliding or rolling from the stacks. This can be accomplished by frequent chocking of the bottom layer of rolls. Rolls should be stacked no higher than the height at which the spreader bar assembly can be safely handled by laborers (typically no higher than four). Rolls should never be stacked on end.

7.7.7 Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry and stable. Moisture protection of the GCL is provided by its packaging; however, an additional tarpaulin or plastic sheet is recommended.

7.8 Installation

7.8.1 GCL rolls should be taken to the working area of the site in their original packaging. Prior to deployment, the packaging should be carefully removed without damaging the GCL. The orientation of the GCL (i.e., which side faces up) may be important if the GCL has two different geotextiles. Unless otherwise specified, however, the GCL should be installed such that the product name printed on one side of the GCL faces up.

7.8.2 Equipment which could damage the GCL should not be allowed to travel directly on it. Acceptable installation, therefore, may be accomplished such that the GCL is unrolled in front of the backwards-moving equipment. If the installation equipment causes rutting of the subgrade, the subgrade must be restored to its originally accepted condition before placement continues.

7.8.3 If sufficient access is available; GCL may be deployed by suspending the roll at the top of the hill with a group of laborers pulling the material off of the roll and down the slope.

7.8.4 GCL rolls should not be released on the slope and allowed to unroll freely by gravity.
7.8.5 Care must be taken to minimize the extent to which the GCL is dragged across the subgrade in order to avoid damage to the bottom surface of the GCL. A temporary geosynthetic subgrade covering commonly known as a slip sheet or rub sheet may be used to reduce friction damage during placement.

7.8.6 The GCL should be placed so that seams are parallel to the direction of the slope. End-of-roll seams should also be located at least 3 ft. (1 m) from the toe and crest of slopes steeper than 4H:1V.

7.8.7 ALL GCL panels should lie flat on the underlying surface, with no wrinkles or folds, especially at the exposed edges of the panels.

7.8.8 The GCL should not be installed in standing water or during rainy weather. Only as much GCL shall be deployed as can be covered at the end of the working day with soil, a geomembrane, or a temporary waterproof tarpaulin. The GCL shall not be left uncovered overnight. If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. The project engineer and CQA inspector should be consulted for specific guidance if premature hydration occurs.

7.9 Anchorage

7.9.1 The end of the GCL roll should be placed in an anchor trench at the top of a slope. The front edge of the trench should be rounded to eliminate any sharp corners that could cause excessive stress on the GCL. Loose soil should be removed or compacted into the floor of the trench.

7.9.2 Anchorage should be as per the project drawings and specifications. In case of difficulty, the Project Manager should be contacted for his instructions.

7.9.3 If a trench is used for anchoring the end of the GCL, soil backfill should be placed in the trench to provide resistance against pullout. The size and shape of the trench, as well as the appropriate backfill procedures, should be in accordance with the project drawings and specifications.

7.10 Seaming

7.10.1 GCL seams are constructed by overlapping their adjacent edges. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. In some types of GCL’s supplemental bentonite in granular form may be required for seaming. This should be provided as per the manufacturer’s recommendations.

7.10.2 Unless otherwise specified, the minimum dimension of the longitudinal overlap should be 6 inches (150 mm). End-of-roll overlapped seams should be similarly constructed, but the minimum overlap should measure 24 inches (600 mm).

7.10.3 Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade to prevent the potential for runoff flow to enter the overlap zone. End panel overlap seams on slopes are not permissible.

7.10.4 End-of-panel seams are constructed first by overlapping the adjacent panels, exposing the underlying edge, and then applying a continuous bead or fillet of granular sodium bentonite (supplied with the GCL) along a zone defined by the edge of the underlying panel and the 12-inch (300 mm) Line. The minimum application rate at which the bentonite is applied is one quarter pound per linear foot (0.4 kg/m).

7.11 Seaming Around Penetrations & Structures
7.11.1 Cutting the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid irregular tearing of the geotextile components of the GCL during the cutting process.

7.11.2 The GCL should be sealed around penetrations and structures embedded in the subgrade. Granular bentonite or a bentonite mastic shall be used liberally (approx. 2 Lbs./ln ft. or 3 kg/m) to seal the GCL to these structures.

7.11.3 When the GCL is placed over an earthen subgrade, a "notch" should be excavated into the sub-grade around the penetration. The notch should then be backfilled with granular bentonite or bentonite mastic.

7.11.4 A secondary GCL layer of 300 mm overlap should also be placed to avoid any leakages. The granular bentonite should be applied between the 1st and the 2nd GCL layers.

7.11.5 When the GCL is terminated at a structure or wall that is embedded into the subgrade on the floor of the containment area, the subgrade should be notched as described above. The notch is filled with bentonite, and the GCL should be placed over the notch and up against the structure. The connection to the structure can be accomplished by placement of soil or stone backfill in this area.

7.12 Damage Repair
7.12.1 If the GCL is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area. The patch should be obtained from a new GCL roll and should be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all parts of the damaged area. Granular bentonite or bentonite mastic should be applied around the damaged area prior to placement of the patch. It may be necessary to use an adhesive such as wood glue to affix the patch in place so that it is not displaced during cover placement. Smaller patches also may be tucked under the damaged area to prevent patch movement.

7.13 Cover Seal
7.13.1 Cover soils should be free of angular stones or other foreign matter that could damage the GCL. Cover soils should be approved by the Engineer with respect to particle size, uniformity and chemical compatibility.

7.13.2 Recommended cover soils typically have a particle size distribution ranging between fines and 1 inch (25 mm). The minimum final thickness of soil cover on the GCL must be 300 mm thick.

7.13.3 Soil cover shall be placed over the GCL using construction equipment that minimizes stresses on the GCL. A minimum thickness of 1 foot (300 mm) of cover should be maintained between the equipment tires /tracks and the GCL at all times during the covering process. In areas or roadways, a minimum thickness of 2 feet (600 mm) is required.

7.13.4 Soil cover should be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover should be pushed up slopes, not down slopes, to minimize tensile forces on the GCL.

7.13.5 When a textured geomembrane is installed over the GCL, a temporary geosynthetic covering known as a slip sheet or rub sheet should be used to minimize friction during placement and to allow the textured geomembrane to be more easily moved into its final position.
7.14 Hydration

7.14.1 In cases where the containment of non-aqueous liquids is required, it may be necessary to hydrate the covered GCL with water prior to use. Hydration is usually accomplished by natural rainfall and/or absorption of moisture from soil.

7.14.2 If manual hydration is necessary, water can be introduced by flooding the covered lined area or using a sprinkler system.

Table No. 4 Properties of Geosynthetic Clay Liner

<table>
<thead>
<tr>
<th>Geotextile properties</th>
<th>Test method</th>
<th>Nominal value</th>
<th>Tolerance</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap non-woven PP – mass per unit area</td>
<td>ASTM D5261</td>
<td>180</td>
<td>-20</td>
<td>g/m²</td>
</tr>
<tr>
<td>Carrier woven PP – mass per unit area</td>
<td>ASTM D5261</td>
<td>110</td>
<td>-10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sodium Bentonite properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montmorillonite content</td>
</tr>
<tr>
<td>Swell index</td>
</tr>
<tr>
<td>Fluid loss</td>
</tr>
</tbody>
</table>

Finished GCL properties

| Bentonite mass per unit area (at 12% moisture) | ASTM D 5993 | 4.800   | -100    | g/m²    |
| Bentonite mass per unit area (at 0% moisture) | ASTM D 5993 | 4.29    | -90     | g/m²    |
| GCL mass per unit area (at 12% moisture) | ASTM D 5993 | 5.290   | -130    | g/m²    |
| Hydraulic conductivity (k20) | ASTM D5887 | 2·10⁻⁹  | +8·10⁻¹⁰ | cm/s    |
| Index flux (qi) | ASTM D5887 | 5·10⁻⁹  | +8·10⁻¹⁰ | (m³/m²)/s |
| Tensile strength (TMAX) – MD | ASTM D 6768 | 14,0    | -2,0    | kN/m    |
| Tensile strength (TMAX) – CMD | ASTM D 6768 | 10,0    | -1,0    | kN/m    |
| Static puncture strength (FP) | ASTM D 6241 | 2,2     | -0,2    | kN      |
| Peel strength – MD2 | ASTM D6496   | 65,0    | -6,5    | N       |

Roll size

| Thickness | ASTM D5199 | 6,5 | -0,7 | Mm |
| Dimensions (H x L) | 44 x 5 | m |
| Total area | 220 | M² |
| Total weight | 1.250 | kg |
Table No. 5 Test Results for Quality Certification

<table>
<thead>
<tr>
<th>Material Property</th>
<th>Test Method</th>
<th>Test Frequency Ft2(M2)</th>
<th>Required Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentonite Swell Index</td>
<td>ASTM D 5890</td>
<td>1 per 50 tonnes</td>
<td>24mL/2g min</td>
</tr>
<tr>
<td>Bentonite Fluid Loss</td>
<td>ASTM D 5891</td>
<td>1 per 50 tonnes</td>
<td>18mL max</td>
</tr>
<tr>
<td>Bentonite Mass/ Area</td>
<td>ASTM D 5993</td>
<td>40,000ft2 (4,000m2)</td>
<td>0.75lb/ft2 (3.6 kg/m2) min</td>
</tr>
<tr>
<td>GCL Grab Strength</td>
<td>ASTM D 4632</td>
<td>200,000ft2 (20,000m2)</td>
<td>90lbs (400 N) MARV</td>
</tr>
<tr>
<td>GCL Peel Strength</td>
<td>ASTM D 4632</td>
<td>40,000ft2 (4,000m2)</td>
<td>15lbs (65 N) min</td>
</tr>
<tr>
<td>GCL Index Hux</td>
<td>ASTM D 5887</td>
<td>Weekly</td>
<td>1 x 10-8m3/m2/sec max</td>
</tr>
<tr>
<td>GCL Permeability</td>
<td>ASTM D 5887</td>
<td>Weekly</td>
<td>5 x 10-9cm/sec max</td>
</tr>
<tr>
<td>GCL Hydrated Internal Shear Strength</td>
<td>ASTM D 5321</td>
<td>Periodic</td>
<td>500psf (24 kPa) typical</td>
</tr>
</tbody>
</table>

Notes
1. Bentonite property tests performed at a bentonite processing facility before shipment to manufacturer's GCL production facilities.
2. Bentonite mass/area reported at 0 percent moisture content.
3. All tensile testing is performed in the machine direction, with results as minimum average roll values unless otherwise indicated.
4. Index flux and permeability testing with desired distilled/deionized water at 50psi (351kPa) cell pressure, 77psi (531kPa) headwater pressure and 75psi (517kPa) tail water pressure. Reported value is equivalent to 925gal/acre/day. This flux value is equivalent to a permeability of 5x10⁻³ cm/sec for typical GCL thickness. This flux value should not be used for equivalency calculations unless the gradients used represent field conditions. A flux test using gradients that represent field conditions must be performed to determine equivalency. The last 20 weekly values prior the end of the production date of the supplied GCL may be provided.
5. Peak value measured at 200psf (10kPa) normal stress. Site-specific materials, GCL products, and test conditions must he used to verify internal and interface strength of the proposed design.

SECTION 8: HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE LINER

8.1 Scope of work
Furnish all labor materials, equipment and incidentals required and install the High Density Polyethylene (HDPE) Geo-membrane Liner as shown on the drawings and as specified herein.

8.2 Related Work
8.2.1 Trenching, backfilling and compaction are included in Section 3.
8.2.2 Compacted layer is included in Section 6.

8.3 Reference Standards
American Society for Testing and Materials (ASTM)
6. ASTM D 1204 – Standard Test Method for Linear Dimensional Changes of Non-rigid Thermoplastic Sheeting or Film at Elevated Temperature.

Federal test Method Standards (FTMS)
GRI GM-13 & GRI GM-17 Standards
All the HDPE Geomembrane liners must meet the GRI GM-13 specifications while the LLDPE/VFPE Geomembrane liners must meet the GRI GM-17 specifications for Quality Control and Quality Assurance in manufacturing of liners.

- Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

8.4 Quality Assurance

8.4.1 In addition to manufacturer and installer requirement for qualification and certification specified in Section 8.3, the Quality Assurance consists of conformance testing of the material delivered to the site and field quality control during installation.

8.4.2 Conformance testing requirements are specified in Section 8.11
8.4.3 Field quality control requirements are specified in Section 8.17
8.4.4 Quality Control Plan:
The forms for geomembrane quality control documentation shall be used for field installation documentation. Alternative forms may be used for documentation as approved by the ENGINEER.

8.4.5 Geomembrane Quality Control Documentation
8.4.5.1 Pre-installation Conference
8.4.5.1.1 Prior to commencing work, a pre-installation conference shall be held and the following subject personnel shall be identified by name and recorded in project files.
   o Installer’s Field Site Manager (FSM)
   o ENGINEER’S field Representative (EFR)
   o Quality Assurance laboratory (QAL)
8.4.5.1.2 Two (2) duplicate project files shall be maintained One (1) shall be maintained by the EFR and the other shall be maintained by the FSM. At the end of each work week the files shall be updated and checked to assure that copies of all pertinent projects information is includes in each file. The CONTRACTOR shall insure that the following forms are completed daily and distributed as required.
8.4.5.1.3 Blank copies of the following seven (7) projects forms shall be available onsite throughout the duration of the projects.
Table No. 6: Formats for HDPE Liner Testing

<table>
<thead>
<tr>
<th>Form No</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Liner Delivery</td>
</tr>
<tr>
<td>2</td>
<td>Daily Checklist</td>
</tr>
<tr>
<td>3</td>
<td>Geomembrane panel Placement</td>
</tr>
<tr>
<td>4</td>
<td>Onsite Geomembrane Welding Report</td>
</tr>
<tr>
<td>5</td>
<td>Damage and Repair report</td>
</tr>
<tr>
<td>6</td>
<td>Destructive Seams testing Report</td>
</tr>
<tr>
<td>7</td>
<td>Daily field Log</td>
</tr>
</tbody>
</table>

8.4.5.1.4 As-built drawings

The CONTRACTOR shall furnish as-built drawings and a copy of complete documentation for final installation of the geomembrane

8.5 Qualifications

8.5.1 Manufacturer

The manufacturer of the lining material described hereunder shall have previously demonstrated his/her ability to produce this geomembrane by having at least five (5) years continuous experience in the manufacture of HDPE geomembrane and successfully manufactured a minimum of 50 million square feet of similar liner material for hydraulic lining installations. The manufacturer must satisfy the GRI GM-13/ GRI GM-17 Standards as meeting all the requirements for manufacturing geomembrane.

8.5.2 Installer

The installer shall be the manufacturer or an approved installer trained and certified to install the manufacturer’s geomembrane. Installation shall be performed under the constant direction of a single field site manager (provided by the installer) who shall remain on site and be in responsible charge, through the geomembrane installation, for geomembrane layout seaming, testing & repairs and all other activities required by the installer. The installation site manager shall have installed or supervised the installation and seaming of the minimum of two million square feet of HDPE geomembrane Liner.

8.6 Delivery, Storage And Handling

8.6.1 The geomembrane rolls shall be packaged and shipped by appropriate means to prevent damage of the geomembrane rolls. Off-loading and storage of the geomembrane is the responsibility of the CONTRACTOR. The CONTRACTOR shall be responsible for replacing any damaged or unacceptable materials at no cost to the owner.

8.6.2 No off-loading shall be performed unless the EFR is present. Damage during off loading shall be documented by the EFR. All damage rolls must be separated from the undamaged rolls until the proper disposition of that material has been determined by the ENGINEER.

