



माझगांव डॉक शिपबिल्डर्स लिमिटेड

(भारत सरकार का उपक्रम)

राष्ट्र के पोत निर्माता

डॉकयार्ड रोड, माझगांव

मुंबई - ४०००१०

भारत

MAZAGON DOCK SHIPBUILDERS LIMITED

(A Government of India Undertaking)

Shipbuilders to the Nation

Dockyard Road, Mazagon,

Mumbai 400 010.

INDIA

ई-निविदा फॉर्म दो हिस्सो में

e-TENDER ENQUIRY FORM (TEF) Two-Bid System

मंडल: समवाय

DIVISION: SHIP BUILDING

विभाग: बाह्यस्तोत-तकनीकी सेवाएँ

DEPARTMENT: OTS-TECHNICAL SERVICES

निविदा क्रमांक: १९०००००२५३

TENDER NO: 1900000253

निविदा जारी दिनांक : 30 मार्च २०२६

TENDER DATE: 30th March' 2026

निविदा देय दिनांक एवं समय: 21 अप्रैल २०२६ दोपहर १४:३० बजे

CLOSING DATE & TIME: 21st April' 2026, at 14:30 Hr

भाग १ - तकनीकी एवं वाणिज्यिक हिस्सा खोलने (ऑनलाइन) कि तिथि एवं समय: 22 अप्रैल २०२६, दोपहर १४:३० बजे से

Online Opening of Part-I (Techno-commercial Bid): 22nd April' 2026, 14:30 Hrs. IST onwards

माझगांव डॉक शिपबिल्डर लिमिटेड प्रासिद्ध निविदाकर्ताओं / विक्रेताओं से निम्नलिखित कार्य के लिए प्रतियोगी ऑनलाइन निविदाएँ दो हिस्सो में (भाग १ - तकनीकी एवं वाणिज्यिक हिस्सा और भाग २ - मूल्य हिस्सा) अपने ई-प्रॉक्यूरमेंट पोर्टल <https://eprocuremdl.nic.in> पे आमंत्रित करते हैं।

MAZAGON DOCK SHIPBUILDERS LIMITED hereinafter referred to as **MDL**, INVITES ONLINE COMPETITIVE BIDS from reputed Bidders in TWO BID SYSTEM (Part-I Techno-Commercial Bid and Part-II Price Bid) on e-procurement portal <https://eprocuremdl.nic.in> for the following Work / Services:



कार्य का वर्णन
DESCRIPTION OF WORK

SSA वर्कशाप से **SY** की सड़क की मरम्मत और डामर बिछाने का काम .

Asphalting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)

निविदा क्र.: १९०००००२५३
TENDER NO: 1900000253

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1. प्रस्तावना /PREAMBLE

- 1.1. Mazagon Dock Shipbuilders Ltd. (MDL), a listed Company, hereinafter referred as Employer (Client), is a Public Sector Undertaking by the Government of India under the administrative control of Department of Defence production, Ministry of Defence.
- 1.2 MDL's main business/ activities are Shipbuilding, Submarine Construction and Heavy Engineering Works.

2. काम का संक्षिप्त विवरण/BRIEF SCOPE OF WORK:

- 2.1.MDL intends to Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)
- 2.2.Bidder shall refer detailed Scope of Work and Technical Specifications which is at **Enclosure-21** and drawing attached at **Enclosure-20**. The Safety Instructions & Statutory compliances are attached at Annexure A & B respectively.

3. निविदाकर्ताओं के लिए निर्देश/ INSTRUCTIONS TO THE BIDDERS:

- 3.1.This is an e-tender and bids have to be submitted online ONLY. It is the sole responsibility of the bidders to submit their bids online in time. Bidders are, therefore, advised to commence the bidding process on the e-procurement portal WELL IN ADVANCE (preferably 3-4 days prior to tender closing date) and not wait for last minute submission of their bids. MDL reserves the right for grant of extension or otherwise without assigning any reason. Bidder's failure to complete submission of their online bids in time on account of reasons such as SLOW SPEED OF SERVER, TECHNICAL PROBLEMS etc. shall not be entertained and EXTENSION OF SUBMISSION TIME shall not be granted on this account.
- 3.2. In case any bidder intending to respond against the tender and is not having the DSC to facilitate uploading of his bid, should approach the Service Provider at least 10 working days in advance of the tender closing date requesting for DSC. The request so made to the Service Provider should simultaneously be forwarded to MDL Dealing Officer. In case the DSC is not received within 3 to 4 working days of the request by the bidder, the Head of the concerned Commercial section be informed immediately. If the DSC is not received from the Service Provider three working days prior to the tender closing date, suitable extension to the tender closing date shall be considered if requested by the concerned bidder on submission of requisite supporting documents (scanned copy of application submitted to the service provider).
- 3.3. In case of any discrepancies'
 - 3.3.1. Between Hindi and English Versions of the Tender Clauses, English Version will prevail.
 - 3.3.2. In the drawings or between the drawings, technical specifications, and/ or schedule of items/quantities, the contractor shall seek clarification from MDL and shall carry out the work in accordance with the clarification furnished by MDL.
 - 3.3.3. MDL at its discretion, may follow the following order of preference- Description of Schedule of Bill of Quantities, Technical Specifications, Drawings, General Condition of Contract.
- 3.4. Tender due date extension may have considered if extension of time asked by bidder in 3 days' in advance.



3.5. The online bid can be submitted by the authorized representative of the bidder as detailed below,

- 3.5.1. By the Proprietor, in case of a proprietary firm; or
- 3.5.2. By a Partner, in case of a partnership firm and/or a limited liability partnership;
- 3.5.3. By a duly authorized person holding the Power of Attorney, in case of a Limited or Private Limited Company or a corporation.

3.6. In case of any techno-commercial query prior to submission of bids, the bidder(s) are requested to contact the following from MDL. Letter(s)/emails shall be addressed to GM/HOD (OTS), MDL. Contact details are as under:

MDL	
Shri. Anant Garkhedkar DGM/HOS (OTS-TS) Email: apgarkhedkar@mazdock.com Tel No: +91 22 23763086 Mob No: 9324019254	Shri. Naushad C S, DGM (OTS-TS) Email: nshaikh@mazdock.com Tel No: +91 22 23763312 Mob No: 8108078627

3.7. Before submission of the tender, the bidder shall visit the site, examine the General Conditions of Contract, the Specifications (including any drawings and other specifications referred to therein), the schedules and the Bill of Quantities. In case of any ambiguity or discrepancy between any of these documents or between figured and measured dimensions, the bidder should immediately refer the matter to MDL.

3.8. Corrigendum:

- 3.8.1. Before the deadline for submitting bids, MDL may update, amend, modify, or supplement the information, assessment or assumptions contained in the Tender Document by issuing a corrigendum.
- 3.8.2. The corrigendum shall be published in the same manner as the original Tender Document. Without any liability or obligation, the Portal may send intimation of such corrigendum to bidders who have downloaded the document under their login. However, the bidders' responsibility is to check the website(s) for any corrigendum. Any corrigendum thus issued shall be considered a part of the Tender Document. To give reasonable time to the prospective bidders to take such corrigendum into account in preparing their bids, MDL may suitably extend the deadline for the bid submission, as necessary. After MDL makes such modifications, any Bidder who has submitted his bid in response to the original invitation shall have the opportunity to either withdraw his bid or re-submit his bid superseding the original bid within the extended time of submission.

3.9. Mazagon Dock Shipbuilders Limited will not be responsible for any costs or expenses incurred by the Bidder in connection with the preparation and submission of his bid or for any other expenses incurred in connection with such bidding regardless of the conduct or outcome of the tendering process including cancellation of this tender process.

3.10. The bidder shall not take any benefit of grammatical or printing mistakes, which may have occurred.

3.11. **DEVIATIONS:** - Deviations, if any, from Terms, Conditions & Technical requirements specified in the Tender Enquiry, General Conditions of Contract (GCC) should be clarified from MDL well before the closing date of the tender. Deviations put up along with the tender is generally discouraged and not accepted.



- 3.12. Information relating to the examination, clarification, evaluation and comparison of bids, and recommendations for the award of a contract, shall not be disclosed to bidders or any other person not officially concerned with such a process until the award to the successful bidder has been announced.
- 3.13. From the time of bid opening to the time of contract award, no bidder shall contact MDL on any matter related to the bid, except on request and prior written permission.
- 3.14. Any effort by the bidder to influence MDL in bid evaluation, bid comparison or contract award decisions will vitiate the process and will result in the rejection of the bidder's bid.

4. ई-टेंडरिंग के लिये मार्गदर्शन /GUIDANCE FOR E-TENDERING:

- 4.1. No offer in sealed envelope will be accepted against e-Procurement.
- 4.2. Bidders can participate in online bidding
 - 4.2.1. By registering with above referred portal for User ID and password.
 - 4.2.2. By obtaining class III B DSC (Digital Signature Certificate) for secured bidding.
- 4.3. For any further details on e-tendering & Digital Signature Certificate (DSC), following are the contact details – email: eproc-support@gov.in , global support number - +91-120-4200462/+91-120-4001002, Mobile No -+918826246593.
- 4.4. For uploading the tender details, DSCs issued by the following are acceptable: i) n-Code ii) MTNL iii) TCS iv) SIFY
- 4.5. For mapping of DSC, representative of National Informatics Centre may be contacted.
- 4.6. Bidders who had earlier participated in MDL tenders on e-Procurement portal <https://mdl.eproc.in> need to register again on the current e-Procurement portal <https://eprocuremdl.nic.in>.

5. दो प्रणाली में ऑनलाइन प्रस्ताव प्रस्तुत करे /ONLINE SUBMISSION OF OFFER IN TWO-BID SYSTEM:

- 5.1. Offer must be submitted in Two parts i.e. Part-I (Techno-Commercial Bid) and Part-II (Price Bid) as appearing online on the portal <https://eprocuremdl.nic.in>
 - 5.1.1. **Techno-Commercial (Part-I) Bid:** Bidders shall submit/upload scanned copy of the following duly filled in, signed & stamped with company seal in online Part (I) bid: -
 - i. In respect of technical requirements of the tender:
 - a. Under taking for making available the required Key personnel as specified in the tender as per **Enclosure-3.1**
 - b. Scanned copy of Bidder's company profile.
 - c. Proposed methodology and Program for execution duly supported by equipment planning and QA procedures proposed to be adopted by the bidder to be submitted.
 - ii. In respect of Commercial requirements of the tender:
 - a. Bidder's Undertaking at **Enclosure-1**.



- b. Acceptance on clauses of Tender Enquiry (TEF) in the Prescribed Format appearing online stating 'Accepted' OR 'Not Accepted' as applicable for each of the clause in the format attached at **Enclosure-2**.
- c. Acceptance on clauses of General Conditions of Contract (GCC) in the Prescribed Format appearing online stating 'Accepted' OR 'Not Accepted' as applicable for each of the clause in the format attached at **Enclosure-4**.
- d. Deviations, if any, from Terms, Conditions & Technical requirements specified in the Tender Enquiry, GCC with reasons thereof shall be clearly indicated against the relevant clause(s) in the format attached at **Enclosure-5**.
- e. Bidder shall submit Declaration certificate for Local Content as per **TEF Clause No. 41 and** in the format attached at **Enclosure-10 (A)** Sample filled up Form is appended for reference.
- f. Bidder shall submit Declaration in respect of restriction under Rule 144 (xi) of the General Financial Rules (GFRs), 2017 **TEF Clause No. 42** in the format attached at **Enclosure-10 (E)**.
- g. Bidder shall submit Declaration in respect debarred under Public Procurement Policy (PPP) Make In India (MII) **TEF Clause No.41** order, in the format attached at **Enclosure-10 (F)**.
- h. Bidder shall submit Declaration for Banned or delisted Tenderer/firms/Vendors as per **TEF Clause No.39** and in the format attached at **Enclosure-11**.

The address label of the addressee is at Enclosure 27 on the envelope

- i. **EMD instrument (EMD BG)** shall be sent by Registered Post/Speed Post/Courier in a sealed envelope super scribing Tender Enquiry No. and Due date, so as to reach within 07 Days from the closing date of the tender during office working hours i.e. up to 1630 hrs, to the following address.

बिभाग प्रमुख(बाह्यस्त्रोत),
बाह्यस्त्रोत -तकनीकी सेवाएँ,
छटा मंज़िल, सर्विस ब्लॉक बिल्डिंग,
नॉर्थ यार्ड, माझगांव डॉकशिपबिल्डर्स लिमिटेड,
डॉकयार्ड रोड, मुंबई - ४०००१० (भारत)

**Head of the Department (OTS),
OTS-TS Department,
6th Floor, Service Block Building,
North Yard, Mazagon Dock Shipbuilders Limited,
Dock Yard Road, Mumbai - 400010 (INDIA)**

- j. Scanned copy of Bank details for payment by NEFT/RTGS/ECS with authenticated by the Banker in the format attached at **Enclosure-14**.
- k. Scanned copy of GST Registration Certificate & Permanent Account Number (PAN).
- l. Bidder should have valid ESIC code as per ESIC act and PF code- Bidder should have valid registration with Employees Provident Fund Organization under 'EPF and Miscellaneous Provisions Act, 1952'



- m. Scanned copy of Valid Bidder's Shop & Establishment Registration Certificate or Certification of Incorporation from Registrar of Companies or registration certificate from Registrar of firms.
- n. In case of Bidder registered with Mazagon Dock Shipbuilders Limited may upload scanned copy of Valid Registration Certificate issued by MDL, for the items/services for which the offer is being submitted.
- o. Power of Attorney, in case of a Limited or Private Limited Company or a corporation.
- p. CHECKLIST OF SUBMITTALS attached along with online Technical Bid as per format at **Enclosure-26**.
- q. Declaration in respect of Conflict of Interest among Bidders/Agents- **Enclosure-29** to be filled and submitted duly signed and stamped.
- r. Signed copy of Corrigendum if issued by MDL
- s. In Price bid, GST to be indicated by the bidder. Further, **Blank Rate sheet as per Price bid** to be submitted by the bidder along with the technical bid, duly indicating the GST, 'quoted or not Quoted' against rate, HSN / SAC code no. as per **(Price Blank sheet format)**.
- t. Bidders shall upload scanned copy of Solvency certificate for at least **Rs 157.63 lakhs**, The Solvency Certificate should not be older than One Year as on the Tender date. It should be issued by a Scheduled Commercial (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act, 1934 excluding Co-operative banks or Regional Rural Banks). The Bank Guarantee shall be from banks as per list approved by SBI Bank published on MDL website.

Notes:

- i) MDL has a right to verify / cross verification of authenticity of the scanned documents with respect to original submitted against this tender
- ii) The bidder is requested to ensure that all the documents asked for are submitted and are clear, legible & duly signed (i.e. self-attested), as it would save considerable time without necessitating the need for furnishing of the documents again by them. The bidder is also requested not to submit unnecessary documents not asked for, like signed & stamped copy of this Tender document, etc.
- iii) Bidders are requested to ensure that only relevant documents complete in all respect as indicated in the tender should be attached with their offer. The first page of every uploaded set of scanned document shall be with an index of its contents.
- iv) The bidder is required to compulsorily select "ACCEPTED" or "DEVIATION" from the choices available against the relevant Para no. /Clause no. of TEF/GCC (as applicable). In case "DEVIATION" is selected against a particular Para no. /Clause no., it would be mandatory to explain the deviation proposed by the bidder in the Deviation form at **Enclosure-5**. Any deviation(s) mentioned elsewhere in the Offer/Bid, other than in the said forms, will not be considered.

5.1.2. **मूल्य हिस्सा(भाग-२) /Price Bid (Part-II):**

- a. Price Bid as appearing in the format is to be filled by the bidder ONLINE ONLY.
- b. The Bill of Quantities (BOQ) are as appearing at **Enclosure -19**
- c. The quantities of individual items in the BOQ are approximate and may vary.
- d. Bidder after considering the estimated rates of individual items in the BOQ and the total estimated value, shall quote their overall percentage at par, below or above the estimated rates.



- e. The percentage quoted/agreed by the Bidder shall be applied to the estimated rates of individual items in the BOQ, trucking off to two decimal places, to arrive at the order value.
- f. The Lowest Bidder (L1) shall be evaluated based on the overall cost quoted by the bidder including applicable Goods & Service Tax
- g. However, Purchase Preference in line with **Clause No 41.2** shall be given to Class I Local Supplier.
- h. If a firm quotes NIL charges/consideration, the bid shall be treated as unresponsive and will not be considered.
- i. If a firm do not quote GST in the Price bid, then the base price shall be reduced by applicable GST during placement of order.
- j. **Note:**

1. If, in the price structure quoted for the required goods, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit prices shall prevail and the total price corrected accordingly.
2. If there is an error in a total corresponding to the addition of subtraction of sub-totals, the sub-totals shall prevail and the total shall be corrected.
3. If there is a discrepancy between words and figures, the amount in words shall prevail.

6. बोलियाँ में संशोधन /MODIFICATION TO THE BIDS :

Bidders desirous of modifying their bids prior to the closing date & time may do so online in the e-Procurement Portal <https://eprocuremdl.nic.in> prior to the tender closing date & time.

7. पूर्व योग्यता मापदंड/ PRE-QUALIFICATION CRITERIA:

7.1. Technical PQC

Particular experience-निविदा जारी दिनांक के पूर्व माह के अंतिम दिवस के समाप्ती तक पीछले सात वर्षों के दौरान समरूप कार्य के सफलतापूर्वक पूरा करने का अनुभव किसी भी निम्नलिखित के अंतर्गत होनी चाहिए:

Bidder's experience of having successfully completed similar works during last 7 years ending 31st March, 2026 should be either of the following:

- a. तीन समरूप संपन्न कार्य जिसकी प्रत्येक की लागत ₹ 186 लाख से कम न हो।
Three similar* completed works each costing not less than **₹ 186 lakhs.**
OR
- b. दो समरूप संपन्न कार्य जिसकी प्रत्येक कीलागत ₹ 233 लाख से कम न हो।
Two similar* completed works each costing not less than **₹ 233 lakhs.**
OR
- c. एक समरूप संपन्न कार्य जिसकी प्रत्येक कीलागत ₹ 372 लाख से कम न हो।
One similar* completed work costing not less than **₹ 372 lakhs.**

***Similar Work:** "Similar work shall mean "Construction of Asphalt Road work along with allied Civil works"

In respect of the above, following shall be applicable

- (i) Similar completed works referred above means each work and not all works put together.



- (ii) Successfully completed or substantially completed similar works can also be considered for above similar works. Substantial completion shall be based on 80 (eighty) per cent (value wise) or more works completed under the contract. (**Note:** Substantial completion should not be defined in terms of percentage completion, rather it should be based on functional consideration.)
- (iii) Client certificate for 'substantial project/work/asset should contain two parts. Part-I shall 'Financial value of work done' or client certified invoice and Part-II shall contain; certificate of functional completion of project/work/asset'
- (iv) It is clarified that the work executed by the bidders for their in-house or capital use will not be considered for the purpose of bidder's experience of completion of similar works.
- (v) The work executed under labour rate where input materials which are supplied by client shall not be considered as experience in similar completed works.
- (vi) Documentary evidence in support of similar completed works viz., copies of Work Order(s)/Contract Agreement(s) indicating contract amount, Project/Work value, Scope of Work etc. & Work Completion Certificate(s) issued by the Client(s) indicating proper reference of the Work Order/Contract Agreement & date of Completion, duly signed & stamped with company seal shall be scanned and uploaded online. Bidder shall submit scanned copies of TDS certificate/ Copies of Certified invoices of relevant projects.
- (vii) **Start-ups shall be given 100% relaxation in prior turnover and prior experience subject to meeting of quality & technical specifications, wherever applicable**
- (viii) **Clarification of Bids/ Shortfall Documents:** During evaluation and comparison of bids, MDL may, at his discretion, ask the bidder for clarifications on the bid. Reasonable & fair opportunity may be provided to all the bidders for furnishing shortfall documents. The request for clarification shall be given in writing, asking the bidder to respond by a specified date. if the bidder does not comply or respond by the date, his offer will be liable to be rejected. No change in prices or substance of the bid shall be sought, offered or permitted. No post-bid clarification at the initiative of the bidder shall be entertained. The shortfall information/documents should be sought only in case of historical documents which pre-existed at the time of the tender opening and which have not undergone change since then.
- (ix) **Memorandum of Understanding:** (For Projects involving Design) Bidder has to submit copy of MoU for engagement of agency, if required, for carrying out the Design requirements.

7.2 General Construction Experience: Annual Turnover: The bidder should have achieved an annual turnover of general construction work of at least Rs.11.82cr. in any of the year over a period of 07years, ending 31st march 2025. Further, out of the above annual turnover in the relevant year, the bidder should have achieved at least Rs.5.91Cr from construction work comprising Civil work. Bidder has to submit a certificate from their Chartered Accountant for the above.

7.3 Personnel Capability & Special Conditions of Contract: The Contractor's Key Personnel should meet the requirements of qualification and experience as under.

On award of work, Contractor to submit an organogram highlighting site team as well as office staff. Nevertheless, a minimum technical team staff as detailed below is required at site failing which suitable recovery shall be made.

Sr.No	Designation Technical Staff	Total No's	Qualification	Min. Experince	Duration	Rate at which recovery shall
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						be made from the contractor
01	Project Manager Cum Planning	01	B.E,Civil or Diploma Engineer	02Years or 05years respectively	Till Completion of the work	Rs.15000 per month.
02	Site/ Billing/Quality Engineer	01	B.E,Civil or Diploma Engineer	02Years or 05years respectively	Till Completion of the work	Rs.15000 per month.
03	Safety Officer	01	Graduate / Diploma with Safety Certificate Course	03years	Till Completion of the work	Rs.15000 per month

7.4 Commercial PQC

- a. Submission of requisite Instrument in support of Bid Security viz EMD/Proof of EMD Exemption.
- b. Submission of Valid Bidder's Shop & Establishment Registration Certificate or Certification of Incorporation from Registrar of Companies or registration certificate from local body / Factory license or any document authorizing conduct of business in legal manner.
- c. Submission of Integrity Pact.
- d. The Pact essentially envisages an agreement between the prospective vendors & bidders and MDL committing the persons / officials of both the parties, not to exercise any corrupt influence on any aspect of the contract.
- e. Only those vendors / bidders who enter into such an Integrity Pact with MDL would be competent to participate in the bidding.
- f. The Integrity Pact would be effective from the stage of invitation of bids till the complete execution of the contract. This pact begins when both parties have signed it. It expires for the Contractor **12 months** after the last payment under the contract and for all other bidders, **06 months** after the contract has been awarded.
- g. Integrity Pact shall be duly signed and stamped on all pages. Bidders shall upload the signed Integrity Pact, as per format enclosed at **Enclosure-13** in the online Techno-Commercial Bid (Part-I). The hard copy of the 'INTEGRITY PACT' shall be submitted in the office of Outsourcing (OTS) Department, 6th floor Service Block Bldg., NY, Mazagon Dock Shipbuilders Limited within 07 Days after closing of the tender.
- h. The Integrity Pact would be signed by the Competent Authority in MDL & a copy returned to the bidder.
- i. MDL has appointed Independent External Monitors (IEMs), who will monitor the tender process and the execution of the contract, for compliance with all relevant laws, rules, regulations, economic use of resources and for fairness



/ transparency in its relations with its Bidder(s) and /or Contractor(s). The names and complete address with contact details of the IEMs are displayed on MDL's website www.mazagondock.in

7.5 Financial Capabilities

- a. Bidder's average Audited Annual financial turnover during last 3 years ending 31st **March 2025** should be at least Rs. **118.22 lakhs/-** as per the annual report or audited balance sheet and profit and loss account of the relevant period, duly authenticated by a Chartered Accountant/ Cost Accountant.
- b. The bidder should have access to, or possess available liquid assets and other financial means (independent of any contractual advance payments) sufficient to meet the construction cash flow requirements for the subject contract, of the certain minimum amount specified. The bidder should have adequate sources of finance to meet the cash flow requirements of works currently in progress and for future contract commitments. In support of the above, the bidder should have positive Working capital as on **31st March 2025**.

7.6 Clarification of Bids/Shortfall documents:

- a. During evaluation and comparison of bids, MDL may, at its discretion, ask the bidder for clarifications on the bid. The request for clarification shall be given in writing, asking the bidder to respond by a specified date & time.
- b. If the bidder does not comply or respond by the said date, his offer will be liable to be rejected.
- c. Post-bid clarification at the initiative of the bidder shall not be entertained.

8. स्थल मुआयना /SITE VISIT:

- 8.1. The site for the work is located North Yard and South Yard MDL, Mumbai.
- 8.2. It is considered necessary that the Bidder(s) shall visit the site and get clear idea about the work involved, before quoting. The Bidder(s) are therefore advised to visit the site and study all the particulars of the site and the nature of the work.
- 8.3. Bidder(s), if required, may contact on telephone no. 022 2376 3312 or email: nshaikh@mazdock.com for any doubts /clarifications / site visits.

9. बयाना राशि/ बोली प्रतिज्ञापत्र /EARNEST MONEY DEPOSIT (EMD) / BID BOND:

- 9.1. Bidders shall furnish EMD of **₹ 7.88 lakhs (Rupees Seven lakhs and Eighty Eight thousand only)**, against this tender.
- 9.2. EMD can be paid online through the link mazagondock.in/onlinepayment.aspx Or following the steps listed below:
 - a. Go to www.mazgondock.in
 - b. Click on Online Payment Tab available on the home page
 - c. Click on the Tender Tab.
 - d. Make the payment online using Debit Cards, Credit cards, Net Banking, BHIM/UPI etc. after filling the required details.



- 9.3. The EMD can also be remitted directly to MDL Bank Account as per details given below:

Beneficiary's Name	Mazagon Dock Shipbuilders Limited
Name of Bank	State Bank of India
Branch	Mazagon Br.
Branch Code	9054
Bank Address	Mazagon Branch, Mazagaon, Mumbai - 400 010
Telephone No. of Bank	23752802
Account No	10005255246
Account Type	Current Account
IFSC Code	SBIN0009054
MICR / NECS Code	400002120
Income Tax PAN No.	AAACM8029J
Income Tax TAN No.	MUMMO2076E

- 9.4. In case bidders pay EMD online or remit the same directly to MDL Bank account through NEFT, they should specifically mention the details of company name as well as nature of remittance, tender number/order number etc. in the text/narration fields of Bank's NEFT remittance in order to identify the same. The format at **Enclosure-12** is required to be filled up by the bidder and scanned copy of the same is to be uploaded along with Techno-commercial bid (Part-I).
- 9.5. EMD can also be submitted in the form of Bank Guarantee in the prescribed format at **Enclosure-15**. The Bank Guarantee (Including E-Bank Guarantee) should be valid for the offer validity period indicated in the Tender plus minimum one month as claim period
- 9.6. BG should be drawn from any of the banks from the list of Banks issued by a Scheduled Commercial (i.e. Indian Banks included in the Second Schedule of Reserve Bank of India Act, 1934 excluding Co-operative banks or Regional Rural Banks).and from list of Bankers approved by SBI/Canara bank published on MDL website.

Bidders submitting EMD by way of Bank Guarantee are requested to inform their issuing Bank to provide complete details viz., address, telephone / fax number(s) and e-mail id on their cover letter enclosing the BG.

Alternatively, bidder can submit the EMD in the form of ISB (Insurance Surety Bond) issued by an Indian Insurance company as defined in Section 2(7A) of the Insurance Act, 1938 and the Insurer should also be registered under the Insurance Act,1938 to transact the business of general insurance and also registered with the IRDAI. The bond shall be irrevocable and unconditional. The Format for the ISB for EMD is attached at Enclosure-15-A.

- 9.7. The Scanned Copy of the Bank Guarantee towards EMD shall be uploaded in the Techno-commercial bid (Part-I).
- 9.8. The Address Label of the Designated Addressee is at **Enclosure-27**



- 9.9. If the original of EMD instrument is NOT RECEIVED within the stipulated period of 07 Days from the closing date of the tender, the Bids / Offers will be liable for rejection.
- 9.10. Refund of EMD in all the cases shall be without interest as stated below:
- EMD will be refunded to the technically rejected bidders within 15 days from the date of price bid opening and remaining bidders within 30 days of determination of L1 or placement of Order on Successful bidder whichever is earlier.
 - In the event of cancellation of tender, the EMD will be refunded / returned to all the bidders.
 - EMD of successful bidders may be converted into performance security or refunded on receipt of performance security B.G.
 - If the validity of the offer of the firm has expired and if bidder is not willing to extend the validity of offer, the EMD of such bidders to be refunded.
- 9.11. The Earnest Money Deposit shall be forfeited by MDL in the following events:
- If the bidder withdraws, amends, impairs or derogates from the tender, agreed conditions of Technical Negotiation Committee/Commercial Negotiation Committee /Price Negotiation Committee in any respect within the period of validity of his offer.
 - If the successful bidder declines acceptance of order.
- 9.12. **बयाना राशि जमा करने से छूट/बोली प्रतिज्ञापत्र / EXEMPTION FROM SUBMISSION OF EMD/BID BOND:** Offers with non-submission of EMD shall be categorically rejected other than exempted category. Bidder shall submit/upload the supporting documentary evidence along with Part I bid for claiming EMD exemption. EMD is exempted for following cases:
- State & Central Government of India Departments & Public Sector Undertakings.
 - Firms registered with MDL. To qualify for EMD exemption, firms should necessarily submit valid copy of the Registration Certificate issued by MDL, under material group **9990003** for the items for which the offer is being submitted, in Part-I offer/bid. Firms in the process of obtaining MDL registration will not be considered for EMD exemption.
 - Common/Deemed DPSU registered vendors qualify for EMD exemption. Such firms shall submit valid copy of the registration certificate issued by DPSUs (other than MDL) for the works for which the offer is being submitted in Part-I offer/bid. Firms in process of obtaining registration in other DPSUs will not be considered for EMD exemption Start-ups as recognized by Department of Industrial Policy and Promotion (DIPP).
 - Green Channel Status vendors qualify for EMD exemption. Such firms shall submit valid copy of the Green channel certificate issued by MoD for the items for which the offer is being submitted in Part-I offer/bid. Firms in process of obtaining this certificate will not be considered for EMD exemption.
 - All the MSME bidders also need to submit the EMD, as there is no EMD exemption for MSME bidders because this being WORKS tender.



10. अखंडता समझौता / INTEGRITY PACT:

- 10.1. The Pact essentially envisages an agreement between the prospective vendors / bidders and MDL committing the persons / officials of both the parties, not to exercise any corrupt influence on any aspect of the contract.
- 10.2. Only those vendors / bidders who enter into such an Integrity Pact with MDL would be competent to participate in the bidding.
- 10.3. The Integrity Pact would be effective from the stage of invitation of bids till the complete execution of the contract. This pact begins when both parties have signed it. It expires for the Contractor **12 months** after the last payment under the contract and for all other bidders, **06 months** after the contract has been awarded.
- 10.4. Integrity Pact shall be duly signed and stamped on all pages. Bidders shall upload the signed Integrity Pact, as per format enclosed at **Enclosure-13** in the online Techno-Commercial Bid (Part-I). The hard copy of the 'INTEGRITY PACT' shall be submitted in the office of Outsourcing (OTS) Department, 6th floor Service Block Bldg., NY, Mazagon Dock Shipbuilders Limited within 07 Days after closing of the tender.
- 10.5. The Integrity Pact would be signed by the Competent Authority in MDL & a copy returned to the bidder.
- 10.6. MDL has appointed Independent External Monitors (IEMs), who will monitor the tender process and the execution of the contract, for compliance with all relevant laws, rules, regulations, economic use of resources and for fairness / transparency in its relations with its Bidder(s) and /or Contractor(s). The names and complete address with contact details of the IEMs are displayed on MDL's website www.mazagondock.in

Presently the panel consisting of the following Independent External Monitors (IEMs) has been appointed by MDL, in terms of Integrity Pact (IP) which forms part of MDL Tenders / Contracts.:

1. Mr. M N Krishnamurthy IPS(Retd) E-mail ID - krishnamurthymn19@gmail.com
2. Mr. Deepak Kashyap, IRTS (Retd) E-mail ID - deepakkashyapnd02@gmail.com

This panel is authorized to examine / consider all references made to it under this tender / contract. The bidder(s), in case of any dispute(s) / complaint(s) pertaining to this tender falling under provisions of Integrity Pact may raise the same directly with the IEMs on the panel viz

Shri M.N.Krishnamurthy, IPS(Retd.) Email ID: krishnamurthymn19@gmail.com;

Shri Deepak Kashyap, IRTS (Retd) Email ID : deepakkashyapnd02@gmail.com.

11. वैधता अवधि /TENDER VALIDITY PERIOD:

- 11.1 Bids / Offers shall remain valid for a period of not less than **180 Days** after the deadline date of submission.



- 11.2 Techno-Commercially accepted bidder shall be given opportunity to accept validity as per the tender in case of shorter validity quoted by him. Non-acceptance thereafter the bid shall be rejected by MDL as non-responsive.
- 11.3 In exceptional circumstances, prior to expiry of the original validity of offer(s), the bidders will be requested to extend the period of offer validity for a specified additional period.
- 11.4 In case the day up to which the bids are to remain valid falls on/ subsequently declared a holiday or closed day for MDL, the bid validity shall automatically be deemed to be extended up to the next working day.
- 11.5 In case techno-commercially accepted offer of the bidders than in exceptional circumstances, prior to expiry of the original validity of offer(s), MDL shall request the bidders to extend the period of offer validity for a specified additional period.
- 11.6 In case techno-commercially accepted bidder/s does not agree to extend the offer validity, the offers of all techno-commercially accepted bidder/s including the bidder who has not agreed to extend their offer validity shall be opened and proceed further with valid bids.
- 11.7 If the bidder who has not agreed to extend their offer validity found to be L1 then his price shall be used as reference price for negotiation purpose as applicable.

12. निविदाएँ खोलने की प्रक्रिया /OPENING OF BIDS:

- 12.1. Part-I (Techno-commercial Bid): Part-I bid will be opened online on the due tender opening date from 14:30 Hrs onwards in OTS-TS Section, OTS-Dept. The bidder can view the tender online by logging their user ID on the portal <https://eprocuremdl.nic.in>
- 12.2. **Part-II (Price Bid):** After completion of Techno-Commercial scrutiny, intimation for opening of Part-II bid will be communicated only to Techno-Commercially accepted bidders. Such intimation may be given at a short notice by E-mail or even by telephone, only to the Techno-Commercially qualified bidder(s). The bidders can view the price bids online from their location by logging on to the portal <https://eprocuremdl.nic.in> with their Class-III B digital signature certificate.

13. बोलियों का मूल्यांकन/EVALUATION OF BIDS:

- 13.1. The Bidders should meet the criteria as stipulated in "Prequalification criteria" and submit all documents as stipulated in Clause "Techno-Commercial (Part-I) Bid"
- 13.2. The Price bid of only Techno-Commercially qualified bidders shall be opened.
- 13.3. The comparison of the responsive tenders shall be on total outgo on Least Cost Net of Credit Basis (LCNC), for the procurement to be paid to the Contractor or the Service provider, including all elements of costs, duties, levies, freight, insurance etc. excluding GST (where ITC is available).
- 13.4. The applicable loading towards deviations shall be loaded for ranking purpose.
- 13.5. Discount given, if any, by the bidders, after the last date for submission of the bids but before opening of the price bids, will not be considered for determining the ranking of bids but will have to be considered after the said bidder is adjudged as L1.
- 13.6. Instances of multiple L1s: In cases where multiple bidders emerge as L1, the following action in the order of sequence shall be followed
 - a. Offline sealed supplementary bids indicating discount offered over already quoted price shall be sought from such L1 bidders on a pre-determined date and time. The



sealed supplementary bids shall be opened by tender opening executives in presence of representatives of those bidders on pre-determined date and time.

b. In case the above option is inconclusive, lottery option to be exercised.

13.7. Negotiations will be done with L1 bidders.

13.8. However, Purchase Preference in line with PUBLIC PROCUREMENT POLICY (Preference to Make in India) ORDER 2017 shall be extended to Class I Local Supplier. Order shall be placed accordingly on offered/negotiated price with such Class I Local Supplier, if the offered/negotiated price is acceptable to MDL

13.9. In case Purchase Preference is not applicable, the Order shall be placed on Lowest bidder (L1) in case the offered/negotiated price of L1 bidder is acceptable to MDL.

14. बोली अस्वीकृति करनेकी मापदंड / BID REJECTION CRITERIA:

14.1. The Following conditions/deviations are non- negotiable and therefore any bid falling under these conditions/ deviations shall be summarily rejected. Bidders to note that they shall not be provided any opportunity to rectify these conditions/ deviations post bid opening:

- a. Bids received after tender closing date and time.
- b. Bids received other than through e-portal.
- c. Bidders who are debarred under Public Procurement Policy (PPP) Make In India (MII) order 2017, GeM, CPPP including Tender holiday issued by MDL.
- d. Bids received without EMD (other than those who are exempted from payment of EMD).

14.2. Non-compliance/non-acceptance to any of the terms and conditions of the tender shall render the bid liable for rejection;

14.3. Equal time and opportunity for submission of deficient techno-commercial documents and clarification shall be given to the bidder's subject to TEF clause no:5.1 Note-s.no. i & ii. Bidders are required to submit such documents / clarifications within the duration / date stipulated by MDL failing which their bids are liable for rejection.

