

# UDUPI COCHIN SHIPYARD LIMITED

(Formerly Tebma Shipyards Limited)



Date: 28.05.2025

## TENDER ENQUIRY

Dear Sirs,

Sealed Tenders in duplicate, super scribing the Enquiry Number & Last date for receipt of Quotations on the envelope, are invited in in **TWO BID SYSTEM** two separate covers as 'Part- I Techno-commercial' and 'Part- II Price' - both enclosed in the single envelope, for the supply of following materials so as to reach the undersigned on or before the last date and time shown. Tenders should be addressed to Assistant General Manager (Materials), Udupi Cochin Shipyard Limited, Malpe Harbor Complex, Malpe. Udupi-576108, Karnataka, India.

Submission by Email: Offers (both Part- I Techno-commercial' and 'Part- II Price) in two separate password protected PDF file format, can also be made by E-mail ([sony.clement@udupicsl.com](mailto:sony.clement@udupicsl.com), [purchase1@udupicsl.com](mailto:purchase1@udupicsl.com) / [ganesh.a@udupicsl.com](mailto:ganesh.a@udupicsl.com)) on or before, the last date & time of receipt of tender as shown below, if delivery of sealed offers cannot be ensured at UCSL on the due date. The offer PDF files (Part- I Techno-commercial' and 'Part- II Price) to be named clearly (UCSL/MAT/NPROJ/2024-25/406)

Enquiry No.	Enquiry Date	Last Dt. & Time for Receipt of Tender	Tender Opening Date & Time
UCSL/MAT/NPROJ/2025-26/406	28.05.2025	18.06.2025, 15:00:00	18.06.2025, 15:30:00

Sl No	Material/ Service Description	UOM	Qty	Required Date at UCSL
1	ISMC 300X90 MAIN MAKE	KG	14,500	Within Four Weeks from the Date of PO.
2	ISMB 300X140 MAIN MAKE	KG	8,000	
3	ISA 75X75X10 MAIN MAKE	KG	2,500	
4	ISA 100X100X10 MAIN MAKE	KG	1,000	
6	CR 80 RAIL 12000MM MAIN MAKE	KG	10,500	

उदुपी कोचीन शिपयार्ड लिमिटेड  
पन्नन, पोत परिवहन और जलमार्ग मंत्रालय  
भारत सरकार

UDUPI COCHIN SHIPYARD LIMITED  
Ministry of Ports, Shipping & Waterways  
Government of India

पंजीकृत कार्यालय:  
एस. नं. 377, पञ्चमत्तूर गाँव  
पुकातुरई पोस्ट, मदुरान्तकम तालुका  
कांचीपुरम - 603 116, तमिल नाडु, भारत ।

कॉर्पोरेट कार्यालय:  
माल्पे हार्वर कॉम्प्लेक्स, माल्पे  
उदुपी - 576 108, कर्नाटक, भारत ।

CIN: U27209TN1984GOI010994

Registered Office:  
S.No.377, Pazhamathur Village  
Pukathurai Post, Madurantakam Taluk  
Kancheepuram - 603 116, Tamil Nadu, India

Corporate Office:  
Malpe Harbour Complex, Malpe  
Udupi - 576 108, Karnataka, India

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In case of any queries, please contact: Mr. Sony Clement - AGM (Materials), Ganesh Achary - Manager (Materials) Mobile No. 8618154912, Email: [sony.clement@udupicsl.com](mailto:sony.clement@udupicsl.com), [ganesh.a@udupicsl.com](mailto:ganesh.a@udupicsl.com), [purchase1@udupicsl.com](mailto:purchase1@udupicsl.com),

**Enclosures:**

1. General Terms and Conditions of procurement - Annexure 1
2. Price bid format - Annexure 2
3. Bank Guarantee/Security Deposit Format - Annexure 3
4. Material Specification - Annexure 4