8.6.3 The Geomembrane rolls shall be stored so as to be protected from dirt, puncture, grease, water, moisture, mud, mechanical abrasions and excessive heat that may damage the geomembrane material. The rolls shall be stored on a prepared surface (not wooden pallets) and shall not be stacked more than two rolls high.

8.7 Material Warranty

8.7.1 The HDPE geomembrane manufacturer shall warrant the membrane, on a prorated basis, against manufacturing defects and material degradation under outdoor exposure for a period of twenty (20) years from the date of installation. The manufacturer shall replace, at no expense, any
material which fails from the above causes within the warranty period. The manufacturer shall furnish a written warranty covering the requirements of this paragraph.

8.7.2 Guarantee
The CONTRACTOR shall guarantee the HDPE/LLDPE geomembrane against defects in installation and workmanship for the period of one year commencing with the date of final acceptance. The guarantee shall include the services of qualified service technicians and all materials required for the repairs at no expense of the OWNER.

8.8 Definitions and Responsibilities

8.8.1 Contractor
The CONTRACTOR is the firms or corporation with whom the OWNER has entered into agreement to construct the project. The contractor is responsible for all submittals by the manufacturer and the installer as required by the specifications. The contractor is also responsible for scheduling and co-ordination of the required work with the manufacture and the installer to complete the work.

8.8.2 Manufactures
The manufacture is the firm or corporation responsible for production of the geomembrane material to be used in the project. The manufacturer is responsible for the condition of the geomembrane until the material accepted by the owner or his/her field representative upon delivery. The manufacturer shall produce consistent products meeting the projects specifications, and shall provide quality control documentations for the products specified herein.

8.8.3. Installer
The installer is the firm responsible for installation of the geomembrane. The installer shall be a manufacturer or an approved installer trained and certified to install the manufacturer’s geomembrane. The installer shall be responsible for field handling, storage, placing, seaming and all other aspects of the geomembrane installation.

8.9 Materials

8.9.1 General
8.9.1.1 The Geomembrane shall be manufactured of new, prime first quality resin, specifically formulated, designed and manufactured specially for the purpose of liquid containment in hydraulic structures and chemically resistant to leachate.
8.9.1.2 The geomembrane material shall be so produced as to be free of holes, blister, undispersed raw materials, or any sign of contamination by foreign mater.
8.9.1.3 The sheets shall be flat cast manufactured to meet the GRI GM-13 / GRI GM-17 specifications and shall be manufactured in a minimum 7 m seamless width. The liners shall identify the thickness, length, width and manufacturer's lot number. The linings shall be from a reputed manufacturer adhering to all the latest norms. The list of approved companies are Poly-Flex Inc, GSE, Naue (Germany), Solmax, Atarfil, Huitex, Engepol.

8.9.2 Properties
The geomembrane shall meet the minimum properties listen in Table No. 8 for a geomembrane of 1.5mm thickness.

8.9.3 Other Materials
8.9.3.1 Extruded welding roads shall be of the same compound as the geomembrane and supplied by the manufacturer and shall be delivered in the original sealed containers. Each
container shall have a label bearing the brand name, manufacturer’s lot number and complete directions as to proper storage.

8.9.3.2 Boots and shrouds for pipe penetration shall fit snugly around the pipe. Prefabricated materials shall be designed to fit site specific conditions for the intended slope and size of pipe.

8.10 Quality Control Documentation

Prior to installation commencement of any geomembrane materials, the CONTRACTOR shall provide the following information certified by the manufacturer for the delivered geomembrane.

8.10.1 Origin, identification and production of the resin (supplier’s name, brand name and production plant.)

8.10.2 Copies of quality control certificate issued by the resin supplier.

8.10.3 Manufacturer’s certification, verifying that the quality of the resin used to manufacture the geomembrane meets the fingerprint properties shown in Table No. 8

8.10.4 Each roll delivered to the project site shall have the following identification.

- Manufacturer’s name
- Product identification
- Thickness
- Roll number
- Roll dimensions

8.10.5 Quality control certificates, signed by the manufacturer’s quality assurance manager. Each certificate shall have roll identification number, sampling procedures, frequency and test results, at the minimum the following test results shall be provided in accordance with test requirement special in Table No. 7

- Thickness
- Density
- Tensile Properties
- Tear Resistance
- Carbon Black Control
- Carbon Black Dispersion

8.11 Conformance Testing

8.11.1 Conformance testing shall be performed by independent Quality Assurance laboratory (QAL) approved by the OWNER the following conformance test shall be conducted at the laboratory.

- Thickness
- Density
- Tensile properties
- Tear resistance
- Carbon black Control
- Carbon Black Dispersion

8.11.2 These conformance test shall be performed in accordance with Table No. 7

8.11.3 All conformance test results shall be reviewed by ENGINEER and accepted or rejected prior to the placement of the geomembrane. All test results shall meet, or exceed, the property value listed in Table No. 8. in case of failing test result the manufacturer may request that another sample be retested by an independent laboratory with manufacture’s technical representative present during the testing procedure. This retesting shall be paid for by the manufacturer. The manufacturer may also have the sample retested at two (2)
different laboratories approved by the OWNER. If both laboratories report passing results, the materials shall be accepted. If both laboratories do not report passing results, all geomembrane from the lot representing the failing sample will be considered out of specification and rejected.

8.12. **Sub-grade Preparation**

8.12.1 Preparation of the sub-grade shall be specified in Section 1 to 5.
8.12.2 The surface of the sub-grade shall be smooth, uniform, free from sudden changes in the grade (such as vehicular ruts,) rocks, stones, debris and delirious materials. During actual placing and seaming of the geomembrane, the sub-grade shall be kept free of all standing water. If the sub-grade below the geomembrane wet and unstable, it shall be dried and recompacted.

8.13.3 Before the geomembrane installation beings, the ENGINEER and the INSTALLER shall verify and approve on the following:
8.12.3.1 Lines and grades are conformance with the drawings and specification.
8.12.3.2 The surface area to be lined has been rolled and compacted, free of irregularities and abrupt changes in grades.

8.13 **Anchor Trench**

8.13.1 The anchor trench shall be constructed as shown on the Drawings and as specified herein.
8.13.2 Slightly rounded corners shall be provided in the trench to avoid shrap bends in the geomembrane.
8.13.3 The anchor trench shall be adequately drained to prevent ponding and softening to adjacent soils. The anchor trench shall be backfilled with local fill material and compacted to 90% Standard proctor density, ASTM D 698.
8.13.4 If the anchor trench is located in a clay susceptible to desiccation the amount of the trench open at any time shall be limited to one (1) day of geomembrane installation capacity.

8.14 **Geomembrane Placement**

8.14.1 Weather Conditions
Geomembrane placement shall not proceed at an ambient temperature below 5 degrees C or above 40 degrees C unless otherwise authorized in writing, by the ENGINEER or his/her field representative. Geomembrane placement shall not be performed during precipitation, excessive moistures, in an area of ponded water, or executive winds.

8.14.2 Method of placement
8.14.2.1 Each panel of the geomembrane shall be rolled out and installed in accordance with the approved shop drawings prepared by the CONTRACTOR. The layout shall be designed to keep field joining of the HDPE geomembrane to a minimum and consistent with proper methods of HDPE geomembrane installation.
8.14.2.2 Geomembrane shall be placed using proper spreader and rolling bars with cloth slings. If a sheet must be replaced a distance greater than its width, a slip-sheet will be used.
8.14.2.3 The EFR shall inspect each panel, after placement and prior to seaming for the damage and/or defects. Damage and defective panels shall be replaced or repaired, as approved by the ENGINEER.
8.14.2.4 The installer shall avoid dragging the Geomembrane sheets on rough soil sub-grades.
8.14.2.5 All Geomembrane shall be anchored as shown on the Drawings and consistent with manufacturer’s recommendations.
8.14.2.6 Personnel working on the Geomembrane shall not smoke, wear damaging shoes or involve themselves in any activity that may damage the Geomembrane.

8.14.2.7 All edges of the Geomembrane shall be properly weighted to avoid uplift due to wind.

8.14.2.8 Vehicular traffic across the Geomembrane shall not be allowed.

8.14.2.9 All damage shall be recorded and located on the as-built drawings.

8.14.2.10 When tying into existing Geomembrane, all excavation of previously installed liner shall be performed by hand to prevent damage.

8.14.2.11 The Geomembrane shall be kept free of debris, unnecessary tools and materials. In general, the Geomembrane area shall remain neat in appearance.

8.14.2.12 Equipment necessary to perform the installation (generators, compressors etc.) shall have a scrap Geomembrane sheet placed underneath to protect the installed Geomembrane from possible Geomembrane damage.

8.14.2.13 No welding or testing equipment shall be allowed to remain on top of the installed Geomembrane overnight. All equipment must be removed and stored away from the installed Geomembrane.

8.14.2.14 The installer is responsible for providing adequate temporary gas venting measures during installation of cap liner to prevent Geomembrane uplift due to possible gas pressure accumulations. The installer shall repair any damaged Geomembrane as a result of gas pressure accumulation at no additional cost to the OWNER.

8.14.3 Liner boots

8.14.3.1 HDPE boots or shrouds shall be furnished and installed where indicated on the Drawings. The boots shall be of the same materials as the Geomembrane.

8.14.3.2 The Geomembrane end of the boots shall terminate in a skirt section suitable for welding to the Geomembrane. The overlap between the boots and the Geomembrane shall be approximately 18-in. The boots shall be welded to the Geomembrane as previously specified herein.

8.14.3.3 Boots and shrouds shall fit snugly around the pipe prefabricated material shall be designed to meet site specific condition, for the intended slope and size of the pipe.

8.14.3.4 Neoprene sponge or rubber gasket shall be used between the boot or shroud and the pipe with a stainless steel clamp. An HDPE sacrificial sheet shall be used. The fastener of the second clamp shall be located on the opposite side of the pipe from the first clamp, to compensate for uneven pressure and elongation.

8.15 Field Seams

8.15.1 Individual panels of geomembrane shall be laid out and overlapped by a minimum of 4-in prior to welding. The area to be welded shall be cleaned and prepared in accordance with the quality control welding procedures.

8.15.2 Single or double track hot wedge fusion welder shall be used for straight welds.

8.15.3 Extrusion welder shall be used for cross seam tees, patches and repairs and penetration boots where a hot wedge fusion welder is not appropriate.

8.15.4 The welding equipment used shall be capable of continuously monitoring and controlling the temperatures in a zone of contract where the machine is actually fusing the Geomembrane material so as to ensure that changes in environmental conditions will not affect the integrity of the weld.

8.15.5 No “fish mouths” will be allowed within the seam area. Where “fish mouths” occur the material shall be cut, overlapped and a patch fusion shall be applied. All welds upon completion of work shall be tightly boned. Any Geomembrane area showing injury due
to excessive scuffing, puncture or distress from any cause shall be replaced or repaired
with an additional piece of Geomembrane. The number of patches per 100-ft length shall
not exceed five (5). If more than five (5) patches per 100-ft length are necessary, then
the entire 100-ft of seam shall be removed. Further welding will cease at this time and
the ENGINEER shall be notified all seams shall have a seam number that corresponds
with the panel layout numbers. The numbering systems shall be used in the development
of the as-built drawings. Seams numbers shall be derived from the combination of the
two panel number that are to be welded together.

8.15.6 All fusion welded “T” seams (i.e. the result of the Geomembrane panels placed
perpendicular to each other) shall be duplicate welded possible. The extrusion process
shall be used for the second weld.

8.15.7 All extruded shall be free of dirt, dry and protected from damage.

8.15.8 If an extrusion weld is stopped for longer than one (1) minute, it shall be purged to
remove heat-degraded extrudate. All purged extrudate shall be placed on a sacrificial
sheet and disposed of.

8.15.9 All seams constructed on sloped surfaces shall be vertical seams.

8.15.10 All vertical panels placed on sloped surface shall extend 5-ft inward from the toe of the
slop.

8.15.11 All end seams shall be staggered a minimum of 5-ft in length between continuous panels.

8.15.12 To prevent moisture built-up during fusion welding, it may be necessary to place a
moveable protective layer of plastic directly below each overlap of Geomembrane that is
to be seamed.

8.15.13 If required, a firm substrate shall be provided by using a flat board or similar hard surface
directly under the seam overlap to achieve proper support.

8.15.14 All seams shall extend across the anchor trench.

8.15.15 All factory seams, field seams and repair welds shall meet seam strength requirements
specified in Table No. 8

8.16 Seaming Weather Conditions.

8.16.1 Normal Weather Conditions

8.16.1.1 The normal required weather conditions for seaming are.

- Ambient temperature higher than 5 degrees C and lower than 40 degrees C
- No precipitation or other excessive moisture, such as fog of dew.
- No excessive winds.

8.16.1.2 These weather conditions shall be fulfilled during seaming process.

8.16.2 Cold Weather Conditions

If the ambient temperature is below 5 degrees C, the following conditions shall be met to
ensure quality seaming process:

8.16.2.1 Preheating the surface of the Geomembrane to achieve normal temperature range.

8.16.2.2 Preheating may be waived by the EFR if the installer demonstrates that satisfactory welds
of equivalent quality may be obtained without preheating at the expected temperature of
installation.

8.16.2.3 Preheating devices shall be approved by the manufacturer.

8.16.2.4 Care shall be taken to ensure that surface temperatures are not lowered below the minimum
required surface temperature for welding due to winds.

8.16.2.5 Additional destructive samples will be taken at the discretion of the ENGINEER.
8.16.2.6 Test seams as described in Section 8.17.1 shall be performed under the same ambient temperature conditions as the actual seams.

8.16.3 Warm Weather Conditions
8.16.3.1 If the ambient temperature is above 40 degrees C, no seaming of geomembrane shall be permitted unless the installer can demonstrate, to the satisfaction of the ENGINEER that geomembrane seam quality is not adversely impacted.

8.16.3.2 Test seams shall be performed under the same ambient temperature conditions as the actual seams.

8.16.3.3 Additional destructive tests shall be taken at the discretion at the ENGINEER.

8.17 Field Quality Control
8.17.1 Start-up testing
8.17.1.1 A test weld 3-ft long from each welding machine shall be run upon the beginning of each shift and every four hours, thereafter, under the same conditions as exit for the geomembrane welding. The test weld shall be marked with date, ambient temperature and welding machine number. A tensiometer shall be required to be on site before and during geomembrane installation for the purpose of testing samples. Specimens of weld 1-in wide shall be cut from the test weld and tested on site for shear and peel strength in accordance with Table No. 8. No welder may start work until the sample weld has been approved by the EFR.

8.17.1.2 Test seams shall be performed under the same conditions as the actual seams and shall be at least 3-ft long, 1-ft wide after seaming. Test seam for welding shall be cut out of the Geomembrane rolls.

8.17.2 Non-Destructive Seam Testing
8.17.2.1 The installer shall perform non-destructive test on all field seams over their full length. The purpose of this test is to assure continuity and integrity of the seams. Vacuum and air pressure tests shall be used of non destructive testing. The vacuum test shall only be used for extrusion welds and single track hot wedge welds. The air pressure test shall be used for all double track hot wedge welds.

