



GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION
(A Govt. of Gujarat Undertaking)
Office of the Executive Engineer,
1st Floor, Plot No.-622/A,
Administrative Building, Near Notified Office,
Valia Road, GIDC, Ankleshwar -393 002.
Email: xen-ank@gidcgujarat.org

E-TENDER NOTICE NO. 03 OF 2026-27
SR No. 06

For

Repairing GIDC Staff Quarters 4 block of RCL-12-(17,18,19,20) at GIDC
Ankleshwar.

Name of work : Repairing GIDC Staff Quarters 4 block of RCL-12-(17,18,19,20) at GIDC Ankleshwar.

INDEX

SR. NO.	PARTICULARS	PAGES FROM TO
1	Notice inviting tenders	3-11
2	Memorandum of work in brief	12-15
3	Instruction for Prequalification	16-26
4	General Conditions & Information and Instructions to bidders	27-35
5	Special conditions	36-39
6	General Technical Specification	40-54
7	Specification of Materials	55-82
8	Code of Practice	83-151
9	Item wise Specification	152-176
10	SCHEDULE – B	177-183
11	B-2 Agreement (Containing Page No.1 to 48)	Attached

ગુજરાત ઔદ્યોગિક વિકાસ નિગમ



(ગુજરાત સરકારનું સાહસ)
અધિક્ષક ઇજનેરશ્રી (મ.ગુ) ની કચેરી,
પાંચબત્તી, જી.આઇ.ડી.સી., ભરૂચ.
ફોન નંબર (૦૨૬૪૨)૨૪૨૪૪૨
જાહેર નિવેદા નં.૦૩/૨૦૨૬-૨૭

ગુજરાત ઔદ્યોગિક વિકાસ નિગમની વર્તુળ કચેરી અધિક્ષક ઇજનેરશ્રી(મ.ગુ), જી.આઇ.ડી.સી., ભરૂચનાં તાબા હેઠળ કાર્યરત વિભાગીય કચેરીઓ માટે અનુ.નં .૦૧ ના કામો માટેનું ટેન્ડર આર.પદ્ધતી અને અનુ .પી.એફ.નં .૦૨ થી ૧૭ ના કામો માટેના ટેન્ડરો ઓનલાઇન પદ્ધતી થી આમંત્રિત કરવામાં આવે છે. જેની અંદાજીત કિંમત પૈકી લઘુત્તમ અંદાજીત કિંમત રૂ. ૪૪,૫૮,૬૦૦.૦૦ અને મહત્તમ અંદાજીત કિંમત રૂ. ૩૦,૫૪,૯૪,૨૩૦.૪૧ ની વચ્ચે છે.

ઓનલાઇન ટેન્ડર વેબ સાઇટ <https://tender.nprocure.com> ઉપરથી ડાઉનલોડ-અપલોડ નિયત સમય-મર્યાદામાં કરી શકાશે. આ કામોની વિગતવાર જાહેર નિવેદા ઓફિસનાં નોટીસ બોર્ડ ઉપર અને જી.આઇ.ડી.સી.ની વેબસાઇટ www.gidc.gujarat.gov.in તેમજ માહિતી ખાતાની www.statetenders.gujarat.gov.in માં જોઇ શકાશે. નિવેદામાં જણાવેલ તમામ ટેન્ડરો અથવા તે પૈકી કોઇ પણ એક, કારણ જણાવ્યા વગર સ્વીકારવા, ન સ્વીકારવા તેમજ રદ કરવા એ નિગમનો અબાધિત અધિકાર છે, જે તમામને બંધનકર્તા રહેશે. બાના મુકતિ પ્રમાણપત્ર ગ્રાહ્ય/સ્વીકાર્ય નથી. વધુમાં, ટેન્ડરને લગતા તમામ સુધારા / વધારા <https://tender.nprocure.com> વેબ-સાઇટ પર ટેન્ડર ભરવાની છેલ્લી તારીખ સુધી જોવાની રહેશે.

સહી/-

અધિક્ષક ઇજનેર (મ.ગુ)
ગુ.ઔ.વિ.નિ., ભરૂચ.

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

(A Govt of Gujarat Undertaking)

Office of the Superintending Engineer (CG)

2nd Floor, Narmada Commercial Complex,

M.G.Road, PanchBatti, Bharuch-392001

Phone: (02642)242432/242442 FAX:(02642)241902

E-TENDER NOTICE No. 03 of 2026-27

The tender for the works vide Sr.no. 01for RFP and 02 to 17 having minimum cost Rs.44,58,600.00 to maximum cost Rs. 30,54,94,230.41are invited by office of the Superintending Engineer (CG), G.I.D.C., Bharuch under jurisdiction various offices through online.

The tenders for Online works can be uploading - download on website <https://tender.nprocure.com>. The detailed tender notice can be seen in GIDC office notice board / GIDC website www.gidc.gujarat.gov.in / information department website www.statetenders.gujarat.gov.in . Right to reject any or all the tenders without assigning any reasons thereof are reserved by G.I.D.C., which will be binding to all bidders. Exemption certificate for Earnest Money Deposit should not be acceptable. Please stay touring web site - <https://tender.nprocure.com> for any corrigendum / addendum / modification till last date of receipt.

Sd/-

Superintending Engineer (CG)

G.I.D.C., Bharuch.

(NOT FOR PUBLICATION)**GUJARAT INDUSTRIAL DEVELOPMENT
CORPORATION**

(A Govt. of Gujarat Undertaking)
Office of the Superintending Engineer (CG)
2nd Floor, Narmada Commercial Complex,
M.G. Road, PanchBatti, Bharuch-392001
Phone: (02642)242432/24244 FAX:(02642)241902

E-TENDER NOTICE NO. 03 OF 2026-27

Online and Offline for the following works of GIDC are publically invited from the intending bidders registered in appropriate class with state Govt. of Gujarat R&B/ W.R.D / GIDC and other State Governments equivalent, by the Superintending Engineer (CG), GIDC, “Bharuch”, 2nd floor, Narmada Commercial Complex, Panchbatti, Bharuch 393001 under jurisdiction Executive Engineer (R&B), GIDC, Bharuch, Executive Engineer, GIDC, Ankleshwar, Executive Engineer (M&E), GIDC, Bharuch, Executive Engineer, GIDC, Vadodara and Executive Engineer (W/s & Drg.), GIDC, Bharuch on web site <https://tender.nprocure.com>, www.statetenders.gujarat.gov.in

DETAILS FOR ONLINE TENDERS :

The tenders under Sr. No. 01 for RFP and 02 to 17 are invited percentage (%) above / below – B1 Agreement / Item rate – B2 Agreement and two bid System (Technical bid & Price bid). The bids will be opened on schedule date and thereafter on evaluation thereof, the price bid of the pre-qualified bidders, will only be opened.

GENERAL DETAILS OF WORKS:

Sr. No	Name of work	Estimated cost Earnest Money Deposit Non-refundable Tender Fee (Inclusive of 18% G.S.T)	Class of registration
	Bharuch (R&B) DIVISION		
1	Project Management Consultancy Services for Construction & Development of CoE (Centre of Excellence) buildings as per requirement of Engineering, Textile and Chemical at GIDC Estates. (Re-invited)	(1) Rs. ----- (2) Rs. 1,00,000.00 (3) Rs. 2,832.00	As Per Tender Document
	ANKLESHWAR DIVISION		
2	Upgradation and Strengthening of remaining SWD of GIDC Jhagadia Estate by Notified Area, Jhagadia. (Re-invited)	(1) Rs. 6,42,90,617.00 (2) Rs. 6,42,907.00 (3) Rs. 14,160.00	"A" Class and Above
3	Construction of RCC SWD, Recharge well and Water Distribution Line & E.S.R. Tank at GIDC, Rajpipla-1 Industrial Estate. (Re-invited)	(1) Rs. 2,71,76,938.44 (2) Rs. 2,71,770.00 (3) Rs. 4,248.00	"B" Class and Above

4	Work of Construction of PQC approach road with SWD from NH-48 at GIDC, Ankleshwar. (Re-invited)	(1) Rs. 2,62,65,315.28 (2) Rs. 2,62,654.00 (3) Rs. 4,248.00	"B" Class and Above
5	Construction of RCC SWD and recharge well @ GIDC Rajpipla-2 Industrial Estate. (Re-invited)	(1) Rs. 2,45,35,140.00 (2) Rs. 2,45,352.00 (3) Rs. 4,248.00	"B" Class and Above
6	Repairing GIDC Staff Quarters 4 block of RCL-12-(17,18,19,20) at GIDC Ankleshwar.	(1) Rs. 99,88,359.48 (2) Rs. 99,884.00 (3) Rs. 2,832.00	"D" Class and Above
	M&E DIVISION, GIDC, Bharuch		
7	Design, Engineering, Supply, Installation, Testing and commissioning of "Non Clog End Suction Type Horizontal Centrifugal Pump Set for effluent" with accessories and allied Electro-Mechanical and Instrumentation and SCADA work at Dahej PCPIR Pumping Station at Dahej - II. (Suva Village).	(1) Rs. 4,95,10,474.00 (2) Rs. 4,95,105.00 (3) Rs. 7,080.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
8	Annual Comprehensive Maintenance Contract (ACMC) for the work of Operation, Maintenance and Repairing of all and all risk comprehensive maintenance contract for all installed Air Quality Monitoring Station Covering all Manpower Support, Moving Crane, Transport, Sensor Replacement, Cloud Software and all Allied Accessories at Dahej PCPIR Industrial Estate.	(1) Rs. 3,37,28,000.00 (2) Rs. 3,37,280.00 (3) Rs. 7,080.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
9	Annual Comprehensive Maintenance Contract (ACMC) for the work of Operation, Maintenance and Repairing of all and all risk comprehensive maintenance contract for all Installed toxic gas removal system at all drainage pumping Station Covering all Manpower Support, Transport, Media Replacement and all allied accessories at Dahej GIDC Industrial Estate.	(1) Rs. 3,28,81,000.00 (2) Rs. 3,28,810.00 (3) Rs. 7,080.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
10	Annual Comprehensive Maintenance Contract (ACMC) for the work of Operation, Maintenance and Repairing of all and all risk comprehensive maintenance contract for all Installed water quality monitoring buoy at all reservoir on Real Time Basis Covering all Manpower Support, Transport, Sensor Replacement, Cloud Software and all allied accessories at Dahej GIDC Industrial Estate.	(1) Rs. 2,03,38,000.00 (2) Rs. 2,03,380.00 (3) Rs. 4,248.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
11	Design, Engineering, Supply, Installation, Testing and commissioning of " Non Clog	(1) Rs. 1,86,19,741.00 (2) Rs. 1,86,198.00	Bidder should be as per 2.

	sewage Submersible type Pumps with accessories and allied Electro-Mechanical and Instrumentation and SCADA work accessories at Dahej PCPIR Pumping Station.	(3) Rs. 4,248.00	Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
12	Design Supply Installation Testing & Commissioning of Solar Roof Top plant at GIDC Ankleshwar Office Building.	(1) Rs. 44,58,600.00 (2) Rs. 44,586.00 (3) Rs. 1,770.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
13	Annual Comprehensive Maintenance Contract (ACMC) for the work of Atmospheric Pollution Monitoring on Real Time Basis Covering all Manpower Support, Transport, Sensor Replacement, Cloud Software and all Allied Accessories Including Civil Foundation, GSM Connectivity, Transport, Maintenance Arrangement, Spares, Sensor replacement, Cloud Software, Manpower etc at Dahej GIDC Industrial Estate.	(1) Rs. 1,27,96,000.00 (2) Rs. 1,27,960.00 (3) Rs. 4,248.00	Bidder should be as per 2. Prequalification criteria for Work-(2.1) Eligibility and Having similar Experience
	BARODA DIVISION		
14	Construction of New Office Building at Vadodara.	(1) Rs. 9,99,93,434.00 (2) Rs. 9,99,935.00 (3) Rs. 14,160.00	"AA" Class and Sp. Category Building – I
15	Construction of basic Infrastructure facilities including Water supply Distribution Network, Toilet Block, Site grading and Pumping machinery at GIDC, Indranaj Estate.	(1) Rs. 4,29,54,610.42 (2) Rs. 4,29,547.00 (3) Rs. 7,080.00	"A" Class and Above
16	Construction of Flexible pavement road including street light at Sahera Industrial Estate. (Re-invited)	(1) Rs. 2,09,07,806.48 (2) Rs. 2,09,079.00 (3) Rs. 4,248.00	"B" Class and Above & Sp. Category Road - III
	Bharuch (W/s & Drg.) DIVISION		
17	Work of water supply line infrastructure for M/s Petronet LNG Ltd for their Petrochemical complex at Dahej and ARHC complex at Eksal Village including Five years free maintenance guarantee period.	(1) Rs. 30,54,94,230.41 (2) Rs. 30,54,943.00 (3) Rs. 21,240.00	"AA" Class

(A) SCHEDULE OF E-TENDERING

(i)	Downloading of Tender Documents from Web site of www.nprocure.com (The tender document for these work are available only in Electronic format which Bidder can download at free of cost)	From 08th June 2026 to 30th June 2026 upto 17.00 hours
-----	---	--

(ii)	SUBMISSION OF TENDER Online submission Online submission of bid documents. Scanned copies of DD for tender fee & EMD in electronic format only through online	From 08th June 2026 to 30th June 2026 upto 17.00 hours
	Other Documents required to be submitted by scanning in electronic format only through online Required Class of registration Valid Bank Solvency and also as per para - C - Sub para 4	From 08th June 2026 to 30th June 2026 upto 17.00 hours
	Submission in physical form D.D. / FDR in original (for Tender fee & EMD) Other documents mentioned in para C, Sr. No. 5 for the purpose of verification only (in physical form) by personally i.e by Speed Post / Currier / Hand delivery. (Kindly refer C-1,2 &3)	From 1st July 2026 to 3rd July 2026 upto 17.00 hours
(iii)	Opening of Technical Bid documents.	In the Office of Superintending Engineer (CG), GIDC, 2nd floor, Narmada Commercial Complex, PanchBatti, Bharuch as under:- Preferably On dtd. 4th July 2026 at 12.00 noon

(B) On line Submission of Tender

Bidders can prepare & edit their offers number of times before tender submission date & time. After tender submission date & time, bidder cannot edit their offer submitted in any case. No written or online request in this regard shall be granted.

Bidder shall submit their offer i.e. Pre-qualification document with Technical Bid & Price Bid in Electronic format on above mentioned website & Date shown above after digitally signing the same.

For the purpose of verification, the original documents for Pre-qualification submitted in electronic format for Sr. No. 01 to 17 should be submitted in physical form as under:-

For Sr. No. 01 - O/o Executive Engineer, Construction Division, Dahej -II, GIDC, Bharuch, Narmada Commercial Complex, 1st floor, Panchbatti, Bharuch

For Sr. No. 02 to 06 - O/o Executive Engineer, GIDC Admin Building, Plot no. 624/B, Valia Road, GIDC, Ankleshwar-393002

For Sr. No. 07 to 13 - O/o Executive Engineer, (M&E) Dn. GIDC, 2nd floor, Narmada Commercial Complex, PanchBatti, Bharuch

For Sr. No. 14 & 16 - O/o Executive Engineer, GIDC, 5th floor, Unique Trade Centre, Sayajigunj, Vadodara

For Sr. No. 17 - O/o Executive Engineer, (W/s & Drg.) Dn., GIDC, Bharuch, Narmada Commercial Complex, 1st floor, Panchbatti, Bharuch

By personally i.e by hand delivery during office hours.

Offers submitted without digitally signed will not be accepted.

Offers i.e. Pre-qualification document with Technical Bid & Price Bid in physical form will not be accepted in any case.

It is Bidder's responsibility to verify Online Corrigendum / Amendments until last submission date and time as well as before Final Submission of Bid.

Required documents for pre Pre-qualification document received later than the time specified will not be accepted in any case and the bid of that bidder shall be considered non-responsive.

(C) Submission of Tender Fees, EMD

Interested Bidders can view these tender documents online, but bidders who are interested in bidding these tenders can download tender documents from web site as mentioned above and bidder who wish to submit their offer shall pay non-refundable tender fee in the form of Account Payee Demand Draft payable at Bharuch, Ankleshwar and Baroda respectively for the works as under drawn on any Nationalized Bank in favour of -

Executive Engineer, Construction Division, Dahej -II, GIDC, Bharuch for work at Sr. No. 01

Executive Engineer, GIDC, Ankleshwar for work at Sr. No. 02 to 06 & 12

Executive Engineer, GIDC, Bharuch for work at Sr. No. 07 to 11 & 13 & 17

Executive Engineer, GIDC, Baroda for work at Sr. No. 14 to 16

EMD in the form of Account Payee Demand Draft / F.D.R. payable at Bharuch and Baroda drawn on any Scheduled / Nationalized Bank in favour of Executive Engineer (R&B), GIDC, Bharuch, Executive Engineer, GIDC, Ankleshwar, Executive Engineer, GIDC, Baroda and Executive Engineer (W/s & Drg.), GIDC, Bharuch respectively for the works pertaining to respective divisions as under. EMD in the form of Bank Guarantee of the Scheduled Bank or Nationalized Bank also acceptable as per the manner set out in the prevailing Form B1 & Form B2.

Executive Engineer, Construction Division, Dahej -II, GIDC, Bharuch for work at Sr. No. 01

Executive Engineer, GIDC, Ankleshwar for work at Sr. No. 02 to 06 & 12

Executive Engineer, GIDC, Bharuch for work at Sr. No. 07 to 11 & 13 & 17

Executive Engineer, GIDC, Baroda for work at Sr. No. 14 to 16

Demand Draft for E.M.D. & Tender Fee shall be submitted in Electronic Format only through Online (by scanning) while uploading the Bid. This submission shall mean that E.M.D. & Tender Fee are received. Accordingly, offer of those shall be opened whose E.M.D. & Tender Fee is received electronically as well as received in physical form. For the purpose of realization of D.D. as stated above under para (C- 1 & C - 2). However, bidder shall send the D.D. in original along with other documents (as stated in para C- 5) by personally i.e. by Speed Post/ Currier /Hand delivery during office hours as per point No. B-3.

Required Documents mentioned as under (a), (b), (c) & (d) are mandatory for submitting scanned copies through ONLINE. Otherwise tender offer shall be treated as NON RESPONSIVE, without any further intimation.

Scanned copy of tender fee and EMD

Required Class of registration, Latest Income Tax return filed, R.P.F.C registration certificate with latest challan, Pan Card & GST Registration certificate.

Fresh Valid Bank Solvency- (Calendar Year) - (20% value of the estimated cost put to tender)

Other documents if any mentioned in tender documents.

For the purpose of verification, the original documents submitted in electronic format should be submitted in physical form for the works in the manner set out below by personally i.e. by hand delivery during office hours.

Original tender fee in form of DD and EMD in form of DD/ FDR.

Executive Engineer, Construction Division, Dahej -II, GIDC, Bharuch for work at Sr. No. 01

Executive Engineer, GIDC, Ankleshwar for work at Sr. No. 02 to 06

Executive Engineer (M&E), GIDC, Bharuch for work at Sr. No. 07 to 13

Executive Engineer, GIDC, Baroda for work at Sr. No. 14 to 16

Executive Engineer, GIDC, Bharuch for work at Sr. No. 17

Tender fee, EMD in original and other required documents for verification received before or later than the time From 1st July 2026 to 3rd July 2026 upto 17.00 hours will not be accepted in any case and the bid of that bidder shall be considered non-responsive. GIDC will not be responsible for delay in receipt of such documents due to any reasons by the postal department or any other agencies.

Any documents in supporting of tender bid shall be submitted in electronic format only through online (by Scanning etc.) and hard copy will not be accepted separately.

GENERAL :

Intending bidders or their representative who wish to remain present at the time of tender opening can do so.

The tender fees for on line tender document will not be refunded under any circumstances.

EMD in the form specified in tender document only shall be accepted.

Exemption certificate for Earnest Money Deposit should not be acceptable.

Tenders without Registration Certificate, Special Category Certificate, Solvency Certificate, Tender fees, Earnest Money Deposit (EMD) and which do not fulfill all or any of the condition or submitted incomplete in any respect will be rejected.

This tender notice shall form a part of tender / contract document.

Conditional tender shall not be accepted.

Rules of GIDC are binding to the Tenderer.

GIDC reserves the rights to reject any or all tenders without assigning any reason thereof.

Please stay touring above web sites for any corrigendum / addendum/ modification till last date of receipt.

NOTE :

If any clarification / query regarding these tenders are required, do not hesitate to contact our concerned Executive Engineers through mobile.

For Bharuch Division (R&B) - Shri A. R. Raval – I/c Executive Engineer – Mo. 9409046898

For Ankleshwar Division - Shri S. S. Das – Executive Engineer – Mo. 9726424264

For Bharuch Division (M&E)- Shri Kapil Oza - Executive Engineer - Mo. 9825608907

For Baroda Division – Shri D. K. Lad - Executive Engineer – Mo. 9879110077
For Bharuch Division (W/s & Drg.) - Shri A. R. Raval – I/c Executive Engineer – Mo.
9409046898

Sd/-
SE, GIDC, Bharuch

MEMORANDUM OF WORK IN BRIEF

1)	Name of work	Repairing GIDC Staff Quarters 4 block of RCL-12- (17,18,19,20) at GIDC Ankleshwar.
2)	Estimated cost	Rs.99,88,359.48
3)	Joint Venture (J.V)	Joint Venture (J.V.) is not allowed.
4)	Earnest Money Deposit (EMD) Total 1% of the estimated cost.	<p>Total amount Rs.99,884.00</p> <p>Rs.99,884.00/- in the form of D.D./F.D.R for the minimum period of 180 days in favor of "Executive Engineer, GIDC, Ankleshwar" from any Nationalized/Scheduled Bank or any approved bank by government's latest G.R.</p> <p style="text-align: center;">OR</p> <p>Rs. 50,000/- in the form of D.D./F.D.R for the minimum period of 180 days in favor of "Executive Engineer, GIDC, Ankleshwar" from any Nationalized/Scheduled Bank or any approved bank by government's latest G.R.</p> <p style="text-align: center;">AND</p> <p>Remaining amount of Rs.49,884.00/-in the form of B.G./D.D./F.D.R for the minimum period of 180 days in favor of "Executive Engineer, GIDC, Ankleshwar" from any Nationalized / Scheduled Bank.</p> <p>(FDR or BG of schedule bank will be accepted as per the GR No. FD/MSM/e –file/4/2025/2712/D.M.O. Dated 01/04/2026 of Finance department of Government of Gujarat and as per the amendment issued by GoG from time to time)</p>
5)	Validity period of tender offer.	120 days from the date of opening of online bids.
6)	Total Security Deposit- 10.00% of estimated cost put to tender + GST @18% -	Rs.11,78,800.00 (10.00%)
(i)	Initial Security Deposit in the form of small saving or Narmada Bond or FDR – 2.5% of the estimated cost + GST @18%. (Validity period of 18 months)	Rs. 2,94,700.00
(ii)	To be deducted from R.A. Bill - 2.5% of the estimated cost + GST @18%.	Rs. 2,94,700.00

(iii)	Performance Bond in form of BG / FDR of scheduled or Nationalize Bank or any approved bank by government's latest GR. - 5.00% of the estimated cost + GST @18%. (Validity period of 18 months)	Rs. 05,89,400.00 (To be paid with initial security deposit) in the form of B.G./D.D./F.D.R for the minimum period of 180 days in favor of "Executive Engineer, GIDC, Ankleshwar" from any Nationalized / Scheduled Bank. (FDR or BG of schedule bank will be accepted as per the GR No. FD/MSM/e –file/4/2025/2712/D.M.O. Dated 01/04/2026 of Finance department of Government of Gujarat and as per the amendment issued by GoG from time to time)
7)	Liquidated Damages	As per clause No.2 of B-2 Form attached herewith.
8)	Defect liability period – Refer modified clause-17A of form B-2 as per R&B Circular No.PRCH/102008 / (2076) / N dtd.31/01/2009.	The defect liability period shall be Five years from the certified date of completion of work.
9)	Free Maintenance guarantee period under clause no.17B of form B-2 –Free maintenance guarantee Bond in form of BG / FDR of scheduled or Nationalize Bank - 5% of the estimated cost + GST @18%. (Validity period of 5 (Five) years from certified date of completion)	Rs. 05,89,400.00 05 (Five) Years--Free Maintenance Guarantee with effect from the certified date of completion. (FDR or BG of schedule bank will be accepted as per the GR No. FD/MSM/e –file/4/2025/2712/D.M.O. Dated 01/04/2026 of Finance department of Government of Gujarat and as per the amendment issued by GoG from time to time)
10)	Workers Welfare Cess Under The Building & Other Construction Workers Cess Act 1996 (Labour Cess)	1% of value of work done (i.e. Invoice Value including GST) shall be deducted from the all bills payable to the contractor.
11)	Testing Charges	1% Testing charges of the Estimated Cost + GST as applicable from time to time will be deducted from each Running Account Bill of agency.
12)	Time limit for completion of work from the date of written order to commence.	12 (Twelve) Months
13)	GST & other taxes	1. Estimated cost put to tender is excluding GST. GST will be paid additional as per applicable rate prevailing from time to time. 2. All other statutory liabilities are part of estimated cost and will be bound by bidder. 3. The Agency has to pay all Govt. Taxes (GST, etc.) whichever is applicable to this work as per thenotification of government by time to time

14)	Site Office accommodation for G.I.D.C. staff.	The agency has to arrange at his own cost a properly covered site office for GIDC Officials/staff having min. size of 6mt x 6mt with all required Furniture, Toilet facility, Latest updated version Computers, Laptop (I-7 or above) with Internet facilities, Laser Printers with required stationary, Cupboards, Mineral Waters etc. from the starting date of contract and to maintain till completion of the work satisfactorily.
15)	Submission date & time of tender documents	
i)	Date on (or before) which the tender with DD / FDR for Tender fee & EMD (by scanning) including required documents must upload on the web site of www.gidc.nprocure.com	From 08th June 2026 to 30th June 2026 upto 17.00 hours
	b) Date on (or before) which DD/FDR in original for Tender fee & EMD must reach in the office of the Office of the Executive Engineer, 1st Floor, Plot No.-622/A, Administrative Building, Near Notified Office, Valia Road, GIDC, Ankleshwar - 393 002. (By RPAD/Courier/Personally i.e. Hand Delivery)	From 1st July 2026 to 3rd July 2026 upto 17.00 hours Physical submission of documents prior and after these dates will not be considered and bids of the agency will be considered as nonresponsive.
ii)	Mode of sending the tender documents.	
	The tender with DD / FDR for Tender fee & EMD (by scanning) including required documents	By Online through E - Tendering process
	DD/FDR in original for Tender fee & EMD	By RPAD/Courier/Personally i.e. Hand Delivery to Office of the Executive Engineer, 1st Floor, Plot No.-622/A, Administrative Building, Near Notified Office, Valia Road, GIDC, Ankleshwar -393 002.
16)	Opening of Technical bid	In the Office of Superintending Engineer (CG), GIDC, 2nd floor, Narmada Commercial Complex, Panch Batti, Bharuch as under:- Preferably On dtd. 4th July 2026 at 12.00 noon
17)	Tender to be opened by	Superintending Engineer (CG), GIDC, 1st floor, Narmada Commercial Complex, Panch bhatti, Bharuch.

18)	Description essential to be made on sealed cover for documents to be submitted by RPAD/Courier/Personally i.e. Hand Delivery	<p>(1) Name of Work : Repairing GIDC Staff Quarters 4 block of RCL-12-(17,18,19,20) at GIDC Ankleshwar.</p> <p>(2) Date of receiving the documents From 1st July 2026 to 3rd July 2026 upto 17.00 hours</p>
19)	Important Note :	<p>For any technical discrepancy, the latest version of MORT&H / IRC shall be applicable.</p> <p>Prospective bidders are requested to join the site visit.</p> <p>GIDC reserves the right, without any obligation or liability, to accept or reject any or all the bid at any stage of the process, to cancel or modify the process or any part thereof or to vary any of the terms and conditions at any time, without assigning any reason whatsoever.</p> <p>Registration required "D" class & Above</p> <p>GST registration certificate required mandatory</p> <p>Required Documents mentioned in as under (a), (b), (c) & (d) are mandatory for submitting scanned copies through ONLINE. Otherwise tender offer shall be treated as NON RESPONSIVE, without any further intimation.</p> <p>Scanned copy of tender fee and EMD</p> <p>Required Class of registration, Latest Income Tax return filed, RPFC registration certificate with latest challan, GST Registration & Pan Card.</p> <p>Fresh Valid Bank Solvency- (20% value of the estimated cost put to tender)</p> <p>GST registration certificate</p> <p>Submit the required documents online duly named and page numbered in proper manner for simplicity.</p>
20)	Site Visit	<p>Contact Person :</p> <p>Shri S S Dash XEN, GIDC, Ankleshwar Mo. No. 9726424264</p> <p>Shri Chintan K Patel DEE, GIDC, Ankleshwar Mo. No. 9687481212</p>
21)	Vehicle Accommodation	<p>The agency has to arrange at his own cost to provide one (1) Nos., 4+1 four wheeler, private or taxi passing A.C. vehicle for Engineer-in-charge / Supporting Staff at site for 24 hours with driver at free of cost for limited to 4500 Km per month for each vehicle.</p>

PRE-QUALIFICATION APPLICATION

- (1) **Following constitution of Pre-Qualification evaluation committees is finalized.**

Statement 1.1

Sr.No.	Constitution of Committee
1	Committee of the Superintending Engineer as under. (1) Superintending Engineer (CG), GIDC, Bharuch – Chairman (2) Executive Engineer, GIDC, Ankleshwar – Member (3) Executive Engineer(M&E), GIDC, Bharuch – Member (4) Account Officer / Division Accountant, GIDC, Ankleshwar – Member

- (2) **Prequalification criteria for the Civil / Mechanical / Electrical works.**

(2.1) Eligibility:

(2.1.1) Bidder's registration:

(2.1.1.1) Only those bidders shall bid whose names are borne on the approval list of registered contractors in the required class **"D" Class and above** with Gujarat state R&BD / W.R.D. / GIDC.

(2.1.1.2) If the Contractor's registration in the required class with Gujarat state R&BD / W.R.D. / GIDC is expired on or before the last date of online bidding period of the tender, the bidder must submit through online in electronic form the application for renewal of the same with the concerned department along with receipt of fees paid for it. In such cases, the bidder at his own responsibility must produce valid renewed registration certificate in the required class & category with Gujarat state R&BD / W.R.D. / GIDC before issuance of the work order. Bidder will solely be responsible for obtaining the required registration.

(2.1.1.3) In context to above Para (2.1.1.2), it is clarified that the bidder who is having registration in class & category below than the minimum required class & category and the bidder have applied for up-gradation in required class and category with Gujarat state R&BD / W.R.D. / GIDC shall not be considered valid. In such cases the bidder shall not be considered eligible for bidding.

- (2.1.1.4) The contractor, who are registered in appropriate category of C.P.W.D., M.E.S., Railways and Indian state government, can also bid provided the bidder produce such registration certificate at the time of bidding and obtain registration in required class & category from the Gujarat state R&BD / W.R.D. / GIDC before issuing work order. Bidder will solely be responsible for obtaining the required registration.

(2.2) Litigation history:

- (2.2.1) The applicant should provide accurate information on litigation and/or arbitration resulting from contracts completed or under execution by him over the last five financial years. A consistent history of arbitration awards/judgements against the applicant or any partner of a joint venture may result in disqualification for proposed work. If the details of litigation history is hidden by the applicant and later on it comes to knowledge of the employer the bidder shall be disqualified for the proposed work and other appropriate action shall be taken against the bidder.
- (2.2.2) Information of litigation history in following statement to be submitted, if any other wise Nil / Not Applicable statement to be submitted

LITIGATIONHISTORY

Sr.No.	Name of Contract	Work completed or under execution	Financial year	Brief Detail of the arbitration / litigation matter	Department in opposition	Whether awards / judgements is pending or made?	Details of Result of arbitration / Judgement	Whether Judgement in favour or in against

(Signature of bidder)

- (2.3) Affidavit regarding Termination / Blacklisting / Ban / Registration kept in Abeyance:**

- (2.3.1) The bidders shall be disqualified for opening of his price bid if he is under blacklist and / or under ban and /or his registration is under abeyance by any Central / State Government Department, Board, Corporation, Municipal Corporation, Municipality, Government Local Bodies, University etc.
- (2.3.2) The bidder shall have to submit prescribed notarized affidavit on appropriate stamp paper as under, failing to which the bidder shall be disqualified for opening of his price bid.

Affidavit regarding Termination / Blacklisting / Ban / Registration kept in Abeyance.

(To be submitted on Rs.300/- stamp paper & notarized.)

Name of work:

Tender ID:

I, _____, Age, _____, Resident of, _____ in the capacity of _____ Do hereby solemnly affirm and declare as under.

We are not under blacklist and / or under ban and /or our registration has not been kept under abeyance by any Central / State Government Department, Board, Corporation, Municipal Corporation, Municipality, Government Local Bodies, University etc. as on date of participating for this bid.

Date :

Authorised signatory

Place:

(2.4) Machinery / Equipment:

Bidder shall have to submit a prescribed notarized undertaking on Rs.300/- stamp paper for deploying machinery/equipment for the work under tender as per below.

Undertaking for deploying Machineries/Equipments/Tools & Plants

(To be submitted on Rs.300/- stamp paper & notarized.)

To,

(Authority holding the digital key)

Name of Work:

Tender ID:

APPENDIX – B
Indicative List of minimum Plant & Equipment to be deployed on Contract Work

Sr.No.	Type of Equipment	Minimum No. of equipment required
1	Excavator	1 Nos.
2	Vibrator (Needle)	1 Nos
3	Vibrator (Plate)	1 Nos
4	Water tanker	1 Nos
5	Tripper Truck / Dumpers	1 Nos
6	Leveling Instrument	1 Nos

I/We hereby undertake that if i/we awarded the above said work then i/we shall deploy all Machineries/Equipments/Tools and Plants etc. as shown in the Appendix-B in fully working condition and utilize the same while execution of the work.

We also undertake that i/we shall deploy other Machineries/Equipments/Tools and Plants etc. over and above shown in Appendix-B in working condition and utilize the same as per instruction of Engineer-In-Charge.

Failing to above we shall not object any action taken against us within the tender provision.

In case of any dispute, Superintendent Engineer's decision shall be final.

Date:

Authorised signatory

Place:

(2.5) Bidding in E-tendering:

- (2.5.1) Submission of documents must be through e-tendering i.e. electronic form, unless specified in Para (2.6).
- (2.5.2) All of the online submitted documents must be clearly readable, failing to which the same shall be considered as void.
- (2.5.3) Bids of those bidders who have submitted all information, statistical details as required in the bid documents through E-Tendering will only be considered. If the employer desires any clarification, for verification/clarification, ambiguity of difference

found in the documents/statistical details submitted online (by e-tendering) by the bidder the same shall be furnished within stipulated time otherwise further processing will be carried out in absence of above and the bidders shall be liable for any consequence.

(2.5.4) No bidder can participate in more than one bid for proposed work.

(2.6) Submission of documents:

- (2.6.1) Following documents / papers shall form part of the Bid & must be submitted through online in electronic form unless specified separately, failing to which the bidder shall be dis-qualified for opening of his price bid.
- (2.6.1.1) D.D. of require tender fee.(To be submitted in electron i.e form at the time of online submission of the bid &the same to be submitted in original during prescribed time period for submission of documents in physical form.)
- (2.6.1.2) DD / FDR and BG of required EMD. (To be Submitted in electronic form at the time of online submission of the bid & the same to be submitted in original during prescribed time period for submission of documents in physical form.)
- (2.6.1.3) Copy of valid bank solvency certificate of minimum 20% amount of the estimated cost put to the tender of the work. (Bank Solvency certificate issued during current calendar year is considered as valid up to end of the December of the current calendar year. 31stmarch of the next calendar year. In case, where solvency certificate is not obtained in time, the certificate of previous year will be considered valid up to the end of March of current calendar year. In some certificates date of validity is stated. In such cases the same stated date is considered for validation instead of end of December of the current calendar year.)

- (2.6.1.4) Copy of relevant required Registration Certificate / Certificates.
(In case of renewal, copy of application & receipt of fee paid.).
- (2.6.1.5) Litigation history as per Para (2.2)
- (2.6.1.6) Affidavit regarding Termination / Blacklisting / Ban / Registration kept
in Abeyance as per Para (2.3).
- (2.6.1.7) The undertaking for deploying machinery/equipment for the work under
tender as per Para (2.4).
- (2.6.1.8) MOU & all relevant required documents of MOU agency.

(Note: - The MOU must be submitted in prescribed format as incorporated
in the approved D.T.P. & to be executed on relevant valued stamp paper &
duly notarized.)
- (2.6.2) Following documents/papers shall also form part of the bid, but these
documents are not mandatory to be submitted through online in electronic
form. However, the same shall be submitted in physical form, if not
submitted through online in electronic form, within time period given by
authority holding the digital key, failing to which the bidder shall be dis-
qualified for opening of his price bid.
 - (2.6.2.1) Copy of registration certificate of firm / documents of public limited /
private limited / partnership firm / proprietor firm, whichever is applicable.
For example, Partnership Deed, Certificate of incorporation, Memorandum of
association, Article of Association etc.
 - (2.6.2.2) Copy of Power of Attorney, if any.
 - (2.6.2.3) Copy of PAN Card.
 - (2.6.2.4) Copy of latest income tax return certificate. (Note :- latest income tax return
certificate means the income tax return certificate of the last completed
financial year for which pre-determined/extended time period by the
Income Tax Department for filing income tax return is over on or before last
date of online submission.
 - (2.6.2.5) Copy of Goods & Services (G.S.T.) registration certificate.
 - (2.6.2.6) Copy of RPFC registration certificate.
 - (2.6.2.7) Copy of RPFC Challan of any of the completed last three months from the
month of last date of online submission of the tender.
- (2.6.3) Following Undertaking / Declaration to be incorporated on **(n) Procure
website** in such a manner that without attending this undertaking /
declaration the tender cannot be uploaded.

UNDERTAKING / DECLARATION

“I hereby declare that I have after thoroughly understand the Pre-Qualification criteria / conditions and the details filed & documents submitted are true and correct to the best of my knowledge and belief. I shall not have any objection against any action taken by GIDC if any of the information submitted is found to be incorrect / false.”

- (2.6.4) Any information, data, statistics etc. which are not related to bid document will not be considered in evaluation even though furnished by the applicant.
- (2.6.5) In accordance with stipulated of Para (2.8), employer reserves the right to call any information/documents which is mandatory, essential and critical for the purpose of evaluation. Any information provided by the applicant after last date of electronic submission will not be considered in evaluation, unless except the employer has specially asked for any information/document, which is mandatory, essential and critical for evaluation of PQ document. If required information is not furnished within stipulated time, proposal will be liable for rejection.
- (2.6.6) If any of the information provided by the bidder is found false during scrutiny or at the later stage, his EMD shall be forfeited and he shall be disqualified for the proposed work. In case when bidder has furnished exemption certificate in lieu of EMD, an amount equal to EMD shall be appropriated from his FDR pledged to avail of exemption certificate. If any of the information provided by the bidder is found false after award of work, the performance security of the bidder shall be forfeited and the contract shall be terminated.
- (2.6.7) Authority holding the digital key ((n) code solution), respective Executive Engineer of Civil branch, respective Executive Engineer of M&E branch and Account Officer / Divisional Accountant of the respective Division office shall be jointly liable to download, evaluate, verify all online documents submitted by the bidder with respect to Pre-Qualification criteria.
- (2.6.8) In case of committee of Chief Engineer, concerned field Superintending Engineer and Concerned field Executive Engineers (Civil) & (M&E), after carried out all above procedures and verifying all print outs of the online documents submitted by the bidders, shall submit the same documents (Indicating page no. on each & every documents submitted by the bidder through online in electronic form.) along with evaluation sheet (Details against each P.Q. Criteria along with page No., remarks etc. Note :- To be prepared by respective Executive Engineer of Civil branch, respective Executive Engineer of M&E branch and Account Officer / Divisional Accountant of the respective Division office jointly), duly signed by all the

concerned, to Chairman (i.e. Chief Engineer) of the Pre-Qualification committee and also shall brief the other members of the Pre-Qualification committee on documents submitted by the bidders through online in electronic form and evaluation done by his office, at the time of meeting of the Pre-Qualification committee.

- (2.6.9) In case of committee of Superintending Engineer, concerned field Executive Engineer (Civil) & (M&E) and Account Officer/Divisional Account jointly, after carried out all above procedures and verifying all print outs of the online documents submitted by the bidders, shall submit the same documents (Indicating page no. on each & every documents submitted by the bidder through online in electronic form.) along with evaluation sheet (Details against each P.Q. Criteria along with page No., remarks etc.), duly signed by all the concerned, to Chairman, (i.e. Superintending Engineer) of the Pre-Qualification committee and also shall jointly brief the Chairman of the Pre-Qualification committee on documents submitted by the bidders through online in electronic form and jointly evaluation done by them, at the time of meeting of the Pre-Qualification committee.
- (2.6.10) Accordingly, concerned Pre-Qualification committee shall decide to qualify / dis-qualify the bidder & circulate / issue minutes of the meeting to concerned for further action.

APPENDIX – C						
SELF EVALUATION FORM						
Sr. No.	Component	Requirement as per tender	M/s.		Page No.	Remarks
			DETAILS FURNISHED BY BIDDER			
1	Tender Fees including GST	₹. 2400/- + 216/- CGST + 216/- SGST = 2832/- by DD	Name of Bank			
			D.D. No. and Date			
			Amount in ₹.			
2	EMD (₹.99,884.00)	(A) ₹. 50,000.00 by DD / FDR	Name of Bank			
			D.D. / F.D.R. No. and Date			
			Amount in ₹.			
		(B) ₹. 49884.00 by B.G. (Schedule or Nationalized Bank Only)	Name of Bank			
			B.G. No. and Date			
			Valid up to Date.			
			Amount in ₹.			
		3	Registration certificate	"D" Class and above	Name of Department	
Valid up to Date.						
Authority						
4	Bank Solvency Certificate	20% amount of Estimated Cost i.e. Rs. 19,97,672.00 (Refer Para 2.6.1.3)	Name of Bank			
			Amount in Rs.			
			Date of Issue			
			Valid up to Date.			
5	Litigation History		(Refer Para 2.2)			
6	Affidavit regarding Termination / Blacklisting / Ban/ Registration kept in Abeyance.		(Refer Para 2.3)			
7	Machinery/Equipment: Proof of deployment of required minimum machinery / equipments mentioned in Appendix - B		(Refer Para 2.4)			
8	Registration certificate / Documents of /public Limited / Private Limited/ Partnership deed /		To be furnished which ever is applicable			

	Proprietor Firm.					
9	Power of Attorney					
10	Latest Income tax return filed and PAN Card Details	(A) Year of Income tax Return filed	Assessment Year			
			Name			
		(B) PAN Card No.	PAN Card No.			
			Name			
11	Good and Service Tax (GST) Number	GST No.	GST No.			
			Name			
12	RPFC Registration certificate & RPFC Challen	(A) RPFC Registration Certificate No.				
		Name				
		(B) RPFC Challen of any of the completed last three months from the monthh of last date of submission of the tender.				
			Name			
13	Undertaking / Declaration	Truth fullness certificate				
14	Other Remarks					
15	Whether Qualified or not?					

ANNEXURE - I
Form of Bank Guarantee
(Earnest Money Deposit)

Whereas M/s. (Here in after called Bidder) is desirous and prepared to tender for work in accordance with terms and conditions of Tender No. Dated And whereas we Bank, agree to give the Bidder a Guarantee for the Earnest Money Deposit.