14.4. **DISQUALIFICATION:** Even if a bidder meets the tender terms and conditions including prequalification criteria, he shall be subject to disqualification if he is found to have:

- a. Made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirements; and/ or;
- b. On account of currency of debarment by MDL.

15. बेसलाईन शेड्यूल और प्रभावित शेड्यूल / Baseline Schedule and Impacted Schedule

15.1. The Contractor to submit Baseline Schedule in MS Project, duly approved by EIC/ Consultant, before commencement of Project. In case of additional work, revised schedule to be submitted by the Contractor.

15.2. Extension of Time Period shall be considered for delays not attributable to the Contractor only for the activities identified in the baseline schedule/ revised schedule. No Extension to the Contract shall be considered in case of failure of submission of Baseline Schedule and Impacted Schedule.

15.3. Construction Drawings for any activity identified in the baseline schedule will be issued 60 days prior to start date of that activity.

15.4. Contractor shall notify the Consultant/MDL in writing at least 15 days in advance for any drawings/ sketches/ detailing required during execution of the work at site.



16. समापन अवधि /DELIVERY PERIOD/COMPLETION SCHEDULE:

- 16.1 The overall time period for completion of the work from the date of placement of Work order is **08 (Eight)** months excluding 21 days' mobilization period.
- 16.2 The successful bidder shall submit detailed bar chart/work schedule including activity, milestones, deployment of resources/manpower for execution of the work within 21 days after placement of the Purchase Order.

17. लामबन्धी /MOBILIZATION: The Contractor shall deploy his manpower, material & machinery within 21 (Twenty-One) days from Placement of P.O.

18. मूल्य निर्धारण /PRICING: All materials shall be procured by the contractor as specified in the Technical Specification/Bill of Quantities, at his own cost and the price quoted shall be deemed to be inclusive of all applicable taxes, transportation, storage, royalties, handling, etc. The contractor should produce challans / Invoices of the materials and its quantity brought to the site as and when required by MDL.

19. कर और शुल्क /TAXES AND DUTIES:

- 19.1. GST as per GST Laws shall be payable extra as quoted and agreed.
- 19.2. In case of purchases of goods/services from unregistered dealers under GST Laws, GST will be paid by MDL under reverse charge mechanism.
- 19.3. Benefits from reduction in rate of tax/ITC are required to be passed on to consumer. Where "applicable GST" has been quoted as extra, Goods and service providers (except un-registered dealers under GST Law) have to submit declaration that they have complied with 'Anti-profiteering clause' under GST Law. Such declaration be given in technical bid.
- 19.4. If the vendor is registered under GST, vendor shall mention the HSN code for goods &/or SAC for services in their tax invoice, etc. These codes must be in accordance with GST Laws and responsibility of specifying correct HSN codes for goods &/or SAC for services is that of the vendor. MDL shall not be responsible for any error in HSN code for goods &/or SAC for services specified by supplier / contractor. Supplier /Contractor shall pay penalty and/ or interest imposed on MDL or any loss due to delay in availing ITC by MDL or any loss of ITC to MDL due to errors by vendors at any stage. MDL reserves right to recover any such interest, penalty or loss from any amount due to Supplier /Contractor or otherwise.
- 19.5. In case, MDL is unable to avail ITC, supplier/contractor at their own cost shall rectify the shortcoming in the returns to be filed immediately thereafter. Further, if the ITC is delayed / denied to MDL / reversed subsequently as per GST Laws due to non / delayed receipt of goods and / or services and / or tax invoice or expiry of timelines prescribed in GST Laws for availing ITC, non-payment of taxes or non-filing of returns or any other reason not attributable to MDL, Supplier /Contractor shall pay any loss of amount along with interest and penalty on MDL under GST Laws for the number of days the ITC was delayed. If the short coming is not rectified by supplier/contractor and MDL ends up in reversal of credits and / or payments, supplier /contractor is fully liable for making good all the loss incurred by MDL. MDL reserves right to recover any interest, penalty or loss from any amount due to Supplier /Contractor or otherwise.



- 19.6. If the vendor is registered under GST, the GST registration number (15 digit GSTIN) issued by GOI shall be mandatorily provided by the vendor. Vendor having multiple business verticals within state / at multiple states with separate GST registration numbers shall forward GSTIN of only that vertical which is involved in supply of goods and/or services. MDL GSTIN is 27AAACM8029J1ZA and vendor shall mention the same while invoicing and avoid any data entry error on GST portal.
- 19.7. If the vendor is registered under GST, Vendor shall ensure timely submission of invoice as per the provisions / requirement / timeline promulgated by GOI in relation to GST Law with all required supporting documents to enable MDL to avail input tax credit promptly. The vendors invoice inter alia should contain GSTIN of vendor, GSTIN of MDL (i.e. 27AAACM8029J1ZA), GST tax rate separately, HSN code wise goods or services, place of supply, signature of vendor, etc. Original invoice needs to be submitted to Bill Receipt Centre at MDL gate, and a copy of the invoice should be given to the goods receiving section (GRS).
- 19.8. If the vendor is registered under GST, vendor shall file all applicable returns under GST Laws in the stipulated time & any losses of tax credit to MDL arising due to delay in filing will be recovered from their invoice wherever MDL is eligible to avail tax credit. Any default towards payment of tax and / or uploading of monthly returns by supplier/contractor, MDL retains right to withhold payments towards tax portion until the same is corrected & complied by the supplier/contractor with the requirement of GST along with satisfactory evidence.
- 19.9. The rate sheet enclosed with the tender will indicate the rates to be entered under each head wherever applicable. Bidders must clearly mention the applicable Taxes & Duties unless otherwise stated in tender. The item-wise rates (i.e. Basic +P&F+F&I) quoted in the Rate Sheet should exclude Taxes & Duties. Bidder should indicate GST rates as applicable separately under each of the head in the same Rate sheet, which will be paid extra based on tax invoice to the extent applicable. The GST will be applicable on total basic rate of each item (i.e. Basic + P&F + F&I).
- 19.10. **Stamp Duty:** It shall be incumbent on the Contractor to pay Stamp duty on the contract. As per the provision made in article 63, Schedule-I, read with section 30, of the Maharashtra Stamp Act (Bombay Act LX of 1958), Stamp duty is payable by the Contractor for “works contract” that is to say, a contract for works and labour or services involving transfer of property in goods (whether as goods or in some other form) in its executions and includes a sub-contract, as under:

Contract Value	Stamp Duty
a. Where the amount or value said forth in work contract does not exceed ₹10 Lakhs.	₹500.00
b. Where it exceeds ₹10 Lakhs	₹500.00 +0.1% of the amount above ten lakhs subject to maximum of ` 25 lakhs.

Note: The Stamp Duty is applicable on Base value excluding GST.

- 19.11. Bidder(s) will not be entitled to any increase in rate of taxes occurring during the period of extended delivery schedule, if there is delay in supply / completion



attributed to him. However, if there is a decrease in taxes, the same must be passed on to MDL.

19.12. Wherever all-inclusive prices are quoted by the Bidder(s) without bifurcation of tax elements, no Price Variation can be considered in respect of any variations in statutory levies arising subsequently because of the absence of the required base figures in the purchase order / contract.

19.13. Taxes and other levies shall be deducted at source, wherever applicable, from the invoices of the Contractor/Bidder as per statutes.

19.14. Any increase/decrease in taxes, duties & levies or introduction of new taxes due to change in the legislation shall be subject to adjustment During currency of the original contract period.

19.15. **LABOUR CESS:** Deduction towards Labour Cess shall be made from invoices of contractor in line with 'Building & Other Construction Workers (BOCW) Act,1996. The Contractors who are having 20 or more workers have to be registered under BOCW (RE& CS) Act,1996. The Contractor shall ensure compliance of the same, if applicable to them.

20. भुगतान की शर्तें /TERMS OF PAYMENT: MDL Payment terms shall be as under

20.1. The payment for work done after reducing any deductibles and/or the amount leviable towards liquidated damages, if any and after including statutory taxes, duties and levies as applicable will be made through RTGS/NEFT/ECS as per the actual quantities of the work executed by way of running account invoices per item basis (R. A.) Preferably as on monthly basis.

20.2. The invoices must be submitted in four copies (**1-Original + 3 copies**) along with the joint measurements taken at site duly approved by the designated representatives of the Technical Services department.

20.3. The payment against invoices will be made within 15 days of its receipt in MDL provided submission of invoice in totality along with all the necessary documents as under:

20.3.1 Invoice Certification as per **Enclosure-24**,

20.3.2 Joint Measurement sheets duly signed & stamped by MDL,

20.3.3 Soft copy of Joint Measurement sheets.

20.3.4 SAP generated work completion certificate indicating deduction if any duly signed & stamped by MDL

20.3.5 Copy(s) of invoices of materials,

20.3.6 Vendor's self-Declaration (Refer Clause 20.1.6) wherever applicable,

20.3.7 Certification of Disposal of Scrap/ Debris as per **Enclosure-28**

20.3.8 Before submission of the final bill, the Contractor should sign and submit the following:

a. Actual Local Content Certificate as per Enclosure-10 (D)

b. A "No Claim Certificate" indicating that he has no claim against the company under the contract except as included in the final bill.

c. Taking over certificate issued by Engineer In charge, MDL

20.3.9 On request from Contractor, ad-hoc payments of not less than 75 % of eligible running account bill/due stage payment, shall be made within 10 working days of the submission of complete bill along with all applicable documents. The remaining payment is also to be made after final checking of the bill within



28 working days of submission of complete bill along with all applicable documents by the contractor.

20.3.10 **Electronic Invoicing System (EIS):** In any preceding financial year from 2017-18 onwards Contractor whose turnover is more than ₹ 5 crores on award of Purchase order, need to issue E invoice to MDL, which has an Invoice Registration Number (IRN) and a Quick Response (QR) code. An invoice without an IRN and QR code will be treated as an invalid invoice and MDL will not be entitled for Input Tax Credit (ITC)/ GST on a vendor Invoice which is not compliant with the above invoice notification.

20.3.11 **Vendor's self-declaration:** Wherever GST is applicable, payment will be released against e-Invoice (refer TEF Clause No. 22.1.5) or Invoice accompanied with Vendor's self-declaration stating that " we do not fall under the category of registered persons notified under Rule 48(4) of the Central GST Rules, 2017 and we are not required to comply with the e-Invoicing provisions under GST Act, as our aggregate turnover in any preceding financial year from 2017-18 onwards has not exceeded ₹ 5 Crore as per GST Act"

20.3.12 **Alternate MSME vendor payment through TReDS:**

In order to address the financial needs of MSME firms, GoI has introduced a platform for facilitating the financing of trade receivables of MSMEs from buyers, through multiple financiers which is termed as Trade Receivables Discounting System (TReDS). At TReDS, auctioning of invoices at competitive & transparent environment is done by financiers based on Buyer's credit profile.

MDL is registered on the "Invoicemart" TReDS platform and M1xchange of M/s Mynd Solutions Pvt. Ltd. Further, MDL has entered into an agreement with M/s.Receivables Exchange of Indica Limited (RXIL) for registration on TreDs platform. As a special gesture, all the above three discounting platforms i.e M/s.RXIL, Invoice Mart and M1Exchange have offered waiver of registration / on boarding fees to MDL Vendors

MSME bidders desirous to receive payments through TReDS platform may avail the facility if they are already registered on

1."Invoicemart" TReDS platform or by registering on it.

Contact details at "Invoicemart" TReDS platform are as below:
022 6235 7373 and a new mail id service@invoicemart.com.

2. "M1xchange" TReDS platform or by registering on it.

Contact details at "M1xchange" TReDS platform are as below:

+91 9920455374 Ms. Ashwathi Jayandran

email id ashwathi.jayandran@m1xchange.com

+91 8839915724 Ms. Prinyaka Shah Email id prinyaka.shah@m1xchange.com

21. वृद्धि/PRICE VARIATION: Not Applicable for this tender

22. परिनिर्धारित हर्जाना /LIQUIDATED DAMAGES:

22.1.Time is the essence of the contract and therefore the job, as ordered, should be completed on the dates mutually agreed upon in accordance with the delivery schedule. In cases of delay not attributable to MDL beyond the agreed schedule, the Contractor shall pay liquidated damages, a sum representing 0.5% (Half



percent) per week or part thereof, subject to maximum of 10% of the contract value (completed value).

22.2.If the Contractor fails to complete the works within the time or extended time as per the Order, then the contractor shall pay to MDL the sum stated above as liquidated damages for such default and not as a penalty for every day or part of a day which shall elapse between the time prescribed or extended time as the case may be and the date of completion of works. MDL may without prejudice to any other method of recovery deduct the amount of such damages from any monies in his hands due or which may become due to the contractor. The payment or deduction of such damages shall not relieve the contractor from his obligation to complete the works or from any other of his obligations and liabilities under the contract.

23. दोष दायित्व अवधि/DEFECT LIABILITY PERIOD (DLP):

- 23.1.The defect liability period shall be **01 Year** from the date of actual completion of entire work.
- 23.2.The contractor shall have to rectify any defects noticed in the work either by way of bad material or workmanship during the Defect Liability Period at no extra cost to MDL, on priority.

24.CLAIMS BY FIRMS: No claims by the firms will be entertained after 03 years from completion of Defect Liability Period.

25. अनुबंध निष्पादन गारंटी /CONTRACT PERFORMANCE GUARANTEE

25.1.Within 25 days after placement of order, the Contractor shall submit “PERFORMANCE BANK GUARANTEE” as per MDL format at **Enclosure-16** for 10% of contract value excluding taxes valid till 60 days beyond the stipulated Defect Liability Period of one year from actual completion of entire work.

Alternatively, bidder can submit the Performance security in the form of ISB (Insurance Surety Bond) issued by an Indian Insurance company as defined in Section 2(7A) of the Insurance Act, 1938 and the Insurer should also be registered under the Insurance Act,1938 to transact the business of general insurance and also registered with the IRDAI. The bond shall be irrevocable and unconditional. The Format for the ISB for Performance Security is attached at Enclosure-16 (A).

25.2.In case of increase in the Contract Value during execution of work: -

- i. In case of Contract value increases more than 10% during execution of the work, within 25 days after issue of Amendment of Purchase order, the contractor shall submit the additional “PERFORMANCE BANK GUARANTEE” of 10% of additional contract value excluding taxes valid till 60 days beyond the stipulated Defect Liability Period of three years from actual completion of entire work.
- ii. No additional Bank Guarantee for amended value upto 10% of Original Order Value is required

25.3.The Bank Guarantee shall be submitted by the bidders preferably in E-BG mode or through SWIFT drawn in favour of MAZAGON DOCK SHIPBUILDERS LIMITED, MUMBAI. The Bank Guarantee shall be only from the list of Banks issued by a Scheduled Commercial (i.e. Indian or Foreign Banks included in the



Second Schedule of Reserve Bank of India Act, 1934 excluding Co-operative banks or Regional Rural Banks). The Issuing Bank Notified vide OM No.F.9/4/2020-PPD issued by Department of Expenditure dated 30.12.2021 should also state the name and designation of the next Higher Authority of the Officials who have issued the Bank Guarantee. Crossed DD / Pay Order issued by Co-operative banks however may be considered to be accepted and the bid would be considered accordingly.

25.4. The Bank Guarantee shall be from banks as per list approved by SBI Bank published on MDL website. Bank Guarantee from banks not mentioned in the aforesaid approved list shall NOT be accepted.

25.5. Rolling Bank Guarantee towards Performance Security can be submitted with the validity period of at least three years with a claim period of three months within which the same to be extended by the contractor for further period by Amendment.

25.6. In case of non-submission of PBG within 25 days of Placement of Purchase Order, there is likelihood of cancellation of the order.

25.7. In case of delays in submission of the Performance Bank Guarantee, the amount towards the Bank Guarantees shall be retained from the subsequent Invoice. The same shall be returned to the Contractor, without interest, on submission of the Bank Guarantee and receipt of confirmation from the bank. In such case, MDL reserves the right to charge Interest @ SBAR+2% from the firm for such period of delays.

25.8. The Performance Bank Guarantee will be returned only after expiry of the 60 Days beyond the stipulated Defect Liability Period of three years from actual completion of entire work, provided there are no pending defects for rectification, already notified to the contractor. However, in cases where rectification of defects notified are not likely to be completed by the Contractor before expiry of the DLP, the Contractor will have to extend the Performance Bank Guarantee suitably or as requested by MDL.

25.9. The BG's should contain the following:

- i. The name, designation and code number of the Bank officer(s) signing the Guarantee.
- ii. The address and other details (including telephone No.) of the controlling officer of the Bank issuing the BG.

25.10. In case the validity of the Bank Guarantee is on the verge of expiry and the same is not the extended /not renewed by the contractor as per order terms, MDL reserves the right to forfeit the same.

26. जलरोधी गारंटी / WATERPROOFING GUARANTEE : (Not Applicable to this tender).

27. जल रिसाव के खिलाफ बैंक गारंटी/ BANK GUARANTEE AGAINST WATER LEAKAGE- (Not Applicable to this tender).

28. बीमा / INSURANCE:



- 28.1. The Contractor has to keep MDL indemnified against any claims by purchasing **CONTRACTOR ALL RISK** insurance policy for the value of the Contract from any Insurance Company of repute.
- 28.2. The policy shall be obtained in the **joint names of MDL and the Contractor**, with MDL's name appearing first. The Policy should be of full value of the Contract and shall be valid till the completion of the works. Contractor shall submit the policy within 21 days from the date of placement of order or before commencement of work whichever is earlier. The Original CAR Policy shall be deposited with Engineer in Charge and copy to be submitted to HOD (OTS) and shall be extended well in time as required.
- 28.3. In case Contract value increases more than 10% from Original Contract value during execution of the work, the contractor shall submit the additional "**CONTRACTOR ALL RISK** insurance of additional contract value.
- 28.4. The original of policy shall be lodged with MDL.
- 28.5. In case Contractor fails to submit valid CAR policy of full value of contract, their workmen shall not be allowed to enter inside MDL premises/ working areas and Engineer-In-Charge may issue prior Notice for Stoppage of work.

29. ठेकेदार का दायित्व / CONTRACTOR'S OBLIGATION:

- 29.1. Bidder shall abide by all Terms of Tender Enquiry (TEF), General Conditions of Contract (GCC) for Civil Works and respective acceptance formats are to be filled as appearing online in e-Techno-Commercial (Part-I) bid. The bidder shall also abide by the statutory requirements, Official Secret Acts 1923, Safety Code and Security Procedure, which can be downloaded from www.mazagondock.in → Tenders → Technical Services.
- i. The Contractor shall pay to his employees not less than the minimum wages and other statutory obligations applicable to the Engineering Industry as notified from time to time by the Central Government or the State Government whichever is higher under Minimum Wages Act.
 - ii. The Contractor shall be responsible for timely payment of wages of all his employees engaged in the Purchaser's Yard, not less than the prescribed minimum wages in each case and without any deductions of any kind, except as specified by Government or permissible under the Payment of Wages Act.
 - iii. The Contractor must settle all the pending dues of the employees i.e. arrears of wages, proportionate leave wages, proportionate bonus payment, etc.
 - iv. Before winding up the site, the Bidder / Contractor shall pay all terminal dues to his employees such as Notice pay, Gratuity, Retrenchment compensation, etc.
- 29.2. **Breach of Obligation with respect to Bid submitted:** In case of breach of any obligation mentioned under, the bidder shall be disqualified / debarred from the bidding process for a period of one year from the date of notification:
- i. Bidder has withdrawn / modified / amended / impaired / derogated from the tender during the period of bid validity
 - ii. Bidder fails or refuses to execute the contract upon notification of acceptance of bid by the Purchaser during the period of bid validity.



30. नियम और शर्तों की स्वीकृति/ACCEPTANCE OF TERMS AND CONDITION:

In case of improper on-line filling of Acceptance Formats for Tender Enquiry Form, General Conditions of Contract (GCC), it shall be presumed that all our tender terms & conditions are acceptable to bidder.

31. कार्य एवं माप का क्रियान्वयन /EXECUTION OF WORK AND MEASUREMENT:

- 31.1. All works shall be carried out and measured as per specifications and standard Engineering practice and mode of measurements, conforming to the relevant IS code. The Contactor shall ensure that skilled workmen in their respective trades are employed. He shall also employ qualified Engineer(s) / Supervisor(s) experienced in similar type of work, as required, for execution of work efficiently.
- 31.2. Request for permission for working on Saturday / Sunday / holidays if required, should be submitted 3 working days prior to the date of holiday, to Personnel department and Security through Technical Services Department.
- 31.3. The work is to be carried out in the area where MDL's normal activities are in progress. The Contractor has to plan his work in such a way as not to disturb the normal activities of MDL. The contractor shall not be paid for any compensation for idle period if generated due to any reason whatsoever. Reasonable extension in time, however, may be considered on application in writing along with supporting Documents.
- 31.4. All the quantities indicated in the Bill of Quantities are indicative only. However, the Contractor shall be paid for the actual work carried out at site in line with the Contract terms and conditions.
- 31.5. All the works under or in course of execution or executed in pursuance of the contract shall at all times be open to inspection and supervision of the MDL and the Contractor at all times during the usual working hours, offer assistance for the inspection of work. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.
- 31.6. The Contractor shall submit supporting documents such as Invoice of Materials, Delivery Challan(s), Release note from the nominated Inspection Agency, Test reports / Certificates, Packing Lists, Invoice, Performance Guarantee, Storage / Preservation / Installation / Commissioning / Maintenance Procedures & other Technical documentation in requisite sets as relevant along with the invoice for the purpose of certification by MDL.
- 31.7. The contractor shall give seven days' notice for MDL to arrange representatives for inspection at their works. Testing of samples shall be made in the presence of MDL representatives. Materials shall be delivered to MDL site only after clearance from MDL along with test certificates. MDL reserves the right to take random samples from materials delivered by the Contractor at site and send the same for testing at Govt. approved laboratory(s). Cost towards the same shall be borne by the Contractor.
- 31.8. Contractor shall arrange for equipment's / instruments with valid calibration certificate as required at site. The cost towards the same is deemed to be included in the quoted rates.



31.9. The Contractor shall comply with the sanitary requirements of the local Medical Health Authorities and bear the cost of any charges levied by such Authorities for the execution of work.

32. अनुबंध की निगरानी/MONITORING OF CONTRACT:

32.1. The Contractor shall record; submit to the Engineer daily, progress report for the preceding day showing up to date progress and progress during the previous day on all items of each section of the works in relation to and in consideration of the schedule. In addition, the Contractor shall submit on the second day of every fortnight, a detailed progress report giving the progress of the works during the preceding fortnight and also indicating the up to date progress of the work.

32.2. The Contractor shall appoint the Contractor's Representative with prior written approval from the MDL and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

32.3. The Contractor shall not, without the prior consent of the MDL, revoke the appointment of the Contractor's Representative or appoint a replacement.

32.4. The Contractor's Representative shall, on behalf of the Contractor, receive instructions from MDL.

32.5. The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Purchaser has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked. The Contractor shall appoint a team of qualified persons having adequate experience in execution of such works for assisting the Contractor's Representative.

32.6. The Contractor has to co-ordinate with the other specialised agencies so working on the project so as to ensure a proper end product of the work.

33. (A) ठेकेदार का दायरा/CONTRACTOR'S SCOPE:

33.1. **Power:** Power, if available and required by the Contractor, may be supplied in single phase or three phases, at a single nearby source free of cost. The contractor shall make his own arrangement for electrical fittings, cables/wires, welding transformers, etc. at his own cost.

33.2. **Water:** Water, if available, and required by the Contractor, may be supplied by MDL free of cost. However, the contractor shall make his own arrangement for connecting lines, storage etc. at his own cost.

33.3. **Equipment/Machinery:** The contractor shall make his own arrangement for all equipment, machinery, tools and tackles etc.

33.4. **Construction Material:** All the materials required for works procured by the Contractor shall be of repute make and as approved by MDL. The rate shall be inclusive of transportation, storage, security, handling etc.



33.5. **Consumables:** All the consumables required for the works including temporary works, allied/ associated job etc. shall be procured by the Contractor including transportation, storage, security, handling etc.

34. अतिरिक्त कार्य /EXTRA ITEMS/VARIATION IN QUANTITY:

34.1. Extra items of works, if any, shall be determined supported by a rate analysis on the following basis this needs to be submitted by the contractor the rate analysis shall contain bifurcation of material, labour, transportation and Overhead & profit components:

i. Rates derived from similar items of this Contract.

OR

ii. Rates for similar items of work executed through other agencies for MDL recently.

OR

iii. Rates mutually agreed to.

34.2. Variation in the quantities of items in the BOQ is permitted at the same rates provided the total value of the growth does not exceed 25% of the original order value. The same is binding to the contractor and the contractor shall execute the same at the specified rate in the Purchase Order for that item.

34.3. MDL reserves the right to conduct price negotiations with the Contractor in the following cases:

i. Finalization of rates for extra items.

ii. To seek reduction in the unit rates of the items for the excess quantity, if the total value of variation in quantities exceeds 25% of the original order value

35. बाधा / HINDRANCE:

35.1. A Hindrance Register as per attached format at **Enclosure-22** shall be maintained with the Designated Representative from TS Department. The Contractor shall submit schedule for completion of work and get it signed by MDL Engineer in charge of the project. The Schedule shall list out the major milestones leading to the completion of work as per final delivery date stipulated in the PO/Contract.

35.2. The Hindrance Register shall document the following aspect post placement of the PO/ Contract: -

i. Reasons for the delay vis-à-vis the mutually agreed schedule

ii. Delay in inputs (Drawings/ Documents/ Site Clearances/ Services/ Inspection Call)

iii. Delay by Inspection Agency/ Customer

iv. Delay on account of specialist services

v. Non-performance by the Contractor

vi. Delinquency by the vendor

vii. Force Majeure

viii. Any other relevant reason

35.3. All the hindrances with date of occurrence and removal are to be noted in the hindrance register. The Hindrance Register will be signed by the Designated Representatives from Technical Services Department (MDL) and the authorized Signatory from the Contractor side.



- 35.4. The Contractor may record their observations in the hindrance register. Any objections raised by the contractor shall be attended to and resolved without any delay.
- 35.5. In case the contractor has a different opinion for hindrance and a dispute arises, then the matter shall be referred to next higher authority in MDL and the decision shall be communicated to the Contractor within 15 days. The Contractor shall note that the decision of the next higher authority from MDL in case of dispute in respect of hindrances during the course of executing an order/ contract shall be final and binding on the contractor.
- 35.6. In case, MDL is unable to remove the hindrance immediately and if it is likely to take some time, the contractor shall be informed accordingly by the user. In such cases the contractor on MDL's approval may reduce manpower deployed on the work. **The Contractor shall also note that Under no circumstances Contractor shall be paid for idle manpower.**

36. कचराहटाना /DEBRIS REMOVAL/ स्वच्छता/HOUSEKEEPING:

- 36.1. Debris generated during execution of work shall be promptly disposed off outside MDL. The site will be maintained clean at all times and the Contractor is expected to budget for the same. Also, during dignitary visits, temporary works materials, debris etc. shall be shifted suitably without any additional cost to MDL.
- 36.2. In case debris is not removed within two days, MDL will remove the same and the charges towards debris removal @ Rs. 10,000/- per truck shall be deducted from Contractor's RA bills. Engineer-In-charge shall keep the record of the same and forward the details of recoveries in Invoice Certification.
- 36.3. The site will be maintained neat and clean at all times and the Contractor is expected to budget for the same. MDL has Designated Bins separately for Scrap Steel, Wood Scrap & Rubbish. Contractor shall segregate unusable scrap steel, wood, rubbish, if any, and deposit the same in the nearest respective bin.
- 36.4. The contractor to submit Certification of Disposal of Scrap/ Debris as per **Enclosure-28**

37. सुरक्षा और प्रशिक्षण /SAFETY AND TRAINING:

- 37.1. During the Construction Period, Safety Engineers shall be deputed on site as and when required and directed by MDL. This is mandatory requirement.
- 37.2. All the workers, Engineers of the contractor shall have Safety PPE's (Personnel Protective Equipment's) like Safety Helmets, Safety Shoes, Safety Belts, Hand Gloves, and Goggles etc. Contractors shall also have provision for minimum 5 to 10 visitors PPE's. The periphery of the building shall be covered with the Green net. The contractor shall also provide Safety net and Safety Belts for height work.
- 37.3. All workers on site shall adhere to the best safety practices applicable. All personal, process & material safety procedures shall be planned & implemented on site. Training & regular inspection shall ensure that safety standards are met.



- 37.4. First Aid kit & First aid training shall be given to all key members of the Site team.
- 37.5. Proper signage's shall be placed on site. Warning in case of any critical/hazardous activity shall be given prior to starting of such activity.
- 37.6. All workers, supervisor's contractor shall optimum training regarding all aspects of site management prior to commencement of work
- 37.7. Please refer Safety Instruction for sub Contractor's as Enclosed at Annexure 'A'.

38. ठेकेदार के कर्मचारियों का पुलिस सत्यापन /POLICE VERIFICATION OF CONTRACTOR's EMPLOYEES: The Contractor shall have to obtain Police Verification Report (PVR) of their Employees prior to deployment at MDL site for execution of the work. A Detailed procedure for Entry Passes for Contractor's Employees is displayed on MDL's website www.mazagondock.in → Tenders → Technical Services. In addition to this for loss of pass, bidders shall refer **Enclosure-23**. BIDDERS ARE REQUESTED TO NOTE THE SAME. NO RELAXATION SHOULD BE ASKED FOR.

39. प्रतिबंध निविदाकार/फ़र्म/विक्रेता/BANNED OR DE-LISTED TENDERER/FIRMS/VENDORS:

The Bidder / Contractor declares that they being Proprietors / Directors / Partners have not been any time individually or collectively blacklisted or banned or de-listed by any Government or quasi Government agencies or PSUs. If a Tenderer's entities as stated above have been blacklisted or banned or de-listed by any Government or quasi Government agencies or PSUs, this fact must be clearly stated in the prescribed format **online** at **Enclosure-11**. Filling the information in the said format is Mandatory for every Tenderer. MDL reserves the right to ask for additional information and right to accept /reject the bid.

40. मूल्य वरीयता /PRICE PREFERENCE: NO PRICE PREFERENCE SHALL BE GIVEN TO ANY BIDDER IRRESPECTIVE OF THEIR STATUS.

41. सार्वजनिक खरीद नीति (मेक इन इंडिया को प्राथमिकता) आदेश 2017/PUBLIC PROCUREMENT POLICY (Preference to Make in India) ORDER 2017:

The Government of India has issued revised Public Procurement (Preference to Make in India) order 2017 on 19th July 2024 as part of its policy to encourage "Make in India" and promote manufacturing and production of goods and services in India with a view to enhancing income and employment. Subject to the provisions of this order and to any specific instructions issued by Nodal Ministry or in pursuance of this order, Purchase Preference shall be given to local suppliers in all the procurements undertaken by MDL in the manner specified below:

- 41.1 Aspects of 'Preference to Make in India':** The following terminology / definitions used in the policy is enumerated below and applicable to the tender:
- Local content:** means the amount of value added in India which shall be the total value of item (goods, services or works or their combination) under procurement (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value in percent. Different definition of local Content may be



specified by the Nodal Ministry for items assigned to them which will prevail over above.

Note:

- a) The local content can be increased by vendors through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them.
- ii. Class-I Local Supplier: means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-I Local Supplier' under this Order.
- iii. Class-II Local Supplier: means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-II Local Supplier' but less than that prescribed for 'Class-I Local Supplier' under this Order.
- iv. Non-Local Supplier: means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II Local Supplier' under this Order.
- v. Minimum Local Content: The 'Local Content' requirement to categorize a supplier as 'Class-I Local Supplier' is minimum 50%. For 'Class-II Local Supplier', the 'local content' requirement is minimum 20%.
- vi. L1: means the lowest tender or lowest bid or lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.
- vii. Margin of Purchase Preference: means the maximum extent to which the price quoted by a Class-I Local Supplier may be above the L1 for the purpose of purchase preference. The margin of purchase preference shall be 20%.

Note:

1. Procedure for determination of L1 price for the purpose of deciding eligibility for Purchase Preference shall be as per tender Ranking criteria.
2. If Price/s of all Class I Local Supplier/s is more than 20% of L1's price, no purchase preference shall be applicable.

41.2 Purchase Preference (PP):

40.2.1 Subject to the provisions of the Order and to any specific instructions issued by the Nodal Ministry or in pursuance of the Order, purchase preference shall be given to 'Class-I local supplier' in procurements undertaken by procuring entities in the manner specified here under:
In the procurements of goods or works, which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

- a) Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract will be awarded to L1.



- b) If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
- c) In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.
- d) "Class-II local supplier" will not get purchase preference in any procurement, undertaken by procuring entities.

41.3 Reciprocity Clause:

- i) Entities of countries which have been identified by the nodal ministry/ department as not allowing Indian Companies to participate in their Government procurement for any item related to that nodal ministry shall not be allowed to participate in Government Procurement in India for all items related to that Nodal Ministry/ Department, except for the list of items published by the Ministry/ Department permitting their participation.
- ii) The term 'entity' of a country shall have the same meaning as under the FDI policy of Department for Promotion of Industry and Internal Trade(DPIIT) as amended from time to time.

41.4 Declaration/ Verification of Local content

- i) Participating bidders to indicate the percentage of local content (i.e. value added in India) along with the details of location/s where the local value addition is made, in their bids, item wise or tender wise. The indicated local content percentage shall decide categorization of the vendors as "Class-I Local Supplier" / "Class-II Local Supplier" / "Non-local Supplier". All bidders should declare that the item and service offered meets the minimum local content & indicate its percentage in their offer which shall meet or excel required local content specified in tender. This declaration is necessary even if Custom Duty Exemption and / or ERV (if applicable) are not being sought. Certification as under is to be submitted mandatorily in technical Offer-Part-I bid.

The bidders shall provide a certificate, as per **Enclosure-10(A)**, from statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of supplier other than companies) giving the percentage of local content.

- ii) Bidders to be noted that once the declaration / certification is committed at tender submission stage, the same cannot be altered subsequently at technical negotiation stage or after award of contract otherwise would be treated / considered as false declaration by bidder and necessary action shall be initiated as per Para 40.6 of the said Order for debarment.
- iii) Declared Local Content shall be the basis for categorization of the vendors and tender evaluation. However, MDL reserves the right to undertake detailed examination of declared local content and may call vendor to submit relevant documents.



- iv) In cases where MDL received the complaint from any vendor or person, along with the fees prescribed below, verification of Declared Local Content shall be carried out by seeking additional info as deemed necessary and the bidders (including unsuccessful bidders) against the tender shall be obliged to furnish the necessary documents. Failing to do so, the vendor may invite penal action as per the provisions of the Order. If MDL assess the capability, then it shall perform the verification. However, if in the opinion of MDL matter needs to be dealt at higher level, then the complaint shall be referred to Nodal Ministry and their fees / expenses / charges applicable as per the Nodal Ministry, if any, shall be borne by the complainant. MDL is authorized to prescribe fees for handling complaints under revised PPP MII 2017 Order. The fees for filing a complaint under the order shall be Rs. 10,000/- per case. The complaint shall be filed to the Chairman, Public Grievance Cell. The fee shall be deposited by complainant in MDL's Account by NEFT.
- v) On scrutiny of offer, if all the bidders participating in the tender happen to have either not submitted the declaration certificate or not declared / specified the local content percentage in the declaration certificate or specified local content lower than the minimum local content requirement as per the tender, the subject tender shall be cancelled & matter shall be taken up with Ministry through MDL Nodal Executive. Meanwhile, retendering may be done without applying the provisions of said Order for need fulfilment of MDL.
- vi) On opening of the price bids, if it is identified that there is difference in local content declaration made & local content percentage as per price quoted is now not meeting (i.e. lesser than) the specified tender requirement (i.e. only on the quoted price without any loading) then such bidder shall be disqualified and shall not be considered for ranking purpose. The bid would be treated / considered as given false declaration and necessary action for debarment shall be initiated.

41.5 Price negotiation & contract placement:

- i) MDL has right to negotiate with L1 bidders on the quoted prices. However, it shall be ensured that Local Content percentage as declared by the vendors maintained or increased but not reduced. The supplier shall provide a Local Content Certificate **Enclosure-10(C)**, from statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of supplier other than companies) giving the percentage of local content.
- ii) Supplier shall be intimated that the supporting documentation towards realization of committed Local Content as per the contract / order terms & conditions shall be maintained for a period of seven years from the date of completion of the contract for audit purpose. Nodal Ministry may constitute committees with internal & external experts for independent verification of self-declarations and auditor's / accountant's certificates on random basis and in the case of complaints.

41.6 Debarment of bidders / suppliers:

- i) False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of GFR 2017 for which a bidder or its successors can be debarred for up to 2 years as per Rule 151(iii) of GFR 2017 along with such other actions as may be permissible under law.



- ii) A supplier who has been debarred by any procuring entity for violation of said Order shall not be eligible for preference under said Order for procurement by any other procuring entity for the duration of debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in such a manner that ongoing procurements are not disrupted.