8.17.2.2 Vacuum testing (for extrusion weld and single track hot wedge weld only)
8.17.2.2.1 Equipment for testing single wedge fusion seams and extrusion seams shall be comprised of the following
8.17.2.2.1.1 A vacuum box assembly consisting of a rigid housing, a transparent viewing windows, a soft rubber gasket attached to the bottom, port hole or valve assembly and a vacuum gage.
8.17.2.2.1.2 A vacuum tank and pump assembly equipped with a pressure controller and pipe connections.
8.17.2.2.1.3 A rubber pressure/vacuum hose with fittings and connections.
8.17.2.2.1.4 A plastic bucket and wide paint brush.
8.17.2.2.1.5 A soapy solution.
8.17.2.2.2 The following procedures shall be followed by the installer.
8.17.2.2.2.1 Excess sheet overlap shall be trimmed away.
8.17.2.2.2.2 the windows, gasket surfaces and check for leaks.
8.17.2.2.2.3 Energize the vacuum pump and reduce the tank pressure to approximately 5 psi
8.17.2.2.2.4 Wet a strip of Geomembrane approximately 12-in by 48-in (length of box) with the soapy solution.
8.17.2.2.2.5 Place the box over the wetted area and compress.
8.17.2.2.2.6 Close the bleed valve and open vacuum valve.
8.17.2.2.2.7 Ensure that a leak-tight seal is created.
8.17.2.2.2.8 For a minimum period of ten (10) seconds, examine the geomembrane through the viewing windows for the presence of soap bubbles.
8.17.2.2.2.9 If no bubbles occur after ten (10) seconds, close the vacuum valve an open the bleed valve, move the box over the next adjoining area with a minimum of 3-in overlap and repeat the process.
8.17.2.2.2.10 All areas where soap bubbles appear shall be marked and repaired in accordance Section 8.18.7 and then retested.
8.17.2.3 Air Pressure Testing (for double track fusion seams only)
8.17.2.3.1 The following procedures are applicable to those processes, which produce a double seam with an enclosed space.
8.17.2.3.2 Equipment for testing double fusion seams shall be comprised of the following.
8.17.2.3.2.1 An air pump equipped with pressure gage capable of generating and sustaining a pressure between 25 and 30 psi and mounted on a cushion to protect the Geomembrane.
8.17.2.3.2.2 A manometer equipped with sharp hollow needle, or other approved pressure feed device.
8.17.2.3.3 The following procedures shall be followed by the installer.
8.17.2.3.3.1 Seal both ends of the seam to be tested.
8.17.2.3.3.2 Insert needle or other approved pressure feed device into the tunnel created by the double wedge fusion weld.
8.17.2.3.3.3 Energize the air pump to a pressure between 25 and 35 psi, close valve and sustain pressure for at least five (5) minutes.
8.17.2.3.3.4 If loss of pressure exceed 4 psi, or pressure does not stablilize, locate faulty area, repair in accordance with Section 8.18.7 and retest.
8.17.2.3.3.5 Remove needle or other approved pressure feed device and seal.
8.17.2.3.4 Destructive seam testing shall be performed in accordance with Section 8.18

8.18. Destructive Seams Testing
8.18.1 The purpose of the destructive testing is to evaluate seam strength properties. A minimum of one (1) test sample shall be obtained per 500 feet of performed seam length or one (1) sample per crew member per day whichever produces the maximum number of samples. The location of the samples shall be determined by the EFR. Selection of such locations may be prompted by suspicion of overheating, contamination or other potential cause that may adversely affect impact the welds. Sampling shall be performed by the installer. Testing of field samples shall be performed in the presence of the EFR as described herein
8.18.2 Sampling procedures
8.18.2.1 Sample shall be cut by the installer at locations chosen by the EFR as the seaming progresses.
8.18.2.2 The seams shall not be covered by another material before they have been tested and accepted by the EFR.
8.18.2.3 Upon obtaining each sample, assign a number to the sample and mark it accordingly.
8.18.2.4 Record sample location on layout drawings.
8.18.2.5 Record purpose of the sample, statistical routine or suspicious weld area.
8.18.2.6 Holes in the geomembrane resulting from destructive seam testing shall be immediately repaired in accordance with Section 8.18.7
8.18.3 Size and Disposition of Samples
8.18.3.1 Two (2) types of samples shall be taken by the installer. First two (2) samples, 12-in x 12-in, for field testing shall be taken. Specimens shall be taken from each of these samples as stated in Section 8.18.4, with the seam centered parallel to the width. The distance between these two samples shall be 36-in. If the specimens pass the field test described in Section 8.18.4, a sample for laboratory testing shall be taken.

8.18.3.2 The sample for laboratory testing shall be located between the samples for field testing. The sample for laboratory testing shall be 12-in wide by 36-in long with the seam centered lengthwise. The samples shall be cut into three (3) parts and distributed as follows.

1. One (1) portion to the installer for optional laboratory testing, 12-in by 12-in
2. One (1) portion for geosynthetics laboratory quality assurance testing, 12-in by 12-in
3. One (1) portion the ENGINEER for archive storage, 12-in by 12-in

8.18.4 Field Testing
8.18.4.1 The following shall be performed by the installer in the presence of the EFR. The installer shall cut ten 1-in wide replicate specimens from the sample to be tested for shear and peel strength, in accordance with the criteria set in Table No. 9.

8.18.4.2 The Installer shall test five (5) specimens for shear seam strength and five (5) for peel strength. Four (4) out of the five (5) replicate test specimens shall pass for the seam to be acceptable.

8.18.4.3 Any specimen that fails through the weld or by fusion at the weld sheet interface is a non-FTB (Film Tearing Bond) break and shall be considered a failure.

8.18.5 Quality Assurance laboratory Test
8.18.5.1 The installer shall package and ship destructive samples to the independent Quality Assurance Laboratory (QAL) approved by the owner.

8.18.5.2 Laboratory tests shall include shear and peel strength tests. The minimum acceptable values obtained in these tests shall be in accordance with Table No. 9.

8.18.5.3 At least five (5) specimens shall be tested each for shear and peel strength. A passing test shall meet the minimum required values in at least four (4) of the five (5) specimens tested for each method.

8.18.5.4 The QAL shall provide verbal test results to the ENGINEER no more than 24 hours after they receive the sample. The ENGINEER shall review the laboratory results as soon as they are available.

8.18.6 Procedures for Destructive Test failure
8.18.6.1 The following procedures shall apply whenever a sample fails a destructive test, whether that test is conducted in the field or by the QAL. The Installer has two (2) options.

8.18.6.1.1 The installer can repair the seam between any two (2) passing test locations.

8.18.6.1.2 The installer can retrace the welding path to an intermediate location 10-ft from the location of the failed test, on both sides, and take s sample for an additional field test. If this test passes, then the seam shall be repaired between that location and original failed location. If the test fails, then the process is repeated to establish the zone in which the seam should be repaired. Failed seams shall be repaired in accordance with Section 8.18.7.

8.18.6.2 All acceptable repaired seams shall be bound by two locations from which samples padding laboratory destructive tests have been taken from the zone in which the seam has been repaired must pass destructive testing. Repairs shall be made in accordance with Section 8.18.7.

8.18.6.3 The EFR shall document all actions taken in conjunction with destructive test failures.

8.18.7 Repair Procedures
8.18.7.1 Any portion of the geomembrane exhibiting signs of defect, failing a destructive or a non-destructive test, shall be repaired. Several procedures exist for the repair of these areas.

8.18.7.2 The repair procedures include:
- Patching used to repair large holes, tears, un-dispersed raw materials and contamination by foreign matter.
- Spot welding or seaming, used to repair small tears, pinholes or other minor, localized defects.
- Capping, used to repair large lengths of failed seams.
- Removing bad seam and replacing with a strip of new material welded in place.

8.18.7.3 For any repair method, the following provisions shall be satisfied:
- Surface of the geomembrane which are to be repaired using extrusion methods shall be abraded no more than one hour prior to the repair.
- All surfaces shall be clean and dry at the time of repair.

8.18.8 Repair verification

Each repair shall be numbered and logged by the installer. Each repair shall be non-destructively tested using the methods described in Section 8.17.2 as appropriate. Repairs which pass the non-destructive test shall be taken as an indication of an adequate repair. Repairs more than 150-ft long may be of sufficient length to require destructive test sampling, at the discretion of the ENGINEER. Failed tests indicate that the repair shall be redone and retested until passing test results are achieved. The ENGINEER shall observe all non-destructive testing of repair. The installer shall record the number of each repair, date and test outcome.

8.19 Disposal of Waste material

Upon completion of installation, the CONTRACTOR shall dispose off all trash, waste material and equipment used in connection with the performed work and shall leave the premises in a neat and acceptable condition.

Table No. 7: Test Methods for HDPE Liners

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>ASTM D 7923 OR ASTM D 1505</td>
</tr>
<tr>
<td>Melt Index</td>
<td>ASTM D 1238</td>
</tr>
<tr>
<td>High Load Melt Index</td>
<td>ASTM D 1238</td>
</tr>
<tr>
<td>Carbon Black Content</td>
<td>ASTM D 1603</td>
</tr>
<tr>
<td>Oxidative Induction Time</td>
<td>ASTM 3895</td>
</tr>
<tr>
<td>Crystallinity Melting range and point at endotherm maximum</td>
<td>Differential Scanning Calorimetry</td>
</tr>
</tbody>
</table>

The above tests shall be performed by the manufacturer of the geomembrane for identification of the manufacturer’s products. The above test result shall be submitted to the ENGINEER for approval of the product. The geomembrane to be supplied for the project shall meet these fingerprinting properties.

Table No. 8: Properties of High Density Polyethylene (HDPE) Smooth Geomembrane

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>1.50 mm</th>
</tr>
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<tbody>
<tr>
<td>Thickness, microns</td>
<td>ASTM D 5199</td>
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<tr>
<td>minimum average</td>
<td></td>
<td>1,500</td>
</tr>
<tr>
<td>lowest individual reading</td>
<td></td>
<td>1,350</td>
</tr>
<tr>
<td>Sheet Density, g/cc</td>
<td>ASTM D 1505/D 792</td>
<td>0.94</td>
</tr>
</tbody>
</table>
### Tensile Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Value</th>
<th>Test Method</th>
<th>1.5mm HDPE Thk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Strength, kN/m</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Break Strength, kN/m</td>
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<td></td>
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<tr>
<td>Yield Elongation, %</td>
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<tr>
<td>Break Elongation, %</td>
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<td>700</td>
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</tr>
<tr>
<td>Tear Resistance, N</td>
<td></td>
<td>187</td>
<td>ASTM D 1004</td>
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<td>Puncture Resistance, N</td>
<td></td>
<td>530</td>
<td>ASTM D 4833</td>
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<td>Stress Crack Resistance 2, hrs</td>
<td></td>
<td>500</td>
<td>ASTM D 5397 (App.)</td>
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<tr>
<td>Carbon Black Content 3, %</td>
<td></td>
<td>2.0 - 3.0</td>
<td>ASTM D 1603</td>
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<tr>
<td>Carbon Black Dispersion 4</td>
<td></td>
<td></td>
<td>ASTM D 5596</td>
<td>Cat.1 or 2</td>
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### Oxidative Induction Time (OIT)

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Value</th>
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<tbody>
<tr>
<td>Standard OIT, minutes</td>
<td>ASTM D 3895</td>
<td>100</td>
</tr>
<tr>
<td>Oven Aging at 85°C</td>
<td>ASTM D 5721</td>
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<tr>
<td>Standard OIT</td>
<td>ASTM D 3895</td>
<td>55</td>
</tr>
<tr>
<td>(% retained after 90 days)</td>
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<tr>
<td>UV Resistance 5</td>
<td>GRI GM11</td>
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<tr>
<td>High Pressure OIT 6</td>
<td>ASTM D 5885</td>
<td>50</td>
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<tr>
<td>(% retained after 1600 hrs)</td>
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</table>

1. Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Yield elongation is calculated using a gauge length of 33 mm; Break elongation is calculated using a gauge length of 50 mm.

2. The yield stress used to calculate the applied load for the SP-NCTL test should be the mean value via MQC testing.

3. Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.

4. Carbon black dispersion for 10 different views: All 10 in Categories 1 and 2.

5. The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation 60°C.

6. UV resistance is based on percent retained value regardless of the original HP-OIT value.

**Table No. 9: Factory and Field Seams Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Value</th>
<th>Test Method</th>
<th>1.5mm HDPE Thk</th>
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<tr>
<td>Shear Strength</td>
<td>KN/m</td>
<td>Min</td>
<td>ASTM D4437</td>
<td>FTB and 20.9</td>
</tr>
<tr>
<td>Peel Strength</td>
<td>KN/m</td>
<td>Min</td>
<td>ASTM D4437</td>
<td>FTB and 15.4</td>
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</tbody>
</table>


2. Peel Incursion must be less than 10%
SECTION 9: GEONET

Geosynthetic drainage nets (geonets) may be substituted for the granular layers of the Leachate Collection & Removal on the bottom and the side wall of the landfill cells. Geonets require less space than perforated pipe or gravel and also promote rapid transmission of liquids. They do, however, require geotextile filters above them and can experience problems with creep and intrusion.

Geonets are often used on the side walls of landfills because of their ease of installation. They should be placed with the top ends in a secured anchor trench with the strongest longitudinal length extending down the slope. The geonets need not be seamed to each other on the slope, only tied at the edges. They should be placed in a loose condition, not stretched or placed in a configuration where they are bearing their own weight in tension.

9.1. Material Specifications

The drainage net shall be manufactured by extruding two sets of Polyethylene strands to form a three dimensional structure to provide planar flow of fluids. The drainage net shall contain UV inhibitors to prevent ultraviolet light degradation. The drainage net shall conform to the minimum average values listed in FORM. The list of approved companies are Polyfelt, Tencate Inc, NAUE, ABG, Bonar, GSE, etc.

9.2. Quality Control Documentation

9.2.1 Prior to installation commencement of any drainage net material, the Contractor shall provide to the Owner the following information certified by the manufacturer for the delivered drainage net.

9.2.2 Each roll delivered to the project shall have the following identification information:
- Manufacturer's name
- Product identification
- Thickness
- Roll number
- Roll dimensions

9.2.3 Quality Control certificates, signed by the manufacturer's quality assurance manager. Each certificate shall have roll identification number, sampling, frequency and test results. At a minimum the following tests results shall be provided at every 5000 Sq. m. of manufactured drainage net in accordance with the specified test methods.
- Density
- Melt index
- Carbon Black Content
- Thickness
- Tensile Strength(MD)
- Mass per unit Area
- Transmittivity – every 10,000 sq.m.

Table No. 10 : Properties of Geonet

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Units</th>
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<tbody>
<tr>
<td>Thickness</td>
<td>ASTM D 5199</td>
<td>5 mm</td>
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<tr>
<td>Mass per Unit Area</td>
<td>ASTM D 5261</td>
<td>790 g/m2</td>
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<tr>
<td>Density</td>
<td>ASTM D 1505</td>
<td>0.940 g/cc</td>
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<td>Melt Index</td>
<td>ASTM D 1238</td>
<td>1.0g/10minutes</td>
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<tr>
<td>Carbon Black Content</td>
<td>ASTM D 1603</td>
<td>2%</td>
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<tr>
<td>Property</td>
<td>Standard</td>
<td>Value</td>
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<tr>
<td>--------------------------------</td>
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<tr>
<td>Tensile Strength (MD)</td>
<td>ASTM D 1682 or ASTM D 5053</td>
<td>7.9 kN/m</td>
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<tr>
<td>Transmittivity, (MD)</td>
<td>ASTM D 4716</td>
<td>1 X 10^-3 m²/sec</td>
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<td>Metal plate/net/metal plate</td>
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<td></td>
</tr>
<tr>
<td>Hydraulic gradient I=1</td>
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<tr>
<td>Normal pressure = 15000psf</td>
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<tr>
<td>(718 Kpa)</td>
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**9.3 Installation:**

**9.3.1 Panel Placement:**

9.3.1.1 Care shall be taken to keep the drainage net clean and free from debris prior to installation. If the drainage net is not clean, it should be washed prior to installation.