1. Therefore, we here by affirm that we are Guarantors on behalf of the Bidder upto a total of Rupees (i.e. ₹.) and we undertake to pay the Executive Engineer, Gujarat Industrial Development Corporation, Ankleshwar, upon his first written demand and without demur, without delay and without necessity of previous notice of individual or administrative procedure and without necessity to prove the bank the defects or short coming or debit of the bidder any sum within the limit of Rupees.....

2. We further agree that the guarantee here in contained shall remain in full force and effect during the period that would be taken for the acceptance of tender. However, unless a demand or claim under this guarantee is made only in writing on or before the We shall be discharged from all liabilities under the guarantee there after.

3. We undertake not to revoke the guarantee during its currency except with the previous consent of the Executive Engineer, Gujarat Industrial Development Corporation, Ankleshwar, in writing.

4. We lastly undertake not to revoke the guarantee for any change in constitution of the Bidder or the Bank.

Signature and Seal of Guarantor

Date:

Bank:

Address:

Signature of Contractor

Executive Engineer,
G.I.D.C., Ankleshwar.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

GENERAL CONDITIONS:

Tenderer shall very carefully read through and take note of following conditions :

1. The successful tenderer shall have to enter into an agreement in 'B-2' form. Tender can be inspected during office working hours and shall be part of agreement with successful tenderer.
2. The tenderer shall get himself well acquainted with the job requirement site conditions, route and alignment etc.
3. Contractor shall make his own arrangement for providing all necessary tools, plants, equipment's, manpower as required. No extra payment in any such respect would be made to the contractor.
4. In conformity with prevailing income tax Rules 2% and surcharges of bill value shall be deducted at source as per I.T. Rules for which necessary certificate shall be released by the Executive Engineer.
5. Security deposit of 5.00% of the estimated cost will have to pay. 2.5% through each R.A. Bills and 2.50 % against the signing of agreement in the form of Narmada Bond / N.S.C. / FDR.
6. The EMD payable to GIDC by the tenderer by D.D. or F.D.R. of Nationalized bank/Scheduled bank or other banks as per Govt. latest GR for Rs. 50,000/- and remaining amount by B.G. /DD/FDR of Nationalized bank / Scheduled bank or other banks as per Govt. latest GR shall be drawn in favor of Executive Engineer, GIDC, Ankleshwar. The tender fee payable to GIDC by DD only.
7. 1% amount of the work done will be deducted from each R.A. bill in respect of Gujarat Building & Other Construction work – Labour Welfare Cess
8. Contractor shall have to mention their Regional Provident Fund number.
9. The rate quoted by the agency should remain force throughout the contract period i.e. for the period .
10. Rates quoted by the contractor shall be excluding GST but inclusive of all taxes and duties.

Staff of contractor should cover under suitable insurance scheme.

The tenderer has to take site visit and understand the work before submitting the tender.

The tenderer has to give the consent that they have already taken the site visit and understand the nature of work. Go through item specifications.

The contractor shall be responsible for theft of the materials etc.

The medical facilities, weekly off, safety equipment's, over time etc. as per Government Act, will be provided by the agency to the staff engaged for the job.

In case of accident during the work, all the responsibility of man, machinery & property will be rest with the agency.

The payment shall be made as per actual work done.

Machinery, materials, labours etc. are to be brought by agency at his own expenditure.

The contractor shall have to engage qualified plumber & Supervisor. The labours who shall be fit to work in mud in any weather shall be engaged.

The order for materials shall be placed time to time and when required. Material shall have to be supplied on demand.

Material shall have to be supplied of standard quality as per related to IS specification. One stack of each type of material shall have to be stacked at site of work and have to be got

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

tested for its requirement as per norms of quality control. If materials fails to required standards, than the same have to be removed from the site by the agency at his own cost. If the tenderer are firm, company or limited concern, they should mentioned the names of all the partners or the Directors, as the case may be, in their forwarding letter and indicate the name of person who holds, the power of attorney, authorizing him to conduct all transactions on behalf of the firm, company or limited concern. A true copy of partnership deed or the articles of association and power of attorney shall be attached with the tender, in case; the tender is finalized in favor of successful tenderer. The contractor shall have to enter into the agreement as per the rules.

The successful bidder in whose favor the tender is finalize has to enter into agreement in B2 form with GIDC. If agency desire to study the same, it is available in the office of Executive Engineer, GIDC, Ankleshwar in the office hours of any working days.

Testing charges of material shall be borne by agency as per tender clause. 1% of the estimated cost shall be deducted from the running account bills of the contractor for testing the quality of materials and workmanship. However, the agency has to establish at site of work the fully equipped laboratory for day to day testing like gradation, density, cube tests etc.

Agency shall have to provide the mobilization of staff for site visit daily till completion of work. ONE number AC Vehicle four wheelers to be provided with drivers& fuels in good condition. The vehicle should not be older than three years. This is mandatory to the bidder as a part of the tender but no separate claim shall be entertained. If the above vehicle is not provided compensation shall be levied and deducted from the bill as decided by the engineer in charge.

All the documents to be submitted online and original DD and FDR for tender fee and EMD will have to send physically.

“Prevailing policy / Government Resolution (G.R.) of Govt. of Gujarat (GoG) / Competent Authority regarding GST / service tax including Swatchh Bharat Cess may please be read carefully by the prospective bidder for all the works and submit the price bid offer accordingly. GST / Service tax(including Swatchh Bharat cess) if applicable on any item/part item or part work, the contractor is bound to pay the GST / service tax for the whole of the contract value”.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

INFORMATION AND INSTRUCTION FOR BIDDERS

INTRODUCTION:

Bids i.e., Price Bid and Technical Bid for the Repairing GIDC Staff Quarters 4 block of RCL-12-(17,18,19,20) at GIDC Ankleshwar is invited from Contractors on e-tendering process.

LOCATION OF WORK AND SITE INFORMATION:

The work site is located In Ankleshwar.

SCOPE OF WORKS:

The works include site clearings and repairing of the housing building..

The contractor shall co-operate with local people & plot / shed's holders to maintain co-cordial working environment and shall take full care to minimize hassles to the local people & plot / shed's holders while working. The contractor shall, upon the completion of works, hand over the site of works in neat & clean manner. The proposed works are as under.

BIDDER'S RESPONSIBILITY

The intending Bidders shall be deemed to have visited the site and familiarized themselves thoroughly with the site conditions and all other aspects affecting the work under this Contract before submitting the tender. No claim / extension of time whatsoever shall be entertained on account of prevailing site conditions.

Interested Bidders may obtain further information at the following address:

Executive Engineer, GIDC, Ankleshwar.
1st Floor, Plot No.-622/A,
Administrative Building, Near Notified Office,
Valia Road, GIDC, Ankleshwar -393 002.

EARNEST MONEY DEPOSIT (EMD)

EMD is payable in the manner set out in the Form B-2.

Demand Draft for E.M.D. shall be submitted in electronic format only through online (by scanning) while uploading the bid. The submission shall mean that E.M.D. is received for purpose of opening the bid. Accordingly offer of those shall be opened whose E.M.D. is received electronically. However, bidder shall submit the DD in original to 1) **Executive Engineer, GIDC, Ankleshwar payable at Ankleshwar.** As per the schedule specified in tender notice for submission of **document in physical form i.e. From 1st July 2026 to 3rd July 2026 upto 17.00 hours submission of document before 01/07/2026 and after 03/07/2026** will not be considered and offer treated as non-responsive. Exemption certificate shall not be acceptable.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Earnest money in specified form @ 1.00 % of the estimated cost must be sent as mentioned above preceding electronically Tenderer may pay earnest money up to Rs. 50,000 in cash or in the form of Crossed Demand Draft or fixed deposit or fixed deposit at-call receipts with a validity period of not less than 180 days of Nationalized or Scheduled bank or any approved bank by government's latest GR or Narmada/Shrinidhi F.D.Rs. drawn in favor of Executive Engineer/Divisional Officer concerned. Earnest money by cheque & Bank Guarantee shall not be accepted. (vide R &BD G. R. No. TNC/ 1090/(100) (4)-C, dated 4-11 -2000).

However in respect of the works estimated to cost above Rs. 50 lacs, the amount of earnest money in excess of Rs. 50,000 can be offered by the contractor, at his choice, in the form of Bank Guarantee of the Scheduled or nationalized Bank or any approved bank by government's latest GR only. The Bank Guarantee in such cases will be furnished in the following form. In such cases also, the amount of earnest money first Rs. 50,000 will be paid only in the form of crossed demand drafts or fixed deposit receipts or deposit at call receipts worth the validity period of not less 180 days of the nationalized or Scheduled or Narmada/Shrinidhi F.D.

If the contractor does not turn up to pay the Security Deposit and execute contract agreement within specified (or extended) time after intimation to him about acceptance of his offer, the earnest money paid for this work will be forfeited according to Clause-1 of this tender form tenderer's tender shall be rejected and then according to aforesaid provision of tender, action to blacklist the Contractor will be initiated without Delay. (Vide R & B D G.R. No. Misc.-1097 -90-1091/97 -Z/C dated 04-10-97 & Parach-102008-5-C-Partfile dated 27-11-08). Bank Guarantee is permissible only when the estimated cost of work is more than Rs. 50 lacs.
BANK GUARANTEE

Whereas M/s _____
_____ (hereinafter called the Tenderer) is desirous and preferred to tender for works in accordance with the terms and conditions of tender for the work of _____ and where as We, Bank, agree to give the tenderer a guarantee for the Earnest Money. Therefore, we hereby affirm that we are guarantors on behalf of the Tenderer upto total rupees _____ in words) Rs. _____ (in figures) and we undertake to pal to Executive Engineer _____ Division _____ Department of Government of Gujarat _____ upto his first written demand, without demur, without delay and without the necessity of a previous notice of judicial or administrative procedures and without the necessity to prove to the Bank the defects or shortcomings or debits of the contractor any sum within the limit of Rs. _____.

We further agree that the Guarantee herein contained, shall remain in full force and effect during the period that would be taken for the acceptance offender. However, unless a demand of claim under this guarantee is made on us in writing on or before the _____ (Date to be specified - will not be less than 180 days from the stipulated date of receiving the tender) we shall be discharged from all liabilities under this guarantee thereafter.

We undertake not to revoke the guarantee during it currency except with the previous consent of the Executive Engineer _____ Division _____ in writing.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

We lastly undertake not to revoke the guarantee for any charge in constitution of the Tenderer or of the Bank.

Date Signature & Seal of Guarantor _____
Bank Address _____

The Earnest Money submitted in the form of Deposit-At-call receipt shall need minimum validity of six months from the last date of online submission of tender. Tender not supported with tender fee, Earnest Money & documents and not submitted in electronic format (by scanning) while uploading the bid shall be rejected as NON Responsive.

If the tenderer modifies or withdraws his tender, the Earnest Money (in case of EMD exemption certificate, proportionate amount equivalent to EMD of a particular tender) shall be forfeited and the tenderer may be disqualified from tendering for future works under the Government.

The Earnest Money will be returned to the unsuccessful tenderer. The Earnest Money will be returned to the successful tenderer after he furnishes security deposit and duly enters into the contract.

Within Ten days or within such time as may be decided by the Tender Inviting Authority from date of receipt of the Letter accepting his tender, the successful tenderer shall furnish the required security deposit and attend the office of the Tender Inviting Authority for execution of the contract documents. If he fails to furnish the security deposit or execute the contract document, his Earnest Money (in case of EMD exemption certificate equivalent amount there from) shall be forfeited and action to blacklist the contractor will be initiated without delay (Vide R & B.D. G. R. No. Misc. 1097-90-1091-97 -Z/C dated 4-10-97).

SECURITY DEPOSIT (SD) – 5.00% of Estimated Cost put to tender.

SD is payable in the manner set out in the Technical Bid with Prequalification Application by the successful tenderer / Bidder.

Initial Security Deposit in the form of small saving or Narmada Bond or FDR – 2.50% of the estimated cost + 18% GST. (Validity period of 18 months)	Rs.2,94,700.00
To be deducted from R.A. Bill - 2.50% of the estimated cost + 18% GST.	Rs.2,94,700.00

PERFORMANCE BOND – 5.00% OF THE ESTIMATED COST PUT TO TENDER

Performance Bond in the form of Bank guarantee of Nationalized Bank / scheduled bank is payable in the manner set out in the Form B-2 from section-2 clause-1 along with initial security deposited by the successful bidder

Performance Bond of scheduled or Nationalize Bank / scheduled bank - 5.00% of the estimated cost + 18% GST. (Validity period of	Rs. 05,89,400.00 (To be paid with initial security deposit)
---	---

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

18 months)	
------------	--

PROGRAMME OF WORK :

The program of work for this contract is as under.

Online Submission of Bid Document	Period for Validity of offer	Period of completion
From 08th June 2026 to 30th June 2026 upto 17.00 hours	120 days from the date of opening of online bids.	12 Months from the date of work order

The time is essence of the contract. The contractor shall have to ensure progress of the work proportionately as per Schedule-C of B-2 agreement.

SUPERVISION OF WORK:

G.I.D.C reserves the right to appoint Third Party Inspectors (TPI) for quality assurance and quality control in addition to the Engineer-in-charge of the work & Quality Control branch of G.I.D.C. Head Office.

FREE MAINTENANCE GUARANTEE PERIOD:

Clause No.17 B of B-2 Form

The scope of works also includes Five years free maintenance guarantee period from the certified date of completion of the works as per clause No.7.

During this period, the contractor shall be responsible to make good, working condition and remedy at his own expenses, any defects, which may develop or may be notice for the work carried out by him or due to reasons attributed to him.

The Engineer-in-charge shall give the contractor a notice in writing about the defects with remedial measures and the contractor shall make good the same within period specified in the notice. In case of failure, on the part of the contractor to carry out / comply the instructions of Engineer-in-charge, the Engineer-in-charge may rectify or remove and re-execute the work at the risk and cost of the contractor.

The Engineer-in-charge shall be entitled to appropriate the whole or any part of the amount of (i) security deposit (ii) Performance Guarantee Bond in the form of B.G. or N.S.C. / F.D / S.S.N.N.L., and (iii) Free maintenance guarantee bond in the form of B.G. or N.S.C. / F.D / S.S.N.N.L towards the expenses, if any incurred by him / Engineer-in-charge for rectification / removal, and re-execution the work.

The contractor shall immediately recoup the amount so spent such that at any given time the security deposit, Performance Guarantee Bond or N.S.C. / F.D / S.S.N.N.L. and free maintenance guarantee bond for maintenance guarantee period shall be maintained as laid down in the Special condition of the contract.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

If contractor fails to recoup the amount of Security deposit, Performance Guarantee Bond or N.S.C. / F.D / S.S.N.N.L. and free maintenance guarantee bond for maintenance guarantee period, Engineer-in-charge shall be entitled to recover the amount spent over the above from the amount of security deposit, Performance Guarantee Bond or N.S.C. / F.D / S.S.N.N.L. and free maintenance guarantee bond for maintenance guarantee period.

The Corporation reserves the rights to en-cash the Performance Guarantee Bond & Bank Guarantee or N.S.C. / F.D / S.S.N.N.L., if required.

DEFECT LIABILITY PERIOD :

The defect liability period shall be Five years from the certified date of completion of work or Five monsoons whichever is later.

PRICE VARIATION CLAUSE & STAR RATE FOR CEMENT, STEEL AND BULK BITUMEN :

Please read the clause No. Clause No. 59A of B-2 form (Contract agreement to be executed) attached herewith for price variation for cement, steel & Bulk Bitumen. Star rate for cement, steel & bulk bitumen (Bulk Bitumen Emulsion & paving bitumen) is given in the Clause No. 59A of B-2 form(Contract agreement to be executed) attached herewith.

Sr. No.	Quantity	Star Rates (Excl. GST)	Month in which DTP is approved
1	Cement	Rs.5288.13/MT	April - 2026
2	Steel (FE-500D Grade)	Rs.53813.55/MT	April - 2026

PRICE ESCALATION : Not applicable

The Price escalation shall not be payable as per GIDC circular.

MOBILIZATION ADVANCE: - Not applicable

Mobilization advance shall not be payable as per GIDC circular.

PURCHASE OF BITUMEN BY THE AGENCY:

The contractor shall have to purchase the bitumen in Bulk only from only Govt. recognized refinery & shall have to produce the original purchase bills along with the original gate passes etc. The bitumen to be brought on site includes all transportation charges, taxes etc. with all lead and lift.

POWER SUPPLY / WATER SUPPLY / OTHER UTILITIES:

The Contractor will make his own arrangement at his cost for power supply / water supply and other utilities required for the execution of work and arrangements for temporary distribution. All the works will be done as per IEA regulations. The Contractor shall ensure at his cost that all electrical lines, water supply lines and equipment & all installations are

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

approved by the state electricity inspector before power can be supplied by State Electricity Board & GIDC for water

CONDITIONS OF CONTRACT:

Successful bidder shall have to enter in to prevailing agreement B-2 with GIDC, all the tender documents including pre-bid meeting minutes, negotiation letter and acceptance letter will form-A integral part of the contract. All works will confirm to the Indian Standards, specifications for road & Bridge works of Ministry of Road Transport and Highway or other equivalent standard mentioned in the contract document as approved by the Engineer-in-charge.

OTHER:

In the all items of Schedule “B”, the thickness mentioned is compacted thickness to be considered for the purpose of measurements and payments.

The contractor document shall include the original tender papers of GIDC, submission of contractor negotiation letter, letter of acceptance, agreement in B-2 form and the work order. In conformity with prevailing GST, Income Tax and surcharge of bill value or applicable at time to time shall be deducted at source for which necessary certificate shall be released by the Executive Engineer.

In conformity with prevailing sales tax, rules vide No. ANVE: WORKS: TAX: 97-98: 2162, dtd. 24/11/1997, published by Additional Sales Tax Commissioner, Govt. of Gujarat, Sales tax and surcharge applicable of bill value shall be deducted at source or applicable at time to time shall be deducted for which necessary certificate shall be released by Executive Engineer.

The contractor shall exhibit a board as per requirement of GIDC with detailed specification and details of work and amount at site at his own cost as directed by the Engineer-in - charge.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Special Condition

Following documents/papers shall form part of the bid & must be submitted through online in electronic form unless specified separately, failing to which the bidder shall be dis-qualified for opening of his price bid.

“ It will be mandatory to get site visit certificate from “ Deputy Executive Engineer” in said work.

પ્રમાણપત્ર

કામનુંનામ:.....

.....

આથીપ્રમાણપત્રઆપવામાઆવેછેકેઉપરોક્તકામબાબતેમે.....
નામનીએજન્સીએરૂબરૂસાઈટવિઝીટકરીછેતથાટેન્ડરઅંદાજપત્રઅનેઉપરોક્ત
કામનીસમયમર્યાદા અંગે નીસમજણકચેરીએથીમેળવેલછે

સ્થળ : અંકલેશ્વર

તા:.....

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

SPECIAL CONDITION

1) JOINT VENTURE (J.V.)

1.1) Joint Venture (J.V.) not allowed.

1.2) For any technical discrepancy, the latest version of MORT&H / IRC shall be applicable.

2) Free Maintenance guarantee period:

The contractor shall also undertake **three years** comprehensive free maintenance contract starting from the date of completion of the work.

2.1) The contractor shall have to give **Three years** maintenance guarantee period from the certified date of completion. During this period contractor shall have to maintain & repair the damaged portion of Box type road Bridge, Roads including its components & other works done under this contract by him at his risk and cost as per direction of the Engineer-in-charge of GIDC.

The requirement and nature of repair work will be decided by Engineer-in-charge and will be binding to contractor. **If any discrepancy regarding maintenance work, final decision to be taken by Chief Engineer.**

2.2) The maintenance work shall be carried out by the contractor as and where required and asked by the Engineer-in-charge without fail & within the period given by Engineer-in-charge.

The contractor shall attend the complaint in maximum 48 hours and rectify it to the satisfaction of Engineer-in-Charge.

The contractor should have to take the insurance policy against Damages due to accident and theft by antisocial elements. The premium of the insurance policy will be paid by the contractor.

2.3) Maintenance works for all works done under this contract:

During the maintenance guarantee period as described under Para 2.1, Contractor shall be responsible for maintaining the Box type road Bridge, Roads including its components & other works done under this contract in best of condition by carrying out the routine maintenance works as decided by the Engineer-in-charge. The routine maintenance work shall be carried out as per direction of Engineer-in-charge.

Special repairs shall be carried out for keeping the road surface in perfect riding condition with required camber and gradient as may be required, from time to time. Action shall be taken for repairing of all the pot holes, depressions, cuts in riding surface, as well as in the side shoulders of the road & other works so that the crust as well as other components of

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

the work does not get damaged due to any reasons whatsoever.

During the maintenance guarantee period, contractor shall have to repair the damage portion of surface of road at his risk and cost as per direction of the Engineer-in-charge of GIDC. Where ever, roughness value of surface during the free maintenance period of 3 years is above 3500 MM / KM, the contractor will have to provide renewal layer overlay

as per requirement of that portion in full width of surface for relevant length as directed by the Engineer- in- charge of GIDC. The roughness value of surface shall be measured by rough meter or suitable means as approved by the Engineer –in- charge of GIDC and said test shall be carried only through GERI or any other

as approved by the GIDC. The entire cost of testing shall be borne by the contractor. Contractor will perform such test periodically (minimum once in a year) during the free maintenance guarantee period or as directed by the Engineer-in-charge of GIDC.

2.4) GIDC reserve the right to withdraw the maintenance work at any stage. The decision of GIDC will be final and binding to the contractor.

2.5) NO PAYMENT TOWARDS MAINTENANCE WORK: -

If the contractor does not maintain the Structure of Box type road Bridge and BT roads including its components & other works done under this contract to the entire satisfaction of GIDC / Engineer-in-charge, GIDC will undertake repairs of structure of Box type road Bridge and roads & its components by themselves and the expenditure so incurred shall be recovered from Maintenance Guarantee Bond. GIDC reserves right to en-cash Maintenance Guarantee Bond.

2.6) The maintenance guarantee amount shall be given for 5% of the estimated cost or 5% of Approved tender cost whichever is more and in the form of Bank Guarantee of Nationalized Bank / Schedule Bank for the period of minimum 3 (Three) years and shall only be released after satisfactory completion of maintenance guarantee period of 3 (Three) years. The maintenance guarantee bond shall have to be executed on non-judicial stamp paper in standard Performa.

3) Setting up of adequate laboratory & deployment of quality engineer.

The contractor shall have to set up the laboratory with adequate equipment. Till the setting up of adequate laboratory is completed & reported of this to the engineer (subject to due verification by engineer's representative) by contractor in writing, Rs.2,00,000 shall be withheld. The qualified quality engineer shall be deployed exclusive for this contract by the contractors. If quality engineer is not deployed by contractor within one month after the date of work order, the amount equivalent to Rs.15,000 per month shall be recovered till the actual deployment of quality, engineer. The amount so recovered towards the deployment of quality engineer shall not be refunded.

4) PROGRAMME OF WORK:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The programme of work for this contract is as under Filling / up -loading the tender online	Validity period	Period of completion
From 08th June 2026 to 30th June 2026 upto 17.00 hours	120 days from the date of opening of technical bid.	12 Months from the date of work order

The time is essence of the contract. The contractor shall have to ensure progress of the work proportionately, failure to adhere to this; he shall be liable to compensation as per the Clause No. 2 & 7 of B-1 agreement form attached herewith.

5) SUPERVISION OF WORK:

G.I.D.C. reserves rights to get check the quality of works through **THIRD PARTY INSPECTION** also in addition to the Engineer-in-charge & Quality Control Units of the Corporation.

6) PRICE VARIATION CLAUSE & STAR RATE FOR CEMENT, STEEL & ASPHALT: Not Applicable

~~Please read the clause No. **Clause No. 59 deleted and 59A applicable only of B2 form (Contract agreement to be executed).**~~

7) PURCHASE OF BITUMEN BY THE AGENCY:

The contractor shall have to purchase the asphalt from refinery & shall have to produce the original purchase bills along with the original gate passes etc. The bitumen to be brought on site includes all transportation charges, taxes etc. with all lead and lift.

8) SURVEYING & MEASURING EQUIPMENTS:

Equipment's for surveying & measurement on the work shall be procured by the contractor for his use. The same also be made available to the Engineer at site or any work connected with the contract without any additional charges.

9) UNITS RATES UNDER SCHEDULE "B":

The Unit rates specified for various items to be executed as per Schedule "B" attached with the Price Bid are excluding GST but inclusive all labours, materials, testing charges, equipment's, all incidental charges involving in the work and as specified in the Mode of measurement & payment of detailed specifications of items incl. all taxes(Except GST), royalty, octroi, transportation cost etc. all as applicable presently as to be enforced for future by any / all including Central/State Government & Statutory bodies from time to time. GST will be paid extra as per the prevailing rate.

10) PERFORMANCE BOND OF NATIONALIZED BANK:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contractor shall have to execute the Performance Bond of Nationalized schedule bank in the given format attached here with or in the format as approved by the Corporation and shall be for validity period of **3 year** with effect from date of work order. The banker shall confirm this every year.

N.S.C. / F.D. / S.S.N.N.L. shall also be acceptable in favour of Executive Engineer. GIDC, Ankleshwar.

11) OTHERS:

In all the items of Schedule "B", the thickness mentioned is compacted thickness to be considered for the purpose of measurements and payments.

The contractor document shall include the original tender papers of GIDC, submission of contractor negotiation letter, letter of acceptance, agreement in B-1form and the work order.

~~In conformity with prevailing GST rules & regulations, Income Tax rules and regulations deductions from bill value will be made as per clause 47 of B2 agreement.~~

The contractor shall exhibit a board as per requirement of GIDC with detailed specification and details of work and amount at site at his own cost as directed by the Engineer-in - charge.

12) The tenders are invited by GIDC as implementing agency (i.e. Client) and hence agreement is to be executed between GIDC and successful agency.

13) GIDC will deduct 1% of the Estimated Cost from each Running Account Bill against the testing charges of materials.

14) IMPORTANT NOTE: -

Self-Evaluation form Placed in Pre-Qualification (Technical Bid - (Part-II)) as a Annexure-C is mandatory and required details as per Performa with page number must be field-up. If such detail is not submitted with the bid documents, the bid shall be liable for disqualification.

For any technical discrepancy, the latest version of MORT&H / IRC shall be applicable.

The bidder shall have to give their queries regarding the said tenders in writing one day before the Pre-Bid meeting to the office of the Executive Engineer, GIDC, Ankleshwar. No queries shall be accepted after the due date or during the Pre-Bid meeting.

A site visit programmer has been arranged after the Pre-Bid meeting. Prospective bidders are requested to join the site visit.

GIDC reserves the right, without any obligation or liability, to accept or reject any or all the bid at any stage of the process, to cancel or modify the process or any part thereof or to vary any of the terms and conditions at any time, without assigning any reason whatsoever.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

GENERAL TECHNICAL SPECIFICATION

1) GENERAL:

These specifications apply to all such Storm Water Drainage, its related works and other development works, as are required to be executed under the contract or otherwise directed by the Engineer-in-charge. In every case, the work shall be carried out to the satisfaction to the Engineer and conform to the location, lines, dimensions, grades, & cross section shown on the drawing or as indicated by the Engineer. The quantity of materials, processing of materials as may be needed at the site, nature of the construction work and quality of finished work shall comply with the requirements set forth in succeeding section, where the drawing and specification describe a portion of the work in only general terms and not in complete detail it shall be understood that only the best general practice to prevail, materials and workmanship of the best quality are to be employed and instruction of the Engineer are to be fully complied with.

A list of Indian Road Congress Specifications, recommended code of practice and specification of Road and Bridge works (Ministry of Road Transport & Highways) published by I.R.C. etc., which have been made use of in the preparation of these specifications. The latest edition of all specifications / standards till 30 (thirty) days before the final date of submission of tender, shall be adopted.

2) DEFINITIONS:

The words like contract, contractor, / binder, Engineer (Synonymous) with Engineer-in-charge, drawings, employer, Government, G.I.D.C., Works, & work site used in this specification shall be considered to have the meaning as understood from the definitions of these terms given in the General condition of contract. The following abbreviations shall have the meaning as set forth below:

ASTM : American Society for Testing and Materials.

BS : British Standard published by the British Standards Institutions.

CBR California Bearing Ratio

IRC : Indian Road Congress.

IS : Indian Standard published by the Bureau of Indian Standards.

MORT & H : Ministry of Road Transport & Highways – Specifications for road and bridge works published by the I.R.C.

PWD : Public Works Department.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

MATERIAL & TEST STANDARDS:

The relevant standard of material as well as the testing procedures, have been indicated at appropriate place in the specification or standard books of I.R.C./I.S code/MORT & H.

3) SIEVE DESIGNATION:

The sieve designation referred to the specification correspondence to those specified by Bureau of Indian Standard in I.S. 460.

4) SCOPE OF WORK :

The work to be carried out under the contract shall consist of the various items as generally described in the tender documents as well as in the bill of quantities furnished in the tender documents.

The work to be performed shall include all general works, preparatory to the construction of road and all other related works. The work shall include work of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meanings of the drawings and these specification and further drawings and orders that may be issued by the engineer from time to time.

The scope of work shall include compliance by the contractor with all general condition of contract, whether specifically mentioned or not in the various clauses of these specifications, all materials, apparatus, plant, equipment, tools, fuel, watering, strutting, timbering, transport, offices, stores, workshop, staff, labour and provision of proper and sufficient protective work, diversions, temporarily fencing & lighting. It shall also include : Safety of workers, first-aid equipment's, suitable accommodation staff and workman with adequate sanitary arrangement, the effecting and maintenance of all insurance, the payment of all wages, salaries, fees, royalties, duties, or other charges arising out of the erection of the work and the regular clearance of rubbish, reinstatement and cleaning up of the site as may be required on completion of works, safety of the public and protection of the works and adjoining land.

The contractor shall ensure that all actions are taken to built in quality insurance in the planning and execution of the work. The quality insurance shall cover all stages of work, such as setting out, selection of materials, selection of construction method, selection of equipment and plant, deployment of personnel and supervisory staff, quality, control, testing etc. The work of building in quality insurance shall be deemed to be covered in this scope of the work.

5) REFERENCE STANDARD BOOKS:

The work included in this contract, shall be carried out in accordance with the specifications, rules and regulations as laid down in the books mentioned below:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

i) Specifications for Road & Bridge Works, Ministry of Road Transport & Highway published by Indian Road Congress - IVth revision or revised from time to time.

ii) For Hot mix plants and accessories to be used for the work shall be in conformity with the specifications prescribed vide Govt. of India M.O.S.T. circular No. RW/24011/2/89-RMP, dtd. 29/09/1989. The plant shall be equipped with all units and accessories as per latest I.S.:3056- 1995 & as amended from time to time.

iii) For paver finisher: Requirement for essential features for paver finisher: (As per M.O.S.T. specification-2nd Revision February-1998 or as revised from time to time) and as specified in the tender documents.

iv) Relevant I.S. and I.R.C. specified in specification of item.

v) **P.W.D. Hand Book Vol. I and II.**

If the reference books quoted above fall short for the items quoted in the schedule of this contract, reference shall be made to Indian Standard Specification of the latest addition, if any of the items of this contract are not covered by reference books quoted above, details and specifications directed by the Supdt. Engineer, GIDC, shall be final.

This shall depend on the standard specifications followed in difference countries of the World for the item concerned.

6) GENERAL CONDITION REGARDING USE OF EQUIPMENT ON WORKS:

i) The contractor shall be required to give a trial run of the equipment(S) or establishing their capability to achieve the laid down specifications and tolerance to the satisfaction of the Engineer before commencement of the work.

ii) All equipments provided shall be of proved efficient and shall be operated and maintained at all times in a manner acceptable to the Engineer.

iii) All the plant / equipment to be deployed on the work shall be got approved from the Engineer for ensuring their fitness and efficiency before commencement of the work.

iv) Any material or equipment not meeting the approval of the Engineer shall be removed from the site forthwith.

v) No equipment or personnel will be removed from site without permission of Engineer. vi) The contractor shall also make available the equipment for site quality control work as directed by the Engineer.

In addition to the general conditions already indicated, the following conditions regarding use of equipment in works shall be satisfied.

7) CONTRACT DRAWINGS :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contract drawings provided for tendering purpose shall be as content in the tender documents and shall be use as a reference only.

The two copies of the drawings, on the basis of which actual execution of the work is to proceed, shall be furnished free of cost to the contractor by the Engineer, progressively according to the work programme submitted by the contractor and accepted by the Engineer.

Examination and / or approval by the Engineer of any drawings or other documents submitted by the contractor shall not relieve the contractor of his responsibilities and liability under the contract.

8) PROGRAMMING:

The Executive Engineer may at any time give directions as to the order & manner in which the several parts of the work shall be carried out. The contractor shall strictly observe such directions. The contractor shall at all time be responsible for any damage and trespass committed by his agent and working people in earring out the work unless trespass is authorized by the Executive Engineer is working.

9) PERMIT & LICENSE:

The contractor shall procure at his sole expenses all permit & license & pay all charges and fee for lawful execution of the work.

10) INSPECTION OF WORKS & MATERIALS:

For Site engineer, Agent & employees of the contractor shall provide safe and proper facilities.

i) The inspection of 'work shall not be relieved the contractor of his obligations to fulfill the terms of the contract as herein prescribed by the plans and specifications.

ii) The Executive dates of work.

The contractor shall furnish written information to the Executive Engineer, carting the original sources of supply and dates of manufacturing of all materials brought to site of the work.

iii) In order to ensure a proper time sequence for required inspection and approval, this information shall be furnished at least two weeks or as directed by the Engineer-in-charge in advance of use or incorporation in the work of any such materials and this shall be given in written by the contractor.

iv) Failure to reject any defective work or materials at any time will not in any way prevent later rejection when such defects is discovered or observed by the department to the final acceptance.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKS

1) In the specifications, “as directed / “Approved” shall be taken to mean “as directed / “approved” by the Engineer-in-charge.

2) Whenever a reference to any Indian Standard appears in the specification, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.

3) The contractor shall invariably carry out Materials & work Tests as specified in the tender document (**B1- Form**) and IS code. However, if the additional tests are required as per the opinion of the Engineer-in-charge, the same shall also have to be carried out. All such tests shall be got carried out in Government or as approved laboratories and cost thereof shall be entirely borne by the contractor. No collection of materials shall be made before it is got approved from the Engineer-in-charge.

4) The following specifications, standards and codes are made a part of this specification.

Indian Standards: specification for building materials, specification for equipment, method of test, method of measurement of building works ,code of practice for construction , safety code for demolition of building, safety code for scaffolds etc. published by the Bureau of Indian Standards

5) In “Mode of Measurement” in the specifications wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provision on these particular points or aspects in the relevant Indian Standards shall be referred to.

6) All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits :

I) Length, width and depth (height) ----- 0.01 Meter.

II) Areas ----- 0.01 sq.mt.

III) Cubic contents -----0.01 cu.mt.

7) Whereas lead is specified, it shall mean “all leads”.

8) Up to “floor two levels” means actual height of floor (maximum 4 M) up to 3 Mt. above plinth level.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- 9)** Definite particulars covered in the item of work, though not mentioned or elucidated in it, specifications shall be deemed to be included therein.
- 10)** Reference to specifications of materials as made in the detailed specification of the item of work is in the form of a designation containing the number of the specification of the material and prefix "M" e.g. "M-5".
- 11)** Approval to the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective later. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
- 12)** The contract rate of the item of work shall be for the work completed in all respects.
- 13)** Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
- 14)** Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.
- 15)** No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damaged or overloading of the various components of the structure.
- 16)** All works shall be carried out in a workman like manner as per the best techniques for the particular item.
- 17)** All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of work.
- 18)** The mode, procedure and manner of execution shall be such that it does not cause damage or over leading of the various components of the structure during execution or after completion of the structure.
- 19)** Special modes of construction not adopted in General Engineering practice, if proposed to be adopted by the contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- 20)** All installation pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the contractor.
- 21)** The contractor shall responsible for observing the rules and regulations imposed under “Minor Minerals Act”, and such other laws and rules prescribed by the Government from time to time.
- 22)** All necessary safety measures and precaution (including those laid in the various relevant Indian Standards) shall be taken to ensure the safety of men, minerals and machinery on the works as also of the work itself.
- 23)** The testing charges of all materials shall be borne by the contractor
- 24)** Approval to any of the executed item for the work does not in any way relieved the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specification.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

GENERAL SPECIFICATION FOR QUALITY CONTROL ON WORKS & MATERIALS

(1) GENERAL

1.1) The contractor shall be responsible for the quality of the work in the entire construction work within the contract. He shall, therefore, have his own independent and adequate set up for ensuring the same.

1.2) The contractor shall provide necessary co-operation and assistance in obtaining the samples for test and carrying out the field tests as required by the Engineer-in-charge from time to time. This may include provision of labour, attendance, assistance in packing and dispatch and any other assistance considered necessary in connection with the test.

1.3) All materials to be used, all method adopted and all works performed shall be strictly in accordance with the requirements of this specification. The contractor shall set up field laboratory at the location approved by the Engineer & equip the same with adequate equipment and personnel in order to carry out all required test & quality of control work as per specification or as directed by the Engineer-in-charge. The list of equipment & the facilities to be provided shall be got approved from the Engineer-in-charge in advance.

1.4) The contractor's laboratory should be manned by a qualified materials Engineers, Civil Engineers, assisted by experienced technicians & the set up should be got approved by the Engineer.

1.5) The contractor shall carry out quality control tests on the materials & work to the frequency stipulated in subsequent paragraphs. In the absence of clear indications about method and or frequency of tests for any item, the instructions of the Engineer shall be followed.

1.6) For satisfying himself about the quality of the materials & work, quality control test will also be conducted by the Site Engineer in charge and TPQA for quality control units or consultant as approved by GIDC, generally to the frequency set forth herein under. Additional tests may be also conducted where, in the opinion of the Engineer, need for such test exists.

1.7) For the work of embankment, sub-grade, and pavement, construction of subsequent layer of same or other materials the finished layer shall be done after obtaining permission the Engineer. Similar permission from the Engineer shall be obtained in the respect of all other items of work prior to proceeding with the next stage of construction.

1.8) The contractor shall carry out modifications in the procedure of work if found necessary, as directed by the Engineer during inspection. Works failing short of quality shall be rectified / redone by the contractor at his own cost and defective work shall also be removed from the site of work by the contractor at his own cost.

1.9) For testing of samples of soil/soil mixes, granular materials, and mixes, bituminous materials & mixes, aggregates, course etc. samples in the required quality & form shall be supplied to the Engineer by the contractor at his own cost.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

1.10) For cement, quarry spalls, aggregate, bitumen, mild steel similar other materials where essential tests are to be carried out at the manufacture's plant or at laboratory other than the site laboratory, the cost of samples, sampling, testing, and furnishing of test certificate shall be borne by the contractor. He shall also furnish the test certificate to the Engineer. The contractor should not that materials other than site laboratory shall be tested in Govt. recognized laboratory at his own cost.

1.11) For testing of cement concrete at site during construction, arrangement for supply of samples, sampling, testing & supply of test results shall be made by the contractor as per the frequency and number of test specified in the Hand book of Quality control for construction of roads and runways (IRC Special publication No.II), and the Ministry of Shipping & Transport Specifications and where the same are silent, as per the relevant IRC Standards, specifications, guidelines, Special publications and IS Standards. In the absence of relevant Indian standards, the sampling and testing procedure to be used shall be approved by the Engineer. Where the Engineer considers that in the interest of the Control of Quality on materials or workmanship, modifications, if any, are necessary, such modifications shall be carried out by the Contractor at no extra cost. The sampling and testing procedure to be used shall be approved by the Engineer and his decision shall be final and binding on the contractor.

1.12) The materials shall be tested in approved Laboratory other than site laboratory.

1.13) All testing charges involved in the entire work shall be borne by the contractor.

1.14) The materials for embankment construction shall be got approved from the Engineer. The responsibility for arising & obtaining the land for borrowing or explore in any other way shall rest with the contractor who shall ensure smooth & uninterrupted supply of materials in the required quality during the construction period.

Similarly, supply of aggregates for construction of road pavement shall be from quarries approved by the Engineer. Responsibility for arising uninterrupted supply of material from the source shall be that of the contractor.

(2) DEFECTIVE MATERIALS:

All materials, which the Engineer/ Q.C. unit of GIDC/ Third Party Inspector appointed by the GIDC has determined as not conforming to the requirements of the contract shall be rejected whether in place or not, they shall be removed immediately from the site as directed. Materials, which have been subsequent collected, shall not be used in the work unless approval is accorded in writing by the Engineer. Upon failure of the contractor to comply with any order of the Engineer/ Q.C. unit of the GIDC / Third Party Inspector appointed by the GIDC, given under this clause. Engineer/ Q.C. unit of the GIDC / Third Party Inspector appointed by the GIDC,, shall have authority to cause the removal of rejected material and to deduct the removal & allied cost thereof from any payments due to the Contractor.

(3) CONTROL OF ALIGNMENT, LEVELS & SURFACE REGULARITY.

3.1) GENERAL:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

All works performed shall conform to the lines, grades, cross sections and dimensions shown on the drawings or as directed by the Engineer-in-charge subject to the permitted tolerances described hereinafter.

3.2) HORIZONTAL ALIGNMENT:

Horizontal alignment shall be reckoned with respect to the centre line of the carriageway as shown on the drawings. The edges of the carriageway as constructed shall be corrected within a tolerance of +/- 10mm there from. The corresponding tolerance for edges of the roadway and lower layers of pavement shall be +/- 25mm.

3.3) LONGITUDINAL PROFILE:

The levels of the sub grade and difference pavement courses as constructed shall not vary from those calculated with reference to the longitudinal and cross profile of the road shown on the drawings or as directed by the Engineer-in charge, beyond the tolerance mentioned below:

1	Sub grade	+ 20mm - 25mm
2	Sub-base	+ 10mm
	(a) Flexible pavement	- 20mm
	(b) Concrete pavement	+ 6mm
3	Sub-base for flexible payment	
	(a) Bituminous course	+/- 6mm
	(b) Other than bituminous	
	(i) Machine laid	+/- 10mm
	(ii) Manually laid	+/- 15mm
4	Wearing course of flexible pavement.	
	(i) Machine laid	+/- 6mm
	(ii) Manually laid	+/- 10mm
5	Cement concrete pavement	+/- 5mm - 6mm

Provided, however, that the negative tolerance for wearing course shall not be permitted in conjunction with the positive tolerance for base course if the thickness of the former is thereby reduced by more than 6mm for flexible pavement and 5mm for concrete pavement.

For checking compliance with the above requirement for sub-grade, sub-base & base courses, measurement of the surface levels shall be taken on a grid of points placed at 6.25mm longitudinally

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

and 3.5 mtr, transversely. For any 10 consecutive measurements taken longitudinally and transversely, not more than one measurement shall be permitted to exceed the tolerance as above, this one measurement being not in excess of 5mm above the permitted tolerance.

For checking the compliance with the above requirement for bituminous wearing courses and concrete pavements, measurement of the surface levels shall be taken on a grid of points placed at 6.25mm along the length and at 0.5mtr. from the edges & at the centre of the pavement. In any length of the pavement, compliance shall be deemed to be met for the final road surface, only if the tolerance given above is satisfied for any point on the surface.

3.4) SURFACE REGULARITY OF SUB GRADE & PAVEMENT COURSES:

The surface regularity of completed sub-base, base courses and wearing surfaces in the longitudinal and transverse directions shall be within the tolerance indicated in Table-1.

