

Madurai Corporation

Tender Document

MADURAI CORPORATION
Section – I
Notice Inviting Tenders

Tender No.	: E2 /Est. No. 820 / 2021-22 (3rd CALL)
Name of the Work	: Supply and Delivery of 600mm dia FRC manhole frame with cover as per IS 12592/2007 and as amended from time to time with in print of MMC and year during casing etc., complete for Madurai City Municipal Corporation.
Tender value	: Rs.31,56,500/-
E.M.D.	: Rs.33,000/-
Period of Completion	: 120 Days
Date & Time of Opening	: 29.04.2022, 3.00PM
No of Covers	: Two Cover System

For and behalf of Madurai Corporation Sealed tenders are invited for **Supply and Delivery of 600mm dia FRC manhole frame with cover as per IS 12592/2007 and as amended from time to time with in pint of MMC and year during casing etc., complete for Madurai City Municipal Corporation** as noted in 'A' Schedule of this notice and as per detailed specification enclosed herewith and it will be received by The Commissioner, Madurai Corporation. For and on behalf of Corporation council sealed tenders are invited in the form prescribed for the work mentioned above and will be received by the Commissioner, Madurai Corporation upto **29.04.2022, 3.00 P.M** as per office clock time and open the same day at **3.30 P.M** Bidding document is available <http://www.tenders.tn.gov.in> and website till **29.04.2022, 3.00 P.M**

1. Tenders will be opened by the Corporation Engineer or by an officer authorized by the Commissioner in the absence of Corporation Engineer for this purpose at **29.04.2022, 3.00PM** on the said date in the presence of such of the meanderers or their authorized representatives as may attend.
2. **Bidding document is available in <http://www.tenders.tn.gov.in> and the bidders can submit the tender in person The Commissioner, Madurai Corporation, Aringar Anna Maligai, Tallakulam, Madurai.**
3. **(Original copy of EMD should be submitted to the Office before the prescribe date and time)**
4. The E.M.D. should be in the form of Demand Draft from any Nationalized bank or scheduled banks payable at Madurai in favour of Commissioner, Madurai Corporation or by cash remitted at treasury counter, Madurai Should be enclosed with bid document. But the original **EMD** is received after the prescribed date and time will be rejected **the EMD exemption under any ground is not allowed**. The **EMD** will not bear any interest. Tenders not accompanied by **Earnest Money Deposit** will be rejected. The **Earnest Money Deposit** will be returned to the unsuccessful tenderers within 15 days from the date of disposal of tender. In the case of successful tenderers, the **EMD** will be retained and converted as security deposit.

5. The Corporation will not accept letter authorizing the Department to adjust amounts towards **EMD/SD** out of the dues payable by the department to the tenderer.
6. If the tender is made by an individual, it shall be signed by him or his power of attorney in which case a certified copy of the registered power of attorney shall accompany the tender.
7. If the tender is made by proprietary concern, it shall be signed by the proprietor with his usual signature and furnish his full name with the full name of firm and its current address or his power of attorney in which case a certified copy of the registered power of attorney shall accompany the tender.
8. Attention is drawn to the Security Deposit to the extent of 1% of the total value of contract or such other security demanded which will have to be made with Commissioner, Madurai Municipal Corporation, Madurai by the successful tenderer and to his having to execute the contract attached within the time stated in the Letter of Tender. **In respect of the successful tenderer, the EMD remitted along with the tender shall be converted as Security Deposit. The EMD remitted in any other approved forms by the successful tenderer converted to security deposit and he will be called upon to pay difference between 1% contract value and EMD remitted by the notified that and before signing the contract agreement.**
9. The duration of the scripts shall be valid for the complete period of completion. The Security Deposit remitted by the successful tenderer shall not bear any interest. The form of agreement of the accepted tenderer will have to be executed with special adhesive stamps to a value of Rs.50/-, the cost of which must be borne by the tenderer.
10. The duration of the scripts shall be valid for the complete period of completion. The Security Deposit remitted by the successful Bidder shall not bear any interest. The form of agreement of the accepted Bidder will have to be executed with special adhesive stamps to a value of Rs.20/-, the cost of which must be borne by the Bidder.
11. The tender deposit of **Rs.33,000/-** of each unsuccessful Bidder will be returned to him as soon as possible after the final disposal of the tenders, The tender deposit of **Rs.33,000/-** of the successful Bidder will be returned to his after he has deposited the required Security Deposit and agreement executed.
12. It should be clearly understood that the prices quoted in the tender are to include everything required to be done by the conditions of the contract and specification or by any drawings therein referred to, and also all such work as is necessary to the proper completion of the contract, although special mention thereof may have been omitted in the specification and schedule or drawings.
13. The Commissioner, Madurai Municipal Corporation, Madurai does not bind itself to accept the lowest or any tender and will not assign any reason for its action in their respect.
14. The Commissioner, Madurai Municipal Corporation, Madurai reserves the right to subdivide the contract between two or more tenderers.
15. The successful tenderer will not be exempted from the payment of any municipal rates, tolls or taxes in consequence of his being contractor for the Commissioner, Madurai Municipal Corporation, Madurai.