9.3.1.2 The drainage net should be handled in such a manner as to ensure that it is not damaged during installation. The installer shall comply with the following:

- Drainage net shall be anchored into a trench as shown in the drawings.
- On slopes, the drainage net shall be secured and rolled down the slope in such a manner as to minimize wrinkles.
- In the presence of wind, all drainage net shall be weighted with sandbags or other means. Such sandbags shall be installed during placement and shall remain until the drainage net is covered. Care should be taken that the sandbags do not rupture to spill the sand, and if so, it should be cleaned.
- Drainage net shall not be welded to the geomembrane.
- Drainage net shall only be cut using scissors or other cutting tools approved by the manufacturer that will not damage the underlying geosynthetics. Care shall be taken not to leave tools on the drainage net.
- Necessary precautions shall be taken to prevent damage to underlying layers during placement of the drainage net.

**9.3.2 Field Seams & Overlaps**
The following requirements shall be met during the installation of the drainage net.

Adjacent rolls shall be overlapped by at least 2 inches.

Overlaps shall be secured by tying. Tying can be achieved by plastic fasteners or polymeric braid. Tying devices shall be white or yellow. Metallic devices are not allowed.

Tying shall be at every 2 feet along the slope and on the base, every 6 inches in the anchor trench.

**9.4 Field Quality Control**

9.4.1 Duplicate documentation files for panel placement shall be maintained. One shall be the Contractor and the other by the Engineer. At the end of each week the files shall be updated and checked to assure that all copies of pertinent project information are included in the files. The Contractor shall submit daily copies of the documentation to the Engineer.

9.4.2 Any holes or tears in the drainage net shall be repaired by placing a patch extending one foot beyond the edges of the hole or tear. The patch shall be secured to the original drainage net by placing ties every six inches.
SECTION 10: HIGH DENSITY POLYETHYLENE (HDPE) PIPE

10.1 Scope of Work
Furnish all labor, materials, equipment and incidentals required and install high density polyethylene pipe, fittings and appurtenances as shown on the Drawings and as specified herein.

10.2 Related Work
Earthwork, backfilling and compaction is included in Section 1&3

10.3 Reference Standards
American society for Testing and Materials
1. ASTMD1238 – Standard Test Method for flow Rate Thermoplastics by extrusion plastometer.
8. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

OR --- IS 4984:1995 or latest amendment with ISO certification and meting the norms

10.4 High Density Polyethylene (HDPE) Pipe
10.4.1 High Density Polyethylene (HDPE) Pipe resins shall be high molecular weight, high density polyethylene with a cell classification number of 355434C in accordance with ASTMD3350.
10.4.2 The Pipe shall have the nominal dimensions shown the drawings, and shall meet the requirement of Standard Dimension Ratio (SDR) 110.
10.4.3 All polyethylene pipe shall meet the requirement of ASTM F714.
10.4.4 The pipe shall be joined with butt, heat fusion joints shall be made in strict compliance with the manufacturer’s recommendations.
10.4.5 All high density polyethylene pipe and fittings shall be made from the same resin.

10.5 Installation
10.5.1 High Density Polyethylene (HDPE) Pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall do all heat fusion joints.
10.5.2 Pipe shall be laid to lines and grade as shown on the drawings with bedding and backfill as shown on the drawings
10.5.3 When laying is not in progress the open ends of the pipe shall be closed by fabricated plugs, or by other approved means. All plugs shall be OD fitting type plugs. No plugs will be allowed that require insertion of plug into pipe.

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10.5.4 Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 10 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges or scratches.

10.5.5 Section of pipe with cuts, scratches or gouges deeper than allowed shall be removed completely and the ends of pipeline rejoined.

10.5.6 The pipe shall be joined by the method of thermal butt fusion, as outlined in ASTM D 26510. All joints shall be made in strict compliance with the manufacturer's recommendations.

10.5.7 Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps and tanks shall be through flanged connections which will consist of the following

10.5.10.1 A stainless steel backup, polyethylene flanges shall be thermally butt-fused to the stub end of the pipe.

10.5.10.2 A 316 stainless steel back up ring on both sides of the connection shall be used as approved by the ENGINEER.

10.5.8 Flange connections shall be provided with a full face neoprene gasket.

10.5.9 All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.

10.6 Field Testing.

10.6.1 All piping shall be field tested. The CONTRACTOR shall supply all labor, equipment, material, gages, pumps, meters and incidentals required for testing. The CONTRACTOR shall pressure test each force main upon completion of the pipe laying and backfilling operations.

10.6.2 All piping shall be tested at 150 percent of the operating design pressure of the pipe unless otherwise approved by the ENGINEER or his/her designated representative.

10.6.3 Testing shall be conducted after backfilling has been completed and before placement of permanent surface.

10.6.4 If any test of pipe laid disclosed leakage significant pressure drip greater than that allowed, the CONTRACTOR shall, at his/her own expense, locate and repair the cause of leakage and retest the time.

10.6.5 All visible leaks are to be repaired regardless of the amount of leakage.

10.6.6 At the conclusion of the work, thoroughly clean all of the new pipe to remove all dirt, stones, pieces of wood or other materials which may have entered during the construction period. Debris cleaned from the lines shall be removed from the jobsite if, after this cleaning, any obstruction remain, they shall be removed.
### Table No. 11 List of Parameters to Be Analyzed For Well Water Or Ground Water

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<th>Sr. No</th>
<th>Parameter</th>
<th>Sr. No</th>
<th>Parameter</th>
</tr>
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<td>1</td>
<td>Colour</td>
<td>2</td>
<td>Odour</td>
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<td>3</td>
<td>Dissolved Oxygen</td>
<td>4</td>
<td>Turbidity</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>6</td>
<td>Total Hardness</td>
</tr>
<tr>
<td>7</td>
<td>Total Dissolved Solids</td>
<td>8</td>
<td>Alkalinity</td>
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<td>9</td>
<td>Chlorides</td>
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<td>Sulphates</td>
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<td>11</td>
<td>Nitrates</td>
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<td>13</td>
<td>Calcium</td>
<td>14</td>
<td>Free Chlorine</td>
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<td>Iron</td>
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<td>Manganese</td>
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<td>Copper</td>
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<td>Hexavalent Chromium</td>
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<td>25</td>
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<td>Phenolic Compound</td>
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<td>Oil &amp; Grease</td>
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<td>Magnesium</td>
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<td>31</td>
<td>Potassium</td>
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<td>Cyanide</td>
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### Table No. 12 Compendium Of Indian Standards On Soil Engineering

**PART 1**

{SP 36 (PART I) : 1987}

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<td>Determination of Chemical Properties of Soil</td>
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<td>IS : 2720 (Part 11)-1971 Methods of test for soils : Part 11 Determination of shear strength parameters of a specimen test in unconsolidated undrained tri-axial compression without the measurement of pore water pressure (first revision)</td>
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<td>14</td>
<td>IS : 2720 (Part 12)-1981 Methods of test for soils : Part 12 Determination of shear strength parameters of soil from consolidated undrained tri-axial compression test with measurement of pore water pressure (first revision)</td>
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<td>15</td>
<td>IS : 2720 (Part 13)-1986 Methods of test for soils : Part 13 Direct shear test (second revision)</td>
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<td>16</td>
<td>IS : 2720 (Part 14)-1983 Methods of test for soils : Part 14 Determination of density index (relative density) of cohesion less soils (first revision)</td>
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<td>17</td>
<td>IS : 2720 (Part 15)-1986 Methods of test for soils : Part 15 Determination of consolidation properties (first revision)</td>
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<td>18</td>
<td>IS : 2720 (Part 16)-1979 Methods of test for soils : Part 16 Laboratory Determination of CBR (first revision)</td>
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<td>19</td>
<td>IS : 2720 (Part 17)-1986 Methods of test for soils : Part 17 Laboratory Determination of permeability (first revision)</td>
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<td>20</td>
<td>IS : 2720 (Part 18)-1964 Methods of test for soils : Part 18 Determination of field moisture equivalent (first revision)</td>
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<td>IS: 2720 (Part 19)-1964 Methods of test for soils: Part 19 Determination of centrifuge moisture equivalent (first revision)</td>
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<td>22</td>
<td>IS: 2720 (Part 21)-1966 Methods of test for soils: Part 20 Determination of linear shrinkage soluble solids (first revision)</td>
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<td>23</td>
<td>IS: 2720 (Part 21)-1977 Methods of test for soils: Part 21 Determination of total matter (first revision)</td>
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<td>24</td>
<td>IS: 2720 (Part 22)-1972 Methods of test for soils: Part 22 Determination of organic matter (first revision)</td>
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<td>26</td>
<td>IS: 2720 (Part 24)-1976 Methods of test for soils: Part 24 Determination of cation exchange capacity (first revision)</td>
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<td>27</td>
<td>IS: 2720 (Part 25)-1982 Methods of test for soils: Part 25 Determination of silica sesquioxide ration (first revision)</td>
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<td>28</td>
<td>IS: 2720 (Part 26)-1987 Methods of test for soils: Part 26 Determination of pH Value (second revision)</td>
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<td>29</td>
<td>IS: 2720 (Part 27)-1977 Methods of test for soils: Part 27 Determination of total soluble sulphates (first revision)</td>
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<td>IS: 2720 (Part 30)-1980 Methods of test for soils: Part 30 Laboratory vane shear test (first revision)</td>
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<td>31</td>
<td>IS: 2720 (Part 35)-1974 Methods of test for soils: Part 35 Measurement of negative pore water pressure</td>
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<td>32</td>
<td>IS: 2720 (Part 36)-1987 Methods of test for soils: Part 30 Laboratory determination permeability of granular soils (Constant head)(first revision)</td>
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<td>33</td>
<td>IS: 2720 (Part 37)-1976 Methods of test for soils: Part 37 Determination of sand equivalent values of soils and fine aggregates</td>
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<td>34</td>
<td>IS: 2720 (Part 38)-1976 Methods of test for soils: Part 38 Compaction control test (hilf method)</td>
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<td>35</td>
<td>IS: 2720 (Part 39/Sec-1)-1977 Methods of test for soils: Part 39 Direct sheartest for soils containing gravel, Section 1 Laboratory test</td>
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<td>36</td>
<td>IS: 2720 (Part 40)-1977 Methods of test for soils: Part 40 Determination of free swell index of soils</td>
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<td>37</td>
<td>IS: 2720 (Part 41)-1977 Methods of test for soils: Part 41 Determination of swelling pressure of soils</td>
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<td>38</td>
<td>IS: 2809-1972 Glossary of terms and symbols relating to soil engineering (First revision)</td>
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<td>39</td>
<td>IS: 2810-1979 Glossary of terms relating to soil dynamics (First revision)</td>
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<td>40</td>
<td>IS: 4332 (Part 1)-1967 Methods of test for stabilized soils: Part 1 Method of sampling and preparing of stabilized soils for testing</td>
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<td>41</td>
<td>IS: 4332 (Part 2)-1967 Methods of test for stabilized soils: Part 2 Determination of moisture content of stabilized soils mixtures</td>
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<td>42</td>
<td>IS: 4332 (Part 3)-1967 Methods of test for stabilized soils: Part 3 Test for determination moisture content-dry density relation for stabilized soils mixtures</td>
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<td>43</td>
<td>IS: 4332 (Part 4)-1968 Methods of test for stabilized soils: Part 4 Wetting and drying and freezing and thawing tests for compacted soil-cement mixilized soils mixtures</td>
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<td>No.</td>
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<td>44</td>
<td>IS : 4332 (Part 5)-1970</td>
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<td>IS : 4332 (Part 6)-1972</td>
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<td>IS : 4332 (Part 7)-1973</td>
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<td>IS : 4332 (Part 8)-1969</td>
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<td>IS : 4332 (Part 10)-1969</td>
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<td>IS : 9669-1980</td>
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<td>IS : 10074-1982</td>
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<td>IS : 10837-1984</td>
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<td>56</td>
<td>IS : 11196-1985</td>
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<td>57</td>
<td>IS : 11209-1985</td>
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<td>58</td>
<td>IS : 11229-1985</td>
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</table>
Name of Work: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

### Part- A

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description of Item</th>
<th>Qty.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Clearing jungle</strong> including uprooting of rank vegetation, grass, brush wood, trees</td>
<td>127607.00</td>
<td>sqm</td>
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<td></td>
<td>and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.</td>
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<td></td>
<td>Ref: Vol I-Page No.80, Item No. 2.31 DSR 2016</td>
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<tr>
<td>2</td>
<td>Earth work in excavation work by <strong>mechanical means</strong> (Hydraulic excavator)/manual means in foundation trenches or drains not exceeding 1.5m in width or 10 sqm on plan including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 50m. <strong>Hard rock (blasting prohibited)</strong></td>
<td>469.00</td>
<td>cum</td>
</tr>
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<td></td>
<td>Ref: Vol I-Page No. 77, Item No. 2.9.3 DSR 2016</td>
<td></td>
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<tr>
<td>3</td>
<td><strong>Earth work</strong> 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 lift upto 1.5 m, as directed by Engineer-in-charge. <strong>Hard rock (blasting prohibited)</strong></td>
<td>504093.50</td>
<td>cum</td>
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<td></td>
<td>Ref: Vol I-Page No. 76, Item No. 2.7.3 DSR 2016</td>
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<td>4</td>
<td><strong>Excavation work by mechanical means</strong> (Hydraulic excavator)/manual means in foundation trenches or drains not exceeding 1.5m in width or 10 sqm on plan including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 50m.</td>
<td>63369.45</td>
<td>cum</td>
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<td>Ref: Vol I- Page No. 76, Item No. 2.6.1 DSR 2016</td>
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<td>5</td>
<td><strong>Filling available excavated earth</strong> (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 m and lift up to 1.5 m.</td>
<td>18866.72</td>
<td>cum</td>
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<td>Ref: Vol I-Page No. 79, Item No. 2.25 DSR 2016</td>
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<tr>
<td>6</td>
<td>Supplying and stacking at site. <strong>Moorum- Bunds</strong></td>
<td>57828.08</td>
<td>Cum</td>
</tr>
<tr>
<td></td>
<td>Ref: Vol II -Page No. 945, Item No. 16.3.10 DSR 2016</td>
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<tr>
<td>7</td>
<td>Supplying and stacking at site. <strong>Good earth- Cover Soil</strong></td>
<td>20259.67</td>
<td>cum</td>
</tr>
<tr>
<td></td>
<td>Ref: Vol II - Page No. 945, Item No. 16.3.9 DSR 2016</td>
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<tr>
<td>8</td>
<td>Extra for <strong>compaction of earth work</strong> in embankment under optimum moisture conditions to give at least 95% of the maximum dry density (proctor density).</td>
<td>57828.08</td>
<td>cum</td>
</tr>
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<td>Ref: Vol II- Page No. 942, Item No. 16. 2 DSR 2016</td>
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</table>
9. Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm. depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres. - **Leachate collection layer, soil layer and cover soil layer**

Ref: Vol II - Page No. 941, Item No. 16.1 DSR 2016

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<td>254930.78 sqm</td>
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</table>

10. Supplying and stacking at site. **53 mm to 22.4 mm** size stone aggregate

Ref: Vol I Page No. 943, Item No. 16.3.3 DSR 2016

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<td>27866.25 Cum</td>
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</table>

11. Providing and laying in position ready mixed plain cement concrete, using fly ash and cement content as per approved design mix and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for plain cement concrete work, including pumping of R.M.C. from transit mixer to site of laying and curing, excluding the cost of centering, shuttering and finishing, including cost of curing, admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge. and aggregate derived from natural sources.