42. सामान्य वित्तीय नियमों के नियम 144 (xi) के तहत प्रतिबन्ध/ Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017:

- 42.1. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
- 42.2. "Bidder" (including the term 'tenderer', 'Consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- 42.3. "Bidder from a country which shares a land border with India" for the purpose of this Order means: -
- An entity incorporated, established or registered in such a country; or
 - A subsidiary of an entity incorporated, established or registered in such a country; or
 - An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - An entity whose *beneficial owner* is situated in such a country; or
 - An Indian (or other) agent of such an entity; or
 - A natural person who is a citizen of such a country; or
 - A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.
- 42.4. The beneficial owner for the purpose of **41.3** above will be as under:
- In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(S), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.
Explanation---
 - "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;
 - "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder's agreements or voting agreements. - In case of a partnership firm, the beneficial owner is the natural person(S) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;



- iii. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
 - iv. Where no natural person is identified under **(42.4.i) or (42.4.ii) or (42.4.iii)** above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
 - v. In case of a trust, the identification or beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- 42.5. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.
- 42.6. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.
- 42.7. The bidders shall provide Declaration in respect of restriction under Rule 144 (xi) of the General Financial Rules (GFRs), 2017 in the prescribed format as per **Enclosure-10 (E)**

43. सार्वजनिक शिकायत कक्ष /PUBLIC GRIEVANCE CELL

A Public Grievance Cell headed by Executive Director (Tech) has been set up in the Company. Members of public having complaints or grievances are advised to contact him on Wednesday between 10:00 hours and 12:30 hours in his office on 4th Floor, D2 Building, East yard, MDL or send their complaints / grievances to him in writing for redressal. His Telephone No. is 022- 2376 3512 / 2372 3426 / 8879399826

44. विवाद समाधान तंत्र /DISPUTE RESOLUTION MECHANISM(DRM) and मध्यस्थता /ARBITRATION: Refer General Conditions of Contract Clause No. 23,24,25.

45. अधिकार क्षेत्र /JURISDICTION: Refer General Conditions of Contract Clause No. 26.

46. एमडीएल का अधिकार /MDL's RIGHT: MDL reserves the right to consider placement of Order / Contract in part or in full against the tendered quantity or reject any or all tenders without assigning any reasons thereof.

47. बोलीदाताओं / एजेंटों के बिच हितों का टकराव / CONFLICT OF INTEREST AMONG BIDDERS /AGENTS:

- 47.1. Conflict of Interest among bidders/ Agents: A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-



competitive practices to the detriment of MDL’s interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) They have controlling partner(s) in common; or
- b) They receive or have received any direct or indirect subsidy/ financial stake from any of them; or
- c) They have the same legal representative/agent for purposes of this bid; or
- d) They have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.
- f) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/ management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidder must proactively declare such sister/ common business/ management units in same/ similar line of business.

47.2. Declaration in respect of Conflict of Interest among Bidders/ Agents as per format at **Enclosure-29** is to be submitted by bidder.

We look forward to your participation in on-line bidding by offering your most competitive and reasonable bid against this tender.

48. List of Enclosures attached below

Yours faithfully,
 For **MAZAGON DOCK SHIPBUILDERS LIMITED,**
 GM/HOD (OTS)

List of Enclosures:

1.	Enclosure-1	-	Form of undertaking to be furnished by the bidder
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2.	Enclosure-2	-	Tender Enquiry Acceptance Form
3.	Enclosure-3, Enclosure -3.1	-	Details Of General Engineering Work - Special Condition of Contract
4.	Enclosure-4	-	General Conditions of Contract (GCC) Acceptance Form–GCC attached separately.
5.	Enclosure-5	-	Deviations from Tender Enquiry Form/ GCC
6.	Enclosure-6	-	Financial Information of Bidder
7.	Enclosure-7	-	Details of Existing Commitments & On-going Works-Calculation of Bid capacity.
8.	Enclosure-8	-	Particulars of Experience in Similar Projects
9.	Enclosure-9	-	Personnel available with the Contractor for this Project
10.	Enclosure- 10 (A)	-	Declaration Certificate for Local Content (Sample Filled up Form for Filling Enclosure-10 (A) ATTACHED SEPERATELY)
11.	Enclosure- 10 (C)	-	Actual Local Content Certificate
12.	Enclosure- 10 (E)	-	Declaration in respect of restriction under Rule 144 (xi) of the General Financial Rules (GFRs), 2017
13.	Enclosure- 10 (F)	-	Declaration in respect of debarred under Public Procurement Policy (PPP) Make In India (MII) order 2017
14.	Enclosure-11	-	Banned or Delisted of Firm/Vendor
15.	Enclosure-12	-	MDL Bank Account Details for Online Remittance of Security Deposit/ Performance Bank Guarantee
16.	Enclosure-13	-	Integrity Pact
17.	Enclosure-14	-	RTGS/NEFT/ECS – Mandate Authorisation Form
18.	Enclosure-15	-	EMD
19.	Enclosure-15(A)	-	Proforma of unconditional and irrevocable Insurance Surety Bond for BID BOND/ EMD
20.	Enclosure-16	-	Proforma for Performance Bank Guarantee
21.	Enclosure-16(A)	-	Proforma of unconditional and irrevocable Insurance Surety Bond for Performance Security
22.	Enclosure-17	-	Performa for Waterproofing Bank Guarantee - (Not applicable to this tender)
23.	Enclosure-18	-	Performa for Bank Guarantee against water leakage- (Not applicable to this tender)
24.	Enclosure-19	-	Price Bid (Part-II) - to be submitted online
25.	Enclosure-20	-	Tender Drawings at Attached
26.	Enclosure-21	-	Scope of Work
27.	Enclosure-22	-	Hindrance Register Format
28.	Enclosure-23	-	Loss of Pass
29.	Enclosure-24	-	Invoice Certification Format
30.	Enclosure-25	-	Extract of Official Secrets Act, 1923



31.	Enclosure-26	-	CHECKLIST OF SUBMITTALS ATTACHED ALONGWITH ONLINE TECHNICAL BID
32.	Enclosure-27	-	Address Label
33.	Enclosure-28		Certification for Disposal of Scrap/Debris
34.	Enclosure-29		Declaration in respect of Conflict of Interest among Bidders/ Agents
35.	SAMPLE FORMAT	-	SAMPLE FORMAT FOR FILLING ENCLOSURE-10 (B) OF TENDER
36.	Statutory requirements & Safety clause	-	<u>To be downloaded from our website www.mazagondock.in</u>
37.	Procedure for security passes	-	<u>To be downloaded from our website www.mazagondock.in</u>
38.	ANNEXURE-A		<u>SAFETY INSTRUCTIONS FOR SUB-CONTRACTORS IN MDL, attached separately</u>
39.	ANNEXURE-B		<u>STANDARD TERMS AND CONDITION (HR) FOR STATUTORY COMPLIANCE WHILE ENGAGING SUB-CONTRACTORS/ OUTSOURCED MANPOWER AND ITS UNIT attached separately</u>
40.	Enclosure GCC		GENERAL CONDITIONS OF CONTRACT FOR WORKS



Enclosure-1

FORM OF UNDERTAKING TO BE FURNISHED BY THE BIDDER

(To be typed on Bidder's Letter head)

To,
The General Manager (OTS),
OTS-TS Section
Mazagon Dock Shipbuilders Limited,
Dockyard Road, Mumbai-400 010.
Sir,

Sub:

Asphalting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)

1. Having visited the site and having examined the General Conditions of Contract, Special Conditions of Contract, Technical Specifications and Bill of Quantities for the above named work, we offer to construct, complete and maintain the whole of the said works in conformity with the said General Conditions of Contract, Special Conditions of Contract, Technical Specifications, and Bill of Quantities for the sum stated in Bill of Quantities included in this Tender Document for such other sum as may be ascertained in accordance with the said conditions of Contract.
2. We undertake to complete and deliver the whole of the works comprised in the Contract within the time stated in this tender.
3. We have independently considered the amount of Liquidated damages indicated in the tender and agree that it represents a fair estimate of the loss likely to be suffered by you in the event of the work(s) not being completed in time.
4. If our Tender is accepted, we will, when required, obtain the guarantees from a Bank (to be approved by you) to be jointly and severally bound with us for the sum named in the tender for the due performance of the Contract under the terms of a Bond to be approved by you.
5. The Contractor's All Risk Policy for the full value of the Contract valid till the completion period will be obtained by us in the joint names of Mazagon Dock Shipbuilders Limited and ourselves.
6. We agree to abide by this Tender for the period of **150** days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiry of this period.
7. Unless and until a formal Agreement or Order is prepared and executed, this tender together with your written acceptance thereof, shall constitute a binding Contract between us.
8. We understand that if our Tender-Bid is accepted, we are to be jointly and severally responsible for the due performance of the Contract.
9. We understand that you are not bound to accept the lowest or any Tender you may receive.
10. We undertake to comply with the Anti-profiteering provisions of GST Act 2017 and we will pass on the benefits from reduction in the rate of Tax/input Tax credit if any, to MDL and there will be no liability on MDL on account of GST/Input Tax Credit.

Dated this _____ day of _____ (year)

Signature _____ in the capacity of _____

duly authorised to sign Tenders for and on behalf of _____

(IN BLOCK CAPITALS)



Signature _____ Witness:
Name _____ Address of Witness _____
Occupation _____

**Enclosure-2****TENDER ENQUIRY (TEF) ACCEPTANCE FORM**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED**

TEF CLAUSE NO.	TENDERER'S REMARK	TEF CLAUSE NO.	TENDERER'S REMARK
	ACCEPTED/ DEVIATION		ACCEPTED/ DEVIATION
1		24	
2		25	
3		26	NA
4		27	NA
5		28	
6		29	
7		30	
8		31	
9		32	
10		33	
11		34	
12		35	
13		36	
14		37	
15		38	
16		39	
17		40	
18		41	
19		42	
20		43	
21	NA	44	
22		45	
23		46	
		47	

COMPANY'S NAME & ADDRESS :

SIGNATURE:

DATE:

NAME:

DESIGNATION:



TENDERER'S COMPANY

SEAL:

NOTES :

1. Bidder(s) should carefully read the Tender Enquiry Terms & Conditions (TEF) included in the tender prior to filling up this acceptance format.
2. Bidder(s) should indicate Accepted/ Deviation Taken for each clause number in the above table.
3. Bidder(s) to attach Separate Sheet indicating all relevant details such as Number & description of the Clause, Reasons for Deviation and Alternative suggested for any deviations taken by them in the prescribed format indicated at **Enclosure-5**.
4. TEF clause numbers shown in the above format also includes the sub-clauses under these clauses. For example 4 means – clause nos. 4, 4(i), 4(ii) etc.

**Enclosure-3**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

Sub:- Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY).

Details of General Construction Work

(To be typed on Bidders Letterhead & submitted)

Sr. No	Financial Year	Particulars	Amount in Rs.
1	31st March 2025	Annual turnover value of General Construction work in any of the year over a period of 07years, ending 31st March 2025	
2		Out of the above, annual turnover value in the relevant year from road work	

Signature of Chartered Accountant
with Seal

Signature and Seal of the Bidder

**Enclosure-3.1**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

Sr.No	Designation Technical Staff	Total No's	Qualification	Min.Experince	Duration	Rate at which recovery shall be made from the contractor
01	Project Manager Cum Planning	01	B.E,Civil or Diploma Engineer	02Years or 05years respectively	Till Completion of the work	Rs.15000 per month.
02	Site/ Billing/Quality Engineer	01	B.E,Civil or Diploma Engineer	02Years or 05years respectively	Till Completion of the work	Rs.15000 per month.
03	Safety Officer	01	Graduate / Diploma with Safety Certificate Course	03years	Till Completion of the work	Rs.15000 per month



Enclosure-4

ACCEPTANCE FORM FOR GENERAL CONDITIONS OF CONTRACT (GCC)

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED

GCC CLAUSE No.	TENDERER'S REMARK	GCC CLAUSE No.	TENDERER'S REMARK	GCC CLAUSE No.	TENDERER'S REMARK
	ACCEPTED/ DEVIATION		ACCEPTED/ DEVIATION		ACCEPTED/ DEVIATION
1		38		76	
2		39		77	
3		40		78	
4		41		79	
5		42		80	
6		43		81	
7		44		82	
8		45		83	
9		46		84	
10		47		85	
11		48		86	
12		49		87	
13		50		88	
14		51		89	
15		52		90	
16		53		91	
17		54		92	
18		55		93	
19		56		94	
20		57		95	
21		58		96	
22		59		97	
23		60		98	
24		61		99	
25		62		100	
26		63		101	
27		64		102	
28		65		103	
29		67		104	
30		68		105	
31		69		106	
32		70		107	
33		71		108	



34		72		109	
35		73		110	
36		74			
37		75			

COMPANY'S NAME & ADDRESS:

SIGNATURE:

DATE:

NAME:

DESIGNATION:

TENDERER'S COMPANY

SEAL:

NOTES:

1. Bidder(s) should carefully read the General Conditions OF CONTRACT (GCC) of the Tender Enquiry prior to filling up this acceptance format.
2. Bidder(s) should indicate Accepted/ Deviation Taken for each clause number in the above table.
3. Bidder(s) to attach Separate Sheet indicating all relevant details such as Number & description of the Clause, Reasons for Deviation and Alternative suggested for any deviations taken by them in the prescribed format indicated at **Enclosure-5**.
4. Clause numbers shown in the above format also includes the sub-clauses under these clauses. For example, Clause no. 56 means – Clause nos. 56, 56 i), 56 a) etc.



Enclosure-5

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

**DEVIATIONS FROM TERMS & CONDITIONS OF TENDER ENQUIRY
FORM/GCC/TECHNICAL SPECIFICATION**

All deviations from the Conditions of Tender Enquiry Form/ GCC shall be filled in by the bidder clause by clause in this Schedule. If deviations are discussed in the covering Letter of Tender, then reference to the said letter shall be made below.

Clause No.	Contractual requirement	Deviation proposed by the Bidder	Reason for proposed deviation
(1)	(2)	(3)	(4)

The Bidder hereby certifies that the above mentioned are the only deviations from the Conditions of Contract.

SIGNATURE _____

NAME _____

DESIGNATION _____

COMPANY SEAL

COMPANY _____

DATE _____



Enclosure-6

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.

Financial Information of Bidder

(To be typed on Bidders Letterhead & submitted)

Description	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	Maximum Value ₹
	V	W	X	Y	Z	(A)
Maximum value of General Civil Construction						
Above Value updated at the current price level by applying a weightage of 7% per annum						

Signature of Chartered Accountant
with Seal

Signature and Seal of the Bidder

**Enclosure-7**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

Details of Existing Commitments & On-going Works*(To be typed on Bidders Letterhead & submitted)*

1	2	3	4	5	6	7	8
Sr. No.	Name of the Work/ Project	Contract Value (₹)	Date of start as per PO/ Contract	Date of Completion as per PO/Contract	Work Done up to the preceding Month of submission of Bid (₹)	Value of existing commitments and on-going works to be completed (for all the Clients of the Bidder) during the period of completion of work for which bids have been invited (₹)	Value updated at the current price level (₹) (B)

Note: The bidder shall also include the value of all such works which are awarded to bidder but yet not started up to the last day of preceding month of submission of bid.

CALCULATION OF AVAILABLE BID CAPACITY

- (a) Available Bid Capacity = $[AxNx1.5]-B$, where
- A = Maximum value of engineering (Civil/ Electrical/ Mechanical as relevant to work being procured) works executed in any one year during the last five years (updated at the current price level by applying a weightage of 7% per annum), taking into account the completed as well as works in progress. Value of engineering works executed during last five years shall be certified by Chartered Accountant and shall be considered for evaluation.
 - N = Number of years prescribed for completion of work for which bids have been invited = **0.67 (08 months)**.



- iii. B = Value (updated at the current price level) of the existing commitments and ongoing works to be completed in the next 'N' years. This statement should be submitted duly verified by Chartered Accountant.

Note: -

- a) The yield rate of GoI bonds as on the closing date of the tender shall be considered as discounting factor for updation of the value of "B".

Available Bid Capacity = ₹_____

Note: The bidder should attach the proof for 'A' & 'B' mentioned above.

Signature of Chartered Accountant
with Seal

Signature and Seal of the Bidder

**Enclosure-8****PARTICULARS OF EXPERIENCE IN SIMILAR PROJECTS**

The General Manager,
OTS Department,
6th Floor, Service Blcock Bldg. NY,
Mazagon Dock Shipbuilders Limited,
Dock Yard Road,
Mumbai - 400010, INDIA

Sir,

Sub: Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY).

With reference to the above and after having read the terms & conditions in the Tender Enquiry, we wish to submit our bid for consideration of pre-qualification under **Clause 7.1.1.1/7.1.1.2/7.1.1.3** (*strike out whichever is not applicable*) of the tender. The details of similar projects as stipulated in the tender enquiry form and completed satisfactorily by us are as under:

Clause 7.1.1.1: Three similar completed works each costing not less than **₹ 186 Lakhs.**

Sr. No	PO No & Date	Completion Cost	Work order (Submitted/Not submitted)	Completion Certificate (Submitted/Not Submitted)
1				
2				
3				

OR

Clause 7.1.1.2: Two similar completed works each costing not less than **₹ 233 Lakhs.**

Sr. No	PO No & Date	Completion Cost	Work order (Submitted/Not submitted)	Completion Certificate (Submitted/Not Submitted)
1				
2				

OR

Clause 7.1.1.3: One similar completed work costing not less than **₹ 372 Lakhs.**

Sr. No	PO No & Date	Completion Cost	Work order (Submitted/Not submitted)	Completion Certificate (Submitted/Not Submitted)
1				

2. The brief details of above similar projects are as under: (Use separate sheet for each work)

i.	Project Name:	
ii.	Project Location	
iii.	Client:	
iv.	Address of the Client & contact person with Tel No. & Fax No	



v.	Brief Description of the work	
vi.	Cost of project	
vii.	Contract/Work order No:	
viii.	Completion Certificate details viz, ref. No & date of issue	
ix.	Date of Commencement of Work	
x.	Date of completion work	

3. The following documents in support of the above similar projects are enclosed in our techno-commercial bid:
1. Copy of Work Order/Contract Agreement indicating contract amount, Project/Work value, Scope of Work & other details with signature of Both Parties.
 2. Work Completion Certificates issued by the Client(s) indicating proper reference of Contract Agreement & Date of Completion.
 3. Any other document (*please specify*)
4. We further agree to produce originals of the documents submitted in respect of the similar projects detailed above for verification by MDL as and when called for.

Signature of Contractor:

Name and Address:

Place:

Date:

Official Seal



Enclosure-9

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

KEY PERSONNEL AVAILABLE WITH THE CONTRACTOR FOR THIS PROJECT

Bidders should provide information of personnel of relevant discipline (Engineers & Supervisors) including Safety Officer(s) who will be deployed for this Project in the following prescribed format.

Sr. No.	Designation of the Personnel with Discipline	No of Personnel to be deployed	Month wise Duration of Deployment for this project	No of Years of Relevant Experience



Enclosure-10 (A)

**To,
OTS-TS SECTION
OTS Department, (OTS-TS Section)
MAZAGON DOCK SHIPBUILDERS LIMITED.**

DECLARATION CERTIFICATE FOR LOCAL CONTENT

This declaration serves as a declaration form for the bidders. (Before completing this declaration, bidders must study the General Conditions, Definitions, Govt. Directives applicable in respect of Local Content & prescribed tender conditions).

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CORPORATION, PARTNERSHIP OR INDIVIDUAL)

**IN RESPECT OF BID/ TENDER No.....
ISSUED BY: MAZAGON DOCK SHIPBUILDERS LIMITED**

NB: The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned, (full names), do hereby declare, in my capacity as of(name of bidder entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have read and understood the requirement of local content (LC) and same is specified as percentage calculated in accordance with the definition provided at clause 2 of revised Public Procurement (preference to Make in India) Order2017.

“Local content” as per above order means the amount of value added in India which shall be the total value of items procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value in percent.”

(c) I have satisfied myself that the goods/services/works to be delivered in terms of the above specified bid comply with the local content requirements as specified in the tender for ‘Class- I Local Supplier’ / ‘Class-II Local Supplier’, and as above.

(d) The local content calculated using the definition given above are asunder:

Tender Item Sr No	Local content calculated as above %	Location of value addition
1		
2		



3		
4		

Attach separate sheet duly signed if space is not sufficient

NB: Local content percentage shall be declared item wise or tender wise strictly as per the terms of the tender.

- (e) I accept that the Procurement Authority / Institution / MDL / Nodal Ministry has the right to request that the local content be verified in terms of the requirements of revised Public Procurement (preference to Make in India) Order 2017 dtd16.09.2020 and I shall furnish the document / information on demand. Failure on my part to furnish the data will be treated as false declaration as per PPP MII Order 2017. In case of contract being awarded, I undertake to retain the relevant documents for 7 years from date of execution.
- (f) I understand that the submission of incorrect data, or data that are not verifiable as described in revised Public Procurement (preference to Make in India) Order 2017, may result in the Procurement Authority / Nodal Ministry / MDL imposing any or all of the remedies as provided for in Clause 9 of the Revised Public Procurement (preference to Make in India) Order 2017 dated 16.09.2020.

SIGNATURE: *(TO BE SIGNED & STAMPED BY AUTHORISED SIGNATORY STRICTLY AS PER TEF CLAUSE NO. 41.4.i)*-VIZ; CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CORPORATION, PARTNERSHIP OR INDIVIDUAL)

Seal / Stamp of Authorized Signatory DATE:_____



Enclosure-10 (C)

ACTUAL LOCAL CONTENT CERTIFICATE

Note: This certificate shall be submitted by the successful bidder post execution of the contract.

LOCAL CONTENT DECLARATION (post execution of contract / PO) BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF CONTRACT No./ PO

No.....

ISSUED BY: MAZAGON DOCK SHIPBUILDERS LIMITED

NB: The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned,
(full names), do hereby declare, in my capacity as of(name of bidder entity), that:

- (a) The facts contained herein are within my own personal knowledge.
- (b) My/our company has declared the local content at the time of tender as under

Tender Item Sr. No	Local content calculated as above %	Location of local value

(c) My/our company has completed the above referred contract and the actual local content of the delivered item/s calculated using the definition in the declaration given at the time of bid is as under:

Tender Item Sr.No	Declared minimum Local content at the time of bidding (%)	Achieved Local content delivered items (%)

NB: Local content percentage shall strictly be declared item wise or tender wise as was declared at the time of bid / tender.

(d) I accept that the Procurement Authority / Institution / MDL / Nodal Ministry has the right to request that the local content be verified in terms of the requirements of revised Public Procurement (preference to Make in



India) Order 2017 dated 16.09.2020 and I shall furnish the document / information on demand. Failure on my part to furnish the data will be treated as false declaration as per PPP MII Order 2017. I undertake to retain the relevant documents for 7 years from date of execution.

(e) I understand that the submission of incorrect data, or data that are not verifiable as described in revised Public Procurement (preference to Make in India) Order 2017, may result in the Procurement Authority / Nodal Ministry / MDL imposing any or all of the remedies as provided for in Clause 9 of the Revised Public Procurement (preference to Make in India) Order 2017 dated 16.09.2020.

SIGNATURE: _____

DATE:

Seal / Stamp of Bidder



Enclosure-10 (E)

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

Declaration in respect of restriction under Rule 144 (xi) of the General Financial Rules (GFRs), 2017

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authorities and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authorities. I hereby certify that this bidder fulfils all requirements in this regards and is eligible to be considered. (Where applicable, evidence of valid registration by the Competent Authorities shall be attached]

SIGNATURE:_____

DATE:_____

Seal / Stamp of Bidder



Enclosure-10 (F)

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

Declaration in respect of debarred under Public Procurement Policy (PPP) Make In India (MII) order 2017, GeM, CPPP including Tender holiday issued by MDL.

*I have read the **Clause No. 41** of the Tender and hereby declare that I/ we have not been debarred by any Government or quasi Government agencies or PSU's under Public Procurement Policy (PPP) Make In India (MII) order 2017, GeM and CPPP.*

Further, I hereby declare that I/ we have not been given the Tender holiday by MDL.

SIGNATURE: _____

DATE: _____

Seal / Stamp of Bidder

**Enclosure-11**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

PARTICULARS OF BANNED OR DE-LISTED TENDERER/FIRM/VENDORS

The General Manager,
OTS Department,
6th Floor, Service Block Bldg. NY,
Mazagon Dock Shipbuilders Limited,
Dock Yard Road,
Mumbai - 400010, INDIA

Sir,

Sub: Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY).

With reference to **Clause no: 39** (Banned or De-Listed Tenderer/ Firms / Vendors), referred Tender Enquiry, we declare the Information as below.

A. In case of Banned / Blacklisted by the client.

Sl	Name of Government/ quasi Government agencies/or PSUs who has Banned/Black listed	Name of Project value which firm is Banned/ Blacklisted	Banned/ Black listed for the Duration	Reasons

B. In case of penal Action Proceeding / Show cause notices initiated/issued by the Government or quasi Government agencies or PSU's including Pending in Judicial proceedings:

Sl	Name of Client	Name of Project / Work	Status

C. The bidding firm to enclose / submit all relevant documents pertaining to Sr. no. A & Sr. no. B above.

Signature of Contractor:

Name and Address:

Place:

Date:

Official Seal

**Enclosure-12**

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.

MAZAGON DOCK SHIPBUILDERS LIMITED
DOCKYARD ROAD
MUMBAI - 400010

1. MDL'S BANK ACCOUNT DETAILS:

NAME OF BANK A/C HOLDER	:	MAZAGON DOCK SHIPBUILDERS LTD
BANK AND BRANCH	:	STATE BANK OF INDIA, MAZAGON BRANCH, MUMBAI
BRANCH CODE	:	9054
BANK ACCOUNT NO	:	10005255246
IFSC CODE		SBIN0009054
MICR/NECS CODE		400002120
INCOME TAX PAN NO		AAACM8029J
INCOME TAX TAN NO		MUMM02076E

2. DETAILS OF REMITTANCE TO MDL'S BANK ACCOUNT:

(To be filled in by the vendors/firms making remittance of funds in MDL'S Bank Account)

Date of Remittance	Name of Firm	UTR No.	MDL tender/PO. Ref No.	Nature of Remittance viz. Performance Bank Guarantee etc.	Amount Remitted (₹)
			MDL Tender No. 1900000253		

Signature of Bidder

3. SAP Parked Document No: _____ Date: _____
(To be filled in by MDL's Commercial Executive)



Enclosure-13

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

INTEGRITY PACT:

MAZAGON DOCK SHIPBUILDERS LIMITED (MDL) hereinafter referred to as "**The Principal/Buyer**"

And.....hereinafter referred to as "**The Bidder/ Contractor**"

Preamble

The Principal/Buyer intends to award, under laid down organizational procedures, contract/s forThe Principal/Buyer values full compliance with all relevant laws of the land rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s) and /or Contractor(s).

In order to achieve these goals, the Principal/Buyer will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 - Commitments of the Principal/Buyer:

- (1) The Principal/Buyer commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - a) No employee of the Principal/Buyer, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - b) The Principal/Buyer will during the tender process treat all Bidder(s) with equity and reason. The Principal/Buyer will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - c) The Principal/Buyer will exclude from the process all known prejudiced persons.
 - d) The Principal/Buyer undertakes to scrupulously follow the tender containing General Conditions of Contract (GCC) in respect of procurement contracts for goods, services and civil works.
- (2) If the Principal/Buyer obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti Corruption Laws of India, or if there be a substantive suspicion in this regard, the Principal/Buyer will inform the Chief Vigilance Officer, MDL and in addition can initiate disciplinary actions.



Section 2 - Commitments of the Bidder(s)/Contractor(s):

- (1) The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- a) The Bidder(s)/Contractor(s) will not, directly or through any other persons or firm, offer promise or give to any of the Principal/Buyer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage or any kind whatsoever during the tender process or during the execution of the contract.
 - b) The Bidder(s)/Contractor(s) shall not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal.
This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
 - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant Anti-Corruption Laws of India; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to other, any information or document provided by the Principal/Buyer as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. All payments made to the Indian Agent/representative have to be in Indian Rupees only. Further details as mentioned in the "Guidelines of Indian Agents of Foreign suppliers" shall be disclosed by the Bidders(s)/Contractor(s). Copy of the "Guidelines on Indian Agents of Foreign Suppliers" as annexed and marked as Annexure-A.
 - e) The Bidder(s)/Contractor(s) will when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
 - f) The Bidder (s)/Contractor(s), their agents, representatives shall not do such things so as to interfere with the procedures laid down in the Principal/Buyer's tender containing the General Conditions of Contract (GCC) in respect of procurement contracts for goods, services and civil works.
 - g) The Bidder commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- (2) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 - Disqualification from tender process and exclusion from future contracts:

If the Bidder(s)/Contractor(s) before contract award or during execution of Contract has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility as Bidder(s) in question, the Principal/Buyer is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or to terminate the contract, if already signed for such reason, as per the procedure mentioned in the



"Guidelines on Banning of business dealings" Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annexure-B.

- 1) If the Bidder(s)/Contractor(s) has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal/Buyer is entitled also to exclude the Bidder(s)/Contractor(s) from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder(s) and the amount of the damage. The exclusion shall be imposed for a minimum of six months and maximum of five years, which may be further extended at the discretion of the Principal/Buyer.
- 2) A transgression is considered to have occurred, if the Principal/Buyer after due consideration of the available evidence, concludes that no reasonable doubt is possible.
- 3) The Bidder (s) accepts and undertakes to respect and uphold the Principal/Buyer's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining legal advice.
- 4) If the Bidder(s)/Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Buyer may revoke the exclusion prematurely.

Section 4 – Sanctions for Violation:

- (1) Any breach of the aforesaid provisions by the Bidder or any one employed by him or acting on his behalf (whether with **or** without the knowledge of the Bidder) or the commission of any offence by the Bidder or any one employed by him or acting on his behalf, as defined in Chapter IX of the Indian Penal Code, 1860 or the Prevention of Corruption Act 1988 or any other Act enacted for the prevention of corruption shall entitle the Principal/Buyer to take all or any one of the following actions, wherever required –
 - a) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the Bidder. However, the proceedings with the other Bidder (s) would continue.
 - b) The Earnest Money Deposit/Security Deposit/Performance Bond shall stand forfeited either fully or partially, as decided by the Principal/Buyer, and the Principal/Buyer shall not be required to assign any reason therefor.
 - c) To immediately cancel the contract, if already signed, without giving any compensation to the Bidder.
 - d) To recover all sums already paid by the Principal/Buyer, in case of an Indian Bidder with interest thereon at 2% higher than the prevailing Base Rate of SBI, and in case of a Bidder from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the Bidder from the Buyer in connection with any other contract for any other Defence stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.



- e) To en-cash the advance Bank Guarantee and Performance Bond/Warranty bond, if furnished by the Bidder, in order to recover the payments, already made by the Principal/Buyer, along with interest.
- f) To cancel all or any other contracts with the Bidder.
- g) To debar the Bidder from entering into any bid from Principal/Buyer for a minimum period of five years, which may be further extended at the discretion of the Principal/Buyer.
- h) To recover all sums paid in violation of this Pact by Bidder(s) to any middleman or agent or broker with a view to securing the contract.
- i) If the Bidder or any employee of the Bidder or any person acting on behalf of the Bidder, either directly or indirectly, is closely related to any of the officers of the Buyer, or alternatively, if any close relative of an officer of the Buyer has financial interest/stake in the Bidder's firm, the same shall be disclosed by the Bidder at the time of filing of tender. Any failure to disclose the interest involved shall entitle the Buyer to rescind the contract without payment of any compensation to the Bidder.

The term 'close relative' for this purpose would mean spouse whether residing with the Principal/Buyer's employee/employees or not, but not include a spouse separated from the Principal/Buyer's employee/employees by a decree or order of a competent court; son or daughter or step son or step daughter and wholly dependent upon Principal/Buyer's employee/employees, but does not include a child or step child who is no longer in any way dependent upon the Principal/Buyer's employee/employees or of whose custody the Principal/Buyer's employee/employees has been deprived of by or under any law; any other person related, whether by blood or marriage, to the Principal/Buyer's employee/employees or to the Principal/Buyer's employee/employees wife or husband and wholly dependent upon Principal/Buyer's employee/employees.

- j) The Bidder shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Principal/Buyer, and if he does so, the Principal/Buyer shall be entitled forthwith to rescind the contract and all other contracts with the Bidder. The Bidder shall be liable to pay compensation for any loss or damage to the Principal/Buyer resulting from such rescission and the Principal/Buyer shall be entitled to deduct the amount so payable from the money(s) due to the Bidder.
 - k) In cases where Irrevocable Letters of Credit have been received in respect of any contract signed by the Principal/Buyer with the Bidder, the same shall not be opened.
- (2) The decision of the Principal/Buyer to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder shall be final and binding on the Bidder, however, the same Bidder can approach the Monitor(s) appointed for the purposes of this Pact.

Section 5 - Previous Transgression:



- (1) The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti-corruption approach or with any other public section enterprise in India that could justify his exclusion from the tender process.
- (2) If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process or further action can be taken.

Section 6 - Equal treatment of all Bidders/Contractor(s)/Subcontractors:

- (1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this integrity Pact, and to submit it to the Principal before contract signing.
- (2) The Principal/Buyer will enter into agreements with identical conditions as this one with all bidders, contractors and subcontractors.
- (3) The Principal/Buyer shall disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 - Criminal charges against violation Bidder(s)/Contractor(s)/ Subcontractor(s):

- (1) If the Principal/Buyer obtains knowledge of conduct of a Bidder, Contractor or subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor of subcontractor which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal/Buyer shall inform the same to the Chief Vigilance Officer, MDL.

Section 8 - Independent External Monitor/Monitors:

- (1) The Principal/Buyer appoints competent and credible independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively whether and to what extent the parties comply with the obligations under this agreement.
- (2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairman & Managing Director of the Principal/Buyer.
- (3) The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal/Buyer including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Subcontractor(s) with confidentiality.
- (4) The Principal/Buyer will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations, between the Principal/Buyer and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- (5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal/Buyer and request the Management to



discontinue or take corrective action, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Monitor shall give an opportunity to the Bidder(s)/Contractor(s) to present its case before making its recommendation to the Principal/Buyer.

- (6) The Monitor will submit a written report to the Chairman & Managing Director of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the Principal/Buyer and, should the occasion arise, submit proposals for correcting problematic situations.
- (7) Monitor shall be entitle to compensation on the same terms as being extended to / provided to Independent Directors on the Board of Principal/Buyer.
- (8) If the Monitor has reported to the Chairman & Managing Director of the Principal, a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India and the Chairman & Managing Director of the Principal/Buyer has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- (9) The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration:

This pact begins when both parties have legally signed it. It expires for the Contractor **12 months** after the last payment under the contract and for all other Bidders **06 months** after the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above unless it is discharged / determined by Chairman & Managing Director of the Principal/Buyer.

Section 10 - Other provisions:

- (1) This agreement is subject to Indian Law, place of performance and jurisdiction is the Registered Office of the Principal/Buyer, i.e. Mumbai (For MDL). The Arbitration clauses provided in the main tender document/ contract shall not be applicable for any issue/dispute arising under this Integrity pact.
- (2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- (3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- (4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties shall strive to come to an agreement to their original intentions.

Section 11 – Fall Clause:



“The Bidder undertakes that it has not supplied/is not supplying similar products/ systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/ Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the Bidder to any other Ministry/ Department of the Government of India or a PSU at a lower price, then that very price, with due allowance of elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the Bidder to the Principle/Buyer, if the contract has already been concluded.”

For & on behalf of
MAZAGON DOCK SHIPBUILDERS LIMITED

For & on behalf of Bidder/Contractor

(Office Seal)

(Office Seal)

Place_____

Date_____

Witness 1:

Witness 1:

(Name & Address)

(Name & Address)



Annexure-A

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with MDL shall apply for registration.
- 1.1 An agent shall represent only one Foreign Supplier and not represent two suppliers or quote on their behalf in the same tender.

However, either the Indian Agent on behalf of the Foreign Suppliers (also includes foreign manufacturers) or the Foreign Suppliers (also includes foreign manufacturers) directly could bid in a tender, but not both. In cases where an agent participates in a tender on behalf of one manufacturer, shall not quote on behalf of another manufacturer along with the first Manufacturer in a subsequent/parallel tender for the same item.

- 1.2 Registered agents shall file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/remuneration/salary/ retainer ship being paid by the principal to the agent before the placement of order by MDL.
- 1.3 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.

2.0 DISCLOSURE OF PARTICULARS OF AGENTS/ REPRESENTATIVES IN INDIA, IF ANY.

2.1 Tenderers of Foreign nationality shall furnish the following details in their offer:

- 2.2.1 The name and address of the agents/representatives in India, if any and the extent of authorization and authority given to commit the Principals. In case the agent/representative be a foreign Company, it shall be confirmed whether it is real substantial Company and details of the same shall be furnished.
- 2.2.2 The amount of commission/remuneration included in the quoted price(s) for such agents/representatives in India.
- 2.2.3 Confirmation of the Tenderer that the commission/ remuneration if any, payable to his agents/ representatives in India, may be paid by MDL in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:

- 2.2.1 The name and address of the foreign principals indicating their nationality as well as their status, i.e, whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/representatives.
- 2.2.2 The amount of commission/remuneration included in the price (s) quoted by the Tenderer for himself.
- 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/remuneration, if any, reserved for the Tenderer in the quoted price (s),



may be paid by MDL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.