16. The tenders shall be open for acceptance for a period of ninety days from the last date fixed for the receipt of tenders.
17. The tenderers should be able to commence the supply of the Vehicles within **90 days** from the date of communication or acceptance of this tender and complete the supply as mentioned in the schedule from the date of communication or acceptance of this tender and execute agreements for the supply of Vehicles.
18. The bidder should be able to commence the supply of the FRC manhole frame with cover immediately from the date of communication or acceptance of this tender and complete the supply as mentioned in the schedule from the date of communication or acceptance of this tender and execute agreements for the supply of vehicles.
19. Any further information required may be obtained from the Office of the Commissioner, Madurai Municipal Corporation, Madurai – 625 002. E -mail Address: mducorpce@gmail.com Contact No.:0452-2532412
20. The rates should be quoted both in figure and in words. In case of discrepancy between the prices quoted in words and in figures, lower of the two shall be considered.
21. The payment will be made within 30 days after acceptance of FRC manhole frame with cover under Madurai Municipal Corporation, Madurai.
22. Note: 1. The rates quoted shall include the delivery of the FRC manhole frame with cover to the Commissioner, Madurai Municipal Corporation, Madurai.
23. Reputed Manufacturers or their authorized dealers or certified bodybuilders only to participate in the tender.
24. Proof should be furnished in number of years of standing in the business.
25. Conditional tenders will not be considered.
26. The Commissioner, Madurai Municipal Corporation, Madurai will fix the third party inspection agency at Madurai Municipal Corporation Cost to inspect the FRC manhole frame with cover to be supplied by the company to ensure as per the specification of the materials.
27. Delivery period : Within 120 days from the date of issue of purchase order
28. Payment : 75% against supply and balance 25% will be paid after completion of defects liability period
29. Validity of Tender : 120 Days
30. EMD : **Rs 33,000/-The offer without EMD will not be considered.**
31. The prices should be firm till completion of supply.
32. The quoted rates should be only on unit basis.
33. The defect liability period is one year from the date of supply
34. Delivery time is the essence of the contract.
35. The Madurai Municipal Corporation reserves the right to accept or reject the tenders wholly or partly depending on its requirement on the date of order without assigning reasons. Madurai Municipal Corporation also reserves the right to increase or decrease the quantity.

36. Within the validity period of tender enquiry, no change in price by the Bidder shall be permitted after the opening of tenders. If any tender as his own change the price quoted by him in his tender after opening of tender, the concerned tender would become liable for rejection.
37. It may clearly be noted that the Tender should accompany in this specified tender book with all necessary details and signed in Letter Tender and Schedule.
38. The tenders will be evaluated as per the Tamil Nadu Transparency in Tender Act 1998 and Tamil Nadu Transparency in Tender Rules 2000.

Corrupt or Fraudulent Practices

39. The Employer requires that Bidders observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer defines, for the purposes of this provision, the terms set forth below as follows
 - i) corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
 - ii) “fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition or furnishing of false and fabricated documents
 - iii) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.
 - iv) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Bank-financed contract. Further, Criminal proceedings will also be initiated against the Bidder/ Contractor.

QUALIFICATION CRITERIA FOR THE BIDDERS

Qualification of Bidders

- A. The Bidder should be a Manufacturer located in India with a capacity of manufacturing at least 500 no's/ per annum 600mm FRC manhole frame with cover. In proof thereof, the incorporation certificate of the company OR manufacturing capacity certificate from govt. dept of Industries and Commerce has to be submitted. Dealers should submit the documents of its manufacturer as proof.
- B. No Joint ventures are allowed.
- C. The Bidder should have recorded an annual turnover of Rs.33.00 lakhs on average in atleast any three of the last (5) five financial years. In proof thereof, a certificate from a chartered accountant should be provided.
- D. Factory registration, GST Certificated, Income Tax Clearance TIN, registration certificates to be enclosed. Also, the PAN card of the company should be submitted.
- E. The Bidder should have the previous experience of supplying of 500 no's of 600mm FRC manhole frame with cover to any Municipality/Corporation/ULB in India during any one of the last 5 years. In proof thereof, copies of the Work order and Performance Certificate issued by the purchasers (should be signed not less than the grade of an Executive Engineer) concerned should be enclosed. The performance of the same should be dated within one year from the date of tender submission. Dealers should submit the documents of its manufacturer as proof.
- F. The Bidder should have not been blacklisted by any Urban Local Bodies or Sewerage Boards in India in the past or present for any reasons whatsoever. A self-declaration to this effect in the form of an affidavit in Rs. 100 stamp paper duly notarized should be enclosed with the bid.
- G. Manufacturer should be an ISO Certified company

submission of Bids

Sealing and Marking of Bids

The intending bidder should submit tender in two cover system. The cover containing EMD and other clearance certificate, qualification and information etc., shall be super scribed as “Technical Bid”. Another cover containing the duly filled in tender schedule shall be super scribed as “Price Bid”. Both these covers shall be put in a single big envelope and shall be submitted.

The Cover super scribed as “Technical Bid” will be opened first. The Price Bid cover will be opened only if the document required in the Technical Bid cover viz., EMD and other clearance certificate, other relevant certificate and work experience etc., are found in order as per the tender conditions. If Technical Bid is not submitted with these particulars, the Price Bid cover will not be opened and the tender will be rejected and returned to the bidder “un opened”

The **inner and outer** envelopes shall

- (a) be addressed to the Employer at the following address:

The Commissioner,
Madurai Corporation,
Aringar Anna Maligai Tallakulam
Madurai-625002

Bear the following identification: **Supply and Delivery of 600mm dia FRC manhole frame with cover as per IS 12592/2007 and as amended from time to time with in pint of MMC and year during casing etc., complete for Madurai City Municipal Corporation.**

Bid Reference : **E2 / Est. No. 820 /21-22 (3rd CALL)**

DO NOT OPEN BEFORE 15.30 hours on **29.04.2022**

If the outer envelope is not sealed and marked as above, the **Tender Inviting Authority** will assume no responsibility for the misplacement or premature opening of the bid.