Note : (1) Excess/less cement used than specified in this item is payable/recoverable separately. (2) Fly ash conforming to grade I of IS 3812 (Part-1) only be used as part replacement of OPC as per IS : 456. Uniform blending with cement is to be ensured in accordance with clauses 5.2 and 5.2.1 of IS: 456 - 2000 in the items of BMC and RMC All works upto plinth level: **M-10 grade plain cement concrete** (cement content considered @ 220 kg/cum)

Ref: Vol I -Page No. 160, Item No. 4.19.1.2 DSR 2016

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<td>603.29 cum</td>
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</table>

12. Providing and laying in position ready mixed **M-25 grade concrete for reinforced cement concrete work**, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge. (Note : Cement content considered in this item is @ 330 kg/cum.Excess/less cement used as per design mix is payable/recoverable separately) All works upto plinth level

Ref: Vol I Page No. 226, Item No. 5.37.1 DSR 2016

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<td>1210.16 cum</td>
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</tbody>
</table>

13. Providing and laying in position ready mixed **M-25 grade concrete for reinforced cement concrete** work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge.(Note : Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately) **All works above plinth level upto floor V level**

Ref: Vol I Page No. 227, Item No. 5.37.2 DSR 2016

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<td></td>
<td>855.66 cum</td>
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</table>
14 | **Centering and shuttering** including strutting, propping etc. and removal of form for: Foundations, footings, bases for columns etc. for mass concrete  
Ref: Vol I -Page No. 176, Item No. 5.9.1 DSR 2016 | 1622.42 sqm |
---|---|---|
15 | **Centering and shuttering** including strutting, propping etc. and removal of form for: Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.  
Ref: Vol I-Page No. 176, Item No. 5.9.2 DSR 2016 | 13488.67 Sqm |
---|---|---|
16 | **Centering and shuttering** including strutting, propping etc. and removal of form for all heights Suspended floors, roofs, landings, balconies and access platform  
Ref: Vol I -Page No. 177, Item No. 5.9.3 DSR 2016 | 458.50 sqm |
---|---|---|
17 | Centering and shuttering including strutting, propping etc. and removal of form for: Columns, Pillars, Piers, Abutments, Posts and Struts  
Ref: Vol I -Page No. 180, Item No. 5.9.6 DSR 2016 | 1133.11 sqm |
---|---|---|
18 | **Centering and shuttering** including strutting, propping etc. and removal of form for all heights Edges of slabs and breaks in floors and walls Under 20 cm wide  
Ref: Vol I -Page No. 190, Item No. 5.9.16.1 DSR 2016 | 917.00 meter |
---|---|---|
19 | Steel reinforcement for **R.C.C. work including straightening, cutting, bending**, placing in position and binding all complete upto plinth level. Hard drawn steel wire  
Ref: Vol I-Page No. 208, Item No. 5.22.2 DSR 2016 | 114316.04 Kg |
---|---|---|
20 | Steel reinforcement for **R.C.C. work including straightening, cutting, bending**, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more  
Ref: Vol I-Page No. 208, Item No. 5.22.6 DSR 2016 | 592544.13 Kg |
---|---|---|
21 | Providing and laying C.C. pavement of **mix M-25 with ready mixed concrete** from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator ,cum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in-charge.(The panel shuttering work shall be paid for separately).(Note:- Cement content considered in this item is @ 330 kg/cum.Excess/less cement used as per design mix is payable/ recoverable separately).- Roads & Footpath  
Ref: Vol II -Page No. 1047, Item No. 16.75 DSR 2016 | 5144.37 cum |
---|---|---|
22 | Construction of dry **lean cement concrete** sub base over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per specifications, cement content not to be less than 150 Kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, for all leads & lifts, laid with a mechanical paver, compacting with 8-10 tonne vibratory roller, finishing and curing etc. complete as per direction of Engineer-in-charge.  
Ref: Vol II-Page No. 1053, Item No. 16.80 DSR 2016 | 3429.58 Cum |
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<td>23</td>
<td>Extra for providing richer mixes</td>
<td>at all floor levels Note:- Excess/less cement over the specified cement content used is payable/recoverable separately. Providing M-40 grade concrete instead of M-25 grade BMC/ RMC. (Note: Cement content considered in M-40 is @ 360 kg/cum)</td>
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<td>Ref: Vol I -Page No. 226, Item No. 5.34.3 DSR 2016</td>
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<td>4951.80 cum</td>
</tr>
<tr>
<td>24</td>
<td>Providing and placing in position <strong>100 mm thick</strong> factory made machine batched &amp; 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 i/c cost of cartage, all leads &amp; lift, handling at site etc. all complete as per direction of Engineer-in-Charge</td>
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<td>Ref: Vol II -Page No. 1063, Item No. 16.93 DSR 2016</td>
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<td>550.20 sqm</td>
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<td>25</td>
<td>Providing and fixing in position pre-moulded joint filler in expansion joints.</td>
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<td>Ref: Vol II -Page No. 1003, Item No. 16.45 DSR 2016</td>
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<td>3977.00 per cm. depth per cm width per m length</td>
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<tr>
<td>26</td>
<td>Providing and laying in position bitumen hot sealing compound for expansion joints etc. Using grade ‘A’ sealing compound.</td>
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<td>Ref: Vol II -Page No. 1003, Item No. 16.46 DSR 2016</td>
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<td></td>
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<td>3977.00 per cm. depth per cm width per m length</td>
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<tr>
<td>27</td>
<td>Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete : <strong>700 mm dia. R.C.C. pipe</strong></td>
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<td>Ref: Vol II - Page No. 1412, Item No. 19.6.8 DSR 2016</td>
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<td>50.00 Rmt</td>
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<td>28</td>
<td>Dry stone pitching <strong>22.5 cm thick</strong> including supply of stones and preparing surface complete</td>
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<td>Ref: Vol II -Page No. 950, Item No. 16.11 DSR 2016</td>
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<td>10421.42 sqm</td>
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<td>29</td>
<td>Providing and installing <strong>5HP Leachate pump</strong> of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F having SD 50m, 2880 RPM, 3 Phase, DOL, using copper cable of approx 15m in length of size 1x4x2.5mm², discharge size 80mm, capacity 16 to 20cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturers specification</td>
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<td>Market rate</td>
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<td>3.00 No</td>
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<tr>
<td>30</td>
<td>Supply &amp; install <strong>Geosynthetic Clay Liner</strong> laying, anchoring in trench, seaming, testing complete as given in General Specification complete to form an impervious barrier as shown in drawings and as per the Engineer’s directions. Minimum width of the Liner shall be 4.9M. GCL must be anchored within anchor trench including excavation of trench and backfilling, compaction complete at top and bottom portion. Rate to include the necessary lap for jointing, wastage, and testing including bentonite powder at joints etc. complete. Measurement will be made as per finished surface area. GCL in the anchor trench will be taken in measurement.</td>
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<td>As per M.R &amp; RA</td>
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<td>109841.56 Sqm</td>
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<td>No.</td>
<td>Description</td>
<td>Rate</td>
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<tr>
<td>31</td>
<td>Supply &amp; installation of <strong>1.5mm Thick HDPE Smooth Geomembrane Liner</strong> by Blown/Flat die cast process as per list of companies approved in the detail specifications, laying, anchoring in trench, seaming, testing complete as given per Specifications, complete to form an impervious barrier as shown in drawings and as per the directions given by the Engineer-in-charge. Minimum width of the Liner shall be 7M. Geomembrane must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion. Rate to include the necessary lap for jointing, wastage, testing and extrusion rods complete. Measurement will be made as per finished surface area. Liner in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)</td>
<td>112921.23</td>
</tr>
<tr>
<td>32</td>
<td>Supply &amp; installation of <strong>Non-woven Geotextile (GT) of 400g/M2</strong> made of Polypropylene of TC Mirafi (USA) / Polyfelt (Austria) / Synthetic Industries (USA) / Amoco Fabrics (USA) make or from its regional offices, as per details given in Specifications, spreading on the sand layer or Geomembrane as per the directions given by the Engineer-in-charge, without damaging the Geotextile or Geomembrane. The Geotextile must be placed along the slope from top to bottom with an overlap of minimum 100mm. It should be stitched with HDPE thread. Geotextile must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion. Rate to include the necessary lap for jointing, stitching, wastage complete. Measurement will be made as per finished surface area. Geotextile in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)</td>
<td>109841.56</td>
</tr>
<tr>
<td>33</td>
<td>Supply &amp; installation of <strong>Non-woven Geotextile (GT) of 800g/M2</strong> made of Polypropylene of TC Mirafi (USA) / Polyfelt (Austria) / Synthetic Industries (USA) / Amoco Fabrics (USA) make or from its regional offices, as per details given in Specifications, spreading on the sand layer or Geomembrane as per the directions given by the Engineer-in-charge, without damaging the Geotextile or Geomembrane. The Geotextile must be placed along the slope from top to bottom with an overlap of minimum 100mm. It should be stitched with HDPE thread. Geotextile must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion. Rate to include the necessary lap for jointing, stitching, wastage complete. Measurement will be made as per finished surface area. Geotextile in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)</td>
<td>109841.56</td>
</tr>
<tr>
<td>34</td>
<td>Supply &amp; install <strong>Geosynthetic drainage nets (Geonets)</strong> of thickness 5mm &amp; mass 790 g/m2 made by extruding two sets of polyethylene strands of Poly-Flex, TC Mirafi, Naue-faser Technik, Polyfelt Tenax make, laying anchoring in trench, overlapping, testing complete as given in General Specification and as shown in the drawings &amp; as per engineer's directions. Geonet must be anchored within anchor trench including related anchoring work etc. complete. Rate to include the necessary lap at joints, wastage, testing etc complete. Measurement will be made as per finished area. Geonet in the anchor trench will be taken in measurement.</td>
<td>42767.20</td>
</tr>
</tbody>
</table>
Providing, supplying and installation in standard lengths Polyethylene Pipes, confirming to IS 4984 /14151 / 12786 / 13488 with necessary jointing material like mechanical connector i.e. thread / insert joint / quick release coupler joint / compression fitting joint or flanged joint, including all local & central taxes, transportation and freight charges inspection charges, loading/unloading charges, conveyance to the departmental stores / site & stacking the same in closed shade duly protecting from sunrays & rains, etc. complete. Note: Excavation for pipe trench considered paid in item no 1- (PE100, 10 kg/cm²)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>HDPE pipes- 350mm OD pipe, (PE100, 10 kg/cm²)</td>
<td>789.00</td>
<td>RMT</td>
</tr>
<tr>
<td>36</td>
<td>HDPE pipes-160mm OD pipe, (PE100, 10 kg/cm²)</td>
<td>3959.00</td>
<td>RMT</td>
</tr>
<tr>
<td>36</td>
<td>Providing and fixing micro processor based fully electronic 50 MT weighbridge (KANAN KWS 2000 or equivalent) with electronic printer (TVSE or equivalent) with load cells, lead structure, civil work etc all complete as per drawings and specifications as per direction of engineer-in-charge.</td>
<td>1.00</td>
<td>Unit</td>
</tr>
<tr>
<td>37</td>
<td>Supply, Installation and Commissioning of 100 KLD Leachate Treatment Plant, civil work alongwith power generation unit all complete as per drawings, specifications and as per direction of engineer-in-charge.</td>
<td>1.00</td>
<td>Unit</td>
</tr>
</tbody>
</table>

Part-B (Recovery Item)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>Recovery for Hard Rock generated by excavation (recovery to be made from the bills payable to the contractor @ 80% of Hard Rock excavation work as a in item no. 3 of BOQ )</td>
<td>400000.00</td>
<td>cum</td>
</tr>
</tbody>
</table>

Note: Against the item of excavation of Hard Rock, the contractor shall be allowed to take away the excavated Hard Rock from the site at his own expense. For this, he shall be liable to pay the cost of the hard rock material assuming quantity @ 80% of the excavated quantity. The unit recovery rate for Hard Rock shall have to be quoted by the contractor against Item No. 38 of BOQ.
## CHAPTER-XI FORMS

### FORM – I

**DETAILS OF ALL WORKS/CONTRACTS OF SIMILAR CLASS COMPLETED DURING LAST SEVEN YEARS**

<table>
<thead>
<tr>
<th>S No</th>
<th>Name of work/Project and location</th>
<th>Owner of sponsoring organization</th>
<th>Cost of Work (Rs. In Lacs)</th>
<th>Date of commencement as per contract</th>
<th>Stipulated date of completion</th>
<th>Actual Date of completion</th>
<th>Litigation arbitraton cases pending/ in progress with detail</th>
<th>Name and address/ telephone number of officer to whom reference may be made</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

Indicate gross amount claimed and amount awarded by the Arbitrator.

Signature of bidder along with stamp
## FORM – II

### PROJECTS UNDER EXECUTION OR AWARDED

<table>
<thead>
<tr>
<th>S N o</th>
<th>Name of work/Project and location</th>
<th>Owner of sponsoring organization</th>
<th>Cost of Work (Rs. In Lacs)</th>
<th>Date of commencement as per contract</th>
<th>Stipulated date of completion</th>
<th>Upto date percentage progress of work</th>
<th>Slow Progress if Any and Reasons thereof</th>
<th>Name and address/telephone number of officer to whom reference may be made</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

Certified that the above list of works is complete and no work has been left out and that the information given is correct to my knowledge and belief.

Signature of bidder along with stamp
FORM – III
INFORMATION REGARDING FINANCIAL DATA

Applicant’s legal name

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Financial Data for latest last 5 Financial Years (Indian Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total Assets</td>
</tr>
<tr>
<td>2</td>
<td>Current Assets</td>
</tr>
<tr>
<td>3</td>
<td>Total Liabilities</td>
</tr>
<tr>
<td>4</td>
<td>Current Liabilities</td>
</tr>
<tr>
<td>5</td>
<td>Profits Before Taxes</td>
</tr>
<tr>
<td>6</td>
<td>Profits After Taxes</td>
</tr>
<tr>
<td>7</td>
<td>Net Worth [ = 1-3]</td>
</tr>
<tr>
<td>8</td>
<td>Working Capital [=2-4]</td>
</tr>
<tr>
<td>9</td>
<td>Annual Turnover</td>
</tr>
</tbody>
</table>

- Attached copies of the audited balance sheets, including all related notes, income statements for the last five years, as indicated above, complying with the following conditions.
- Historic financial statements must be audited by a certified accountant.
- Historic financial statements must be complete, including all notes to the financial statements.
- Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods will be accepted).
- The financial data in above prescribed format shall be certified by the Chartered Accountant alongwith his signature and seal.