- 2.3 In either case, in the event of contract materializing, the terms of payment shall provide for payment of the commission /remuneration, if any payable to the agents/representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph-2.0 above shall render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by MDL. Besides this there would be a penalty of banning business dealings with MDL or damage or payment of a named sum.

**Annexure-B****GUIDELINES ON BANNING OF BUSINESS DEALINGS****CONTENTS**

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1. Introduction

- 1.1 Mazagon Dock Shipbuilders Limited (MDL), being a Public Sector Enterprise and 'State', within the meaning of Article 12 of Constitution of India, has to ensure preservation of rights enshrined in Chapter III of the Constitution. MDL as also to safeguard its commercial interests. MDL deals with Agencies, who have a very high degree of integrity, commitments and sincerity towards the work undertaken. It is not in the interest of MDL to deal with Agencies who commit deception, fraud or other misconduct in the execution of contracts awarded / orders issued to them. In order to ensure compliance with the constitutional mandate, it is incumbent on MDL to observe principles of natural justice before banning the business dealings with any Agency.
- 1.2 Since banning of business dealings involves civil consequences for an Agency concerned, it is incumbent that adequate opportunity of hearing is provided and the explanation, if tendered, is considered before passing any order in this regard keeping in view the facts and circumstances of the case.

2. Scope

- 2.1 MDL reserves its rights to remove from list of approved suppliers / contractors or to ban business dealings if any Agency has been found to have committed misconduct and also to suspend business dealings pending investigation.
- 2.2 Similarly, in case of sale of material there is a clause to deal with the Agencies / customers / buyers, who indulge in lifting of material in unauthorized manner.
- 2.3 However, absence of such a clause does not in any way restrict the right of MDL to take action / decision under these guidelines in appropriate cases.
- 2.4 The procedure of (i) Removal of Agency from the List of approved suppliers / contractors; (ii) Suspension and (iii) Banning of Business Dealing with Agencies, has been laid down in these guidelines.
- 2.5 These guidelines apply to all the Divisions/Yards of MDL.
- 2.6 It is clarified that these guidelines do not deal with the decision of the Management not to entertain any particular Agency due to its poor / inadequate performance or for any other reason.
- 2.7 The banning shall be with prospective effect, i.e., future business dealings.

3. Definitions

In these Guidelines, unless the context otherwise requires:

- a) 'Bidder / Contractor / Supplier / Purchaser / Customer' shall mean and include a public limited company or a private limited company, a firm whether registered or not, an individual, a cooperative society or an association or a group of persons engaged in any commerce, trade, industry, etc. 'Bidder / Contractor / Supplier / Purchaser / Customer' in the context of these guidelines is indicated as 'Agency'.
- b) 'Inter-connected Agency' shall mean two or more companies having any of the following features:
 - a) If one is a subsidiary of the other.
 - b) If the Director(s), Partner(s), Manager(s) or Representative(s) are common;
 - c) If management is common;
 - d) If one owns or controls, the other in any manner;
- c) 'Competent Authority' and 'Appellate Authority' shall mean the following:



- a) Functional Director shall be the 'Competent Authority' for the purpose of these guidelines. CMD, MDL shall be the 'Appellate Authority'.
- b) CMD, MDL shall have overall power to take suo-moto action on any information available or received by him and pass such order(s) as he may think appropriate, including modifying the order(s) passed by any authority under these guidelines.
- d) 'Investigating Department' shall mean any Department or Unit investigating into the conduct of the Agency and shall include the Vigilance Department, Central Bureau of Investigation, the State Police or any other department set up by the Central or State Government having powers to investigate.
- e) 'List of approved Agencies – Bidder / Contractors / Suppliers / Purchasers / Customers shall mean and include list of approved / registered Agencies - Bidder / Contractors / Suppliers / Purchasers / Customers, etc.

4. Initiation of Banning / Suspension

Action for banning / suspension business dealings with any Agency should be initiated by the department having business dealings with them after noticing the irregularities or misconduct on their part. Besides the concerned department, Vigilance Department may also be competent to initiate such action.

5. Suspension of Business Dealings

- 5.1 If the conduct of any Agency dealing with MDL is under investigation by any department, the Competent Authority may consider whether the allegations under investigation are of a serious nature and whether pending investigation, it would be advisable to continue business dealing with the Agency. If the Competent Authority, after consideration of the matter including the recommendation of the Investigating Department, if any, decides that it would not be in the interest to continue business dealings pending investigation, it may suspend business dealings with the Agency. The order to this effect may indicate a brief of the charges under investigation. If it is decided that inter-connected Agencies would also come within the ambit of the order of suspension, the same should be specifically stated in the order. The order of suspension would operate for a period not more than six months and may be communicated to the Agency as also to the Investigating Department. The Investigating Department may ensure that their investigation is completed and whole process of final order is over within such period.
- 5.2 The order of suspension shall be communicated to all Commercial Departmental Heads. During the period of suspension, no business dealing may be held with the Agency.
- 5.3 As far as possible, the existing contract(s) with the Agency may continue unless the Competent Authority, having regard to the circumstances of the case, decides otherwise.
- 5.4 If the gravity of the misconduct under investigation is very serious and it would not be in the interest of MDL, as a whole, to deal with such an Agency pending investigation, the Competent Authority may order suspension of business dealing with Agency and send his recommendation to Chief Vigilance Officer (CVO), MDL along with the material available, copy of which may be issued to the Agency concerned with intimation to CVO MDL. Such an order would operate for a period of six months from the date of issue.
- 5.5 If the Agency concerned asks for detailed reasons of suspension, the Agency may be informed that its conduct is under investigation. It is not necessary to enter into correspondence or argument with the Agency at this stage.



5.6 It is not necessary to give any show-cause notice or personal hearing to the Agency before issuing the order of suspension. However, if investigations are not complete in six month's time, the Competent Authority may extend the period of suspension by another three months, during which period the investigations must be completed.

6. Ground on which Banning of Business Dealings can be initiated

6.1 If the security consideration, including questions of loyalty of the Agency to the State, so warrants;

6.2 If the Director / Owner of the Agency, proprietor or partner of the firm, is convicted by a Court of Law for offences involving moral turpitude in relation to its business dealings with the Government or any other public sector enterprises or MDL, during the last five years;

6.3 If there is strong justification for believing that the Directors, Proprietors, Partners, owner of the Agency have been guilty of malpractices such as bribery, corruption, fraud, substitution of tenders, interpolations, etc.;

6.4 If the Agency continuously refuses to return / refund the dues of MDL without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or Court of Law;

6.5 If the Agency employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offence;

6.6 If business dealings with the Agency have been banned/blacklisted by Government Agencies/ Statutory bodies, DGQA, Defence Shipyards, DPSUs or with whom commercial transactions have been suspended for sufficient and justifiable reasons.
If the Agency having same promoters/Directors /Partners as the barred/blacklisted Company as at 6.6 above for the duration for which the barring/ blacklisting of sister concern persists.

6.7 If the Agency has resorted to Corrupt, fraudulent practices including misrepresentation of facts;

If the agency who had fraudulently dealt with the Company for pecuniary gains or had connived with dealing officers for mutual benefit.

6.8 If the Agency uses intimidation / threatening or brings undue outside pressure on the MDL or its official in acceptance / performances of the job under the contract;

6.9 If the Agency indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;

6.10 Wilful indulgence by the Agency in supplying sub-standard material irrespective of whether pre-despatch inspection was carried out by MDL or not;

6.11 Based on the findings of the investigation report of CBI / Police against the Agency for malafide / unlawful acts or improper conduct on his part in matters relating to the MDL or even otherwise;



- 6.12 Established litigant nature of the Agency to derive undue benefit;
- 6.13 Continued poor performance of the Agency in several contracts;
- 6.14 If the Agency misuses the premises or facilities of the MDL, forcefully occupies, tampers or damages the Company's properties including land, water resources, forests / trees, etc.

If the Agency who knowingly collude to defeat competition with the aim of deriving undeserved profit or gain from doing business with MDL.

(Note: The examples given above are only illustrative and not exhaustive. The Competent Authority may decide to ban business dealing for any good and sufficient reason).

7. Banning of Business Dealings

- 7.1 Decision to ban business dealings with any Agency would apply throughout the Company.
- 7.2 There shall be a Standing Committee to be appointed by the CMD which may include HOD of respective Commercial Section/Capital Works/OTS, HOD (M), rep of Legal Deptt. and OIC (SR&R) for processing the cases of "Banning of Business Dealings". The functions of the committee shall, inter-alia include:
 - a) To study the report of the Investigating Agency and decide if a prima-facie case for banning exists, if not, send back the case to the Competent Authority.
 - b) To recommend for issue of show-cause notice to the Agency by the concerned department.
 - c) To examine the reply to show-cause notice and call the Agency for personal hearing, if required.
 - d) To submit final recommendation to the Competent Authority for banning or otherwise.
- 7.3 If the Competent Authority is prima-facie of view that action for banning business dealings with the Agency is called for, a show-cause notice may be issued to the Agency as per paragraph 9.1 and an enquiry held accordingly.

8. Removal from List of Approved Agencies - Suppliers / Contractors, etc.

- 8.1 If the Competent Authority decides that the charge against the Agency is of a minor nature, it may issue a show-cause notice as to why the name of the Agency should not be removed from the list of approved Agencies - Suppliers / Contractors, etc.
- 8.2 The effect of such an order would be that the Agency would not be disqualified from competing in Open Tender Enquiries but LTE may not be given to the Agency concerned.
- 8.3 Past performance of the Agency may be taken into account while processing for approval of the Competent Authority for awarding the contract.

9. Procedure for issuing Show-cause Notice

- 9.1 In case where the Competent Authority decides that action against an Agency is called for, a show-cause notice has to be issued to the Agency. Statement containing the imputation of misconduct or mis-behaviour may be appended to the show-cause notice and the Agency should be asked to submit within 15 days a written statement in its defence.



- 9.2 If the Agency requests for inspection of any relevant document in possession of MDL, necessary facility for inspection of documents may be provided.
- 9.3 The Competent Authority may consider and pass an appropriate speaking order:
- For exonerating the Agency if the charges are not established;
 - For removing the Agency from the list of approved Suppliers / Contactors, etc.
 - For banning the business dealing with the Agency.
- 9.4 If it decides to ban business dealings, the period for which the ban would be operative may be mentioned. The order may also mention that the ban would extend to the interconnected Agencies of the Agency.

10. Appeal against the Decision of the Competent Authority

- 10.1 The Agency may file an appeal against the order of the Competent Authority banning business dealing, etc. The appeal shall lie to Appellate Authority. Such an appeal shall be preferred within one month from the date of receipt of the order banning business dealing, etc.
- 10.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the Agency as well as the Competent Authority.

11. Review of the Decision by the Competent Authority

Any petition / application filed by the Agency concerning the review of the banning order passed originally by Competent Authority under the existing guidelines either before or after filing of appeal before the Appellate Authority or after disposal of appeal by the Appellate Authority, the review petition can be decided by the Appellate Authority upon disclosure of new facts / circumstances or subsequent development necessitating such review. The Competent Authority may refer the same petition to the separate Standing Committee which may be constituted by Appellate Authority for examination and recommendation.

12. Circulation of the names of Agencies with whom Business Dealings have been banned

- 12.1 Depending upon the gravity of misconduct established, the Competent Authority may direct HOD (Materials)/OIC (SR&R) to circulate the names of Agency with whom business dealings have been banned, to the Government Departments, other Public Sector Enterprises, etc. for such action as they deem appropriate.
- 12.2 If Government Departments or a Public Sector Enterprise request for more information about the Agency with whom business dealings have been banned, a copy of the report of Inquiring Authority together with a copy of the order of the Competent Authority / Appellate Authority may be supplied.
- 12.3 If business dealings with any Agency have been banned by the Central or State Government or any other Public Sector Enterprise, MDL may, without any further enquiry or investigation, issue an order banning business dealing with the Agency and its interconnected Agencies.

**Enclosure-14**

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

RTGS/NEFT/ECS – MANDATE AUTHORISATION FORM

1.	NAME OF THE FIRM	:	
2.	CONTACT PERSON AND DESIGNATION	:	
3.	PAN NO	:	
4.	VENDOR ADDRESS	:	
5.	VENDOR'S TELEPHONE/FAX	:	
6.	E-MAIL ADDRESS	:	
7.	BANK NAME	:	
8.	BANK ADDRESS	:	
9.	ACCOUNT NUMBER	:	
10.	ACCOUNT TYPE	:	
11.	IFSC CODE	:	
12.	MICR CODE	:	
13.	GST ID NO.	:	

We hereby declare that the particulars given above are correct and complete. If the transaction is delayed for reasons of incomplete or incorrect information, we would not hold MDL responsible.

Date**Vendor's Seal****Authorised Signature of the Vendor**

Certified that the particulars as per Serial No. 1 & 6 to 12 are correct as per our records.

Date**Bank's Stamp****Authorised Signature of the Bank Officer**



Enclosure-15

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

PROFORMA BANK GUARANTEE FOR BID BOND / EMD

(On Non-Judicial stamp paper of value ₹500/-)

IN CONSIDERATION OF MAZAGON DOCK SHIPBUILDERS LIMITED, a company incorporated under the Companies Act 1956 and having its registered office at Dockyard Road, Mumbai 400010 (hereinafter referred to as the "the Company" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) having agreed to accept the Earnest Money Deposit (EMD) of Rs----- ----
---(Rupees-----only) in the form of Bank Guarantee from Messers a partnership firm/sole proprietor business/a company registered under the Companies Act, 1956 having its office at(hereinafter called " the tenderer" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) for participating in the Tender no.....dated..... (hereinafter called "the tender" which expression shall include any amendments/alterations to "the tender" issued by "the Company") for the supply, delivery at site, installation and commissioning of certain equipment, item/services/civil works etc., We, Bank having office at (hereinafter referred to as "the Bank" which expression shall includes its successors and assigns) hereby agree to pay to the Company without any demur on first demand an amount not exceeding Rs..... (Rupees.....only) against any loss or damage, costs, charges and expenses caused to or suffered by the Company by reason of non performance and non-fulfilment or for any breach on the part of the tenderer of any of the terms and conditions of the said tender.

2. We, Bank further agree that the Company shall be sole judge whether the said tenderer has failed to perform or fulfil the said tender in terms thereof or committed breach of any terms and conditions of the tender the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by the Company on account thereof and we waive in the favour of the Company all the rights and defences to which we as guarantors may be entitled to.

3. We, Bank further agree that the amount demanded by the Company as such shall be final and binding on the Bank as to the Bank 's liability to pay and the amount demanded and the Bank undertake to pay the Company the amount so demanded on first demand and without any demur notwithstanding any dispute raised by the tenderer or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this guarantee being absolute and unconditional.

4. We, Bank further agree with the Company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said tender/or to extend time of performance by the tenderer from time to time or to postpone for any time to time any of the powers exercisable by the Company against the tenderer and to forbear to enforce any of the terms and conditions relating to the tender and we shall not be relieved from our liability by reason of any such variation or extension being granted to the tenderer or for any forbearance, act or omission on the



part of the Company or any indulgence by the Company to the tenderer or by any such matter or things whatsoever which under the law relating to sureties would have the effect of relieving us.

5. We, Bank further undertake not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

6. We, Bank also agree that the Bank's liability under this guarantee shall not be affected by any change in the constitution of the tenderer or dissolution or winding up of the business of the tenderer.

7. Notwithstanding anything contained herein above:

i) Our liability under this guarantee shall not exceed Rs.....

ii) This Bank Guarantee shall be valid upto and including; and

iii) We are liable to pay the guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before(validity + --- weeks from the date of expiry of this guarantee).

8. This Guarantee shall be governed by Indian laws and the Courts at Mumbai, India shall have the exclusive jurisdiction.

IN WITNESS WHEREOF the Bank has executed this document on this..... day of

For Bank
(by its constituted attorney
or the person authorised to sign)

(Signature of a person authorised
to sign on behalf of "the Bank")



Enclosure-15(A)

PROFORMA OF UNCONDITIONAL AND IRREVOCABLE INSURANCE SURETY BOND FOR BID BOND / EMD

(On Non-Judicial stamp paper of value Rs. 500/-. However, the value of stamp paper to be confirmed from Legal Department, MDL.)

Ref. No.
Insurance Surety Bond No.
Dated:

1. IN CONSIDERATION OF MAZAGON DOCK SHIPBUILDERS LIMITED, a company incorporated under the Companies Act 1956 and having its registered office at Dockyard Road, Mumbai 400010 (hereinafter referred to as the "the Company" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) having agreed to accept the Earnest Money Deposit (EMD) of Rs------(Rupees-----only) in the form of an unconditional and irrevocable Insurance Surety Bond (ISB) from Messers a partnership firm/sole proprietor business/a company registered under the Companies Act, 1956 having its office at(hereinafter called " the tenderer" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) for participating in the Tender no.....dated..... (hereinafter called "the tender" which expression shall include any amendments/alterations to "the tender" issued by "the Company") for the supply, delivery at site, installation and commissioning of certain equipment, item/services/civil works etc., We, Surety Insurer having office at (hereinafter referred to as "the Surety" which expression shall includes its successors and assigns) hereby agree to pay to the Company without any demur on first demand an amount not exceeding Rs..... (Rupees.....only) against any loss or damage, costs, charges and expenses caused to or suffered by the Company by reason of non-performance and non-fulfilment or for any breach on the part of the tenderer of any of the terms and conditions of the said tender.

2. We, the Surety further agree that the Company shall be sole judge whether the said tenderer has failed to perform or fulfil the said tender in terms thereof or committed breach of any terms and conditions of the tender the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by the Company on account thereof and we waive in the favour of the Company all the rights and defences to which we as sureties may be entitled to.

3. We, the Surety further agree that the amount demanded by the Company as such shall be final and binding on the Surety as to the Surety's liability to pay and the amount demanded and the Surety undertake to pay the Company the amount so demanded on first demand and without any demur notwithstanding any dispute raised by the tenderer or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this Bond being absolute and unconditional.

4. We, the Surety further agree with the Company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said tender/or to extend



time of performance by the tenderer from time to time or to postpone for any time to time any of the powers exercisable by the Company against the tenderer and to forbear to enforce any of the terms and conditions relating to the tender and we shall not be relieved from our liability by reason of any such variation or extension being granted to the tenderer or for any forbearance, act or omission on the part of the Company or any indulgence by the Company to the tenderer or by any such matter or things whatsoever which under the law relating to sureties would have the effect of relieving us.

5. We, the Surety further undertake not to revoke this Bond during its currency except with the previous consent of the Company in writing.

6. We, Surety also agree that the Surety's liability under this Bond shall not be affected by any change in the constitution of the tenderer or dissolution or winding up of the business of the tenderer.

7. Notwithstanding anything contained herein above:
(i) Our liability under this Bond shall not exceed Rs.....
(ii) This Surety Bond shall be valid upto and including; and
(iii) We are liable to pay the Bond amount or any part thereof under this Surety only and only if you serve upon us a written claim or demand on or before(validity + ---weeks from the date of expiry of this Bond).

8. This Bond shall be governed by Indian laws and the Courts at Mumbai, India shall have the exclusive jurisdiction.

IN WITNESS WHEREOF the Surety has executed this document on this.....
day of
For
(Signature of a person authorised
to sign on behalf of "the Surety")



**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

PROFORMA FOR PERFORMANCE BANK GUARANTEE

(On Non-Judicial stamp paper of value ₹500/-)

IN CONSIDERATION OF MAZAGON DOCK SHIPBUILDERS LIMITED (formerly known as MAZAGON DOCK LIMITED, a company incorporated under the Companies Act 1956 and having its registered office at Dockyard Road, Mumbai 400010 (hereinafter referred to as the "the Company" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) having placed an order on Messers a partnership firm/sole proprietor business/a company registered under the Companies Act, 1956 having its office at(hereinafter called " the Contractor" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) vide order No..... dated..... (hereinafter called "the order" which expression shall include any amendments/alterations to "the order" issued by "the Company") for the work of _____ as stated in the said Order and the Company having agreed that the Contractor shall furnish a security for the performance of the Contractor obligations and/or discharge of the Contractor liability in connection with the said order and the Company having agreed with the Contractor to accept a performance guarantee, We, Bank having office at (hereinafter referred to as "the Bank" which expression shall include its successors and assigns) hereby agree to pay to the Company without any demur on first demand an amount not exceeding Rs..... (Rupees.....only) against any loss or damage, costs, charges and expenses caused to or suffered by the Company by reason of non performance and non-fulfillment or for any breach on the part of the Contractor of any of the terms and conditions of the said order.

2. We, Bank further agree that the Company shall be sole judge whether the said Contractor has failed to perform or fulfill the said order in terms thereof or committed breach of any terms and conditions of the order and the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by the Company on account thereof and we waive in the favour of the Company all the rights and defences to which we as guarantors may be entitled to.

3. We, Bank further agree that the amount demanded by the Company as such shall be final and binding on the Bank as to the Bank's liability to pay and the amount demanded and the Bank undertake to pay the Company the amount so demanded on first demand and without any demur notwithstanding any dispute raised by the Contractor or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this guarantee being absolute and unconditional.

4. We, Bank further agree with the Company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said order/or to extend time of performance by the Contractor from time to time or to postpone for any time to time any of the powers exercisable by the Company against the Contractor and to forbear to enforce any of the terms and conditions relating to the order and we shall not be relieved from our liability by reason



of any such variation or extension being granted to the Contractor or for any forbearance, act or omission on the part of the Company or any indulgence by the Company to the Contractor or by any such matter or things whatsoever which under the law relating to sureties would have the effect of relieving us.

5. We, Bank further undertake not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

6. We,Bank also agree that the Bank's liability under this guarantee shall not be affected by any change in the constitution of the Contractor.

7. Notwithstanding anything contained herein above:

- i) Our liability under this guarantee shall not exceed Rs.....
- ii) This Bank Guarantee shall be valid upto and including; and
- iii) We are liable to pay the guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before(validity + ---weeks from the date of expiry of this guarantee).

8. This Guarantee shall be governed by Indian laws and the Courts at Mumbai, India shall have the exclusive jurisdiction.

IN WITNESS WHEREOF the Bank has executed this document on this..... day of

For Bank
(by its constituted attorney)

(Signature of a person authorised
to sign on behalf of "the Bank")



Enclosure-16(A)

**PROFORMA OF UNCONDITIONAL AND IRREVOCABLE INSURANCE SURETY
BOND FOR PERFORMANCE SECURITY**
(ILLUSTRATIVE FORMAT)

(On Non-Judicial stamp paper of value Rs. 500/-. However, the value of stamp paper to be confirmed from Legal Department, MDL.)

1. IN CONSIDERATION OF MAZAGON DOCK SHIPBUILDERS LIMITED, a company incorporated under the Companies Act 1956 and having its registered office at Dockyard Road, Mumbai 400010 (hereinafter referred to as the "the Purchaser" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) having placed an order on Messers a partnership firm/sole proprietor business/a company registered under the Companies Act, 1956 having its office at(hereinafter called " the Contractor/ Supplier" which expression shall, unless it be repugnant or contrary to the subject or context thereof, be deemed to mean and include its successors and assigns) vide order No..... dated..... (hereinafter called "the order" which expression shall include any amendments/alterations to "the order" issued by "the Purchaser") for the supply , delivery at site, installation and commissioning of certain equipment, item/services/civil works etc. as stated in the said Order and the Purchaser having agreed with the Contractor/Supplier to accept an unconditional and irrevocable Insurance Surety Bond in lieu of Performance Security payable under the said order for the fulfillment and performance of the said order, We, Surety Insurer having office at (hereinafter referred to as "the Surety" which expression shall includes its successors and assigns) hereby agree to pay to the Purchaser without any demur on first demand an amount not exceeding Rs..... (Rupees.....only) being 5% (10% in case of Capital Procurement) of the order value against any loss or damage, costs, charges and expenses caused to or suffered by the Purchaser by reason of non performance and non-fulfillment or for any breach on the part of the Contractor / Supplier of any of the terms and conditions of the said order.

2. We,the Surety further agree that the Purchaser shall be sole judge whether the said Contractor/Supplier has failed to perform or fulfil the said order in terms thereof or committed breach of any terms and conditions of the order and the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by the Purchaser on account thereof and we waive in the favour of the Purchaser all the rights and defences to which we as surety may be entitled to.

3. We, the Surety further agree that the amount demanded by the Purchaser as such shall be final and binding on the Surety as to the Surety's liability to pay and the amount demanded and the Surety undertake to pay the Purchaser the amount so demanded on first demand and without any demur notwithstanding any dispute raised by the Contractor/Supplier or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this Bond being absolute and unconditional.

4. We, the Surety further agree with the Purchaser that the Purchaser shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said order/or to extend



time of performance by the Supplier from time to time or to postpone for any time to time any of the powers exercisable by the Purchaser against the Contractor/ Supplier and to forbear to enforce any of the terms and conditions relating to the order and we shall not be relieved from our liability by reason of any such variation or extension being granted to the Contractor/ Supplier or for any forbearance, act or omission on the part of the Purchaser or any indulgence by the Purchaser to the Contractor/Supplier or by any such matter or things whatsoever which under the law relating to sureties would have the effect of relieving us.

5. We, the Surety further undertake not to revoke this Bond during its currency except with the previous consent of the Purchaser in writing.

6. We, the Surety also agree that the Surety's liability under this Bond shall not be affected by any change in the constitution of the Contractor / Supplier or dissolution or winding up of the business of the contractor/ supplier.

7. Notwithstanding anything contained herein above:
(i) Our liability under this Bond shall not exceed Rs.....
(ii) This Surety Bond shall be valid upto and including; and
(iii) We are liable to pay the Bond amount or any part thereof under this Surety Bond only and only if you serve upon us a written claim or demand on or before(validity + 4 weeks from the date of expiry of this Bond).

8. This Bond shall be governed by Indian laws and the Courts at Mumbai, India shall have the exclusive jurisdiction.

IN WITNESS WHEREOF the Surety has executed this document on this.....day of

For Surety
(by its constituted attorney)
(Signature of a person authorised to sign on behalf of "the Surety")



Enclosure-17

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

PROFORMA FOR WATERPROOFING BANK GUARANTEE
(On Non-Judicial stamp paper)

Not Applicable



Enclosure-18

**To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.**

PROFORMA FOR BANK GUARANTEE AGAINST WATER LEAKAGE (Not applicable to this tender)

Not Applicable

**Enclosure-19****ENCLOSURE-19**

Asphalting of Road from Main gate to Gate No.10,Surrounding roads of SSA Workshop,infront of TS dept to ATS,Pier Road to Crane track no.11 (ALY,NY,SY)

It. No.	Item Description	Unit	Quantity	Rate	Amount
1	Milling upto 60mm. Depth Asphaltic surface by using milling machine including transportation anywhere as directed. NOTE: For further passes of 60mm. Or part thereof, same rate will be applicable.	Sqm	10190.00	95.33	
2	Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.30 to 0.35 Kg. of Sq.mt. over prepared surface to receive bituminous mix by applying TACK COAT with mechanical spray bitumen, including cleaning of road surface etc. completed , as directed For NON BITUMINOUS SURFACES,CEMENT CONCRETE PAVEMENT.for DBM 1st layer.	Sqm	70.00	51.59	
3	Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.25 to 0.30 Kg. of Sq.mt. over prepared surface to receive bituminous mix by applying TACK COAT with mechanical spray bitumen, including cleaning of road surface etc. completed, as directed For DRY & HUNGRY BITUMINOUS SURFACES.(tack coat on existing surface for DBM-1 layer)	Sqm	10130.0	48.22	
4	Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.20 to 0.25 Kg. of Sq.mt. over prepared surface to receive bituminous mix by applying TACK COAT with mechanical spray bitumen, including cleaning of road surface etc. completed, as directed For NORMAL BITUMINOUS SURFACES.(tack coat on DBM1, & DBM2 layer)	Sqm	20380.0	44.86	



5	Providing & Laying Pre Mix hot mix Dense Bituminous Macadam 100mm compacted thickness -in 02layers each layer of 50mm thick compacted thickness with 4.50% bitumen content of grade VG-30 to the required line,level,and camber rolling with 10/12 M.T.power ,vibratory roller & Sensor paver etc. complete as specified and as directed with antistripping agent at 1%by weight of bitumen using grading II of "MORTH"	Cum	1030.0	17379.58	
6	Providing & Laying premix hot mix Bituminous concrete with 6.00% of polymer modified bitumen (PMB-40) (VG-30) content by weight of mix surface coat to compacted to required thickness using new material to the required grade, level and camber rolling with power roller, vibratory roller,pnumatic roller & Sensor paver,etc. complete as specified and as directed with addition of lime filler 2% and anti stripping agent @ 1% by weight of bitumen etc.	Cum	425.0	25369	
7	Providing and applying 2.5 mm thick road marking strips (retroreflective) of specified shade/ colour using hot thermoplastic material by fully/ semi automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour, T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-in-charge and accordance with applicable specifications.	Sqm	460.0	751.06	

It. No.	Item Description	Unit	Quantity	Rate	Amount
8	Providing & Fixing Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	Kg	8000.0	117.86	
9	Steel work welded in built up sections/ framed work, including cutting,hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.In gratings, frames, guard bar, ladder, railings, brackets,gates and similar works	Kg	18250.0	173.35	



10	Providing and applying Epoxy painting to Structural steel (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.	Sqm	310.0	242.80	
11	Removing existing kerb stones, cleaning off old mortar, carting away up to a distance of 2 K.M. and stacking the same as directed by the Engineer, carting away to dumping ground.	Rmt	125.0	137.94	
12	Providing and fixing of cement concrete Kerb Stone of M-25 grade in white cement with colour of size: 500mm width x 325 height x 165mm thick (Half Batter, Bull Nose / Full Batter) manufactured in wet press vacuum dewatering technology plant /equivalent with face pimple finish for high visibility with excellent quality and finish and edges perfect and sharp. Including excavation in any soil except rock, laying a leveling course of M 15 grade RMC 100 mm thick, to required slope (inclusive of form work) jointing in C.M.1:2 proportion flush to concrete surface, any shade as directed by engineer.	Rmt	125.0	2186.89	
13	Providing applying Yellow & Black road marking paint grade -I in 3- coats including single coat of approved brand primer after cleaning of old surface of kerb stone with brushing by wire brush as per relevant I. S.codes to satisfaction of Engineer in charge etc. complete.	Rmt	125.0	66.17	
14	Road studs : Providing and fixing of polymer shanked road studs (Reflective Pavement Marker / Cat eye) body made of tough polycarbonate of size not more than 105 x 130 x 20 mm; having reflector panel made of poly carbonate micro prismatic lens (providing total internal reflection). Electronically welded to the body. The two shanks attached with RPM to hold the marker at its place, fixed at site by drilling holes and applying high strength epoxy adhesive recommended by the manufacturer & Engineer in charge including materials, equipment, loading, unloading etc. necessary for successful fixing as directed.	No	570.0	471.68	



It. No.	Item Description	Unit	Quantity	Rate	Amount
15	Demolishing Plain Cement Concrete manually/ by mechanical means including disposal of debris outside MDL premises to municipal dumping ground complete as directed at any height / Location etc.	Cum	120.0	3061.61	
16	Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within MDL Scrap Bins.	Kg	10830.00	5.91	
17	PCC : Providing and laying in position Ready mixed or Site batched design mix cement concrete for plain cement concrete work;using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; laying the concrete at site, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the engineer-in-charge.Concrete of M20 grade with minimum cement content of 270 kg /cum	Cum	120.00	8895.64	
18	Providing & fixing in position reinforcement bars including straightening, cutting, bending, placing in position & binding with binding wires / welding where ever necessary for slabs / beams / columns/ Chajja etc. complete as directed at any height and any location. (Lapping / chairs will be measured & paid)-ThermoMechanically Treated bars of grade Fe-500D or More at all the levels.	Kg	1000.00	108.32	
19	Centering and shuttering including strutting, propping etc. and removal of form work for-foundation ,walls of chamber	Sqm	125.00	393.86	



20	Providing and laying in position machine batched and machine mixed design mix M-40 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including laying concrete at site but excluding the cost of centering,shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge incl.scaffolding. <u>At all level -M-40 grade concrete with minimum cement content 390Kg/Cum</u>	Cum	140.00	9643.89	
21	Extra Over item of stencil concrete above M40 in footpath. Providing, applying and finishing the top surface of M-40 concrete with stamp/stencil of approved pattern and colour, in accordance with manufacturer's specification of any approved brand of colour hardener @of 3.5 kgs/m2; including floating of colour hardened over concrete surface with different types of floaters; including application of release agent @ of 0.15 kgs/m2, stamping over the concrete surface with stamping tools; including cleaning of surface with water and cutting of finished concrete;including application of two coats of acrylic based sealer for finishing. Colour hardener and release agent shall be tested for abrasion resistance for a depth of wear,should not be more than 0.025 mm.Coverage of sealer should not be more than 6.5 sq.m per one litre coat; including cost of skilled manpower, cutting machine, sprayer and all tools tackles for all activities;complete smooth & finish as per direction of Engineer-In-Charge.	Sqm	410.00	297.19	

It. No.	Item Description	Unit	Quantity	Rate	Amount
22	Taking out existing interlocking paver blocks from footpath incl.removal of rubbish etc.disposal of unserviceable material to the municipal dumping ground as per direction of Engineer In charge.	Sqm	410.00	163.16	



23	Earth work in excavation in all types of soil including boulders,if any etc.by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including taking out and disposal of excavated earth to minicipal dumping ground outside MDL premises as directed by Engineerincharge.	Cum	5.00	949.13	
24	Providing & laying Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Superstructure above plinth level in all shapes and sizes in :Cement mortar 1:4 (1 cement : 4 coarse sand) incl.scaffolding.	Cum	2.00	9385.12	
25	Providing and applying 20 mm thick cement plaster(1:4) in two coats for external surface, curing etc; at all height and location etc. all complete as directed incl.scaffolding.	Sqm	10.00	489.53	
26	Providing and applying Acrylic Smooth exterior paint to Walls of plastered surface of required shade, New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 0.90Litre/10 sqm)-External Paint.incl.Scaffolding.	Sqm	10.00	161.30	
27	Raising or lowering man-holes/ water gullies or chambers including dismantling/ building up brick masonry/concrete including removing and re-fixing frame and cover etc. complete as directed.	No	20.00	1268.8	

Note:

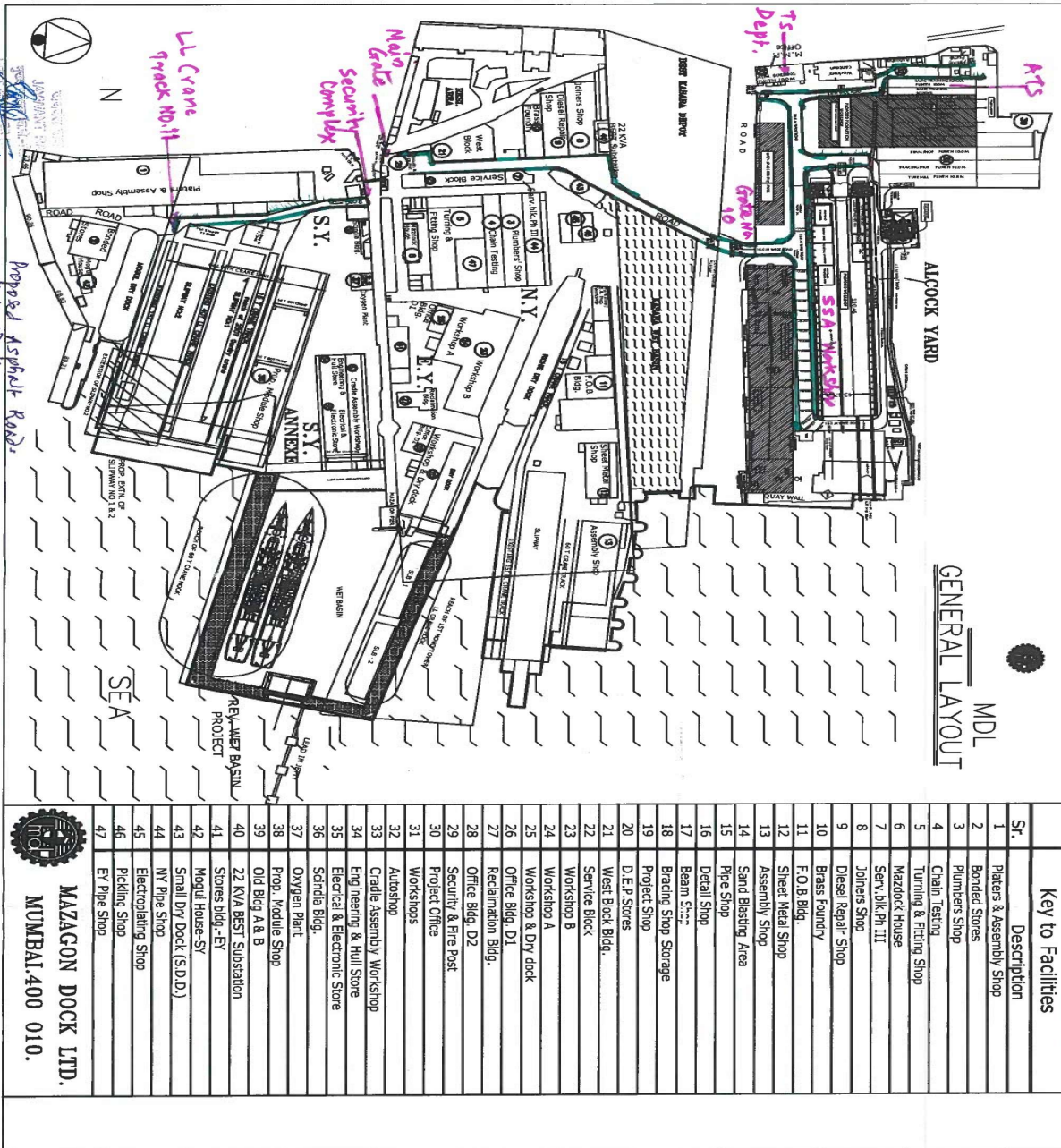
- i. Bidder after considering the estimated rates of individual items in the BOQ and the total estimated value, shall quote their overall percentage on line price sheet only
- ii. Bidder Percentage GST to be quote on line



Enclosure-20

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.