For Udupi Cochin Shipyard Ltd,



Authorized Signatory  
**Sony Clement T M**  
AGM - Materials  
UCSL

**Annexure 01/A GENERAL TERMS AND CONDITIONS**

SL NO	Description	Compliance by Supplier (YES/NO) In case of non compliance, please provide remarks.
1	Tenderers are to carefully go through the terms and conditions and the technical specification of the items for which offers are called for. Tenderers have to adhere to above and supply full technical scope of items along with compliance of commercial conditions. UCSL have full right upon deviations, if any, including rejecting the partial scope/ complied offers.	
2	Offers are to be furnished in duplicate and should be free from overwriting. Corrections and additions, if any, must be attested. <del>In the case of E-tender offers shall be submitted only through UCSL E-procurement portal.</del> Incomplete/ambiguous/conditional offers are likely to be rejected.	
3	Technical checklist, if applicable and current general terms & conditions of enquiry duly filled and signed and technical specifications of items offered (refer clause 5), should be submitted along with part-1 techno-commercial bid in the case of two-bid tenders <del>and along with the bid documents in the case of single bid.</del> Non receipt of the document may lead to rejection of offers. <del>In the case of E tender filling up of GTC check list in the portal itself is sufficient.</del>	
	Spare/Tool requirements to be confirmed, if applicable i) Spare parts shall be furnished in accordance with the Class recommendations and manufacturers standard ii) The same shall be included in offered costs and shall be a part of L1 evaluation. iii) List of spares with quantity and without indicating the price should be submitted	
4	Following Certificates/documents is to be submitted for the item in the event of an order: a. Invoice and Packing List b. Material Test Certificate	
5	<b>SPECIFICATIONS: -</b> a) Manufacturer's name, their trade mark and brand, if any, should invariably be mentioned and illustrative leaflets giving technical particulars (technical details of items offered including technical literature) etc., should be attached to the offer.	
	b) Materials offered shall conform to UCSL specifications.	
	<del>c) Samples are to be supplied free of cost in the event of requirement by UCSL.</del> The detailed working drawing, if called for, is also to be furnished for approval before commencement of manufacture.	
6	Packing materials should be eco friendly.	
7	Supplier should follow the statutory requirements of product offered.	
8	Products supplied shall be non toxic and harmless to health. In case of toxic materials, Materials Safety Data Sheet may be furnished along with the material.	

9	<b>COMMISSIONING:</b> – Service engineer assistance for 6 man days irrespective of number of engineers in two trips (3 days for TY 161 & 3 days for TY 162) for two ships is to be included in scope and costs.	
	b) Cost considered to include travel tickets, lodging and local transport costs.	
	e) Additional manday rates to be indicated separately (all inclusive of cost for lodging and local transport etc.) for extension beyond agreed mandays. Additional mandays only applicable after completion of 6 days for both the vessels together.	
	d) Whether the applicable taxes in India shall be borne by UCSL/Supplier (In the case of foreign vendors)	
	e) Income tax liability of non resident service engineer based on his period of stay in India shall not be borne by UCSL	
	f). The non resident vendor/service provider shall provide such documents that are necessitated by the Indian income tax laws so as to enable UCSL to comply with the provisions of Indian statute and for payments of income tax in India. Following documents shall be sought by UCSL in this regard (i) Certificate under 10 (F) (ii) Tax residency certificate (iii) The certification regarding the existence/non existence of business connection or permanent establishment in India. (The above is only an indicative list)	
10	Taxes and duties, if any, payable extra are to be indicated in the price part for single bid and in techno commercial part and price part (in the case of 2 bid tender).	
11	<b>MSEs, Startups and Make in India</b> a) Local Suppliers (Make In India), MSME firms and Startups will be eligible for various Relaxations in pre-qualification criteria and other Benefits as per the orders promulgated by Government of India. Bidders are advised to refer the details of various Benefits and Relaxation in pre-qualification criteria as published at CSL website ( <a href="http://www.cochinshipyard.in">www.cochinshipyard.in</a> ) under the Tenders tab for further reference.	
12	Delivery Period: Material required date at UCSL is : Within four weeks from the Date of PO.	
13	<b>SHIPMENT</b> a. Supplier shall intimate UCSL the readiness of the Equipment/ Machinery/ Components and Parts prior to fourteen days of shipment.	
	b. A minimum 14 days free detention period is to be granted for clearance of the goods at Mangalore/Mumbai/Chennai seaport, as applicable for full containers.	