The longitudinal profile shall be checked within a 3 meter long straight edge/ moving straight edge as desired by the Engineer, at the middle of each traffic lane along a line parallel to the centre line of the road. The maximum permitted number of surface irregularities shall be as per Table -1 below.

TABLE-1 : MAXIMUM PERMITTED NUMBER OF SURFACE IRREGULARITIES

	Surfaces of carriageways & paved shoulder				Surfaces of laybys Service area and all bituminous base courses			
Irregularity	4mm		7mm		4mm		7mm	
Length (M)	300	75	300	75	300	75	300	75
Double lane/single lane	20	9	2	1	40	18	4	2

The maximum allowable difference between the road surface & underside of a 3 mtr, straight edge when placed parallel with or at right angles to the center line of the road at points decided by the Engineer shall be :

For pavement surface (bituminous & cement concrete) 3 mm

For bituminous base courses 6 mm

For Granular sub-base/base courses 8 mm

For sub-bases under concrete pavements 10 mm

3.5) RECTIFICATION:

Where the surface irregularity of sub grade and the various pavement courses fall outside the specified tolerance, the contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer-in-charge.

(i) **Sub grade:**

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Where the surface is high, it shall be trimmed and suitably compacted. Where the same is low, the deficiency shall be corrected by adding fresh material. The degree of compaction and the type of material to be used shall conform to the relevant specifications.

(ii) **Granular/ Sub base:**

Same as at (i) above except that the degree of compaction and the type of material to be used shall conform to the relevant specifications.

(iii) **Water Bound Macadam Base/Wet Mix Macadam Base :**

Where the surfaced is high or low, the top 75mm shall be scarified, re-shaped with added material as necessary and re-compacted to MoRTH clause-404/406. The area treated as a place shall not be less than 5 meter long and 2 meters wide.

(iv) **Bituminous Constructions:**

For bituminous construction, other than wearing course, where the surface is low, the deficiency shall be corrected by adding fresh material and re-compacting to specifications. Where the surface is high, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications.

For wearing course, where the surface is high or low, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications. In all cases where the removal and replacement of a bituminous layer is involved, the area treated shall not be less' than 5 meter in length & not less than 3.5 mtr, in width.

(4) QUALITY CONTROL TESTS DURING CONSTRUCTION:

4.1) GENERAL:

The materials supplied and the works carried out by the contractor shall conform to the specifications prescribed in the preceding clauses.

For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control tests, as described hereinafter by the Engineer-in-charge shall have the full authority to carry out tests as frequently as he may deem necessary to satisfy himself that the materials and works comply with the appropriate specification. Test procedure for the various quality control tests are indicated in the respective sections of the specifications or for certain tests within this section. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering practice to the directions of the Engineer in-charge.

4.2) TESTS ON EARTH WORK FOR EMBANKMENT CONSTRUCTION:

a. **4.2.1: Borrow materials:**

- a) Sand content (I.S.:2720 -Part-4): Two tests per 3000 cu.mts. of soil.
- b) Plasticity test (I.S.:2720-PART-5):Each type to be tested,2 tests/ 3000 M3 ofsoil.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- c) Density Test (I.S.:2720 -PART-8):Each type to be tested,2 tests/ 3000 M3 of soil.
- d) Each soil type to be tested, 2 tests per 3000 cu.mts.of soil.
- e) Deleterious content Test (I.S.:2720 -Part-27) as & when required by Engineer
- f) Moisture content Test (I.S.:2720 -Part-2)One test for every 250 M2 of soil.
- g) C.B.R. test on materials to be incorporated in the sub grade on soaked/ un soaked samples (IS:2720-Part-16) one CBR test for every 3000 cu.mtr. at least or closer as and when required by the Engineer-in-charge.

b. 4.2.2.: COMPACTION CONTROL:

Control shall be exercised by taking at least one measurement of density for each 1000 square meters of compacted area or closer as required to yield the minimum number of test results for evaluating day's work on statistical basis. The determination of density shall be in accordance with I.S.:2720 -Part-28). Test locations shall be chosen only through random sampling techniques. Control shall not be based on the result of anyone test but on the mean value of a set of 5-10 density determinations. The number of test in one set of measurements shall be 6 (if nondestructive test are carried out, the number of test shall be doubled) as long as it is felt that sufficient control over borrow material and the method of compaction is being exercised. If considerable variations are observed between individual density results, the minimum number of tests in one set of measurement shall be increased to 10. The acceptance criteria shall be subject to the condition that the mean density is not less than specified density plus:

$1.65 - \frac{1.65}{(\text{No. of samples})^{0.5}}$: times the standard deviation.

(No. of samples)^{0.5}

However, for earthwork in shoulders (earthen) and in the sub grade, at least, one density measurement shall be taken for every 500 square meters of the compacted area provided further that the number of tests in each set of measurements should be at least 10. In other respects, the control shall be similar to that described earlier.

c. TESTS ON SUB BASE AND BASES & BITUMINIOUS WORKS:

The tests and their frequencies for the different types of bases and sub-bases shall be as given in TABLE-2. The evaluation of density results for compaction control shall be on lines similar to those set on in Clause - 4.2.2.

TABLE – 2 : CONTROL TEST & THEIR MINIMUM FREQUENCY FOR WORKS

Sr. No.	Type of material /Construction	Types of tests to be conducted/carried out	Frequency @ which minimum test shall be carried out
---------	--------------------------------	--	---

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

1	Cement	a) Setting time – Initial & Final b) Fineness c) Compressive strength d) Consistency e) Fineness test by specific surface f) Chemical test	1 Test : up to 50 MT 2 Test : 50 to 100 MT 3 Test : 100 to 200 MT 4 Test : 200 to 300 MT 5 Test : 300 to 500 MT 6 Test : 500 to 800 MT 7 Test : 800 to 1300 MT
2	Sand	a) Silt content b) Fineness modulus c) Gradation	1 Test /150M3
3	Water	a) Chemical	1 Test per Source
4	Coarse & fine aggregates (Except Road work)	a) Gradation b) Flakiness c) Impact value d) Abrasion value. e) Water absorption	1 Test : up to 100 M3 3 Test : 101 to 500 M3 5 Test : 501 to 1500 M3 7 Test : 1501 to 5000 M3
5	M.S./H.Y.S.D./TMT bars	a) Ultimate tensile strength b) Yield stress (Proof stress) c) Percentage elongation	1 sample / 40 MT for each diameter.
6	Structural steel	a) Ultimate tensile strength b) Yield stress (Proof stress) c) Percentage elongation	1 sample / 20 MT for each dimension of steel component
7	Bricks	a) Compressive strength b) Water absorption	1 Test / 50000 No. (5 bricks)
8	Plain tiles / mosaic tiles/flooring tiles/vitrified	a) Transverses strength b) Abrasion	1 Test / 2000 No. (12 tiles)

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

	tiles/wall tiles	c) Water absorption	
9	Cement concrete cubes	a) Compressive strength for 7 days b) Compressive strength for 28 days	1 samples / 1-5 M ³ 2 samples / 6-15 M ³ 3 samples / 16-30 M ³ 4 samples / 31-50 M ³ 4+1 samples for each additional 50 M ³ or part thereof.
10	Cement mortar	Compressive strength	As per the requirement of Engineer
1	Concrete	Strength of concrete IS: 516 Core strength on hardened concrete IS: 516 Workability of fresh concrete – Slump test IS: 1199. Thickness determination Thickness measurement for trial length. Verification of level of string line (Building work, foundation, cement concrete works)	As per Sr. No. 10 above or As per the requirement of Engineer As per the requirement of Engineer. -do- -do- 2 cores per trial length and as above. String line or steel forms shall be checked for level at an interval of 5 mtr. or 6.25 mtr. The level tolerance allows shall be +/- 2mm.

OTHER SPECIFICATIONS:

Unless specified otherwise in this Schedule, Specifications as given in other volumes of the Tender Documents and List of Approved Makes, Notes on Bills of Quantities and Theoretical Unit Consumptions shall be applicable.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

SPECIFICATION OF MATERIALS

GENERAL

- (1) All materials to be used shall conform to the relevant specifications as per the latest edition of Indian Standard, unless otherwise stated in the detailed specifications of items of work.
- (2) All materials to be used shall be of approved quality & make as per list of approved make attached with the tender documents
- (3) Wherever a reference to any Indian Standard appears in the specification, it shall be taken to mean as a reference to the latest version of the standard.
- (4) The following specifications, standards, and codes are made a part of this specification\Tender document.

Indian Standards : specification for building materials, specification for equipment, method of test, method of measurement of building works ,code of practice for construction , safety code for demolition of building, safety code for scaffolds etc. published by the Bureau of Indian Standards

- (5) The contractor shall invariably carry out Materials & work Tests as specified in the tender document (**B1- Form**) and IS code. However, if the additional tests are required as per the opinion of the Engineer-in-charge, the same shall also have to be carried out. All such tests shall be got carried out in Government or as approved laboratories and cost thereof shall be entirely borne by the contractor. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
- (6) Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
- (7) Materials, if rejected by the Engineer-in-charge, shall be immediately removed from the site of work. If they are not removed within twenty four hours of receiving such intimation, Engineer-in-charge shall get the same removed at contractor's cost.

The Engineer-in-charge shall dispose off such materials in a manner as he chooses and the contractor shall not entitle to any compensation for the cost of such materials.

- (8) Approval to the samples of various materials given by the Engineer-in-charge will not absolve the contractor from the responsibility of replacing the defective material brought on site of materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
- (9) The contractor shall be responsible for observing the law, rules and regulations imposed under the "Minor Minerals Act " and such officer laws and rules prescribed by Government from time to time.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

M-1 Water :

Water shall not be salty or brackish and shall be clean, reasonably clean and free from objectionable quantities of silt and traces of oil and injurious alkalis, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in RCC container for transport storage and handling of water shall be clean.

If required by Engineer-in-charge it shall be tested by comparison with detailed water. Comparison shall be made by means of standard cement, tests, soundness, time of setting and mortar strength as specified in IS- 269-1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar, prepared with water sample when compared with the result obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

Water for curing to mortar concrete or masonry should not be too acidic or too alkaline, it shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during those produce objectionable stain or other unsightly deposits on concrete or mortar surface. Hard and bitter shall not be used for curing. Potable water will generally be found suitable for curing of mortar or concrete.

M-2 Lime :

Lime shall be hydraulic lime as per I.S. 712-1973. Necessary tests shall be carried out as per IS- 69332 (Part I to X) 1973.

Storage shall comply with I.S. 712-1973. The slacked limes if stored shall be kept in a weather proof and damp- proof shed with impervious floor and sides be protected it against rain, moisture, weather and extraneous materials mixing with it. All limits that have been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.

Field testing shall be done according to I.S. 1624-1974 to show the acceptability of materials.

M-3 Cement :

Cement shall be ordinary Portland cement as per I.S. 269-1975.

The contractor shall take every precaution to store the cement properly. So that it is not spoiled by dampness etc. Cement required for use shall be fresh as possible and stored on plank raised 15 to 20 cms above the floor and stacked 30 cms. Away from the wall in suitable closed whether proof godown at the site of work. Cement shall be stored in such a way to allow the removal and use of cement in chronological order on receipt i.e. first received being first used. Not more than 15 bags shall be stacked vertically in one pile and maximum width of the piles should not be more than 3 meters. Any cement which has deteriorated caked or which has been set or partially set shall not be used. When temporarily stored in open for use it shall be kept on a suitable platform and suitably protected as necessary.

Different brands of cement or cement of the same brand from different factories shall be stored in separate groups and shall not be mixed during use. Cement shall be kept in a store under double locking arrangement. A board indicating stock and daily transaction or cement shall be kept in each

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

room of the cement store. Daily account of receipt and use of cement bag shall be maintained by the contractor in the Performa prescribed by the Engineer-in-charge.

The cement shall be measured by one bag for all use in concrete (except otherwise stated) etc. In no case cement shall be measured by boxes or other means for the volumetric proportion of concrete and mortar. For calculation for the proportion, the volume of the cement bag shall be taken as 0.0342 cu.m. (1.20 cf) and measuring of size 30 cms x 30x38 cms for concrete works. If weight batch concrete is to be used, the cement shall have to be used as per actual weight and the contractor shall not be entitled for any compensation for loss in weight due to shifting of bags or on account of any other reasons.

M-4 White cement :

The whole cement shall conform to IS- 8042-E-1076.

M-5 Coloured cement :

Coloured cement shall be with white or grey Portland cement as specified in the item of the work.

The pigments used for coloured cement shall be of approved quality and shall not exceed 10% of cement used in the mix. The mixture of pigment and cement shall be properly ground to have a uniform colour and shade. The pigment shall have such properties to provide for durability under exposure to sunlight and weather. The pigments shall have the property such that it is neither affected by the cement nor deterrent to it.

M-6 Sand :

Sand shall be natural and clean, well graded, hard strong durable and gritty partition free from injuries amount of dust, clay, kankar nodules, or of flaky partition shale alkali, salts, organic matter loam mica or other deleterious substance shall be got approved from the Engineer-in-charge if sand is covered with dust it shall be washed with water to make it clean.

(A) The sand to be used in cement mortar for masonry work and first coat of plaster should generally satisfy the following grading.

I.S. sieve	Percentage by weight passing through.
480	100
230	80-95
120	70-90
60	40-85
30	5-50
15	0-10

(B) The fineness modules shall not exceed 3.0. Sand to be used in cement mortar for stone slab lining work, pointing and second coat of plaster may have the grading.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

I.S. sieve	Percentage by weight passing through.
480	100
240	100
120	75-100
60	40-85
30	5-50
15	0-10

The fineness modules shall not exceed 1.6.

(C) Sand to be used for concrete work shall of grades as specified in I.S. 383-1970 with fineness modules varying from 2.6 to 3.6 as per requirement.

The sand shall be stacked carefully on a clean hand surface. Sand of approved quality shall be obtained from approved sources and will be allowed to be used for work.

M-7 Stone Dust :

This shall be obtained from crushing hard black trap stone. It shall not contain more than 8% of silt determined be field test with measuring cylinder. The method of determining silt content by field is given as under.

A sample of stone dust to be tested shall be placed without drying in 200 mm measuring cylinder. The quantity of the sample shall be such that it fills the cylinder up to 100mm mark. The clean water shall be added up to 150mm mark. The mixture shall be stirred vigorously and the content allowed settling for 3 hours.

The height of silt visible as settled layer above the stone dust shall be expressed as percentage of height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.

The fineness modules of stone dust shall not be less than 1.80.

M-8 Black Trap Grit :

Grit shall consist of crushed or broken stone and be hard, strong dense, durable clean of proper gradation and free from skin or coating likely to prevent proper adhesion of Mortar Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provision of IS – 383-1970. Unless special stone of particular quarries are mentioned, aggregate shall be broken from the best black trap stone as approved by the Engineer-in-charge. Stones shall have no deleterious reaction with cement.

The grit shall conform to the following gradation as per sieve analysis.

I.S. sieve designation	Percentage passing for sieve.
------------------------	-------------------------------

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

12.50 mm	100%
10.00 mm	45-100%
4.75 mm	0-20%
2.36 mm	0-5%

The crushing strength of grit shall be such as to allow the concrete in which to be used to built up the specified strength of concrete.

The necessary test for grit shall be carried out as per the requirement of I.S.- 2386-Part-I to VIII of 1993 or as revised from time to time as per instruction of the Engineer-in-charge.

M-9 Cement Mortar :

Cement : Cement shall conform to specification M-3

Water: Water shall conform to specification M-1

Sand: Sand shall conform to specification M-6.

Proportion of mix :

Cement and sand shall be mixed to specified proportion. Sand being measured by measuring boxes. The proportion of cement will be by volume on the basis of 50 kg/bag of cement being equal to 35 liters or 0.0342 M³. The mortar may be hand mixed or machine mixed as directed by the Engineer-in-charge.

Preparation of mortar:

In hand mixed mortar, cement and sand in the specified proportion shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times of more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious, extraneous material shall be get mixed with mortar or mortar shall flow out, while mixing the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio may be adopted as directed by the Engineer-in-charge.

The mortar so prepared shall be used within 30 minutes of adding water; only such quality of mortar shall be prepared as can be used within 30 minutes. The mortar remaining unused after that period or mortar which has partially hardened or damaged shall not be re-tempered or remixed. It shall be destroyed or thrown away.

M-10 Black trap stone coarse aggregate for plain and ordinary reinforced concrete.

Coarse aggregate shall be of machine crushed stone of black trap and be hard strong, dense, durable, clean and free in skin and coating likely to prevent proper adhesion of mortar. The aggregate shall generally be cubical in shape. Unless special stones or particular quarries are mentioned, aggregates shall be machine crushed from the best black strap stone as approved by the Engineer-in-charge. Aggregate shall leave no deleterious reaction with cement. The size of the

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6 mm less than the minimum lateral clear distance between bars or 6mm less than the cover which is smaller.

TABLE -1

L.S. sieve designation.	Percentage aggregates 40 mm	Passing for single of nominal size 20 mm	Size 16mm
40mm	85-100	100	100
20mm	0-20	85-100	100
16mm	--	--	--
12.5 mm	--	--	--
10 mm	0-5	0-20	0-30
4.75mm	--	0-5	0-5
2.36 mm	--	--	--

Note:

This percentage may be varied some what by the Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

Single size coarse aggregates conforming to the requirements in Table No. 1 above or following nominal size shall be used at site with the other ingredients of concrete as indicated below. The mixing shall be in a mixture or on the platform as directed in case of CC 1:5:10 only. For CC 1:4:8, CC 1:3:6, CC 1:2:4 and CC 1:1^{1/2}:3 mixing with the other ingredient of concrete shall be done in the mixture only except for small works.

- (1) CC 1:5:10 - Nominal size of aggregate 40 mm
- (2) CC 1:3:6 - Nominal size of aggregate 20 / 40 mm
- (3) CC 1:4:8 - Nominal size of aggregate 40 mm
- (4) CC 1:2:4 - Nominal size of aggregate 20 mm
- (5) CC 1:1^{1/2}:3- Nominal size of aggregate 20 mm

The grading test shall be taken in the beginning and at the change at the source of materials. The necessary test indicated in IS 383-1970 and 456-1978 shall have to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner to prevent the inter mixing of different aggregates. If the aggregates are covered with the dust, it shall be washed with water to make it clean. The coarse aggregates for plain and reinforced concrete shall be measured by volume in the steel or wooden boxes prepared as per the direction of the Engineer-in-charge.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

M-11 Black trap stone coarse aggregates for controlled reinforced concrete:

Coarse aggregate shall be of machine crushed stone of black trap and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion mortar.

The aggregates shall generally be cubical in shape. Unless special stones of particular quarries are mentioned, aggregate shall be machine crushed from the best, black trap stone as approved by the Engineer-in-charge. Aggregate shall have no deleterious reaction with cement.

In proportion concrete, the quantity of coarse aggregate shall be determined by weight only. The grading of coarse aggregate shall be controlled by obtaining the aggregate in different size and blending them in the right proportions as per concrete mix design approved by the Engineer-in-charge. The different sizes shall be stocked in separate stock piles. The grading of aggregates shall be checked as frequently as possible. The frequency for verification of the grading shall be as directed by the Engineer-in-charge to ensure that the grading as maintained uniform with that of the samples used in the preliminary tests.

The necessary test indicated in I.S. 383-1976 and I.S. 456-1978 shall have to be carried out to ensure the acceptability of the material.

If aggregate is covered with dust, it shall be washed with water to make it clean.

M-12 Brick Bats Aggregate :

Brick aggregates shall be broken from well burnt to slightly over burnt and dense bricks. It shall be homogeneous in texture, roughly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40mm to 50mm unless otherwise specified in the item. The under burnt to over burnt brick bats shall not be allowed.

M-13 Bricks / flyash building brick :**(A) First class Bricks :**

The bricks shall be hand or machine moulded and made from suitable soils and klin burnt. They shall be free from cracks and flaws modules of free time. They shall have smooth rectangular faces with sharp corners and shall be of uniform colour. The bricks shall be moulded with a frog of 100mm x 40 mm and 10mm to 20 mm deep on one of the flat sides. The bricks shall not break when thrown on the ground from a height of 600 mm.

The size of modular bricks shall be 190mmx90mm x 90mm and shall conform to IS 1077-1976 in respect of tolerance for sub-class "A" bricks.

The crushing strength of the bricks shall not be less than 35 kg / sq.cm. The average water absorption shall not be more than 20 percent by weight. Necessary tests for crushing strength and water absorption shall be carried out as directed by the Engineer-in-charge.

(B) Second class bricks:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The second class bricks shall be similar to first class bricks except that they may be permitted to have slight distorted and rounded edges provided no difficulty shall arise on this account in laying of uniform courses.

M-14 Mild Steel Bars :

Mild steel bars reinforcement for RCC work shall conform to I.S. 432 1966 and of tested quality. It shall also comply with relevant part of IS 456-1978.

All reinforcement shall be cleaned and free from dirt, oil, paint, grease, mill's make or loose or thick rust at the time of placing.

Reinforcement steel shall be stored such as to avoid distortion and sogs of long length and shall be protected as far as possible from surface deterioration. All bars of the same designation shall be stacked separately as far as possible and distinctly marked. For the purpose of payment the bar shall be measured correct up to 10mm length and weight payable worked out at the rate specified below.

1	6 mm	0.22 kg / Rmt
2	8 mm	0.39 kg / Rmt
3	10 mm	0.62 kg / Rmt
4	12 mm	0.89 kg / Rmt
5	14 mm	1.21 kg / Rmt
6	16 mm	1.58 kg / Rmt
7	18 mm	2.00 kg / Rmt
8	20 mm	2.47 kg / Rmt
9	22 mm	2.98 kg / Rmt
10	25 mm	3.85 kg / Rmt
11	28 mm	4.83 kg / Rmt
12	32 mm	6.31 kg / Rmt
13	36 mm	7.99 kg / Rmt
14	40 mm	9.86 kg / Rmt

M-15 High Yield Strength Steel Deformed Bars/TMT/CRS :

High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to IS 1786-1979 & I.S. 1139-1966 respectively or as revised from time to time.

T.M.T. shall conform to IS 1789-FE 500 or as revised from time to time. Approved make for TMT bar shall be Tata, Shah Alloys, Malhotra, Rajury, Sirhind, Thermax, vizag, sail, essar

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Corrosion Resistance Steel shall conform to relevant IS code or as revised from time to time.

Other provisions and requirements shall conform to specification No. M -14 for Mild steel bars.

M-16 Mild Steel Binding Wire :

The mild steel wire shall be of 1.63mm or 1.22mm (16 or 18 gauge) diameter and shall conform to IS 280-1978 or as revised from time to time.

The use of black wire will be permitted for binding reinforcement bars. It shall be free from dust, oil paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

Storage: The wire coils shall be stored such as to avoid deterioration.

Measurement: No measurement will be taken of the wire used for tying reinforcement bars. The rate for reinforcement steel and its fabrication shall include the cost of binding wire.

M-17 Structural Steel :

All structural steel shall conform to I.S.226-1975 & I.S. 800-1962 or as revised from time to time. The steel shall be free from defects mentioned in I.S. 226-1975 and shall have smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability Rivet bars shall conform to I.S. 1148-1973.

Structural steel shall be stored such as to avoid distortion of section of long length and shall be protected as far as practicable from surface deterioration. It should be so stored and handled that material will not be subject to excessive stress and damages. All deformed structural material will be properly straightened by methods which are not injurious prior or being aid off, punched or otherwise worked in the shop. Sharp kinks and bends shall be caused for rejection.

When the steel is supplied by the contractor test certificate of the manufacturers shall be produced, if so required by the Engineer-in- charge. If further test be necessary, they will be done according to I.S. 226-1975 & I.S. 223-1950 or as revised from time to time.

M-18 Shuttering :

The shuttering shall be either of wooden planking of 30mm minimum thickness with or without steel sheet lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical bellies properly cross braced together so as to make the form work rigid.

The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

If at any stage of work during or after placing concrete in the structure, the forms work sags or budes out beyond the required shape of the structure, the concrete shall be removed and work

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

redone with fresh concrete and adequate rigid form work. The complete form shall be got inspected by and approved from the Engineer-in-charge before the reinforcement bars are placed in position.

If wooden props are used, the props shall consist of bellies having 100mm minimum diameter measured at mid length and 80mm at thin end and shall be placed at 1 to 1.20 m. spacing. These shall rest squarely on wooden sole plates 10 mm thick and minimum bearing area of 0.10 sq.m. laid on sufficiently hard base.

Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and casing of shuttering without jarring the concrete.

The timber used in shuttering shall not be so dry as to absorb water from concrete and swell budge nor so green or wet as to shrink after erection. The limber shall be properly swan and planned on the sides and the surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel shall be permitted.

As far as practicable clamp shall be used to hold the forms together and use of nails and spikes avoided.

The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of soap solution or raw linseed oil of approved manufacturer may be applied in place of soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface.

The shuttering for beams and slabs shall have camber of 4 mm per meter (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilever the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

The period that shall elapse after concrete has been laid before easing and removal of centering and shuttering as under taken shall be as follows :

	Part of structure	Period
1	Sides of foundation, columns beams & walls.	34 to 48 hours
2	Undersides of slabs up to 4.5 m span	7 days.
3	-do- above 4.5 m add under side of beams and arches up to 6 m span.	14 days.
4	-do- above 6 m. span and up to 9 m span.	21 days
5	Undersides of beams and arches over 9 m span	28 days
6	Domes: Shall & other structure of special nature.	As per instruction.

Work damaged through premature or careless removal of forms shall be reconstructed. The period for striking the form work shall be 1.5 times more in case of Pozzolona cement if used then that of the ordinary Port land cement and the contractor shall not entitle for any extra claim for the same.

M-19 Expansion Joints, Pre-moulded Filler :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The item provides for expansion joints in R.C.C. frame structure for internal joints, as well as for exposed joints with the use of pre-moulded bituminous joint filler.

Pre-moulded bituminous joint filler i.e. pre-formed strip of expansion joints filler shall not be deformed or broken by twisting bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.

Thickness of the pre-moulded joint filler shall be 25mm unless otherwise specified pre-moulded bituminous joints filler shall conform to I.S. 1938-1961 or as revised from time to time.

M-20 Expansion Joints – Copper Strip & Holdfast :

The item provides for expansion joints in R.C.C. frame structure for internal joints as well as for exposed joints with the use of necessary copper strip and hold fasts. Copper sheet shall be of 125 mm thick and 125mm or required width with the “U” shape in the middle. Copper strip shall hold fast of 3mm diameter copper rod fixed to the plaster shoulders on strip at intervals of about 30 or as shown in the drawing or as directed by the Engineer-in-charge. The width of each flange (horizontal side) of the copper plate to be embedded in the concrete work shall be 25mm depth of “U” to be provided in the expansion joint in the copper plate shall be of 25mm.

M-21 Teak Wood :

The teak wood shall be of good quality as required for the item to be executed when the kind of wood is not specially mentioned good Indian Teak Wood as approved by the Engineer-in-charge shall be used.

Teak wood shall generally free from large, loose, dead or cluster knots, flows, shakes, wraps twists bends or any other defects it shall generally be uniform in substance and of straight fibers as far as possible. It shall be free from rot, decay, harmful fungi and other damages of harmful nature which will affect the strength durability or its usefulness for the purpose for which it is required. The colour shall be uniform as far as possible. Any effort like painting using and adhesive or resinous materials, made to hide the defects shall render the pieces liable to rejection by the Engineer-in-charge.

All scantlings, planks etc. shall be swept in straight lines and planes in the direction of grains and of uniform thickness.

The tolerance in the dimensions shall be allowed at the rate of 1.5mm per face to be planned.

M-22 Glass :

All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes, blisters and other defects. The kind of glass to be used shall be as mentioned in the item of specification or in the special provisions or as shown in detailed drawings. Thickness of glass panels shall be uniform. The specification of different kind of glass shall be as under:

Sheet Glass :

In absence of any specified thickness or weight in the item of detailed specifications of the item of work sheet glass shall be weighing 7.5 kg/ sq.m. up to 600mm x 600mm.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

For panes larger than 600mmx600mm up to 800mmx800mm the glass weighting not less than 8.75 kg /sq.m. shall be used. For bigger panes up to 900mmx900mm glass weighting less than 11.25 kg/sq.m. shall be used.

Sheet glass shall be patent Battered glass of best quality and for glazing and framing purposes shall conform to IS – 2835-1977. Sheet glass of the specified colour shall be used, if shown on detailed drawings or so specified. For important buildings and for panes with any dimensions 900 plate glass of specified thickness shall be used.

Plate Glass:

When plate glass is specified, it shall be “Polished Patent Plate Glass” of best quality. It shall have both the surface ground flat and parallel and polished to obtain clear undisturbed vision and reflection. The plate glass shall be of the thickness mentioned in the item or as shown in the details drawing or as specified. In absence of any specified thickness, the thickness of plate glass to be supplied shall be 6mm and to tolerance of 0.55 to 0.88 mm shall be admissible.

Obscured Glass:

This type of glass transmits lights so that vision is partially or almost completely, obscured. Glass shall be plain rolled or double rolled, figured, ribbed or fluted, or frosted glass as may be specified or required, the thickness and types of glass shall be as detailed on drawings or as specified or as directed by the Engineer-in-charge.

Wired Glass:

Glass shall be with wire netting embedded in a sheet or plate glass electrically, welded 13mm. Georgian square mesh shall be used. Thickness of glass shall not be less than 6 mm wired glass shall be of type and thickness specified.

M-23 Fixtures & Fastenings :

General:

The fixtures and fastenings that is but things, tee and strap hinges, sliding door bolts, tower bolts, door latch, bathroom latch, handles, door stoppers, casement window fasteners, casement stays and ventilators catch shall be made of the metal as specified in the item or its specifications.

They shall be of iron, brass, aluminum chromium plated iron, chromium plated brass, copper, oxidized iron, copper brass or anodized mat aluminum, stainless steel matt as specified.

The fixtures shall be approved make as per list of approved make attached with the tender document. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operations.

The sample of fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.

Their size shall conform to those prescribed in C-12. In respect of other dimensions not specified they shall conform to relevant I.S.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Hold Fast:

Hold fast shall be made from mild steel flat 50mm length at one end of the hold fast shall be bent at right angle and two Nos. of 6mm diameter holds shall be made in it for fixing it to the frame with screws. At the other end, the hold fast shall be forked and bent at right angles in opposite direction.

Butt Hinges:

Medium type iron butt hinges shall be specified.

Tee and strap hinges shall be manufactured from M.S. sheet as specified in the item.

Sliding Door Bolts (Aldrops)

In case of single leaf door, where iron socket plate or brass or aluminum fixing bolts (for sliding door bolt) cannot be fixed, a hole of suitable size shall be drilled in the door frame and a counter sunk plate not less than 1.5mm thick cut to shape shall be fixed at the face of the holes.

Tower Bolts (Barrel Type)

Mild steel door bolts shall be made in one piece. Knobs of tower bolts shall be cast and knob fixed in the bolt.

Door Latch:

The size of the door latch shall be taken as the length of latch.

Bathroom Latch:

Bathroom latch shall be similar to tower bolt. The size of the handles shall be determined by the inside grip length of the handles.

Door Stoppers:

Door stopper shall be either floor door stopper type or door catch type. Floor door stopper shall be of overall size as specified and shall have a rubber cushion.

Door Catch:

Door catch shall be fixed at a height of about 900 mm from the floor level such that one part of catch is fitted on the inside of the shutter and the other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixity. The catch shall be fixed 20mm inside the face of the door for easy operation of catch.

Casement window fastener:

Casement window fastener for single leaf window shutter shall be left or right hand as directed.

Casement stays (straight peg stay):

The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially as directed.

Pivot:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The base socket plate shall be made from minimum 3 mm thick plate, and protected pivot shall not be less than 12 mm diameter and 12mm length and shall be firmly riveted to the base plate in case of iron pivot. Size of the stay shall be 250mm, 800mm as directed.

M-24 Paints :

(A) Oil Paints :

Oil paints shall be of the specified colour and shade, and approved by the Engineer-in-charge. The ready mixed paints shall be used. However, if it ready mixed paint of specified shade or tint is not available white ready mixed paint with approved strainer shall be allowed in such a case, the contractor shall ensure that the shade of the paints so allowed be uniform.

All the paints shall meet with the following general requirement:

- i) Paints shall not show excessive setting in a freshly opened full can and shall easily be redispersed with a paddle to a smooth homogeneous state. The paint shall show no curding, levering, cracking or colour separation and shall be free from lumps and skins.
- ii) The paint as received shall brush easily possesses good leveling properties and show no running or sagging tendencies.
- iii) The paint shall not skin within 48 hours in a three quarters filled closed container.
- iv) The paint shall dry to smooth uniform finish free from roughness, grit, unevenness and other imperfections.

Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

(B) Enamel Paints:

The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints.

Enamel paint shall conform to IS 2933-1975 or as revised from time to time.

M-25 French Polish :

The French polish of required tint and shade shall be prepared with the below mentioned ingredients and other necessary materials.

- i) Denatured spirit
- ii) Chandra's.
- iii) Shellac
- iv) Pigment

The French polish so prepared shall conform to I.S. 348-1968 or as revised from time to time.

M-26 Marble Chips for Marble Mosaic Terrazzo :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The marble chips shall be Makrana white or Chittor pink, yellow, green and black , Jaisalmer yellow, Baroda green, Deheradun white, grey (surat) and Alwar black or as specified. It shall be hard, sound, dense and homogeneous in texture with crystalline and coarse grains. It shall be uniform in colour and free from stains cracks, decay and weathering.

The size of various colours of marble chips ranging from the smallest up to 20mm shall be used where the thickness of top wearing layer is 6mm size. The marble chips of approved quality and colours only as per grading as decided by the Engineer-in-charge shall be used for Marble Mosaic Tiles or works.

The marble chips shall be machine crushed. They shall be free from Foreign matters, dust, etc. Except as above the chips shall conform to I.S. 2114-1962 or as revised from time to time.

M-27 Flooring Tiles :

(a) Plain Cement Tiles:

The plain cement tiles shall be of general purpose type. These are the tiles in the manufacture of which no pigments are used.

The tiles shall be manufactured from a mixture of cement and natural aggregates by pressure process. During manufacture tiles shall be subjected to a proportion of not less than 140 kg / sq.mt. The proportion of cement to aggregate in the backing of the tiles shall be not less than 1:3 by weight. The wearing face through the tiles are of plain cement shall be provided with stone aggregates on 1 to 2 mm size. The proportion of cement to be aggregate in wearing layer of the tiles shall be three parts of cement to one part of chips by weight. The minimum thickness of wearing layer shall be 3 mm. The colour and texture of wearing layer shall be uniform through out its face and thickness. On removal from mould, the tiles shall be kept in moist condition continuously at least for seven days and subsequently if necessary, for such period that would ensure their conformity to requirements of I.S. 1237-1980 regarding resistance to wear and water absorption.

The wearing face of the tiles shall be plane, free from projections, depressions and cracks and shall be reasonably parallel to the back face of the tiles. All angles shall be right angles and all edges shall be sharp and true.

The size of tiles shall generally be squared shape size 24.85 cm x 24.85 cm or 25 cm x 25 cm. The thickness of tiles shall be 20 mm.

Tolerance on length and breadth shall be plus or minus one millimeter. Tolerance on thickness shall be plus 5 mm.

The tiles shall satisfy the test as regards transverse strength, resistance to wear and water absorption as per I.S. 1237-1980. Necessary tests shall be got carried out by the contractor.

(B) Plain Coloured Tiles :

These tiles shall have same specification as per plain cement tiles as per (A) above except that they shall have a plain wearing surface wherein pigments are used. They shall conform to IS 1237-1980.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The pigment used for colouring cement shall not exceed 10 percent by weight of cement used in the mix. The pigments, synthetics or otherwise used for colouring tiles shall have permanent colour and shall not contain materials detrimental to concrete.

The colour of the tiles shall be as specified in the item or directed by the Engineer-in-charge.

(C) Marble Mosaic Tiles / Terrazzo tiles :

These tiles shall have the same specifications as per plain cement tiles except that requirements as stated below:

The pigment incorporated in terrazzo shall be of permanent colour and shall conform to requirement mentioned in Appendix-A in I.S. 2114-1962. The marble powder shall passed through I.S. sieve Terrazzo-30. Marble chips shall conform to M-26.

The marble mosaic tiles shall conform to I.S. 1237-1980. The wearing face of the tiles shall be mechanically ground and filled. The wearing fact of tiles shall be free from projection, depressions, and cracks and shall be reasonably parallel to the back face of the tiles. All angles shall be right angel and all edges shall be sharp and true.

Chip used in the tiles shall be up to 6mm sizes. The minimum thickness of wearing layer of tiles shall be 6 mm. For pattern of chips to be had on the wearing face, few samples (with or without their full size photographs as directed by the Engineer-in-charge) shall be presented to the Engineer-in-charge for approval.

Any particular samples, if found suitable shall be approved by the Engineer-in-charge or he may ask for few more samples to be prepared indicating roughly the particular sized chips to be more or less in the sample presented. The sample shall have to be made by the contractor till a suitable sample is finally approved for use in the work. The contractor shall ensure that the supplied for the work shall be in conformity with the approved sample only tiles in item of its dimensions thickness of backing layer and wearing surface material ingredients, colour, shade chips distribution etc. required.

The tiles shall be prepared from cement conforming to I.S. or coloured Portland cement generally depending upon the colour of tiles to be used or as directed.

M-28 Rough Kotah Stone :

(A) Kotah Stones :

The kotah stones shall be hard, even, sound and regular in shape and generally uniform in colour. The colour of the stone shall generally be Green. Brown or yellow coloured, stones shall not be allowed for use. They shall be without any soft veins, cracks or flows.

The sizes of the stones to be used for flooring shall be of size not less than 600mm x 450mm as directed. However, smaller sizes will be allowed to be used to the extent of maintaining required pattern. Thickness shall be as specified.

(B) Polished Kotah Stones :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Polished kotah stone shall have the same specification as per rough kotah stone as per (A) above except as mentioned below.

The stone shall have machine polished smooth surface. When brought on side, the stone shall be single or double polished depend upon the its use or as described in the item of Schedule "B". The stone for flooring shall generally be single polish. The stone to be used for dedo, skirting, platform, stair case steps etc. shall be double polished&all exposed edges rounded.

M-29 Dholpur Stone Slab :

Dholpur stone slab shall be for best quality as approved by the Engineer-in-charge. The stone slab shall be without any veins, cracks and flaws. The stone slab shall be even, sound and durable, regular in shape and of uniform colour.

The size of the stone shall be as specified in the item or detailed drawing or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work with the permissible tolerance of plus or minus 2mm. The provisions in respect of polishing as per M-29 (B) of polished kotah stone shall apply to polished Dholpur stone also. All angles and edges of the face of the stone slab shall be file chiseled or polished as specified in the item of work and all the four edges shall be machine cut. All angles and edges of the stone slab shall be true square cut and free from chippings and surface shall be true and plane.

The sample of stone shall be got approved from the Engineer-in- charge for shade and tint for a particular work. It shall be ensured that the stones to be used in a particular work and shall not differ much in shade or tint from the approved sample.

M-30 Marble Slab :

Marble slabs shall be white or of another colour and of best quality as approved by the Engineer-in-charge.

Slab shall be hard, close, uniform and homogeneous in texture. They shall have even crystalline grain and free from defects and cracks. The surface shall be machine polished to an even and perfectly plane surface and edges machine cut true and square. The rear face shall be rough enough to provide key for the mortar.

Marble slabs with natural veins. If selected have to be laid as per the pattern given by the Engineer-in-charge. Size of slab shall be minimum 450mm x 450mm preferably 600mm x 600 mm. However, smaller size will be allowed to be used to the extent of maintaining required pattern.

The slab shall not be thinner than the specified thickness at its thinnest part. A few specimen of finished slab to be used shall be deposited by the contractor in the office for reference.

Except as above, the marble slab shall conform to IS 1130-1969 or as revised from time to time.

M-31 Granite Stone Slab :

Granite shall be of approved colour and quality. The stone shall be hard sound, durable, resistant to wear, rectangular or square in shape and as directed by the Engineer-in-charge. Uniformity of size shall generally be maintained for the stones used in any one room. The stone shall be without any

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

soft. Veins, cracks or flaws and shall have uniform colour. They shall have natural surface free from broken flakes on top, and the exposed surface shall be machine polished to a smooth, even and true plane and the edges hand cut and dressed true and square. The evenness of the surface of slabs and edges of the slab shall not be marred by careless dressing or handling and no patching up shall be allowed for the slab. The edges shall be quite straight. The under face may be left as required or rough dressed. Before taking up the work samples of stone slabs, to be used and their dressing and polishing shall be got approved by the Engineers in-charge and will keep them in his office' for reference and the stone slabs to be used shall conform to the approved sample.

The maximum water absorption percentage and minimum compressive strength shall be as given in Table – 1 below:

Table -1

Type of Stone	Maximum Water Absorption percentage by weight	Minimum Compressive strength Kg/Sq. cm
Granite	0.50	1000

Note -1: Test for compressive strength shall be carried out as laid down in IS: 1121(Part1).

Note -2: Test for water absorption shall be carried out as laid down in IS: 1124.

The thickness of the stone shall be as specified in the item.

The Granite stone of approved colour shall be double polished on single or both side as per requirement of items to be executed.

All exposed faces shall be double polished to render truly smooth and even reflecting surface. The exposed edges and corners shall have rounded off as directed. The exposed edges shall be machine cut& rounded and shall have uniform thickness.

M-32 White Washing :

Following materials shall be used for preparing white wash.

1. Fresh burnt white stone or lime.
2. Gum Arabic 2.0 kg / cmt. of lime.
3. Indigo as required.

It shall conform to relevant I.S. specifications.

M-33 Distemper :

Oil bound washable distemper of approved brand and manufacture and colour and shade shall be used. It shall conform to IS 427-1965. Distemper shall be used according to the manufacturer's instructions only.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

M-34 White Glazed Tiles :

The tiles shall be of second class quality as approved by the Engineer-in-charge. They shall be flat and true to shape. They shall be free from cracks, crazing spots, chipped, edges and corners. The glazing shall be of uniform shade.

The tiles shall be of nominal size of 150mm x 150mm unless otherwise specified. The maximum variation from the stated sizes, other than the thickness of tiles, shall be plus or minus 1.5mm. The thickness of tiles shall be 6 mm. except as above the tiles shall conform to IS 777-1970.

M-35 Galvanized Iron Pipes & Fitting :

Galvanized Iron pipe shall be of the medium type and of required diameter and shall comply with IS 1239-1979. The specified diameter of the pipes shall refer to the inside diameter of the bore. Clamps, screws, all galvanized iron fittings shall be of the standard "R" or equivalent make. All the pipes and fittings shall have ISI certification mark.

The pipe and fittings shall be smooth, sound, free from any imperfections and neatly dressed. The pipe and fittings shall be able to withstand a safe pressure of 6kg per square centimeter.

M-36 Bib Cock & Stop Cock :

A bib cock is a drawn off tap with a horizontal inlet and free outlet. A stop cock is a valve with a suitable means of connection for inserting in a pipe line for controlling stopping the flow.

They shall be of SPVC screw down type and of brass chromium plated and of diameter as specified in the description of the item. It shall conform to IS 781-1977 or as revised from time to time and they shall be of best Indian make. They shall be polished bright.