Attached of Drawing



**Enclosure-21****SCOPE OF WORK**

Sub: Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)

- Milling upto 60mm depth of existing asphalt surface by using Milling machine...
- Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.30 to 0.35 Kg. of Sqmt. for Non bituminous existing surfaces...
- Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.25 to 0.30 Kg. of Sqm. on dry bituminous layer surfaces...
- Providing and applying TACK COAT with bitumen VG-30 bitumen @ 0.20 to 0.25 Kg. of Sqmt. for Bituminous layers in between DBM & DBM-BC layer...
- Providing & Laying Dense Bituminous Macadam of 100mm compacted thickness- in 02layers each of 50mm compacted thickness
- Providing & Laying premix hot mix Bituminous concrete with 6.00% of polymer modified bitumen.
- Providing and applying 2.50mm thick road marking strips (retroreflective) of specified shade/ colour using hot thermoplastic material...
- Providing & fixing Structural Steel in Single section...
- Providing & fixing Structural Steel in Built up sections...gratings
- Applying Epoxy painting to structural steel...
- Removing existing Kerb stones, carting away to dumping ground.
- Providing and fixing of cement concrete Kerb stone of M-25.
- Providing applying Yellow & Black Road marking paint grade -I in 3- coats to Kerb stones...
- Providing and fixing of polymer shanked Road Studs
- Dismantling of existing PCC and carting away debris
- Dismantling of steel works in in built up sections in angles, tees, flats and channels & carting away to MDL scrap bins...
- Providing and laying PCC M20 Grade where ever required
- Providing & fixing Steel reinforcement...
- Providing & fixing Centering & shuttering ...
- Providing and laying RCC M40 Grade where ever required
- Removal of existing interlocking paver blocks from footpath and disposing to dumping ground...
- Earthwork in excavation in all types of soils incl. boulders...
- Providing & laying Brickwork in Superstructure...
- Providing & applying 20MM thick external Plaster in two coats...



- Providing & applying Acrylic smooth exterior paint to walls..
- Raising or lowering manholes / water gullies or chambers where ever necessary

Technical Specifications

MAZAGON DOCK SHIPBUILDERS LIMITED
(Formerly known as Mazagon Dock Ltd.)
CIN : U35100MH1934GOI002079
(A Government of India Undertaking)
Shipbuilders to the Nation
Dockyard Road, Mazagon,
Mumbai 400 010.
INDIA

Construction of Asphalt Roads at MDL Yard, Mumbai

VOLUME-I

Technical Specification & Preferred Make

**I N D E X**

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		From	To
	TECHNICAL SPECIFICATIONS		
I	SECTION – I, TECHNICAL SPECIFICATIONS FOR CIVIL WORKS		
II	SECTION – II, SPECIFICATIONS FOR ASPHALTING WORKS		



TECHNICAL SPECIFICATIONS

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1. EARTHWORK

1.1. Excavation

- 1.1.1. The work to be done under this section comprise performance of all work necessary for excavation with shoring, strutting, dewatering, pumping including disposing of all surplus excavated material from the site as directed by the Engineer.
- 1.1.2. Excavation shall be carried out in any type of soil, gravel, conglomerate, soft rock, boulders, old foundation, hard rock, concrete, asphalt or stone paved surfaces old masonry or concrete (plain or reinforced) encountered within width, length and depths indicated in the drawings. Where any temporary or permanent structure like sheet piling, diaphragm wall or piles have already been taken up, all excavation work shall be from the point carried out earlier and all precaution during further excavation and or any construction operation shall be exercised not to damage such existing temporary or permanent work. Where directed by the Engineer trees encountered within the work site shall be uprooted as per approved manner and serviceable wooden logs shall be stacked at site / disposed of as directed by the Engineer. Branches of trees etc. shall be disposed of or stacked at site as directed by the Engineer. No permanent work shall be commenced in the excavated area until the foundations pits have been inspected and approved by the Engineer. The Contractor may use any suitable excavated materials for incorporation in the permanent or temporary works as may be convenient subject to compliance with the specifications. Any obstacles encountered during excavation shall be reported immediately to the Engineer and shall be dealt with as directed by the Engineer.

1.2. Site Levels

- 1.2.1. Survey of existing road level by approved survey equipment to establish initial surface level and finalization of related road work activities. Contractor shall submit level book / Graphic chart for each road section.
- 1.2.2. Before the work commences the Contractor shall carry out a survey of the levels of the site and obtain verification by the Engineer of these levels. Levels shall be taken on a grid to be agreed with the Engineer and the Contractor shall submit three prints of the drawing showing the site levels for record purpose.

1.3. Support of Excavation

- 1.3.1. The Contractor shall adequately support the sides of excavation as may be necessary to prevent subsidence or movement of the material in which the excavation is being carried out and to ensure the safety of persons and nearby structures.

1.4. Slips

- 1.4.1. The Contractor shall take all necessary precautions to prevent slips in excavations and shall **at his own** make good any damage or defect and remove to spoil dumps any surplus material caused by slips.

1.5. Excavation beyond Required Limit

- 1.5.1. Any excavation beyond the required limits and against which concrete is to be placed shall be made good with concrete of similar grades. Any excavation beyond the required limits at locations where no concrete is to be placed will not be required to be made good with concrete unless otherwise directed by the Engineer



provided always that any consequential additional work caused or necessitated by the excavation beyond limits will not be admitted for payment.

1.6. Dewatering

1.6.1. While execution of works, if so encountered, the Contractor shall provide for the purpose of excavation under water all the necessary dewatering equipment like well points, pumps (including stand byes), pipes, conduits, etc. and make necessary arrangement for proper drainage of the pumped water from the well points and its easy disposal without affecting the site and the adjoining areas. The Contractor at his own cost shall take any permission required for such disposal of water to other areas, from the respective authorities.

1.7. Earthwork in Filling and Site Clearing

1.7.1. Filling is to be carried out up to the level as shown in the drawing. All old foundations, boulders etc. encountered during filling shall be removed as directed by the Engineer.

1.8. Soft Patches

1.8.1. All the soft patches encountered at the desired level of excavation, shall be removed completely as directed by the Engineer and filled back with approved soil and duly rammed and compacted with water to the required density of filling as specified and to the entire satisfaction of the Engineer. In case of rocky founding strata any soft patch and or voids are encountered, such soft patches shall be replaced and the void filled with plain cement concrete of M-15 grade compacted and finished as per direction and satisfaction of the Engineer.

1.9. Compaction Quality

1.9.1. Compaction of earth and sand filling in areas where foundations and floors are located, the degree of compaction achieved shall be minimum 95% of maximum dry density as obtained by Proctor compaction as per IS: 2720 (Part VII). Unless otherwise specified, in roads & other areas the degree of compaction shall be 90%.

1.10. Testing of Filling Layer

1.10.1. After the compaction of each layer, samples shall be taken from the compacted layer and tested for dry density as per IS Practice. The next layer of filling shall not be permitted to be deposited until the Engineer is satisfied that the previous layer has achieved required compaction. The contractor shall inform the Engineer in writing for inspection after filling and Compaction of each layer. If any particular layer fails to meet the required compaction, it shall be re-compacted as directed by the Engineer and fresh samples shall be taken to ascertain the compaction density. Such re-compaction shall be continued till the desired compaction is achieved. The thickness of each compacted layer shall not exceed 200 mm.

1.11. Dressing & Finishing

1.11.1. The filling after it reaches the required level, shall be dressed and finished as specified to the required alignment, levels, cross sections, dimensions and slopes as shown in the drawing or as directed by the Engineer. No deviation shall generally be allowed from the levels shown in the drawings.

1.12. Surface Excavation



1.12.1. Excavation exceeding 1.5 m in width or / and 10 sq. m. on plan but not exceeding 30 cm in depth shall be described as 'Surface Excavation`.

1.13. **Setting Out and Making Profiles**

1.13.1. Masonry pillars shall be erected at suitable points in the area, which is visible from the largest area to serve as benchmarks for the execution of the work. These benchmarks shall be constructed as required and connected with standard B.M. as approved by the Engineer. Necessary profiles with pegs, bamboos and strings shall be made to show the correct formation levels before the work is started. These shall be maintained during the excavation.

1.14. **Classification of Earth Work**

1.14.1. The earthwork shall be classified under the following main categories and measured separately for each category.

- a) **Soil:** It includes various types of soils, mud concrete below the ground level. Shingle and river or nallah bed boulders soling of road, paths and hard core, macadam surface of any description, lime concrete, stone masonry below the ground level, soft conglomerate and laterite when the stone can be detached from the matrix with picks and shovel.
- b) **Ordinary Soils, Sand, Clay & Soft Moorum :** This includes earth, soft murrum, top deposits of agricultural soil, reclaimed soil, clay, sand or any combination thereof which can be excavated with shovels, loose application of pick axes etc.
- c) **Hard soil, murrum, boulders, weathered / soft rock :** All decomposed weathered rock, highly fissured rock, old masonry, boulders bigger than 0.03 cum. in volume but not bigger than 0.5 cum. and other varieties of soft rock which can be removed only with hard application pick axes, crow bars, wedges and hammers with some difficulty. The more fact that the contractor resorts to blasting and / or wedging and chiseling for reasons of his own, shall not mean the rock is classifiable as hard rock.
- d) **Ordinary Rock :** All type of laterite rock will be treated as ordinary rock. If there is any difference of opinion in distinguishing between ordinary and hard rock, then the engineer's decision shall be final and binding.

Note: The scope of work taking site levels, support the sides of excavation, barricades, dewatering, etc. are inclusive of excavation item, no extra payment will be given to the contractor.

2. Earth Work in Filling / Refilling:

2.1. Unless otherwise specified, selected excavated earth shall be used for refilling. For general area filling for raising formation level selected earth shall be used as directed by the Engineer. Before filling of such area existing top soil shall be scarified to remove all vegetation and soft or debris already existing. After cleaning of debris etc the top soil shall be compacted before filling with any new soil. In case the filling earth contains deleterious salts it shall not be used. Approval of filling materials is to be obtained well in advance to commencement of work. All clods of earth shall be broken



or removed. Where the excavated material is mostly rock with boulders, the boulders shall be broken into pieces not bigger than 7.5 cm size in any direction mixed with fine materials consisting of decomposed rock, murum or earth so as to fill up the voids as far as possible and then the mixture used for filling, as approved by the Engineer. However the decision / instructions of the Engineer shall be final.

3. Hard Core Soling (Trap rubble stone Soling)

- 3.1. The hard core shall consist of layers of uniform thickness of trap stone rubble (of size 150 mm to 230 mm) or any other approved stone carefully set as close as possible on ground properly formed for the purpose. The packing shall consist of large stones. The interstices between the rubble stones shall be filled up with stone chips, spalls, and oversized metal removing the projection of the upper part of the packing so as not to loosen the hard core soling. Also spreading approved hard murrum or soil collected/stacked during excavation etc, complete, the hard-core soling should be thoroughly rammed, watered, settled to place and made compact.

4. CONCRETE WORK

4.1. General

- 4.1.1. This section covers the requirements for furnishing of cement concrete including materials proportioning, batching, mixing, testing, placing, compacting, finishing, jointing, curing & all other work as required for cast-in-situ or ready mixed plain and reinforced concrete.

4.2. Submittals

4.2.1. Materials Reports

- a) Prior to start of delivery of materials required for cement concrete the following shall be submitted by the Contractor to the Engineer for approval.
- i) Recommended suppliers and / or sources of all ingredients for making concrete including cement, fine & coarse aggregates, water and additives including samples thereof.
- ii) Quality Inspection Plan to ensure continuing quality control of ingredients by periodic sampling, testing and reporting to the Engineer on the quality of materials being supplied.

4.2.2. Plant and Equipment

- a) The contractor shall submit the proposed programme, methods and details of plant and equipment to be used for batching, mixing and placing of concrete to the Engineer, well in advance prior to start of work.

4.2.3. Certificates

- a) With each mix design, the Contractor shall submit test reports on concrete cubes and as well as on ingredients to be used at the actual construction work for approval of the Engineer.
- b) In case the source, brand or characteristic properties of the ingredients are required to be varied during the term of the contract, a revised mix design report shall be submitted to the Engineer.

4.2.4. Schedules

- a) The Contractor shall prepare working schedules for dates and quantity, location of pouring of concrete for each item of work and submit same to the Engineer at least 48 hours before commencement of such work.

4.3. Materials

- 4.3.1. Before bringing to the site, all materials for cement concrete shall be got approved by the Engineer. All approved samples shall be retained in the office of the



- Engineer before placing orders for the materials with suppliers. The materials brought on to the works shall conform in every respect to their approved samples.
- 4.3.2. Fresh samples shall be delivered to the Engineer whenever type or source of any material changes. The contractor shall check each fresh consignment of materials as it is brought on to the works to ensure that they conform to the specifications and / or approved samples.
 - 4.3.3. The Engineer shall have the option to have any of the materials tested to find whether they are in accordance with specifications. All bills, vouchers and test certificates which in the opinion of the Engineer are necessary shall be produced for his inspection when required.
 - 4.3.4. Any materials which have not been found to conform to the specifications and not approved by the Engineer shall be removed from the site by the contractor within the time stipulated by the Engineer.

4.4. **Cement**

- 4.4.1. The cement used shall be Ordinary Portland Cement conforming to IS: 8112.
- 4.4.2. Whenever possible all cement of each type shall be obtained each from one constant source throughout the contract. Cement of different types shall not be mixed with one another. Different brands of cement, or the same brand of cement from different sources, shall not be used without prior notification and approval of Engineer.
- 4.4.3. The cement shall be supplied either packed in bags or in silos installed for the purpose of supply. Packed cement shall be delivered to the site in original sealed bags which shall be labeled with the weight, date of manufacture, name of manufacturer, brand and type. Cement received in torn bags shall not be used. Moreover bags of cement which vary in weight by more than 3% shall not be accepted.
- 4.4.4. All cement shall be fresh when delivered and at ambient atmospheric temperature.
- 4.4.5. In fair-faced elements, the cement used in the concrete for any complete element shall be from a single consignment. All cement for exposed concrete shall be from the same approved source and uniform in colour.
- 4.4.6. With each and every delivery of cement the contractor shall provide the manufacturer's certificate that the cement conforms to the relevant Indian Standard.
- 4.4.7. The Contractor shall provide facilities for making 7 days tests and 28 days from time to time in accordance with IS:3535, IS:4031 and IS:4032 (Latest Edition) and shall allow for carrying out such tests as may be required by the Engineer and for reporting the results.

4.5. **Aggregates**

- 4.5.1. Aggregates from natural sources shall be in accordance with IS: 383. The Contractor shall submit to the Engineer certificates of grading and compliance from the suppliers for all consignment of aggregate. In addition from time to time, the Contractor shall test that aggregate at site in accordance with IS: 2386 Part I, II & III. The contractor shall allow for and provide all necessary apparatus for carrying out such tests and for supplying test records to the Engineer. The aggregates shall be free from salts or other harmful chemical impurities.
- 4.5.2. For fair-faced concrete, the contractor shall ensure that aggregates are free from iron pyrites and impurities, which may cause discoloration.
- 4.5.3. Fine Aggregates



- a) The fine aggregate shall be pit sand, river sand or other approved sand conforming to IS: 383. It shall be free from clay, loam, and earth or vegetable matter & from salt or other harmful chemical impurities. In case impurities cannot be removed by screening process, sand shall be washed and cleaned to the satisfaction of the Engineer. It shall be clean, sharp, strong, angular and composed of hard silicious material.

i) Silt Content

The maximum quantity of silt in fine aggregates as determined by the Field method shall not exceed 8 percent by volume.

4.5.4. Coarse Aggregate

- a) The coarse aggregate shall be crushed stone conforming to IS: 383, having nominal size of 20 mm & 40 mm as per requirements and as approved by Engineer.
- b) Coarse aggregate obtained from crushed or broken stone shall be angular, hard, strong, dense, durable, clean and free from soft, friable, thin flat, elongated or flaky pieces.
- c) Except where it can be shown to the satisfaction of the Engineer that a supply of properly graded aggregate of uniform quality can be maintained over the period of the works, the grading of aggregate shall be controlled by obtaining the coarse aggregate in different sizes & blending them in correct proportions as and when required.

4.6. Water

- 4.6.1. Water used in the works shall be potable water & free from deleterious materials. Water used for mixing and curing concrete as well as for cooling and / or washing aggregate shall be fresh and clean, free from injurious amounts of oil, salts, acids, alkali, other chemicals and organic matter.
- 4.6.2. Water shall be from the source approved by the Engineer and shall be in accordance with IS: 456 (latest edition)
- 4.6.3. Before starting any concreting work and wherever the source of water changes, the water shall be tested for its chemical and other impurities to ascertain its suitability for use. No water shall be used until tested, found satisfactory and approved by Engineer. Water testing kit shall be made available at site for random checking of water.

4.7. Steel Reinforcement

- 4.7.1. Steel reinforcement shall be of Thermo Mechanically Treated (TMT) bar conforming to IS 1786 (latest edition)

4.8. Admixtures and Additives

- 4.8.1. Chemical admixtures shall conform to IS 9103 & are not to be used unless permitted by the Engineer. In case their use is permitted, the type, amount, chemical property and method of use of any admixture proposed by the contractor shall be submitted to the Engineer for approval prior to the approval of the same.
- 4.8.2. The contractor shall further provide the following information concerning each admixture to the Engineer.
- a) Normal dosage and detrimental effects if any of under dosage and over dosage.
- b) The chemical names of the main ingredients in the admixture.



- c) The chloride ion content if any expressed as a percentage by weight of admixture.
 - d) Whether or not the admixture leads to entrapment of air when used in the manufacturer's recommended dosage.
 - e) Where two or more admixtures are proposed to be used in any one mix, the manufacturer's written confirmation of their compatibility.
- 4.8.3. In reinforced concrete, the chloride ion of any admixture used shall not exceed 2% by weight of the admixture as determined in accordance with IS: 6925 and the total chloride ion in all admixtures used in concrete mix shall not exceed 0.83 percent by weight of cement or as per latest IS code.
- 4.8.4. The admixtures shall conform to IS: 9103. The suitability of all admixtures shall be verified by trial mixes.
- 4.8.5. The addition of calcium chloride to concrete containing embedded metal will not be permitted under any circumstances.
- 4.8.6. Retarding admixtures when used shall be based on lingo sulphonates with due consideration to clause 5.2 and 5.3 of IS: 7861.
- 4.8.7. Waterproofing admixtures shall comply with IS: 2645.

4.9. **Storage**

All goods and products covered by these specifications shall be procured well in advance and stored as specified below:

4.9.1. **Storage of Cement**

- a) Cement shall be stored on a raised floor in dry, waterproof and well ventilated shed.
- b) Cement bags shall be stacked at least 60 cm away from external walls and in stacks of not more than ten bags to avoid lumping under pressure.
- c) Cement stored during monsoons shall be completely enclosed in 700 gauge polythene sheet so arranged that the flap closes on the top stack. The contractor shall ensure that protective polythene sheet is not damaged at any time during use.
- d) Cement of different types shall be stored in separate sheds or separate compartment of a shed. If different types of cement are mixed, the Engineer will have the discretion to condemn all the cement concerned.
- e) Consignment of cement shall be used in order of delivery. A record shall be kept of the batch numbers of cement deliveries in such a form that the part of the works in which the cement is used can be readily identified.
- f) The contractor shall be responsible for the storage of cement at the site and no claim will be entertained in the event of any damage occurring to cement due to faulty storage by the contractors or on account of his negligence.
- g) Cement stored on site for a period longer than eight weeks shall be tested to the satisfaction of the Engineer before it is used in the works.
- h) Cement which has so deteriorated in quality that it no longer conforms in all respects to the requirements of this specification will be condemned by the Engineer & shall not be used in the works. The contractor shall immediately remove from the site all cement, which has been so condemned

4.9.2. **Stacking of Aggregates**

- a) Aggregates shall be stored on a suitable well drained raft of concrete, timber, metal or other approved material. The storage of aggregate on the ground will not be permitted.



- b) Each size of aggregate shall be stored separately in such a manner as to prevent spillage and mixing of one aggregate with an adjacent aggregate. The dividing wells of any bins shall be of sufficient height & the aggregate shall be so deposited that a distance of 300 mm shall be left between the top of the division wall and any part of the aggregate stack.
- c) When stack piling, the aggregate shall not form pyramids resulting in segregation of different size particles. The stacks shall be regular and of a height not exceeding two meters.

4.9.3. **Stacking and Storage of Steel Reinforcement**

- a) Steel reinforcement shall be stored in a way as to prevent distortion and corrosion, bars of different classifications, sizes and lengths shall be stored separately to facilitate issues in such sizes and lengths and to minimize wastage in cutting from standard lengths.

4.10. **Concrete Mix**

4.10.1. Cement concrete used in the works shall be either of the two categories given below:

a) **Nominal Mix Concrete**

- i) The proportion of aggregates and cement shall be as specified.

b) **Design Mix or Controlled Concrete**

- i) The design mix or controlled concrete shall conform to the grades specified in item or drawings. The mix shall be designed to achieve the required strength and the ingredients shall be measured by weight in approved weigh batching equipment. Mixing of water shall be measured in graduated liter cans. In case cement is supplied packed in bags one or more complete bags of cement shall be used for each batch of concrete.
- ii) The controlled concrete shall meet with the strength requirement laid down in Table 2. The aggregate cement ratio and water cement ratio to be used for obtaining the specified strengths given in Table 2, shall be determined in accordance with the design of the mix. The water cement ratio shall not be more than the maximum water cement ratio specified hereinafter.

TABLE-1

Grade of Controlled Concrete	Compressive Strength of 15 cm Cubes (Kg/cm ²)			
	Laboratory Design Strength		Field Test	
	7 days	28 days	7 days	28 days
M15	143	210	105	150
M20	190	280	140	200
M25	235	345	175	250
M30	270	410	205	300
M40	360	560	270	400

- iii) The contractor shall be responsible for designing mixes of the specified performance to suit the degree of workability and characteristic strength, required for the various parts of the works.
- iv) Alternative mixes may be designed by the contractor for use in both thin and narrow sections & thick sections. Special mixes using finer aggregates



may be designed by him for infilling pockets and narrow spaces and for regions of congested reinforcement.

- v) The minimum cement content for various grades of concrete shall be as follows.

Grade of Concrete	Minimum cement content (Kg/m ³)	
	PCC	RCC
M 15 (1:2:4)	240	300
M 20 (1:1.5:3)	260	340
M 30 (Design Mix)	-	340
M 40 (Design Mix)		360

- vi) The maximum water cement ratio shall be 0.45 for M-30 & M-25 grade concrete, and 0.5 for M 20 grade concrete

4.10.2. **Strength of Nominal Mix Concrete**

- a) The compressive strength on field tests for different nominal mixes, if adopted are given in Table - 3 below :

Table - 3

Concrete Mix (Nominal)	Compressive Strength (Kg/cm ²)	
	7 days	28 days
M - 15	105	150
M - 20	140	200

4.11. **Water Cement Ratio**

- 4.11.1. The quantity of water added to the cement and aggregate during mixing shall be such as to produce a concrete having sufficient workability to enable it to be properly compacted to be worked into the corners of the shuttering and around reinforcement.
- 4.11.2. The variation of moisture content within any consignment of aggregate and any variations due to watering, exposure to rain or drying weather shall be taken into account in determining the quantity of water to be added in concrete mix. The contractor shall carry out regular moisture content tests in accordance with IS:2386 Part III on stacked aggregate as directed by the Engineer and results submitted to him.
- 4.11.3. In case of nominal mix concrete the maximum water cement ratio shall be as stated in Table - 9, IS : 456 and in the case of controlled concrete the water cement ratio shall be as determined in the approved mix design subject to maximum limit as stated herein before.
- 4.11.4. The contractor shall exercise tight control on the water content for concrete mix.
- 4.11.5. When a suitable water cement ratio has been determined and approved by the Engineer, it shall be maintained throughout the corresponding part of works. Approved tests shall be undertaken periodically by the contractor to satisfy the Engineer of the maintenance of the consistency. However the amount of water



added to a mix other than for fair faced concrete may be reduced below the agreed design amount with the consent of the Engineer if the contractor is able to demonstrate that such a reduction is consistent with producing concrete of the required workability and characteristic strength.

4.11.6. The contractor shall frequently test the concrete for slump cone test. The slump at the actual location of placing as measured in accordance with the methods laid down in IS:1199 shall not be more than 75 mm and not less than 50 mm unless otherwise approved by the Engineer.

4.12. **Approval of Design Mixes**

4.12.1. The contractor shall submit to the Engineer for comment sufficient evidence based on trial mixes that for each grade of concrete, the intended workability, the proposed mix proportions & method of manufactures, which will produce concrete of the required quality.

4.12.2. The contractors shall obtain from the Engineer his written approval on the mix design for each grade of concrete before any concrete of that grade is placed in the works.

4.12.3. For each grade of concrete, three separate batches of concrete shall be made by the contractor using materials typical of the proposed supply and under full scale site conditions.

4.12.4. The workability of each of the trial batches shall be determined and 3 specimen preliminary test cubes shall be tested at 7 days & 6 cubes of each set shall be tested at 28 days.

4.12.5. Following agreement with the Engineer on the trial mix proportions should the contractor wish to make substantial changes in the materials or in the proportions of the materials to be used in mix, the Engineer will require further trial mixes to be made and their results submitted for comments prior to such materials or proportions being adopted by the contractor.

4.13. **Concrete Testing**

4.13.1. **Cube Test**

a) The strength of concrete either in assessing the suitability of the trial mixes or when placed in the works shall be determined from 150 mm cubes made, cured, stored, transported and tested in accordance with IS:516 and as specified.

b) Test cubes shall be made as and when required by the Engineer as per the relevant IS Stipulation.

c) Test cubes shall be made under the direct supervision of the competent person appointed by the contractor to supervise all stages of the preparation and placing of concrete. They shall be made by the contractor in the presence of the Engineer and generally from concrete taken at the point of discharge from the mixer and the contractor shall provide suitable facilities in the form of a shed or other covered protection as agreed with or directed by the Engineer for the storing and curing of the test cubes during the first 24 hours after making them and until they are dispatched to the testing laboratory.

d) Test cubes shall be marked and dated in such a manner that the trade and the part of the works in which the concrete they represent has been placed can be readily identified.

e) Testing shall be done in the field laboratory only; in special case with due approval of Engineer or whenever so desired and directed by the Engineer, testing may be carried out in approved laboratory and the results shall be submitted promptly by the contractor to the Engineer without any extra cost.



- f) When concrete of a particular grade is first used in the works, 2 cubes each shall be taken from 3 separate batches during each of the first 7 days of using that grade. Of these 6 cubes made daily, 3 cubes (each cube representing concrete made of a different batch) shall be tested at 7 days and the remaining 3 cubes shall be tested at 28 days.
- g) If the concrete strength determined from such 28 days cube tests does not reach the characteristic strength for that grade, the materials and / or their proportions for that grade shall be modified by the contractor to the satisfaction of the Engineer.
- h) In addition the contractor shall at his own expense take such actions as the Engineer may consider necessary on the concrete placed in that part of the works represented by the set of cubes so found to be below the characteristic strength.

4.14. **Concrete Production**

4.14.1. For production of concrete, concrete batching plant of about 12-15 m³/hr. capacity with tested and calibrated water meter, mechanical weigh batcher shall be used for production of all concrete. Necessary approval shall be obtained from Engineer before the installation of mixing arrangement is installed at site. However, the contractor, if desires so can procure ready mix concrete from the market at no extra cost subject to compliance of technical specifications as laid down in the contract agreement for various grade of concrete. Concrete mixer for production of small quantum of concrete and non-structural member can be allowed at the discretion of Engineer.

4.15. **Concrete Mixing**

- 4.15.1. All concrete in the correct proportion of ingredients approved by the Engineer, whether ordinary or controlled, shall be mixed in a batching plant for the minimum time necessary to ensure adequate quality and uniform distribution of the materials. The cement and aggregates shall normally be first mixed dry until all particles of aggregate are coated with cement after which the water shall be added along with admixture.
- 4.15.2. Allowance shall be made for the moisture content of the aggregates when calculating the amount of water to be added for each mix.
- 4.15.3. The temperature of the aggregate, water and cement when added to the mixer shall be such that the temperature of the concrete at the time of placement is less than 40°C.
- 4.15.4. Materials for concrete shall be deposited into the drum while it is in rotation. Mixers shall not be loaded beyond their rated capacity and each batch shall be completely discharged from the drum before recharging takes place.
- 4.15.5. Facilities shall be provided to spray the mixer drum with cool water between batches and on the completion of concreting the drum shall be washed thoroughly. The surface of the mixer drum shall be maintained in a clean condition at all times.
- 4.15.6. Retempering and / or mixing of concrete, which has partially hardened and set will not be permitted under any circumstances.

4.16. **Transporting**



- 4.16.1. The period between mixing the concrete and placing it in the final position shall be kept to a minimum and the delivery of concrete shall be coordinated with the rate of placement to avoid delays in delivery and placement.
- 4.16.2. Concrete shall be handled from the place of mixing to the place of final deposit by methods, which prevent segregation, loss of ingredients and contamination and maintain the required workability.
- 4.16.3. Should any segregation have occurred in any batches arriving at the place of deposition, such batches shall be rejected and shall not be allowed to use. Where concrete is conveyed by chutes, the chutes shall be made of metal or fitted with metal linings. The approval of the Engineer shall be obtained for the use of chutes more than 3 metres long.
- 4.16.4. All plant and equipment used in the transportation of concrete shall be thoroughly cleaned before and after each working period and at all changes of concrete mixes.
- 4.16.5. All major concreting is advisable to be done by concrete pump of adequate capacity with necessary approval obtained by the contractor. If concrete pump is used, delivery system with adequate boom length, pipeline and associated items shall be obtained before installation of the concrete pump. There shall also have the provision of a approved standby system in case of any eventualities for transportation and placement of the concrete.

4.17. **Preparation Before Concreting**

- 4.17.1. The inside surface of the forms against which concrete is to be placed shall be clean and free from dried or hardened spattering or coatings of concrete. The forms shall be wetted before placing concrete.
- 4.17.2. When the work has to be resumed on a surface which has hardened, such surface shall be roughened. It shall then be swept clean and covered with a coating of freshly mixed epoxy based concrete adhesive as per manufacturer's instructions immediately before placing of concrete.
- 4.17.3. Before any concrete is placed on the sub grade, the sub grade shall be checked and approved for degree of compaction and alignment. The sub grade shall be kept damp ahead of concreting.
- 4.17.4. Concrete shall not be placed in the works until the Engineer has inspected the formwork, reinforcement, inserts and sleeves if any & given his permission to place concrete.

4.18. **Placing**

- 4.18.1. Concreting of any portion of the works shall be done only in the presence of the Engineer or his representative.
- 4.18.2. Concreting shall be carried out continuously between construction or expansion joints, shown on the drawings or as agreed with the Engineer. The contractor shall closely follow the sequence of concreting where such is specified in the drawings or instructed at site. If concreting is interrupted before reaching the predetermined joint an approved construction joint shall be provided after obtaining necessary approval from the Engineer.
- 4.18.3. Immediately before placing of concrete for columns & walls, the reinforcement within and the old concrete at the bottom of the formwork shall be given a coating of epoxy based concrete adhesive, to prevent the loss of bonding with existing surface.
- 4.18.4. Concrete shall be deposited as nearly as is practicable to its final position and shall not be dumped in a large quantity at any point to be run or worked along the formwork manually or with vibrators. Concrete shall not be deposited at a



faster rate than it can be placed and compacted. Concrete shall not be placed from a height more than 1.5 m.

4.18.5. Concrete shall be thoroughly worked into the forms so that they are entirely filled, reinforcing bars adequately and tightly surrounded and entrained air released from the mass of concrete. Placing shall be carried with the use of vibrators in a manner approved by the Engineer.

4.18.6. For members having thickness more than 300 mm, the concrete shall be placed in layers not greater than 300 mm thickness and thoroughly compacted before succeeding layers are placed. Concrete shall be placed in single operation to the full thickness of slabs, beams and similar members. No concrete shall be placed on concrete which has set sufficiently to cause the formation of planes of weakness & where these are likely to occur due to unforeseen circumstances and the procedure to be followed shall be as given earlier of this specification. As far as possible, cold joints in concrete shall be avoided.

4.19. **Compaction**

4.19.1. Each layer of concrete whilst being deposited shall be compacted by approved methods to form a dense material with all surface free from honeycombing, air holes or other blemishes. The contractor shall use mechanical vibration for all concrete and shall take care that internal vibrators shall not be brought into contact with the reinforcement or the formwork.

4.19.2. An adequate number of vibrators shall be used to ensure that compaction of concrete is achieved within 10 minutes of placing. Particular attention shall be given to the compaction of the concrete around the water bars to ensure that no voids or porous areas are left.

4.19.3. Compacting shall cease as soon as excess water appears on the face of concrete. Any water accumulating on the surface of newly placed concrete shall be removed by approved methods and no further concrete shall be placed thereon until such water has been removed.

4.19.4. Notwithstanding the requirements regarding mix design, should it be found that the proportion of water in the mix is such that the laitance forms before compaction (i.e. completion of expulsion of air) is complete and unacceptable, the quantity of water in the mix shall be reduced. Approved admixture / plasticizer shall be used to achieve the necessary workability, as approved by the Engineer and strictly in accordance with manufacturer's instructions. Whenever either of the aforesaid procedures are to be adopted, an additional set of 6 cubes for testing at 7 or 28 days shall be made from the adjusted mix.

4.19.5. The time elapsed between the discharge of the concrete from the mixer and the completion of compaction shall not exceed 30 minutes where concrete admixture is not used.

4.19.6. A sufficient number of spare vibrators of various capacities & types shall be kept readily accessible to the place of deposition of concrete to assure adequate vibration in case of breakdown of those in use.

4.20. **Finish**

4.20.1. All concrete surfaces shall have a good, densified form finish. The top surfaces specified as smooth shall be leveled and towed before the concrete begins to set to a smooth finish at levels and falls shown on the drawings. The toweling shall be done at such a time and in such a manner that excess of mortar is not brought to the surface of concrete nor the aggregate displaced. The top surfaces of



concrete slabs specified to receive an integral finish shall be uniformly roughened by deep hacking before the finish is laid

- 4.20.2. Immediately after striking the formwork and removing any superficial water, honeycombed areas in normal unfinished concrete shall be inspected by the Engineer and where directed the contractor shall immediately make it good to the satisfaction of the Engineer. All air holes shall be similarly filled up.
- 4.20.3. The contractor shall be responsible for providing an adequate key in concrete where plastering or rendering is specified to be applied. Hacking of the concrete surface after striking the formwork will be permitted only after 3 days after the concreting is done.
- 4.20.4. The faces of all fair faced concrete shall be of even colour throughout, free from air bubbles, cracks, honeycombing or other blemishes and will be inspected by the Engineer on report by the Contractor, immediately after the formwork has been struck. Such faces shall not be rubbed down or otherwise repaired to remove any defects or imperfections without the prior permission of the Engineer.
- 4.20.5. Concrete surface finishes shall accord to the requirements and all instructions by the Engineer with regard to the method of achieving such finishes as implemented. Wherever directed or specified, concrete surface shall be made broom finished.

4.21. **Curing and Protection**

- 4.21.1. Walling or further loading on concrete shall not be permitted for at least 48 hours after it has been placed in position, or for such additional length of time as the Engineer may direct.
- 4.21.2. Immediately after compaction and completion of any surface finishes, the concrete shall be protected from the evaporation of moisture by means of polythene sheeting, wet hessian or other suitable material kept soaked by spraying. As soon as the concrete has attained a degree of hardening sufficient to withstand surface damage, continuous moist curing shall be implemented and maintained for a period of at least 15 days after casting to full satisfaction of the Engineer.
- 4.21.3. Method of curing and their duration shall be such that the concrete will have satisfactory durability and strength and members will suffer a minimum distortion, be free from excessive efflorescence and will not cause, by its shrinkage, undue cracking in the works.
- 4.21.4. The top surfaces of slabs and other horizontal surfaces shall be cured by ponding of water in cement mortar bunds. Steeply sloping and vertical formed surfaces shall be kept completely and continuously wet prior to and during the striking of formwork and thereafter by applying adequate water to the top surfaces and allowing it to pass down between the formwork and the concrete, if required by discharging water through hose pipes and pumps.
- 4.21.5. The Contractor shall give careful consideration to the curing methods and conditions for fair-faced concrete. Components which are specified to have exposed concrete finish shall receive the same curing treatment. Moreover water used for curing shall be clean and free from deleterious materials so as not to discolour the concrete.
- 4.21.6. All fair faced concrete shall be protected from damage at the time of striking the formwork. All edges and surfaces of such concrete shall be protected from



chipping using notched timber or aluminium corner pieces or other suitable covers, which shall be maintained, in place until the completion of the works.