Deadline for Submission of the Bids

Bids must be received by the **Tender Inviting Authority** at the address specified above not later than **15.00 hours on 29.04.2022**. In the event of the specified date for the submission of bids is declared a holiday, the Bids will be received up to the appointed time on the next working day

- 19.2 The Commissioner, Madurai Corporation,** may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 9, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

Late Bids

- 20.1** Any Bid received by the **Tender Inviting Authority** after the deadline will be returned unopened to the bidder.

Municipal Administration and Water Supply department

MADURAI LIMITED

Section – IV

FORM OF AGREEMENT

Articles of Agreement made this
Hundred and ninety-nine
between Thiru..... hereinafter
referred to as the contractor which expression shall where the context so admits include his heirs,
executors, administrators and legal representatives of the one part and the Corporation (hereinafter
called the Department) which expression shall where the context so admit include its successors
in office and assigns) of the other part. Whereas the contractor delivered to the Department the
tender which was opened on one thousand nine hundred and ninety where by
the contractor offered and undertook to carry out the works specified under this contract and
accessory work as detailed in scope of work:

In the state of Tamilnadu in India, and provide the works, vehicles matters and things
described or mentioned in these presents at the prices set forth in the schedule annexed to such
tender and the contractor also undertook to do all extra and varied works which might be ordered as
part of the contract on the terms provided for in the conditions and specifications hereto annexed
and Department accepted such tender in pursuance whereof the parties here have entered into this
contract.

And whereas the contractor in accordance with the terms of the said tender has deposited in
the office of the..... Engineer, the due and faithful
performance by the contractor of this contract, the sum of Rs.....
(Rupees.....)

And whereas the contractor fully understands that on receipt of communication of
acceptance of tender from the accepting authority, there emerges a valid contract between the
contractor and Department represented by the officer accepting the agreement and the tender
documents i.e., tender notice, letter of tender, bill of quantities and other schedule, general
conditions to the contractor and special conditions of the tender, negotiation letter communications
of acceptance of tenders, shall constitute the contract for this purpose and be the foundation of
rights of both the parties, as defined clause of tender notice. Now hereby agreed that no
consideration of payment of the said sum of Rs.....
(Rupees.....) or such other sum as may be arrived at under the
clause of the General conditions of the contract relating to payment of final measurement at unit
prices, the contractor shall and well within the time specified in his letter of tender thoroughly and
efficiently and in a good workman like manner perform, provide, execute and do all the works,
vehicles matters of things incidental to or necessary for the entire completion of the works
specified under this contract and necessary works including all works shown in the drawings
hereinafter referred to or described or set forth the said specifications and schedule hereto annexed
and in accordance with such further drawings and instructions as the Engineer of the Department
or other Engineer duly authorised in that behalf thereinafter and in the annexed documents
referred to as the Engineer) shall at any time in accordance with the said schedule
(Bill of quantities) and specifications provide and give together, with any alternations in the works
or additions thereto, in the time and manner in such schedule (Bill of quantities) and specifications
stipulated to the entire satisfaction of the Engineer, and their successors covenant and agree with
the contractor that during the progress of the works and on the completion of contract to the
satisfaction of the Engineer, the Department shall and will from time to time on receiving the

certificate in writing of the Engineer, the Department shall and will from time to time on receiving the certificates in writing of the Engineer pay to the contractor according to such certificates and the terms of this contract subject nevertheless to deductions or additions thereto or there from which may be lawfully made under terms of this contract. It is hereby mutually agreed and decreed as follows.

- a) All certificates or notices or orders for items or for extra varied or altered works which are to be the subject of an extra or varied charge shall be in writing shall not be valid or binding or be of any effect whatsoever.
- b) The terms contract shall include these presents and the notice inviting tender, letter or tender, bill of quantities and other schedules general conditions and specifications hereto annexed and plans drawings herein and hereafter referred to.
- c) The arbitrator for fulfilling the duties set forth in the arbitration clause of the general conditions of the contract shall be.
 - i) If the contractor claims that the decisions or the instructions of the Engineer/Department are unjustified and that accordingly, he is entitled to extra payments on account thereof he shall forthwith notify this to the Engineer/Department to record his decisions and reasons there for in writing and shall within two weeks state his claims in writing to the Engineer/Department thereafter. The Engineer/Department shall thereafter within four weeks of the receipt of the claim, reply to the points raised in the claim. Unless resolved by negotiation or discussions immediate thereafter within further four weeks the question of liability for such payment will be treated as a dispute.
 - ii) Engineer/Department during the progress of the work, the mode or manner of the exercise of discretion shall not be a matter for arbitration.
 - iii) The decision of the Engineer/Department shall be final, conclusive and binding on all parties to the contract upon all questions relating to the meaning of specifications, design, drawings and instructions, and as to the quality of workmanship or vehicle used on the works or any matter arising out of or relating to the specifications, designs and drawings and instructions concerning the works or the erection of or failure to execute the same arising during the course of works. The above shall not be the subject matter of arbitration and in case shall the work be stopped consequent on such a dispute arising and the work shall also be carried out by the contractor strictly in accordance with the instruction of the Engineer/Department.
 - iv) In case any question, difference or dispute shall arise on matters other than sub clauses (ii) and (iii) and above and except any of the "exclude matters" mentioned in clause 24 touching the construction of any clause herein contained on the rights, duties and liabilities of the parties hereto or any other way touching or arising out of these presents the same shall
 - a) In cases where the total value of claims, under the contract is less than and up to Rs. 50,000/- be referred to the interpretation decision and award of a Superintending Engineer of the Department at the said Arbitrator whose decision shall all be final and binding on the parties to the contract.
 - b) In case where the value of claims is more than Rs. 50,000/-the parties will seek remedy through the competent civil court having local jurisdiction.
 - c) The provisions of the India Arbitration and Reconciliation Act 1998 and the rules there under the statutory modification thereof shall be deemed to apply to such reference and deemed to be incorporated in the contracts. The arbitrator shall state the reasons for the award.