The minimum finished weight of bib cock and stop cock shall be as given below :

Diameter	Bib cock	Stop cock
8 mm	0.25 kg	0.25 kg
10 mm	0.30 kg	0.35 kg
15mm	0.40 kg	0.40 kg
20mm	0.75 kg	0.75 kg

M-37 Gun Metal Wheel valve :

The gun metal wheel valve shall be of approved quality, these shall be of the gun metal fitted with wheel and shall be of gate valve opening full way and of the size as specified. They shall conform to I.S. 778-1980.

M-38 White Glazed Porcelain Wash Basin :

Wash basin shall be of white porcelain of approved quality best Indian make and it shall conform to IS 771-1979 or as revised from time to time. The size of the wash basin shall be as specified in the item. Wash basin shall be of one piece construction with continued over flow arrangements. All

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

internal angles shall be designed so as to facilitate cleaning. Wash basin shall have simple tap hole as specified. Each basin shall have a circular waste hole which is either rebated or leveled internally with 65mm diameter at top 10 mm depth to suit the waste fitting. The necessary stud slot to receive the bracket on the under side of the basin shall be provided. Basin shall have an internal soap holder recess which shall fully drain into the bowl. Necessary CP brass waste, CP chain, brass CP 15mm dia socket, bottle trap, PVC waste pipe, waste plug and waste couplings shall be provided. The pillar cock for wash basin shall be in conformation with the I.S. 1275-1976 or as revised from time to time. The height from the floor to top of the rim of basin shall be 750 to 800 mm as directed.

M-39 European type water closet:

The European type water closet shall be white glazed porcelain second quality and shall be of wash down type conforming to I.S. 2556-1981 and 771-1979 or as revised from time to time.

“S” trap shall be provided as required with water seal not less than 50 mm. The solid plastic seat and cover shall be of the best Indian make conforming to I.S. 2548-1980 or as revised from time to time. They shall be made of moulded synthetic materials which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects as shall have chromium plated brass hinges and rubber butter four number of suitable size.

M-40 Indian type Water closet :

The Indian type white glazed water closet of second quality shall be of size as specified in the item conforming to IS 771-1979 and I.S. 2556 (Part-II) 16981. Each pan shall have materials flushing ring of suitable type with adequate number of holes around as directed to have satisfactory flushing. It shall also have an inlet or back or front for connecting flush pipe as directed by the Engineer-in-charge. The inside of bottom of pan shall have sufficient slope from the front towards the outlet and surface shall be uniform and smooth.

Pan shall be provided with 100mm diameter “P” or “S” trap with approximately 50mm water seal and 50mm diameter Vent horn.

A pair of white glazed earthen ware rectangular foot rests of minimum size 250mm x 130mm x 20mm shall be provided with the water closet.

M-41 Flush Cock :

Half turn flush cock (Medium weight) shall be of brass chromium plated of diameter as specified in the description of the item. The flush cock shall conform to relevant IS or as revised from time to time.

The flush cock shall be of a make as approved by the Engineer-in-charge.

M-42 Cast Iron Pipes & Fittings :

All soil, waste, vent and anti-symphonize pipes and fittings shall conform to IS 1729-1979 or as revised from time to time. The pipes shall have spigot and socket ends with head on spigot end. The pipes and fitting shall be true to shape, smooth, cylindrical their inner and outer surfaces being a

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pin holes or other imperfection and shall be neatly dressed and carefully fettled.

The ends of pipes and fittings shall be reasonable square to their axis.

The sand cast iron pipes shall be of the diameter as specified in the description and shall be in length of 1.5, 1.8m and 2m. including socket ends of pipes unless shorter length either are specified or require at junctions etc. Tee pipes and fittings shall be supplied without ears unless specified or directed otherwise.

Tolerances:

The standard weights and thickness of pipes shall be as shown in the following table:

A tolerance up to minus 10 percent may however be allowed against these standard weights.

Sr. No.	Nominal dia of Bore.	Thickness	Overall weight of pipes excuding ears.		
			1.5m long	1.8 m long	2.0 m long
1	75 mm	50 mm	13.83 kg	16.52 kg	18.37 kg.
2	100 mm	50 mm	18.14 kg	21.67 kg	24.15 kg.

A tolerance up to minus 15 percent in thickness and 20mm in length will be allowed. For fittings tolerance in lengths shall be plus 25mm and minus 10 mm.

The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding size of straight pipes. The tolerance in weights and thickness shall be the same as for straight pipes.

M-43 Nahni Trap :

Nahni trap shall be sound and free from porosity or other defect which affects serviceability, the thickness of the base metal shall not be less than 6.5 mm. The surface shall be coated with vitreous enamel thoroughly fused to the cast iron base. The coating shall be adequate even and shall cover the entire surface. The surface shall be glossy, smooth and free from craze, chips and other flows or any other kind of defect which affect serviceability. The size of Nahni trap shall be as specified and shall be self cleansing design.

The Nahni trap shall be of best quality approved by the Engineer-in-charge and shall generally conform to the relevant I.S.

The Nahni trap provided shall be with deep seal, minimum 50mm except at places where trap with deep seal cannot be accommodated. C.I. Jali shall be of appropriate size and quality.

M-44 Gully Trap :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Gully trap shall conform to I.S. 651-1980. These shall be sound, free from visible defects such as fire cracks or hair cracks. The glaze of the traps shall be free from crazing. There shall give a sharp clear tone when struck with light, hammed. There shall be no broken blisters.

The size of the gully trap shall be specified in the item.

Each gully trap shall have on CI grating of square size corresponding to the dimensions of inlet of gully trap. It shall also have water tight. C.I. cover with frame inside dimensions 300 mm x 300 mm. The cover weighting not less than 4.53 kg., and the frame not less than 2.72 kg. The grating cover and frame shall be of sound and good casting and shall have truly square machined scatted facts.

M-45 Glazed Stoneware Pipe & Fittings :

The pipes and fittings shall be of best quality as approved by the Engineer-in-charge. The pipe shall be of best quality manufactured from stoneware of fire clay, self glazed thoroughly burnt through out the whole thickness of a close event texture, free from air blows, fire blisters, cracks and other imperfections, which affect the serviceability. The inner and outer surface shall be smooth and perfectly glazed. The thickness of the wall shall not be less than $1/12$ th of the internal dia. The depth of socket should not be less than 38 mm. The socket shall be sufficiently large to allow a joint of 6mm around the pipe.

The pipes shall generally conform to relevant I.S. 651-1980.

M-46 GI Water Spout :

The G.I. pipes of 40 mm dia shall be medium quality and specials shall be of "R" brand or equivalent brand of best approved quality.

The pipes shall have length as required for thickness and wall in which it is fixed and at the outside end one tee and bend cut at half the length shall be provided and at other end coupling shall be provided to have better fixing. the water spout shall be provided as per detailed drawing or as directed by the Engineer-in-charge.

M-47 Selected earth / Murrum :

The selected earth / Murrum shall be that obtained from excavated material or shall have to be brought from outside as indicated in the item. If item does not indicate anything the selected soil shall have to be brought from outside.

The selected earth / Murrum shall be good yellow soil and shall be got approved from the Engineer-in-charge in case black cotton soil or similar greatly expensive and shrinkable soil shall be used. It shall be cleaned and free from all rubbish and perishable materials, stones or bats. The cold shall be broken to a size of 50mm or less. Contractor shall make his own arrangement at his own cost for land for borrowing selected earth / Murrum. The stacking of material shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any construction activities in decent stacks.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

When excavated material is to be used only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all requirements of selected mentioned in Para 2 above.

M-48 Rolling shutters :

The rolling shutters shall be of approved makes and design and shall be suitable for fixing in position as directed by the Engineer-in-charge.

The shutter shall be built up of inter locking lath section formed from cold rolled strips. The size of different component shall be as per IS 6248-1979.

The cold rolled steel grip shall be rolling shutter lath section conforming to I.S. 4030-1973.

The self coiling type rolling shutter shall be raised lowered manually by means of a pulling applied to the pulling handle fixed on the bottom lock place to the top most position with each.

The thickness of steel sheets from which the lath sections have been rolled shall be not less than 0.9 mm for shutter up to 3.5 m width and not less than 1.2mm. Shutter above 3.5 m width.

The lath section shall be rolled so as to have interlocking curls at bottom edges and a deep corrugation at the centre with a bridge depth of not less than 12 mm for each lath section shall be continuous signal place without any welded points.

The depth and width of guide channel shall be as under :

Clear width of shutter	Min. depth of guide channel.
Up to 3.5 m	65 mm
3.5 to 8 M	75 mm
8 M and above	100 mm

Width of guide channel shall be 25mm for lath section with bridge depth of about 12 mm and 32mm for lath section with bridge depth of about 16 mm. Size of bracket plate for different height of different rolling shutter shall be as follows :

Clear height Mt.	Size of bracket plate minimum mm x mm x mm
Up to 2.3	300x300x3.15
Above 2.3 & up to 2.6 Mt.	325x325x3.15
Above 2.6 & up to 3.00	350x350x3.15
Above 3.0 & up to 3.5	375x375x3.15
Above 3.5 & up to 4.5	400x400x6.00

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Above 4.5 & up to 5.5	450x450x6.00
Above 5.5 & up to 6.50	500x500x10.00

Size of shaft pipe shall be as given below :

Width	Size of pipe
Up to 2.0	32mm nominal bore
Up to 3.0 m	40mm nominal bore
Up to 6.00 m	50mm nominal bore

Hood cover shall be made of mild steel not less than 0.9 mm thick.

M-49 Urinal :

Urinal shall be of 2nd class quality white porcelain of approved quality, best Indian make and it shall conform to IS 1556-Part-II 1974 with suitable size of side collar for fixing in position. The size of urinal shall be as specified in the item. Urinal shall be of one piece construction. All internal angles shall be designed so as to facilitate cleaning. Urinal shall have single tap hole as specified. Urinal shall have a circular waste hole which is 65mm dia and 100 mm deep to suit the waste fitting.

Necessary C.P. brass stop cock with PVC connection of specified size shall conform to I.S. 781-1977. Necessary PVC reducer with PVC waste pipe of 25mm dia shall be designed to make height from the floor to the top of the rim of the urinal 550 to 600 mm as directed.

M-50 Wooden flush door shutters (solid Core) :

The solid core type flush door shutters shall be decorative or non-decorative in the drawing. The size and thickness of the shutter shall be as specified in drawings or as directed. The timber species for core shall be used as per IS- 2202 – (Part-1) 1980. The timber shall be free from decay and insect attack. Knots and know holes less than half the width of cross section of the members in which they occur may be permitted. Pitch pockets, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross – bands shall conform to I.S 303-1275.

The face panel of the shutters shall be formed by gluing by the hot press on both faces of the core with either plywood or cross-bands and face veneers. The hopping rebating opening of glazing, venation etc. shall be provided if specified in the drawing.

All edges of the door shutters shall be square. The shutters shall be free from twist or warp in its plane. Both faces of the shutters shall be sand papered to smooth even texture.

The shutter shall be tested for :

1. **End immersion test :** The test shall be carried out as per IS 2202 (Part-I) 1980. There shall be no delaminating at the end of the test.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

2. **Knife Test** : The face panel when tested in accordance with IS 1659-1979 shall be pass the test.

3. **Glue adhesion test** : The flush door shall be tested for glue adhesive test in accordance with I.S. 2202 (Part-I) 1980. The shutters shall be considered to have passed the test if no delaminating occurs in the glue lines in the plywood and if no single delaminating more than 80mm in length and more than 3 mm in depth has occurred in the assembly glue lines between the plywood face and the style and rail. Delaminating at the corner shall be measured continuously around the corner. Delaminating at the knots, knot holes and other permissible wood defects shall not be considered in assessing the sample.

The tolerance in size of solid core type flush door shall be as under :

In normal thickness +/- 1.2mm

In normal height +/- 3mm.

The thick of the shutters shall be uniform throughout with a permissible variation of not more than 0.8 mm when measured at any two points.

M-51 Aluminum doors, windows, ventilators :

Aluminum alloy used in the manufacture of extruded window sections shall conform to I.S. designation HEA-WP of I.S. 733-1975 and also to I.S. Designation WVG-WP of I.S. 1285-1975. The section shall be as specified in the drawing and design. The fabrication shall be done as directed.

The hinges shall be cast or extruded aluminum hinge of same type as in window but of large size.

The hinges shall normally be of 50mm projecting type. Non-projecting type of hinges may also be used if directed. The handles of door shall be of specified design. A suitable lock for the door operatable either from outside or inside shall be provided. In double shutter door, the first closing shutter shall have concealed aluminum alloy bolt at top and bottom.

M-52 Collapsible Steel Gate :

The collapsible steel gate shall be in one or two leaves and size as per approved drawings or as specified. The gate shall be fabricated from best quality mild steel channels, flats etc. Either steel pulleys or ball bearings shall be provided in every double channel. Unless otherwise specified the particulars of collapsible gates shall be as under :

- a) Pickets : These shall be of 20mm M.S. channels of heavy sections unless otherwise shown on drawings. The distance centre to centre of pickets shall be 12 cms. with an opening of 10 cms.
- b) Pivoted M.S. flats shall be 20mm x 6mm.
- c) Top and bottom guides shall be from tee or flat iron of approved size.
- d) The fittings like stoppers, fixing hold fast, locking cleats, brass handles and cast iron rollers shall be of approved design and size.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

M-53 Plastic sections for door / window partition etc.

Technical features for plastic section shall be as under:

- i) Material of construction shall be specially formulated PVC compounds.
- ii) **Water absorption:** 0.8% at 100 degree Centigrade in 24 hours thus virtually water and moisture proof.
- iii) **Chemical resistance:** It shall be resistance to acid / alkalis.
- iv) **Fire resistance:** Self-extinguishing classified under first class construction material by insurance companies.
- v) **Termite and Fungal resistance:** Material shall be fully resistance to termite and fungal attack.
- vi) **Thermal conductivity:** Very low thermal conductivity co-efficient varies from 0.015 to 0.016 Kcal / HrmC.
- vii) **Acoustic property:** Max. absorption shall be up to 38%.

M-54 Water Proofing Cement Paint:

Water proofing cement paint of approved shade shall conform to IS-5410-1969 or as revised from time to time. Primer shall be best quality, make and as approved by the Engineer-in-charge. The materials required for work of painting shall be obtained directly from approved manufacturer or approved dealer and brought to the site in maker's drums, keys etc. with seal unbroken.

M-55 Stone For Bela Masonary:

Pucca approved white stone bella of sand of uniform size shall be dressed, earth/murrumy or discolnged or weathered or water worm stone shall not be used. The size of bella stone shall as directed by Engineer to suit the width of wall. Corner stones & quoins shall be of good quality and should be dressed to correct angle. The corner stone shall be got approved before bringing to site.

The stone shall be free from defects like cavity, flaws, sand holes, and veins, patches of soft or loose material. The percentage of water absorption shall generally not exceed 5 % by weight. Generally, the stone shall not contain silica or chert, mica or any other deleterious material like iron oxide organics impurities etc. The crushing strength of bella stone shall not less than 300 Kg/cm². Transverse strength shall not less than 70 Kg/cm².

M-56 Vitrified floor tiles :

Vitrified floor tiles shall be of best quality & approved make as approved by the Engineer. They shall conform to the relevant I.S. codes.

Vitrified tiles using for floor finishing should confirm ISO13006/E176 group B.1.a of international standards and also should confirm of testing methods of norms EN 98.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The vitrified tiles shall be Monolithic and available in smooth, mirror polished and anti-skid finish. Their water absorption rate shall be less than 0.5%. They shall offer hard working and hardwearing floors for public buildings. The tiles shall be of ASTM or DIN standards.

The vitrified tiles shall be extremely strong breaking strength of the tiles being 1600 kg./cm², flexural strength 200 kg. / Cm² and bounding strength of 2500 kg/cm². There shall after good resistance to abrasion i.e. greater than 100. There shall be scratch resistance; their hardness on the Moh's scale shall be min. 7. They shall also to resist thermal shock up to 10 cycles. They shall have a density of 2.2 gm/cc. They shall have 0.6 co-efficient of friction for polished / unpolished surfaces.

M-57 85 mm thick pre-cast Rubber molded interlock paver concrete block

The 85mm thick pre-castRubber molded interlock paver concrete block shall be manufactured by electrical hydraulic operated block marking machine. The block should have minimum compression strength of 300 kg. Per sq.cm. The minimum thickness of the pre-castRubber molded interlock paver concrete block shall be 85mm and minimum size shall be 300x300mm. The block shall be of approved make & best quality as approved by the Engineer-in-charge. The size, shape, and shade of pre-cast Rubber moulded interlock paver concrete block shall be as approved by the Engineer-in-charge. There shall be true to shape. There shall be free from crack, crazing, and spots etc.

M-58 Acrylic roof Sheets:

Acrylic roof sheets shall be of thickness as specified in the item. The shape and size of sheet shall be as directed. Acrylic roof Sheets may be flat or curved. It should be light in weight. It shall be colourless or coloured or opaque. Colourless sheet shall be as transparent as the finest optical glass. Its light transmission rate shall be about 95%. Transparency shall not be affected for the sheets of larger thickness. It shall be extremely resistant to sunlight, weather and low temperatures. It shall not show any significant yellowing or change in physical properties or loss of light transmission over a longer period of use. The sheet shall be impact resistant also. Sheet should be available in complete range of standard transparent, man lucent and opaque colors. Sheets shall be of such quality that they can be cut bent and jointed as desired. Solution for the joints shall be used as per the requirement of manufacturer.

M-59 Galvanised iron pipes and fittings :

Galvanised iron pipe shall be of the medium type and of required diameter and shall comply with I.S.I 239-1979. The specified diameter of the pipes shall refer to the inside diameter of the bore. Clamps, screw and all galvanised iron fittings shall he of the standard 'R' or equivalent make.

M-60 Crydon Ball Valve :

Ball valve of screwed type including polthylene float and necessary lever etc. shall be of the sizes mentioned in the description of item and shall conform to I.S. 1703-1977.

M-61Plywood :

The plywood for general purpose shall conform I:S. 303- 1975.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Plywood is made by cementing together thin boards or sheets of wood into panels. There are always an odd number of layers 3, 5, 7, 9 ply etc. The plies are placed so that grain of each layer is right angle to the grain in the adjacent layer.

The chief advantages of plywood over a solid board of the same thickness is the more uniform strength of the plywood, along the length and width of the plywood and greater resistance to cracking and splitting with change in moisture content. Usually synthetic resins are used for gluing, phenolic resins are usually cured in a hot press which compresses and simultaneously heats the plies between hot plates which maintain a temperature of 90 degree C. to 140 degree C. and a pressure of 11 to 14 Kg/Sq. Cm. on the wood. The times of heating may be anything from 2 to 60 minutes depending upon thickness.

When water glue are used, the wood absorbs so much water that the finished plywood must be dried carefully. When synthetic resins are used as adhesive finished plywood must be exposed to an atmosphere of controlled humidity until the proper amount of moisture, has been absorbed.

According to I.S. 303-1975 the plywood for general purpose shall be of three grades namely BWR, WWR and CWR, depending upon the adhesives used for bonding and veneers, and it will be further classified into six types namely AA, AB, AC, BB, BC and CC based on the quality of the two faces, each face being of three grades namely, A, B. and C. After pressing, the finished plywood should be reconditioned to a moisture content not less than 8 percent and not more than 16 percent.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

CODE OF PRACTICE

GENERAL

- (1) The method of execution of the items shall conform to the relevant specifications as per the latest version of the Indian Standard unless specified otherwise and as far as applicable.
- (2) Wherever a reference to ANY Indian Standard appears in the specification, it shall be taken to mean as a reference to the latest version of the standard.
- (3) The following specifications, standards, and codes are made as a part of this specification.

Indian Standards : specification for building materials, specification for equipment, method of test, method of measurement of building works ,code of practice for construction , safety code for demolition of building, safety code for scaffolds etc. published by the Bureau of Indian Standards

- (4) The contractor shall invariably carry out Materials & work Tests as specified in the tender document (**B2- Form**) and IS code. However, if the additional tests are required as per the opinion of the Engineer-in-charge, the same shall also have to be carried out. All such tests shall be got carried out in Government or as approved laboratories and cost thereof shall be entirely borne by the contractor. No collection of materials shall be made before it is got approved from the Engineer-in-charge.

All moulds, equipments etc. required of preparing specimens for the test shall be kept in sufficient numbers and in good state, as directed by the Engineer-in-charge on the site of work.

Specimen for tests shall sent to the laboratory along with representative of GIDC in time and the results thereof shall be promptly obtained and reported to the Engineer-in-charge.

- (5) Satisfactory test results shall not observed the contractor from dismantling and re-doing any work revealed to the defective at a later date. The contractor shall have no claim for any payment or compensation whatsoever on account of replacement of such defective work. Contractor shall take all precautions and care during dismantling and re-doing the work to ensure that any other work so far executed does not get damage or affected.
- (6) The work shall be carried out in true line and level and in conformity with the detailed drawing and specified patterns.
- (7) All the work shall be carried out in a workmanship like manner and as per the best techniques for the particular item.
- (8) All tools, tempts equipments etc. for correct execution of the work as well as for checking lines, levels, alignments of the works, during execution shall be kept in sufficient numbers on the side of work.
- (9) All installations pertaining to water supply and its fixtures as well as drainage lines and sanitary fitting shall be deemed to be completed only after giving satisfactory tests by the contractor.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

(10) Scaffolding being provided by the contractor at his own cost for such of the items for the execution of which it is essential.

C1 Excavation

General:

In all sorts of soil, sand, gravel, soft murrum and other similar soft or loose material. The excavation will generally refer to the open excavation for foundation.

Clearing the site:

The site on which the structure is to be built shall be cleared and all obstructions, loose stones, material, and rubbish of all kind, bush, wood, and trees shall be removed as directed. The materials so obtained shall be the property of the GIDC and shall be conveyed the stacked as directed by the Engineer-in-charge.

Setting out:

After clearing the site the centre lines will be given by the Engineer. The contractor shall assume full responsibility for alignment, elevation, and dimension of each and all parts of the work. Contractors shall supply labour materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required.

Excavation:

It shall be all sorts of soil, sand, gravel, soft murrum, or other similar soft or loose materials.

The excavating for foundation and for basement shall be carried out in true line and level and shall have the width and depth as shown in the drawing or as directed by the Engineer-in-charge. The contractor shall do the necessary shorting and shutting or slopes to a safe angel, if necessary including bailing and pumping out water when separate provision does not exist for it in tender, at his own cost. The bottom of the excavated area shall be leveled both longitudinally and transversely as directed by the Engineer-in-charge. No earth filling will be allowed to bring it to level if by mistake or any other reasons excavation is made deeper or wider than shown on the plan or directed by the Engineer-in- charge. The extra depth or width shall be made up with concrete or masonry of the foundation grade as directed by the Engineer-in- charge and at the cost of the contractor.

Disposal of the excavated stuff:

The excavated stuff of the selected type shall be used in filling the trenches in layers including ramming and watering etc.

The balance of the excavated quantity shall be removed by the contractor from site of work to a place as directed by the Engineer-in-charge with all lead and lift but within the same estate.

1 Excavation in Hard murrum :

Same as C-1/1 except that the excavation shall be in hard murrum.

2 Excavation in Hard murrum and boulders.

Same as C-1/1 except that the excavation shall be in hard murrum and boulders.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

3 Excavation in soft rock :

Same as C-1/1 except that the excavation shall be in soft rock.

4 Excavation in Hard rock.

Same as C-1/1 except that the excavation shall be in hard rock

C-2 Plain Cement Concrete Laying in Foundation / for Floor Bedding :**General:**

Before starting concrete, the bed of the foundation trenches shall be cleared of all loose materials and watered as directed.

Proportioning of Mix:

The proportion of the cement to sand and coarse aggregates shall be as specified in the item and shall be measured by volume.

Mixing:

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantities of work if approved by the Engineer-in-charge. The mixing shall be done for a period of 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

Scaffolding:

All scaffolding, hoisting arrangement and ladders etc. required for the facility of concrete shall be provided by the contractor and removed on completion of work. The scaffolding, hoisting arrangement and ladders shall allow easy approach to the work and afford easy inspection.

Form work:

The form work shall be provided if necessary as directed by the Engineer-in-charge and shall be as per I.S. 461-1972 or revised from time to time.

Transporting & placing the concrete:

The concrete shall be handled from the place of mixing to the final position by not more than 15 minutes by the method as directed by the Engineer-in-charge and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms to 20 cms.

Compaction:

The concrete shall be thoroughly compacted by hammers immediately after depositing to get a dense concrete. Concrete shall not be disturbed once it has set.

Curing:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

After the final set, the concrete shall be kept continuously wet, if required by pounding for a period of not less than 7 days from the date of placement.

C-3 Lime Cinder Concrete Laying :

This shall be as per C-2 of code of practice. The coarse aggregate in this case shall cylinder.

C-4 Ordinary Cement Concrete Plain or Reinforce :

I.S. 466-1978 or as revised from time to time shall be followed in general cement sand by black trap grit and coarse aggregate shall be measured by volume. For proportioning of cement by volume one bag of cement shall be taken as 0.0342 cu.m. (1.2 cft)

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 but in no case shall mixing be done for less and 1.1/2 minutes. When hand mixing is permitted by the Engineer-in-charge in case of small work or in case of break down of machineries and in the interest of the work it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However, in such cases 10% more cement than otherwise required have to be used without any extra cost.

Transporting:

Concrete shall be handled from the place of mixing of the final position as quickly as practicable by methods which will prevent segregation or loss of ingredients. In no case operation shall be taken more than 15 minutes.

Placing:

The concrete shall be placed into its final position and completed and finished within 30 minutes of mixing the water and before setting commence. Method of placing shall be such as to avoid segregation, approved by the Engineer-in-charge. Concreting shall be carried out continuously up to construction joints, the position and arrangement of which, shall be pre-determined by the designer.

When the work has to be resumed on a surface which has hardened, such surface shall be roughened. It shall then be swept clean thoroughly wetted and covered with a thin layer or mortar composed of cement and sand in the same proportion as the cement and sand in the concrete mix. This layer of mortar shall be freshly mixed and placed immediately before the placing of the concrete.

When the concrete has not fully hardened, all laitance shall be removed by scrapping the wet surface with wire or bristles care being taken to avoid dislodgement of particles or aggregates. The surface shall be thoroughly wetted and all free water removed. The surface shall be coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150mm in thickness and shall be well rammed against old work. Particular attention is paid no corners and spots.

Compaction:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Concrete shall be thoroughly compacted during the operation of placing and thoroughly worked around the reinforcement, around embedded fixtures and into corners of the form work. Compacting shall be done by mechanical vibrations, in such a way that a dense mix is obtained.

Curing:

The concrete shall be kept covered with a layer of sacking canvas or similar materials or by pounding and kept constantly wet for twenty one days from the date of placing concrete. Curing by pounding shall preferably be done by erecting suitable dykes of lean mortar.

Form work:

General:

The form work shall conform to the shape, lines and dimensions as on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete, and shall be sufficiently water tight to prevent loss of liquid from concrete. Adequate arrangements shall be made by the contractor to safeguard against any settlement of the form work during the course of concreting and after concreting. The design of the form work and centering shall be got approved from Engineer-in-charge before erection.

Cleaning & Treatment of Forms:

All rubbish, particularly chipping shavings and saw dust shall be removed from the interior of the forms before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treatment with an approved composition. Care shall be taken that such approved composition is kept out of contact with reinforcement.

Stripping Time:

In normal circumstances and where ordinary cement is used, forms may be struck after expiry of following period

(a)	Walls columns & vertical side of beams	24 to 48 hours as may be decided by the Engineer-in-charge.
(b)	Side of slabs	3 days
(c)	Beam	7 days
(d)	Removal of props to slabs. (i) Slabs spanning up to 4.5 M (ii) Spanning over 4.5 M	7 days. 14 days.
(e)	Removal of props to beams & arches. (i) Spanning up to 6 M (ii) Spanning over 5 M	14 days 21 days

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Procedure when removing the Form work:

All form shall be removed without such shock or vibrations as would damage the reinforced concrete surface. Before the soffits and struts are removed and concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. The form work will be paid under the respective item if provided in the tender.

Centering:

The centering to be provided shall be got approved from the Engineer-in-charge. It shall be sufficiently strong to ensure absolute safety of the form work and concrete work before, during, and after pouring concrete. Watch should be kept to see that behavior of centering and formwork is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

The props of centering shall be provided on firm foundation of base of sufficient strength to carry the loads without settlement.

The centering and form work will be inspected and approved by the Engineer-in-charge before concreting. But this will not relieve the contractor or his responsibility for strength, adequacy, and safety of form work and if there is a failure of form work or centering, contractor shall be responsible for the damages to work, injury to life and damage to the property.

Scaffolding:

All scaffolding, hoisting arrangements etc. required for the facility of concreting shall be provided and removed on completion of work by the contractor at his own expenses. The scaffolding, hoisting arrangement and ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work, and workmanship etc.

The scaffolding, hoisting arrangement and ladders shall allow easy approach to the work spot and afford easy inspection.

Testing:

Work sample of concrete 150mmx150mm x 150mm shall be taken as under:

Qty. of work in M3	No. of sample
1.5	1
6.15	2
16-30	3
31-50	4
51 & above	4+1 for each additional quantity of 50 M or part thereof.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contractor shall make his own arrangement for taking sample and testing of the sample in the Government or the approved laboratories. The test shall be carried out in accordance with IS 516-1959 or as revised from time to time. A register of cubes shall be maintained the site of work in the prescribed Performa. The result of the cubes shall be submitted to the Engineer-in-charge by the contractor.

Note: (1) At least one sample shall be taken from each shift

(2) Each sample consists of three test specimens for testing at 28 days.

Additional cubes may be required for various purposes. Such as to determine the strength of concrete at 7 days or at the time of striking the form work or to determine the duration of curing or to check the testing error.

Finishing unless otherwise specified in the item to keep the exposed concrete surface, the concrete surface shall be finished with cement mortar 1:4 (1- cement: 4-sand) in true line level in accordance with M-9 of specification of materials.

C-5 Controlled concrete :

Grade:

The concrete shall be designed as M-150, M-200, M-250, M -300 & M-400 as prescribed in I.S. 456-1978 or as revised from time to time.

Aggregates:

Samples of the aggregates proposed to be used shall be got approved from the Engineer-in-charge prior to collection of the materials at the site of work field test for determining the content of silt, loam, clay etc. In fine aggregate and grading and moisture content in both fine and coarse aggregate shall be carried out before commencing the concreting work and record of the test shall be maintained till the completion of the work.

The grading of aggregate shall be controlled by obtaining the fine and coarse aggregate in different size being stocked in separate stock piles. The grading of coarse and fine aggregate shall be checked as frequently as possible. The frequency shall be as directed by the Engineer-in-charge, to ensure that the uniform grading as per approved samples used in the preliminary tests is maintained.

As soon as possible, after receiving the order to commence the work the contractor shall design the mix for different grades of concrete required in the work submit details in respect of proportion of cement and aggregates water cement ration etc. and arrangement to make trial mixes for preliminary tests to be carried out in the Government or any other approved laboratory to satisfy the Engineer-in-charge that the designed mix meets with the prescribed strength. The maximum total quantity to aggregates by weight per 50 Kg. of cement shall not exceed 450 Kg. except where otherwise specifically permitted by the Engineer-in-charge.

The minimum number of specimens for preliminary test and criteria for acceptance of test strength shall conform to Table –V **Acceptance criteria for concrete of I.S. 456-1978.**

On the satisfactory results of the above tests, the mix actually to be used shall be got approved from Engineer-in-charge. The approval of the Engineer-in-charge will not relieve the contractor of his

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

responsibility for obtaining the required minimum strength in the work test. Record of all tests in support of mix design shall be maintained as a part of record of the contract.

STRENGTH REQUIREMENT OF CONCRETE:

The compressive strength requirements for various grades of concrete shall not be lower than the figures given below:

Grade of concrete	Compressive strength of 15 cms cubes conducted in accordance with I.S. 516-1959.		
	After 28 days after mixing in preliminary test (Kg/cm ²)	At 7 days after mixing in work test	At 28 days after mixing in work test (Kg/cm ²)
M-100	135	70	100
M-150	200	100	150
M-200	260	135	200
M-250	320	170	200
M-300	380	200	300
M-350	440	235	350
M-400	500	270	400

PROPORTIONING & WORKS CONTROL:

The mix proportions shall be selected to ensure that the workability of the fresh concrete suitable for the condition of handling and placing, so that after compaction it surrounds all reinforcement and completely fills the form work. When concrete is hardened, it shall have the required strength, durability and surface finish.

The determination of the proportions of cement, aggregate and water to attain the required strength shall as follows:

- (a) By designing the concrete mix; such concrete shall be called "Design Mix Concrete" or "Controlled Concrete".
- (b) By adopting nominal mix, such concrete shall be called "Nominal Mix Concrete".

TABLE - 2.8

OPTIONAL WORK TEST REQUIREMENTS OF CONCRETE (All values in N/mm²)

(All tests conducted in accordance with IS: 516)

Grade of Concrete	Compressive Strength of 150mm cubes, min at 7 days	Modulus of Rupture by Beams Test Min.
-------------------	--	---------------------------------------

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

		At 72 + 2 hrs.	at 7 days
M - 10	7	1.2	1.7
M - 15	10	1.5	2.1
M - 20	13.5	1.7	2.4
M - 25	17	1.9	2.7
M - 30	20	2.1	3.0
M - 35	23.5	2.3	3.2
M - 40	27	2.5	3.4

The concrete mix shall be designed to have an average strength corresponding to the values specified for preliminary tests in Table. The proportions chosen should be such that the concrete is of adequate workability for the conditions prevailing on the work in question, and can be properly compacted with the means available. The maximum total quantity of aggregate by weight per 50 kg. Of cement shall not exceed 450 kg. except where otherwise specially permitted by the Engineer-in-Charge.

Except where it can be shown to the satisfaction of the Engineer-in-Charge that supply of properly graded aggregate of uniform quality can be maintained over the period of work, the grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes and blending them in the right portions when required, the different sizes being stocked in separate stock piles. The material should be stock piled for several hours preferably a day before use. The grading of coarse and fine aggregate should be checked as frequently as possible, the frequency for a given job being determined by the Engineer-in-Charge to ensure that the suppliers are maintaining the grading uniform with that of the samples used in the preliminary test.

In proportioning concrete, the quantity of both cement and aggregate should be determined by weight, where the weight of cement is determined by accepting the maker's weight per bag. A reasonable number of bags should be weighted separately to check the net weight. Where the cement is weighed on the site and not in bags, it should be either measured by volume in calibrated tanks or weighed. All measuring equipment should be maintained in clean serviceable conditions, and their accuracy periodically checked.

It is most important to maintain the water cement ratio constant at its correct value. To this end, determination of moisture contents in both fine and coarse aggregates should be made as frequently as possible, the frequency for a given job being determined by the Engineer-in-Charge according to weather conditions. The amount of the added water shall be justified to compensate for any observed variations in the moisture contents. For the determination of moisture content in the aggregate for concrete: Part-III specific gravity, density, voids, absorption and bulking may be referred to. To allow for the variation in weight of aggregate due to variation in their moisture content, suitable adjustments in the weights of aggregate should also be made.

No substitutions in materials used on the work or alterations in the established proportions, except as permitted in the above para shall be made without additional tests to show that the quality and strength of concrete are satisfactory.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

WORKABILITY OF CONCRETE:

The concrete mix proportions chosen should be such that concrete is of adequate workability for the placing conditions of the concrete and can properly be compacted with the means available. The definitions of the ranges of "workability" of concrete as measured by either the slump or V-B tests (IS: 1199) and the range to be adopted for different kinds of work unless specified otherwise is given in Table - 2.9.

TABLE - 2.9**WORKABILITY OF CONCRETE**

Placing conditions	Degree of Workability	Slump (mm)	Values of Workability	
			Vee-Bee	Compacting Factor
Blinding concrete; Shallow Sections; Pavements using pavers	Very Low	--	20- 10 secs	0.75 - 0.80
Mass concrete; Lightly reinforced sections in slabs, beams, walls, columns; Floors; Hand placed pavements; Canal lining; Strip footings	Low	25 - 75	10 - 5 secs	0.80 - 0.85
Heavily reinforced sections in slabs, beams walls, columns; Slip form work; Pumped concrete	Medium	50 - 100 75 - 100	5 - 2 secs	0.85 - 0.92*
Trench fill; In-situ piling Termite concrete	High Very high	100 - 150 Workability to be decided by determination of flow (IS: 9103)	--	Above 0.92** Above 0.92**

Note: For most of the placing conditions, internal vibrators (needle vibrators) are suitable. The diameter of the needle shall be determined based on the density and spacing of reinforcement bars and thickness of sections. For tremie concrete, vibrators are not required to be used.

A competent person should be employed whose duty will be to supervise all stages in the preparation and placing of the concrete. All works test specimens should be prepared and site tests carried out under his direct supervision

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

REQUIREMENT FOR DURABILITY:

Minimum cement content required in cement concrete to ensure durability under specified conditions of exposure should be as given in Table 2.12 unless otherwise specified. The general environment to which the concrete will be exposed during its working life is classified into five levels of severity, that is, mild, moderate, severe, very severe and extreme as described in Table 2.13.

TABLE - 2.12

Minimum Cement Content, Maximum Water Cement Ratio and Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20mm Nominal Maximum Size

Sr. No.	Exposure	Plain Concrete			Reinforced Concrete		
		Minimum Cement Content kg/m ³	Maximum Free Water-Cement Ratio	Minimum Grade of Concrete	Minimum Cement Content kg/m ³	Maximum Free Water-Cement Ratio	Minimum Grade of Concrete
1.	Mild	220	0.60	--	300	0.55	M-20
2.	Moderate	240	0.60	M-15	300	0.50	M-25
3.	Severe	250	0.50	M-20	320	0.45	M-30
4.	Very Severe	260	0.45	M-20	340	0.45	M-35
5.	Extreme	280	0.40	M-25	360	0.40	M-40

The general environment to which the concrete will be exposed during its working life is classified into five levels of severity, that is, mild moderate, severe, very severe and extreme as described in Table 2.13.

TABLE 2.13**ENVIRONMENTAL EXPOSURE CONDITIONS**

Sr. No.	Environment	Exposure Conditions
1.	Mild	Concrete surfaces protected against weather or aggressive conditions, except those situated in coastal area.
2	Moderate	Concrete surfaces sheltered from severe rain or freezing whilst wet. Concrete exposed to condensation and rain Concrete continuously under water Concrete in contact or buried under non-aggressive soil/ground water Concrete surfaces sheltered from saturated salt air in coastal area

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- | | | |
|----|-------------|--|
| 3. | Severe | Concrete surfaces exposed to severe rain, alternate wetting and drying or occasional freezing whilst wet or severe condensation. |
| | | Concrete completely immersed in seawater |
| | | Concrete exposed to coastal environment |
| 4. | Very Severe | Concrete surfaces exposed to seawater spray, corrosive fumes or severe freezing conditions whilst wet. |
| | | Concrete in contact with or buried under aggressive sub-soil/ground water |
| 5. | Extreme | Surface of members in tidal zone |
| | | Members in direct contact with liquid/solid aggressive chemicals |

MIX DESIGN AND SAMPLING AND TESTING FOR CONCRETE

Facilities required for sampling materials, shall be provided when required by the Engineer. The methods used in sampling, laying curing and testing the concrete samples, either in the field or in the laboratory, shall be in accordance with the appropriate Indian Standards. This is to investigate the grading of aggregate, water cement ratio, workability and the quantity of cement required to give works cubes of the minimum strength specified.

The mix shall be designed to produce the grade of concrete having required workability and desired characteristic strength. As long as the quality of the materials does not change, a mix design done earlier may be considered adequate for later work. As already stated under "proportioning" the proportion of the mix shall be by weight. In case uniformity in the materials used for concrete making has been established over a period of time, the proportioning may be done by volume batching, by the use of bulk densities, provided periodic checks are made on mass/volume relationships of materials. Where weigh batching is not practicable, the quantities of fine and coarse aggregate (not cement) may be determined by volume. If aggregate is moist and volume batching is adopted, allowance shall be made for bulging in accordance with IS: 2386 (Part-III). Mix proportioning shall be carried out according to the ACI Standard ACI 631 or "Design of Concrete Mixes" Road Research Note No.4 of Department of Scientific and Industrial Research, U.K.

Whenever there is either a change in strength of concrete required, water cement ratio, workability or the source of aggregates and cement, preliminary tests shall be conducted again to determine the revised proportions of the mix to suit the later conditions. While designing mix proportions, over wet mixes should always be avoided.

PRELIMINARY TESTS:

The materials and proportion used in main preliminary tests shall be similar in all respects to those to be actually employed in the works as the object of this test is to determine proportion of cement, aggregates and water necessary to produce the concrete of consistency required to give the strength specified. It will be the contractor's sole responsibility to carry out these tests and he shall therefore furnish to the Engineer, statement of proportions proposed to be used for concrete mix. For preliminary tests, the following procedure shall be followed. Materials shall be brought to the room temperature and all materials shall be in a dry condition. The quantities of water, cement and aggregate for each batch shall be determined by weight to an accuracy of 1 Part in 1000.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

(a) Mixing:

Concrete shall be mixed in a mechanical mixer. The mixer should comply with IS: 1791. The cement and fine aggregate shall first be mixed dry until the mixture is in uniform colour. The coarse aggregate shall then be added, mixed and water added and mixed thoroughly for a period of not less than two minutes after all the materials are in the drum and until the resulting concrete is uniform in appearance. If there is segregation after unloading from the mixer, the concrete should be remixed.

(b) The consistency of each batch of concrete shall be measured immediately after mixing, by the slump test in accordance with IS: 1999. In the slump test, care shall be taken to ensure that no water is lost; the material used for slump test may be remixed with the remainder of concrete for making the test specimen. The period of remixing shall be as short as possible yet sufficient to produce a homogeneous mass.

Note: In exceptional circumstances such as mechanical breakdown of mixer, work in the remote areas or when the quantity of concrete work is very small, hand mixing may be permitted, subject to adding 10% extra cement at his (contractor's) cost. When hand mixing is permitted, it shall be carried out on a watertight platform and care shall be taken to ensure that mixing is continued until the concrete is uniform in colour and consistency.

CONCRETE CUBES:**(a) Size of test specimen & moulds:**

Test specimens cubical in shape shall be 150 x 150 x 150 mm. If the largest nominal size of the aggregate does not exceed 200mm, 100 mm cubes may be used as an alternative.

A cube mould should be of metal and stout enough to prevent distortion. It shall be constructed in such a manner as to facilitate the removal of the moulded specimen without damage, and shall be so machined that, when it is assembled ready for use, the dimensions and internal faces shall be accurate within the following limits:

Height of mould and distance between opposite faces: Specified size + 0.2 mm.

Angle between adjacent faces: 90 ± 0.5 degree

Each mould shall have a plane face metal base plate of such size as to support the mould during the filling without leakage and shall be attached to the moulds; when assembled shall be positively and rigidly held together and suitable methods of ensuring this, both during filling and on subsequent handling of the filled mould, shall be provided. In assembling the mould for use, the joints between the sections of mould shall be thinly coated with mould oil and a similar coating of mould oil shall be applied between the contact surfaces of the bottom of the mould and the base plate in order to ensure that no water escapes during filling. The interior surfaces of the assembled mould shall be thinly coated with mould oil to prevent adhesion of the concrete. The tamping bar shall be a steel bar 16 mm. in diameter, 0.6 m. long and bullet pointed at the lower end.