- 4.21.7. The Contractor shall be responsible for ensuring all fair faced concrete free of blemishes defect & stains and shall remove all such staining as may occur as soon as possible to the satisfaction of the Engineer.

4.22. **Internal Vibrators**

- 4.22.1. These should invariably be used. However, vibrators shall not be used for displacing concrete. Overloading the vibrators by placing too much concrete per vibrator, over vibrating by using too many vibrators relative to quantity of concrete shall be avoided. Segregation by excessive vibration or excessive water content should be strictly avoided. Vibrator shall be withdrawn gradually and smoothly, and in a manner which shall not cause suction, voids or air entrapment.

4.23. **Construction Joints**

- 4.23.1. Prior to concreting, the Contractor shall submit his proposals giving the position, form and treatment of such joints to the Engineer for his approval.
- 4.23.2. Vertical construction joints shall be formed against a stop board of approved quality and horizontal construction joints shall be level.
- 4.23.3. Except where shown otherwise on the drawings, reinforcement shall continue through construction joints and stop boards are to be formed to suit such requirements at site.
- 4.23.4. As soon as possible after the formwork has been struck for vertical joints or after the concrete has set in horizontal joints, the surface laitance of the hardened concrete on the face of the joint shall be removed to expose the coarse aggregate in such a manner that the loosened particles of aggregate and damaged concrete are not left on the surface. The exposed face shall be swept clean of foreign matter and laitance. Immediately before placing the new concrete, a coat of epoxy based concrete adhesive shall be put over the old concrete followed for joints of thickness as per manufacturer's instructions.
- 4.23.5. Before next operation is started, all timber spoils, laitance, scum or loose concrete shall be removed by hacking the surface and then scrubbing off with a wire brush to remove all loose mortar or aggregates. Thereafter, before resuming concreting operation, the surface should be thoroughly cleaned and a coat of epoxy based conc. adhesive shall be applied. As an additional precaution, approved water bars (as in IS: 3370 (Part-I)-1965) shall be used, if required at such joints as per manufacturer's instruction. But sufficient care shall be taken when such water barriers are used during pouring concrete from height, so that these strips shall not get bent; and thereby restrict the passage of concrete; causing large size pores and honeycomb concrete. The rate of epoxy based conc. Adhesive is deemed to be included in the concrete item.

4.24. **Expansion Joints**

- 4.24.1. Expansion joints shall be provided where shown on the drawings. They shall be constructed with an initial gap between the adjoining parts of the works of the width specified in the drawings.
- 4.24.2. The contractor shall ensure that no debris is allowed to enter and be lodged in expansion joints.
- 4.24.3. Expansion joints shall be provided with approved joints filler, a joint sealing compound and in waterproof concrete a water bar as specified in drawing.
- 4.24.4. **Joint fillers:**



- a) The joints filler compound shall be easily and uniformly compressible to its original thickness, tamp able, easily cut or sawn, robust, durable, resistant to decay due to termite or weathering, unaffected by water & free of any constituent which will bleed into or stain the concrete.
- b) The joint filler shall be of same thickness of the joint width, it shall extend through the full thickness of the concrete unless otherwise specified and shall be sufficiently rigid during handling & placing to permit the formation of straight joints.

4.24.5. **Joint Sealing Compounds**

- a) Joint sealing compounds shall be in accordance with the IS 3037-1986 and approved by the Engineer and shall seal joints in concrete against the passage of water, prevent the ingress of grit or other foreign material and protect the joint filler. The compound shall have good extensibility and adhesion to concrete surfaces and shall be resistant to flow and weathering.
- b) Where so specified joints shall be sealed with approved polysulphide / polyurethane, stored, mixed, handled, applied and cured strictly in accordance with the manufacturer's printed instructions. Such joints shall be formed to the correct dimensions, thoroughly cleaned and treated with recommended primer. The Contractor shall use only competent personnel experienced in the application of sealant for such work.
- c) Where specified in the drawings, rubber / bituminous based sealants shall be of an approved manufacturer. The treatment of the joint and the use of sealing compound shall be strictly in accordance with the manufacturer's printed instructions.

4.25. **Cracks**

- 4.25.1. If any cracks develop in the reinforced cement concrete construction which in the opinion of the Engineer may be detrimental to the strength of the construction, the contractor shall test the structural element in question. If under these test loads the cracks shall develop further the contractor shall dismantle the construction, cart away the debris replace the construction and carryout all consequential work thereto.
- 4.25.2. If the cracks are not detrimental to the stability of the construction in the opinion of the Engineer, the contractor shall grout the cracks with pneumatically applied mortar or epoxy grout or by other specified treatment as directed by the Engineer at his own expense and risk.
- 4.25.3. The repair work shall be carried out to the satisfaction of the Engineer. The decision of the Engineer as to the extent of the liability of the contractor in the above matter shall be final and binding on the contractor.

4.26. **Load Testing on Completed Structures**

- 4.26.1. During the period of construction or within the defect liability period as the case may be, the Engineer may at his discretion order the load testing of any completed structure or any part thereof if he has reasonable doubts about the adequacy of the strength of such structure for any of the following reasons:
 - a) Unsatisfactory values of the Cube strength of the grade of concrete specified.
 - b) Premature removal of formwork.
 - c) Inadequate curing of concrete.
 - d) Over loading during the construction of the structure or part thereof.
 - e) Carrying out concreting of any portion without prior approval of the Engineer.



- f) Honey combed or damaged concrete, which in the opinion of the Engineer is particularly weak and will affect the stability of the structure to carry the design load, more so in important or critical areas of the structure.
- g) Any other circumstances attributable to alleged negligence of the contractor which in the opinion of the Engineer may result in the structure or any part thereof being of less than the expected strength.
- 4.26.2. All the loading tests shall be carried out by the contractor strictly in accordance with the instructions of the Engineer. Such tests should be carried out only after expiry of minimum 28 days or such longer period as directed by the Engineer.
- 4.26.3. The structure should be subjected to a load equal to full dead load plus 1.25 times the imposed load. This load shall be maintained for a period of 24 hours before removal. During the test, struts strong enough to take the whole load shall be placed in position leaving a gap under the members as directed.
- 4.26.4. The deflection due to the superimposed load shall be recorded by sufficient number of approved deflectometers capable of reading upto 1/500 of a cm and located suitably under the structure as directed by the Engineer. If within 24 hours of the removal of the superimposed load, the structure does not recover at least 75% of the deflection under the superimposed load, the test loading shall be repeated after a lapse of 72 hours. If the recovery after the second test is less than 80% of the maximum deflection shown during the second test, the structure shall be considered to have failed to pass the test and shall be deemed to be unacceptable.
- 4.26.5. If the maximum deflection in mm, shown during 24 hrs. under load is less than $40l^2 / D$, where l is the effective span in m; and D , the overall depth of the section in mm, it is not necessary for the recovery to be measured and the recovery provisions as stated above.
- 4.26.6. The part of the work failed in test shall be taken down or cut out and reconstructed to comply with the specifications. Other remedial measures may be taken to make the structure secure at the discretion of the Engineer. Moreover, such remedial measures shall be carried out to the complete satisfaction of the Engineer.
- 4.26.7. In addition to the above load tests, non destructive test methods such as core test and ultrasonic pulse velocity test shall be carried out by the Contractor at his own expense if so desired by the Engineer. Such tests shall be carried out by an agency approved by the Engineer and shall be done under expert guidance using only recommended testing equipment. The acceptance criteria for these tests shall be in accordance to IS: 1959 and IS:456.
- 4.27. **Non-Destructive Test**
- 4.27.1. If necessitated, the Engineer may ask for Non-Destructive Test for the structural members under doubt about their strength. None-Destructive Test include Ultrasonic Pulse velocity (IS: 13311, Part-1) & rebound hammer IS: 13311 (Part-2).
- 4.27.2. All costs involved in carrying out the Load Tests and Non-destructive Test and other incidental expense thereto shall be borne by the contractor regardless of the result of the tests. The Contractor shall take down or cut out and reconstruct the defective work or shall make the remedial measures instructed at his own cost.
- 4.28. **Supervision**
- 4.28.1. All concreting work shall be done under strict supervision of qualified and experienced representatives of the Contractor as well as those of the Engineer. The contractor's supervisor who is in charge of concreting work shall be experienced &



skilled in this class of work and shall personally supervise all the concreting operations at all stages.

4.29. Special attention shall be paid to the following

- 4.29.1. Proportioning, mixing and quality testing of the materials with particular control on the water cement ratio.
- 4.29.2. Laying of material in place and thorough compaction of the concrete to ensure solidity and freedom from voids and honeycombing.
- 4.29.3. Proper curing for the requisite period.
- 4.29.4. Reinforcement positions are not disturbed during concreting & consolidation by vibration.

4.30. Quality Control

- 4.30.1. The Engineer reserves the right to make changes in the mix proportions including the increased cement content or / and a change in the Contractor's control procedure, should the quality control during progress of the works prove to be inadequate in his opinion and the contractor shall carry out the same. Any extra cost due to change in mix proportions shall be deemed to have been included in relevant item rates.
- 4.30.2. All the concrete work shall be true to level, plumb & square within the acceptable tolerance. The corners, edges and rises in all cases shall be unbroken and finished properly and carefully.

5. SPECIFICATION FOR TESTING CONCRETE

5.1. Cement

- 5.1.1. The Contractor shall make his own arrangement for procurement of cement. Cement should be of Ultratech, ACC, Gujarat Ambuja or equivalent brand Ordinary Portland cement conforming to IS 8112 – 1989 (Grade 43 or higher).

5.2. Concrete:

- 5.2.1. Controlled concrete shall be based on a mix design carried out in a laboratory, approved by MDL, and shall conform to IS 456-2000. The requirements of sampling and testing shall be as given in these specifications.

5.2.2. Design Mix Concrete:

- a) As the guarantor of quality of concrete used in the construction, the Contractor shall carryout the mix design and the mix so designed (not the method of design) shall be approved by the Employer within the limitation of parameters and other stimulations laid down by IS: 456-2000.
- b) The mix shall be designed to produce the grade of concrete having the required workability and a characteristic strength not less than appropriate value given in Table I below. The target mean strength of concrete mix should be equal to the characteristic strength plus 1.65 times the standard deviation.
- c) Mix design done earlier not prior to one year may be considered adequate for later work provided there is no change in source and quality of the materials.

Table I: Grades of Concrete

Table I Grades of Concrete

Group	Grade Designation	Specified Characteristic Compressive Strength of 150 mm Cube at 28 days in N/mm ²
(1)	(2)	(3)



Ordinary Concrete	M 10	10
	M 15	15
	M 20	20
	M 25	25
Standard Concrete	M 30	30
	M 35	35
	M 55	55

Notes:

- d. In the designation of the concrete mix M refers to the mix and the number to the specified compressive strength of 150 mm size cube at 28 days, expressed in N/mm².
- e. For concrete of compressive strength greater than M 55, design parameters given in the standard may not be applicable and the values may be obtained from specialised literatures and experimental results.

5.3. Standard Deviation

5.3.1. The standard deviation for each grade of concrete shall be calculated separately.

5.3.2. Standard deviation based on test strength of sample.

- a) Number of test results of samples – The total number of test strength of samples required to constitute an acceptable record for calculation of standard deviation shall not be less than 30. Attempt should be made to obtain the 30 samples, as early as possible, when a mix is used for the first time.
- b) In case of significant changes in concrete – When significant changes are made in the production of concrete batches (for example changes in materials used, mix design, equipment or technical control), the standard deviation value shall be separately calculated for such batches of concrete.
- c) Standard deviation to be brought up to date – The calculation of the standard deviation shall be brought up to date after every change of mix design.

5.3.3. Assumed Standard Deviation

- a) Where sufficient test results for a particular grade of concrete are not available, the value of standard deviation given in Table II may be assumed for design of mix in the first instance. As soon as the results of the samples are available, actual calculated standard deviation shall be used and the mix design properly. However, when adequate past records for a similar grade exist and justify to the designer a value of standard deviation different from that shown in Table II, it shall be permissible to use that value.

Grade of Concrete	Assumed Standard Deviation (N/mm ²)
M 10	3.5
M 15	
M 20	4.0
M 25	
M 30	5.0
M 35	
M 40	



M 45	
M 50	

Note:

The above values correspond to the site control having proper storage of cement; weigh batching of all materials; controlled addition of water; regular checking of all materials; aggregate grading and moisture content; and periodical checking of workability and strength. Where there is deviation from the above, the values given in the above Table shall be increased by 1 N/mm².

5.4. Specimen

5.4.1. Test specimens shall be cubes whose sizes shall be as given below.

Minimum size of Coarse Aggregate	Size of specimen cubes in cm.
Not exceeding 20 mm	10 x 10 x 10
Greater than 20 mm but not exceeding 40 mm	15 x 15 x 15

5.4.2. Sampling of Concrete

- a) Samples for concrete for test specimens shall be taken at the mixer or in the case of ready mixed concrete from the transportation vehicle during discharge. The sample of concrete from which test specimens are made shall be representative of the entire batch. Such samples shall be obtained by repeatedly passing a scoop or pail through the discharging stream of concrete, stacking the sampling operation until the entire batch is discharged. The sample thus obtained shall be transported to the place of moulding of specimen, and to counteract segregation, the concrete shall be mixed with a shovel until it is uniform in appearance. The location in the work of the batch of concrete thus sampled shall be noted for further reference. In the case of paving concrete, samples may be taken from the batch immediately after deposition on the sub-grade. At least five samples shall be taken from different positions of the pile and these samples shall be thoroughly mixed before being used to form the test specimens.

5.4.3. Preparation of Test Specimens

- a) The interior surfaces of the mould and base plate shall be lightly oiled before the concrete is placed in the mould. From the samples of concrete, the test specimen shall be immediately moulded by one of the following methods.
- i) When the job concrete is compacted by ordinary methods, the 1st specimen shall be moulded by placing the test concrete in the mould in layers, each approximately one-third of the volume of the mould. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it, in order to ensure a uniform distribution of concrete within the mould. Each layer shall be rodded 25 times with a 16 mm rod, 60 cm in length, bullet pointed at the lower end. The strokes shall be distributed in a uniform manner over the cross section of the mould and shall penetrate into the underlying layer. The bottom layer shall be rodded throughout its depth. After the top layer has been rodded, the surface of the concrete shall be struck off with a trowel and covered with a glass plate at least 6.5 mm thick or a machined metal plate. The whole process of moulding shall be carried out in such a



manner as to preclude the alteration of the water cement ratio of the concrete, by loss of water either by leakage from the bottom or overflow from the top of the mould.

- ii) When the job concrete is placed by vibration and the consistency of the concrete is such that the 1st specimen cannot be properly moulded by hand rodding as directed under (i) above, the specimens shall be vibrated to give a compaction corresponding to that of the job concrete. The fresh concrete shall be placed in the mould in two layers, each approximately half the volume of the mould. In placing each scoopful of concrete, the scoop shall be moved around the top edge of the mould as the concrete there slides from it, in order to ensure a symmetrical distribution of concrete within the mould. Either internal or external vibrators may be used. The vibration of each layer shall not be continued longer than is necessary to secure the required density. Internal vibrators shall be of appropriate size and shall penetrate only the layer to be compacted. In compacting the first layer, the vibrators shall not be allowed to rest on the bottom of the mould. In placing the concrete for the top layer, the mould shall be filled to the extent that there will be no mortar loss during vibration. After vibrating the second layer, enough concrete shall be added to bring the level above the top of the mould. The surface of the concrete shall then be struck off with a trowel and covered with a glass or steel plate as specified under (a) above. The whole process of moulding shall be carried out in such a manner as to preclude the alteration of the water cement ratio of the concrete, by loss of water either by leakage from the bottom or overflow from the top of the mould.

5.5. **Method of Testing**

- 5.5.1. The tests shall be made at the age of the concrete corresponding to that for which the strengths are specified.
- 5.5.2. Compression tests shall be made immediately upon removal of the concrete test specimens from the curing tank i.e. the test specimens shall be loaded in damp condition. The dimensions of the test specimens shall be measured in millimeters accurate to 0.5 mm.
- 5.5.3. The metal bearing plates of the testing machine shall be placed in contact with the ends of the test specimens. Cushioning materials shall not be used. In the case of cubes, the test specimen shall be placed in the machine in such a manner that the load is applied to the sides of the specimen as cast. An adjustable bearing block shall be used to transmit the load to the test specimen. The size of the bearing block shall be the same or slightly larger than that of the test specimen. The upper or lower section of the bearing block shall be kept in motion as the head of the testing machine is brought to a bearing on the test specimen.
- 5.5.4. The load shall be applied axially without shock at the rate of approximately 140 kg/cm² per minute. The total load indicated by the testing machine at failure of the test specimen shall be recorded and the unit compressive strength calculated in kg/sq.cm. Using the area computed from the measured dimensions of the test specimen. The type of failure and appearance of the concrete shall be noted.

5.6. **Standard of Acceptance**

- 5.6.1. The standard of acceptance shall be as described below:



- a) Three test specimens shall be made for each age at which tests are required. The average of strength of the three specimens may be accepted as the compressive strength of concrete, provided the difference between the maximum and minimum strengths of the three specimens does not exceed 15% of the average strength. If the difference exceeds 15% of the average strength, repeat tests shall be made unless the minimum strength is greater, than the strength specified.
- b) In order to get a relatively quicker idea of the quality of concrete, compressive strength tests at 7 days may be carried out in addition to 28 days compressive strength tests. For this purpose, the values given in Table above may be taken for general guidance in the case of concrete made with ordinary Portland cement. In all cases, the 28 days compressive strength specified in Table above shall alone be the criterion for acceptance or rejection of the concrete. If, however, from tests carried out in a particular job over a reasonably long period, it has been established to the satisfaction of the Engineer –in-charge that a suitable ratio between 28 days compressive strength and the 7 days compressive strength exists, the compressive strength at 7 days may be accepted, and the Engineer-in-charge may suitably relax the frequency of 28 days compressive strength specified provided the expected strength values at the specified early age are consistently met.
- c) If the average strength of the sample concrete is less than the specified strength, the work for that day shall be accepted at reduced rate, provided the average strength of sample concrete is not less than 75% of the specified strength. The Engineer-in-charge shall determine the reduced rate and the quantity of the day's work for which the rate is to be reduced. If the strength of sample concrete is less than 75% of the minimum specified strength after 28 days, the Engineer-in-charge shall reject the defective portion of the work done during the day along with the other concrete work structurally affected by the defective portions and get it dismantled.

Note: Six cubes shall be made for a test and 3 out of these shall be tested after 7 days, the remaining 3 cubes shall be tested after 28 days. The result of the 28 days test shall be taken into account while reducing the rate of rejecting the concrete represented by the sample. The result of the test conducted by the approved testing laboratory shall be taken as final and binding on the Contractor.

6. Reinforcement Work

6.1. Steel reinforcement shall be of Thermo Mechanically Treated (TMT) bar conforming to IS 1786 (latest edition)

6.1.1. Bar-Bending Schedules

- a) The Contractor shall be responsible for preparing, checking all bar bending schedules against the drawing and obtain approval from the Engineer before cutting and bending and prior to fixing of steel. The Contractor shall remove from site, at his own risk and cost, any steel bar fixed in position, without obtaining prior approval of bar bending schedule from the Engineer.

6.1.2. Bending and Cutting of Reinforcing Steel Bars

- a) Reinforcement shall be to the size and shape as shown in drawings and bent cold, correctly and accurately in accordance with IS: 2502 "Code of Practice for Bending and Fixing Bars for Concrete Reinforcement". Hooks, L-bends, ties, binding wires & any other subsidiary reinforcement, which are not shown in its correct position, shall be provided by the contractor as per instructions of the Engineer. As far as possible, laps in bars shall be avoided. Any laps and chairs



provided by the contractor other than authorized as per approved bar bending schedule shall be considered to have been provided by the contractor for his own convenience and shall not be measured and paid.

6.1.3. **Laps**

- a) Preferably, bars of full length shall be used. Lap of bars, where necessary, shall be done in accordance with the drawings or as directed by the Engineer and as specified in IS : 456. Wherever facility is available, or there is any requirement, welding of bars may be adopted in lieu of overlap. The location and type of welding shall be as approved by the Engineer and as shall be done in accordance with IS:2751.
- b) The lapping of bars shall be staggered for different bars and located at points where neither shear nor bending moment is maximum. Hooks, etc. shall be provided as per Indian Standard Practice and as shown in the drawings.

6.1.4. **Chairs etc.**

- a) The Contractor shall provide necessary steel chairs, etc. or other subsidiary reinforcement which are not shown on the drawings but may be necessary to keep the reinforcement firmly in its correct position as per the instructions of the Engineer. Hooks, L-bends and laps in bars shall be provided by the Contractor as shown in the drawing and as instructed by the Engineer.

6.1.5. **Placing in Position**

- a) Reinforcement bars shall be placed in position as shown in the drawings. The bars crossing one another shall be tied together at every intersection with two strands of annealed steel wire 0.90 mm (20 SWG) thickness twisted tight to make the skeleton of the steel work rigid so that the reinforcement does not get displaced during the deposition of concrete. The concrete cover shall not be less than that specified in the drawings. The bars shall be bent and fixed in accordance with the procedure specified in IS: 2502.
- b) Tack welding shall also be permitted in lieu of binding with steel wire if approved by the Engineer.
- c) The bars shall be kept in position by the following methods.
 - i) In case of beam and slab construction, precast cover blocks in cement mortar 1:2 (1 cement : 2 coarse sand), about 4 x 4 cm section and of thickness equal to the specified cover shall be placed between the bars and shuttering, so as to secure and maintain the requisite cover of concrete over reinforcement.
 - ii) In case of beams with more than one layer of reinforcement at top or bottom or slabs the vertical distance between the horizontal bars shall be maintained by introducing spacers or support bars of steel at 1.0 meter or at shorter spacing to avoid sagging.
 - iii) In case of columns and walls, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them; or with block of cement mortar (1:2) suitably tied to the reinforcement.
 - iv) In case of other R.C.C. structure such as arches, domes, etc. cover blocks spacers & templates shall be used as directed by the Engineer.

6.1.6. **Storage of Steel Reinforcement**

- a) It shall be stored in such a way as to avoid distortion and to prevent deterioration and corrosion. Steel reinforcement, shall be stored clear of the ground, on rack or otherwise supported, covered in bundles indicating the type, number, size, length, diameter and date of delivery to the site of the bars and fabric reinforcement as per IS: 456 and as directed by the Engineer.

6.1.7. **Approval of Reinforcement**



- a) The Contractor must obtain the approval of the Engineer to the reinforcement fixed in position, before concrete is deposited on the shutters.

7. READY-MIXED CONCRETE

- 7.1. Concrete mixed in a stationary mixer in a central batching and mixing plant or in a truck-mixer and supplied in the fresh condition to the purchaser either at the site or into the purchaser's vehicles.
- 7.2. **Approved Plant: Ready mixed concrete conforming to IS 4926: 2003 shall be supplied from Ultratech, ACC, Godrej, Hella Infra Market, Lafarge RMC plants or other any plants as approved by MDL Engineer in Charge.**

7.3. MATERIALS

7.3.1. Selection and Approval of Materials

- a) Materials used should satisfy the requirements for the safety, structural performance, durability and appearance of the finished structure, taking full account of the environment to which it will be subjected. The selection and use of materials shall be in accordance with IS 456. Materials used shall conform to the relevant Indian Standards applicable. Where materials are used which are not covered by the provisions of the relevant Indian Standard, there should be satisfactory data on their suitability and assurance of quality control. Records and details of performance of such materials should be maintained. Account should be taken of possible interactions and compatibility between materials used. Also, prior permission of the purchaser shall be obtained before use of such materials.

7.3.2. Cement

- a) Cement used for concrete shall be in accordance with the requirements of IS 456.
- b) Mineral Admixtures — Use of mineral admixtures shall be permitted in accordance with the provisions of IS 456.

7.3.3. Aggregates

- a) Aggregates used for concrete shall be in accordance with the requirements of IS 456. Unless otherwise agreed testing frequencies for aggregates shall be as given in Annex B.

7.3.4. Chemical Admixtures

- a) Use of chemical admixtures shall be permitted in accordance with the provisions of IS 456.
- b) It shall be the responsibility of the producer to establish compatibility and suitability of any admixture with the other ingredients of the mix and to determine the dosage required to give the desired effect.
- c) Admixtures should be stored in a manner that prevents degradation of the product and consumed within the time period indicated by the admixture supplier. Any vessel containing an admixture in the plant or taken to site by the producer shall be clearly marked as to its content.
- d) When offering or delivering a mix to a purchaser it should be indicated if such a mix contains an admixture or combination of admixtures or not. The admixtures may be identified generically and should be declared on the delivery ticket.
- e) The amount of admixture added to a mix shall be recorded in the production record. In special circumstances, if necessary, additional dose of admixture



may be added at project site to regain the workability of concrete with the mutual agreement between the producer and the purchaser.

7.3.5. **Water**

- a) Water used shall be in accordance with the requirements of IS 456-2000 cl.5.4
- b) The use of re-cycled water is encouraged as long as concrete of satisfactory performance can be produced and steps are taken to monitor the buildup of chlorides in any recirculated water and that any subsequent adjustments to the mix design are made to ensure that any overall limit on chloride contents is satisfied. The addition of any recycled water shall be monitored and controlled to meet these requirements.
- c) The total amount of water added to the mix shall be recorded in the production record. The water content of concrete shall be regulated by controlling its workability or by measuring and adjusting the moisture contents of its constituent materials. The producer's production staff and truck-mixer drivers shall be made aware of the appropriate responses to variations in concrete consistence of a particular mix caused by normal variations in aggregate moisture content or grading.

7.4. **GENERAL REQUIREMENTS**

7.4.1. **Basis of Supply**

- a) Ready-mixed concrete shall be supplied having the quality and in the quantity in accordance with the requirements agreed with the purchaser or his agent. Notwithstanding this, the concrete supplied shall generally comply with the requirements of IS 456.
- b) All concrete will be supplied and invoiced in terms of cubic metres (full or part) of compacted fresh concrete. All proportioning is to be carried out by mass except water and admixture, which may be measured by volume.

7.4.2. **Transport of Concrete**

a) **General**

- i) Ready-mixed concrete shall be transported from the mixer to the point of placing as rapidly as practicable by methods that will maintain the required workability and will prevent segregation, loss of any constituents or ingress of foreign matter or water. The concrete shall be placed as soon as possible after delivery, as close as is practicable to its final position to avoid re-handling or moving the concrete horizontally by vibration. If required by the purchaser the producer can utilize admixtures to slow down the rate of workability loss, however this does not remove the need for the purchaser to place the concrete as rapidly as possible. The purchaser should plan his arrangements so as to enable a full load of concrete to be discharged within 30 min of arrival on site.
- ii) Concrete shall be transported in a truck-mixer unless the purchaser agrees to the use of non-agitating vehicles. When non-agitating vehicles are used, the mixed concrete shall be protected from gain or loss of water.

b) **Time in Transport**

- i) The general requirement is that concrete shall be discharged from the truck-mixer within 2 hrs of the time of loading. However, a longer period may be permitted if retarding admixtures are used or in cool humid weather or when chilled concrete is produced.



- ii) The time of loading shall start from adding the mixing water to the dry mix of cement and aggregate or of adding the cement to the wet aggregate whichever is applicable.
- iii) Ready-mixed concrete plant shall have test facilities at its premises to carry out routine tests as per the requirement of the standard.

7.5. **SAMPLING AND TESTING OF READY-MIXED CONCRETE**

7.5.1. **Point and Time of Sampling**

- a) For the assessment of compliance of ready-mixed concrete, the point and time of sampling shall be at discharge from the producer's delivery vehicle or from the mixer to the site or when delivered into the purchaser's vehicle. It is critical that the sampling procedure and equipment used enables as representative a sample as possible to be taken of the quantity of concrete delivered (see Annex C). The sampling may be carried out jointly by the purchaser and the supplier with its frequency mutually agreed upon. However, it will not absolve the supplier of his responsibility from supplying concrete as per the requirements given in this standard or otherwise agreed to where so permitted in the standard.

7.5.2. **Workability**

- a) The test for acceptance is to be performed upon the producer's delivery vehicle discharge on site or upon discharge into the purchaser's vehicle. If discharge from the producers' vehicle is delayed on site due to lack of preparedness on behalf of the purchaser then the responsibility passes to the purchaser after a delay of more than 30 min. The workability shall be within the following limits on the specified value as appropriate:

Slump: ± 25 mm or $\pm 1/3$ of the specified value, whichever is less.

Compacting factor : ± 0.03 , where the specified value is 0.90 or greater,
 ± 0.04 , where the specified value is less than 0.90 but more than 0.80, and
 ± 0.05 , where the specified value is 0.80 or less.

- b) Flow table test may be specified for concrete, for very high workability (see IS 9103). Acceptance criteria for spread (flow) are to be established between the supplier and the purchaser.

7.5.3. **Specified Strength**

- a) Compliance shall be assessed against the requirements of IS 456 or other agreed Indian Standard. The purchaser may perform his own sampling and testing or may enter in to an arrangement with the producer to provide his testing requirements.

- 7.5.4. Unless otherwise agreed between the parties involved, the minimum testing frequency to be applied by the producer in the absence of a recognized ready mixed concrete industry method of production control, should be one sample for every 50 m³ of production or every 50 batches, whichever is the greater frequency. Three test specimens shall be made up for each sample for testing at 28 days (see also IS 456).



- 7.5.5. In order to get a relatively quicker idea of the quality of concrete, optional test on beams for modulus of rupture at 72 + 2 h or at 7 days or compressive strength test at 7 days maybe carried out in addition to 28 days compressive strength test. For this purpose the value should be arrived at based on actual testing. In all cases 28 days compressive strength shall alone be the criteria for acceptance or rejection of the concrete.
- 7.5.6. The purchaser shall inform the producer if his requirements for sampling and testing are higher than one sample every 50 m³ or 50 batches, whichever is the greater frequency.
- 7.5.7. **Additional Compliance Criteria**
- a) Any additional compliance criteria shall be declared to the producer by the purchaser prior to supply and shall be mutually agreed upon in terms of definition, tolerance, frequency of assessment, method of test and significance of result.

8. PLASTERING

8.1. General

8.1.1. Scope

- a) This section shall cover plastering to masonry wall for storm water drain/cable trench as shown in the drawings. Before commencing the work sample of works shall be made in accordance with the specifications indicated below and got approved by the Engineer.

8.1.2. Mortar

- a) The mortar of specified mix shall be used. Cement and sand shall be tested as specified in the section on concrete.

8.1.3. Preparation of Surface

- a) Joints of stonework/brick work shall be raked-out if not done properly at the time of stonework. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scraping. The surface shall be thoroughly washed with water, cleaned and kept wet before plastering is commenced.
- b) Plastering work shall be started where all conduits, pipes, fittings and fixtures clamps, hooks, doors and window frames etc. are embedded, grouted and cured and all defects are removed to the satisfaction of the Engineer. Special approval shall be taken from the Engineer before commencing each plastering work. No cutting of finished plaster shall be allowed under any circumstance. No portion shall be left out initially to be patched up later on.

8.2. Mixing

- 8.2.1. The ingredients shall be mixed in specific proportions by volume. The mixing shall be done in a mechanical mixer or by hand mixing on watertight platform. The cement and sand shall first be mixed thoroughly dry in the mixer. Water shall then be added gradually and wet mixing continued for at least a minute until mortar attains the consistency of a stiff paste and uniform colour. Mortar shall be used within 30 minutes of addition of water. Mortar which has partially set shall not be used and removed from the site immediately.
- 8.2.2. Wherever specified, waterproofing compound of approved make shall be added to the mortar & mixed strictly in accordance with manufacturer's printed instructions.



9. STRUCTURAL STEEL FABRICATION AND ERECTION WORK

- 9.1. The structural steel fabrication and erection work will be required wherever the structural steel members of the workshop shed are rusted beyond repairs and mainly will consist of crane girders, walkways, bracing and purlins and runners, hand railing and other miscellaneous structures.
- 9.2. The fabrication and erection of structural steel work shall be in compliance with:
 - 9.2.1. General specifications for structural steel work as per IS: 800.
 - 9.2.2. Necessary drawings to be prepared by the contractor to be got approved through MDL before execution of work.
- 9.3. The fabrication and erection of steel work shall consist of accomplishing of all jobs including providing all labour, tools and plant, all materials and consumables such as welding electrodes, bolts and nuts (GKW Quality) Oxygen and Acetylene gases, oils for cleaning, etc., all of approved quality as per the relevant IS Specifications. The work shall be executed according to the drawings, specifications and relevant IS codes in an expeditious and workmanlike manner and of best standard to the complete satisfaction of the Engineer of MDL.
- 9.4. All materials shall be new and shall conform to the respective specifications as specified. The use of equivalent or higher grade or alternative materials will be considered only in very special cases subject to the approval of the Engineer of MDL.
- 9.5. Structural steel shall conform to IS: 226 or IS: 2062. Steel plates for crane girders shall conform strictly to IS: 2062. Bolts and nuts shall be of GKW Quality and in accordance with IS: 1363.
- 9.6. The fabrication work shall be done in accordance with IS: 800, in addition to the following:
 - 9.6.1. The fabrication work shall be done as per the approved fabrication drawings or as directed. The connections shall be welded or bolted as per the approved drawings or as directed. The work shall include also fabrication of built up section, if required. Any fault fabrication pointed out at any stage of the work by MDL shall be made good by the contractor at his own cost.
 - 9.6.2. The structural steel member shall be cut mechanically or by oxy-acetylene flame. All edges cut by oxy-acetylene process shall be cleaned of all slag materials prior to assembly. Edge preparation for welding of members more than 10mm thick shall be done by edge cleaning machine only.
 - 9.6.3. All bolt holes shall be drilled. The drilling shall be made to the diameter specified in the drawings. No enlarging of holes by filling, by man drilling or oxy-acetylene flame shall be allowed.
 - 9.6.4. The assembly of structural members shall be done with proper jigs and fixtures to ensure the correct positioning of the members. The first component / assembly fabrication in such jigs and fixtures shall be inspected thoroughly by the contractor and then offered to the Engineer of MDL for approval before proceeding with the fabrication.
 - 9.6.5. All welding shall be done either manually by the shielded metallic arc process. Welding shall be carried out only by fully trained and experience approved welders. All welds shall be usually made continuous and watertight. The welding electrodes shall conform to IS:816, low hydrogen type covering or equivalent.
- 9.7. The erection work in general shall be carried out as required only after approval by the Engineer of MDL.
 - 9.7.1. All scaffolding work required for the erection work will have to be made by the contractor and included in the structural steel rate.



- 9.7.2. Positioning, levelling of the structural members and their alignment shall be done in accordance with the relevant drawing and to the complete satisfaction of the Engineer of MDL.
- 9.7.3. The various parts of the steel structure shall be done so erected so as to ensure stability against inherent weight, wind and erection trusses.
- 9.7.4. All field assembly and welding shall be executed in accordance with the requirement of the relevant fabrication drawings. The bolted joints shall be tightened so that the entire surface of the bolt heads and nuts shall rest on the members. For parts with sloping surfaces tapered washers shall be used.
- 9.7.5. Any faulty erection done by the contractor shall be made good at his own cost. The contractor shall satisfy himself about the levels, alignment, etc., before starting the erection work.

10. PAINTING OF CONCRETE MASONRY & PLASTERED SURFACES

10.1. MATERIALS

- 10.1.1. Oil bound distemper shall conform to IS:428. The primer shall be alkali resistant primer of the same manufacture as that of the distemper.
- 10.1.2. Cement paint shall conform to IS: 5410. The primer shall be a thinned coat of cement paint.
- 10.1.3. Acrylic emulsion paint shall be of an approved manufacture.
- 10.1.4. Plastic emulsion paint shall conform to IS: 5411.
- 10.1.5. Lead free acid, alkali and chlorine resisting paint shall conform to IS: 9862.
- 10.1.6. White wash shall be made from good quality fat lime conforming to IS: 712. It shall be slaked at site and mixed with water in the proportion of 5 litres of water to 1 kg of unslaked lime stirred well to make a thin cream. This shall be allowed to stand for a minimum period of one day and strained through a clean coarse cloth. Four kg of gum dissolved in hot water shall be added to each cu.m of cream. 1.30 kg of sodium chloride dissolved in hot water shall then be added per 10 kg of lime used for the white wash to be ready for application.
- 10.1.7. Colour wash shall be made by addition of a suitable quantity of mineral pigment, not affected by lime, to the prepared white wash to obtain the shade/tint as approved by the ENGINEER.
- 10.1.8. All the materials shall be of the best quality from an approved manufacturer. CONTRACTOR shall obtain prior approval of the ENGINEER for the brand of manufacture and the colour/shade. All materials shall be brought to the site of works in sealed containers.