Signature of bidder along with stamp

Signature of Chartered Accountant alongwith seal and membership no.
# FORM –IV

## DETAILS OF CONSTRUCTION PLANT AND EQUIPMENT LIKELY TO BE USED IN CARRYING OUT OPERATION AND MAINTENANCE WORK

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of equipment</th>
<th>Nos.</th>
<th>Capacity or type</th>
<th>Age</th>
<th>Condition</th>
<th>Ownership Status</th>
<th>Current Location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Signature of bidder along with stamp
FORM - V

CONTRACTORS ANNEXURE FOR EXECUTION OF WORKS

Tenderer shall furnish the ANNEXURE for the work to be completed as per the following format:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Activity</th>
<th>Expected Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Start</td>
</tr>
<tr>
<td>1</td>
<td>Mobilization at site</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Percentage execution work completed</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
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<td>2.2</td>
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<td>2.4</td>
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<tr>
<td>2.5</td>
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</tbody>
</table>

Signature of the Tenderer with stamp
Name :
Company's seal :
Date:

RFP for Engineering SLF, Tehkhand, Okhla
FORM – VI

STRUCTURE AND ORGANISATION OF FIRM

1. Name of Applicant

2. Nationality of Applicant

3. Office Address
   Telegraphic Address
   Telephone No. Telex No. Fax No.
   E-mail Address

4. Year and location of establishment

5. The Applicant is
   i. An individual
   ii. A proprietary firm
   iii. A firm in partnership
   iv. A limited company or Corp.
      (if a firm in partnership)

6. Attach the organization chart showing the structure of the organization including the names of the Directors and position of officers.

7. Number of years of experience
   i. As a Prime contractor
      (Contractor shouldering major responsibility)
   b) As sub-contractor (Specify main contractor)

8. For how many years has your organization been in business of similar work under its present name? what were your fields when your organization was established?

9. Were you ever disqualified / considered ineligible for similar works?

10. Whether any new fields were added to your organization? If, so, give details.

11. Were you ever required to suspend execution for period of more than six months continuously after you started? If so, give the name of project and reasons thereof.

12. Whether you ever left the work awarded to you incomplete?
    (if so, give name of project and reasons for not completing work?)

13. In how many of your projects penalties were imposed for delays? (Please give details)

14. In which field of civil/electrical / mechanical engineering do you claim specialization and interest?

15. Give details of your experience in pumping machinery for manufacture and quality control.

16. Give details of equipments, if any.
17. Give details of your plans for sub-contracting if any, in terms of percentage of works.

Signature of Tenderer

Name

Company's Seal

Date
FORM - VII

PERFORMANCE REPORT OF WORKS
(ON THE LETTER HEAD OF THE CLIENT)

1. Name of Work/Project and Location
2. Agreement No.
3. Estimated Cost
4. Tendered Cost
5. Date of Start
6. Date of Completion
   a) Stipulated date of completion
   b) Actual Date of Completion
7. No. of persons engaged at site/field under this contract
8. Payment done/made to the agency
9. Brief of nature of work carried out
10. Amount of Compensation levied for delayed completion, if any
11. Amount of reduced rate items, if any
12. Performance Report

<table>
<thead>
<tr>
<th></th>
<th>Quality of work</th>
<th>Outstanding / Very Good/Good//Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Financial Soundness</td>
<td>Outstanding / Very Good/Good//Poor</td>
</tr>
<tr>
<td>(2)</td>
<td>Technical Proficiency</td>
<td>Outstanding / Very Good/Good//Poor</td>
</tr>
<tr>
<td>(3)</td>
<td>Resourcefulness</td>
<td>Outstanding / Very Good/Good//Poor</td>
</tr>
<tr>
<td>(4)</td>
<td>General Behavior</td>
<td>Outstanding / Very Good/Good//Poor</td>
</tr>
<tr>
<td>Overall Grading</td>
<td></td>
<td>Outstanding / Very Good/Good//Poor</td>
</tr>
</tbody>
</table>

Dated:                                      Executive Engineer or Equivalent
FORM – VIII

To,
The Engineering Department, SDMC

Place:
Date:

Details regarding my / our partners / our company (in the case of limited company) Names, Address(es), telephone numbers(s) Income Tax etc. are as under:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name(s) of person/partner</th>
<th>Full address of the Place of business (with pin code)</th>
<th>Telephone No.(s) (Office)</th>
<th>Residential address(es) (Resi.) with telephone no.</th>
<th>Mobile no.(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

I/We hereby agree to intimate to you about change if any, in the above mentioned address(es) and telephone No.(s) within Fifteen days of its occurrence till my / our deposit, for the said work paid by me/us is not returned to me/us.

Signature of the Bidder:
To,

EXECUTIVE ENGINEER (DEMS Store)
South Delhi Municipal Corporation

SUBJECT: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

Dear Sir

With reference to your RFP inviting notice No. ______________, after examining, visiting all sites, Scope of Work (SOW), ANNEXURE of operation and maintenance/details of installations etc. in the Toilets and PTUs and its premises and having visited/examined the said sites and also having acquired the requisite information about the said sites, I/We hereby offer to undertake the job specified in the Terms & Conditions of the RFP with its Appendices/FORM(s) for the duration five years at the rates mentioned in the Financial bid Form (ANNEXURE-G):

A. I/We am are furnishing our bid for the subject work.
B. The Cost of the RFP Document (Rs. 25,000/-) has been deposited by me vide Banker’s cheque/DD No. ______________ in favour of Commissioner/SDMC, as enclosed herewith.

Amount of Earnest money is being deposited vide enclosed DD/Banker’s Cheque No./FDR of Scheduled Bank ______________ dated ______________ for ` ____________/-(in words rupees ______________ only) in favour of the Commissioner, SDMC. The DD/Banker’s cheque is payable at New Delhi/Delhi and drawn on ______________ (bank name)

And
Bank Guarantee No. ______________ for an amount of Rs. ______ issued by ______________ Bank in favour of Commissioner, SDMC, valid up to ______________ with claim period up to ______________

C. A solvency certificate of bank, as required, enclosed with the document.
D. The Contract Period commences from latest by 10th day from the date of issue of letter of acceptance (letter of award) by the SDMC/submission of performance guarantee, whichever is later and period of contract would be 18 months. However, the payment shall be for actual period.

E. I/We agree to abide by the process to be evolved by the SDMC for evaluating the technical and financial bids.
F. Should this RFP be accepted, I/We hereby agree to abide by Terms and Conditions along with its FORM(s) attached hereto duly signed by me/us. I/we am/are not putting any additional condition from my/our side.

G. All the ANNEXUREs and documents necessary in this connection are enclosed hereto. All the documents/photoscopies of the documents have been self-attested by me/us and the SDMC is free to prosecute me/us in a competent court of law if any of the documents/photoscopies of the documents is/are found to be false or forged.

H. Other necessary details about us are given in the Technical bid form (ANNEXURE-B) and as per checklist (ANNEXURE-C) enclosed herewith.

I. We, M/s. ______________ (the names and addresses of the registered office) hereby certify and confirm that we or any of our promoter/s director/s are not barred/blacklisted by Govt. Of NCT of Delhi or barred/blacklisted by any state government or central government / department
/ agency in India from participating in Project/s
J. List of the documents being submitted by me/us in support of my/our technical bid is as under:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars of the Document(s) enclosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technical BID document duly filled in signed on each page</td>
</tr>
<tr>
<td>2</td>
<td>All documents as per check list</td>
</tr>
<tr>
<td>3</td>
<td>'check List' duly filled in signed on each page</td>
</tr>
<tr>
<td>4</td>
<td>deployment plan to be submitted by the bidder</td>
</tr>
<tr>
<td>5</td>
<td>proposed action plan to be submitted by the bidder</td>
</tr>
<tr>
<td>6</td>
<td>“Anti collusion certificate duly signed by bidder”</td>
</tr>
<tr>
<td>7</td>
<td>A self attested copy of the constitution of the Agency.</td>
</tr>
<tr>
<td>8</td>
<td>MOU / JV agreement (as applicable)</td>
</tr>
<tr>
<td>9</td>
<td>FORMS ETC. as required</td>
</tr>
<tr>
<td>10</td>
<td>Other Documents, which bidder has annexed in its bid's support.</td>
</tr>
</tbody>
</table>

Signature of the bidder
Name of Signatory
Status/Post of the Signatory
Name & address of the Company/Agency (along with e-mail address)
Date & Place
### Annexure-B

#### TECHNICAL BID FORM

**Name of work:** Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla.

**Ref:** - ____________________________________________

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Company/Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Registered Office Address</td>
</tr>
<tr>
<td></td>
<td>Telephone Nos.</td>
</tr>
<tr>
<td></td>
<td>Fax Nos</td>
</tr>
<tr>
<td></td>
<td>E-Mail ID</td>
</tr>
<tr>
<td></td>
<td>Website</td>
</tr>
<tr>
<td>3</td>
<td>Is the Company/Agency is Registered (Yes/No)</td>
</tr>
<tr>
<td>4</td>
<td>If Yes, Give details under what Act/Rules</td>
</tr>
<tr>
<td>5</td>
<td>Registering Authority, with Full Address</td>
</tr>
<tr>
<td>6</td>
<td>Registration Number</td>
</tr>
<tr>
<td>7</td>
<td>Registration is valid up till date</td>
</tr>
<tr>
<td>8</td>
<td>Documents Regarding Registration is attached at Page No.</td>
</tr>
<tr>
<td>9</td>
<td>Names and Address of the Proprietor/Directors/Office bearers of the Company/Agency</td>
</tr>
<tr>
<td>S. No.</td>
<td>Name</td>
</tr>
<tr>
<td>--------</td>
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</tbody>
</table>

**Note:** - Annex a separate list if space provided is not sufficient.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Authorized office bearers for dealing with the SDMC in relation with this TENDER.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name</td>
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</table>

7) If the authorization letter of signatory is enclosed if Yes at page No.

8) Local (NCR) Address of the Company/Agency

8.1 Contact person(s) with full address and telephone numbers at NCR

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name</th>
<th>Qualifications</th>
<th>Post</th>
<th>Address</th>
<th>Telephone Nos.</th>
</tr>
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<tbody>
<tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

9) PAN/TIN numbers of the company

<table>
<thead>
<tr>
<th>9</th>
<th>PAN/TIN numbers of the company</th>
</tr>
</thead>
</table>

10) If the undertaking regarding not black listed by any Govt. Organization has been submitted? If yes at Page No.

11) Is the company/Agency Registered under Sales Tax/VAT? (YES/NO)

| 11    | Is the company/Agency Registered under Sales Tax/VAT? (YES/NO) |
|       | If yes please give registration number and enclose the copy of certificate |
|       | At Page____________________|

12) Is the Company ISO 9000 series Certified? (YES/NO)
12.1 If yes, provide a copy of the Certification. (Please mention the enclosure number)  

<table>
<thead>
<tr>
<th>13</th>
<th>Details of Bidder’s Bank is as under:-</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1</td>
<td>Name of Bank/ Branch</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature of the bidder________________________________________________________
Name of Authorized Signatory___________________________________________________
Status/Post of the Authorized Signatory_________________________________________
Name of the Authorized Company/Agency________________________________________
Date_____________
**ANNEXURE – C**

"CHECK LIST FOR TECHNICAL BID"

Name of work: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla.

Ref: ________________________________________________________________

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Company/Agency</th>
<th>Registered Office Address</th>
<th>Telephone Nos.</th>
<th>Fax Nos</th>
<th>E-Mail ID</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 4      | Is the Company/Agency is Registered (Yes/No) |
| 4.1   | If Yes, Give details under what Act/Rules |
| 4.2   | Registering Authority, with Full Address |
| 4.3   | Registration Number |
| 4.4   | Registration is valid up till date |
| 4.5   | Documentary support regarding Registration is attached at Page No. |

| 5      | Documentary support for Experience in similar field in FORM-I and FORM-VII submitted (Yes/No) …………at Page No.………... |

| 6      | Documents regarding one Completed work of any nature costing not less than Rs.1870.00 lacs with some Central Government Department/State Government Department/Central Autonomous Body/Central Public Sector undertaking submitted (Yes/No) ………….at Page No…………. |

| 7      | Solvency certificate of Rs.1870.00 lacs of the tender amount submitted (Yes/No) ………….at Page No…………. |

| 8      | Financial Data in FORM-III and FORM-II has been submitted (Yes/No) ………….at Page No…………. |

| 9      | Certificate from client regarding agency Construction of Engineered Sanitary Landfill including civil and Geosynthetic works submitted (Yes/No) ………….at Page No…………. |

| 10     | Certificate from client regarding Agency is Providing/has provided such Services in central/state government/autonomous bodies/Central Public Sector Undertakings submitted (Yes/No) ………….at Page No…………. |

| 11     | Names and Address of the Proprietor/Directors/Office bearers of the Company/Agency |
|        | S. No. | Name | Qualifications | Post | Address | Telephone Nos. |
|        |        |      |                |      |         |                |
|        | 1      |      |                |      |         |                |
|        | 2      |      |                |      |         |                |
|        | 3      |      |                |      |         |                |

Note: - Annex a separate list if space provided is not sufficient.

| 12     | Authorized office bearers for dealing with the SDMC in relation with this RFP. |
|        | S. No. | Name | Qualifications | Post | Address | Telephone Nos. |
|        |        |      |                |      |         |                |
|        |        |      |                |      |         |                |
|        |        |      |                |      |         |                |

<p>| 13     | If the authorization letter of signatory is enclosed if Yes at page No. |</p>
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Local (NCR) Address of the Company/Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Contact person(s) with full address and telephone numbers at NCR</td>
</tr>
<tr>
<td></td>
<td>S.No.</td>
</tr>
<tr>
<td>14.1</td>
<td></td>
</tr>
</tbody>
</table>

| 15    | Does a Chartered Accountant audit the Company for every Financial Year? (YES/NO) |
| 15.1  | If Yes, enclose audited Balance sheets and P/L account for the 5 preceding years (Please enclose and mention the enclosure number) |
|       | F.Y.2016-17 | At Page__________ |
|       | F.Y 2015-16 | At Page__________ |
|       | F.Y 2014-15 | At Page__________ |
|       | F.Y 2013-14 | At Page__________ |
|       | F.Y 2012-13 | At Page__________ |

| 16    | Income Tax Return for Assessment year 2016-17 (or latest available) |
|       | At Page____________________ |

| 17    | PAN/TAN numbers of the company |

| 18    | If the undertaking regarding not black listed by any Govt. Organization has been submitted? If yes at Page No. |

| 19    | Is the company/Agency Registered under GST? (YES/NO) |

|       | If yes please give registration number and enclose the copy of certificate |
|       | At Page____________________ |

| 20    | Is the Company ISO 9000 series Certified? (YES/NO) |
| 20.1  | If yes, provide a copy of the Certification. (Please mention the enclosure number) |
|       | At Page____________________ |

| 21    | Does the Company have records that prove that only qualified personnel are performing work in the Company? (YES/NO) |
| 21.1  | If yes, provide a copy of the records. (Please mention the enclosure number) |
|       | At Page____________________ |

| 22    | Details of Bidder’s Bank is as under:- |

| 22.1  | Name of Bank/ Branch |

|       | Account No ________________ |
|       | ________________ | Acc No ________________ |

| 23    | Do Insurance / Workers Compensation cover the Company’s workers? (YES/NO) |

| 24    | Is the Company capable of making payments to its staff, if the release of payment is delayed up-to three months from SDMC/MCD for some reason? (YES/NO) |

<p>| 25    | Is Company having the requisite License from Labour Department for Labour Contact? |
| 25.1  | If yes, provide a copy of the records. FORM No. ___at page ___ |</p>
<table>
<thead>
<tr>
<th></th>
<th>(Please mention the enclosure number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>If the Plant and Equipment as per FORM-IV is submitted if Yes at Page No.</td>
</tr>
<tr>
<td>27</td>
<td>If the Details of Technical &amp; Administrative Personnel to be employed for the work in the prescribed Performa at ANNEXURE-D has been submitted if yes at Page No.</td>
</tr>
<tr>
<td>28</td>
<td>Approach, Methodology &amp; Work Plan in ANNEXURE- E has been submitted if yes at page No………</td>
</tr>
<tr>
<td>29</td>
<td>Anti-collusion certificate in ANNEXURE F submitted if yes at page No…………</td>
</tr>
<tr>
<td>30</td>
<td>Contractor ANNEXURE for execution of work FORM-V submitted if yes at page No………</td>
</tr>
<tr>
<td>31</td>
<td>Structure and Organization of Firm FORM-VI submitted if yes at page No………</td>
</tr>
<tr>
<td>32</td>
<td>Detail regarding Person/Partner/Director of the company FORM-VIII submitted if yes at page No………</td>
</tr>
</tbody>
</table>

Signature of the bidder
Name of Signatory
Status/Post of the Signatory
Name of the Company/Agency
Date
## ANNEXURE – D

### DETAILS OF TECHNICAL AND ADMINISTRATIVE PERSONNEL TO BE EMPLOYED FOR THE WORK

<table>
<thead>
<tr>
<th>S. No</th>
<th>Designation</th>
<th>Total Number</th>
<th>Number available for this work</th>
<th>Name</th>
<th>Qualifications</th>
<th>Professional experience and details of work carried out</th>
<th>How these would be involved in this work</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Signature of bidder along with stamp
ANNEXURE - E

DESCRIPTION OF APPROACH, METHODOLOGY, AND WORK PLAN IN RESPONDING TO THE TERMS OF REFERENCE

A description of the approach, methodology and work plan for performing the assignment, including a detailed description of the proposed methodology and staffing for training, if the Terms of Reference specify training as a specific component of the assignment.