- d) Provided always the contractor shall not except with the consent in writing of the Engineer in any way, delay carrying out works with all the diligence and shall until the decision of the Engineer/Department and no award of the Arbitration/Competent Civil court shall relieve the contractor of hi obligations to adhere strictly to the instructions of the Engineer/Department with regard t o the actual carrying out of the works.
- e) Time shall be considered as essence of the contract and the contractor hereby agrees to commence the work within 30 days from the date of acceptance of his tender by the Department complete the work within. Three/Six/Nine months and to show pr ogress at the stipulated rate subject nevertheless to the provisions for extension of time contained in clause 57 of the general conditions of contract.

In witness where of the contract On behalf of the Department have caused their common seal to be affixed the day and year first above written. Signed, sealed and delivered by the said.

In the presence of

Signature of Contractor

Name and seal.

Signature, Name and
Designation of work.

Signed, by on behalf of
Municipal corporation/Municipality / ULB
Signed, Name and
Designation of witness.

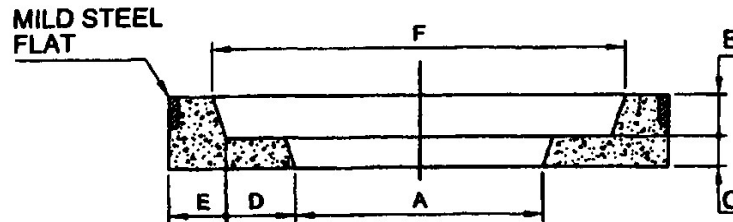
Commissioner _____ Madurai Corporation /

TECHNICAL QUALIFICATION

Amend No. 1 to IS 12592 : 2002

Table 1 Dimensions of Frame
(Clause 5.2)

All dimensions in millimeters.



Grade Designation (1)	Description (2)	Clear Opening in Frame, A (3)	B (4)	C (5)	D (6)	E Min (7)	F Nominal (8)
LD-2.5	Light Duty Rectangular	450 × 600	50	50	50	50	559 × 709
LD-2.5	Light Duty Square	400 × 400 450 × 450	50 50	50 50	50 50	50 50	509 × 509 559 × 559
LD-2.5	Light Duty Circular	370 450 500 560	50 50 50 50	50 50 50 50	50 50 50 50	50 50 50 50	479 559 609 669
MD-10	Medium Duty Rectangular	450 × 600	70	50	50	50	560 × 710
MD-10	Medium Duty Square	450 × 450 600 × 600	70 70	50 50	50 50	50 50	560 × 560 710 × 710
MD-10	Medium Duty Circular	450 500 560 600	70 70 70 70	50 50 50 50	50 50 50 50	50 50 50 50	560 610 670 710
HD-20	Heavy Duty Rectangular (Scraper)	900 × 450	90	75	75	75	1 060 × 610
HD-20	Heavy Duty Square	560 × 560	90	75	75	75	720 × 720
HD-20	Heavy Duty Circular	450 500 560 600	90 90 90 90	75 75 75 75	75 75 75 75	75 75 75 75	610 660 720 760
HD-20	Heavy Duty Lamphole	350	90	75	75	75	510
EHD-35	Extra Heavy Duty Rectangular	900 × 560	100	75	75	75	1 060 × 720
EHD-35	Extra Heavy Duty Square	560 × 560	100	75	75	75	720 × 720
EHD-35	Extra Heavy Duty Circular	450 500 560 600	100 100 100 100	75 75 75 75	75 75 75 75	75 75 75 75	610 660 720 760

NOTES

1 Tolerance on C shall be ± 5 mm, tolerance on A, B, D and E shall be $\begin{matrix} +5 \\ -0 \end{matrix}$ mm.

2 For facility of removing the manhole cover suitable upward taper not more than 5° may be provided to the inner periphery of the frame.

3 If required for the removal of the moulds suitable taper not more than 5° can be given at the lower inner periphery of the frame (see figure).

4 Dimension of cover is covered in 5.2. The dimension F for frames is indicative only and has been arrived at based on the nominal values of dimensions A, B and D and a maximum taper of 5° on the inner periphery of the frame, wherever provided (see Note 2), subject to the provisions in 5.2.

(Page 7, Annex C, clause C-1.2.1, para 2, first sentence) — Substitute the following for the existing:

‘The load shall be applied gradually at the rate of approximately 1 kN/s to 5 kN/s up to 2/3 of the test load.’

(Page 7, Annex C, clause C-1.2.1, para 3, second sentence) — Substitute the following for the existing:

‘The permanent set shall not exceed the following values:

For LD 2.5 and MD 10 — 1/100 time the diameter of the largest circle that can be inscribed in the clear area of the frame as shown in Fig. 3

For HD-20 and EHD-35 — 1/300 time the diameter of the largest circle that can be inscribed in the clear area of the frame as shown in Fig. 3

The permanent set shall be measured to an accuracy of 0.1 mm. Further, no crack wider than 0.2 mm shall appear in the concrete after this test at bottom side of cover.’