10.2. WORKMANSHIP

- 10.2.1. CONTRACTOR shall obtain the approval of the ENGINEER regarding the readiness of the surfaces to receive the specified finish, before commencing the work on painting.
- 10.2.2. Painting of new surfaces shall be deferred as much as possible to allow for thorough drying of the sub-strata.
- 10.2.3. The surfaces to be treated shall be prepared by thoroughly brushing them free from dirt, mortar droppings and any loose foreign materials. Surfaces shall be free from oil, grease and efflorescence. Efflorescence shall be removed only by dry brushing of the growth. Cracks shall be filled with Gypsum. Workmanship of painting shall generally conform to IS: 2395.
- 10.2.4. Surfaces of doors, windows etc. shall be protected suitably to prevent paint finishes from splashing on them.



MEASUREMENT

- 10.2.5. Measurement shall be in Sq. M. correct to two places of decimal. Measurement shall be for the areas as executed duly deducting for any openings etc. Rate quoted shall take into account the provision of necessary enabling works such as scaffolding, painter's cradle etc.

11. PAINTING OF STEEL WORK

11.1. MATERIALS

- 11.1.1. Red oxide - zinc chrome primer shall conform to IS: 2074.
11.1.2. Synthetic enamel paint shall conform to IS: 2932.
11.1.3. Aluminium paint shall conform to IS: 2339.
11.1.4. All the materials shall be of the best quality from an approved manufacturer.
CONTRACTOR shall obtain prior approval of the ENGINEER for the brand of manufacture and the colour/shade. All the materials shall be brought to the site in sealed containers.

11.2. WORKMANSHIP

- 11.2.1. Painting work shall be carried out only on thoroughly dry surfaces.
11.2.2. Painting shall be applied either by brushing or by spraying. CONTRACTOR shall procure the appropriate quality of paint for this purpose as recommended by the manufacturer. The workmanship shall generally conform to the requirement of IS:1477 (Part 2).
11.2.3. The type of paint, number of coats etc. shall be as specified in the respective items of work.
11.2.4. Primer and finish paint shall be compatible with each other to avoid cracking and wrinkling. Primer and finish paint shall be from the same manufacturer.
11.2.5. All the surfaces shall be thoroughly cleaned of oil, grease, dirt, rust and scale. The methods to be adopted using solvents, wire brushing, power tool cleaning etc., shall be as per IS: 1477 (Part-1) and as indicated in the item of work.
11.2.6. It is essential to ensure that immediately after preparation of the surfaces, the first coat of red oxide-zinc chrome primer shall be applied by brushing and working it well to ensure a continuous film without holidays. After the first coat becomes hard dry, a second coat of primer shall be applied by brushing to obtain a film free from 'holidays'.
11.2.7. After the second coat of primer is hard dry, the entire surface shall be wet rubbed cutting down to a smooth uniform surface. When the surface becomes dry, the undercoat of synthetic enamel paint of optimum thickness shall be applied by brushing with minimum of brush marks. The coat shall be allowed to hard dry. The under coat shall then be wet rubbed cutting down to a smooth finish, taking adequate care to ensure that at no place the undercoat is completely removed. The surface shall then be allowed to dry.
11.2.8. The first finishing coat of paint shall be applied by brushing and allowed to hard dry. The gloss from the entire surface shall then be gently removed and the surface dusted off. The second finishing coat shall then be applied by brushing.
11.2.9. At least 24 hours shall elapse between the application of successive coats.
Each coat shall vary slightly in shade and this shall be got approved by the ENGINEER.
11.2.10. All parts i.e. rail sections (except top surface of rail), sole plates, clamps, stoppers, washers, welded joints, etc., are to be thoroughly cleaned with wire



brush and painted with anti-corrosive bitumastic paint of approved make such as Shalimar, Asian Paint, British Paint, etc.

11.3. **MEASUREMENT**

11.3.1. Measurement shall be in Sq.M. correct to two place of decimal. Measurement shall be for the projected area between out to out of frames and no multiplying factor is allowed on any account. Rate shall be inclusive of enabling works such as scaffolding, etc. Measurement and payment is applicable only if a separate item is specified and not if it is already made as part of a combined item.

12. **APPLICABLE CODES AND SPECIFICATIONS**

12.1. The following specifications, standards and codes, including all official amendments/revisions and other specifications & codes referred to therein, should be considered a part of this specification. In all cases the latest issue/edition/revision shall apply. In case of discrepancy between this specification and those referred to herein below or other specifications forming a part of this bid document, this specification shall govern.

12.2. **MATERIALS**

- 12.2.1. IS: 269 - Specification for 33 grade ordinary Portland cement (If specially intended to be used as per drawings/ specifications)
- 12.2.2. IS: 455 - Specification for Portland slag cement.
- 12.2.3. IS: 1489 - Specification for portland-pozzolana cement.
- 12.2.4. IS: 8112 - Specification for 43 grade ordinary Portland cement.
- 12.2.5. IS:12330- Specification for sulphate resisting Portland Cement
- 12.2.6. IS:383 - Specification for coarse and fine aggregates from natural sources for concrete.
- 12.2.7. IS: 432(Parts I & II) - Specification for mild steel and medium tensile steel bars and hard-drawn steel wires for concrete reinforcement.
- 12.2.8. IS: 1786 - Specification for high strength deformed steel bars and wires for concrete reinforcement.
- 12.2.9. IS: 1566 - Specification for hard-drawn steel wire fabric for concrete reinforcement.
- 12.2.10. IS: 2062 – Steel for general structural purposes.
- 12.2.11. IS: 9103 - Specification for admixtures for concrete.
- 12.2.12. IS: 2645 - Specification for integral cement water proofing compounds.
- 12.2.13. IS: 4990 - Specification for plywood for concrete shuttering work.

12.3. **MATERIAL TESTING**

- 12.3.1. IS: 4031(Part 1 to 13) - Methods of physical tests for hydraulic cement.
- 12.3.2. IS: 4032 - Method of chemical analysis of hydraulic cement.
- 12.3.3. IS: 650 - Specification for standard sand for testing of cement.
- 12.3.4. IS: 2430 - Methods for sampling of aggregates for concrete.
- 12.3.5. IS: 2386(Part 1 to 8) - Methods of test for aggregates for concrete.
- 12.3.6. IS: 3025 - Methods of sampling and test (physical and chemical) water used in industry.
- 12.3.7. IS:6925 - Methods of test for determination of water soluble



12.4. MATERIAL STORAGE

- 12.4.1. IS: 4082 - Recommendations On Stacking And Storing Of Construction Materials At Site.

12.5. CONCRETE MIX DESIGN

- 12.5.1. IS: 10262 - Recommended guidelines for concrete mix design.
12.5.2. SP: 23(S&T) - Handbook on Concrete Mixes.

12.6. CONCRETE TESTING

- 12.6.1. IS: 1199 - Method of sampling and analysis of concrete.
12.6.2. IS:516 - Method of test for strength of concrete
12.6.3. IS:9013 - Method of making, curing and determining compressive strength of accelerated cured concrete test specimens.
12.6.4. IS: 8142 - Method of test for determining setting time of concrete by Penetration resistance.
12.6.5. IS:9284 - Method of test for abrasion resistance of concrete
12.6.6. IS: 2770 - Methods of testing bond in reinforced concrete.

12.7. EQUIPMENT

- 12.7.1. IS: 1791 - Specification for batch type concrete mixers.
12.7.2. IS: 2438 - Specification for roller pan mixer.
12.7.3. IS: 4925 - Specification for concrete batching and mixing plant.
12.7.4. IS: 5892 - Specification for concrete transit mixer and agitator.
12.7.5. IS: 7242 - Specification for concrete spreaders.
12.7.6. IS: 2505 - General Requirements for concrete vibrators: Immersion type.
12.7.7. IS: 2506 - General Requirements for screed board concrete vibrators.
12.7.8. IS: 2514 - Specification for concrete vibrating tables.
12.7.9. IS: 3366 - Specification or pan vibrators.
12.7.10. IS: 4656 - Specification for form vibrators for concrete.
12.7.11. IS: 11993- Code of practice for use of screed board concrete vibrators.
12.7.12. IS: 7251 - Specification for concrete finishers.
12.7.13. IS: 2750 - Specification for steel scaffolding.

12.8. CODES OF PRACTICE

- 12.8.1. IS: 456 - Code of practice for plain and reinforced concrete.
12.8.2. IS: 3370(Parts I TO IV) - Code of practice for concrete structures for storage of Liquids.
12.8.3. IS: 3935 - Code of practice for composite construction.
12.8.4. IS: 2502 - Code of practice for bending and fixing of bars for concrete reinforcement.
12.8.5. IS: 5525 - Recommendation for detailing of reinforcement in reinforced concrete works.
12.8.6. IS: 2751 - Code of practice for welding of mild steel plain and deformed bars used for reinforced concrete construction.
12.8.7. Specification for welding cold worked bars for reinforced concrete construction.
12.8.8. IS:3558 - Code of practice for use of immersion vibrators for consolidating concrete.
12.8.9. IS:3414 - Code of practice for design and installation of joints in Buildings.
12.8.10. IS:4326 - Code of practice for earthquake resistant construction of building.



- 12.8.11. IS: 13920 – Code of Practice for ductile detailing of reinforced concrete structures subjected to seismic forces.
- 12.8.12. IS: 4014(Parts I & II) - Code of practice for steel tubular scaffolding.
- 12.8.13. IS: 2571 - Code of practice for laying in-situ cement concrete flooring.
- 12.8.14. IS: 7861 - Code of practice for extreme weather concreting. Part-I Recommended practice for hot weather concreting. Part-II Recommended practice for cold weather concreting.

12.9. **CONSTRUCTION SAFETY**

- 12.9.1. IS: 3696(Parts I & II) - Safety code for scaffolds and ladders.
- 12.9.2. IS: 7969 - Safety code for handling and storage of building materials.
- 12.9.3. IS: 8989 - Safety code for erection of concrete framed structures.

12.10. **MEASUREMENTS**

IS:1200 (Part 1 to 23) - Method of measurement of building and engineering works

13. Following are the list of preferred makes to be used in execution of works, if the same are not specified.

LIST OF PREFERRED MAKE:

S.N.	DESCRIPTION OF MATERIAL	MAKE OF MATERIALS
1.	Cement	Ultratech/ ACC / Ambuja / Birla
2.	Steel (Thermo Mechanically Treated Steel) High strength deformed bars or mild steel reinforcement (TOR-Steel)	SAIL, VIZAG, TATA, JSW, RINL, Jindal, Ispat
3.	Clay Bricks	Good quality locally available material approved by Engineer / Architect
4.	Water proofing material / compound.	Sika / Roff / Sunanda / Krishna Conchem
5.	UPVC Pipes (S/W/R Pipes)	Supreme / Finolex / Prince
6.	G.I. Pipes (B-Class)	Tata / Zenith
7.	G.I. Fittings (ISI Brand)	Unik / AMCO
8.	S.W. Pipes / Fittings & Gully traps	Perfect / Trimurti / Bharat
9.	Ball valves	Zoloto
10.	C.I. Manhole Cover	RIF / BIC / Neco
11.	R.C.C. Pipes	Indian Hume pipe
12.	PVC Fittings (Moulded)	Finolex / Prince
13.	Non-return valve	Intervalve
14.	Stoneware Pipe and fittings	Trimurti / Perfect Potters / Bharat
15.	Stoneware Pipe and fittings	Trimurti / Perfect Potters / Bharat



S.N.	DESCRIPTION OF MATERIAL	MAKE OF MATERIALS
16.	Paint	Burger/ Nerolac/ Asian/ Dulux/ Tractor.
17.	White cement	Birla cement, JK cement
18.	Putty	Birla White Putty
19.	Red Oxide	Asian
20.	Acrylic Exterior paint	Asian Ultra/Nitcotex / Sandtex / Berger Weathershield

Note (i) Wherever specification of BOQ item is not mentioned; then CPWD specification shall be applicable.

(ii) Wherever make is specified in BOQ then manufacture's specifications & procedure shall be applicable.

(iii) Wherever no specifications or make is specified than work is to be carried out as per the written direction of Engineer-In-Charge



SPECIFICATIONS FOR ASPHALTING WORK

Specifications for road work shall be as described under Ministry of Road Transport & Highways (MORTH) and as described under relevant clauses as applicable.

1. EARTHWORK

1.1 Excavation

The work to be done under this section comprise performance of all work necessary for excavation with shoring, strutting, dewatering, pumping including disposing of all surplus excavated material from the site as directed by the Engineer.

Excavation shall be carried out in any type of soil, gravel, conglomerate, soft rock, boulders, old foundation, hard rock, concrete, asphalt or stone paved surfaces old masonry or concrete (plain or reinforced) encountered within width, length and depths indicated in the drawings. Where any temporary or permanent structure like sheet piling, diaphragm wall or piles have already been taken up, all excavation work shall be from the point carried out earlier and all precaution during further excavation and or any construction operation shall be exercised not to damage such existing temporary or permanent work. Where directed by the Engineer trees encountered within the work site shall be uprooted as per approved manner and serviceable wooden logs shall be stacked at site / disposed of as directed by the Engineer. Branches of trees etc. shall be disposed of or stacked at site as directed by the Engineer. No permanent work shall be commenced in the excavated area until the foundations pits have been inspected and approved by the Engineer. The Contractor may use any suitable excavated materials for incorporation in the permanent or temporary works as may be convenient subject to compliance with the specifications. Any obstacles encountered during excavation shall be reported immediately to the Engineer and shall be dealt with as directed by the Engineer.

1.2 Site Levels

Before the work commences the Contractor shall carry out a survey of the levels of the site and obtain verification by the Engineer of these levels. Levels shall be taken on a grid to be agreed with the Engineer and the Contractor shall submit three prints of the drawing showing the site levels for record purpose.

1.3 Excavation beyond Required Limit

Any excavation beyond the required limits and against which asphalt is to be placed shall be made good with bituminous concrete of specified grades. Any excavation beyond the required limits at locations where no Bituminous concrete is to be placed will not be required to be made good with concrete unless otherwise directed by the Engineer provided always that any consequential additional work caused or necessitated by the excavation beyond limits will not be admitted for payment.

1.4 Dewatering

While execution of works, if so encountered, the Contractor shall provide for the purpose of excavation under water all the necessary dewatering equipment like well points, pumps (including stand byes), pipes, conduits, etc. and make necessary arrangement for proper drainage of the pumped water from the well points and its easy disposal without affecting the site and the adjoining areas. The Contractor at his own



cost shall take any permission required for such disposal of water to other areas, from the respective authorities.

1.5 Compaction Quality

Compaction of earth where asphaltting work is located, the degree of compaction achieved shall be minimum 95% of maximum dry density as obtained by Proctor compaction as per IS: 2720 (Part VII). Unless otherwise specified, in roads & other areas the degree of compaction shall be 90%.

1.6 Classification of soil

The earthwork (in the all kinds of soil) shall be classified under the following main categories.

a) Soil includes various types of soils, mud concrete below the ground level, shingle and river or nallah bed boulders, soling of road, paths and hard core, macadam surface of any description, lime concrete, stone masonry below the ground level, soft conglomerate and laterite when the stone can be detached from the matrix with picks and shovel.

b) Ordinary Soils, Sand, Clay & Soft Murrum includes earth, soft murrum, top deposits of agricultural soil, reclaimed soil, clay, sand or any combination thereof which can be excavated with shovels, loose application of pick axes etc.

c) Hard soil, murrum, boulders, weathered / soft rock : All decomposed weathered rock, highly fissured rock, old masonry, boulders bigger than 0.03 cum. in volume but not bigger than 0.5 cum. and other varieties of soft rock which can be removed only with hard application pick axes, crow bars, wedges and hammers with some difficulty. The more fact that the contractor resorts to blasting and / or wedging and chiseling for reasons of his own, shall not mean the rock is classifiable as hard rock.

Note: The scope of work taking site levels, support the sides of excavation, barricades, dewatering, etc. are inclusive of excavation item, no extra payment will be given to the contractor.

2. Hard Core Soling (Trap rubble stone Soling)

The hard core shall consist of layers of uniform thickness of trap stone rubble (of size 150 mm to 230 mm) or any other approved stone carefully set as close as possible on ground properly formed for the purpose. The packing shall consist of large stones. The interstices between the rubble stones shall be filled up with stone chips, spalls, and oversized metal removing the projection of the upper part of the packing so as not to loosen the hard core soling. Also spreading approved hard murrum or soil collected/stacked during excavation etc., complete, the hard-core soling should be thoroughly rammed, watered, settled to place and made compact.

All above work to be carry out as per MOST specification (latest Edition).

3 WATER BOUND MACADAM SUB-BASE/BASE:

Scope:



This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bonding together with screening, stone chips, moorum, binding material where necessary and water laid on a properly prepared sub grade / sub-base / base or existing pavement, as the case may be and finished in accordance with the requirements of these specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by the Engineer.

Materials:

3.2.1 Coarse aggregates: Coarse aggregates shall be either crushed or broken stone, The aggregates shall conform to the physical requirements set forth in **Table -1**. The type and size range of the aggregate shall be specified in the Contract or shall be as specified by the Engineer. If the water absorption value of the coarse aggregate is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as **per IS: 2386 (Part5)**.

3.2.2 Crushed or broken stone: The crushed or broken stone shall be hard, durable and free from excess flat, elongated, soft and disintegrated particles, dirt and other deleterious material.

TABLE- 1.
PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FROR WATER BOUND MACADAM FOR SUB-BASE/BASE COARSE

Test		Test Method	Requirements
1	Los Angeles Abrasion Value	IS:2386 (Part-4)	40 per cent (Max)
	Aggregate Impact Value	IS:2386 (Part-4) or IS:5640	30 per cent (Max)
2.	Combined Flakiness and Elongation Indices (Total)	IS:2386 (Part1)	30 per cent (Max)

3.3 Grading requirement of coarse aggregates: The coarse aggregates shall conform to the grading given in **Table 2** as specified, provided, however, the use of Grading No.1 shall be restricted to sub-base courses only.

TABLE -2
GRADING REQUIREMENTS OF COARSE AGGREGATES

Grading No.	Size Range	IS Sieve Designation	Per cent by Weight passing
2	90 mm to 45 mm	125 mm	100
		90 mm	90-100
		63 mm	25-60
		45 mm	0-15
		22.4 mm	0-5

Note: The compacted thickness for a layer with Grading 2 shall be 120mm.



3.4 Screenings: Screening to fill voids in the coarse aggregate shall generally consist of the same material as the coarse aggregate. However, predominantly non-plastic material such as Moorum or gravel (other than rounded river borne material) may be used for this purpose provided liquid limit and plasticity index of such material are below 20 and 6 respectively and fraction passing 75 micron sieve does not exceed 10 per cent.

Screening shall conform to the grading set forth in **Table -3**. The consolidated details of quantity of screenings required for various grades of stone aggregates are given in **Table 4**. The table also gives the quantities of materials (loose) required for 10 m² for sub-base / base compacted thickness of 100/75 mm.

**TABLE -3
GRADING FOR SCREENINGS**

Grading Classification	Size of Screening	IS Sieve Designation	Per cent by Weight passing the sieve
A	13.2 mm	13.2 mm	100
		11.2 mm	95-100
		5.6 mm	15-35
		180 micron	0-10
B	11.2 mm	11.2 mm	100
		5.6 mm	90-100
		180 micron	15-35

**TABLE -4
APPROXIMATE QUANTITIES OF COARSE AGGREGATES AND SCREENINGS
REQUIRED FOR 100/75 MM COMPACTED THICKNESS OF WATER BOUND
MACADAM (WBM) SUB-BASE/BASE COURSE FOR 10M² AREA**

Classification	Size Range	Compact ed thickness	Loose Qty.	Screenings			
				Grading Classification	For WBM sub-base/ base course (Loose Qty)	Grading Classification & Size	Loose Qty.
				Stone screening		Crushable Type such as Moorum or Gravel	
Grading 1	90 mm to 45 mm	100	1.21 to 1.43 m ³	Type A 13.2 mm	0.27 to 0.30 m ³	Not uniform	0.30 to 0.32
Grading 2	63 mm to	75 mm	0.91 to	Type A 13.2 mm	0.12 to 0.15 m ³	-do-	0.22 to



	45 mm		1.07 m ³				0.24 m ³
-do-	-do-	-do-	-do-	Type B 11.2 mm	0.20 to 0.22 m ³	-do-	-do-

3.5 Binding material: Binding material to be used for water bound macadam as a filler material meant for preventing raveling, shall comprise of a suitable material approved by the Engineer having a Plasticity Index (PI) value of less than 6 as determined in accordance with IS:2720 (Part 5).

The quantity of binding material where it is to be used, will depend on the type of screenings. Generally, the quantity required for 75mm and 100mm compacted thickness of water bound macadam will be 0.06-0.09 m³/10 m² and 0.08-0.10 m³/10 m² respectively.

The above-mentioned quantities should be taken as a guide only, for estimation of quantities for construction, etc.

Application of binding materials may not be necessary when the screenings used are of crushable type such as moorum or gravel.

Note: Quantity of coarse aggregate, screening and binding material required for the compacted thickness 120mm WBM should be taken proportionately with respect to clause 3.2 of this specification.

3.6 Construction Operations:

3.6.1 Preparation of base: The surface of the sub-grade/sub-base/base to receive the water bound macadam course shall be prepared to the specified lines and cross fall (camber) and made free of dust and other extraneous material. Any dust or soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained if necessary by sprinkling water. Any sub-base/base/surface irregularities, where predominant, shall be made good by providing appropriate type of profile corrective course Specifications.

3.6.2 Spreading coarse aggregates: The coarse aggregates shall be spread uniformly and evenly upon the prepared sub-grade/sub-base/base to proper profile by using templates placed across the road/area about 6m apart, in such quantities that the thickness of each compacted layer is not more than 100mm for Grading 1 and 75mm for Grading 2 and 3, as specified in Table-4. Wherever possible, approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimize the need for manual rectification afterwards. Aggregates placed at locations which are inaccessible to the spreading equipment, may be spread in one or more layers by any approved means so as to achieve the specified results.

The spreading shall be done from stockpiles along the side of the roadway or directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregate, as spread shall be of uniform gradation with no pockets of fine material.

The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregates as may be required. The surface shall be checked frequently with a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The coarse aggregates shall not normally be spread more than 3 days in advance of



the subsequent construction operations.

3.6.3 Rolling: Immediately following the spreading of the coarse aggregate, rolling shall be started with three wheeled power rollers of 8 to 10 tonnes capacity or tandem or vibratory rollers of 8 to 10 tonnes static weight. The type of roller to be used shall be approved by the Engineer based on trial run.

Except on super elevated portions where the rolling shall proceed from inner edge to the outer, rolling shall begin from the edges gradually progressing towards the Center. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the center line of the road, in successive passes uniformly lapping preceding tracks by at least one half width.

Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit application of screenings. During rolling, slight sprinkling of water may be done, if necessary. Rolling shall not be done when the sub grade is soft or yielding or when it causes a wave-like motion in the sub grade or sub-base course.

The rolled surface shall be checked transversely and longitudinally, with templates and any irregularities corrected by loosening the surface, adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired cross fall (camber) and grade. In no case shall the use of screenings be permitted to make up depressions.

Material, which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates.

3.6.4 Application of screenings: After the coarse aggregate has been rolled as specified in **3.6.3**, screenings to completely fill the interstices shall be applied gradually over the surface. These shall not be damp or wet at the time of application. Dry rolling shall be done while the screenings are being spread so that vibrations of the roller cause them to settle into the voids of the coarse aggregate. The screenings shall not be dumped in piles but be spread uniformly in successive thin layers either by the spreading motions of hand shovels or by mechanical spreaders, or directly from tipper with suitable grit spreading arrangement. Tipper operating for spreading the screenings shall be so driven as not to disturb aggregate.

The screenings shall be applied at a slow and uniform rate (in three or more applications) so as to ensure filling of all voids. This shall be accompanied by dry rolling and brooming with mechanical brooms, hand-brooms or both. In no case shall screenings be applied so fast and thick as to form cakes or ridges on the surface in such a manner as would prevent filling of voids or prevent the direct bearing of the roller on the coarse aggregate. These operations shall continue until no more screenings can be forced into the voids of the coarse aggregate.

The spreading, rolling, and brooming of screenings shall be carried out in only such lengths of the road which could be completed within one day's operation.

3.6.5 Sprinkling of water and grouting: After the screenings have been applied, the surface shall be copiously sprinkled with water. After water has been applied, the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued, with additional screenings applied as necessary until the coarse aggregate has been thoroughly



keyed, well-bonded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or sub grade does not get damaged due to the addition of excessive quantities of water during construction.

3.6.6 Application of binding material: After the application of screenings as specified in 3.6.4 and 3.6.5, the binding material where it is require to be used (Clause 3.5) shall be applied successively in two or more than layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly, and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding material sticking to them. These operations shall continue until the resulting slurry after filling of voids, forms and wave ahead of the wheels of the moving roller.

3.6.7 Setting and drying: After the final compaction of water bound macadam course, the pavement shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or binding material as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The Engineer shall have the discretion to stop hauling traffic from using the completed water bound macadam course, if in his opinion it would cause excessive damage to the surface.

The compacted water bound macadam course should be allowed to completely dry and set before the next pavement course is laid over it.

3.7 Reconstruction of defective macadam:

The finished surface of water bound macadam shall conform to the tolerance of surface regularity as prescribed in **Table-5**. However, where the surface irregularity of the course exceeds the tolerances or where the course is otherwise defective due to sub grade soil mixing with the aggregates, the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material as applicable and re-compacted. In no case shall depressions be filled up with screening or binding material.

TABLE -5
PERMITTED TOLERANCES OF SURFACE EVENNESS FOR WBM COURSES

Sl. No.	Size range of coarse aggregate	Longitudinal profile measured with a 3 meter straight edge		Cross profile
		Max. Permissible undulation	Maximum number of undulation permitted in any 300 meter length exceeding	Max. Permissible variation from specified profile under a camber template
		mm	12mm	mm
1	90-45 mm	15	30	12

3.8 Measurements for payment:



Water bound macadam shall be measured as finished work in position in cubic metres.

Rate:

The Contract unit rate for water bound macadam sub-base / base course shall be payable in full for carrying out the required operations including full compensation for all components listed in Clause 3.1 to 3.6 **including arrangement of water used in the work as approved by the Engineer.**

Note: All above work to be carry out as per MOST specification (latest Edition).

4 TACK COAT:

4.1 Scope: This work shall consist of application of a single coat of low viscosity liquid bituminous material to an existing road surface/ WBM preparatory to another bituminous construction over it.

4.2. Materials

4.2.1 Binder: The binder used for tack coat shall be bituminous emulsion as specified in the BOQ of the work.

4.3. Construction Operation

4.3.1 Equipment: The tack coat distribution shall be a self propelled or towed bitumen pressure sprayer, equipped for spaying the material uniformly at a specified rate. Hand spraying the materials uniformly at a specified rate. Hand spraying of small areas, inaccessible to the distributor, or in narrow strips, shall be sprayed with a pressure hand sprayer, or as direction by the Engineer.

4.3.2. Preparation of base: The surface on which the tack coat is to be applied shall be cleaned of dust, dirt and any extraneous material before the application of the binder, by using a mechanical broom/high pressure air jet or any other approved equipment/method as specified by the Engineer.

4.3.3. Application of tack Coat: Binder may be heated to the temperature appropriate to the grade of cutback used and approved by the Engineer and sprayed on the base at the rate of 0.75 kg per square meter area. The normal range of spraying temperature for a bituminous emulsion shall be 20°C-70°C and for a cutback, 50°C-80°C if RC-70/ MC-70 grade is used. It shall be the responsibility of the Contractor to carefully handle the inflammable bituminous cutback material so as to safeguard against any fire mishap. The binder shall be applied uniformly with the aid of either self-propelled or towed bitumen pressure sprayer with self-heating arrangement and spraying bar with nozzles having constant volume or pressure system, capable of spraying bitumen at specified rates and temperature so as to provide a uniformly unbroken spread of bitumen. Work should be planned so that no more than the necessary tack coat for the day's operation is placed on the surface. After application and prior to succeeding construction allow the tack coat to cure, without being disturbed, until the water/cutter has completely evaporated, as determined by the Engineer. No vehicles shall be allowed on the tack coat other than those essential for the construction.



4.4 Measurement for Payment: Tack coat shall be measured in terms of surface area of application in Square Meters.

Note: All above work to be carry out as per MOST specification (latest Edition).

5 DENSE BITUMINOUS MACADAM:

5.1 Scope : Dense Bituminous Macadam (DBM) is used mainly for in base/binder and profile corrective courses. DBM is also used as road base material. This work shall consist of construction in a single or multiple layers of DBM on a previously prepared base or sub-base. The thickness of a single layer shall be 50 mm to 100 mm.

5.2 Material

5.2.1 Bitumen: The bitumen shall be paving bitumen of penetration Grade of specified consistency and content conforming to IS 73 or as otherwise specified in the item.

5.2.2 Coarse Aggregates: The coarse aggregates shall consist of crushed rock, crushed gravel or other hard material retained on the 2.36 mm IS Sieve. They shall be clean, hard, durable, or cubical shape, free from dust and soft or friable matter, organic or other deleterious substance. Before approval of the source, the aggregates shall be tested for stripping. The aggregates shall satisfy the physical requirements specified in 16.35, for dense bituminous macadam.

Where crushed gravel is proposed for use as aggregate, not less than 90% by weight of the crushed material retained on the 4.75 mm IS Sieve shall have at least two fractured faces.

5.2.3 Fine Aggregates: Fine aggregates shall consist of crushed or naturally occurring mineral material, or a combination of the two, passing the 2.36 mm IS Sieve and retained on the 75 micron sieve. They shall be clean, hard, durable, dry and free from dust and soft or friable matter, organic or other deleterious matter. The fine aggregate shall have a sand equivalent value of not less than 50 when tested in accordance with the requirements of IS 2720 (Part 37).

The plasticity index of the fraction passing the 0.425 mm IS Sieve shall not exceed 4, when tested in accordance with IS 2720 (Part 5).

TABLE 6

Physical Requirements for Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Specification
Cleanliness (dust)	Grain size analysis 1	Max 5% passing 0.075mm sieve.



Particle shape	Flakiness and Elongation Index (Combined) ²	Max 30%
Strength*	Los Angeles Abrasion Value ³ Aggregate Impact Value ⁴	Max 35% Max 27%
Durability	Soundness ⁵ Sodium Sulphate Magnesium Sulphate	Max 12% Max 18%
Water Absorption	Water Absorption ⁶	Max 2%
Stripping	Coating and stripping of Bitumen aggregate Mixtures ⁷	Minimum retained coating 95%
Water sensitivity**	Retained Tensile Strength ⁸	Min 80%

Note:

1. IS: 2386 Part 1
2. IS: 2386 Part 1

(The elongation test to be done only on non-aggregate in the sample) 3. IS 2368 Part 4*

4. IS 2368 Part 4*
5. IS 2386 Part 5
6. IS 2386 Part 3
7. IS 6241 8. AASHTO T283**

* Aggregate may satisfy requirement of either of these two tests.

** The water sensitivity test is only required if the minimum retained coating in the stripping test is less than 95%.

5.2.4 Filler : Filler shall consist of finely divided mineral matter such as rock dust, hydrated lime or cement approved by the Engineer-in-Charge. The filler shall be graded within the limits indicated in Table 7.

TABLE 7
Grading Requirements for Mineral Filler

Is Sieve (mm)	Cumulative per cent passing by weight of total aggregate
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0.6	100
0.3	95-100
0.075	85-100

The filler shall be free from organic impurities and have a plasticity index not greater than 4. The Plasticity Index requirements shall not apply if filler is cement or lime.

5.2.5 Aggregate Grading and Binder Content : When tested in accordance with IS 2386 Part 1 (wet sieving method), the combined grading of the coarse and fine aggregates and added filler for the particular mixture shall fall within the limits shown in Table 16-37 for dense bituminous macadam.

TABLE 8
Composition of Dense Graded Bituminous Macadam Pavement Layers

Grading	1
Nominal aggregate size	25 mm
Layer Thickness	50-75 mm
IS Sieve1 (mm)	Cummulative % by weight of total aggregate passing
37.5	100
26.5	90-100
19	71-95
13.2	56-80
4.75	38-54
2.36	28.42
0.3	7-21
0.075	2-8
Bitumen content % by mass of total mix ² (Marshal method)	5% or as specified in the item
Bitumen grade	60/70 grade or as specified in the item

Note: The combined aggregate grading shall not vary from the low limit on one sieve to the high limit on the adjacent sieve.

5.3 Mixture Design

5.3.1 Requirement for the Mixture: The mixture shall meet the requirements as given in Table 9.

TABLE 9
Requirements for Dense Bituminous Macadam



Minimum stability (KN at 600C)	9.0
Minimum flow (mm)	2
Maximum flow (mm)	4
Compaction level (number of blow)	75 blows on each of the two faces of the specimen
Per cent air voids	3-6
Per cent voids in mineral aggregate (VMA)	See Table 10
Per cent voids filled with bitumen (VFB)	65-75

The requirements for minimum percent voids in mineral aggregate (VMA) are given in Table 9.

TABLE 10
Minimum Percent Voids in Mineral Aggregate (Vma)

Nominal Maximum Particle	Minimum VMA, Percent Related to Design Air voids, Percent		
	3.0	4.0	5.0
9.5	14.0	15.0	16.0
12.5	13.0	14.0	15.0
19	12.0	13.0	14.0
25	11.0	12.0	13.0
37.5	10.0	11.0	12.0

- Note:** 1. The nominal maximum particle size is one size larger than the first sieve to retain more than 10 percent.
2. Interpolate minimum voids in the mineral aggregate (VMA) for design air voids values between those listed.

5.3.2 Binder Content: The binder content shall be optimized by using Marshall method for determining the optimum binder content shall be adopted as described in the Asphalt Institute Manual MS-2, replacing the aggregates retained on the 26.5 mm sieve by the aggregates passing the 26.5 mm sieve and retained on the 22.4 mm sieve.

5.3.3 Job Mix Formula : The contractor shall inform the Engineer-in-Charge in writing, at least 20 days before the start of the work, of the job mix formula proposed for use in the works, and shall give the details of Source and location of all materials, their sizes, grading and test results.



Approval of the job mix formula shall be based on independent testing by the Engineer-in-Charge for which samples of all ingredients of the mix shall be furnished by the Contractor as required by the Engineer-in-Charge.

Job mix formula shall be revised if there is a change in source of material and be got approved by Engineer-in-Charge.

5.3.4 Plant Trials – Permissible Variation in Job Mix Formula: Once the laboratory job mix formula is approved, the Contractor shall carry out plant trials at the mixer to establish that the plant can be set up to produce a uniform mix conforming to the approved job mix formula. The permissible variations of the individual percentages of the various ingredients in the actual mix from the job mix formula to be used shall be within the limits as specified in Table 16.40.

TABLE 11
Permissible Variations from the Job Mix Formula

Description	Permissible Variation	
	Base/Binder Course	Wearing Course
Aggregate passing 19 mm sieve or larger	± 8%	± 7%
Aggregate passing 13.2 mm, 9.5 mm	± 7%	± 6%
Aggregate passing 4.75 mm	± 6%	± 5%
Aggregate passing 2.36 mm, 1.18 mm, 0.6 mm	± 5%	± 4%
Aggregate passing 0.3 mm, 0.15 mm	± 4%	± 3%
Aggregate passing 0.075 mm	± 2%	± 1.5%
Binder content	± 0.3%	± 0.3%
Mixing temperature	± 10°C	± 10°C

5.3.5 Laying Trials: Once the plant trials have been successfully completed and approved, the Contractor shall carry out laying trials, to demonstrate that the proposed mix can be successfully laid and compacted.

5.4 Construction Operations

5.4.1 Prime Coat: Where the material on which the dense bituminous macadam is to be laid is other than a bitumen bound layer, a prime coat shall be applied, as specified, in accordance with the provisions, or as directed by the Engineer-in-Charge.

5.4.2 Tack Coat: Where the material on which the dense bituminous macadam is to be placed is bitumen bound surface, a tack coat shall be applied as specified, in accordance with the provisions, or as directed by the Engineer-in-Charge.



5.4.3 Mixing and Transportation of the Mixture: The provisions are as specified in item and MORTH specification.

5.4.4 Spreading: MORTH specification shall apply. The paver finisher shall be fitted with electronic sensor device.

5.4.5 Rolling: The compaction process shall be carried out as per MORTH Specification.

5.4.6 Opening to Traffic: The newly laid surface shall not be open to traffic for at least 24 hours after laying the completion of compaction, without the express approval of the Engineer-in-Charge in writing.

5.4.7 Surface Finish and Quality Control of Work: The surface finish of the completed construction shall conform to the requirements of 16.32.3. The materials and workmanship shall comply with the provisions set out in Table.

5.4.8 Arrangement for Traffic: During the period of construction, arrangements for traffic shall be made in accordance with the provisions.

Measurement

Dense Bituminous Materials shall be measured as finished work in cubic meters, correct to two places of decimal.

Rate: The rate includes the cost of all materials, labour and equipment, in all the operation described above.