{Suggested structure of your Technical Proposal :}

a) Technical Approach and Methodology
b) Work Plan
c) Deliverables and Scheduling

a) Technical Approach and Methodology.[Please explain your understanding of the objectives of the assignment as outlined in the Terms of Reference (TORs), the technical approach, and the methodology you would adopt for implementing the tasks to deliver the expected output(s), and the degree of detail of such output. Please do not repeat/copy the TORs in here.]

b) Work Plan. {Please outline the plan for the implementation of the main activities/tasks of the assignment, their content and duration, phasing and interrelations, milestones (including interim approvals by the Client), and tentative delivery dates of the reports. The proposed work plan should be consistent with the technical approach and methodology, showing your understanding of the TOR and ability to translate them into a feasible working plan. A list of the final documents (including reports) to be delivered as final output(s) should be included here. The work plan should be consistent with the Work ANNEXURE Form.}

c) Deliverables and Scheduling.

WORK ANNEXURE AND PLANNING FOR DELIVERABLES

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>WEEK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>e.g. Deliverable 1:</td>
<td></td>
</tr>
<tr>
<td>.............</td>
<td></td>
</tr>
<tr>
<td>Deliverable 2</td>
<td></td>
</tr>
<tr>
<td>.............</td>
<td></td>
</tr>
</tbody>
</table>
1 List the deliverables with the breakdown for activities required to produce them and other benchmarks such as the Client’s approvals. For phased assignments, indicate the activities, delivery of reports, and benchmarks separately for each phase.

2 Duration of activities shall be indicated in a form of a bar chart.

3 Include a legend, if necessary, to help read the chart.

Signature of the Authorized Person
Agency ______________________
ANNEXURE - F
(On the letter head of the bidder & duly signed)

NAME OF WORK: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

ANTI-COLLUSION CERTIFICATE

We hereby certify and confirm that in the preparation and submission of this Proposal, we have not acted in concert or in collusion with any other Bidder or other person(s) and also not done any act, deed or thing which is or could be regarded as anti-competitive.

We further confirm that we have not offered nor paid nor will offer nor pay, directly or indirectly, any illegal gratification, in cash or kind, to any person or agency in connection with the instant Proposal.

Date this ..................Day of .................20__.

Name of the Bidder

Signature of the Authorized Person

Name of the Authorized Person
**ANNEXURE – G**

**Evaluation Criteria**

<table>
<thead>
<tr>
<th>S.N</th>
<th>Attributes</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Financial Strength (20 marks)</td>
<td>(i) 60% marks for minimum eligibility criteria.</td>
</tr>
<tr>
<td></td>
<td>(ii) Average annual turnover 16 marks</td>
<td>(ii) 100% marks for twice the minimum eligibility criteria or more</td>
</tr>
<tr>
<td></td>
<td>(iii) Solvency Certificate 4 marks</td>
<td>in between (i) &amp; (ii) – on pro-rata basis</td>
</tr>
<tr>
<td>(b)</td>
<td>Experience in similar nature of work (20 marks)</td>
<td>(i) 60% marks for minimum eligibility criteria.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(ii) 100% marks for twice the minimum eligibility criteria or more</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in between (i) &amp; (ii) – on pro-rata basis</td>
</tr>
<tr>
<td>(c)</td>
<td>Performance on works (time over run) (20 marks)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parameter</td>
<td>Calculation for Points</td>
</tr>
<tr>
<td></td>
<td>If TOR=</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) Without levy of compensation</td>
<td>1.0 2.00 3.00 &gt; 3.50</td>
</tr>
<tr>
<td></td>
<td>(ii) With levy of compensation</td>
<td>20 15 10 10</td>
</tr>
<tr>
<td></td>
<td>(iii) Levy of compensation not decided</td>
<td>20 5 0 -5</td>
</tr>
<tr>
<td></td>
<td>TOR=AT/ST, where AT=Actual Time; ST=Stipulated Time</td>
<td>20 10 0 0</td>
</tr>
<tr>
<td></td>
<td>Note: Marks for value in between the stages indicated above is to be determined by straight line variation basis.</td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>Performance of works (Quality) (40 Marks)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) Outstanding</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>(ii) Very good</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>(iii) Good</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>(iv) Poor</td>
<td>0</td>
</tr>
</tbody>
</table>

**Total Marks: 100**
**ANNEXURE - H**

**Financial Bid Form**

**Ref. No.** D/EE(Store)/SDMC/2017-18/329  
**Dated:-**

Name of Work: **Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description of Item</th>
<th>Qty.</th>
<th>Unit</th>
<th>Rates (Rs.)</th>
<th>Amount (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared. Ref: Vol I-Page No.80, Item No. 2.31 DSR 2016</td>
<td>127607.00</td>
<td>sqm</td>
<td>127607.00</td>
<td>127607.00</td>
</tr>
<tr>
<td>2</td>
<td>Earth work in excavation work by <strong>mechanical means</strong> (Hydraulic excavator)/ manual means in foundation trenches or drains not exceeding 1.5m in width or 10 sqm on plan including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 50m. Excavated surfaces shouldN not have protrusions of more than 8mm. <strong>Hard rock (blasting prohibited)</strong> Ref: Vol I-Page No. 77, Item No. 2.9.3 DSR 2016</td>
<td>469.00</td>
<td>cum</td>
<td>469.00</td>
<td>469.00</td>
</tr>
<tr>
<td>3</td>
<td>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 lift upto 1.5 m, as directed by Engineer-in-charge. <strong>Hard rock (blasting prohibited)</strong> Ref: Vol I-Page No. 76, Item No. 2.7.3 DSR 2016</td>
<td>504093.50</td>
<td>cum</td>
<td>504093.50</td>
<td>504093.50</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Quantity</td>
<td>Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><strong>Excavation work by mechanical means</strong> (Hydraulic excavator)/ manual means in foundation trenches or drains not exceeding 1.5m in width or 10 sqm on plan including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 50m.**</td>
<td>63369.45</td>
<td>cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>Filling available excavated earth</strong> (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 m and lift up to 1.5 m.**</td>
<td>18866.72</td>
<td>cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>Supplying and stacking at site. Moorum-Bunds</strong></td>
<td>57828.08</td>
<td>Cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>Supplying and stacking at site. Good earth-Cover Soil</strong></td>
<td>20259.67</td>
<td>cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><strong>Extra for compaction of earth work</strong> in embankment under optimum moisture conditions to give at least 95% of the maximum dry density (proctor density).**</td>
<td>57828.08</td>
<td>cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm. depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres. - Leachate collection layer, soil layer and cover soil layer</strong></td>
<td>254930.78</td>
<td>sqm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Supplying and stacking at site. 53 mm to 22.4 mm size stone aggregate</strong></td>
<td>27866.25</td>
<td>Cum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Providing and laying in position ready mixed plain cement concrete, using fly ash and cement content as per approved design mix and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for plain cement concrete work, including pumping of R.M.C. from transit mixer to site of laying and curing, excluding the cost of centering, shuttering and finishing, including cost of curing, admixtures in recommended proportions as per IS : 9103 to accelerate/retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge and aggregate derived from natural sources. Note: (1) Excess/less cement used than specified in this item is payable/recoverable separately. (2) Fly ash conforming to grade I of IS 3812 (Part-1) only be used as part replacement of OPC as per IS : 456. Uniform blending with cement is to be ensured in accordance with clauses 5.2 and 5.2.1 of IS: 456-2000 in the items of BMC and RMC All works upto plinth level: <strong>M-10 grade plain cement concrete</strong> (cement content considered @ 220 kg/cum)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref: Vol I-Page No. 160, Item No. 4.19.1.2 DSR 2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>603.29 cum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge. (Note :- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately) All works upto plinth level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ref: Vol I Page No. 226, Item No. 5.37.1 DSR 2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1210.16 cum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge. (Note: Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)  **All works above plinth level upto floor V level**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer-in-charge. (Note: Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)  <strong>All works above plinth level upto floor V level</strong></td>
<td>855.66</td>
<td>cum</td>
</tr>
<tr>
<td>14</td>
<td>Centering and shuttering including strutting, propping etc. and removal of form for: Foundations, footings, bases for columns etc. for mass concrete</td>
<td>1622.42</td>
<td>sqm</td>
</tr>
<tr>
<td>15</td>
<td>Centering and shuttering including strutting, propping etc. and removal of form for: Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.</td>
<td>13488.67</td>
<td>sqm</td>
</tr>
<tr>
<td>16</td>
<td>Centering and shuttering including strutting, propping etc. and removal of form for all heights Suspended floors, roofs, landings, balconies and access platform</td>
<td>458.50</td>
<td>sqm</td>
</tr>
<tr>
<td>17</td>
<td>Centering and shuttering including strutting, propping etc. and removal of form for: Columns, Pillars, Piers, Abutments, Posts and Struts</td>
<td>1133.11</td>
<td>sqm</td>
</tr>
<tr>
<td></td>
<td><strong>Centering and shuttering</strong> including strutting, propping etc. and removal of form for all heights Edges of slabs and breaks in floors and walls Under 20 cm wide</td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>18</td>
<td>Ref: Vol I-Page No. 190, Item No. 5.9.16.1 DSR 2016</td>
<td>917.00</td>
<td>meter</td>
</tr>
<tr>
<td></td>
<td>Steel reinforcement for <strong>R.C.C. work</strong> including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Hard drawn steel wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Ref: Vol I-Page No. 208, Item No. 5.22.2 DSR 2016</td>
<td>114316.04</td>
<td>Kg</td>
</tr>
<tr>
<td></td>
<td>Steel reinforcement for <strong>R.C.C. work</strong> including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Ref: Vol I-Page No. 208, Item No. 5.22.6 DSR 2016</td>
<td>592544.13</td>
<td>Kg</td>
</tr>
<tr>
<td></td>
<td>Providing and laying C.C. pavement of <strong>mix M-25 with ready mixed concrete</strong> from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator, cum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in-charge.(The panel shuttering work shall be paid for separately).(Note:- Cement content considered in this item is @ 330 kg/cum.Excess/less cement used as per design mix is payable/ recoverable separately).- <strong>Roads &amp; Footpath</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Ref: Vol II-Page No. 1047, Item No. 16.75 DSR 2016</td>
<td>5144.37</td>
<td>cum</td>
</tr>
<tr>
<td></td>
<td>Construction of dry <strong>lean cement concrete</strong> sub base over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per specifications, cement content not to be less than 150 Kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, for all leads &amp; lifts, laid with a mechanical paver, compacting with 8-10 tonne vibratory roller, finishing and curing etc. complete as per direction of Engineer-in-charge.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Ref: Vol II-Page No. 1053, Item No. 16.80 DSR 2016</td>
<td>3429.58</td>
<td>Cum</td>
</tr>
<tr>
<td><strong>Extra for providing richer mixes</strong> at all floor levels Note:- Excess/less cement over the specified cement content used is payable/recoverable separately Providing M-40 grade concrete instead of M-25 grade BMC/RMC. (Note : Cement content considered in M-40 is @ 360 kg/cum)</td>
<td></td>
<td></td>
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<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ref: Vol I-Page No. 226, Item No. 5.34.3 DSR 2016</td>
<td>4951.80 cum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 100mm 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 i/c cost of cartage, all leads & lift, handling at site etc. all complete as per direction of Engineer-in-Charge

| Ref: Vol II-Page No. 1063, Item No. 16.93 DSR 2016 | 550.20 sqm |

Providing and fixing in position pre-moulded joint filler in expansion joints.

<table>
<thead>
<tr>
<th>Ref: Vol II-Page No. 1003, Item No. 16.45 DSR 2016</th>
<th>per cm. depth per cm width per m length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3977.00</td>
<td></td>
</tr>
</tbody>
</table>

Providing and laying in position bitumen hot sealing compound for expansion joints etc. Using grade 'A' sealing compound

<table>
<thead>
<tr>
<th>Ref: Vol II-Page No. 1003, Item No. 16.46 DSR 2016</th>
<th>per cm. depth per cm width per m length</th>
</tr>
</thead>
<tbody>
<tr>
<td>3977.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>27</td>
<td>Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete: 700 mm dia. R.C.C. pipe</td>
</tr>
<tr>
<td></td>
<td>Ref: Vol II - Page No. 1412, Item No. 19.6.8 DSR 2016</td>
</tr>
<tr>
<td>28</td>
<td>Dry stone pitching 22.5 cm thick including supply of stones and preparing surface complete</td>
</tr>
<tr>
<td></td>
<td>Ref: Vol II - Page No. 950, Item No. 16.11 DSR 2016</td>
</tr>
<tr>
<td>29</td>
<td>Providing and installing Submersible 5HP Leachate pump of ISI mark dry type squirrel cage induction type, IP 68 the class of insulation is F having SD 50m, 2880 RPM, 3Phase, DOL, using copper cable of approx 15m in length of size 1x4x2.5mm², discharge size 80mm, capacity 16 to 20cum per hr with head of 16 to 20m including all electrical connections, starter making connection to the motor and other safety devices to electrical panel board as per manufacturers specification</td>
</tr>
<tr>
<td>30</td>
<td>Market rate</td>
</tr>
<tr>
<td>30</td>
<td>Supply &amp; install Geosynthetic Clay Liner laying, anchoring in trench, seaming, testing complete as given in General Specification complete to form an impervious barrier as shown in drawings and as per the Engineer’s directions. Minimum width of the Liner shall be 4.9M. GCL must be anchored within anchor trench including excavation of trench and backfilling, compaction complete at top and bottom portion. Rate to include the necessary lap for jointing, wastage, and testing including bentonite powder at joints etc. complete. Measurement will be made as per finished surface area. GCL in the anchor trench will be taken in measurement.</td>
</tr>
<tr>
<td></td>
<td>As per M.R &amp; RA</td>
</tr>
</tbody>
</table>
|   | Supply & installation of **1.5mm Thick HDPE Smooth Geomembrane Liner** by Blown/Flat die cast process as per list of companies approved in the detail specifications, laying, anchoring in trench, seaming, testing complete as given per Specifications, complete to form an impervious barrier as shown in drawings and as per the directions given by the Engineer-in-charge. Minimum width of the Liner shall be 7M. Geomembrane must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion. Rate to include the necessary lap for jointing, wastage, testing and extrusion rods complete. Measurement will be made as per finished surface area. Liner in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)  
As per M.R & RA | 112921.23 | Sqm |
|---|---|---|
| 32 | Supply & installation of **Non-woven Geotextile (GT) of 400g/M2** made of Polypropylene of TC Mirafi (USA) / Polyfelt (Austria) / Synthetic Industries (USA) / Amoco Fabrics (USA) make or from its regional offices, as per details given in Specifications, spreading on the sand layer or Geomembrane as per the directions given by the Engineer-in-charge, without damaging the Geotextile or Geomembrane. The Geotextile must be placed along the slope from top to bottom with an overlap of minimum 100mm. It should be stitched with HDPE thread. Geotextile must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion.  
Rate to include the necessary lap for jointing, stitching, wastage complete. Measurement will be made as per finished surface area. Geotextile in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)  
As per M.R & RA | 109841.56 | Sqm |
| 33 | Supply & installation of **Non-woven Geotextile (GT) of 800g/M²** made of Polypropylene of TC Mirafi (USA) / Polyfelt (Austria) / Synthetic Industries (USA) / Amoco Fabrics (USA) make or from its regional offices, as per details given in Specifications, spreading on the sand layer or Geomembrane as per the directions given by the Engineer-in-charge, without damaging the Geotextile or Geomembrane. The Geotextile must be placed along the slope from top to bottom with an overlap of minimum 100mm. It should be stitched with HDPE thread. Geotextile must be anchored within anchor trench including excavation of trench and backfilling, compaction complete, at top and bottom portion. Rate to include the necessary lap for jointing, stitching, wastage complete. Measurement will be made as per finished surface area. Geotextile in the anchor trench will be taken in measurement. (Spec.- As directed by the Engineer-in-charge)