(b) Compacting:

The test specimens shall be made as soon as practicable after mixing and in such a way as to produce full compaction of the concrete with neither segregation nor excessive laitance. The concrete shall be filled into the mould in layers approximately 50 mm deep. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete slides from

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

it, in order to ensure a symmetrical distribution of the concrete within the mould. Each layer shall be compacted as described below. After the top layer has been compacted, the surface of the concrete shall be finished level with the top of the mould using a trowel, and covered with a glass or metal plate to prevent evaporation.

For compacting, standard tamping bar shall be used and the strokes of the bar shall be distributed in a uniform manner over the cross section of the mould. The number of strokes per layer required to produce specified conditions will vary according to the type of concrete but in no cases shall be less than 35 strokes per layer for 150 mm cubes or 25 strokes per layer for 100 mm cubes. The strokes shall penetrate into the underlying layer and the bottom layer shall be rodded throughout its depth. Where the tamping bar leaves voids, the sides of the mould shall be tapped to close the voids.

(c) Curing:

The test specimen shall be stored on the site at a place free from vibration under damp-matting, sacks or other similar material for 24 hours + 0.5 hour from the time of adding water to the other ingredients at a temperature range of 22° C to 32° C After 24 hours, they shall be marked for later identification, removed from the moulds and stored in clean water at a temperature of 24° C to 30° C. They shall be sent to the testing laboratory well packed in damp sand, sacks or other suitable material so as to arrive there in a damp condition not less than 24 hours before the time of test. On arrival at the testing laboratory, the specimen shall be stored in water at 27° C +2° C temperature until the time of test. Records of the daily maximum and minimum temperature shall be kept both during the period the specimens remain on the site and in the laboratory.

(d) Tests for Cube Specimen:

The concrete cubes shall be tested in standard testing machines by skilled personnel. Tests shall be made at recognized ages of the test specimen, the most usual being 7 and 28 days. Tests may be made at 24 hours + 1/2 hour and 72 hours + 2 hours if early strengths are needed. The age shall be calculated from the time of the addition of water to the dry ingredients.

At least three specimens, preferably from different batches shall be made for testing at each selected age.

Specimens stored in water shall be tested immediately on removal from the water and while they are still in the wet condition. Surface water and grit shall be wiped off the specimens and any projecting fins removed.

The bearing surface of the testing machine shall be wiped clean and any loose sand or other material removed from the surfaces of the specimen, which are to be in contact with the compression platens. The specimen shall be so placed in the machine that the load shall be applied to the opposite sides of the cubes as cast, that is, not to the top and bottom. The axis of the specimen shall be carefully aligned with the centre of thrust of the spherically seated platen. No packing plates shall be used between specimen and platens of the machine. Once the uniform seating is obtained, load shall be applied without shock and increased continuously at a rate of approximately 14.0 N/mm² /Min. until the resistance of the specimen to the increasing load breaks down and no greater load can be sustained. The maximum load applied to the specimen shall be recorded and the appearance of the concrete and any unusual features in the type of failure shall be noted.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The measured compressive strength of the specimen shall be the maximum load applied to the specimen divided by the cross sectional area of the specimen and shall be expressed to the nearest N. per sq. mm. Average of the values shall be taken as the representative of the batch provided the individual variation is not more than + 15 percent of the average. Otherwise repeat tests shall be made. Cube crushing strength shall conform to the values given in Tables 2. 7 and 2.8.

(e) Frequency of Sampling of Concrete Cubes:

A random sampling procedure should be adopted to ensure that each concrete batch shall have a reasonable chance of being tested; that is, the sampling should be spread over the entire period of concreting covering all mixing units. The minimum frequency of sampling of concrete of each grade shall be as follows:

Quantity of concrete in the work cu. m.	No.of samples
1 - 5	1
6 - 15	2
16 - 30	3
31 - 50	4
51 and above	5 Plus one additional sample for each additional 50m or part thereof

The test specimens shall be made from each sample for testing at 28 days. Additional cubes may be required for determining strength of concrete at 7 days. The test strength of the sample shall be the average strength of three specimens. The individual variation should not be more than 15 percent of the average.

Concrete shall be assessed daily for compliance. The contractor shall keep a record at site of all such tests identifying them with the proportion of the work to which they relate. The Architects will check this record from time to time. The said record shall give the following details and shall be initiated by the Engineer-in-Charge.

- (i) Reference to specific structural member receiving the batch of concrete from which the cubes were cast.
- (ii) Mark on cubes.
- (iii) Mix of concrete.
- (iv) Data and time of casting.
- (v) Water cement ratio by weight and slump.
- (vi) Crushing strength as obtained at the end of 7 days for 3 cubes out of a set of 6 cubes and the end of 28 days for the remaining 3 cubes.
- (vii) Laboratory in which tested and reference to test certificates.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- (viii) The quantity of concrete, incorporated in work that is represented by the quantity of concrete of the set of the cubes.
- (ix) Any other information required by Architects.

(f) Consistency:

The consistency of each sample of concrete shall be measured immediately after remixing by the slump test. The slump shall be as directed by the Engineer, which would be based on the preliminary test result keeping in view, the workability of the concrete. The approved slump shall be maintained through the field operations unless otherwise directed by the Engineer. In order to ensure the maintenance of uniform consistency, slump tests shall be carried out as often as demanded by the Engineer and invariably with the batch of concrete from which test cubes are made.

(g) Record of Temperature:

A record of maximum and minimum temperature at the places of storage of the cube shall be maintained, during the period they remain at site, by the Contractor.

OPTIONAL TESTS:

The Engineer, if he so desires, may order tests to be carried out on cement, sand, coarse aggregate in accordance with the Indian Code of Practice or any other approved code.

Tests on cement shall include:

- (i) Fineness Test,
- (ii) Test for Normal Consistency,
- (iii) Test for Setting Time,
- (iv) Test for Soundness,
- (v) Test for Tensile Strength,
- (vi) Test for Heat of Hydration (by experiment and by calculations) in accordance with BIS or any other approved standard for cements.

Test on sand shall include:

- (i) Sieve Test
- (ii) Test for Organic Impurities
- (iii) Decantation Test for Determining Clay
- (iv) Specific Gravity Test
- (v) Test for Sieve Analysis and Fineness Modulus.

Tests on coarse aggregate shall include:

- (i) Sieve Analysis
- (ii) Specific Gravity and Unit Weight of Dry Loose and Rodded Aggregate (Bulk Density Test)

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- (iii) Determination of Yield of a Dry Mixture
- (iv) Petrographic Examination of Deleterious Minerals in Aggregates.
- (v) Test for Aggregate Crushing Value and 10% Fine Value Test.
- (vi) Aggregate Impact Value
- (vii) Toughness Test
- (viii) Soundness Test
- (ix) Hardness Test
- (x) Alkali Aggregate Reaction
- (xi) Deleterious Material

Any or all these test would normally be ordered to be carried out, if the specified concrete strengths are not obtained, at the Contractor's cost. If the works cubes do not give the stipulated results, the Engineer reserves the right to ask the Contractor to dismantle such portions of the work, which in his opinion are unacceptable and re-do the work to the standard stipulated at his (Contractor's) cost. It shall be very clearly understood by the Contractor that no extra claims shall be entertained by the Owner for excess use of cement over the minimum quantity stipulated to give the works cubes of required strength. The unit rate for design and test cubes, works cubes, testing them as per specifications, optional tests etc.

Unless otherwise stipulated, the concreting, testing, etc. shall be carried out as directed by the Engineer and to the appropriate BIS Specifications. In the event of any work being suspected of faulty materials or workmanship or both, the Engineer before requiring its removal and reconstruction, may order, or the contractor may request, that it should be load tested in accordance with the following provisions.

LOAD TEST ON MEMBERS OR ANY OTHER TEST:

The test load shall be 125 percent of the specified super imposed load for which the structure was designed in addition to the full dead load (self weight of structure members plus weight of finishes and walls or partitions, if any as considered in the design). Such test load shall not be applied before 28 days after the time of placing of concrete.

During the tests, struts strong enough to take the whole load shall be placed in position leaving a gap under the members. The test load shall be kept for 24 hours before removal.

If within 24 hours of the removal of the load, the structure does not show a recovery of at least 75 percent of the maximum deflection shown during the 24 hours under load, the test loading shall be repeated after a lapse of at least 72 hours. The structure shall be considered to have failed to pass the test if the recovery after the second test is not at least 80 percent of the maximum deflection shown during the second test.

If during the test, or upon removal of the load, the structure shows signs of weakness, undue deflection or faulty construction it shall be reconstructed or strengthened as necessary.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Any other test, e.g. taking out concrete cores, examination and test on such cores removed from such parts of the members in an approved manner and as directed by the Engineer shall be carried out by the Contractor at his own cost, if so directed.

TESTING CONCRETE OF TANKS FOR LEAKAGE:

In addition to the structural test given in clause above, structures (tanks, chests, pits, etc.) to be used for storage of liquids shall also be tested for water tightness at full storage level as described below:

(a) In case of structure whose external faces are exposed such as elevated tanks, the requirements of the test shall be deemed to be satisfied if the external faces show no sign of leakage or sweating and remain completely dry over the period of observation of seven days after allowing a seven days period for absorption after filling with water.

(b) In case of structures whose external faces are backfilled and are not accessible for inspection, such as underground tanks, the tanks shall be filled with water and after the expiry of seven days after the filling; the level of the surface of the water shall be recorded. The level of water shall be recorded again at subsequent intervals of 24 hours over a period of 7 days. The total drop in surface level over a period of seven days shall be taken as an indication of the water tightness of the tank. The Engineer shall decide on the actual permissible rate of this drop in the surface level, taking into consideration whether the tanks are open or closed and the corresponding effect it has on evaporation losses. Backfilling shall be withheld till the tanks are tested if directed by the Engineer

Costs of Tests:

The entire cost of tests as specified, in clause above shall be borne by the Contractor.

Unsatisfactory Test:

If the results of any test prove unsatisfactory, the Contractor shall remove and rebuild the member or members involved or carry out such other remedial measures as may be required by the Engineer or his representative. The Contractor shall bear the cost of so doing, unless the failure of the member or members to fulfil the test condition is solely due to faulty design.

PLACING:

The procedure for placing of concrete shall be as follows:

Preparation before placing of concrete shall be as given below.

(i) **Engineer's Approval of Equipment & Method:**

Before any concrete is placed, the entire placing programme, consisting of equipment, layout, proposed procedure and methods shall be submitted to the Engineer for approval if so demanded by the Engineer and no concrete shall be placed until the Engineer's approval has been received.

(ii) Hardened concrete and foreign materials should be removed from the inner surface of the conveying equipments.

(iii) Form work shall have been completed; snow, ice and water shall have been removed. Reinforcement shall have been secured in place, expansion joint material, anchors and other embedded items shall have been positioned and the entire preparation shall have been approved.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

(iv) No concrete shall be placed on watered surface.

(v) Rain or Wash Water:

No concrete shall be placed in wet weather and any concrete that has been washed by heavy rains shall be entirely removed, if there is any sign of cement and sand having been washed away from the concrete mixtures. To guard against damage which may be caused by heavy rains, the works shall be covered with gunny bags immediately after the concrete has been placed in position on the surface of the newly placed concrete and shall be removed by approved means and no further concrete shall be placed thereon.

a. Time interval between mixing and placing:

Concrete shall be placed in the forms within 30 (thirty) minutes as rapidly as practicable, after addition of water to cement and aggregate, unless otherwise authorised by the Engineer.

b. Concrete placing by manual labour:

Except when otherwise approved by the Engineer, concrete shall be placed in the shuttering by shovels or other approved implements and shall not be dropped from a height or handled in a manner, which will cause segregation. Accumulation of set concrete shall be avoided. Concrete shall be placed directly in its permanent position and shall not be worked along the shuttering to that position.

c. Avoiding segregation:

Concrete shall, in all cases, be deposited as nearly as practicable directly in its final position, and shall not be caused to flow in a manner, which will cause segregation, loss of materials and impair its strength. For locations where direct placement is not possible, and in narrow forms, the Contractor shall provide suitable drop chutes and "Elephant Trunks" to confine the concrete in movement.

d. Concrete placing by Mechanical Equipment:

The following specification shall apply where placing of concrete by use of mechanical equipment is specifically called for while inviting bids or is warranted considering the nature of the work involved.

The control of placing shall begin at the mixer discharge. Concrete shall be discharged by the vertical drop into the middle of the bucket or hopper and this principle of a vertical discharge of concrete shall be adhered to throughout all stages of delivery until the concrete comes to rest in the structures.

e. Type of Buckets:

Central bottom dump buckets of a type that provides for positive regulation of the amount and rate of deposit of concrete in all dumping positions shall be employed.

f. Operation of Bucket:

In placing concrete in large open areas, the bucket shall be spotted directly over the position designated and then lowered for dumping. The open bucket shall just clear the concrete already in place and the height of drop shall not exceed 1.00 M. The bucket shall be opened slowly to avoid high vertical bounce. Dumping of buckets on the swing, or in any manner which results in segregation of ingredients or disturbances of previously placed concrete will not be permitted.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

g. Placement in Restricted Forms:

Concrete placed in restricted forms by borrows, buggies, cars, short chutes or hand shovelling shall be subject to the requirement for vertical delivery of limited height to avoid segregation and shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or falling.

h. Chuting:

Where it is necessary to use transfer chutes between mixer, containers or hoppers, and point of deposit in the forms, specific approval of the Engineer must be obtained as regards the type, length, slopes, baffles and vertical terminals. Concrete shall not be permitted to fall from the end of the chutes or tube more than 1.00 M. Chutes, when approved for use shall have slope not flatter than 1to3 and not steeper than 1to2.

i. Placing by Pumping:

Concrete may be conveyed and placed by mechanically operated pressure equipment only with the written permission of the Engineer. Water cement ratio may not be increased above that for the same class of concrete placed by bucket and the slump shall be held to the minimum necessary for conveying concrete by this method.

j. Bonding Mortar:

Immediately before concrete placement begins, prepared surfaces except formwork, which will be in contact with the concrete to be placed, shall be covered with a bonding mortar as specified.

k. Thickness of Layers:

Concrete shall be placed in successive horizontal layers ranging in thickness from 15 to 90 mm. as directed by the Engineer the bucket loads, or other units of deposit shall be potted progressively along the face of the layer with such overlap as will facilitate spreading the layer to uniform depth and texture with a minimum of shovelling. Any tendency to segregation shall be corrected by shovelling stones into mortar then mortar on the stones. Such a condition shall be corrected by redesign of mix or other means, as directed by the Engineer.

l. Bedding of layers:

Bedding planes shall be approximately horizontal unless otherwise instructed.

m. Compaction:

Concrete shall be compacted with approved mechanical vibrating equipment until the concrete has been consolidated to the maximum practicable density, and is free of pockets of coarse aggregate, and fits tightly against all form surfaces and embedded materials.

TYPE OF VIBRATORS:

- (i) Vibrators shall be the internal or immersion high frequency type, with speed of not less than 6000 revolutions per minute when immersed in the concrete. Vibrators shall be used in sufficient number of units and power of each unit shall be adequate to properly consolidate the concrete.

(ii) Use of Vibrators:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Vibrators shall be inserted in a vertical position at intervals of about 600 mm depending upon the mix; the equipment used, and continued experience on the job. Vibrators shall be withdrawn slowly. In no case shall vibrators be used to transport concrete inside the forms.

(iii) Successive Batches:

In placing concrete in layers, which are advancing horizontally as the work progresses, great care shall be exercised to ensure adequate vibration, blending of the concrete between the succeeding batches.

(iv) Vibrator Penetration of under layer:

The vibrator shall penetrate the layer being placed and also penetrate the layer below while under layer is still plastic to ensure good bond and homogeneity between the two layers and prevent the formation of cold joints.

(v) Vibrating Against Reinforcement:

Care shall be taken to prevent contact of vibrators against reinforcement steel. Vibrators shall not be allowed to come in contact with reinforcement steel after start of initial set. Vibrators shall not be allowed to come in contact with forms of finished surface.

(vi) Use of form attached Vibrators:

The use of form attached Vibrators shall be used only with specific authorization of the Engineer.

(vii) Use of Surface Vibrators:

The use of surface vibrators will not be permitted under ordinary conditions. However, for thin slabs such as highways, runways, and similar construction surface vibration by specially designed vibrators may be permitted, upon the approval of the Engineer.

(viii) Stone pockets and Mortar Poundage's:

The formation of stone pockets and mortar poundage in corners and against form face shall not be permitted. If these occur, they shall be dug out, reformed and refilled to sufficient depth and shape for the rough blending, as directed by Engineer.

CONSTRUCTION JOINTS AND KEYS:

Concrete shall be placed continuously unless otherwise specified.

If stopping of concreting becomes unavoidable anywhere, the construction joint shall be made, where the work is stopped, concrete that is in the process of setting shall not be disturbed or shaken by traffic either on the concrete itself or upon the shuttering. Horizontal and vertical construction joints and bonding keys shall be located and shall conform in details to the requirements of the plans unless and otherwise directed by the Engineer. Where not described, the joint shall be in accordance with the following:

(a) Column joint:

In a column, the joint shall be formed 75 mm. below his lowest soffit of the beams joining to it.

(b) Beam and Slab joint:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Concrete in a beam shall be placed throughout without a joint but, if the provision of a joint is unavoidable, the joint shall be vertical and at the middle of the span. A joint in a slab shall be vertical and parallel to the principal reinforcement. Where it is unavoidable, the joint at right angles to the principal reinforcement, shall be vertical and at the middle of the span.

CURING, PROTECTING, REPAIRING AND FINISHING:

All concrete shall be cured by keeping it damp for the period of time required for complete hydration and hardening to take place.

Certain types of finish, or preparation for overlaying, concreting must be done at certain stages of the process and special treatment may be required for specific concrete surface finish.

(i) Curing with water:

Fresh concrete shall be kept continuously wet for a minimum period of at least 21 days since lapse of 24 hours after laying concrete. Quantity of water supplied shall be controlled so as to prevent the erosion of freshly placed concrete.

(ii) Continuous Spraying:

Curing shall be assured by use of an ample water supply under pressure in pipes, with all necessary appliances of hose (sprinklers to be used), unless otherwise specified or approved by the Engineer.

(iii) Alternate Curing Methods:

Whenever, in the judgement of the Engineer, it may be necessary, the continuous spray method may be omitted and a covering of sand, or other approved mulching such as wet gunny bags, which will prevent loss of moisture from the concrete, may be used. No type of covering will be approved which should strain or damage the concrete during or after curing period. Covering shall be kept continuously wet during the curing period.

(iv) Curing compounds:

Surface coating type-curing compounds shall be used only by special permission of and under the direction of the Engineer. Curing compounds shall be colourless / pigmented, liquid type, conforming to approved specifications. No curing compound shall be used on surfaces where future blending with concrete or painting is specified.

(v) Ponding:

For curing of concrete in pavement, sidewalks, floors, flat roofs or other level surfaces, the ponding method of curing is preferred. The method of containing the ponded water shall be approved by the Engineer. Special attention shall be given to edges and corners of the slabs to ensure proper protection to these areas. The ponded areas shall be kept continuously filled with water.

(vi) Curing Equipment:

All equipment and materials required for curing shall be on hand and ready for the use before concrete is placed.

(vii) Protection of Fresh Concrete:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Fresh concrete shall be protected by leaving forms in place for an ample period as specified later in this specification. Newly placed concrete shall be protected by approved means from rain, sun and winds. Steps as approved by the Engineer shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion or other materials etc. that may impair the strength and/or durability of the concrete. Workmen shall be warned against and prevented from disturbing green concrete during its setting period. If it is necessary that workmen enter the area of freshly placed concrete, the Engineer may require that bridges be placed over the area.

(viii) Repair and Replacement of Unsatisfactory Concrete:

Immediately after the shuttering is removed, the surface of concrete shall be very carefully one over and holes noticed shall be filled up and made good with mortar composed of one part of cement to one part of sand after removing any loose stones adhering to the concrete. Concrete surfaces shall be finished as described under the particular items of work. Superficial honeycombed surfaces shall be made good immediately after removal of shuttering, in presence of Architect's representative and superficial water and air holes shall be filled in. Unless otherwise instructed by the Engineer, the surface of the exposed concrete placed against shuttering shall be rubbed down immediately on removal of shuttering to remove fins or other irregularities.

Unsatisfactory concrete shall be cut out and replaced with new concrete, as soon as practicable after removal of forms. Anchors, tees, or dovetail slots shall be provided wherever necessary to attach the new material securely in place. Surface of prepared voids shall be wetted for 24 hours immediately before the patching material is placed. Use of an epoxy for blending fresh concrete used for repairs will be permitted upon written approval of the Engineer. Epoxies shall be applied in strict accordance with the instructions of the manufacturer.

FINISHING - GENERAL:

The specification is intended to cover the treatment of concrete surfaces of all structures. Area requiring special finish not covered by this specification may be clearly indicated on the drawings and specifications will be furnished.

(a) Finish for Formed Surfaces:

The type of finish for formed concrete surfaces shall be as follows, unless otherwise specified by the Engineer:

(i) Cement plaster finish:

The concrete shall be properly roughened immediately after the shuttering is removed, taking care to remove the laitance completely without disturbing concrete. The roughening shall be done by hacking. Before the surface is plastered, it shall be cleaned and wetted so as to give good bond between concrete and plaster.

(ii) For surface against which backfill or concrete is to be placed, 'no' treatment is required except tie holes & repair of defective areas shall be patched with cement mortar.

(iii) For surfaces below grade, which will receive waterproofing treatment, the concrete shall be free of surface irregularities, which would interfere with proper application of the waterproofing material, which may be specified for use.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

(iv) Surfaces which will be exposed when the structure is in service shall receive no special finish except repair of damaged or defective concrete, removal of fins and abrupt irregularities, filling of holes left by form ties and rods, and clean up of loose or adhering debris.

(b) Finishing:

Finishing of exposed concrete surface shall conform to the following.

Smooth form finish:

The form facing material shall produce a smooth, hard, uniform texture on the concrete; it may be plywood or other approved material capable of producing the desired finish. All ties, burns and fins are to be removed. Mix one part of Portland cement and one part fine sand with sufficient water to produce a stiff mortar. The mortar after drying shall match the rest of the surface in colour. Before application of mortar, concrete surface is to be dampened. Mortar is to be applied by firm rubber float or trowel, filling all surface voids. Compressing mortar into voids by using carborundum stone shall be continued till uniform colour and texture is produced. If the mortar surface dries too rapidly to permit proper compaction and finishing, apply a small amount of water with a sprayer. Quoted rate of exposed shuttering shall be inclusive of this treatment.

(c) Finish for Unformed Surfaces:

Surfaces which will be exposed to the weather and which would normally be a specified level, a horizontal surface or shows the slope required, the tops of narrow surfaces, such as stair treads, walls, curbs and parapets shall be sloped approximately 10mm in 300mm width, broader surfaces such as walkways, roads, parking areas and platforms shall be sloped about 1 in 50. Surfaces that will be covered by backfill or concrete, sub-floors to be covered with concrete topping, terrazzo or quarry tile, and similar surfaces shall be smooth screened and levelled to produce even surfaces. Surfaces which will not be covered by backfill, concrete or tile toppings such as outside desks, floors of galleries and sumps, parapet, gutters, sidewalks and slabs shall be consolidated, screened and flattened. Flattening may be done with hand and started as soon as the screened has attained a stiffness to permit finishing operations, and shall be the minimum required to produce surface uniform in texture and free from screened marks or other imperfections. Joints and edges shall be tooled as called for on the drawings or as directed by the Engineer.

(d) Protection:

All concrete shall be protected against damage until final acceptance by the Architect or his representative.

CONCRETING IN HOT WEATHER:

Concreting in extreme hot weather shall be avoided. Special care shall be exercised and measure undertaken when temperature on site exceeds 105° F or 40° C. Such measures shall include:

- (i) Provision of a shade for coarse aggregate so that the same do not absorb heat from the directly indenting rays of sun.
- (ii) Continuously wetting coarse aggregates to keep their temperature down, fog sprays.
- (iii) Providing a shade for the mixing machine.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- (iv) Depositing the concrete from the machine as quickly as possible.
- (v) Adjusting water proportions throughout the day to account for water in the wet aggregate, giving desired strength and workability.
- (vi) (Covering the deposited concrete by a membrane as soon after the placing as possible without damaging the fresh concrete.
- (vii) Wet gunny bags shall be laid immediately after two hours of concreting on the top surfaces of slab and shall be kept wet for curing period.
- (viii) Use of retarder (2% of Calcium Chloride).
- (ix) Use of Zero Heat Portland Cement or even the Portland Pozzolana Cement.
- (x) Use of higher water cement ratio.
- (xi) Keep moist, the formwork continuously for the period of 2 hours at least.

On such days of hot weather, concreting records shall be kept of the atmospheric temperature and corresponding temperatures of concrete discharged from the mixing machine.

CURING OF DIFFERENT ITEMS:

For all the time during construction, curing shall be carried out especially from 7.00 AM to 7.00 PM even on holidays with proper manpower, necessary pumps and pipe lines, connections, etc.

Exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacking, canvas, hessian or similar material and kept constantly wet for at least seven days from the date of placing concrete in case of OPC and at least 10 days where mineral admixtures or blended cements are used. The period of curing shall not be less than 10 days for concrete exposed to dry and hot weather conditions. In the case of concrete where mineral admixtures or blended cements are used it is recommended that above minimum periods may be extended to 14 days. For the concretes containing PPC or Portland Slag Cements, period of curing may be increased.

FORM WORK:

General:

The form work shall conform to the shape, lines and dimensions as shown on the drawings and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete and shall be sufficiently tight to prevent loss of slurry.

- (a) All forms shall be checked frequently during the concreting operations and until removed so that they may be driven up if any settlement occurs.

The design, fabrication and erection of formwork are solely the responsibility of the Contractor. The formwork should be safe and stable to withstand dead load of concrete, men etc. Further, the form should yield security to the structure or its members.

(b) Materials:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The selection of materials suitable for formwork shall be based on economy and consistency with safety and quality required in the finished work. Formwork shall be of timber, plywood, steel or any other materials as approved by Architect/Engineer-in-Charge whose decision in this respect shall be final. Props and shores shall be of steel, timber posts, bullies or any other material as approved by Architects.

(c) Chamfer strips shall be placed in corner of forms to produce bevelled edges on permanent exposed surface, if specified.

(d) Temporary openings shall be provided at the base of column forms and wall forms and at other points where necessary to facilitate cleaning and observation immediately before concrete is placed.

(e) Mould Oil:

Care should be taken to see that the formwork is perfectly cleaned and two coats of mould oil or any other approved material is applied before placing the concrete. Such coating shall be insoluble in water, non-staining and non-injuries to the concrete. It shall not become flaky or be removed by rain or wash water. Block boards or equivalent shall be used for shuttering columns, beams, etc. and steel sheets for slab shuttering will be allowed.

(f) Chamfers and fillets:

All concrete and angles exposed in the finished structure shall be formed with mouldings to form chamfers or fillets on the finished concrete. The standard dimensions of chamfers and fillets, unless otherwise specified, shall be 20 mm. Care should be exercised to ensure accurate mouldings. The diagonal face of the moulding shall be placed or surfaced to the same textures as the forms to which it is attached.

(g) Vertical construction joint chamfers:

Vertical construction joints on faces, which will be exposed at the completion of the project, shall be chamfered as above except where not permitted by the Engineer for structural or other reasons.

(h) Reuse of Forms:

Before reuse, all forms shall be thoroughly scraped, cleaned, joints examined and when necessary, repaired and the inside retreated to prevent adhesion, to the satisfaction of the Engineer. The Contractor shall equip himself with enough shuttering to complete the job in the stipulated time.

(i) The contractor shall record on the drawing or a special register the date upon which the concrete is placed in each part of the work and the date on which the shuttering is removed there from. Striking of forms in the case of sides of beams, columns and slabs can be carried out after 24 hours of concreting. The striking of forms shall be done as para 2.12.4. Striking shall be done with utmost care without shock or vibration by gently easing the wedges. If, after removing the formwork, it is found that the timber is embedded in the concrete, it has to be cut out and made good with fine concrete. Due care shall be given to the provision of correct form work for holes and openings in the slabs, inserts, grounding cables, conduits and pipe sleeves, foundation or anchor bolts etc. as per approved drawings or as directed by the Engineer.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

CLEANING AND TREATMENT OF FORMS:

The forms shall be carefully examined to see that they are vertical and horizontal and the joints are properly closed. If forms are to be reused, they should be carefully examined before such reuse, properly aligned and open joints shall be repaired and coated with crude oil. The centring planks for columns shall be joined together and provided with threaded bolts and nuts.

The centring and props for the various members shall be fixed in a workman like manner to be approved by the Engineer-in-Charge. They shall be of such size as the Engineer-in-Charge thinks fit and proper. The centring shall be removed only after the permission has been obtained from the Engineer-in-Charge. Props shall be supported on wedges placed on planks and the planks shall be 25 mm thick.

All rubbish, particularly chippings, shavings and saw dust shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approved composition is kept out of contact with the reinforcement.

(a) In columns of any forms where access to the interior is not available otherwise, a sufficient area of one side shall be left loose so that it may be removed for cleaning out all chips, dirt, sawdust and other extra materials.

(b) Where the shoring bores on the ground, the Contractor shall spread the load from shores by suitable brick platforms in order to prevent settlement.

ARCHITECTURAL EXPOSED REINFORCED CEMENT CONCRETE:**(i) General:**

Generally specification for reinforced cement concrete work shall also apply to this type of work and additional specification set-forth below.

(ii) Materials:

(i) Cement used for such work shall be of a uniform colour and obtained from one source of manufacture.

(ii) Aggregate:**a) Fine Aggregates:**

Colour being an important consideration for exposed concrete, colour of sand used shall also be uniform through out the entire construction. Preferably total quantity required for the work shall be collected and well mixed together to a uniform shade.

b) Coarse Aggregate:

The colour of the aggregate shall be maintained the same through out. Unless otherwise specified, exposed concrete in walls, fences and parapets which are no-load bearing and are less than 120 mm. in thickness the maximum size of coarse aggregate shall be limited to 12 mm for which nothing extra shall be admissible. Flat and flaky pieces shall not be allowed.

(iii) Reinforcement & Cover of the Concrete:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Correct placing of the reinforcement with proper cover is important in all exposed work to avoid discolouration by rusting. The minimum cover specified in the Specification shall be maintained throughout.

Concrete blocks or spacers shall be sparingly used at exposed surfaces. When used, such blocks shall preferably be cast on vibrating tables or in some other similar manner so that it may match the concrete surface in texture and colour. Cover blocks of materials other than precast blocks shall not be allowed to be used.

(iii) Construction of shuttering:

All centring and framework shall be rigid and of robust construction. All vertical props shall be cut square at ends and shall rest on double wedges, placed on continuous horizontal runners on firm natural soil. Resting of props or runners on made up soil shall not be permitted on any account. All members of the formwork shall be closely fixed without any gap between them so as to safeguard against any settlement or displacement of shuttering at the time of concreting.

i) Timber Shuttering:

Formwork for exposed work shall be of seasoned wrought hard wood timber planks free from loose knots. The planks shall be 50 mm thick, 100 to 125 mm wide with tongue and groove joints, assembled to a pattern approved by the Architect. The formwork shall be so constructed, braced, and stayed as to remain absolutely rigid and true during and after concreting. The boards shall be planed to a suitable thickness in order that the surface against the concrete shall not be broken at joints between boards. Chamfers, grooves, drips mouldings, bevelled edges etc. shall be made in the form itself to the size, profiles and details called for on the drawings.

ii) Plywood Shuttering:

The contractor shall provide shuttering quality plywood not less than 12 mm thickness as per IS.4990 (type-I) of approved make or equivalent approved by the Architect in place of timber plank shuttering mentioned above for such location as called for by the Architects. The joints in plywood shuttering shall be located as directed by the Architects. Shuttering, centring and form work for all exposed concrete work like exposed columns, beams, ribs, slabs, chajjas, facia, walls etc. shall be of such finish and rigidity as to produce all faces fair and smooth, true to line level and plumb. No rendering or touching shall be permitted on these faces.

iii) Steel shuttering:

Steel shuttering for exposed concrete work shall be made of shuttering plates of standard sizes and to suit the pattern of exposed concrete indicated in Architect's drawings. The shutter plates used will be made of steel sheets strengthened at the edges and in middle to prevent sagging or any deflection and concrete deformity or dents and should fit with each other properly without any space or groove being left between adjacent plates to avoid and leakage of concrete slurry. If any concrete projects out between plates this will be neatly cut away.

The contractor shall be required to produce details of working showing the general construction of formwork and panels with details such as nail position and holes for supports that may be required; nail heads shall be positioned as instructed by the Architects. Grooves and chamfers shall be formed as shown on the drawings without any extra cost.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Any holes for the supports, which the contractor may need, shall be permitted only if approved by the Architects. All such holes shall be subsequently filled in carefully as to match with the other surface. Walls, columns etc. shall generally be cast to the full height in one operation and the formwork shall be provided accordingly. If permitted by the Architects, these may be completed in two or more heights when the formwork shall be carefully and correctly raised for further height so as to ensure a neat joint without disturbing the pattern. Any groove desired by the Architect at the joint shall be provided by the Contractor at no extra cost. .

(iv) Coating for shuttering:

Shuttering oil, colourless and emulsifiable in water shall be used for oiling the woodwork, when only a thin film shall be neatly applied avoiding collection at one place. Any mark left by the shuttering oil shall be washed clean.

(v) Measurements and proportioning of concrete materials:

This shall be as laid down generally for R.C.C. work. In no case extra dust or sand or additional water shall be allowed with the intention of getting better finish, which shall only be obtained by erecting centring as specified above and proper vibrating of the mix after placing. In no case, the slump limit, specified in the Specification shall be exceeded.

(vi) Preparation for placing concrete:

Special care is essential to see that all saw dust, chips, nails or any foreign material is washed out or otherwise removed from the shuttering.

(vii) Mechanical vibration:

All concrete for exposed concrete work shall be vibrated, using needle vibrators -30/32 mm. Surface or trough vibrators may be permitted to be used for thin slabs. External vibrators for walls may be allowed but this shall be done carefully to safeguard the displacement of the shuttering. Vibrators shall only be operated by skilled labour; over or under vibration shall not be permitted. Any spillage, or leakage, which is unavoidable and which flows down the exposed concrete surfaces, shall be immediately washed away with clean water and brush. Exposed concrete members shall be finished to desired surface while the concrete is still green.

(viii) Curing and protection of concrete:

Curing will be done with clean water, so as not to discolour the concrete. All exposed concrete work shall be properly protected by Alkathene film, gunny bags, wooden boards etc. so the surfaces and edges are not damaged or discoloured till the entire construction is handed over, at no extra cost. All such damages shall be set right or replaced by the contractor at his own cost; the contractor is deemed to have considered this in quoting his rate.

(i) Removal of shuttering:

Striking and removing of formwork for exposed concrete shall be done very carefully without damaging the surface or edges. All such damages shall be set right or replaced by the contractor at his own cost.

(ii) Finishing:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Finishing of exposed concrete surface shall be as specified.

Exposed concrete surface shall on no account be permitted to any sort of repairs or patching after striking the formwork. In the event of any portion not coming up to standard, this shall be taken down by the contractor at no extra cost. Decision of the Architects as to the rejection of such work shall be final and binding on the contractor.

STRIPPING TIME:

In normal circumstances (generally where temperatures are above 20° C) and where Ordinary Portland Cement is used, forms may generally be removed after expiry of following periods:

Type of Formwork		Minimum Period Before Striking Formwork
(a)	Vertical formwork to columns, walls, beams	16 - 24 h
(b)	Soffit formwork to slabs (Props to be refixed immediately after removal of formwork)	3 days
(c)	Soffit formwork to beams (props to be refixed immediately after removal of formwork)	7 days
(d)	Props to slabs:	
	(a) Spanning up to 4.5 m.	7 days
	(b) Spanning over 4.5 m.	14 days
(e)	Props to beams and arches:	
	(a) Spanning up to 6 m	14 days
	(b) Spanning over 6 m	21 days

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

However, this period may be increased or decreased at the discretion of Architects. In case when the cube strengths at seven days are found to be low or in the cases when other cements are used, the curing period and stripping time for forms and removal of props may have to be extended. This shall be decided by the Architect and the contractor shall not claim any extra costs for such increased periods of curing and stripping of forms etc. Special care shall be taken while removing the cantilevering of cantilever slab, canopies, portal frames, folded plates construction etc. Stripping time for such special structure as shell roofs etc. shall be determined from tests of stripping cubes taken especially for the purpose. These cubes shall give strength of 75% of the 28 days strength.

For rapid hardening cement 3/7 of the above period will be sufficient in all cases except vertical sides of slabs, beams and columns, which should be retained for 24 hours.

Note:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The props left under shall mean that the form work for slabs and beams soffits at 3 days and 7 days respectively can be removed only if the same can be done without disturbing the props which are required to support the slab or beam completely. In normal cases this will mean that period for removal of formwork for slabs and beam soffits will be 7 days and 14 days respectively.

PROCEDURE WHEN REMOVING THE FORMWORK:

All formwork shall be removed without such shock or vibration as would damage the reinforced concrete. Before the soffit and struts are removed, the concrete surface shall be exposed, where necessary, in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occurs with all cements in the cold weather.

CAMBER:

It is generally desirable to give forms an upward camber to ensure that the beams do not have a sag when they have taken up their deflection, but this should not be done unless allowed for in the design calculation of the beams.

TOLERANCES:

The Contractor shall, before putting any concrete in any unit, check all dimensions according to the drawing governing the accuracy of the dimension of all the units and the necessary formwork shall be approved by the Engineer-in-charge and if any error is found in dimensions, the Engineer-in-charge will not allow in any case more than the tolerances specified as below and any unit which does not comply will be liable to rejection at the discretion the Engineer-in-charge.

The formwork shall be designed and constructed to the shapes, lines and dimensions shown on the drawings within the tolerances as given below. The tolerances in footings apply to concrete dimensions only and no to positioning of vertical reinforcing steel or dowels.

(a)	Deviation from specified dimensions of cross sections of columns and beams	- 6 mm +12 mm
(b)	Deviation from dimensions of footings:	
	(i) Dimensions in plan	-12 mm
	(ii) Eccentricity	0.2 times the width of the footing in the direction of deviation but not more than 50 mm.
	(iii) Thickness	+0.05 times the specified thickness

TRANSPORTING AND PLACING OF CONCRETE:

The concrete shall be mixed in quantities required for immediate use and shall be deposited on the sub-grade/sub-base to the required depth and width of the pavement section in successive batches and in continuous operation without the use of intermediate form between the joints. Care shall be taken to see that no segregation of materials results whilst the concrete is being transported from

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

the mixer to the place where it is to be deposited. The spreading shall be as uniform as possible to avoid re-handling of concrete. Where, however a certain amount of redistribution is necessary, it shall be done with shovels and not with the rakes.

While being placed the concrete should be rodded with suitable tools so that formation of voids or honeycomb pockets is prevented. The concrete shall be well placed and tamped against the forms and along all joints.

COMPACTION OF FLOOR CONCRETE:

The concrete at the side of the forms and between the reinforcements at joints and at corners to be compacted with internal vibrator (needle vibrators) to avoid honeycombing and to get perfect compaction at these locations.

The vibrating screed shall rest on side forms and it shall be lowered vertically on the concrete surface, (evenly spread to an appropriate level above the base) to provide the required surcharge for compaction; allowed to remain in position for few seconds until compaction is completed, then lifted vertically and lowered on to the adjacent strip of un-compacted concrete. The amplitude of vibration of the screed shall not be less than 1.5 mm and speed of travel not more than 0.60 m per minute. The screed shall again be taken slowly over the surface, sliding with its axis slightly fitted away from the direction of sliding and operation repeated until the required dense, close knit textured finish surface is obtained.

Notes: Precautionary measures to be taken before starting concrete floor.

(a) The working of vibrators shall be regularly checked and standbys shall always be maintained for emergency use.

(b) The segregated particles of coarse aggregates which collect in front of the tamper or screed shall be thrown outside the forms. Under no circumstances shall such segregated particles be carried forward and pushed on to the base in front of the mass.

CONCRETE FLOOR FINISHING:

Immediately after completing the compaction by screed vibrator and excess water has disappeared but while the concrete is still plastic, the floor top surface shall be tested for true-ness with a 3.65 M long straight edge (Aluminum Box Section).

The straight edge shall be held in successive positions parallel to the guide channels in contact with top surface of floor laid and the whole area gone over from the one side of the floor to the other. Advance along the floor shall be in successive stages of not more than one half length of straight edge. Any area of the depressions found shall be scooped to a depth of 40 to 50 mm filled immediately with freshly mixed concrete, struck, compacted and refinished. High areas shall be cut down and refinished. The straight edging and re-floating shall continue until the entire surface is found to be free from observable departures from straight edge and top surface has the required levelled surface.

The floor top surface shall be re-tested for trueness before the concrete begins to set with the 3.60 M long master straight edge (Aluminum Box Patti). Any irregularity in surface to be rectified.

PREPARATION OF SURFACE AND USE OF FLOOR HARDNER (FIRST DRY SHAKE):

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Following types of floor hardeners are used for increasing strength of concrete floors.

- Ironite based
- Silica / Quartz based
- Carborandum based

The quantity of floor hardener shall be used as specified by the Consultants (or as per manufacturers specification) and according to light / medium / heavy-duty floor as specified.

Scrap the concrete deposited, if any, on the top of side form during concreting. As soon as concrete is firm enough to support the weight of workmen and their equipment and no water is observed on surface; apply first shake of hardener evenly using 2/3 of total mix e.g. 2/3 of 7.5 Kg./Smt. Treat areas adjacent to walls and columns first, spread the materials evenly by sprinkling at right angles in two passes close to floor level. Do not broadcast (spread) the hardener from a station position but use a wooden scraper to spread the hardener. Alternatively, a mechanical spreader can be used for better application.

FLOATING: (With Finishing Machine Having DISC)

Power float the shake application promptly, work near wall, columns and door area first. Avoid excessive floating but ensure that the shake application is completely wetted and incorporated in to the base slab.

C-6 Form work for “off the form exposed concrete surfaces having board marked pattern and time texture.”

Relevant specification of form work above (**Given in C-5** above) shall be made applicable.

Concrete surface, which are to be “form finish shall be cast in an approved form work and shall be free from honey combined, fine, projections, and air holes. All external angles to form finish concrete surfaces shall be chaffed if and as directed. All interesting flush surfaces, surfaces horizontally or vertically between columns and beams of other structural members shall be separated by grooves if and as directed by the Engineer-in-charge.

The pattern of the form boards, the disposition of construction joints and lifts, and the incorporation of recessed or raised joints shall be carefully studied by the contractor for its proper implementation.

The contractor shall submit shuttering drawings and details of pattern and the method of forming joints in the exposed (form finish) concrete to the Engineer-in-charge. For his approval and all changes and modification specified by the letter shall be appropriated by the former and final approval whereof obtained from the Engineer-in-charge.

No work of form finished exposed concrete shall be carried out until the contractor has produced acceptable sample of shuttering and concrete to the approval of the Engineer-in-charge.

Utmost care shall be then be constantly exercised by the contractor in the :

- a. Design workmanships and fixing of form work.
- b. Control of concrete ingredients, mixing and placing.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

- c. Adequate technical supervision of all process involved.

Listed below are some form work specifications, for form finished exposed concrete to be used on site as directed by the Engineer-in-charge.

i. Smooth Board Surfaces :

The smooth board marked surfaces are produced by new dressed tongued and grooved boards of uniform thickness of not less than 45 mm. These boards should be brought and dressed on both faces as well as on all side.

ii. Rough Board Surfaces :

A rough texture is obtained by the use of new sawn boards with dressed square edges.