14	<p><b><u>PAYMENT TERMS:</u></b></p> <p>a. <del>For equipment's with commissioning</del>  <del>UCSL payment term is 90% along with 100% applicable taxes within 30 days from the date of receipt and acceptance of items at UCSL stores after inspection and balance 10% on satisfactory completion of commissioning certified by UCSL.</del></p>	
	<p>b. <u>For general items</u>  UCSL payment term is 100% within 30 days of receipt, inspection and acceptance of materials at UCSL on Pro-rata basis for the part quantity delivered.</p>	
	<p>c) Payment mode shall be Electronic Clearing System (ECS)/cheque /NEFT/ /LC/CAD/TT-as mutually agreed in line with above standard payment terms. Variations from standard terms, if any, shall be appropriately loaded for tender comparison purposes for arriving the lowest bid. Bank charges (including LC charges, if any) inside India will be to UCSL account and outside India to supplier's account (In the case of import shipments). The charges for LC amendment, if any, shall be borne by the parties by whom the same is attributed/ necessitated.</p>	
	<p>d) Normally advance payments are not encouraged. In case, if advance payment is sought, the same can be considered for a maximum of 10% order value only. Interest at the base rate of SBI {applicable on the date of price bid opening} + 1% for the amount of advance will be charged. In addition, Bank guarantee for equivalent amount of advance to cover the period till advance payment is adjusted to be furnished. (ie till completion of supplies or for a period as specifically agreed + 90 days). In case interest as above is not agreeable to be paid, the same will be loaded on your quoted basic prices, for tender comparison purposes for arriving the lowest bid</p>	
	<p>e) For deviation in Payments terms from UCSL standard terms, if any, aforesaid interest will be loaded on quoted item prices, for tender comparison purposes for arriving lowest bid.</p>	
	<p>f) Part payment shall be considered only if specifically agreed against partial supplies.</p>	
15	<p><b><u>Security Deposit/ Warrantee Bank Guarantee:</u></b></p> <p>a.i The successful bidder shall remit a security deposit of 3% of the total order value (excluding taxes, duties) in the form of demand draft drawn in favor of Udupi Cochin Shipyard Ltd towards the satisfactory performance of the contract, if an order is placed on them. Alternatively, a Bank Guarantee equivalent to above % of the total order value (excluding taxes, duties) as per UCSL format from an International Bank as per approved list of banks available in CSL website (for overseas supplier) &amp; Scheduled Indian bank for Indian supplier is to be submitted, if an order is placed towards satisfactory performance of the contract.</p> <p>a.ii) The supplier shall also agree for 3% of total order value (excluding taxes and duties) as Bank guarantee towards the Guarantee clause.</p> <p>a.iii) The Bank Guarantee /DD as above should be initially valid till 90 days after completion of supplies in terms of SD and later revalidated (within the validity of initial BG) to cover the guarantee period mutually agreed plus 90 days. <del>However in the case of items where WBG is not applicable (as in 15.a.ii), the SD shall be valid for item delivery at yard plus 90 days.</del> Fixed Deposit Receipt (for equivalent amount of Security Deposit/WBG required as per tender) in lieu of bank guarantee is also acceptable. Fixed Deposit Receipt shall be in the name of</p>	

	<p>supplier with lien marked in favor of Udupi Cochin Shipyard Limited, Kochi.</p> <p>a.iv) The above SD/WBG is required or applicable only when the total order value (excluding taxes and duties) is Rs.20lakhs and above (or equivalent foreign currency). In case supplier have quoted Rs.20 lakhs and above in tender and indicated that BG as not applicable in the check list, the clause 15b shall be considered for further process.</p>	
	<p>b) If the bidder is not agreeable to submission of SD/ warrantee bank guarantee as per UCSL general terms and conditions of enquiry, UCSL reserves the right to reject the offer at our discretion or 3% of total order value (excluding taxes and duties) will be added to the quoted price for tender comparison/ evaluation purpose on case to case basis for arriving the lowest bid.</p> <p>However in cases where total quoted value is less than 20 lakhs, (ie split order etc) and the order value of entire tendered items is more than Rs 20.0 lakhs, the aforesaid loading will be applied on individual items in following cases.</p> <ul style="list-style-type: none"> <li>• The bidder has not quoted for entire tendered quantity</li> <li>• UCSL has technically / commercially rejected a few items in the tender</li> </ul>	
	c) SD to be submitted within 2 weeks of receipt of order from yard.	
	d) Format of bank guarantee along with enquiry to be agreed, in general	
	e) Mode of receipt of bank guarantee is strictly through SWIFT mode from supplier bank to UCSL designated bank (for overseas bidders)	
16	<p><b>Risk Purchase:</b> If the supplier fails to supply the items ordered in good quality as per contract specification and fails to deliver within the delivery date or violate any of the terms and conditions of the purchase order, UCSL shall have the following rights.</p>	
	a. To cancel the order partially or fully with 15 days notice and to forfeit the security deposit, if any.	
	b. To impose tender holiday for the vendor for an appropriate period as decided by UCSL	
	c. To initiate alternate procurement action at the risk and cost of the supplier. This Risk Purchase clause is applicable only in the case of total order/ contract value (excluding taxes and duties) is Rs.20 lakhs and above (or equivalent foreign currency). Cases of value less than 20 lakhs will be addressed by serving appropriate caution/ warning notice to the firm.	
17	<p><b>Liquidated Damage:</b></p> <p>In case of delay in supply of ordered materials beyond the stipulated delivery period, which is not attributable to UCSL, supplier is to pay Liquidated Damages (and not by way of penalty) a sum equivalent to ½% (half percent) per week or part of the week of the total basic price in case of Machinery/Equipment and of basic price of materials delayed-in all other cases, subject to a maximum of 10% of the total basic price of undelivered material/10% of total basic price of machinery/equipment (Total basic price is the order value excluding freight, taxes, other charges etc.). Further, GST will be applicable upon LD and the same also will be deducted along with LD. However LD applicability is without prejudice to UCSL right to terminate contract for delayed delivery or other actions as per clause 16.</p>	