6 BITUMINOUS CONCRETE.

6.1. Scope: This clause specifies the construction of Bituminous Concrete, for use in wearing and profile corrective courses. This work shall consist of construction in a single or multiple layers of bituminous concrete on a previously prepared bituminous bound surface. A single compacted layer shall be 40mm in thickness.

6.2. Materials:

6.2.1. Bitumen: The bitumen shall be paving bitumen of Penetration grade as specified in the BOQ of the work and complying with Indian Standard Specification for Paving Bitumen, IS:73 and of the penetration indicated in Table-8, for bituminous concrete, or as otherwise specified in the Contract

**TABLE 12
COMPOSITION OF BITUMINOUS CONCRETE PAVEMENT LAYERS**

Grading	1	2
Nominal aggregate size	19mm	13mm
Layer Thickness	50-65mm	30-45mm



IS Sieve ¹ (mm)	Cumulative % by weight of total aggregate passing	
45		
37.5		
26.5	100	
19	79-100	100
13.2	59-79	79-100
9.5	52-72	70-88
4.75	35-55	53-71
2.36	28-44	42-58
1.18	20-34	34-48
0.6	15-27	26-38
0.3	5-13	12-20
0.075	2-8	4-10
Bitumen content % by mass of total mix ²	5.0-6.0	5.0-7.0
Bitumen grade (pen)	As specified in item specification of BOQ or as directed by Engineer In-charge	As specified in item specification of BOQ or as directed by Engineer In-charge

- Notes:** 1. The combined aggregate grading shall not vary from the low limit on one sieve to the high limit on the adjacent sieve.
2. Determined by the Marshall method.

6.2.2. Coarse aggregates: The coarse aggregates shall be generally as specified in Clause **4.3**, except that the aggregates shall satisfy the physical requirements of **Table 13**.

**TABLE 13
PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS
CONCRETE PAVEMENT LAYERS.**

Property	Test	Specification
Cleanliness (dust)	Grain size analysis	Max 5% passing 0.075 mm sieve
Particle shape	Flakiness and Elongation Index	Max 30%(Combined) ²
Strength	Los Angeles Abrasion Value	Max 30%
	Aggregate Impact Value	Max 24%
Polishing	Polished Stone Value	Min 55
Durability	Soundness	
	Sodium Sulphate	Max 12%
	Magnesium Sulphate	Max 18%
Water Absorption	Water absorption	Max 2%



Stripping	Coating and Stripping of Bitumen Aggregate Mixtures	Minimum retained coating 95%
Water Sensitivity	Retained Tensile Strength	Min 80%

6.2.3. Fine aggregates: The fine aggregates shall be all as specified in Clause 5.2 of this specification.

6.2.4. Filler: Filler shall consist of finely divided mineral matter such as rock dust, hydrated lime or cement as approved by the Engineer. The filler shall be graded within the following limits:

**TABLE 14
GRADING REQUIREMENT FOR MINERAL FILLER**

IS sieve (mm)	Cumulative % passing by Wt of total aggregate
0.6	100
0.3	95-100
0.075	85-100

The filler shall be free from organic impurities and have a Plasticity Index not greater than 4. The Plasticity Index requirement shall not apply if filler is cement or lime. When the coarse aggregate is grade 1, 2 per cent by total weight of aggregate shall be Portland Cement or hydrated lime and the percentage of fine aggregate reduced accordingly. The cement or hydrated lime not required when the limestone aggregate is used. Where the aggregate fail to meet the requirement of water sensitivity in **Table no. -15** then 2 percent by total wt aggregate of hydrated lime shall be added without additional cost.

**TABLE- 15
PHYSICAL REQUIREMENTS FOR COURSE AGGREGATE FOR BITUMINOUS
CONCRETE PAVEMENT LAYER**

Property	Test	Specification
Cleanliness (dust)	Grain size analysis	Max 5% passing 0.075 mm sieve
Particle shape	Flakiness and Elongation Index (Combined)	Max 30%
Strength	Los Angeles Abrasion Value ³	Max 30%
	Aggregate Impact Value ⁴	Max 24%
Polishing	Polished stone value	Min 24%
Durability	Soundness	
	Sodium Sulphate	Max 12%
	Magnesium Sulphate	Max 18%
Water Absorption	Water absorption	Max 2%
Stripping	Coating and Stripping of Bitumen Aggregate Mixture	Minimum Retained Coating 95%



Water Sensitivity	Retained Tensile Strength	Min 80%
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6.2.5. Aggregate grading and binder content: When tested in accordance with IS:2386 Part 1 (Wet grading method), the combined grading of the coarse and fine aggregates and added filler shall fall within the limits shown in Table -9 for grading 1 or 2 as specified in the Contract.

6.3 Mixture Design:

1. Requirements for the mixture: Apart from conformity with the grading and quality requirements for individual ingredients, the mixture shall meet the requirements set out in Table 16.

**TABLE 16
REQUIREMENTS FOR BITUMINOUS PAVEMENT LAYERS**

Minimum stability (kN at 60°C)	9.0
Minimum flow (mm)	2
Maximum flow (mm)	4
Compaction level (Number of blows)	75 blows on each of the two faces of the specimen
Per cent air voids	3-6
Per cent voids in mineral aggregate (VMA)	As per Table no. 13
Per cent voids filled with bitumen (VFB)	65-75
Loss of stability on immersion in water at 60°C (ASTM D 1075)	Min. 75 per cent retained strength

The requirements for minimum percent voids in mineral aggregate (VMA) are set out in Table 17.

**TABLE -17
MINIMUM PERCENT VOID IN MINERAL AGGREGATE (VMA)**

Nominal Maximum Particle Size (mm)	Minimum VMA, Percent rated to Design Air Void, Percent		
	3.0	4.0	5.0
9.5	14	15	16
12.5	13	14	15
19.0	12	13	14
25.0	11	12	13
37.5	10	11	12



6.4 Binder content: The binder content shall be optimized to achieve the requirements of the mixture set out in Table 12. The binder content shall be as per specification of contract.

6.5. Job mix formula: The procedure for formulating the job mix formula shall be generally as specified in Clause 6.5.1 and the results of tests enumerated in Table 12 as obtained by the Contractors.

6.5.1 : Job Mix Formula: The Contractor shall inform the Engineer in writing, at least 20 days before the start of the work, of the job mix formula proposed for use in the works, and shall give the following details:

- (i) Source and location of all materials;
- (ii) Proportions of all materials expressed as follows where each is applicable.
 - (a) Binder type, and percentage by weight of total mixture;
 - (b) Coarse aggregate/Fine aggregate/Material filler as percentage by weight of total aggregate including mineral filler;
- (iii) A single definite percentage passing each sieve for the mixed aggregate;
- (iv) The individual grading of the individual aggregate fractions, and the proportion of each in the combined grading.
- (v) The results of tests enumerated in Table 12 as obtained by the Contractor;
- (vi) Where the mixer is a batch mixer, the individual weights of each type of aggregate, and binder per batch.
- (vii) Test results of physical characteristics of aggregates to be used;
- (viii) Mixing temperature and compacting temperature.

While establishing the job mix formula, the Contractor shall ensure that it is based on a correct and truly representative sample of the materials that will actually be used in the work and that the mixture and its different ingredients satisfy the physical and strength requirements of these Specifications.

Approval of the job mix formula shall be based on independent testing by the Engineer for which samples of all ingredients of the mix shall be furnished by the Contractor as required by the Engineer.

The approved job mix formula shall remain effective unless and until a revised Job Mix Formula is approved. Should a change in the source of materials be proposed, a new job mix formula shall be forwarded to the Engineer for approval before the placing of the material.

6.5.2 Plant trials – permissible variation in job mix formula: The requirements for plant trials shall be specified in the MOST specification.

6.5.2.1. Laying trials: The requirements for laying trials shall be all as specified in the MOST specification.

6.6 Construction Operations:

6.6.1 Preparation of base: The surface on which the bituminous concrete is to be laid shall be prepared in accordance with Clauses 5 and 9 of this specification, or as directed by the Engineer. The surface shall be thoroughly swept clean by mechanical broom and dust removed by compressed air. In locations where a mechanical broom cannot access, other approved methods shall be used as directed by the Engineer.



6.6.2 Tack coat: Where specified in the Contract, or otherwise required by the Engineer, a tack coat shall be applied in accordance with the requirements of Clause 4 of this specification.

6.6.3 Mixing and transportation of the mixture: The provisions as specified in Clauses 501.3 and 501.4 of MOST specification (latest Edition) shall apply.

6.6.4 Spreading: The general provisions of Clauses 501.5.3 and 501.5.4 MOST specification (latest Edition) shall apply.

6.6.6 Rolling: The general provisions of clauses 5.10 of this specification and 501.7 of MOST specification (latest Edition) shall apply, as modified by the approved laying trials.

6.7 Surface Finish and Quality Control: The surface finish of the completed construction shall conform to the requirements of Clause 7 of this specification. All materials and workmanship shall comply with the provisions set out in Section 900 of MOST specification (latest Edition).

6.8 Measurement for Payment: The work shall be measured as finished work in cubic metres. Same shall be verified with quantity of bituminous Concrete brought at site in Metric Tonnes.

Note: All above work to be carry out as per MOST specification (latest Edition).

7 QUALITY CONTROL FOR ASPHALT WORKS:

General:

7.1. All materials to be used, all methods adopted and all works performed shall be strictly in accordance with the requirements of specified in the tender. The Contractor shall set up a field laboratory at locations approved by the Engineer and equip the same with adequate equipment and personnel in order to carry out the test for Bitumen Content.

7.2. The Contractor shall carry out quality control tests on the materials and 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.

7.3. For satisfying himself about the quality of the materials and work, quality control tests will also be conducted by the Engineer (by himself, by his Quality Control Unit or by any other agencies deemed fit by him), generally to the frequency set forth herein under. Additional tests may also be conducted where, in the opinion of the Engineer, need for such tests exist.

7.4. The Contractor shall provide necessary co-operation and assistance in obtaining the samples for tests and carrying out the field tests/ lab test as required by the Engineer from time to time. This may include provision of labour, attendants, assistance in packing and dispatching and any other assistance considered necessary in connection with the tests.

7.5. The Contractor shall carry out modifications in the procedure of work, if found necessary, as directed by the Engineer during inspection. Works falling 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 works by the Contractor at his own cost.



7.6. The cost of laboratory / field test, essential supplies like water, electricity, sanitary services and their maintenance and cost of all equipment, tools, materials, labour and incidentals to perform tests and other operations of quality control according to the Specification requirements shall be deemed to be incidental to the work and no extra payment shall be made for the same.

7.7. For testing of samples granular materials, and mixes, bituminous materials and mixes, aggregates, cores, etc., samples in the required quantity and form shall be supplied to the Engineer by the Contractor at his own cost.

7.8. Bitumen, and similar other materials where essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, sampling, testing and furnishing of test certificates shall be borne by the Contractor. He shall also furnish the test certificates to the Engineer.

7.9. The method of sampling and testing of materials shall be as required by the "Handbook of Quality Control for Construction of Roads and Runways" (IRC: SP:11), MOST Specifications and specification of tender. Where they are contradicting, the Specifications as directed by Engineer shall be followed. Where they are silent, sound engineering practices shall be adopted. The sampling and testing procedure to be used shall be as approved by the Engineer and his decision shall be final and binding on the Contractor.

8 DEFECTIVE MATERIALS

All materials which the Engineer / his representative 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 subsequently corrected, 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 / his representative, given under this Clause, the Engineer / his representative shall have authority to cause the removal of rejected material and to deduct the removal cost thereof from any payments due to the Contractor.

9 CONTROL OF ALIGNMENT, LEVEL AND SURFACE REGULARITY

9.1. General

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

9.2. Horizontal Alignment

Horizontal alignments shall be reckoned with respect to the centre line of the road work. The edges of the road work as constructed shall be correct within a tolerance of +/- 10mm there from. The corresponding tolerance for edges of the roadway and lower layers of pavement shall be +/- 25mm.

9.3. Surface Levels

The levels of the subgrade and different 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 beyond the tolerances mentioned in **Table 18**.



**TABLE 18
TOLERANCES IN SURFACE LEVELS**

1.	Sub grade	+20 mm -25 mm
2.	Sub-base + 10mm	
	(a) Flexible pavement	-20 mm
3.	Base-course for flexible pavement	
	(a) Bituminous course	+6 mm -6 mm
	(b) Other than bituminous	+10 mm
	(i) Machine laid	-10 mm +15 mm
4.	Wearing course for flexible pavement	
	(a) Machine laid	+6 mm -6 mm

**TABLE 19
MAXIMUM PERMITTED NUMBER OF SURFACE IRREGULARITIES**

Irregularity	Surface of carriageways and paved shoulders				Surfaces of laybys, service areas and all bituminous base courses			
	4mm		7mm		4mm		7mm	
Length (m)	300	75	300	75	300	75	300	75
Roads of lower category	40	18	4	2	60	27	6	3

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

for pavement surface (bituminous and cement concrete)	3mm
for bituminous base courses	6mm
for granular sub-base / base courses	8mm
for sub-bases under concrete pavements	10mm

10 RECTIFICATION

Where the surface regularity of subgrade and the various pavement courses fall outside the specified tolerances, the Contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer.

- (i) Subgrade: Where the surface is high, it shall be trimmed and suitably compacted. Where the same is low, the deficiency shall be corrected by scarifying the lower layer and adding fresh material and recompacting to the required density. The degree of compaction and the type of material to be used shall conform to the requirements of Clause 305 of MOST Specification (latest Edition).



- (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 requirements of Clause 401 MOST Specification (latest Edition).
- (iii) Water Bound Macadam / Wet Mix Macadam Sub-base/Base: Where the surface is high or low, the top 75mm shall be scarified, reshaped with added material as necessary and recompact to Clause 404. This shall also apply to wet mix macadam to Clause 406 MOST Specification (latest Edition).
- (iv) Bituminous Constructions: For bituminous construction other than wearing course, where the surface is low, the deficiency shall be corrected by adding fresh material over a suitable tack coat if needed and recomposing 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 bituminous layer is involved, the area treated shall not be less than 5 m in length and not less than 3.5 m in width.

11 QUALITY CONTROL TESTS DURING CONSTRUCTION

11.1. 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. The testing frequencies set forth are the desirable minimum and the Engineer shall have the full authority to carry out additional tests as frequently as he may deem necessary, to satisfy himself that the materials and works comply with the appropriate specifications. However, the number of tests recommended in Tables 15 and 16 may be reduced at the discretion of the Engineer if it is felt that consistency in the quality of materials can still be maintained with the reduced number of tests.

Test procedures for the various quality control tests are indicated in the respective Sections of these 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.

TABLE 20
CONTROL TESTS AND THEIR MINIMUM FREQUENCY FOR SUB BASES AND BASES
(EXCLUDING BITUMEN BOUND BASES)

Sl. No.	Type of Construction	Test	Frequency (min)
1.	Water Bound Macadam	(i) Aggregate Impact Value	One test per 200m ³ of aggregate/ change of source
		(ii) Grading	One test per 100 m ³ /change of source



		(iii) Flakiness Index and Elongation Index	One test per 200m ³ of aggregate/ change of source
		(iv) Atterberg limits of binding material	One test per 25 m ³ of binding material
		(v) Atterberg limits of portion of aggregate passing 425 micron sieve	One test per 100 cubic metre of aggregate

11.2 Tests on Bituminous Construction

11.2.1. Test and frequency: The tests and their minimum frequencies for the different types of bituminous works shall be as given in Table 16. The Engineer may direct additional testing as required.

Field test for Bitumen Content & temperature to be recorded for random sampling. Extraction test machine to be brought to site for testing the bitumen content in DBM & BC, brought at site. Temperature for the loads at site for DBM & BC to be recorded.

11.2.2. Acceptance criteria: The acceptance criteria for tests on density and Marshall stability shall be subject to the condition that the mean value is not less than the specified value plus:

$$1.65$$

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

TABLE 21

CONTROL TESTS FOR BITUMINOUS WORKS, AND THEIR MINIMUM FREQUENCY

Sl. No.	Type of Construction	Test	Frequency (min)
1.	Prime coat / Tack coat / Fog spray	(i) Quality of binder	Number of samples per lot and tests as per IS:73, IS:217 and IS:8887 as applicable.
		(ii) Binder temperature for application	At regular close intervals.
		(iii) Rate of spread of Binder	One test per 500m ² and not less than two tests per day.
2.	Dense Bituminous Macadam	(i) Quality of binder	Same as mentioned under Serial No.1



		(ii) Aggregate Impact Value / Los Angeles Abrasion Value	One test per 50m ³ of aggregate.
		(iii) Flakiness Index and Elongation Index	-do-
		(iv) Stripping value	Initially one set of 3 representative specimens for each source of supply. Subsequently when warranted by changes in the quality of aggregates
		(v) Water absorption of aggregates	-do-
		(vi) Water sensitivity of mix	-do-
		(vii) Aggregate grading	One test per 100 m ³ of aggregate
		viii) Soundness (Magnesium and Sodium sulphate)	Initially, one determination by each method for each source of supply, then as warranted by change in the quality of the aggregate.
		(ix) Percentage of fractured faces	When gravel is used, one test per 50 m ³ of aggregate.
		(x) Binder content and aggregate grading	Periodic, subject to minimum of two test per day as per laying /application with Extraction apparatus and sieve analysis.
		(xi) Control of temperature of binder & aggregate for mixing & of the mix at the time of laying and rolling.	At regular close intervals.
		(xii) Rate of spread of binder	Regular control through checks of layers thickness
		(xiii) Density of compacted layer	One test per 250 m ³ of area
3.	Bituminous Concrete	(i) Quality of binder	Same as mentioned under Serial No.1



		(ii) Aggregate Impact Value/Los Angeles Abrasion Value	Same as mentioned under Serial No.2
		(iii) Flakiness Index and Elongation Index	Same as mentioned under Serial No.2
		(iv) Stripping Value	Same as mentioned under Serial No.2
		(v) Soundness (Magnesium and Sodium Sulphate)	Same as mentioned under Serial No.2
		(vi) Water absorption of aggregates	Same as mentioned under Serial No.2
		(vii) Mix grading	One set of tests on individual constituents and mixed aggregate from the dryer for each 400 tonnes of mix subject to a minimum of two tests per plant per day.
		(viii) Stability of Mix	For each 400 tonnes of mix produced, a set of 3 Marshall specimens to be prepared and tested for stability, flow value, density and void content subject to a minimum of two sets being tested per plant per day.
		(ix) Water sensitivity of mix (Retained Tensile Strength)	Same as mentioned under Serial No.2
		(x) Swell test on the mix	As required for the Bituminous Concrete
		(xi) Control of temperature of binder in boiler, aggregate in the dryer and mix at the time of laying and rolling	At regular close intervals.
		(xii) Control of binder content and grading of the mix	One test for each 400 tonnes of mix subject to a minimum of two tests day, as per laying /application



			with Extraction apparatus and sieve analysis..
		(xiii) Rate of spread of mixed material.	Regular control through checks on the weight of mixed material and layer thickness.
		(xiv) Density of compacted layer	One test per 250 m ² area
		(xv) OMC & MDD	One test per 250 m ² area

12 ROAD MARKINGS STRIPS

The colour width and layout of road markings shall be in accordance with the Code of Practice for Road Markings with paints, IRC: 35, and as specified in the drawings or as directed by the Engineer-in- Charge.

12.1 Materials

Road markings shall be of ordinary road marking paint (retro-reflective), hot applied thermoplastic compound as specified in the item.

12.2 Hot Applied Thermoplastic Road Marking

General

- (i) The thermoplastic material shall be homogeneously composed of aggregate, pigment, resins and glass reflectorizing beads.
- (ii) The thermoplastic compound shall be screeded/extruded on to the pavement surface in a molten state by suitable machine capable of controlled preparation and laying with surface application of glass beads at a specific rate. Upon cooling to ambient pavement temperature, it shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation by traffic.
- (iii) The thermoplastic material shall conform to ASTM D36/BS-3262-(Part I).
- (iv) The material shall meet the requirements of these specifications for a period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or unmelted particles for the one year storage period. Any material not meeting the above requirements shall be replaced by the manufacturer/supplier/Contractor.
- (v) Marking: Each container of the thermoplastic material shall be clearly and indelibly marked with the following information: 1. The name, trade mark or other means of identification of manufacturer. 2. Batch number 3. Date of manufacture 4. Colour (White or yellow) 5. Maximum application temperature and maximum safe heating temperature.
- (vi) Sampling and Testing: The thermoplastic material shall be sampled and tested in accordance with the appropriate ASTM/BS method. The Contractor shall furnish to the Engineer-in-Charge a copy of certified test reports from the manufacturers of the thermoplastic material showing results of all tests



specified herein and shall certify that the material meets all requirements of this Specification.

12.3 Preparation

- (i) The material shall be melted in accordance with the manufacturer's instructions in a heater fitted with a mechanical stirrer to give a smooth consistency to the thermoplastic material to avoid local overheating. The temperature of the mass shall be within the range specified by the manufacturer, and shall on no account be allowed to exceed the maximum temperature stated by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic material which has natural binders or is otherwise sensitive to prolonged heating, the material shall not be maintained in a molten condition for more than 4 hours.
- (ii) After transfer to the laying equipment, the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

12.4 Properties of Finished Road Marking

- a) The stripe shall not be slippery when wet.
- b) The marking shall not lift from the pavement in freezing weather.
- c) After application and proper drying, the stripe shall show no appreciable deformation or discolouration under traffic and under road temperatures upto 60oC.
- d) The marking shall not deteriorate by contact with sodium chloride, calcium chloride or oil drippings from traffic.
- e) The stripe or marking shall maintain its original dimensions and position. Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.
- f) The colour of yellow marking shall conform to IS Colour No. 356 as given in IS 164.

12.5 Application

Marking shall be done by fully /semi-automatic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator as specified in item. For locations where painting cannot be done by machine, approved manual methods shall be used with prior approval of the Engineer-in-charge. The Contractor shall maintain control over traffic while painting operations are in progress so as to cause minimum inconvenience to traffic compatible with protecting the workmen.

The thermoplastic material shall be applied hot either by screeding or extrusion process. After transfer to the laying apparatus, the material shall be laid at a temperature within the range specified by the manufacturer or otherwise directed by the Engineer-in-Charge for the particular method of laying being used. The paint shall be applied using a screed or extrusion machine.

The pavement temperature shall not be less than 10oC during application. All surfaces to be marked shall be thoroughly cleaned of all dust, dirt, grease, oil and all other foreign matter before application of the paint.



Thermoplastic paint shall be applied in intermittent or continuous lines of uniform thickness of at least 2.5 mm unless specified otherwise. Where arrows or letters are to be provided, thermoplastic compound may be hand-sprayed.

The minimum thickness specified is exclusive of surface applied glass beads.

The finished lines shall be free from ruggedness on sides and ends and be parallel to the general alignment of the carriageway. The upper surface of the lines shall be level, uniform and free from streaks.

12.6 Measurements for Payment

The painted markings shall be measured in sq. metres of actual area marked (excluding the gaps, if any) correct upto the two places of decimal.

12.7 The rate includes the cost of all materials, labour and equipments required in all the above operations.

13 KERB CHANNEL OF CEMENT CONCRETE

Base:

The base of the channel to be of the 75 mm compacted thick dry brick ballast 40 mm nominal size well rammed and consolidated and grouted with fine sand.

Kerb channel shall be provided in cement concrete of specified grade. These shall be cast in-situ of specified size as given in the item. Top surface of channel to be finished smooth.

Measurements:

Cement concrete channel shall be measured in metre of length of the completed channel correct upto two places of decimal.

Rate:

The rate includes the cost of all the materials, labours and tools required in all the operations described above.



HINDRANCE REGISTER

1. Name of the Work:
2. Contract Agreement No. :
3. Date of Commencement:
4. Stipulated Date of Completion:
5. Extended Date of Completion, if applicable:
6. Name of the Supplier / Contractor:

Sr. No.	Nature of Hindrance	Activity of work affected	Date of notification by contractor	Name & Signature		Date of removal of hindrance	Name & Signature	
				Contractors Representative	Site Executive of MDL		Contractors Representative	Site Executive of MDL



Enclosure-23

To,
OTS Department
OTS-TS SECTION
MAZAGON DOCK SHIPBUILDERS LIMITED.

Mazagon Dock Shipbuilders Ltd.

Loss of Pass - Contractor/Vendors.

1. Penalties will be imposed towards loss of passes/ non-renewal of passes apart from warning as deemed necessary for contractors, vendors & their workers. This is in addition to cost of the pass prescribed from time to time.

Loss:

- | | |
|------------------|---------------------------------------|
| a) First loss - | Rs. 250/- |
| b) Second loss - | Rs. 500/- |
| c) Third loss - | Rs. 1000/- and permanent cancellation |

Non-Renewal:

- | | |
|----------------------|-----------------------------|
| a) Upto 4 days- | No Penalty |
| b) 5-10 days- | Rs. 5/- per day |
| c) 11 days & beyond- | Rs. 50/- + Rs. 10/- per day |

2. **Procedure for duplicate pass due to loss:**

The loss has to be immediately reported to the concern Police Station. Thereafter a statement narrating circumstances of the loss, countersigned by the contractor and EIC shall be submitted to security office along with the prescribed penalty.



Enclosure-24



माझगांव डॉक शिपबिल्डर्स लिमिटेड

बाह्यस्त्रोत-तकनीकी सेवाएँ विभाग

INVOICE CERTIFICATION

HOD (OTS)

Ref No.:

Date:

Firm's Name: M/s. _____ RA Bill No: _____

A. Contract Details:

- Subject: _____
- MDL P.O. No: _____ dated: _____ Value: _____
- PO Original Delivery date: _____ Extended Delivery Date (if any): _____
- Contractor All Risk Policy vide No. _____ date.: _____ for an amount of Rs _____ Valid till dated _____
- Performance Bank Guarantee/ Security Deposit vide No. _____ dated: _____ Rs. _____ Valid till _____
- Stamp Duty Paid vide Challan No. _____ Rs. _____

B: Invoice Details:

- Firms Invoice No: _____ dated _____
- Period of Work: From _____ To _____

S.N.	Description	Amount in Rs.
1.	RA Bill Amount	
2.	Price Variation Amount	
3.	Total	

C. Certification Details:

The following have been appended along with the GST Tax Invoice:

- MDL service entry sheets duly signed attached : Yes/ Not Applicable
Service Entry Sheet No _____
EMB No. _____
- Consultant's Certificate (if applicable) : Yes/ Not Applicable
Reference No. _____ Dated: _____
- E-invoice/Vendor's Self Declaration: Yes/ Not Applicable
- No Claim Certificate (applicable for Final Invoice only) : Yes/ Not Applicable
- Vendor rating (applicable for Final Invoice only): Yes/ Not Applicable
- Actual Local Content Certificate (applicable for Final Invoice only) : Yes/Not Applicable
- Price indices & Price Variation sheet (if price variation is included) : Yes/ Not Applicable
- Bank Guarantee against Waterproofing/ Leakages (applicable for Final Invoice only) : Yes/ Not Applicable
- The following deductions to be made from the invoice:
 - Liquidated Damages as per purchase order : To be levied/Not Applicable Details of LD to be levied (if applicable): _____
 - Other Deductions (if any): _____
 - Release of Provisional Retained Amount (if any): _____

Engineer in Charge/HOD (Comm)

(Sign & Stamp with date)

Consultant

(Name, Sign & Stamp with Date)

Contractor

(Name, Sign & Stamp with Date)



Enclosure-25

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.

EXTRACT OF PROVISIONS OF THE OFFICIAL SECRETS ACT, 1923

SECTION 2(B) ; “PROHIBITED PLACE”

It is defined as the place of any work of Defence Dockyard and other so belonging or occupied and used for the purpose of building, repairing, making or storing any ammunitions of war.

For the purpose of the above definition, sketch includes any photograph or other mode of representing any place or thing.

SECTION 3 : “PENALTIES FOR SPYING”

If any per unlawfully -

- a) approaches, inspects, passes over or is in the vicinity of any clear place; or
- b) make any sketches intended to be directly or indirectly useful to an enemy; or
- c) obtains, collects, records or communicates to any other person any secret official code.

Shall be liable for imprisonment of 14 years in case of Defence Installation.

SECTION 4 : “COMMUNICATION WITH FOREIGN AGENTS”

If Any person has been in communication with or attempted to communicate with foreign agents regarding the vital information of any “PROHIBITED PLACE” would be guilty of violating the provisions of this Act.

SECTION 5 : “WRONGFUL COMMUNICATION OF INFORMATION”

If any person having in his possession or control any official document;

- a) Willfully communicates to any person, other than a person, who is authorised to communicate it.
- b) Used the information in his possession for the benefit of any foreign power.
- c) Retain in his possession when he has no power to retain it
- d) Fails to take reasonable care of it.

Shall be guilty of an offence under this Act.

SECTION 6 : “UNAUTHORISED USE OF UNIFORMS”



If any person for the purpose of gaining admission or of assisting any other person to gain admission to a “PROHIBITED PLACE” wears uniforms without lawful authority shall be guilty of offence under this Section.

SECTION 7 : “INTERFERING WITH OFFICERS OF POLICE”

No person in the vicinity of any “PROHIBITED PLACE” shall obstruct any Police Officer engaged on guard, sentry or similar duty. If any person moves in the provisions of this section, shall be punishable with imprisonment, which may extend up to 3 years.

SECTION 8 : “DUTY OF GIVING INFORMATION”

It shall be duty of every person to give on demand to a superintendent of Police or any other Police Officer not below the rank of Inspector, any information in his power relating to an offence under this Act.

If any person fails to give such information, shall be punishable with imprisonment to 3 years or fine or with both.

SECTION 9 : “INCITEMENT”

Any person who attempts to commit or debate the commission of an offence under this Act shall be punishable with the same punishment and be liable to be proceeded against in the same manner as if he had committed such offence.

SECTION 10 : “PENALTY FOR HARBOURING SPIES”

If any person whom he knows or has reasonable grounds for supposing to be person who is about to commit or who has committed offence under this Act shall be guilty of offence under this Section.

SECTION 11 : “SEARCH WARRANTS”

If a presidency Magistrate, Magistrate First Class or Sub-Divisional magistrate is satisfied with the information that there is reasonable ground for suspecting that an offence under this Act has been or is about to be committed, he may grant search warrant to any Police Officer to enter at any time any premises to force to search premises or the places.

**Enclosure-26**

To,
OTS-TS SECTION
OTS DEPARTMENT
MAZAGON DOCK SHIPBUILDERS LIMITED.

CHECKLIST OF SUBMITTALS ATTACHED ALONGWITH ONLINE TECHNICAL BID
TENDER ENQUIRY No. 1900000253

Bidder to indicate Submitted/ Not submitted and Yes / No under relevant Column and Reasons for Non submissions if any

Sr. No.	Submittals (Scanned Copy)	Whether Submitted/ Not Submitted/ Not Applicable	Bidder to indicate the Reasons below for Non Submissions if any, or if they have indicated "NO" under relevant columns
1	Enclosure-1 viz Form of undertaking	Yes/ No	
2	Enclosure-2 viz TEF Acceptance Form	Yes/ No	
3	Enclosure-3 viz General Engineering Work Enclosure-3.1 viz Special condition of contract	Yes/ No	
4	Enclosure-4 viz GCC Acceptance Form	Yes/ No	
5	Enclosure-5 viz Deviation Form	Yes/ No	
6	CA certified Average Audited Annual financial turnover of Past 03 years ending 31 March 2025	NA	
7	Audit certified Balance Sheets of Past 03 years ending 31 March 2025	NA	
8	Audit certified Profit/Loss Accounts of 03 years ending 31 March 2025	NA	
9	a. Enclosure-6 & 7 viz Bidding Capacity	NA	
	b. Whether Enclosure-6 Certified by CA : NOT applicable to this tender	Yes/ No	
	c. Whether Enclosure 7 Certified by CA Not applicable to this tender	Yes/ No	
	d. Whether PO Copies in respect of Projects mentioned in Enclosure 7 submitted		
10	Enclosure-8 viz Exp in Similar Projects		
	a. Work Orders along with Scope of work and BOQ		
	b. Completion Certificates issued / authenticated by Client		



Sr. No.	Submittals (Scanned Copy)	Whether Submitted/ Not Submitted/ Not Applicable	Bidder to indicate the Reasons below for Non Submissions if any, or if they have indicated "NO" under relevant columns
	c. TDS Copy in case of Work Completion Certificate issued by Private firm		
11	Enclosure-9 viz Key Personnel for this Project		
	i) Enclosure-10(A) viz. Declaration certificate for Local Content		
	a. Whether Tender Item Sr. No indicated at Col I of Para (d) of Enclosure	Yes/ No	
	b. Whether Local Content Percentage indicated at Col II of Para (d) of Enclosure	Yes/ No	
	c. Whether Location of Value addition indicated at Col III of Para (d) of Enclosure	Yes/ No	
12	d. Whether Enclosure-10(A) viz. Declaration Certificate for Local Content has been signed by Authorized Signatory as indicated at Tender Clause No. 40.4(i)	Yes/ No	
	ii) Enclosure-10(E) viz Declaration in respect of restriction under Rule 144 (xi) of the General Financial Rules (GFRs), 2017	Yes/ No	
	iii) Enclosure-10(F) viz Declaration in respect of of debarred under Public Procurement Policy (PPP) Make In India (MII) order 2017	Yes/ No	
13	Enclosure-11 viz Declaration for Banned or delisted Tenderer	Yes/ No	
14	Enclosure-15 viz EMD Format	Yes/ No	
15	Enclosure-13 - Integrity Pact	Yes/ No	
	a. Enclosure-14 viz RTGS Form	Yes/ No	
16	b. Whether RTGS form is duly authenticated by any Bank	Yes/ No	
	a. Solvency Certificate	Yes/ No	
	b. Whether Solvency Certificate is issued within 1 Year from Tender date	Yes/ No	
17	c. Whether Solvency is issued by a Scheduled Commercial (i.e. Indian or Foreign Banks included in the Second Schedule of Reserve Bank of India Act, 1934 excluding Co-	Yes/ No	



Sr. No.	Submittals (Scanned Copy)	Whether Submitted/ Not Submitted/ Not Applicable	Bidder to indicate the Reasons below for Non Submissions if any, or if they have indicated "NO" under relevant columns
	operative banks or Regional Rural Banks).		
18	GST Registration Certificate	Yes/ No	
19	PAN CARD	Yes/ No	
20	a. Shop & Establishment Registration Certificate or Certificate of Incorporation from Registrar of Companies or Registrar of firms registration certificate from Registrar of firms	Yes/ No	
	b. Whether Shop and Establishment Certificate is valid as on date of submission	Yes/ No	
21	Company Profile	Yes/ No	
22	ESIC , PF code	Yes/ No	
23	Working capital statement as on 31 March 2024 duly signed & Stamped by CA and all the partners/Owner.	NA	
24	Power of Attorney	Yes/ No	
25	Corrigendum, if any	Yes/ No	
26	Enclosure-29-Declaration in respect of Conflict of Interest among Bidders/ Agents	Yes/ No	

The Bidder hereby declares that in case any of the above submittals are **not submitted/ not appended** along with the tender bid or the bidder have indicated "**No**" against any of the above submittals, MDL reserves the right to disqualify their bid for incomplete submission of the documents without assigning any reasons. The bidder shall be responsible for the incompleteness of their bid.

SIGNATURE _____

NAME _____

DESIGNATION _____

COMPANY SEAL COMPANY _____

DATE _____



Address Label

Please cut & Affix Address label given below on the envelope for sending EMD and Integrity Pact

Sub: Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)

Ref: MDL Tender No. 1900000253

EMD

To,

**Head of Department (OTS),
OTS Department,
OTS-TS Section
6th Floor, Service Block Bldg., NY.
Mazagon Dock Shipbuilders Limited,
Dock Yard Road, Mumbai - 400010.**

From



Enclosure-28



माझगांव डॉक शिपबिल्डर्स लिमिटेड

तकनीकी सेवाएँ विभाग

Certification for Disposal of Scrap/Debris

Sub: Asphaltting of road from CISF control room (near dispensary) to SSA workshop and road around SSA workshop and road from security complex to LL crane track no 11 (SY)

RA NO.:

This is to certify that there is no accumulation of scrap/debris at site in sizable quantum, in respect of the works carried out for the subject work, as on date.

The scrap/debris generated from the above work is disposed of as per extant procedure.

Engineer in Charge

(Name, Sign & Stamp with date)

Contractor

(Name, Sign & Stamp with Date)



Enclosure-29

Declaration in respect of Conflict of Interest among Bidders/ Agents

We, hereby, declare that we do not have Conflict of Interest with other Bidders. We shall be disqualified if found having conflict of interest with other bidders.

We may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) We have controlling partner(s) in common; or*
- b) We received or have received any direct or indirect subsidy/ financial stake from any of them; or*
- c) We have the same legal representative/ agent for purpose of this bid; or*
- d) We have relationship with each other, directly or through common parties, that puts us in a position to have access to information about or influence on the bid of another Bidder; or*
- e) We participate in more than one bid in this bidding process. Participation by us in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid.*
- f) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. We must proactively declare such sister/ common business/ management units in same/ similar line of business.*

SIGNATURE:_____

DATE:_____

Seal / Stamp of Bidder