Steel Mould Surface:

Steel moulds must be rigid enough are perfectly plane and clean. They must be painted with a protective paint and absolutely free from rust or have a special section at their edges to prevent cement leakage and produce a water tight joint.

This type of form work is to be entrusted to a skilled and specialized manufacture who has produce satisfactorily similar form work and who must be approved by the Engineer-in-charge.

In all type of form work to form finished exposed concrete. Only non-staining mould oil supplied by an approved manufacturer will be used.

The repetitive usages of the same form work to cast form finished exposed concrete shall be as decided by the Engineer-in-charge and no case form work not guaranteed to produce the required form finish to the satisfaction of the Engineer-in-charge shall be used.

The exposed concrete shall have uniform finish. The finish of the concrete when shuttering and form work is removed will generally be without blemish and will be such as will not require touch up. Slight touch up a small work or two if necessary shall be carried out immediately on removal of form work by 1:1 proportions. This shall be carried out expertly on removal of form work with entire surface.

C-7 Fabricating placing reinforcement in position :

Fabrication:

The reinforcement bars shall be cut to be required length including necessary bends hooks, overlaps, etc. as shown on the plan or as directed by the Engineer-in-charge and shall conform to I.S. 2502-1963 or as revised from time to time. Details of length and bending diagrams shall be got approved from the Engineer-in-charge.

Placing and Binding:

All reinforcement shall be accurately placed in position with spacing as shown in the drawing and firmly held so during placing and setting of concrete. The bars shall be tied diagonally both ways, at all inter-sections with M.S. binding wire of 1.22mm or 1.63mm dia (16 or 18 gauge). Spot welding instead of tying bars by wires will be permitted by the Engineer-in-charge, if required. Spacing of

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

bars shall be maintained by means of stays, blocks, tiles, spacers, hangers or other approved supports or devices at sufficiently close intervals.

All bars protruding from concrete to which other bars are to be spliced and which are likely to be exposed for indefinite period shall be protected from rusting by thin coat of cement wash.

Welding:

Welding (instead of overlaps) by gas or electricity will be permitted under suitable conditions and with suitable safe-guards. In case such permission is granted, relevant Indian Standards for welding of steel reinforcement bars including carrying out necessary tests shall be followed.

Inspection:

No concrete shall be deposited unless the Engineer-in-charge has inspected the reinforcement work, recorded measurements, and given permission to place the concrete. After the approval of the reinforcement by the Engineer-in-charge, it will be the contractor's responsibility to see that reinforcement is not disturbed from its position till the concreting is completed.

C-8 Fixing Expansion Joints :

The expansion joints shall be provided in R.C.C. structural members:

1. For the joints between twin internal beams of RCC frame structure, copper strip of 1.5mm thickness and width and shape as shown in the detailed drawing shall be placed near the bottom in the first beam such that one Kg. of the specified width is embedded in the beam and "U" fold (of 80mm depth unless otherwise specified) will come in the joint.

The "U" shape gap of the copper strip shall be filled with poured bituminous joint filler and nearly finished on top. Before casting of the jointing member pre-molded bitumen joint filler or required thickness shall be placed in position as directed and concrete then cast, embedding the other leg.

2. The joint between the twin terrace beam shall be prepared in a manner similar to (1) above except that the raised concrete edge shall be provided and the copper plate shall be fixed in the raised edge as directed. It shall be covered by lead flashing 1.5mm thick fixed to one seat with copper screws to the wood blocks embedded in the concrete as shown in the detailed drawing.

3. For the joints between twin internal or external columns, while casting the first column, one leg of each of the copper strips of 1.5mm thickness shall be embedded into the column and "U" fold will come in the joints nearer the exterior faces of the column. The copper strips shall be fixed with hold fast of copper rod as shown in the detailed drawing. Before casting the second column pre-molded bituminous joint filler shall be placed against the face of the first column all along between the two steps as directed by the Engineer-in-charge.

C-9 Constructing Brick masonry :

Classification of brick work :

The bricks work shall be classified as first sort or second sort according as first class and second class brick respectively are used.

Welting of Bricks:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Bricks required for masonry shall be thoroughly wetted with clean water for at least two hours before use or as directed by the Engineer-in-charge. The cessations of bubbles, when the bricks are wetted with water, are an indication of through wetting of bricks.

Lying:

Bricks shall be laid in English bond directed otherwise.

Half or cut bricks shall not be used except when necessary to complete the bond. Closers in such cases shall be cut to required size and used near the ends of walls. A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gentle tapping with handle or wooden mallet. Its inside face shall be flashed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

The walls shall be taken up truly plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. Vertical joints in alternate course will generally directly one over the other. The thickness of brick courses shall be kept uniform. The bricks shall be laid with frogs upwards. A set or tools comprising of wooden straight edge, masons spirit level square half meter cub and pins string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of thickness greater than 23 cm shall be kept in proper plane. All the connected brick work shall be carried up nearly at the level and no portion of the work shall be left more than one meter below the rest of the work. Where this is not possible, the work shall be racked back according to bond (and not left toothed) at angle not steeper than 45 degrees.

All fixtures, pipes, outlets of water hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

Joints:

Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exceed 12 mm. The face joints shall be racked as directed by racking tool, daily during the progress of work, when the mortar is steel green so as to provide key for plaster or pointing to be done.

The face of brick work shall be cleaned on the same day the brick work is laid and mortar dropping shall be removed.

Curing:

Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days, the top of masonry work shall be kept well wetted at the close of the day.

Scaffolding:

The supports or scaffoldings shall be sound and strong tied together with horizontal pieces over which the scaffolding planks shall be fixed. Single scaffolding shall be allowed normally in this case inner end of the horizontal scaffolding pole shall rest in a whole header course only. Only one headed for each pole shall be left out. Such holes shall not however, be allowed in pillars under one meter in width. The holes left in masonry shall be filled and made good before plastering.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contractor shall be responsible for providing and maintaining sufficient strong scaffolding so as to withstand all loads likely to come upon it.

C-10 Construction of brick masonry partition walls :

The partition walls shall be half brick.

(A) All the bricks shall be laid stretcher wise breaking joints with those in the upper and lower course. The wall shall be taken truly plumb. All courses shall be laid truly horizontal and all of vertical joints will be truly vertical. The bricks will be laid with frog upwards. Fixtures, plugs holdfasts, frames of doors, windows etc. shall be housed in the brick work while laying only and at the correct levels and position. Holes of required size and shapes shall be left in the brick work for fixing pipes or service lines etc. After service lines etc. are fixed, the extra hollow left in the hole shall be filled with 1:3 cement mortar or 1:3:6 cement concrete. A set of mason's tools shall be maintained on work as required for frequent checking. The ends of walls shall be bonded into the side walls where necessary joints, curing and scaffolding shall be as per C-10 of code of practice.

(B) Laying 2 numbers of mild steel bars of 6mm diameter in brick masonry partition walls. Two mild steel reinforcement bars of 6mm diameter shall be used longitudinally at every fourth course of the brick work. The first reinforcement shall be placed on the top of bottom most course. The bars shall be fully embedded in the mortar and the end shall be properly bonded in the vertical joints of brick work or to the main wall as directed by the Engineer-in-charge. Bars shall be of length equal 45 times diameter of mild steel bars. The joints in the course, where reinforcement is placed, shall be admitted the mortar cover of at least 5mm in thickness of the reinforcement.

C-11 Constructing Brick Masonry Cavity Walls :

General:

The cavity wall shall be constructed with 2 Nos. 90mm thick reinforced brick partition with cavity of 50mm in between wall shall be connected with metallic walls ties.

Reinforced Brick Partition:

Wall ties shall be of mild steel bars of 6mm dia of the shape as directed by the Engineer-in-charge. The wall ties shall be placed at not more than 800mm apart horizontally and not more than 500mm vertically and shall be placed staggered. Before placing the ties same shall be dripped in hot tar and sanded to protect from rust. The additional ties shall be placed at the opening.

Construction:

The bond used for each skin or leaf of a cavity wall shall be stretcher bond. Flemish bond or any other arrangement of bricks shall not be used during erecting of wall. Sufficient care shall be taken to keep the wall ties and cavity free from mortar dropping, 25mm thick and 40mm wide teak wood batten shall be placed across the wall ties and raised as each row of ties are raised for reducing the mortar dropping in the cavity. The temporary openings shall be provided to permit the daily removal of mortar dropping from the bottom of cavity. At the points where the two leaves of the hollow wall come into contact or above the lintels of doors and windows and at solid at jambs, necessary damp proof membrane of approved quality shall be provided as per the direction of Engineer-in-charge. Except as above the work in general shall be executed as per provision of I.S. 2212-1962 or as revised from time to time so far applicable.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

C-12 Preparing and fixing doors, windows and ventilators, teak wood paneled or Glazed or partly paneled and partly glazed.

General:

The code covers the requirement of preparation of doors, windows, & ventilators with frames and their supply and fixing.

They shall be made on site of work only.

Frames:

All members of frame shall be exactly at right angle shall be checked from inside surface of the respective members.

All members of frames shall be straight without any warp and shall have smooth surface well planned on the three sides exposed at right angle to each other. The surface touching the wall may not be planned unless it is required in order to strengthen up the members or to obtain the overall sizes within tolerance as specified.

Frames shall have overall joints when ventilator is included it shall be provided by having full length one piece post for door or window and ventilator extending the frame on top of the head to the required extent. Horns shall not be provided in the head of the frame when no sills are provided the vertical post of the frame in the ground floor shall be embedded in the sill masonry for 100mm. On upper floors the vertical posts shall be fixed in the floor by forming notches 10mm deep. Slight adjustment of spacing as necessary shall be done to have the holdfasts in the joints of masonry course. The frame shall be done to have the holdfast in the joints of masonry course. The frame shall be erected in position to hold plump with strong supports from both sides and built in masonry as it is being built. The transom shall be thorough tenoned into the mortises of the jamb post to the full width of the jamb post and the thickness of the tendon shall be not less than 15mm. There shall be closely fitted into the mortise and suitably pinned with wood dowels not less than 10mm diameter. The depth of rebate for housing the shutter shall be as shown in detailed drawings or as directed by the Engineer-in-charge.

The contact surfaced or tendon and mortises shall be treated before putting together with an adhesive of approved make.

M.S. hold fasts shall be protected with a coating of primer. The surface of frame abutting the masonry or concrete a faces shall be properly treated by applying a coat of approved premier coal tar shall not be used for this purpose.

Shutter:

Paneled shutters shall be constructed in the form of timber frame work of styles and rails with panel inserted of type as specified in the item of work. Panel shall be fixed by providing grooves in the style and rail. The styles and rails shall be jointed to each other by mortise and tendon joint at right angles.

All members of the shutters shall be straight without any warp or bow and shall have smooth well planned faced of right angles to each other.

Styles and rails of shutters shall be made out of one piece only.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Schedule of fixtures and fastening for Doors, Windows, Ventilators, Wardrobe, and Cupboards.

Notations.

Da- Teakwood doors fully paneled or fully glazed or partly paneled and partly glazed.

Db- Bathroom & W.C. door with single shutter.

Si- Single shutter.

B- Breadth of door shutter.

T- Thickness of door shutter.

900mm & below

900 above 970 mm

Sr. No.	Particular of Fixture & Fastening.	Size in mm	Da. SI:B:900 T-38	Da. SI:B:900 T-38	Db.SI
1	Hold fast	150x16x3m	4	6	4
2	But hinges	10	3	3	3
			4		
3	Sliding door bolts	300x16 250x16	1	-	-
4	Tower bolts (Barrel bolts)	200x10	1	1	-
5	Tower bolts (Barrel bolts)	150x10	-	-	-
6	Door latch	260x16x5	1	1	1
7	Handles	100	2	2	2
8	Door stopper	75	1	1	-

Timber Paneling:

Thickness of the panel shall be as specified in item. When made from more than one place, as shown in the drawing or as directed by the Engineer-in-charge, the places shall be finished as shown in the detailed drawings and shall be jointed with specified size of plywood filled. The end pieces of the panel and the top and bottom of the panel shall be provided with continuous tongue to frame is into groove of the frame of shutter. An air space of 15mm will be left groove of frame of shutter while framing the panels in it.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The faces of the panel as well as various pieces of the panel shall be closely fitted to the side of the grooves.

Finishing of the corners of raised panel edges shall be done as shown on drawings or as directed by the Engineer-in-charge.

Glass Paneling:

The glass panels shall be embedded putty and secured to the rebate of wooden beads or moldings of shape and size as approved with counter sunk screws of suitable size.

Fixtures & Fastenings:

All fixtures and fastenings shall be fixed with appropriate screws in sound and efficient manner to ensure easy operation. They shall be appropriately positioned and shall be truly horizontal or vertical as required.

Height of the shutter shall be such as not allow clearness of more than 6mm above the flooring level.

C-13 Lime Brick bat Concrete :

This shall be as per C-2 of code of practice. The brick bats shall conform to M-12.

C-14 Glazing :

The glass panels shall be properly cut to fit the rebates of the frames and sashes truly with a slight minus margin of about 1.5mm on all sides. Before glazing, the frames shall be primed and prepared for painting so that wood may not draw oil out of putty. The rebate shall be putted to an extent to provide bedding all around the glass edges.

The glass shall then be bedded in putty and fitted with wooden beads or molding as directed and secured with counter sunk screws.

The size of the rebate in the frame and size and shape of beads or moldings shall be as per detailed drawings or as directed by the Engineer-in-charge. The beads or moldings shall have mitred corners. The glazing in metal frame shall be done in the same way as in wooden frames. Except as stated above glazing in metal frames shall be done as specified in I.S. 1081-1960 or as revised from time to time.

C-15 Oil Painting / Synthetic Enamel Painting :

Preparation of surfaces:

The surface to be painted shall be thoroughly.

The screw shall be spaced not more than 100mm from each corner and not more than 200mm apart clean and rubbed smooth with sand paper to bring it to a true plane, when finished. No scratches from sand paper should be shown.

Application:

This shall be applied in 2 coats as per normal practice. After preparing surface as above one coat of white oil paint shall be applied as priming coat. After priming coat, all small holes, cracks, open joints and similar other minor defects of every kind shall be stopped with putty made from pure whiting.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

mixed to the appropriate consistency with raw linseed oil little white lead being worked in after mixing to help in hardening of putty.

The work shall be little rubbed down smooth with sand paper and the consequent coats of paint of the specified shade approved by the Engineer-in-charge shall be applied. The paint shall be applied with brush. It shall be spread as smoothly as possible. Final coat shall be very carefully crossed and laid off, so that brush marks are not visible.. Each coat of paint shall be allowed to dry thoroughly and shall be little rubbed down for the next one is laid. Finished surface shall now show any hair marks, ridges or dry patches of paints and no puddles shall be left in the corner of panels' angle of molding etc.

C-16 French Polishing :

French polish to be used shall conform to I.S. 348-1968 in the requirement of quality.

Preparation of surface:

All unevenness shall be rubbed down to smoothness with sand paper and the surface shall be well dusted. The wood to be polished should be first painted with a filler by mixing whiting in hyphenated spirit to obtain a good glossy surface shall be again rubbed down perfectly smooth with paper.

Application:

The number of coats of polished to be applied shall be as specified in the item. On the wood work thus treated a thin coat of French polish shall be applied by a pad of woolen cloth covered by fine cloth. The pad shall be moisture with polish rubbed hard on the surface in a series of over lapping circles applying the polish sparingly but uniformly over the entire area to give an even surface. A trace of linseed oil on the face of the pad facilitates that operation. The surface shall be allowed to dry and the remaining coats applied in the same way to finish off the pad should be covered with a fresh piece of clean fine cloth, slightly dumped with mentholated spirit, and rubbed lightly and quickly with circular motions. The finished surface shall have a uniform texture and high gloss.

C-17 Laying in Situ Cement Concrete Flooring (I.P.S.) :

The flooring shall be provided with ordinary cement concrete 1:2:4 (1- cement: 2- coarse sand & 4- graded stone aggregate 20 mm nominal size). The work of plain cement concrete 1: 2: 4 shall be carried out as per C-2 above. The thickness flooring shall be specified in the item of work.

The surface of the sub-grade shall be cleaned and all loose materials and moistened immediately before laying flooring.

The concrete shall be laid immediately after mixing white being placed, the concrete shall be vigorously sliced and spaced with suitable tools to prevent formation of voids or honey comp pockets. The concrete shall be brought to the specified levels by means of heavy straight edge resting on the side forms and drawn ahead with a sawing motion in combination with a series of lifts and drops alternating with small lateral shifts immediately after laying concrete the surface shall be checked for high or low sports and any needed corrections made up by adding or removing the concrete. After striking off the surface it shall be compacted with wooden float. The blows shall be fairly heavy in the beginning but as consolidation takes place light rapid strokes shall be given to complete the ramming. The floating shall be followed by steel traveling after concrete has hardened sufficiently to prevent excess of fine material from working to the surface. The finish shall be

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

brought to a smooth and even surface free from defects and blemishes and tested with a straight edges. Dry cement or mixture of dry cement and sand shall not be sprinkled directly on the surface to absorb moisture or to stiffen the mix. After the concrete has dried, sufficiently to allow rendering to a thin floating coat of neat cement slurry uniformly floated.

If so specified in the item of a work approved mineral colour, pigment shall be added to cement mortar to give mortar rendering is sufficiently stiff lines may be marked on it so specified or directed. With strings or any other devices to give the appearance of 250 mm x 250mm tiles of any other size diagonally or square as directed. The junctions of floor with the walls shall be rounded off, if so directed.

Curing:

Curing shall start on the next day after finishing and shall be continued for fourteen days.

C-18 Laying In-Situ Terrazzo Flooring :

Under layer of cement concrete:

The under layer shall be laid as described in C-17 of the code of practice except that only black trap grit shall be used in place of coarse aggregate and no finishing shall be done to make the surface smooth. The compacted thickness of concrete under layer shall be as specified in the item. This layer shall be laid to the require level and grade. The top surface of the under layer concrete shall be kept sufficiently rough to form a key to the top layer.

Dividing strips shall be fixed on the base to the exact surface level of floor so as to divide the surface of the base into the required arrangement of panels. Anchorage arrangement shall be provided either by fixing 4 cms. Long cross nails through the strips or by cutting the edge as directed.

Before spreading the under layers the base shall be cleaned of all dirt laitance or loose material and than well wetted with water without forming any water pools on the surface it shall then be smeared with cement slurry just before the spreading of under layer.

After application of cement slurry, the under layer shall be spread and leveled with a

Screening board. This slightly rough surface left by the screening board will form a satisfactory key for the terrazzo.

Mixing of Materials:

Mixing shall be done manually in a tub. To avoid variation in colour the complete quantity of cement and pigment required for one operation shall be mixed at the beginning of the work and stored properly.

Where the different colour chips are used they shall be well mixed in required proportion of various colour and size. Coloured cement may be ready mix or properly mixed at site. White cement (with or without pigment as directed) or colour cement and marble powder shall be in the proportion of 3 parts of cement and 1 part of marble powder by weight. For every part of this marble mix, the proportion of the aggregate by volume shall be $\frac{1}{2}$ parts.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

While mixing the aggregates care shall be taken not to get the materials into a heap as this would result in the coarsest chips failing to the edge of the heap and the cement working to the centre at the bottom. The materials shall be kept, as far as possible in an even layer during mixing.

After the materials have been through mixed in the dry state, water shall be added in small quantities; preferably in a fine spray while the materials are being proper consistency is obtained. The mixing shall be plastic but not so wet that it will flow; a rough indication for the addition of proper quantity of water in the mix is that it shall be capable of being molded when squeezed in hand without water flowing out. The mix shall be used in the work within half an hour of the addition of water during preparation.

Laying Terrazzo Topping:

Terrazzo topping shall be laid while the under layer is still plastic but it has hardened sufficiently to prevent cement from rising to the surface, this is normally achieved between 18 to 24 hours after the under layer has been laid. A cement slurry preferably of the same colour as the topping shall be brushed on the surface immediately before laying is commenced. If possible, the entire work of laying the topping shall be completed at one stretch.

The terrazzo mix shall be placed on the screed bed and be compacted thoroughly by tamping or rolling and towed smooth. The time interval allowed between each successive toweling is important at only that much toweling which is just sufficient to give a level surface is needed immediately after laying. Further compacting shall be carried out at intervals, the amount depending upon the temperature and rate of set of the cement. Excessive trowelling or rolling in early stages shall be avoided as this will tend to work up cement to the surface which produce a finish liable to cracking and will also necessitate more grinding of surface to expose the marble chips.

The surface shall then be rammed in order to consolidate the terrazzo, it is not sufficient just to "float" lightly, as this would cause depression which have to be filled with mortar. A piece of smooth marble stone of size 15 cm x 2.5 cm may be advantageously used for ramming. Following the rammer a trowel may be used. When using the trowel, the object should be make the surface level smooth with a little use of the float as possible relying upon pressure rather than upon a trowelling action to achieve this end. Rolling will be easier than tamping and patting, but a rolled terrazzo is more like to crack since the roller would draw the cement to the surface unless the mixture is very dry. The best results will be obtained by tamping combined with a minimum of trowelling. The compaction shall ensure that air bubbles are cleared from the mix.

Curing:

The surface shall be left dry for air curing for duration of 12 to 18 hours depending upon atmospheric temperature conditions. It shall then be cured by allowing water to stand in pools over it for a period of not less than four days. Precautions shall also be taken to prevent the floor from being subject to extreme temperature.

Grinding:

The grinding processing and polishing of terrazzo may be commenced not less than 7 days from the time of completion of laying. The grinding shall be done by machine only. The filling shall be done with a grout using the same coloured cement (without marble powder) as it is original max for terrazzo topping and a portion of the coloured cement shall be kept for this purpose when the floor

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

is laid and this will make sure that patches do not differ in appearance from the remainder of the floor.

After the first grinding is done, the surface shall be washed clean and grouted with neat coloured or white cement grout as the case may be of creak like consistency. It shall be allowed to dry for 24 hours and watered for 4 days. The second, third and fourth grinding shall be done in the above manner excepting that the grinding shall be done with finer carborundum stones as directed for each successive grinding.

The floor shall finally be washed clean with dilute oxalic acid solution and dried. In case wax polished surface is required by the Engineer-in-charge. The wax polish shall be sparingly applied with soft Indian on the clean and dry surface then the polishing machine fitted with bobs shall be run over it. Clean saw dust shall then be spread over the floor and polishing machine again applied, mopping us surplus wax and leaving glossy surface. Care shall be taken that the floor is not slippery.

C-19 Laying and finishing of Marble / granite slab Flooring :

General:

The marble stone flooring shall be laid on the cement mortar bedding with neat cement finishing.

Proportion of mix:

The cement mortar bedding shall be as per **M-9** of specification of materials in 1:6 proportions of cement and sand by volume unless otherwise specified in item of work.

Preparation of Bed of cement Mortar:

The bed of cement mortar shall be laid on the compacted base to reasonably true plane surface and to the required slopes. Care shall be taken in preparing ring the mortar bed to ensure that there are no hard lumens that would interfere with the sub-floor or base shall be cleaned of all dirt, scum, or laitance and of loose materials and then well wetted without forming any pool of water on the surface. All points of level for the finished paying surface shall be marked out. The mortar shall then be evenly and smoothly spread over the based by the use of screed battens only over so much area as will be covered with slabs within half an hour. The thickness of the mortar bedding shall not be less than 20 mm and not more than 25mm. The required slope shall be given to the bed.

Fixing stone slab:

Before laying the marble stone slab shall be thoroughly wetted with water, neat cement grout of honey like consistency shall be spread on the mortar bed over as much area as could be covered with the slab within half an hour. Marble slab shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slope on the mortar bed. Each slab shall be generally tapped with a wooden mallet till it is firmly and properly bedded. There shall be no hollows left. If there is a hollow sound on gently tapping of the slab such slab shall be removed and reset properly. The joints shall be of uniform thickness and in straight line. The joint shall not be more than 1.5mm thick and filled solidly with mortar, for their full depth. The joints shall be struck smooth but there shall be no smearing or mortar over the slabs. The slabs shall be laid so as to give continuous parallel long joint with cross joint at right angles to them. The edges of the adjoining slabs shall be in one plane when the slabs cover open edges of the floor or window, sills the edges shall be neatly rounded off.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Pointing:

When pointing is to be done the joints shall be pointed with cement screening of the colour matching the colour of the marble stone slabs. The cement mortar spread on the marble slabs shall be cleared immediately after pointing.

Curing:

The flooring shall be kept well wetted with the damp & or water fourteen days.

Polishing:

The polishing shall be done generally by polishing machine. After the floor is completely dry a hot mixture of turpentine and bees wax (4:1 by weight) shall be applied to the surface and rubbed clean with cotton waste.

Wherever big area of floor are to be tiled the level of the central portion of the floor shall be kept about 10 mm higher than the level marked at the walls unless specified otherwise.

C-20 Laying Kotah stone flooring paving :**Bedding:**

Before spreading the mortar, the sub base of the floor shall be cleaned of all dirt, scum, and loose materials and then well wetted without forming any pools of water on the surface.

In case of R.C.C. floors, the top shall be left a little rough. All points of level for the finished surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base. Bedding layer of cement mortar in proportion 1:6 or 1:3 shall not be less than 20 mm or 12 mm average.

Laying:

Before laying the stones, they shall be thoroughly wetted with water. Neat cement grout of required consistency shall be spread on the mortar bed. The stones shall be laid on the neat cement fiber and shall be evenly and firmly bedded to the required level and slope. There shall no hollows left the joints shall be uniform thickness and in straight lines. They shall be filled solidly with a mortar / cement slurry for the full depth. The points shall be struck smooth. But there shall be no smearing of mortar over the stones. When pointing is to be done, the joints shall be racked out for not less than the width of the joints while the mortar is steel green. The flooring shall be in true plane.

The thickness of joints shall normally be as follows unless otherwise specified or :

- (i) Polished kotah stone with fine chisel 1.55mm dressed edges.
- (ii) Rough kotah stone with dressed 8 mm to 12 mm edges.

Curing:

The flooring shall be kept wetted with damp sand or water for fourteen days. It shall be kept undisturbed at least for seven days.

Cleaning:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Flooring shall be thoroughly cleaned as directed by the Engineer-in-charge.

Polishing:

The polishing shall be done generally by polishing machine. After the floor is completely dry a hot mixture of turpentine and bees wax (4:1 by weight) shall be applied to the surface and rubbed clean with cotton waste.

Wherever big area of floor are to be tiled the level of the central portion of the floor shall be kept about 10 mm higher than the level marked at the walls unless specified otherwise.

C-21 Laying Dholpur Stone paving :

This shall be as per C-20 of code of practice as applicable to rough kotah stone. The stone in this case shall be Dholpur stone.

C-22 Laying and finishing of cement concrete flooring tiles :

The work shall be carried out as per IS 1443-1972 or as revised from time to time as far as is applicable.

Bedding:

Before laying the tiles they shall be thoroughly wetted with water. Neat cement grout of required consistency shall be spread on the mortar bed. The tiles shall be laid on the neat cement float and shall be evenly and finally bedded to the required level and slope as per pattern given during the execution of the work. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

Joints:

The flooring shall be kept wetted with damp sand or water for fourteen days. It shall be kept undisturbed at least for seven days.

Polishing:

After the tiles are properly cured, it shall be polished by machine and shall be waxed to give thoroughly polished even surface. If any part of the building like doors, windows etc. is spoiled or damaged, it shall be repaired to its original condition by the contractor at his own cost.

C-23 Laying & Finishing to marble/granite skirting or dedo :

The work consists of laying of marble stone slab, skirting or dedo in cement mortar.

Preparation of surface:

Before fixing marble stone slab on brick or concrete wall the wall surface shall first be wetted with water. Thereafter about 10mm thick backing of cement mortar in the specified proportion shall be applied on the surface in true line and level generally as per C-31 or practice.

Fixing:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The back of each marble stone slab, to be fixed shall be smeared with cement paste of matching colour and the marble stone slab shall then be gently tapped against wall with a wooden mallet. The skirting shall be done only after the flooring is completed. Any pipe coming out of the wall through the marble stone slab of dedo or skirting shall be approximately so positioned that its centre shall only be at the intersection of horizontal and vertical joints. The tiles shall not have staggered joints, the joints shall be true to centre line both way and the vertical joints shall be in line with the joint in the marble stone flooring. The joints shall not be more than 1.5 mm thick. Each marble stone slab shall be fixed as close as possible to the one adjoining and any difference in the thickness of the marble stone slab shall be even out in the cement paste. So that the entire tile faces are set in conformity with one another. The skirting shall project uniformly and not more than half the tile thickness beyond the finished surface above.

Curing:

Curing shall be done as per C-22 of Code of practice.

Finishing:

Skirting and dedo will be hand polished to have an even smooth and shining surface chamfering shall be done on the junction of cement plaster and cement tiles.

C-24 Laying and finishing of kotah stone skirting or dedo :

This shall be carried out as per C-20 of code of practice except that the skirting or dedo in this case shall be of polished kotah stone and joints shall be 15mm in case of stones with machine cut edges and 3 mm in case of fine chiseled dressed edges.

C-25 Laying & finishing of in Situ Terrazzo Skirting or Dedo :

Under layer of concrete mixing of materials laying terrazzo topping curing and grinding shall be as per C-18 of Code of practice except that the grinding will have to be done manually and the skirting / dedo shall not project more than 7mm and the plaster at the junction at top shall be leveled suitably.

C-26 Laying & Finishing of cement concrete tiles skirting or dedo :

This shall be carried out as per C-23 of code of practice except that the skirting or dedo in the case will be of cement concrete tiles and that joints shall be fitted in with slurry of matching colour cement.

C-27 Laying White Glazed Tiles / Ceramic vitrified tiles flooring :

Bedding:

Mortar shall give sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of bedding. The base shall be cleaned and well wetted. The mortar then shall be spread in thickness not less than 12 mm and not more than 20mm to have a required slope.

Fixing Tiles:

The tiles before laying shall be soaked in water for at least two hours. Neat cement grout of honey like consistency shall be spread over the mortar beddings as directed. The edges of the tiles shall be smeared with neat white cement slurry. The tiles shall be well pressed and gently trove with a

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

wooden mallet till it is property bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints between the tiles shall not exceed 1.0 mm.

The tiles shall not have staged joints. The joint shall be true to centre line both way. The nahni trap coming in the flooring shall be positioned that its grating shall replace only one tile. After fixing the tiles finally in an even plane, the flooring shall be kept wet and allowed to mature undisturbed for 14 days.

Cleaning:

The surplus cement grout that may have come out of the joints shall be cleaned off before it sets. Once the floor has set it shall be carefully washed cleaned by dilute acid and dire proper precautions and measures shall be taken to ensure that the tiles are not damaged any way till the completion of the construction work.

C-28 Laying White glazed tiles / vitrified tiles skirting or dedo :

This shall be carried out as per C-27 of code of practice except that the skirting or dedo in this case shall be of white glazed tiles and the edges of the tiles shall be smeared with and fixed in with neat white cement slurry.

C-29 Laying Tar felt treatment :

General:

The tar felting shall be done on smooth surface previously preparing for making them water proof and damp proof.

Prepare of surfaces:

The surface on which the tar felt is to be laid shall be cleaned with brush and all dust and foreign materials removed. Any cracks in the surface shall be cut to V- section, cleaned and filled up flush with cement and slurry or a suitable grade of bitumen or both.

Laying:

The five layers of the treatment shall be laid as under.

Premier coat:

The first coat of bitumen primer shall be applied as directed by the Engineer-in- charge. The second and fourth coats shall be of hot blown bitumen of approved grade applied at the rate of 1.5 kg. Per sq.mtr.

The third layer shall be of the fiber base self finished felt. The felt shall be laid as mentioned below:

- (a) The felt shall be first cut to required length, brushed clean of dusting materials and laid out flat on a level, dry and clean surface.
- (b) After the surface has been prepared and cement rendering and the corner fillets have set and a primer coat has been applied, the strip of tare felt for laying is rolled up.
- (c) The rolled up felt is laid on one end of the floor, the hot bonding materials is prepared on to the floor in front of it across the full width of the felt, which is then unrolled gradually with a slight

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

pressure to squeeze out the excess bitumen fit and final coat shall be of screened grave or grit laid at the rate of 0.008 cmt / sq.cmt.

The water proofing treatment shall be continuous through out as far as possible. However, where the points are unavoidable the minimum over lapping shall be 100mm and the joints shall be made perfectly water tight.

C-30 Cement pointing :

The joints shall be brushed clean of dust and loose particles with a stiff brush. The area shall be washed and the joints thoroughly wetted before pointing is commenced. The racking out of joint shall be 20mm deep. The surface shall be applied with two coats of Geru wash.

The racked out joints shall be filled with cement mortar as specified in the item. The mortar shall be of required consistency & well pressed and rubbed smooth. The pointing shall be flush or as directed by the Engineer-in-charge.

C-31 Application of cement plaster finish :

Preparatory work:

The smooth surface of concrete / masonry shall be suitable roughened to provide necessary bond. All dirt, swat, oil, or any others material that might interfere with satisfactory be shall be removed. The surface shall be cleaned and scrubbed with fresh water and kept wet for 6 hours prior to plastering. It shall be kept damp during the progress of the work.

Gauge:

Patches of plaster 150mm x 150mm shall be put on above 3 mtr. Apart as gauges to ensure even plastering in one plane.

Plastering: (a) BASE COAT:

In all plaster work, the mortar shall be firmly applied with some what more than required thickness and well pressed into the joints and the surface rubbed and leveled with a flat wooden rule to give required thickness. Long straight edges shall be freely used to ensure a perfectly plane and even surface. All corners shall be finished their true angles or founded as directed by the Engineer-in-charge. The surface shall be finished to plane or curved surface as shown on the plan or as directed by the Engineer-in-charge and shall present a neat appearance. The mortar shall adhere to the concrete surface firmly when set and there shall be no hollow when struck. Cement plastering shall be done in squares or strips as directed. Plastering shall be done from top down wards. All exposed angles and junctions with door frame etc. shall be carefully finished.

(b) FINISHING COAT:

Finishing coat shall be provided to the plaster as specified. A coat of cement slurry shall be applied to the plaster surface with a trowel to provide uniform texture while the base coat is still plastic. In any continuous faced of a wall, finishing treatment should be carried out continuously and day to day breaks made to coincide with architectural breaks in order to avoid unsightly injunction. All tools and accessories used in plaster work shall be cleaned by scraping and washing at the end of each day's works after use. Metal tools shall be cleaned after operation.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

(c) Watering & Curing:

All plaster work shall be kept damp continuously for a period of fourteen days.

C-32 Application of Water proof cement plaster :

The cement plaster of specified thickness shall be provided in cement mortar with integral cement water proofing compound of approved quality.

The plastering work of specified thickness shall be done as per C-31 of Code of practice. Except that while preparing the cement mortar, the approved water proofing compound at the rate 1 kg / 1 bag as per manufacturers specifications of cement shall be added while mixing the mortar. The contractor shall bring the water proof materials to site of work in their original packing the water proofing material shall be mixed in dry cement and sufficient care shall be taken while mixing to see that the water proofing materials gets integrally mixed with the cement and does not run out separately when water is added.

C-33 Application of sand faced plaster :**Base coat:**

The base coat plaster shall be of cement mortar of specified properties and thickness. The base coat shall be laid in a similar manner of laying plaster as per **C-31** of code of practice. However, instead of finishing the top surface smooth keys shall be formed on the surface by thoroughly combing it with way horizontal lines about 12mm apart and about 3 mm deep when the mortar is still plastics. The base coat shall be cured for minimum 2 days.

Second coat:

Second coat shall be cement mortar with specified kind of cement and specified preparation of thickness. The coat shall be applied evenly in true lines and level by using approved quality of coarse and the surface shall be finished with a wooden float. The necessary rubber sponge as approved by the Engineer-in-charge shall be applied over this coat to obtain the surface textures as per previously approved sample.

When the finishing coat has hardened, the surface shall be kept watered continuously for 14 days.

C-34 Application of coloured cement plaster :

The plaster shall be applied in two coats namely base coat and finishing coat. The base coat of thickness specified in the item shall be applied as per that under C-31 of Code of Practice. The finishing coat shall be thickness as specified in the item and shall be carried out as per that under C-31 of Code of Practice except that cement of colour and shade as approved by the Engineer-in-charge shall be used.

C-35 Laying and finishing stone veneering / Lining :

The code covers the requirement of preparing the Dholapur stone of machine polished machine cut edge for stone veneering, lining including laying and finishing.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The exposed veneering / lining face of the stones shall be double machine polished patches or streaks on the face shall not be allowed. The machine cut machine polished stones shall be provided with appropriate six rectangular groove on the top edge to receive one leg of gun metal cramp.

The groove shall be positioned centrally thickness wise or as directed by the Engineer-in-charge.

Circular holes of appropriate depth in the vertical edges shall be provided to receive 6mm diameter copper pin dowels of 75mm length. The holes shall be positioned as directed by the Engineer-in-charge.

The samples of stones prepared as above shall be first got approved from the Engineer-in-charge. In case wax polished surface is designed the wax polish shall be sparingly applied with soft linen on the clean and dry surface and clean saw dust shall then be spread over the surface, and the sample wax mopped up, leaving glossy surface. Care shall be exercised to see that the wax shall not at all stain the edges.

The stones shall be well wetted before laying while applying mortar for fixing the stones in position, no chips or filling of any sort shall be used. The surface to be veneered shall be cleaned of all dirt, maintenances of loose materials and then will wet with water.

The stones shall be secured to the backing by channeled shape gun metal cramps, 30 cm long, 25mm wide and 6mm thick. The legs of the channel shall be 25 cm high. The adjoining stone shall be secured to each other by 6mm dia 75mm long copper pin dowels. The cramps and pin dowels shall be spaced not more than 600mm apart. The samples of pin, dowels and cramps shall be got approved from the Engineer-in-charge. One end of the cramp shall be positioned in the groove in the top edge of the stone and the other end in the joint of the brick masonry at the back.

The pin dowel shall remain inserted in the adjoining stone so that equal length remains in each stone.

The pin dowels and cramps shall be laid in cement mortar of cement and fine sand in proportions as specified in the item.

While laying face work all care shall be taken to see that the edges and corners of the stones are not damaged in any way and that the stone face are not disfigured or stained or any indentation formed on the face if any stone is damaged in any of the above way the same shall be replaced by unblemished and work redone.

The pattern of stone veneering shall be as per the detailed drawing or as directed by the Engineer-in-charge. Few samples of finished stone veneering shall be prepared by the contractor for the approval of the Engineer-in-charge. The work shall be carried out solely in conformity with the approved sample.

The backing joints shall be filled with cement mortar of appropriate proportion and shall be of thickness not more than 10 mm. All these joints shall be full of mortar if any hollow sounding is detected by tapping the stone this shall be taken out and re-laid properly without hollow. The backing joint shall be carried out simultaneously with the face work.

The thickness of the face joints shall not exceed 5mm or as directed by the Engineer-in-charge. The face joints shall be uniform through out. A uniform recess of 10mm depth from face shall be left

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

with the help of steel plates sections. The cement to be used for face joints shall be of matching colour and shade as approved by the Engineer-in-charge.

In case of cement concrete backing, the stone shall be secured with backing after it has set and got cured. The craps shall be fixed in concrete in the required position while laying.

The method of executing this work shall be got approved from the Engineer-in-charge in all its details such as scaffoldings, method of handlings transporting keeping in position of stones, manner and operational phasing of applying the back joints etc. in submitting the data, the contractor shall give due weight age and consideration to the fact that the work is to be carried out at a very great height and such other critical factors.

The curing shall be carried out continuously for 14 days and if possible curing may be carried out by providing perforated pipes horizontally laid.

The face work shall be cleaned off all mortar markings, stain etc.

The face joints of the veneering shall be neat, true to line i.e. perfectly horizontal and perfectly vertical. The face work shall be truly in plane. It shall present a neat appearance.

C-36 Application of flat paint :

The surface on which the flat paint is to be applied shall be thoroughly cleaned of all mortar droppings, dust, algae, grease, and other foreign matter by brushing. The holes and undulations shall be filled up with plaster of Paris and rubbed smooth. The surface so prepared shall be got approved from the Engineer-in-charge prior to painting work is commenced.

Application of paint :

Primer coat :

The specified primer shall be applied with brush in an uniform layer over the surface prepared as above.

Painting coats:

Flat paint shall be applied with brushes when the surface is dry, Paint shall be applied in even and uniform layers. The number of coats shall be specified in the item of work. Each coat shall be allowed to dry overnight and lightly rubbed with very fine grade of sand paper and loose particles shall be brushed off before the next coat is applied. The paint shall be applied evenly and smoothly by brushes with crossing and laying process. The crossing and laying process shall consist of covering the area over with paint and then painting alternatively in opposite direction two or three times and then finally painting lightly in a direction at right angle to the same. This entire process of crossing and laying shall constitute one coat.

No hair marks or clogging of paint puddle in corners etc. shall be left on the surface.

All wood work, glazing, floors etc. shall be protected by covering and stains meals, splashing, if any shall be removed and any damage done shall be made good by the contractor at his cost.

C-37 While Washing or Colour Washing :

White wash:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Lime shall be dissolved with sufficient quantity of water (about 4 to 5 liters per kg. of lime) thoroughly mixed and stirred to attain consistency within screen. The wash shall be strained through a clean cloth. Clean colour dissolved in hot water shall be added in suitable proportion Indigo will be added to obtain required white tint.

Preparation of Surface:

The surface shall be prepared by removing the mortar droppings and foreign matter and thoroughly cleaned with a wire or fiber brush or any other suitable means as directed by the Engineer-in-charge. All loose pieces and scale shall be scrapped off and holes filled with mortar.

Application of white wash:

On the surface so prepared the white wash shall be laid with brush. The first coat shall be from top downwards, and similarly second coat shall be from the right to the left or to right. Each coat must be allowed to dry before the laid it shall present smooth and uniform finish free from brush marks and it should not come off easily when rubbed with finger.

Splashing and dropping, if any, on the doors, windows, ventilators etc. shall be removed and the surface cleaned.

Colour Wash:

Colour wash shall be prepared by adding necessary approved colour matter of the white wash which has been strained and prepared as above. Other provisions as mentioned in white wash shall apply for colour wash.

C-38 Constructing Cooking Platform: (Kitchen, Pantry, Services etc.)

The code covers constructing platform for kitchen service meant for other similar work purpose.

The cooking platform shall have following components.

(a) **Raised Masonry platform of specified height and width as required :**

The vertical face of masonry shall be covered with 12mm thick plaster. The top surface work, cement plaster and I.P.S. specified thickness. The masonry work, cement plaster and I.P.S. shall be as per C-9, C-31 & C-17 respectively of this code of practice.

(b) **Partition wall :**

Hall brick partition wall duly plastered on the faces as per detailed drawings or as directed by the Engineer-in-charge shall be carried out as per C-12 and C-31 of code of practice.

(c) **Cooking Platform Proper:**

This shall be of R.C.C. slab topped with Double polished Telephone black Granite Stone with exposed machine cut edges. The size of various components and kind of stone shall be as specified as per detailed drawings or as directed by the Engineer-in-charge.

The work of cement concrete and reinforcement for 75mm thick slab shall be executed as per C-4, C-6 and C-7 of code of practice.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The vertical exposed face of the slab shall also be veneered with matching stone. The top of the slab shall be suitably slopped towards sink as directed. The veneering shall be provided such that the edge of the veneering shall not be less than 10 mm above the finished surface of the platform.