As per M.R & RA | 109841.56 | Sqm |
---|---|---|
| 34 | Supply & install **Geosynthetic drainage nets (Geonets)** of thickness 5mm & mass 790 g/m² made by extruding two sets of polyethylene strands of Poly-Flex, TC Mirafi, Naue-faser Technik, Polyfelt Tenax make, laying anchoring in trench, overlapping, testing complete as given in General Specification and as shown in the drawings & as per engineer's directions. Geonet must be anchored within anchor trench including related anchoring work etc. complete. Rate to include the necessary lap at joints, wastage, testing etc complete. Measurement will be made as per finished area. Geonet in the anchor trench will be taken in measurement.

As per M.R & RA | 42767.20 | Sqm |
---|---|---|
<p>| 35 | Providing, supplying and installation in standard lengths Polyethylene Pipes, confirming to IS 4984 /14151 / 12786 / 13488 with necessary jointing material like mechanical connector i.e. thread / insert joint / quick release coupler joint / compression fitting joint or flanged joint, including all local &amp; central taxes, transportation and freight charges inspection charges, loading / unloading charges, conveyance to the departmental stores / site &amp; stacking the same in closed shade duly protecting from sunrays &amp; rains, etc. complete. |</p>
<table>
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<tbody>
<tr>
<td><strong>Note:</strong> Excavation for pipe trench considered paid in item no 1 - (PE100, 10 kg/cm²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDPE pipes- 350mm OD pipe, (PE100, 10 kg/cm²)</td>
<td>789.00</td>
<td>RMT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDPE pipes-160mm OD pipe, (PE100, 10 kg/cm²)</td>
<td>3959.00</td>
<td>RMT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing and fixing micro processor based fully electronic 50 MT weighbridge (KANAN KWS 2000 or equivalent) with electronic printer (TVSE or equivalent) with load cells, lead structure, civil work etc all complete as per drawings and specifications as per direction of engineer-in-charge.</td>
<td>1.00</td>
<td>Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply, Installation and Commissioning of 100 KLD Leachate Treatment Plant, civil work alongwith power generation unit all complete as per drawings, specifications and as per direction of engineer-in-charge.</td>
<td>1.00</td>
<td>Unit</td>
<td></td>
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</table>

**Total (A)**

<p>| | | | | |</p>
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</thead>
<tbody>
<tr>
<td>Recovery for Hard Rock generated by excavation (recovery to be made from the bills payable to the contractor @ 80% of Hard Rock excavation work as a in item no. 3 of BOQ )</td>
<td>400000.00 cum</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recovery to be made, Total (B)**

**Grand total (Net quoted amount) = (A)-(B)**

1. Amount of Bid quoted above is inclusive of all Statutory taxes, GST, levies, charges etc. and it also includes any other legal/tax liabilities which may be in force at present or may arise in future etc. Nothing will be extra paid by the SDMC in addition to the above quoted bid amount. If deduction at source is mandatory on account of any statutory tax such as Income Tax, GST, levy, Labour Cess fee etc., the same will be deducted from the bill amount of the Successful Bidder by the payment authority under the SDMC.

2. Against the item of excavation of Hard Rock, the contractor shall be allowed to take away the excavated Hard Rock from the site at his own expense. For this, he shall be liable to pay the cost of the hard rock material assuming quantity @ 80% of the excavated quantity. The unit recovery rate for Hard Rock shall have to be quoted by the contractor against Item No. 38 of BOQ.

3. No additional condition(s) from the bidder would be accepted.

4. Cello Tape has to be affixed on the financial data part of the document.

5. ESI/EPF (employer contribution only) shall be reimbursed to the agency after submission of proof of deposition of the same with the concerned authorities.

6. The bidder is required to sign and affix his stamp on every page of the financial bid.

---

Signature of the Authorized Person with date
Name & Status/Post of the Signatory
Name of the bidder Company/Agency/Institution

RFP for Engineering SLF, Tekhkhand, Okhla  
Page 184 of 192
To

The Commissioner
South Delhi Municipal Corporation

Dear Sir,

In terms of clause 25 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to SE for decision
17. Date of receipt of SE's decision
18. Date of appeal to you
19. Date of receipt of your decision.

Signatures of the applicant

I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims.
2. 
3. 
4. 

Yours faithfully,

(Signatures)

Copy in duplicate to:
1. The Executive Engineer,

...............Division.
Form of Earnest Money Deposit

Bank Guarantee Bond

WHEREAS, Contractor _____________ (Name of contractor) (hereinafter called “the contractor”) has submitted his tender dated ________ (date) for the work of ________________ (name of work) (hereinafter called “the Tender”)

KNOW ALL PEOPLE by these presents that we ________________ (name of bank) having our registered office at ___________ (hereinafter called “the Bank”) are bound unto Commissioner, South Delhi Municipal Corporation in the sum of Rs.______________ (Rs. in Words__________________________) for which payment well and truly to be made to the said Commissioner, SDMC the bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ___________ day of _________ 20___ THE CONDITIONS of this obligation are:

1) If after tender opening the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;

2) If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:

   (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required;

   OR

   (b) fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor,

We undertake to pay to the Engineer-in-Charge either up to the above amount or part thereof upon receipt of his first written demand, without the Engineer-in-Charge having to substantiates his demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by his is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* ............. after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE ............. SIGNATURE OF THE BANK

WITNESS ............. SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 180 days from last date of receipt of tender.
Form of Performance Security (Guarantee)

Bank Guarantee Bond

In consideration of the South Delhi Municipal Corporation (hereinafter called “The Corporation”) having offered to accept the terms and conditions of the proposed agreement between…………………………….and ………………………………. (hereinafter called “the said Contractor(s)”) for the work…………………………………………………… (hereinafter called “the said agreement”) having agreed to production of an irrevocable Bank Guarantee for Rs. ………………. (Rupees ………………………….. only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, ………………………………. (hereinafter referred to as “the Bank”) hereby undertake to pay to the Commissioner, SDMC an amount not exceeding Rs. …………………………. (Rupees………………. Only) on demand by the Commissioner, SDMC or his authorized representator.

2. We, ……………………………….(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. ……………….. (Rupees ……………….only)

3. We, the said bank further undertake to pay the Commissioner, SDMC any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, ……………………………. (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. We, ……………………………. (indicate the name of the Bank) further agree with the Commissioner, SDMC that the Commissioner, SDMC shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Commissioner, SDMC or any indulgence by the Commissioner, SDMC to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

7. We, ……………………………. (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.
8. This guarantee shall be valid up to ………………………unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. ………………….

(Rupees ……………..) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged. Dated the …………………day of …………………..for…………………….(indicate the name of the Bank)
Chapter-XIV

PROFORMA OF SCHEDULES
(Separate Performa for Civil, Elect. & Hort. Works in case of Composite Tenders)
(Operative Schedules to be supplied separately to each intending tenderer)

SCHEDULE ‘A’
Schedule of quantities (Given in the tender document at the appropriate place)

SCHEDULE ‘B’
Schedule of materials to be issued to the contractor: NIL

SCHEDULE ‘C’
Tools and plants to be hired to the contractor: NIL

SCHEDULE ‘D’
Extra schedule for specific requirements/document for the work, if any.

SCHEDULE ‘E’
Reference to General Conditions of contract: As given in the tender document

Name of work: Setting up of Engineered Landfill Site for South Delhi Municipal Corporation at Tehkhand, Okhla

Estimated cost of work: Rs. 46,73,44,600/-
(i) Earnest money: Rs. 93,50,000/- (to be returned after receiving performance guarantee)
(ii) Performance Guarantee : 5% of the tendered value
(iii) Security Deposit : 5% of the each running bill
GENERAL RULES & DIRECTIONS:

Officer inviting tender: **Executive Engineer (DEMS Store), SDMC**

Maximum percentage for quantity of items of work to be executed **As per contract condition**

beyond which rates are to be determined in accordance with

Clauses 12.2 & 12.3.

**Definitions:**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>2(v)</td>
<td>Engineer-in-Charge</td>
</tr>
<tr>
<td>2(viii)</td>
<td>Accepting Authority</td>
</tr>
<tr>
<td>2(x)</td>
<td>Percentage on cost of materials and labour to cover all overheads and profits.</td>
</tr>
<tr>
<td>2(xi)</td>
<td>Standard Schedule of Rates</td>
</tr>
<tr>
<td>2(xii)</td>
<td>Department</td>
</tr>
<tr>
<td>9(ii)</td>
<td>Standard CPWD contract Form</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Executive Engineer (DEMS Store), SDMC**

**Standing Committee, SDMC**

**CPWD DSR 2016 and market rates**

**South Delhi Municipal Corporation**

**GCC 2014, as amended**

**Clause 1**

i). Time allowed for submission of Performance, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance: **15 Days**

ii). Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above: **15 Days**

**Clause 2**

Authority for fixing compensation under clause 2: **Commissioner / Addl. Commissioner, SDMC**

**Clause 2A**

Whether clause 2A shall be applicable: **No**

**Clause 5**

Number of days from the date of issue of letter of acceptance for reckoning date of start: **15 Days**

Mile Stone(s) as per table given below: -

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of Mile Stone (Physical)</th>
<th>Time allowed (from the date of start)</th>
<th>Amount to be withheld in case of non achieving of mile stone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase - I</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1/8th of the work</td>
<td>1 month</td>
<td>1/2%</td>
</tr>
<tr>
<td>2</td>
<td>3/8th of the work</td>
<td>2 months</td>
<td>1/2%</td>
</tr>
<tr>
<td>3</td>
<td>3/4th of the work</td>
<td>3 months</td>
<td>1/2%</td>
</tr>
<tr>
<td>4</td>
<td>Full work</td>
<td>4 months</td>
<td>1/2%</td>
</tr>
<tr>
<td><strong>Phase – II</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1/8th of the work</td>
<td>4 months + 1/4th of the balance time allotted for the full work</td>
<td>1/2%</td>
</tr>
<tr>
<td>2</td>
<td>3/8th of the work</td>
<td>4 months + 1/2nd of the balance time allotted for the full work</td>
<td>1/2%</td>
</tr>
<tr>
<td>3</td>
<td>3/4th of the work</td>
<td>4 months + 3/4th of the balance time allotted for the full work</td>
<td>1/2%</td>
</tr>
<tr>
<td>4</td>
<td>Full work</td>
<td>Time allotted for the full work (18 months)</td>
<td>1/2%</td>
</tr>
</tbody>
</table>

Time allowed for execution of work.
Authority to decide:

i). Provisional Extension of Time: Executive Engineer (SDMC)
ii). Rescheduling of Mile Stone: Superintending Engineer (SDMC)
iii). Shifting of date of start in case of delay in handing over of site: Superintending Engineer (SDMC)

Clause 6, 6A
Clause Applicable – (6 or 6A): 6

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. 1.00 cr.

Clause 10A
List of testing equipment to be provided by the contractor at site lab: As per the requirement

Clause 10B (ii)
Whether Clause 10B (ii) shall be applicable: Yes

Clause 10C
Component of labour expressed as percent of value of work: As per actual labour component taken in the analysis of the work / item

Clause 10CA
Materials covered: Cement, reinforcement bar, structural steel and POL, for which price indices issued by DG, CPWD shall be followed

Clause 10CC: Not applicable

Clause 11
Specifications to be followed: IRC / CPWD / MOEF / CPCB / DPCC

Clause 12
Type of work: Original works

12.2 & 12.3
Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work: 30%

12.5
i). Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (accept items mentioned in earth work subhead in DSR and related items): 100%
ii). Deviation limit for mentioned in earth work subhead in DSR and related items: 100%

Clause 16
Competent Authority for deciding reduced rates: Chief Engineer (SDMC)

Clause 18
List of mandatory machinery, tools and plants to be deployed by the contractor at site:
1. ____________2. ____________3. ____________
4. ____________5. ____________6. ____________

Clause 25
Constitution of Dispute Redressal Committee (DRC)
Chairman: Chief Engineer (SDMC)
Member: Representative of SDMC as nominated by E-in-C, SDMC
Member: Representative of the contractor

Clause 36 (i)

Requirement of Technical Representative(s) and recovery Rate

<table>
<thead>
<tr>
<th>SI No.</th>
<th>Minimum Qualification of Technical Representative</th>
<th>Discipline</th>
<th>Designation (Principal Technical /Technical representative)</th>
<th>Minimum Experience</th>
<th>Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Figures</td>
<td>Words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>B.Tech</td>
<td>Civil</td>
<td>Project Manager</td>
<td>20 1</td>
<td>1,00,000/- per month One Lac per month</td>
</tr>
<tr>
<td>2.</td>
<td>B.Tech / M.Tech</td>
<td>Environment</td>
<td>Environment Engineer</td>
<td>10 1</td>
<td>70,000/- per month Seventy Thousand per month</td>
</tr>
<tr>
<td>3.</td>
<td>B.Tech / Diploma Holder</td>
<td>Mechanical</td>
<td>Deputy Project Manager</td>
<td>8 / 12 1</td>
<td>70,000/- per month Seventy Thousand per month</td>
</tr>
<tr>
<td>4.</td>
<td>Diploma Holder</td>
<td>Civil</td>
<td>Site Engineer</td>
<td>8 1</td>
<td>60,000/- per month Sixty Thousand per month</td>
</tr>
<tr>
<td>5.</td>
<td>Diploma Holder / ITI</td>
<td>Survey</td>
<td>Survey Engineer</td>
<td>6 / 10 1</td>
<td>50,000/- per month Fifty Thousand per month</td>
</tr>
</tbody>
</table>

Clause 42

(i) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates
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7. Variations permissible on theoretical quantities:
(a) Cement 2% plus/minus.
(b) Steel Reinforcement and structural steel sections for each diameter, section and category 2% plus/minus.
(c) All other materials. Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION:
As per justification of rate