(Page 7, Annex C, clause C-1.2.2) — Substitute the following for the existing:

‘Immediately after the test according to C-1.2.1, the load shall be applied at the same rate as given in C-1.2.1, till the full test load is achieved. The test load shall be maintained for a period of 30 ± 2 s. There shall be no loss of adhesion between the concrete and the reinforcing steel at the end of the test.’

**AMENDMENT NO. 2 DECEMBER 2008
TO
IS 12592 : 2002 PRECAST CONCRETE MANHOLE
COVER AND FRAME — SPECIFICATION**

(First Revision)

(Page 2, clause 6) — Substitute the following for the existing:

‘DESIGN

The reinforced concrete manhole cover and frame shall be designed in accordance with the provisions of IS 456. If required by the purchaser, the manufacturer shall furnish the specification and drawing (principle given in IS 456 may be followed).

NOTE — If desired by the purchaser the reinforcement details may be verified against the drawings furnished by the manufacturer by breaking a cover/frame.’

[Page 3, Table 1 (see also Amendment No. 1)] — Substitute the following for the existing values of dimension ‘F’ in col 8 for the corresponding Grade Designation LD-2.5 under col 1 and Clear Opening in Frame, A under col 3:

Grade Designation (1)	Clear Opening in Frame, A (3)	F Nominal (8)
LD-2.5	450 × 600	558 × 708
LD-2.5	400 × 400 450 × 450	508 × 508 558 × 558
LD-2.5	370 450 500 560	478 558 608 668

[Page 4, clause 7.4.2, para 2, second sentence (see also Amendment No. 1)]
— Substitute the following for the existing:

4.4.1 Reinforcement shall be clean and free from loose mill scale, loose rust, mud, oil, grease or any other coating which may reduce or destroy the bond between concrete and steel. A slight film of rust may not be regarded as harmful but steel shall not be visibly pitted by rust.

4.5 Steel Fibres

The diameter/equivalent diameter of steel fibres where used, shall not be greater than 0.75 mm. The aspect ratio of the fibres (ratio of the length of the fibre to its diameter/equivalent diameter) shall be in the range of 50 to 80. The minimum volume of fibres shall be 0.5 percent of the volume of concrete.

In case of propriety fibres, manufacturer's recommendations shall be taken into account.

4.6 Admixtures

Where admixtures are used, they shall conform to IS 9103.

4.7 Water

The water used shall be free from matter harmful to concrete or reinforcement or matter likely to cause efflorescence in the units and shall conform to the requirements of IS 456.

5 SHAPES AND DIMENSIONS

5.1 Shapes

The precast concrete manhole covers and frames shall be of any shape given in 3.1.

5.2 Dimensions and Tolerances

The dimensions and tolerances on dimensions of frames shall be as shown in Table 1 but outside

dimensions of cover at top shall match with the corresponding frame so that the maximum clearance at top between the frame and the cover all round the periphery is not more than 5 mm and the top surface of the frame and cover is in level within a tolerance of ± 5 mm.

For facility of removing the cover from the frame, suitable taper matching with taper given for the frame shall be provided to the periphery of the cover (see Fig. 1).

6 DESIGN

The reinforced concrete manhole cover and frame shall be designed in accordance with the provisions of IS 456. If required by the purchaser, the manufacturer shall furnish the specification and drawings principle given in IS 456 may be followed.

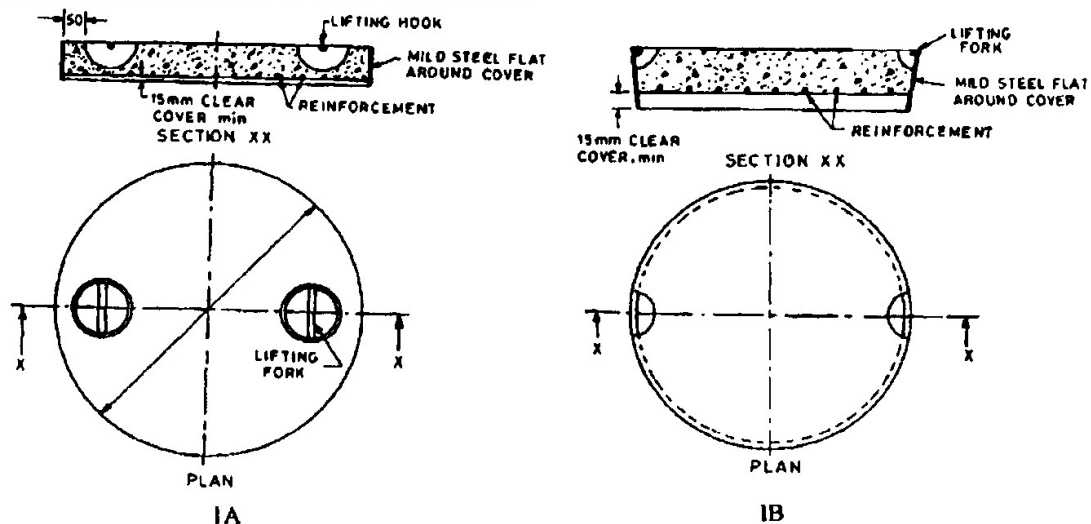
7 MANUFACTURE

7.1 Mixing

Concrete shall be mixed in a mechanical mixer. Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency. If steel fibres are used in addition to reinforcement, it shall conform to the requirements given in 4.5.