C-39 Application of Anti Termite Treatment :

The purpose of providing the treatment is to create a chemical barrier between the ground from where the termites come and wood work cellulose material and other components of building, which may form food for the termite. The treatment is expected to provide complete chemical barrier all around, which will prevent the termite from reaching the super structure of the building and its contents, it may, therefore be understood clearly and distinctly that this is a very important treatment is to be given to the building and therefore has to be carried out through specialized firms only having established reputation and reputed past performance. The name of such specialized firms shall have to be got approved from the Engineer-in-charge. Use of chemical and method of treatment shall be as detailed below:

(1) Chemical and Preparation :

(a) The chemicals used for soil treatment shall be any one or a combination of the following with the concentration shown against each in emulsion :

Chemicals	Concentration
Aldrin	0.51% (by weight)
Chlordane	1.0%
Dieldrin	0.5%
Heptachlor	0.5%

(b) The dilution guide for preparing the emulsions is given below :

Emulsion liters				
Aldrin30 EC	Dieldrin 18 EC	Chlordane 75 BC	Heptachlor 29 EC	20 EC
1267	2280	1000	500	2500

(2) Treatment of column pits, wall, trenches & basement excavation :

The bottom surface and (up to a height of 300mm from the bottom) of the excavation made for column pits, trenches, and basements shall be treated with the chemical emulsion mentioned above at 5 lit. As per sq.mtr of surface area.

(3) Treatment to backfill earth :

After the column foundation, wall foundation, and retaining walls of the basement come up the backfill in immediate contact with the foundation structure shall be treated with the chemical emulsion at the rate of 15 lit. Per sq.m. of the vertical surface of the structure for each side. The selected earth is to be refilled in layers and the treatment shall be carried out in similar stage.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Chemical emulsion shall be directed towards the concrete or masonry surface of the columns and walls so that the earth in contact with this surface is well treated with the chemical.

(4) Treatment of top surface of plinth filling :

After the earth filling is completed with plinth area and before dry sand packing of sub grade is laid, the entire surface of the filled earth shall be treated with chemical emulsion at 5 lit. per sq.m.

Light rodding of the surface may be carried out to facilitate proper absorption of the emulsion.

(5) Treatment at junction of walls and floor :

Special care shall be taken to establish continuity the vertical chemical barrier on inner wall surface from the ground level (where it has stopped with the treatment described in 3 above) up to the level of the filled earth surface. To achieve this a small channel 3x3 cm shall be made at all the junctions of wall and columns with the floor (Before laying the sub-grade) and rod holes made in the channel up to the ground level 15 cm apart and the rod moved backward and forward to break up the earth and chemical emulsion poured along the channel at the rate of 45 lit. per sq.m. of the area of the vertical surface of the sub- structure so as to soak the soil right to the bottom. The soil should be tamped back into place after this operation.

(6) When the building is completed in all respects or when the plinth protection work is commenced. Whichever is earlier, the earth around the external perimeter of the building up to a depth of 30 cm. shall be finally treated at the rate of 4.5 liters per running meter of the plinth wall. To facilitate this treatment, solid M.S. rods should be driven into the soil as close as possible to the plinth wall at intervals of 15 cm. and up to a depth of 30 cm. and the rods moved backward and forward in a direction parallel to the wall to break up the earth so that the chemical emulsion mixes immediately with the soil.

(7) Treatment of soil surrounded pipes wastes and conduits :

When the pipes wet and conduits enter in side the area of the foundation, the soil surrounding the point of entry must be loose around in such pipe, waste of conduit for a distance of 15 cm. and up to a depth of 7.50 cm. before treatment is commenced. When they enter the soil external to the foundation, they shall be similar treated unless they stand clear of the walls of the building by about 7.5 cm. for a distance of over 30 cm.

(8) Spraying Equipment :

A pressure pump shall be used to carry out spraying operations to facilitate proper penetration of chemical into earth.

Guarantee of Anti-Termite Treatment:

The treatment against termite infestation shall remain fully effective for a period of not less than ten years from the date of issue of the final certificate of completion of the work. If at any time during this period, any defect in any part of the building or structure is noticed, the contractor shall have to rectify defects within fifteen days of receipt of the notice from Engineer-in-charge. On the contractor's failure to do so the Engineer-in-charge may get the same rectified through any other agency at the contractors risk and cost and the decision of the Engineer-in-charge as the cost payable by the contractor for the same shall be final and binding to the contractor.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

A guarantee bond on appropriately stamped papers shall be given by the contractor to the department in the manner and form as prescribed below:

Form of Guarantee Bond:

I/We (contractor) hereby guarantee that the work will remain unexpected and will not be in any way damaged by white ant or any other germs of similar types for a period of 10 (ten) years after completion of the work of anti-termite treatment as per terms and condition of the contract and the contractor hereby identifies and agree to save harmless and GIDC from any loss and /or damage that might be caused on account of white ant and/or other similar type of germs and hereby guarantees to make good and loss or damages suffered by GIDC and further guarantees to redo the defective work without claiming any extra cost.

This guarantee shall remain in force for the period of 10 years from the completion of the work under the contract and it shall remain binding the contractor for the said period of 10 (ten) years.

The deposit at the rate of 5% of the cost of this item from the running and final bill shall be recovered and shall be refunded only after the completion of the guarantee period.

C-40 Laying and fixing Galvanized Iron Pipes with fittings :

The trench of laying the pipes shall be excavated true to lines and levels as shown on the plans or as directed by the Engineer-in-charge. The bed of the trench shall be made even. Unless otherwise specified as instructed by the Engineer-in-charge. The trenches shall be excavated 30 cms. Wide and not less than 45 cms. Deep. All pipes, water mains, cables etc. met in the excavation shall be carefully protected and supported. Any damages done shall be made good by the contractor at his own cost. The refilling work in the trenches shall be done in layers and shall be properly rammed except at joints. The refilling at joints shall be done after satisfactory testing of joints and on approval of the Engineer-in-charge. Suitable additional filling shall be done to account for subsequent settlement. Any surplus excavated stuff shall be disposed off as directed.

Laying & Fixing:

The completed lay out of the water supply system of the building shall be got approved from the Engineer-in-charge. The pipes shall be laid plumb, and in straight and parallel lines unless directed otherwise.

In making the joints few turns of line hemp smeared with white zinc shall be taken over the threaded end of the pipes and the socket shall be fastened with a pipe wrench. When the pipe is to be fixed clear to the walls, it shall be fixed with standard brackets or clips held by wooden blocks. The supporting brackets clips etc. for the pipes shall be spaced at an interval of 1 mtr. Or as directed.

Whenever such pipe is to be taken through wall or slab, suitable square hole shall be driven in the wall or slab carefully without damaging the reinforcement or slab. After the pipe is laid, the hole shall be made good with cement concrete and cement mortar. Finishing shall be done similar to wall and slab finishing.

Painting:

The pipes laid under ground shall be painted with one coat of hot asphalt.

Testing:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

On completion of laying the pipe line shall be tested for any leakage at the joints. The defects if any revealed after test shall be remedied to the satisfaction of the Engineer-in-charge.

C-41 Fixing Wash basin :

The code covers fulfilling of wash basin including assembling and fixing brass chromium plated pillar cock, cast iron cantilever brackets, rubber plug, chromium plated brass chain, chromium plated brass stop cock, chromium plated brass waste coupling 32mm diameter, P.V.C. bottle trap, P.V.C. connection etc.

The wash basin shall be fixed on the wall at the location and level as shown on the detail drawing or as directed by the Engineer-in-charge. The wash basin shall be supported on brackets fixed to the wall with wooden cleats and screws. The size of the brackets shall be as per detailed drawings or as directed by the Engineer-in-charge. The brackets shall be securely fixed to the wall and the basin fixed on the brackets.

The PVC bottle trap and union shall be fixed in the hole waste kept at the bottom of wash basin. It shall be ensured that the joints are water tight. This bottle trap shall be then coupled with the waste water pipe.

The waste pipe of required length shall run through the wall. If holes are not left in the wall, they shall be cut and the chase surrounding the pipe made good after fixing the pipe.

C.P. brass stop cock of required size shall be fixed in the supply line. PVC flexible pipe of required diameter shall be provided for supply of water from stopcock to pillar cock. The joints of PVC connections shall be made water tight. The pillar cock shall be fixed on the hole provided in the wash basin. Chain and rubber plug shall be fixed in the hole provided in the wash basin.

The exposed pipe & CI brackets shall be painted with one coat of red lead and three coats of approved oil paints as per C-15 of this code.

The wash basin shall be with one tap hole unless otherwise specified in the item or as directed by the Engineer-in-charge and the case when the tap holes are more than one, equivalent number of taps and allied provisions shall be provided & appropriately connected as directed by the Engineer-in-charge.

C-42 Fixing Indian Type Water Closet :

(a) W.C. pan:

The water closet pan shall be fixed into the place indicated on the drawing or as directed by the Engineer. The vent and soil pipe shall run through the holes left in wall and the wall made good. If holes not left in the wall, they shall be cut and the cavity surroundings the pipe made good properly after fixing the pipes. The pan shall be placed into position with the trap jointed in cement mortar 1:11 and the connecting pipes duly connected including the flush pipes from the flush cock. The jointing of cast iron pipes with the trap shall be with 1:1 cement mortar as directed.

Brick bat cement concrete 1.5:10 shall be cast and pressed around the embedded surface of the pan fittings and pipes to get a solid embedment without any hollows. The whole are for W.C. shall be provided with 1.5:10 blocks bat cement concrete. The pan shall be fixed at slightly lower level than the floor level of the general flooring which should slope on side towards the pan. The pan shall be

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

fixed such that its top glazed ring around under the surrounding flooring shall be in the same level. After the flooring is completed the rectangular foot rests shall be fixed in cement mortar 1:1

C-43 Fixing Orissa Type Water Closet Pan :

The work shall be carried out as per C -41 of the code of practice except that the Orissa type water closet pan shall be provided instead of Indian type water closet pan and that the separate foot rests are not provided.

C-44 Fixing European Type Water Closet:

The European type water closet pan and the low level flushing tank shall be fixed at the places indicated on drawing of as directed by the Engineer-in-charge. The vent and soil pipe shall run through the holes left in the wall and floor. If the holes are not left in wall and floor, they will be cut. The cavity surrounding the pipes shall be made good properly after fixing the pipe. The pan shall be fixed into the position in cement mortar 1:1 (1-cement: 1-sand) with connecting pipe duly connected including flush pipe from the cistern. The joints at the lid then shall be fixed to the pan with chromium plated hinges. The brackets shall be painted with white enamel paint.

C-45 Fixing of urinal :

This code includes fixing of floor mounted wall type urinal necessary spreader arrangement chromium plated pipe connection with stop cock and C.P. brass tap etc. The wall urinal shall be fixed on to the wall as per the detailed drawing or as directed by the Engineer-in-charge in mortar. The floor slab in not shall be suitably sunk to receive the wall urinal. Where the floor slab is not sunk, the wall urinal shall be provided over platform. The lip of the wall urinal shall be flushed with the finished plan level adjacent to it. The wall urinal shall be laid over a fine sand cushion of average 25mm thickness. A space of not less than 3 mm shall be provided all around in front and side and filled with water proofing compound of approved quality.

The C.P. brass trap shall be fixed as directed by the Engineer-in-charge and the trap shall be connected with necessary C.I. waste pipe, the waste pipe shall run through the wall or outside of the wall if necessary.

C.P. brass stop cock of specified diameter shall be provided as shown in the detailed drawing or as directed by the Engineer-in-charge. Chromium plated flushing pipe of specified diameter and length shall be provided and fixed with the stop cock and spreading arrangement.

Spreading arrangement shall be made by providing a spreader nozzle at the end of flushing pipe.

C-46 Fixing Nahni Trap :

The Nahni trap with bend and pipe price up to the outside face of the wall and grating as specified shall be fixed as per drawing or instruction of the Engineer-in-charge. The joints shall be sealed with cement mortar.

The hole shall be kept in the floor and masonry if not left and the same be made good properly after the nahni trap and pipe are fixed. The nahni trap in the white glazed tiles flooring shall be positioned that its grating shall replace only one tile.

C-47 Fixing of Gully Trap :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The gully trap shall be set into 1:4:8 cement concrete extending 300 mm beyond the trap on three sides over which shall be constructed one brick masonry chamber of the dimensions indicated on the drawings or as directed by the Engineer-in-charge. The building wall will be the fourth side. The brick masonry shall be constructed in cement mortar 1:3. The inside shall be plastered with cement mortar 1:3. The top lid of pre-cast concrete cover of 40mm thickness of required size shall be provided on the chamber as directed. The trap in the chamber shall have cast iron grating.

C-48 Fixing Cast Iron Pipes :

The code covers fixing of pipes on walls, filling joints with cement mortar 1:1. Cast iron pipe shall be secured to the face of wall at all joints by standard holder bat clamp.

The bat clamps shall consist of a cast iron base with a projecting shaped lug, to the web of which the 2 semi circular halves of the flat iron clamps are bolted. The base of the holder bat clamps shall be screwed on a pair of wooden plugs fixed in the wall with wood screws driven through the holes in the base. The screws shall be not less than 75mm long for 80mm diameter pipe and 100 mm long for 100 mm dia pipe. The plugs shall be fixed in the wall to depth of 150mm in cement mortar 1:2 (1-cement: 2- fine sand) centrally to the holes in the base of the bat clamps and with the front face projecting to such a length from the brick face that when the bat clamps is fixed the outer face of its base shall be flush with the plaster face of wall. The plugs shall be 110 mm x 50 mm wide at face increasing to 160mm x 70mm wide at rear and shall be 70 mm deep throughout.

Laying of pipe & specials:

The pipes before being laid, shall be examined to see that there are no cracks or defects. Care shall be taken to clean the pipes inside of the socket and outside of the spigot. Spigot of the upper pipe shall be properly fitted in the socket of the lower pipe. The depth of the annular space between socket and spigot shall be filled in with cement mortar 1:1. The joints shall be finished smooth and shall be flush with the top ring or the socket.

The joints of the horizontal pipes running below flooring shall also be filled with cement mortar 1:1. The joints ends of the pipe coming out of the wall shall be provided with required specials, such as Tees, "Y" bends etc. with or without inspection eyes as required and all the joints shall be filled with cement mortar 1:1 as above.

The pipe lines shall be truly vertical or to lines and slopping as directed and shall be at a uniform distance of 20mm from the finished face of the wall.

C-49 Fixing Asbestos Cement pipes :

The provision made in C-48 of code of practice shall be followed in this case also excepting the following changes:

- (1) Instead of cast iron pipes, this code provides for fixing of asbestos cement pipes.
- (2) The joints shall be filled in with stiff cement mortar 1:1 (1-cement: 1- fine sand) instead of lead joints.
- (3) The joints shall be finished smooth at top at an angle of 45 degree sloped up with cement mortar and will be cured for period of 7 days by tying piece of gunny bags to the joints keeping it wet.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

C-50 Laying & stoneware pipe :**Excavation:**

The trench shall be excavated to the exact grading and 450mm wide or as directed by the Engineer-in-charge. The bottom of the trench shall be trimmed off to present a plane surface and excavation below joints shall be taken sufficiently deep so as to accommodate the socket of pipe and all irregularities shall be removed.

Laying:

Before laying the pipes all pipes and fittings shall be inspected and shall be rung with a light hammer to detect cracks. The pipe shall then be laid in trench to the alignment, levels and gradients as shown. The spigot end of one pipe shall be centered in the socket and of other pipe with socket up the gradient. The cutting of pipe for inseting fit or close pipe shall be done in neat and workmanship like manner.

Jointing of pipe:

The stoneware pipe shall be jointed with cement mortar 1:1 (1-cement: 1- sand). The jointing shall be done as follows:

In each joint spun yarn soaked in a neat cement slurry shall be passed round the joint and inserted in by means of a caulking tool. Yarn so rammed as shall not occupy more than $\frac{1}{4}$ the of the depth of socket. Cement mortar 1:1 (1-cement: 1-sand) prepared as per M-11 of specification of materials. The mortar shall be slightly moistened and shall be inserted by hand into remaining space of the joint after yarn. The mortar shall then be caulked into the jointed with a caulking tool. More cement mortar shall be added until the space of the joint has been completely filled with tightly.

The joint shall then be finished off neatly outside the socket at angle of 45 degree.

Curing:

The cement mortar joint shall be cured for seven days.

Testing:

The pipe line shall be tested for leakage before refilling of the trenches etc.

Back Filling:

After satisfactory testing the trenches shall be back filled as per C-53 of code of practice.

C-51 Constructing Inspection Chamber:

This code covers excavation for foundation, laying of cement concrete bedding brick masonry wall with cement plaster on inside surface, cement concrete, benching (channel) fixing of inspection chamber frame and cover R.C.C. slab etc.

The inspection chamber shall be of size as specified in the item or as shown on the drawing or as directed by the Engineer. The various components shall be executed as detailed below.

Excavation:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The excavation shall be done as per C-1 of code of practice or as directed by the Engineer-in-charge so as to have at least 150mm offset from outside face of the brick masonry.

Cement concrete:

The bedding of 150mm thick cement concrete shall be done as per C-2 of code of practice.

Brick masonry:

One thick brick masonry wall in cement mortar 1:6 shall be done as per C-10 of code of practice.

Benching:

Plain cement concrete for benching (channel) of required thickness shall be done as per C-17 of code of practice.

Cement plaster:

Cement plaster work shall be carried out as per C-31 of code of practice, cast iron frame shall be fixed in the slab and then concrete shall be cast. Concrete work shall be finished with cement mortar 1:3 (1-cement: 3 sand)

Pre-cast RCC slab with C.I. manhole cover & Frame:

C.I. manhole cover shall be placed into the CI frame fixed in the slab. It shall be painted with one coat of red lead paint and two coats of black oil paint.

Cement plaster:

Cement plaster work shall be carried out as per C-31 of code of practice. Cast iron frame shall be fixed in the slab and then concrete shall be cast. Concrete work shall be finished with cement mortar 1:4 (1-cement: 4- sand).

C-52 Filling in plinth with selected materials :

The code provides for filling in plinth with selected materials lying and layers of uniform thickness, watering ramming etc.

The ground over which the filling is to be done shall be cleared of all grass, loose stones, rubbish of all kind as well as trees, roots of trees etc.

The approved selected materials shall be cleared of all rubbish; larger size stones etc clods broken down to a size of 59mm or less and conveyed to site of work of filling. The material shall be laid and layers of about 200mm as directed by the Engineer-in-charge. Each layer shall be watered and compacted with heavy hammers before the upper layer is laid till the final level is reached so as to form a thoroughly compacted base.

The process of filling in plinth, watering and compaction shall be carried out in such a way as not be endanger the foundation, columns, plinth, walls etc. already built up. Under no circumstances, black cotton soil shall be used for filling the plinth.

C-53 Fixing of Steel Rolling Shutters:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Fixing of rolling shutter shall be done in a workmanship like manner so that the operation of the shutter is easy and smooth. The hold fast shall be embedded in CC 1:2:4 (1-cement: 2- coarse sand: 4- graded stone) aggregate 20mm nominal size and shall be properly fixed with 100mm long catch bolts of 10mm. All the works disturbed or cut away shall be made good.

The guide channels, shall be attached to the jams in plumb and true either in the over lapping fashion, projection fashion or embedded in grooves, depending on the method of fixing.

The bracket plate shall be fitted at the centre. A "U" shape cast iron or mild steel clamp riveted or welded to it. Since the bracket plate carries the full load of the shutter it should have sufficient cross sectional area to resist the force and it shall be held in position rigidly by means of suitable foundation bolts. When the bracket is to fix on concrete the angle is suitable bent and fixed to the concrete beam of lintel with anchor bolts of at least 16x75 mm size. The pipes of the suspension shaft which are crimped to the bracket shall be fitted with rotted cast iron pulleys to which the curtain is attached. The pulleys and the pipe shaft be connected by means of pretension helical spring to counter balance the weight of the curtain and to keep the shutter in equilibrium in any partly opened position.

The hood cover shall be fixed to the bracket plate by means of angle cleats and supported at the top at suitable intervals for preventing sagging.

Rolling shutter shall be painted with two coats of approved oil paints of approved shades on anti-corrosive paint as directed by Engineer-in-charge.

C-54 Fixing of Urinal :

The fixing of flat back lip type urinal a wall include of PVC connection with stop cock and waste pipe etc.

Urinal shall be fixed on the wall as per the detailed drawing or as directed by Engineer-in-charge. Urinal shall be fixed to the wall wooden putty previously embedded in walls and screw of suitable size.

The C.P. brass stop cock shall be fixed as directed by the Engineer-in-charge and PVC connection of suitable length be provided and connected with G.I. pipe of water supply. PVC reducer shall be connected with PVC waste of specified size and fixed on wall properly with CI clamp, screw etc. The waste pipe run through the wall of outside of the wall as per instruction of Engineer-in-charge.

After fixing of urinal all the floor and wall shall be made good to the satisfaction of the Engineer-in-charge.

Fixing of remaining procedure shall be reversed.

C-55 Fixing of Windows / Ventilators :

Fixing of window and ventilators shall be done workmanship like manner. The hold fast shall be embedded in CC 1:2:4 of size 10 cm x 10 cm x 10 cm (1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size)

The window frame shall be erected in position and held plumb with strong support from both sides and built in masonry as it is being built.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The glass paneling shall be carried out as per C-14 of Code of Practice or as directed and oil painting shall be carried out as per C-15 of Code of Practice.

All fixtures and fastening shall be fixed with appropriate screws in sound and efficient manner to ensure ease of operation. They shall be appropriately positioned and shall be truly horizontal or vertical as required.

Oil painting shall be carried out with one coat of primer and 2 coats of approved oil paints of approved shade and shall conform to C-15 of Code of practice.

C-56 Fixing of Door frame :

Fixing of door frame shall be done in workmanship like manner. The hold fast shall be embedded in CC 1:2:4 of the size 10 cm x 10 cm x 15 cm (1- cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size).

The door frame shall be erected in position and held plumb with strong support from both sides and built in masonry as it is being built.

The shutter shall be prepared as per the detail drawing and shall conform to C-13 of Code of practice or as directed.

Timber/PVC/Aluminum paneling shall be carried out as per C-13 of Code of practice or as directed.

All fixtures and fastening shall be fixed with appropriate screws. Nos. of fixtures and fastening shall be provided as per C.

Oil painting shall be carried out with one coat of primer and 2 coats of approved oil paints of approved shade and shall conform to C-15 of Code of practice.

C-57 Construction of Rubble Uncoursed Stone Masonry :

Pucca approved stone of approved size for un-coursed rubble masonry shall be collected on site. The rubble shall be laid on broad faces. Earthy or dis-coloured weathered or weatherworn stone shall not be used.

The length of the stone shall not exceed three times the height and the breadth on base shall not be greater than three fourths of the thickness of wall nor less than 15 cm. The height of stone for rubble masonry may be up to 30 cm.

Stone shall be hammer-dressed on the face, the sides and the beds to enable it to come in proximity with the neighboring stone. The bushing on the face shall not be more than 40 mm. on an exposed face.

Chips and spalls of stones shall be used wherever necessary to avoid thick mortar beds or joints and it shall be ensured that no hollow spaces are left anywhere in the masonry. The chips shall not be used below hearting stones to bring these upon level of face stones. The use of chips shall be restricted to the filling of interstices between the adjacent stones in hearting and these shall not exceed 20 percent of the quantity of a stone masonry.

The hearting or interior filling of a wall face shall consist of rubble stone not less than 150mm in any direction carefully laid hammered down with a wooden mallet in the position and solidly bedded in mortar. Treating should be laid nearly with facing and backing.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Though bond stones shall be provided in the walls up to 60 cm. thick, in case of highly absorbent type of stone (Limestone or sand stones) the bond stone shall extend about 2/3 in the wall. Each bond stone shall be provided for every of 0.5 m² of the wall surface.

Quoin stone shall not be less than 0.03 m³ in volume.

The plum stone at about 90 cm. interval shall be provided.

The masonry shall be laid with or without courses as the case may be as per general requirement. The quoins shall be laid header and stretcher alternatively. Every stone shall be carefully fitted to the adjacent stone so as to form neat and close joint. Face stone shall be extend and bond well in the back. These shall be arranged to break joints as much as possible and to avoid long vertical lines of joints.

The cement mortar or proportion as specified in the item shall be spread over width and the stone shall be well embedded in it. Joints in the surface shall be carried out in line level plum and of dimensions as mentioned in the drawing. The stone shall be used only after spreading plenty of water over it. No side filling shall be done without obtaining permission of Engineer-in-charge. The work shall be kept wet at least fourteen days.

C-58 Filling of plinth with selected sand :

The code provides, for filling in plinth with sand of approved quality, laying in layers of uniform thickness, watering ramming etc. The ground over which the filling is to be done shall be cleared of all grass, loose stones, rubbish of all kind, as well as trees, roots of trees etc. The approved quality of sand shall be cleared of all rubbish and shall be conveyed to site of work of filling the sand shall be laid in layers, of about 200mm as directed by the Engineer-in-charge. Each layers shall be watered and compacted with heavy rammer before of the upper layers is laid, till the final level is reached, so as to form a thoroughly compacted base.

The process of filling in plinth, watering and compaction shall be carried out in such a way as not to endanger the foundation columns, plinth walls etc. already built up.

C-59 Application of Water proofing cement paint :

The surfaces shall be thoroughly wetted with clean water before cement water proofing paint is applied. Cement paint shall be prepared by adding paint powder to water and stirring to obtain a thick paste, which shall then be diluted to a brushable consistency. Generally, equal volumes of paint powder and water make a satisfactory paint. In all cases, the manufacturer's instruction shall be followed. The paint shall be mixed in such quantities as can use of within a hour of mixing as otherwise the mixture will set and thickness, affecting flowing and finish. The libs of cement paint drums shall be kept tightly when not in use. To maintain the uniform mixture and to prevent segregation, the paint shall be stirred frequently in the bucket. For undecorated surface, the surface shall be treated with minimum two coats of water proof cement paint. Not less then 20 hours, shall be allowed between two coats. Next coat shall not be started until the preceding coat has become sufficiently hard to resist marking by the brush being used if hot dry weather, the preceding coat shall be allowed between two coats. Next coat shall not be started until the preceding coat has become sufficient hard to resist the marking by the brush being used. In hot dry weather, the preceding coat slightly moistened before applying the subsequent coat. The finish surface shall be even a uniform in shade, without patches, brush masks, paint drops etc. The cement paint shall be

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

applied with a brush with relatively short stiff hob or fiber bristles. The paint shall be brushed in uniform thickness and shall be free from excess heavy brush mark. The lamps shall be well brushed out. The water proofing cement paint shall not be applied on surface already treated with white wash, colour wash, distemper, dry or oil bound varnishes paint etc. It shall not be applied on gypsum, wood and metal surface. Painted surface shall be sprinkled with water two or three times a day. This shall be done between coats and for at least two days following the final coat. The curing shall be started as soon as the paint has hardened so as not to be damage by the sprinkling of water say about 12 hours after the application.

C-60 Construction of bela or block in course rough dressed stone masonry:

The work shall be carried out with pucca approved white stone bela of uniform size and well dressed. Earthly or discolored, weathered or water worm stone shall not be used. The size of bela stone to suit the width of wall, shall be as directed by the Engineer. The corner stones and quoins shall be of good quality stones dressed to correct angle.

The cement mortar of proportion specified in the item shall be spread for full width of wall. The stone shall be placed in it. Joint in the surface shall be flushed or raked out 20mm deep during construction as directed by Engineer. The work shall be carried out, in line, level, and plumb & of the dimensions as mentioned in the drawing. The stones shall be used only after spreading, plenty of water over it. The work shall be kept wet for at least 14 days. The scaffolding shall be provided as per C-9 of code of practice.

C-61 Application of plastic emulsion paint :

The work of preparing the surface shall be carried out as per C-36.

The scaffolding work shall be carried out as per the C-9.

Preparation of mix:

This shall be done as per the Manufacturer's instruction. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per Manufacturer's instruction or as directed by the Engineer.

Application:

Before putting into small containers for use, the paint shall be stirred thoroughly in its container. When applying also, the paint shall be continuous stirred in the small container, so that its consistency is kept uniform.

The paint shall be laid on evenly and smoothly by means of crossing and laying of the crossing and laying of consist of covering the area over with paint, brush the surface hard for the first time over and then brushing alternately in opposite direction two or three times and then, finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying of is finished. No hair marks from the brush clogging of paint puddles in the corner of panels, angle of moldings etc. shall be left on the work. The full process of crossing and lying off will constitute one coat.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The paint shall be applied with brush or rollers. For undercoated surface, the surface shall be treated with minimum two coats of cement water proofing paint. The second or substitute coat shall not be started until the preceding has before sufficiently hard to resist marking by brush being used.

The surface on finishing shall present a flat velvety smooth finish. It shall be even a uniform in shade without patches, brush marks, paint drops etc.

Precautions:

Old brushes, if they are to be used with emulsion paints, shall be completely dried of turpentine oil paint by washing in warm soap water.

Brushes shall be quickly washed in water immediately after use and kept emerged in water during break period to prevent the paint from hardening of the brush.

In the preparation of wall for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes, etc.

Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

The washing of surface treated with emulsion paint shall not be done within 3 to 4 weeks of application.

C-62 Fixing of Asbestos cement corrugated sheet roofing:

Fixing accessory such as J-bolts, L-bolts, roof washers etc. shall conform to IS – 730-1956.

The sheet shall be laid with a side lap of half corrugation. For normal roof pitches (that is inclinations greater than or equal to 18). The end laps in sheet shall not be less than 150mm. For law roof pitches (that is inclinations less than 18) or for normal pitched on roof exposed positions the end laps shall be increased.

The side lap shall as far as possible be sheltered from the prevailing wind direction. The free overhang at eaves measured as the length of sheet from its lower edge to the center of bolt holes shall not be more than 300mm for 6mm thick and 400mm for 7mm thick sheets.

Wherever four corners of sheets overlap to of them shall be mitred in order to secure a perfect fit.

All A.C. sheets shall be stored and protected from any damage.

No persons other than workman employed shall be permitted access to any area over which the sheeting is being laid.

Ridge purlins shall be fixed with suitable type of bolt 75mm to 115mm from the apex of the roof.

Sheets shall be cut as necessary with a wood saw. Holes in the sheets shall be drilled, they shall on no account be punched. The holes for fixing shall be 2mm larger than the diameter of the fixing bolts, and shall always be drilled through the crown of the corrugation and not on the valleys. No hole shall be nearer the 40mm to any edge of a sheet or an accessory.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Galvanized iron J-type hook bolts or cranked hook bolts, and nuts bearing on galvanized iron washers and bitumen washers shall be used for fixing sheets on angle iron purling.

It is essential that the bolts holes are made water tight by the use of bituminous felt washers in conjunction with suitable galvanized iron washers.

The length of bolts shall be 75mm longer than the depth of the purling for single sheet fixing and 90mm longer than the depth purling where two sheets overlap or where ridges or other accessories are to be fixed with the sheet. The number and length of bolts and number of bitumen and galvanized iron washers for fixing asbestos cement corrugated sheet shall be as given in table below.

Number and Length of Bolts and Number of Bituminous Felt and galvanized iron washers.

Sr.No	Situation	No. of Bolts and Bituminous washers and Galvanized Iron washer.	Length of bolts.
i	At horizontal (end) laps of sheets at eves when filler pieces are used. At rigid non- corrugated sheets and ridge pcs. Are secured by the same bolts.	Twice the number of sheets in one horizontal course	Depth of purling plus 90mm
ii	At eves when filler pieces are not used at ridge when corrugated sheet and ridge pieces are not secured by the same bolt.	Twice the number of sheets in one horizontal course	Depth of purling plus 75mm
iii	At intermediate purling where horizontal laps do not occur.	Twice the number of sheets in one horizontal course	Depth of purling plus 75mm.

Asbestos cement corrugated sheets shall be laid starting at the caves, either from left to right or from right to left depending upon the prevailing direction of the wind. If laid from left to right, the first sheet shall be laid uncut, but the remaining sheets in this bottom row shall have the top left hand corners cut or mitred. The sheet in the second and other intermediate rows shall have the bottom right hand corner of the first sheet cut all other sheets except the last sheet shall have both the bottom right hand corner and top left hand corner cut; the last sheet shall have only the top left hand corner cut. The last or the top, row sheets shall have the bottom right hand corner cut with the exception of the last sheets which shall be laid uncut. If the sheets are laid from right to left the first sheet shall be laid uncut and the remaining procedure shall be reversed.

C-63 Structural steel work

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

All steel shall be tested and Indian approved manufacturers. One sample would with exact dimensions of all the members of the truss shall be got approved by the Engineer before erecting and fixing the same. Welding shall be properly done to the exact length and shall be got approved by the Engineer and welding shall conform to IS – 816-1956 or as revised from time to time. This items including providing, supplying, fabricating and erecting the same in proper position.

The entire steel surface shall be made clear and free from rust, scales, dust etc. before painting. All the steel work shall be painted with one coat of anti-corrosive paint and two coats of approved enamel paint and shade complete as directed.

There shall be no holes left after welding. The welding shall be carried out by welders, well experienced in the job and possessing certificate. The cutting should be smooth and the steel shall be made perfectly straight as required. The bolts, nuts, washers, etc. used shall be of best approved quality. After welding is done the welding surface shall be made clear by removing all the flux by cheeping hammer wire brush.

The entire steel structure after erection shall be in perfect line and level and plumb and shall structure after erection shall be in perfect in line and level and plumb and shall be approved by the Engineer-in-charge before the sheeting work is started.

C-64 Application of Double coat mala plaster :

Base coat:

The base coat plaster shall be of cement mortar of specified properties and thickness. The base coat shall be laid in a similar manner of laying plaster as per **C-31** of code of practice. However, instead of finishing the top surface smooth keys shall be formed on the surface by thoroughly combing it with way horizontal lines about 12mm apart and about 3 mm deep when the mortar is still plastics. The base coat shall be cured for minimum 2 days.

Second coat:

Second coat shall be cement mortar with specified kind of cement and specified preparation of thickness. The coat shall be applied evenly in true lines and level by using approved quality of coarse and the surface shall be finished with a wooden float. The necessary rubber sponge as approved by the Engineer-in-charge shall be applied over this coat to obtain the surface textures as per previously approved sample.

When the finishing coat has hardened, the surface shall be kept watered continuously for 14 days.

16.18 WELDED STEEL WIRE FABRIC FENCING WITH RCC POSTS

16.18.1 Materials

RCC posts and struts shall be as specified in 16.1.12. Welded steel wire fabric will conform to IS

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

4948 and shall be of rectangular mesh 75 × 25 mm size weighing not less than 7.75 kg/sqm.

16.18.2 Fixing of RCC posts and struts shall be as described in 16.16.3.

16.18.3 Steel wire fabric 90 cm wide will be fixed to the posts by means of G.I. staple on wooden plugs or tied to 6 mm bar ribs with binding wire. The steel fabric shall be fixed to leave 15 cm clearance at the bottom and top of the posts.

16.18.4 Finishing

The steel wire fabric shall be painted with two or more coats of approved shade of enamel paint over a coat of steel primer as for new work.

16.18.5 R.C.C. Posts, Rails and Pales (Fig. 16.10)

16.18.5.1 Materials : R.C.C. posts, rails and pales shall be as described in 16.1.11 & 16.1.12.

16.18.5.2 Spacing of Posts : The spacing of post shall be as specified, or as directed by the Engineer-in-Charge to suit the dimensions of the area to be fenced.

16.18.5.3 Fixing Posts : Pits 45 x 45 cm and 70 cm deep or as directed shall first be excavated true to line and level to receive the posts.

16.18.5.4 Fixing Rails and Pales : The rails shall be slotted into the slots left in the posts, while the pales shall be simply dovetailed into the rails. The pales shall be fixed by pouring a little grout of 1:2 mix (1 cement : 2 fine sand) into the dovetails. The fencing shall be so erected that on completion is truly in line and level and top of the fence shall then follow approximately the profile of the ground.

16.18.6 Measurements

Fencing to be measured in square metre correct to two places of decimal after taking length and width of the finished work in metre.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

ITEMWISE DETAILED SPECIFICATION

PART-A CIVIL WORK

ITEM NO: 1

Demolition tiled of stone floors laid in mortar including stacking of of serviceable materials and disposal of unserviceable materials with all lead and lift. (Dismantles Flooring).

1.0 Workmanship:

1.1 The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant item as specified or shown in the drawings.

1.2 The demolition shall always be planed before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work. This however, will not absolve the contractor from the responsibility of proper and safe demolition.

1.3 Necessary dropping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried such a way that no damages is caused to the adjoining property.

1.4 Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5 Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

1.6 All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.

1.7 Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed, with the all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by the Engineer-incharge.

1.8 On completion of work, the site shall be cleared of all debris, rubbish and cleaned as directed.

2.0 Mode of measurements and payment:

2.1 Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

2.2 The measurement shall be taken in Square meter by Tape measurement of Length X width. **The rate shall be for a unit of one Sq. meter.**

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Item No – 02

Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats architraves, holdfasts and other attachment etc. complete and stacking them within all lead and lift.(i) Not exceeding 3 Sq.M. in area.

1.0 Workmanship:

1.1 The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant item as specified or shown in the drawings. that the doors, windows, ventilators etc. (wood or steel) shutters including chokhats, architraves, holdfasts and other attachments etc. are to be dismantled.

1.2 The demolition shall always be planed beforehand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work. This however, will not absolve the contractor from the responsibility of proper and safe demolition.

1.3 Necessary dropping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried such a way that no damages is caused to the adjoining property.

1.4 Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5 Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

1.6 All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.

1.7 Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed, with the all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by the Engineer- incharge.

1.8 On completion of work, the site shall be cleared of all debris, rubbish and cleaned as directed.

2.0 Mode of measurements and payment:

2.1 Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

2.2 The doors, windows, ventilators etc. not exceeding 3 sq. mt. in area (each) including shutters and chowkhats, architraves, holdfasts and other attachment to grams etc. will be dismantled and measured under this item.

2.3 The rate includes stacking serviceable materials as and where directed with all leads and lifts.

2.4 The rate shall be for a unit of one number.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Item No 03:

Dismantling sanitary fittings like wash basin. W.C. pan Indian and European type, flushing tank etc. including stacking the materials with all lead and lift.

1.0. Materials

1.1. Workmanship – For Sanitary Fittings etc.,..

1.1. The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings.

1.2. The demolition shall always be planned before hand shall be done in reverse order to the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

1.3. Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining property.

1.4. Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5. Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

1.6. All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.

1.7. Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed with all lead and lift. All unserviceable materials, rubbish etc., shall be stacked as directed by the Engineer-in-charge.

1.8. On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

Mode of measurements and payment:

Measurement shall be taken in Nos.

Item No. 04:

Dismantling C.I. pipes G.S.W. pipes and A.C. rain water pipes with fittings and clamps including stacking the materials with all lead and lift (for any dia, of pipe).

Workmanship:

As per Item no 3 all dismantling Sanitary fitting work is carry out or as per instruction given by site in charge.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Mode of measurements and payment:

Measurement shall be taken in RMT.

Item No. 05:

Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (i) R.C.C. work

As per Item no 1 Workmanship is considered.

2.0 Mode of measurements and payment:

2.1 Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

2.2 The measurement shall be taken in Cubic meter by Tape measurement of Length X width x thickness. **The rate shall be for a unit of one cubic meter(m3).**

Item No. 06:

Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C. member including stacking of serviceable material and disposal of unserviceable from site of work with all.

1.0. Workmanship

1.0. Workmanship The old plastering shall be scraped thoroughly by manual or machinery means. It is responsibility of bidder to not damage the brick work during the scraping of plastering. All precaution measure is to be taken by bidders.

2.0. Mode of measurements and payment

2.1. The work shall be measured in actual area of work done as per directed by Engineer incharge.

2.2. The rate shall be for a unit of one sq. meter.

Item No. 07

Scraping oil paint from steel and other metal surface and making the surface even (with Hand Scraping.)

1.0. Workmanship

The old paint from steel and other surface shall be scraped thoroughly with hand scraper followed by wire brushing(first with coarse and then with fine brushes) and finally sand papering with coarse and paper (No.3) steel wood (No.2)or emery paper (No.3) or with emery clothes. This shall then be wiped finally with mineral turpentine to remove greaseand perspiration of hand marks etc. and allowed to dry. The surface shall be made even and smooth.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

2.0 Mode of measurement and payment.

2.1 The payment shall be made per Sqm.

Item No.08

Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:6 (1- Cement : 6 -fine sand)(B) Conventional.

MATERIALS :

The common burnt clay building bricks of IInd class shall conform to **M-13** of Specification of Materials attached herewith.

Cement mortar of proportions 1:6 i.e. 1 part of cement & 6 part of coarse sand shall conform to **M-9** of Specification of Materials attached herewith.

WORKMANSHIP :

The burnt brick masonry work shall conform to **C-9** of Code of practice attached herewith & **IS: 2212 -1962**. The work shall be executed in accordance with best modern practices.

MODE OF MEASUREMENT & PAYMENT:

Thickness of the wall shall be taken as under or actual thickness whichever is less for the purpose of measurement and payment.

1. Brick wall -9" (23 cms)
2. Brick wall -13 ^{1/2}" (35 cms)
3. Brick wall -18" (46 cms)

Except as above, the mode of measurement shall be as specified in I.S.: 1200-1976 (Part-III) or as revised from time to time so far as applicable.

The contract rate shall be for a unit of one Cubic Meter.

Item No. 09

Providing 15mm thick cement plaster in single coat on Rough (Similar)side of single or half brick walls for interior plastering upto floor two level and finished even and smooth in (ii) Cement mortar 1:4 (1-cement :4-sand).

MATERIALS:

Cement shall be of approved make (List of approved make attached with Technical Bid) and shall conform to **M-3** of Specification of Materials attached herewith.

Sand shall conform to **M-6** of Specification of Materials attached herewith.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Cement mortar in proportion 1:3 (1-cement: 3 coarse sand) shall conform to **M-9** of Specification of Materials attached herewith.

Water shall conform to **M-1** of Specification of Materials attached herewith.

WORKMANSHIP :

Plastering work shall be carried out as per **C-31** of Code of practice attached herewith & **IS: 1661-1972**.

The work shall be executed in accordance with best modern practices.

For scaffolding, relevant specification of **C-9** of Code of practice attached herewith shall be followed

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Sq. Meter basis as per I.S. 1200-XII- 1976 or as revised from time to time so far as applicable.

The contract rate shall be for a unit of one Sq. Meter of plastering of specified thickness.

Item No. 10

P/L 20 mm thick sand faced plaster on wall up to any height consisting of 12mm thick backing coat of cement mortar 1:3 (1-cement : 3 sand) & 8mm thick finishing coat of cement mortar 1:1 (1-cement : 1-sand) as per architectural design / drawings incl. making 10 x 10 mm or as specified grooves as per pattern given in the architectural drawings incl. racking out joints, cleaning, drip moulding, curing, scaffolding, etc. complete at all floor levels

MATERIALS:

Cement shall be of approved make (List of approved make attached with Technical Bid) and shall conform to **M-3** of Specification of Materials attached herewith.

Sand shall conform to **M-6** of Specification of Materials attached herewith.

Course sand shall be used for outer finishing.

Cement mortar in proportion 1:3 (1-cement: 3 - coarse sand) for base coat and Cement mortar in proportion in 1:1 (1- cement: 1- coarse sand) for outer finishing coat shall conform to **M-9** of Specification of Materials attached herewith.

Water shall conform to **M-1** of Specification of Materials attached herewith.

WORKMANSHIP :

Plastering work shall be carried out as per **C-33** of Code of practice attached herewith & **IS- 1661-1972**.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The work shall be executed in accordance with best modern practices.
For scaffolding, relevant specification of **C-9** of Code of practice attached herewith shall be followed.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Sq. Meter basis as per I.S. 1200-Part-XII- 1976 or as revised from time to time so far as applicable.

The contract rate shall be for a unit of one Sq. Meter of plastering of specified thickness of visible area.

Item No. 11

Providing & laying 24" X24' vitrified 8mm thick tiles flooring over 20mm (average) base of cement mortar 1:6 (1: Cement, 6: coarse sand) on new surface of fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with clor cement slurry including finished with fluse pointing & Cleaning the surface etc. complete for light shade.

MATERIALS :

Water shall confirm to **M-1** of specification booklet of tender.

Cement mortar shall be confirm to **M-9** of specification booklet of tender.

Fully polished Vitrified floor tiles shall be of shade approved by Engineer - In – Charge.

The tiles shall be hard even / sound 1 regular in shape and uniformly coloured. It shall be without any soft vines and cracks of flow. The size of the tiles shall be as per drawings or otherwise specified by Engineer - In – Charge scratch hardness minimum 7 on Mohr's scale with a density of 2.2 to 2.3.

Epoxy (approved quality and colour) filler material shall be approved brand or as per directed Engineer incharge.

WORKMANSHIP :

Each Vitrified tiles cut to the required size and shape as shown in the working drawing supplied by Engineer - In – Charge. Each tiles shall be in mirror polished. All angles and edges of tiles shall be true square and free from chipping and giving a plain surface. The shade quality of Vitrified tiles shall be got approved by Engineer - In – Charge.

Bedding for the Vitrified tiles shall be 25mm thick in cement mortar 1:3 (1 – cement : 3 – sand) of grey thickness as given in the description of the sub grade shall be cleaned wetted and mopped. Mortar of the specified mix and thickness shall be than spread on the area. Sufficient to receive Vitrified tiles. The tiles shall be washed clean before laying.

It shall laid on top pressed tapped gently to bring it in with the adjoining with 4mm keeping spacer between tiles junctions. The top surface of mortar shall be corrected by adding fresh motor of hollow and depressions. The mortar shall than be allowed to harden bit over the surface cement slurry of honey like consistence shall be applied. The joints shall be as thin

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

as possible. Joints shall be filled up with approved brand of epoxy (approved quality and colour) filler material (up to tiles thickness).

The top surface shall be protected from scratches damages etc

MODE OF MEASUREMENT & PAYMENT :

The flooring shall be measured on Sq.mt. basis. Rates also include rubbing, sizing, 4 mm keeping spacer, cleaning the joints and flooring joints filled with epoxy (approved quality and colour up to tiles thickness) and cleaning of tiles, etc. complete

The contract rate shall be for a unit of one Sq. Meter of visible surfaces.

Item No. 12

Providing & fixing 18 mm thick first quality Black Polished Granite stone approved by Client/Architect for Doors - windows Frame, Lintel, jambs, sill, staircase steps trade, riser & landing etc. in cement mortar (1:3) including cutting, fixing in cement paste with hair line joint, filling the joints with white cement / pigments / joint filler, rounding of edges, edge polishing & finishing as directed by the Engineer.(fixing the granite in one piece)

MATERIALS:

Water shall conform to M – 1 of specification booklet of tender.

Cement mortar of proportion 1:3 (1-cement, 3- coarse sand) shall conform to attached Specification of Materials.

White or colour cement shall conform to **M-4** or **M-5** of attached specification of materials.

WORKMANSHIP:

The work is to be executed as directed by the Engineer in Charge & as per current relevant standards / codes etc. and details specified OR finalized by the Engineer in charge

MODE OF MEASUREMENT & PAYMENT:

The contract rate shall be for a unit of one Sq. Meter of visible surfaces

Item No. 13

Constructing of Cooking platform (sandwich type) 80cm high resting on Kota stone / granite stone in C.M 1:3 with providing and fixing 25 mm thick rough kota stone at bottom and 25mm thick Granite stone (single piece) top and polished kota stone/ granite stone (single piece) 25mm thick on top with 75mm high machine cut polished Granite round moulded fascia patty including polishing etc . complete as per drawing and specification without stainless steel sink including necessary cutting for sink & making hole for gas pipe and fixing P.V.C bend of 25mm dia. -Only top granite shall be measured for payment.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

MATERIALS:

Polished kotah stone of 25mm thickness shall conform to **M-28/B** of Specification of Materials attached herewith.

Cement mortar of proportion 1:6 (1-cement, 6- coarse sand) shall conform to **M-9** of Specification of Materials attached herewith.

WORKMANSHIP :

The polished kotah stone shall be carried out as per **C-20** of Code of practice attached herewith.

The work shall be carried out as per the approved pattern or as directed by the Engineer-in-charge.

MODE OF MEASUREMENT & PAYMENT:

The measurement shall be taken on Sq. Meter basis as per IS: 1200 or as revised from time to time so far as applicable

The contract rate shall be for a unit of one Sq. Meter of visible area.

Item No. 14**Providing and fixing white vitrious ching W.C. sqatting Pan (Indian type).**

European W.C. pan shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-39** of Specification of Materials attached herewith.

25mm dia GI pipe shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-35** of Specification of Materials attached herewith.

25mm dia flush cock shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-41** of Specification of Materials attached herewith.

100 mm CI soil pipe shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-42** of Specification of Materials attached herewith.

Water shall conform to **M-1** of Specification of Materials attached herewith.

Cement shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-3** of Specification of Materials attached herewith.

Sand shall conform to **M-6** of Specification of Materials attached herewith.

WORKMANSHIP :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Fixing of W.C. span with all required fittings shall be carried out as per **C-44** of Code of practice attached herewith.

The work shall be executed in accordance with best modern practices.

MODE OF MEASUREMENT & PAYMENT:

The measurement shall be taken on the Number basis of complete item in all aspects.

The contract rate shall be for a unit of One Number of complete item in all aspects.

Item No. 15

Providing and fixing washbasin with single hole for pillar tap with C.I. Or M.S. brackets painted white including cutting hole and making good the same but exclusive fittings. (A) Vitreous China. (ii) Flat back washbasin 550 mm X 400 mm Size. (i) In White Colour.

MATERIALS :

washbasin shall be of approved make (List of approved make attached with the Technical Bid) and shall conform to **M-38** of Specification of Materials attached herewith.

The chromium plated bottle trap shall be of approved make and of best quality. The bottle trap shall be provided with coupling.

WORKMANSHIP:

Fixing of washbasin with all required fittings shall be carried out as per **C-41** of Code of practice attached herewith.

The bottle trap shall be fixed on hand wash basin with wooden gullies and screws as directed. The work shall be carried out in best workman like manner.

MODE OF MEASUREMENTS & PAYMENT:

The rate includes cost of all materials and labour involved for satisfactory completion of this item.

The rate shall be for a unit of one number.

Item No. 16

Providing, laying and jointing in true line and level 25mm dia U.P.V.C. pipe (SCH-40) for cold water including fittings as approved by engineer in charge. Pipe shall be fixed on the wall with the help of clamp at every two meter C/C or shall be cancelled as

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

directed including necessary fitting etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of materials.

MATERIALS:

The low density polythene pipe of specified diameter with 10Kg./Sq.Cm. working pressure shall conform to I.S. 3076-1968. The specials and fitting required shall be of best quality.

WORKMANSHIP:

The **U P.V.C.** Pipes of specified diameter shall be fixed as directed. Due to thermal expansion of rigid **U P.V.C.** Pipes, due allowance shall be made particularly in over ground pipe lines for any change in length of pipe line which may occur during, installation or when pipe line is in service.

Above ground installation of rigid **U P.V.C.** pipe should be undertaken after preparations are observed for their protection against direct sun rays and mechanical damage.

The rigid **U P.V.C.** pipe lines should not be kept exposed above ground when it passes through public places, railway lines, road side and footpaths.

U P.V.C. pipes shall be supported at the following intervals:

20 mm dia. 500 mm. 32 mm. dia. 900 mm.

25 mm. dia. 750 mm.

Closer support spacings shall be provided if recommended by the manufacture.

The guide lines indicated by the manufacturer regarding, handling, transportation, storing, laying and jointing of pipes shall be kept in view during execution.

U P.V.C. pipes shall be fixed on wall with wooden plugs and suitable plastic clamps. Jointing the pipes :

The pipes and sockets shall be accurately cut. The ends of the pipes and fittings should be absolutely free from dirt and dust. The outside surface of the pipes and the inside of the fittings shall then be roughened with emery paper, and then solvent cement joint. Since solvent cement is aggressive to **U P.V.C.**, care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes, rags, or paper impregnated with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them.

If manufacture recommends its own methods of jointing, the same shall be adopted after necessary approval from the Engineer-in-charge.

Laying pipes in Trenches :

The pipe shall be laid over uniform relatively soft fine grained soil found to be free of presence of hard objects such as large flints, rocky projections, large tree roots etc. The width of the trenches shall be minimum width required for working.

The pipes laid underground shall not be less than one metre from the ground level. The pipe shall be positioned in the trenches so as to avoid any induced stresses due to deflection. Any deviation required shall be obtained by using proper type of rubber ring joints.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

MODE OF MEASUREMENTS & PAYMENT:

The relevant specifications of Shall be followed except that the **U P.V.C...** Pipes of specified dia. shall be paid under this item.

The unit rate shall be for a unit of one **running metre**.

Item No. 17

Providing, laying and jointing in true line and level 50mm dia U.P.V.C. pipe (SCH-40) for cold water including fittings as approved by engineer in charge. Pipe shall be fixed on the wall with the help of clamp at every two meter C/C or shall be cancelled as directed including necessary fitting etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of materials.

MATERIALS:

As per Item No 16

WORKMANSHIP:

As per Item No 16

MODE OF MEASUREMENTS & PAYMENT:

The relevant specifications of Shall be followed except that the **U P.V.C...** Pipes of specified dia. shall be paid under this item.

Item No. 18

Providing, laying and jointing in true line and level 110 mm U.P.V.C. (Type B) conforming to IS 13592-1992 with one end plain and other end socketed with rubbering, & Fitting conforming to ISI 14735-1999 of approved make for drainage system pipe line, pipe shall be jointed with each other with rubber lubricant, pipe shall be fixed on wall using PVC clamp of the size 110mm diameter X 148mm length X 145mm height at every 2000 mm centre X 210 mm length X 196 mm height at every 2000 mm centre to centre or shall be cocealed in wall as directed including necessary fitting such as bends, shoes etc. including testing pies and joint and jointed with adhesive solvent cement including cost of all materials.

MATERIALS:

As per Item No 16

WORKMANSHIP:

As per Item No 16

MODE OF MEASUREMENTS & PAYMENT:

The relevant specifications of Shall be followed except that the **U P.V.C...** Pipes of specified dia. shall be paid under this item.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Item No. 19

Providing & fixing PVC SWR Nahni Trap IS 14735 fir drain with jali of the following nominal diameter of self cleaning design with CI Screwed down or hinged grating including the cost of cutting & making good the walls . - (A) 100 mm.

MATERIALS:

PVC Nahni trap shall conform to **M-43** of Specification of Materials attached herewith.

WORKMANSHIP :

Fixing of PVC Nahni Trap with all required fittings shall be carried out as per **C-46** of Code of practice attached herewith.

The work shall be executed in accordance with best modern practices.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Number basis of complete item.

The contract rate shall be for a unit of One Number.

Item No. 20.

Providing and fixing in position cowel vent to pipes. (C) 100mm dia.

MATERIALS:**WORKMANSHIP:**

fixing cowel vent in position for 100mm dia pipes as directed by the engineer in charge.

Item No. 21

Providing and fixing chromium plates brass half turn flush cock of approved quality including fixing in pipe line etc. complete - 25 mm dia.

MATERIALS:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Chromium plated brass half turn flush cock shall conform to **M-62**.

WORKMANSHIP :

The half turn flush cock of specified diameter shall be fixed as directed. The flush cock shall be fixed in G.I. pipeline with necessary fillings. The joints shall be made leak proof by using spun yarn and white zink.

MODE OF MEASUREMENTS & PAYMENT:

The rate includes cost of all materials and labour required for satisfactory completion of this item including fittings.

The rate shall be for a unit of one number

Item No. 22

Providing and fixing screw down bib taps of following size - (A) Brass screw down bib tap polished bright (i) 15 mm dia.

MATERIALS:

The Brass chromium plated screws down bib top of 15mm diameter shall be of Jaguar continental brand & make and generally shall conform to **M-36** of Specification of Materials attached herewith.

WORKMANSHIP :

The work shall be carried out in best workmanship like a manner and as per direction of Engineer-in-charge.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on number basis of complete item.

The contract rate shall be for a unit of one number

Item No. 23

Providing and fixing gunmetal or non return fullway wheel valve (C) 25 mm dia.

MATERIALS:

Gun metal check or non-return full way wheel valve with all necessary required material shall conform to **M-37** of Specification of Materials attached herewith.

WORKMANSHIP :

The work shall be carried out in best workmanship like a manner and as per direction of Engineer-in-charge. Relevant specification of Item No. 54 above shall be followed.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on number basis of complete item.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contract rate shall be for a unit of one number.

Item No. 24

Providing and fixing window having extruded aluminum Colour anodized section frame main outer size 63.50 x 38.10 x 1.95 mm,@ Wt 1.094 Kg/Rmt, horizontal two track member size 61.85 mm x 31.75 mm x 1.20mm @wt.of 0.695 Kg/mt, vertical member of size 61.85 mm x 31.75mm x 1.30 mm @wt.of 0.659 Kg/mt with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm @wt.of 0.456Kg/mt, vertical member of size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt, @ Wt. 0.457 Kg/mt with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window.

MATERIALS:

The aluminum extruded hollow section of approved colored shall be of approved make (List of approved make attached with the Technical Bid) and shall generally conform to **M-51** of Specification of Materials attached herewith except that aluminum extruded hollow section shall be powder coated.

Aluminum mat finished fixtures and fastenings shall be of approved make (as per list of approved make attached with the Technical Bid) and shall generally conform to **M-23** of Specification of Materials attached herewith.

The 5 mm thick obscured (fluted) glass of brown colour shall be of approved make (as per list of approved make attached with the Technical Bid) and shall generally conform to **M-22** of Specification of Materials attached herewith.

WORKMANSHIP :

Relevant specifications of **C-55** of Code of practice attached herewith shall be except that work is to be carried out for powder coated aluminum window frame and shutter of approved colour. The IS specification for aluminum door shall be followed.

The fabrication work of window frame and shutter shall be carried out as per the detailed drawing, prevailing standard practice and as directed by Engineer-in-charge.

The section specified in the drawing and design shall be only used.

Alluminum Colour Powder Coated section frame main outer size 63.50 x 38.10 x 1.95 mm(of Jindal Section no:4605,@ Wt 1.094 Kg / Rmt), horizontal **two track** member size 61.85 mm x 31.75 mm x 1.20mm (of Jindal Section no: 8687 @ wt.of 0.695 Kg/mt), vertical member of size 61.85 mm x 31.75mm x 1.30 mm (of Jindal Section no:8758 @ wt.of 0.659 Kg/mt) with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm (of Jindal Section no:8949 @ wt.of 0.456Kg/mt), vertical member of size 40mm x 18mm x 1.29mm (of Jindal Section no:8947 @ wt.of 0.456Kg/mt/ Section 8948, @ Wt. 0.457 Kg/mt) with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window and as directed by Engineer in Charge etc. complete at all levels

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Glazing work shall be carried out as per **C-14** of Code of practice attached herewith. The work shall be carried out as directed by the Engineer-in-charge and in the best manner and prevailing standard practice.

Fixtures and fasteners shall be fixed to door as per **C-12** of Code of practice attached herewith.

The work shall be executed in accordance with best modern practices.

The entire work shall be carried out in best workmanship like manner.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Sq. Meter basis as per IS: 1200 or as revised from time to time so far as applicable

The contract rate shall be for a unit of one Sq. Meter of window area inclusive of window frame, out to out measured and the height shall be measured from the sill level as per IS : 1200.

Item No. 25

Providing, Supplying and fixing Aluminum Section any size with powder coated for Door and Windows Section.

MATERIALS:

The aluminum extruded hollow section of approved color shall be of approved make (List of approved make attached with the Technical Bid) and shall generally conform to **M-51** of Specification of Materials attached herewith except that aluminum extruded hollow section shall be powder coated.

Aluminum mat finished fixtures and fastenings shall be of approved make (as per list of approved make attached with the Technical Bid) and shall generally conform to **M-23** of Specification of Materials attached herewith.

The 5 mm thick obscured (fluted) glass of brown color shall be of approved make (as per list of approved make attached with the Technical Bid) and shall generally conform to **M-22** of Specification of Materials attached herewith.

WORKMANSHIP:

As per Item No 24

Fixtures and fasteners shall be fixed to door as per **C-12** of Code of practice attached herewith.

The work shall be executed in accordance with best modern practices.

The entire work shall be carried out in best workmanship like manner.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

MODE OF MEASUREMENT & PAYMENT:

The measurement shall be taken on the Sq. Meter basis as per IS: 1200 or as revised from time to time so far as applicable

The contract rate shall be for a unit of one Sq. Meter of window area inclusive of window frame, out to out measured and the height shall be measured from the sill level as per IS : 1200.

Item No. 26

Providing & Fixing Irin screw 30 mm.

MATERIALS:

Hardware shall consist of bolts, with the necessary nuts and washers, timber connectors, drift pins, dowels, nails, screw nails, coach bolts, spikes and other metal fasteners. They shall be galvanized or un-galvanized as specified. Bolts, nuts and washers shall be mild steel and comply with IS 1363-1992. Drift Pins and dowels shall be mild steel. Nails shall comply with IS 723-1972. Screw nails and screws shall comply with IS 451-1972/IS 2585-1968. Coach bolts shall comply with IS 2609-1972. Spikes and other metal fastenings shall be of mild steel.

MODE OF MEASUREMENT & PAYMENT :

The measurement /payment shall be made per 100 Each.

Item No. 27

Providing & Fixing Irin screw 40 mm.

MATERIALS:

Hardware shall consist of bolts, with the necessary nuts and washers, timber connectors, drift pins, dowels, nails, screw nails, coach bolts, spikes and other metal fasteners. They shall be galvanized or un-galvanized as specified. Bolts, nuts and washers shall be mild steel and comply with IS 1363-1992. Drift Pins and dowels shall be mild steel. Nails shall comply with IS 723-1972. Screw nails and screws shall comply with IS 451-1972/IS 2585-1968. Coach bolts shall comply with IS 2609-1972. Spikes and other metal fastenings shall be of mild steel.

MODE OF MEASUREMENT & PAYMENT :

The measurement /payment shall be made per 100 Each.

Item No. 28

Providing & Fixing S.S. Aldrop 25 Cm long of ASIS 304 grade.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

MATERIALS:

The stainless steel matt fixtures, fasteners and lock shall be of approved quality & approved (List of approved make attached with the technical Bid) & generally conform to **M-23** of Specification of Materials attached herewith.

For the main decorative carved door shutter, the shutter shall be fitted

1 nos. of 300mm brass aldrop, 2 nos. 200mm brass door handle, 4 nos. of 250mm tower bolt, 6 nos. 25x25x125mm brass hinges, nails, screws, with at least three coats of chapra polish, or as per drawing and instruction of engineer, all complete.

MODE OF MEASUREMENT & PAYMENT:

The measurement /payment shall be made per Nos.

Item No. 29

Providing & Fixing S.S. handle for door 15 cm size of AISI 304 grade.

MATERIALS:

The stainless steel matt fixtures, fasteners and lock shall be of approved quality & approved (List of approved make attached with the technical Bid) & generally conform to **M-23** of Specification of Materials attached herewith.

MODE OF MEASUREMENTS:

Clear opening area shall be measured & paid in Nos.

Item No. 30

Providing & Fixing S.S. Door / Window hinges 4" X 1" X 1.

MATERIALS:

The stainless steel matt fixtures, fasteners and lock shall be of approved quality & approved (List of approved make attached with the technical Bid) & generally conform to **M-23** of Specification of Materials attached herewith.

MODE OF MEASUREMENTS:

Clear opening area shall be measured & paid in 10 each.

Item No. 31

Providing & fixing 35mm thick Flush Door shutter with frame of Indian teak wood size 12 cm X 7 cm and Flush door shutter of first class hard wood with cross band and face veneer or plywood face panel including bright finished M.S. piano hinges of Nickel

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

plated Piano hinges an, Stopper size 200 mm (ASIS 304 grade), Aldrop size 20 mm (ASIS 304 grade), Locks Godrej Mortice lock cover including Providing & fixing 4mm thick wood figure veneer /Laminted sheet with screw on shutter etc complete including applying french polish on frame.

MATERIALS:

The flush door shutter shall be of approved make (List of approved make attached with Technical Bid) and generally conform to **M-51** of Specification of Materials attached herewith.

First class teak wood beading of required size shall be of best quality as approved and uniform shade and colour.

2mm thick termite proof, water proof & fire resistant moulded PVC sheet shall be of best quality, approved make & shade.

Wood primer shall be have approved make (List of approved make attached with Technical Bid) and shall conform to **IS: 3536-1966**.

Synthetic enamel paint shall be of approved make (List of approved make attached with Technical Bid) and shall conform to **M-24/B** of Specification of Materials attached herewith.

The stainless steel matt fixtures, fasteners and lock shall be of approved quality & approved (List of approved make attached with the technical Bid) & generally conform to **M-23** of Specification of Materials attached herewith.

The relevant specification of **IS: 2202** shall be followed.

WORKMANSHIP :

The work of shutter shall be carried out as per standard code of practice.

The relevant specification of **C- 12 & C-56** of Code of practice attached herewith shall be followed except that work is to be carried out for flush shutter with laminated PVC sheet on both sides and first class teak wood beading of required size on all faces of shutters.

The work of flush shutter shall be carried out as per given detailed drawing. Fixing work of laminated PVC sheet on other side shall be carried out as directed by the Engineer-in-charge and standard code of practice.

The fixing of teak wood beading on all faces of flush shutter shall be carried out in a best workmanship like a manner and standard code of practice.

Painting work shall be carried out as per **C-15** of Code of practice attached herewith.

Fixtures and fasteners shall be fixed to door as per **C-13** of Code of practice attached herewith. Or as directed by the Engineer-in-charge truly workmanship like manner to give easy operation.

The work shall be executed in accordance with best modern practices.

The entire work shall be carried out in best workmanship like manner & as directed.

MODE OF MEASUREMENT & PAYMENT :

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The measurement shall be taken on the Sq. Meter basis as per IS : 1200 or as revised from time to time so far as applicable

The contract rate shall be for a unit of one Sq. Meter of flush door shutter area exclusive of door frame, out to out measured and the height shall be measured from the finished floor level as per IS : 1200.

Item No.32

Painting one coats (excluding priming coat) on previously painted steel and other metal surface with enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

MATERIALS:

The enamel paint shall conform to M-24.

WORKMANSHIP:

The relevant specification of **C- 15** of Code of practice attached herewith shall be followed except that work is to be carried out for previously painted steel and other metal surface with enamel paint, brushing

General : The materials required for work of painting work shall be obtained directly from approved manufacturers or approved dealer and brought to the site in maker's drums; kegs. etc. with seal unbroken.

All materials not in actual use shall be kept properly protected, lids of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become stale or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into small containers. While applying also, the paint shall

be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.

If for any reasons, things is necessary, the brand of thinner recommended by the manufacturer shall be used.

The surface to be painted shall be thoroughly cleaned and dusted. All rust, dirt and grease shall be thoroughly removed before painting is started. No painting on exterior or other exposed part of the work shall be carried out in wet, damp or otherwise unfavorable weather and all the surfaces shall be thoroughly dry before painting work is started.

APPLICATION OF PAINT:

Brushing operations are to be adjusted to the spreading capacity advised by the manufacturer of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying-off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the -laying off is finished. The full process of crossing and laying off will constitute one coat.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of sand-paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in shade and shall be got approved from Engineer-in-charge before next coat is started.

Each coat the last shall be lightly rubbed down with sand paper of fine pumice stone and cleaned of dust before the next coat is applied. No hair marks from the brush or logging of paint puddles in the corners of panels, angles of moldings etc. shall be left on the work.

Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved best quality brushes shall be used.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Sq. Meter

Item No.33

Applying two coats of putty & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand prepared smooth.

MATERIALS:

Water shall conform to **M-1** of Specification of Materials attached herewith.

The Cement primer shall be ready mixed primer of approved brand and manufacture. The primer to be used for the painting with emulsion on cement concrete surfaces, plastered surfaces etc. shall be of approved base and as per recommendations of the manufacturers.

Putty: Plaster filler to be used for filling up (putting) uneven surfaces, small cracks etc. shall be of approved compound and as per recommendations of the manufacturers.

Exterior ultima paint shall be of **APEX** exterior ultima paint of Asian paints of required shade and conforming to **I.S: 5411-1969**.

WORKMANSHIP :

The work of applying cement primer & External wall painting three coats with plastic ultima paint shall be carried out as per **C-61** of Code of practice attached herewith & **IS : 2394-1995**.

The work shall be executed in accordance with best modern practices.

For scaffolding, relevant specification of **C-9** of Code of practice attached herewith shall be followed.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken as per I.S. 1200-Part-XII- 1976 or as revised from time to time so far as applicable.

The contract rate shall be for a unit of one Sq. Meter of visible area after deducting openings.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Item No.34

Wall painting (Two Coat) with Plastic emulsion paints of approved brand and manufacture on undercoated wall old surface remove to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand paperd smooth .remove all dust, mortar, loose powdered material etc all complete

MATERIALS:

As per Item No.33

WORKMANSHIP :

The work of applying cement primer & internal wall painting three coats with plastic emulsion paint shall be carried out as per **C-61** of Code of practice attached herewith &**IS: 2394-1995.**

The work of applying the readymade shall be carried out as per the instruction & recommendations of the manufacturers.

The work shall be executed in accordance with best modern practices.

For scaffolding, relevant specification of **C-9** of Code of practice attached herewith shall be followed.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken as per I.S. 1200-Part-XII- 1976 or as revised from time to time so far as applicable.

The contract rate shall be for a unit of one Sq. Meter of visible area after deducting openings.

Item No.35

Finishing wall With weather proof Exterior emulsion paints on wall - ceiling surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dust, mortar, loose powdered material etc. all complete.

MATERIALS:

As per Item No.33

WORKMANSHIP :

As per Item No.33

MODE OF MEASUREMENT & PAYMENT:

The measurement shall be taken as per I.S. 1200-Part-XII- 1976 or as revised from time to time so far as applicable.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

The contract rate shall be for a unit of one Sq. Meter of visible area after deducting openings.

Item No.36

Providing and laying broken china mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar cream out up to Surface using white cement including chemical Proofing and rounding off junctions and extending them up to 15 cm along the wall, clearing with water and oxalic acid etc. as directed.

MATERIALS: -

All materials involved in the work shall conform to relevant M of Specification of Materials attached herewith.

Waterproofing material used shall be of approved manufacturers and shall be used according to the manufacturer's specifications.

WORKMANSHIP: -

The surface to be water proofed shall be cleaned thoroughly and shall be free from oil and other foreign materials. Prepared surface shall receive the following treatment.

Area shall be cleaned of all loose materials and shall be treated with neat cement slurry and mixed with water proofing compound to seal the cracks, pores etc. appearing on the surface.

After the slurry coat, a layer of B.B.L.C. (Brick Bat Lime Concrete) of 100 mm thickness shall be laid over tarfelt to the required slope as shown in drawing. Proportion of B.B.L.C. shall be 2 parts of brickbat and one part of lime mortar (1:2) i.e. 1 part of lime and 2 parts of sand) with 50% of C.M. 1:5 (1 Cement: 5 coarse sand) admixed with waterproofing compound over 20 mm thick layer of C.M. 1:5

A coat of cement slurry admixed with water proofing compound shall be applied to the brick bat layer.

A layer of cement mortar (1:3) with water proofing compound shall be applied on the second slurry coat and joints of brick bat layer shall be filled up completely to give a finished plain surface

After 48 hours of laying of B.B.L.C., a bedding of cement mortar (1:5), 18 to 25 mm thick bedding of C.M. 1:4 (1 Cement: 4 coarse sand) admixed with waterproofing compound shall be provided and on top of this layer, 10 mm thick neat cement grout shall be provided. Immediately on application of cement grout, assorted pieces of coloured glazed china previously soaked in water shall be set closely on the fresh surface and properly tamped to get the required top surface. The surface after completion of work shall be cleaned with sawdust or with diluted acid, if directed by Engineer-in-Charge. The finished surface shall be cured for 10 days. If so directed by the Engineer, a border colour or white mosaic shall be provided, without any extra cost. Tarfelt, brickbat coba and china mosaic shall be taken up

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

the parapet walls to a height of 100-150 mm. Necessary vatas shall be provided towards drain as directed.

MODE OF MEASUREMENT

Measurement shall be in square metres correct to two decimal places. Length and breadth of the actual laid area shall be measured and paid. No extra shall be paid for vatas and work carried over parapet.

The contract rate shall be for a unit of one Sq. Meter of china mosaic type water proofing treatment of specified thickness of visible area.

Item No.37

Providing and fixing Teak wood rail of 60mm x 20mm size and 50cm. length including 3 coats of oil paint to wood work with set of 3 pegs

MATERIALS:

- Teak wood shall be of approved quality, well-seasoned, free from defects such as knots, cracks, warping, and insect attack.
- Rail size shall be **60 mm × 20 mm** and **500 mm length**.
- Pegs shall be teak wood, complete with necessary fixing accessories.
- Oil paint shall be of approved brand and shade.

WORKMANSHIP: -

- The rail shall be accurately cut, planed, smooth-finished, and fixed in position with a set of 3 pegs. All joints and fixing shall be neat, firm, and true to line and level. Wood surface shall be properly prepared, sanded, and cleaned before painting.
- Three coats of oil paint shall be applied uniformly to achieve a smooth and durable finish.
- The completed work shall be free from visible defects and to the satisfaction of the Engineer-in-Charge.

MODE OF MEASUREMENT AND PAYMENT:

The item shall be measured and paid per running meter of teak wood rail.

Item No.38

Constructing brick masonry for under ground C.I. inspection chamber and bends with bricks having crushing strength not less than 35 kg/cm² in CM 1:5, C.I. cover with frame (light duty) 445 mm x 610 mm internal dimensions total weight of cover with frame to be not less than 38 kgs (wt. of cover 23 kgs. and wt of frame 15 kgs) RCC top slab with 1;2;4 mix (1 cement , 2 coarse sand, 4 graded stone aggregate 20 mm size) foundation concrete 1:5:10 inside plaster 15 mm thick with cement mortar 1;3 finished smooth with a bed concrete etc complete. (i) inside dimensions 455mm X 610mm X 450mm deep for single pipe line.

MATERIALS:

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

Brick shall conform to **M-13** of Specification of Materials attached herewith.

Brick bat shall conform to **M-12** of Specification of Materials attached herewith.

Cement mortar 1:6 & 1:3 shall conform to **M-9** of Specification of Materials attached herewith.

Water shall conform to **M-1** of Specification of Materials attached herewith.

Cement shall conform to **M-3** of Specification of Materials attached herewith.

Sand shall conform to **M-6** of Specification of Materials attached herewith.

75mm thick pre-cast RCC cover shall be of best and approved quality.

CI manhole cover with frame shall be of size 0.455 x 0.61 mtr. and having weight not less than 35 kg.

CI manhole frame and cover shall be of best quality and make. CI manhole cover shall be of light duty and conform to relevant I.S.

WORKMANSHIP :

Work of inspection chamber shall be carried out as per **C-51** of Code of practice attached herewith. The work shall be executed in accordance with best modern practices.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Number basis of complete item.

The contract rate shall be for a unit of One Number.

Item No.39

Constructing Brick masonry road gully chamber 500mm x 450mm x 600mm including 500mm x 450mm C.I. horizontal grating with frame complete.

MATERIALS:

Stoneware gully trap of size 100 mm x 100mm with all required accessories shall conform to **M-44** of Specification of Materials attached herewith.

WORKMANSHIP :

The work shall be carried out as per **C-47** of Code of practice attached herewith.

The work shall be executed in accordance with best modern practices.

MODE OF MEASUREMENT & PAYMENT :

The measurement shall be taken on the Number basis of complete item.

The contract rate shall be for a unit of One Number.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

SCHEDULE -B

Item No	Description	Qty	Unit	Rate	Amount (in Rs.)
1	Dismantling tiled of stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.	1489.00	Sqm	46.77	69645.15
2	Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats architraves, holdfasts and other attachment etc. complete and stacking them within all lead and lift.(i) Not exceeding 3 Sq.M. in area.	396.00	Each	182.94	72444.75
3	Dismantling sanitary fittings like wash basin . W.C. pan Indian and European type, flushing tank etc. including stacking the materials with all lead and lift.	48.00	Each	394.51	18936.29
4	Dismantling C.I. pipes G.S.W.pipes abd A.C. rain water pipes with fittings and clamps including stacking the materials with all lead and lift (for any dia, of pipe).	1500.00	Rmt	73.02	109534.50
5	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (i) R.C.C. work	540.00	Cum	1030.81	556635.24
6	Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C. member including stacking of serviceable material and disposal of unserviceable from site of work with all	3645.00	Sqm	18.94	69027.19
7	Scraping oil paint from steel and other metal surface and making the surface even (with Hand Scraping.)	256.00	Sqm	49.32	12625.48
8	Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:6 (1- Cement : 6 - fine sand)(B) Conventional.	168.00	Cum	4021.02	675531.71
9	Providing 15mm thick cement plaster in single coat on Rough (Similar)side of single or half brick walls for interior plastering upto floor two level and finished even and smooth in (ii) Cement mortar 1:4 (1-cement :4-sand).	3645.00	Sqm	167.03	608838.20

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

10	P/L 20 mm thick sand faced plaster on wall up to any height consisting of 12mm thick backing coat of cement mortar 1:3 (1-cement : 3 sand) & 8mm thick finishing coat of cement mortar 1:1 (1-cement : 1-sand) as per architectural design / drawings incl. making 10 x 10 mm or as specified grooves as per pattern given in the architectural drawings incl. racking out joints, cleaning, drip moulding, curing, scaffolding, etc. complete at all floor levels	3500.00	Sqm	329.29	1152516.05
11	Providing & laying 24" X24' vitrified 8mm thick tiles flooring over 20mm (average) base of cement mortar 1:6 (1: Cement, 6: coarse sand) on new surface of fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with clor cement slurry including finished with fluse pointing & Cleaning the surface etc. complete for light shade.	1528.00	Sqm	1415.77	2163292.74
12	Providing & fixing 18 mm thick first quality Black Polished Granite stone approved by Client/Architect for Doors - windows Frame, Lintel, jambs, sill, staircase steps trade, riser & landing etc. in cement mortar (1:3) including cutting, fixing in cement paste with hai rline joint, filling the joints with white cement / pigments / joint filler, rounding of edges, edge polishing & finishing as directed by the Engineer.(fixing the granite in one piece)	200.00	Sqm	2042.63	408526.82
13	Constructing of Cooking platform (sandwich type) 80cm high resting on Kota stone / granite stone in C.M 1:3 with providing and fixing 25 mm thick rough kota stone at bottom and 25mm thick Granite stone (single piece) top and polished kota stone/ granite stone (single piece) 25mm thick on top with 75mm high machine cut polished Granite round moulded facia patty including polishing etc . complete as per drawing and specification without stainless steel sink including necessary cutting for sink & making hole for gas pipe and fixing P.V.C bend of 25mm dia. -Only top granite shall be measured for payment.	40.00	Sqm	3478.92	139156.70
14	Providing and fixing white vitrious ching W.C. sqatting Pan (Indian type).	40.00	Each	1283.90	51356.08

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

15	Providing and fixing washbasin with single hole for pillar tap with C.I. Or M.S. brackets painted white including cutting hole and making good the same but exclusive fittings. (A) Vitreous China. (ii) Flat back washbasin 550 mm X 400 mm Size. (i) In White Colour.	58.00	Each	1382.37	80177.27
16	Providing, laying and jointing in true line and level 25mm dia U.P.V.C. pipe (SCH-40) for cold water including fittings as approved by engineer in charge. Pipe shall be fixed on the wall with the help of clamp at every two meter C/C or shall be concealed as directed including necessary fitting etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of materials.	1000.00	Rmt	91.84	91839.30
17	Providing, laying and jointing in true line and level 50mm dia U.P.V.C. pipe (SCH-40) for cold water including fittings as approved by engineer in charge. Pipe shall be fixed on the wall with the help of clamp at every two meter C/C or shall be concealed as directed including necessary fitting etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of materials.	500.00	Rmt	195.67	97833.65
18	Providing, laying and jointing in true line and level 110 mm U.P.V.C. (Type B) conforming to IS 13592-1992 with one end plain and other end socketed with rubbering, & Fitting conforming to ISI 14735-1999 of approved make for drainage system pipe line, pipe shall be jointed with each other with rubber lubricant, pipe shall be fixed on wall using PVC clamp of the size 110mm diameter X 148mm length X 145mm height at every 2000 mm centre X 210 mm length X 196 mm height at every 2000 mm centre to centre or shall be concealed in wall as directed including necessary fitting such as bends, shoes etc. including testing pipes and joint and jointed with adhesive solvent cement including cost of all materials.	300.00	Rmt	835.15	250544.64
19	Providing & fixing PVC SWR Nalni Trap IS 14735 for drain with jali of the following nominal diameter of self cleaning design with CI Screwed down or hinged grating including	150.00	Each	558.36	83753.75

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

	the cost of cutting & making good the walls . - (A) 100 mm				
20	Providing and fixing in position cowel went to pipes. (C) 100mm dia.	15.00	Each	501.87	7528.04
21	Providing and fixing chromium plateds brass half turn flush cock of approved quality including fixing in pipe line etc. complete - 25 mm dia.	100.00	Each	254.78	25478.26
22	Providing and fixing screw down bib taps of following size - (A) Brass screw down bib tap polished bright (i) 15 mm dia.	250.00	Each	186.83	46707.45
23	Providing and fixing gunmetal or non return fullway wheel valve (C) 25 mm dia.	40.00	Each	420.63	16825.39
24	Providing and fixing window having extruded aluminum Colour anodized section frame main outer size 63.50 x 38.10 x 1.95 mm,@ Wt 1.094 Kg/Rmt, horizontal two track member size 61.85 mm x 31.75 mm x 1.20mm @wt.of 0.695 Kg/mt, vertical member of size 61.85 mm x 31.75mm x 1.30 mm @wt.of 0.659 Kg/mt with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm @wt.of 0.456Kg/mt, vertical member of size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt, @ Wt. 0.457 Kg/mt with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window	88.00	Sq.mt	2140.33	188349.16
25	Providing, Supplying and fixing Aluminum Section any size with powder coated for Door and Windows Section	852.00	Kg	171.18	145849.53
26	Providing & Fixing Irin screw 30 mm.	1000.00	100 Each	88.16	88162.90
27	Providing & Fixing Irin screw 40 mm.	1000.00	100 Each	104.42	104423.90
28	Providing & Fixing S.S. Aldrop 25 Cm long of ASIS 304 grade.	450.00	Nos	400.58	180259.25
29	Providing & Fixing S.S. handle for door 15 cm size of ASIS 304 grade.	300.00	Nos	76.17	22852.26
30	Providing & Fixing S.S. Door / Window hinges 4" X 1" X 1.	1200.00	10 each	100.14	120169.80
31	Providing & fixing 35mm thick Flush Door shutter with frame of Indian teak wood size 12 cm X 7 cm and Flush door shutter of first class hard wood with cross band and face	160.00	Sqm	3745.76	599321.07

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

	veneer or plywood face panel including bright finished M,S.piano hinges of Nickel plated Piano hinges an, Stopper size 200 mm (ASIS 304 grade), Aldrop size 20 mm (ASIS 304 grade),Locks Godrej Mortice lock cover including Providing & fixing 4mm thick wood figure veneer /Laminted sheet with screw on shutter etc. complete including applying french polish on fram				
32	Painting one coats (excluding priming coat) on previously painted steel and other metal surface with enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.	254.00	Sqm	55.21	14022.48
33	Applying two coats of putty & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand prepared smooth.	7145.00	Sqm	40.59	290029.13
34	Wall painting (Two Coat) with Plastic emulsion paints of approved brand and manufacture on undercotaed wall old suface remove to give an even shade including throughly brushing the surface free from mortar fropping and other foriegn matter and sand paperd smooth .remove all dust, mortar, loose powdered material etc all complete.	3645.00	Sqm	78.90	287594.87
35	Finishing wall With weather proof Exterior emulsion paints on wall - ceiling surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dust, mortar, loose powdered material etc all complete.	3500.00	Sqm	114.53	400869.00
36	Providing and laying broken chine mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar creme out up to surface using white cement including chemical Proofing And rounding off junctions and extending them up to 15 cm along the wall, clearing with water and oxalic acid etc. as directed.	704.40	Sqm	747.29	526390.30
37	Providing and fixing Teak wood rail of 60mm x 20mm size and 50cm. length including 3 coats of oil paint to wood work with set of 3 pegs.	200.00	Rmt	71.17	14234.94

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

38	Constructing brick masonry for under ground C.I. inspection chamber and bends with bricks having crushing strength not less than 35 kg/cm ² in CM 1:5, C.I. cover with frame (light duty) 445 mm x 610 mm internal dimensions total weight of cover with frame to be not less than 38 kgs (wt. of cover 23 kgs. and wt of frame 15 kgs) RCC top slab with 1;2;4 mix (1 cement , 2 coarse sand, 4 graded stone aggregate 20 mm size) foundation concrete 1:5:10 inside plaster 15 mm thick with cement mortar 1;3 finished smooth with a bed concrete etc complete. (i) inside dimensions 455mm X 610mm X 450mm deep for single pipe line.	50.00	Each	2932.93	146646.45
39	Constructing Brick masonry road gully chamber 500mm x 450mm x 600mm including 500mm x 450mm C.I. horizontal grating wih frame complete.	25.00	Each	2017.19	50429.81
					99,88,359.48

Note: The Unit rates specified for various items to be executed as per Schedule "B" attached with the Price Bid are excluding GST but inclusive all labours, materials, testing charges, equipment's, all incidental charges involving in the work and as specified in the Mode of measurement & payment of detailed specifications of items incl. all taxes(Except GST), royalty, octroi, transportation cost etc. all as applicable presently as to be enforced for future by any / all including Central/State Government & Statutory bodies from time to time. GST will be paid extra as per the prevailing rate.

I / We agree to carry out the work at _____ % above the estimated tender rates

_____ should be written in figures and words.

I / We agree to carry out the work at _____ % below the estimated tender rates

_____ should be written in figures and words.

ESTIMATED AMOUNT

Put to tender **₹.99,88,359.48**

ADD

% _____ above ₹. (+) _____

Net ₹. _____

Rupees in words: _____

ESTIMATED AMOUNT

Put to tender **₹. 99,88,359.48**

DEDUCT

% _____ below ₹. (-) _____

Net ₹. _____

Rupees in words: _____

Signature of
Contractor

Executive engineer
GIDC Ankleshwar

1. (*) Please strike out whichever is not applicable. All work shall be carried out as per the specifications of the GIDC or as directed.
2. All the columns in Schedule should be filled in ink and the total entries in the last column should be struck by the contractor under his signature.
3. Rate quoted included clearance of site (prior to commencement of work & at its close) in all respect & hold good for the work under all conditions, site moisture, weather etc.
4. I/We have read the tender/general specifications/ conditions and I/We agree to follow same and binding to me/us.

Signature of
Contractor

Executive engineer
GIDC Ankleshwar