7.2 Placing and Compaction

The reinforcement shall be placed in proper position in an appropriate mould coated with a thin layer of mould oil in case of frames and within the protective sheet (see 7.4.2) in case of covers. Concrete shall be filled to slightly overfill and compacted by vibration and struck off level with a trowel.



All dimensions in millimetres.

FIG. 1 TYPICAL ILLUSTRATION OF CIRCULAR PRECAST CONCRETE MANHOLE COVER

Table 1 Dimensions of Frame
(Clause 5.2)

All dimensions in millimetres.



Grade Designation (1)	Description (2)	Clear Opening in Frame (3)	B (4)	C (5)	D (6)	E Min (7)	F Min (8)
LD-2.5	Light Duty Rectangular	450 × 450	50	50	50	50	566
LD-2.5	Light Duty Square	450 × 450 400 × 400	50 50	50 50	50 50	50 50	566 × 566 516 × 516
LD-2.5	Light Duty Circular	370 560 500 450	50 50 50 50	50 50 50 50	50 50 50 50	50 50 50 50	486 676 616 566
MD-10	Medium Duty Rectangular	450 × 600	70	50	50	50	570 × 720
MD-10	Medium Duty Circular	450 500 560 600	70 70 70 70	50 50 50 50	50 50 50 50	50 50 50 50	570 620 680 720
HD-20	Heavy Duty Rectangular (Scraper)	900 × 450	90	75	75	75	1 080 × 630
HD-20	Heavy Duty Square	560 × 560	90	75	75	75	740 × 740
HD-20	Heavy Duty Circular	450 500 560 600	90 90 90 90	75 75 75 75	75 75 75 75	75 75 75 75	630 680 740 780
HD-20	Heavy Duty Lamphole	350	90	75	75	75	530
EHD-35	Extra Heavy Duty Rectangular	900 × 560	100	75	75	75	1 078 × 738
EHD-35	Extra Heavy Duty Square	560 × 560	100	75	75	75	738 × 738
EHD-35	Extra Heavy Duty Circular	450 500 560 600	100 100 100 100	75 75 75 75	75 75 75 75	75 75 75 75	628 678 738 778

NOTES

1 Tolerance on C shall be ± 5 mm, tolerance on A, B, D and E shall be $\begin{smallmatrix} +5 \\ -0 \end{smallmatrix}$ mm.

2 For facility of removing the manhole cover suitable upward taper not more than 5° may be provided to the inner periphery of the frame.

3 If required for the removal of the moulds suitable taper not more than 5° can be given at the lower inner periphery of the frame (see figure).

7.2.1 Use of needle vibrators for compacting the wet concrete mix containing fibres is not recommended since the holes left by the vibrator in the wet mix may not close after its removal owing to the interlocking of the fibres with the mix. Compaction by means of shutter or form or table vibrators is recommended. In case of extra heavy duty and heavy duty cover and frame, compaction by means of pressure-cum-vibration technique may also be employed so as to achieve dense and strong concrete.

7.2.2 Clear cover to reinforcement shall be not less than 15 mm.

7.2.3 After demoulding, cover and frame shall be protected until they are sufficiently hardened to permit handling without damage.

7.3 Curing

7.3.1 The hardened concrete manhole cover and frame shall be placed in a curing water tank. The period of curing shall be as given in IS 456.

7.3.2 Steam curing of manhole cover and frames may be adopted instead of method specified in 7.3.1, followed by normal curing for 7 days provided the requirements of pressure or non-pressure steam curing are fulfilled and the manhole cover and frames meet the requirements specified in this standard.

7.4 Edge Protection and Finishing

7.4.1 Frame

The top and inside surface of frames shall be smooth. To prevent the top outer edge from possible damages, it shall be protected by 25 mm × 3 mm mild steel flat as part of the frame. Sufficient number of steel connectors shall be welded to the inner surface of the mild steel flat so as to connect it with the frame reinforcement and these shall be embedded in the concrete during casting. Exposed surface of mild steel flat shall be given suitable treatment with anticorrosive paint or coating.

7.4.2 Cover

To prevent any possible damage from corrosion of reinforcing steel, the underside of the covers shall be treated with anticorrosive paint. The top surface of the covers shall be given a chequered finish.

In order to protect the edges of the covers from possible damage at the time of lifting and handling, it is necessary that the manhole covers shall be cast with a protective mild steel sheet of minimum 2 mm thickness around the periphery of the covers. Exposed surface of mild steel sheet shall be given suitable treatment with anti-corrosive paint or coating.

7.4.3 Suitable arrangements may be made for fixing the manhole cover and frame in position on the

manholes by mutual agreement between the manufacturer and the purchaser.

7.4.4 The manufacture of manhole cover and frame shall be such as to ensure the compatibility of their seatings. For classes HD 20 and HD 35, these seatings shall be manufactured in such a way as to ensure stability and quiteness in use. This may be achieved by grinding the contact surface, if needed.

8 LIFTING HOOKS

The minimum diameter of mild steel rod used as lifting device shall be 12 mm for light and medium duty covers and 16 mm for heavy and extra heavy duty covers. The lifting device shall be protected from corrosion by hot dip galvanizing or any other suitable means approved by the purchaser or shall be made of naturally corrosion resistant metal rods.

The lifting arrangement shall be as agreed between the manufacturer and the purchaser. Typical arrangements of lifting devices are shown in Fig. 1A and 1B.

9 PHYSICAL REQUIREMENTS

9.1 General

All the covers and frames shall be sound and free from cracks and other defects which interferes with the proper placing of the unit or impair the strength or performance of the units. Minor chippings resulting from the customary method of handling and transportation shall not be deemed ground for rejection.

9.2 Dimensions

The dimensions of the cover and frame shall be as specified in 5; the overall dimensions of the units shall be measured in accordance with Annex B.

9.3 Load Test

The breaking load of individual units when tested in accordance with the method described in Annex C shall be not less than the values specified in Table 2. Also, the permanent set shall not exceed the requirement given in Annex C.

Table 2 Test Load and Diameter of Block
(Clauses 9.3, 12.3 and C-1.1)

Grade of Cover	Type	Load	Diameter of Block
		kN	mm
(1)	(2)	(3)	(4)
LD-2.5	Rectangular, square or circular	25	300
MD-10	Rectangular or circular	100	300
HD-20	Rectangular, square or circular	200	300
EHD-35	Rectangular, square or circular	350	300

10 TESTS

Tests shall be conducted on samples of covers and frames selected according to the sampling procedure given in 11, to ensure conformity with the physical requirements laid down in 9.

11 SAMPLING AND INSPECTION

11.1 Scale of Sampling

11.1.1 Lot

In any consignment, 500 percast concrete manhole covers and frames or a part thereof the same dimensions and belonging to the same batch of manufacture, shall be grouped together to constitute a lot.

11.1.2 For ascertaining the conformity of the materials in the lot to the requirements of this specification, samples shall be tested from each lot separately.

11.1.3 The number of covers and frames to be selected from the lot shall depend on the size of the lot and shall be according to Table 3.

Table 3 Scale of Sampling and Permissible Number of Defectives
(Clauses 11.1.3, 11.4.2 and 12.2)

No. of Covers or Frames in the Lot	Dimensional Requirements		Number of Samples for Load Test on Cover Only
	Sample Size	Acceptance Number	
(1)	(2)	(3)	(4)
Up to 100	10	1	2
101 to 200	15	1	3
201 to 300	20	2	4
301 to 500	30	3	5

NOTE — If the number of covers in the lot is 20 or less, the number of samples for load test shall be decided by mutual agreement between the purchaser and the manufacturer.

11.2 Sampling Covers and Frames in Motion

Whenever practicable, samples of covers and frames shall be taken when the units are being moved as in the case of loading, unloading, etc. The batch from where the samples are to be drawn shall be divided into a number of convenient portions such that when one sample is drawn from each of these portions, the minimum number of units specified under 11.1.3, is provided.

11.3 Sampling Covers and Frames from a Stack

The number of covers and frames required for the test shall be taken at random from across the top of the stacks, the sides accessible and from the interior of the stacks by opening trenches from the top.

11.4 Number of Tests

11.4.1 All the covers and frames selected according to 11.1.3, shall be checked for dimensions (*see* 9.2) and inspected for visual defects (*see* 9.1).

11.4.2 The number of covers to be subject to load test shall be according to col 4 of Table 3.

12 CRITERIA FOR CONFORMITY

12.1 The lot shall be considered as conforming to the requirements of the specification conditions mentioned in 12.2 and 12.3 are satisfied.

12.2 The number of covers and frames with dimensions outside the tolerance limit and/or with visual defects among those inspected shall be less than or equal to the corresponding acceptance number given in col 3 of Table 3.

12.3 For load test no value shall be less than the load specified in Table 2.

13 MANUFACTURER'S CERTIFICATE

The manufacturer shall satisfy himself that the manhole cover and frame conform to the requirements of this specification, and if requested, shall supply a certificate to this effect to the purchaser or his representative.

14 MARKING

14.1 Following information shall be clearly and permanently marked on top of each manhole cover and frame:

- Identification of the source of manufacture;
- Grade designation denoted by LD 2.5/MD 10/HD 20/EHD 35;
- Any identification mark as required by the purchaser; and
- Year and month of manufacture of the manhole cover and frame marked at any appropriate location.

14.2 BIS Certification Marking

The manhole cover and frame may also be marked with the Standard Mark.

14.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
269 : 1989	Specification for ordinary Portland cement, 33 grade (<i>fourth revision</i>)	1786 : 1985	Specification for high strength deformed steel bars and wires for concrete reinforcement (<i>third revision</i>)
383 : 1970	Specification for coarse and fine aggregates from natural sources for concrete (<i>second revision</i>)	2062 : 1992	Specification for steel for general structural purposes (<i>fourth revision</i>)
432	Specification for mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement:	6909 : 1990	Specification for supersulphated cement (<i>first revision</i>)
(Part 1) : 1982	Mild steel and medium tensile steel bar (<i>third revision</i>)	8041 : 1990	Specification for rapid hardening Portland cement (<i>second revision</i>)
(Part 2) : 1982	Hard-drawn steel wire (<i>third revision</i>)	8043 : 1991	Specification for hydrophobic Portland cement (<i>second revision</i>)
455 : 1989	Specification for Portland slag cement (<i>fourth revision</i>)	8112 : 1989	Specification for 43 grade ordinary Portland cement (<i>first revision</i>)
456 : 2000	Code of practice for plain and reinforced concrete (<i>fourth revision</i>)	9103 : 1999	Specification for admixtures (<i>first revision</i>)
1489	Specification for Portland-pozzolana cement:	12269 : 1987	Specification for 53 grade ordinary Portland cement
(Part 1) : 1991	Flyash based (<i>third revision</i>)	12330 : 1988	Specification for sulphate resistance Portland cement
(Part 2) : 1991	Calcined clay based (<i>third revision</i>)		

ANNEX B*(Clause 9.2)***MEASUREMENT OF DIMENSIONS****B-1 PROCEDURE**

B-1.1 Individually measurements of the dimensions of each unit shall be made with a steel scale graduated in 1 mm divisions and shall be read to the nearest division of scale and the average recorded.

B-1.2 Length and diameter shall be measured on the longitudinal centre line of each face, width of square or

rectangular manhole covers across the top and bottom bearing at midlength and thickness on both faces at midlength.

B-2 REPORT

The report shall show the average length, width, or diameter and thickness of each specimen.

ANNEX C*(Clause 9.3)***METHOD FOR LOAD TEST****C-1 PROCEDURE**

C-1.1 A suitable testing arrangement is shown in Fig. 2. The cover shall be supported in a frame which may be standard frame or a specially made testing appliance simulating normal conditions of use. The specified load as given in Table 2 shall be applied

without shock through the medium of a bearing block faced with hard rubber or other resilient material. The bearing block shall be of the size specified in Table 2 and shall bear centrally on the cover. The block shall be sufficiently rigid to ensure that the load on the cover is uniformly distributed over the full area of the block.

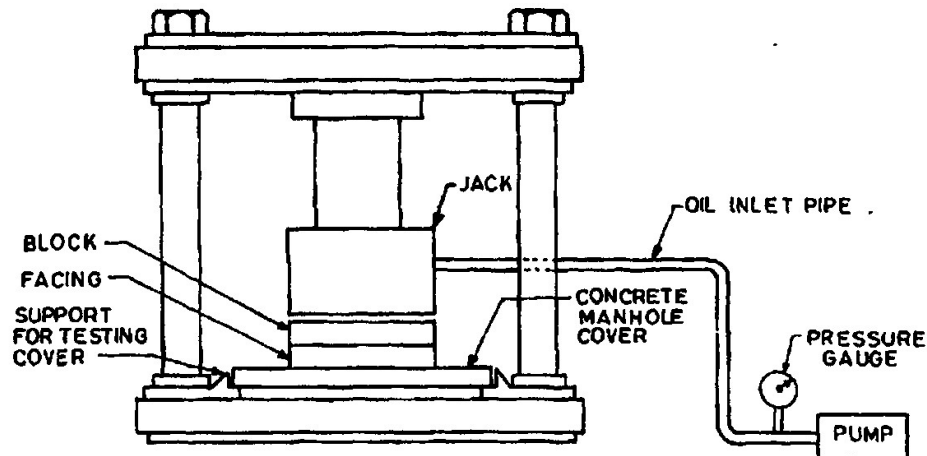


FIG. 2 ARRANGEMENT FOR LOAD TEST OF MANHOLE COVER

C-1.2 All covers shall be submitted to the following tests:

- Measurement of the permanent set of the cover after the application of 2/3 of the test load.
- Application of test load.

C-1.2.1 *Measurement of Permanent Set of the Cover After the Application of 2/3 of the Test Load.*

Before the load is applied take an initial reading at the geometric centre of the cover.

The load shall be applied at the rate of approximately 0.6 ± 0.4 N/mm/s up to 2/3 of the test load. The load on the test specimen is then released. This procedure shall be carried out five times. Then take reading at the geometric centre.

The permanent set shall then be determined on the difference of the measured readings before the first and the fifth loading. The permanent set shall not exceed 1/100 times the diameter of the largest circle that can be inscribed in the clear area of the frame as shown in Fig. 3.

C-1.2.2 *Application of the Test Load*

Immediately after the test according to C-1.2.1, the test load shall be applied at the same rate given in C-1.2.1, the test load shall be applied until it is achieved. The test load to be maintained for 30 ± 2 s. Cover shall not show cracks in the course of the test.

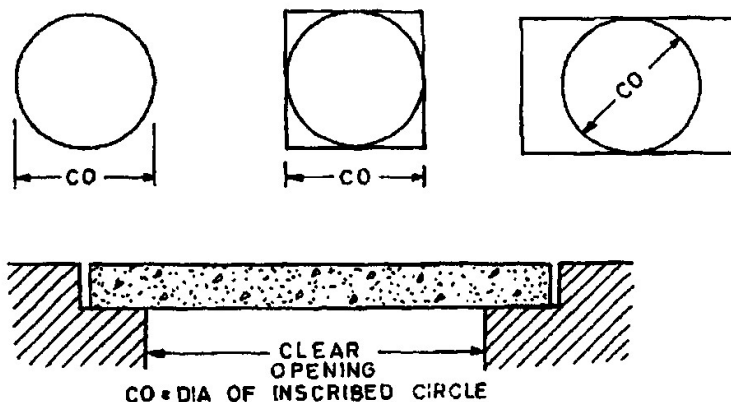


FIG. 3 ILLUSTRATION OF LARGEST INSCRIBED CIRCLE IN CLEAR AREA

‘A’-Schedule

"A" Schedule

NAME OF WORK : Supply and Delivery of 600mm dia FRC manhole frame with cover as per IS 12592/2007 and as amended from time to time with in pint of MMC and year during casing etc., complete for Madurai City Municipal Corporation.

Ref. No : E2 / Est. No. 820/2021-2022 (3rd CALL)

Sl. No	Quantity	Details of Work	Unit	Amount
1	1000.00 No	Supplying and FRC frame with manhole cover 600mm dia (heavy duty) with the imprint of MMC and the year during casting etc, Complete.., MDU-CORP-ROAD-DATA-P-34-SI 24	1 No	
		GST 18%		

Contractor's Signature

Challan No:

Mobile No:

Contractor Class & Registration No:

Address