18	<p><b><u>Guarantee</u></b>  a) The Items supplied shall be guaranteed for rated performance and against damage or failure due to faulty design, defective materials and bad workmanship for a period of 12 months from the date of delivery of the ship to Owners OR 24 months from the date of delivery of items to Yard, whichever is earlier. Should such damage/failure occurred within the Guarantee period, the Supplier should immediately rectify the failure by repair/replacement of any such part found to be under performing/ defective, at his own expenses.</p>	
	<p>b) Further to equipment guarantee, replaced/repared items shall be guaranteed for 12 months from date of repair/replacement.</p>	
19	<p><b><u>Jurisdiction:</u></b>  All questions, disputes or difference arising under, out of, or in connection with contracts shall be subject to the exclusive jurisdiction of the Courts at Bangalore, India. Alternate dispute resolution mechanism can also be considered.</p>	
20	<p><b><u>Force Majeure condition:</u></b>  Should failure in performance of the contract or part thereof arise from war insurrection, restraint imposed by Government, Act of Legislature or other Statutory Authority or illegal strike, riot, legal lock-out, flood, fire, explosion, act of God or any inevitable or unforeseen event beyond human control which may be construed as reasonable ground for an extension of time, UCSL may allow such additional time as is mutually agreed, to be justified by the circumstances of the case. The occurrence/cessation of force majeure situation is to be informed with documentary evidence within 15 days from the date of occurrence/cessation.</p>	
21	<p>Indian Agent:  a) Udupi Cochin Shipyard Ltd prefers to deal directly with the supplier. However, if the supplier appoints an Indian Agent to deal with Udupi Cochin Shipyard Ltd., the Agency commission payable by the supplier to such an agency shall be intimated.  b) If manufacturers affect the supply through Agents only, authorization in writing from manufacturers in favor of the Agent for supply to UCSL shall be furnished.  c) In case where an Agent participates a tender on behalf of a Foreign manufacturer Indian agent should submit specific authorization from the authorized person of foreign manufacturer.  d) In a tender, either the Indian agent on behalf of the Principal/ OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/ product in the same tender. If an agent submits bid on behalf of principal/OEM, the same agent shall not submit a bid on behalf of another principal/OEM in the same tender for the same item/product. Indian agents cannot represent more than one firm or quote on their behalf for any particular tender.  e) Clarifications, either technical or commercial, should be submitted to points specially asked for only. The opportunity so given should not be used for correcting/changing/amending the data/conditions already submitted with the tender</p>	
22	<p><b><u>PRICING:</u></b> a. Overseas firms should quote prices both on FOB and C&amp;F Chennai Seaport terms. Indigenous bidders should quote prices for delivery of materials at UCSL stores. Insurance shall be UCSL scope. <del>In the case of E tender C&amp;F price shall be quoted and the freight charges shall be indicated separately under header conditions as per the provision in the CSL e-tender portal.</del></p>	

	b. Exchange rate variation will not be applicable and the prices shall be fixed for an order within validity period in the case of indigenous orders.	
	c. Offer to be submitted in USD/INR currency Generally. Indian Firms shall quote in INR only.	
	d. Comparison of prices will be in INR only. All foreign currencies will be converted to INR for comparison and Exchange rate as on date of price bid opening shall be considered for arriving lowest bid	
	<b>e. Prices should be valid for acceptance for a period of One month from the date of tender opening.</b>	
	f. No enhancement of rate for whatsoever cause will be allowed once the offer is accepted and an order is placed. Withdrawal of the quotation after it is accepted or failure to make the supply within the stipulated delivery period, will entail cancellation of the order and forfeiture of Earnest Money Deposit/Security deposit, if any and/or risk purchase, without prejudice to other penal actions, including tender holiday after serving show cause notices, as deemed fit.	
	g. Conditional discounts, if any, will not be reckoned for tender evaluation/ comparison purpose. However, if the bidder becomes L1 at original offer, conditional discount shall also be considered.	
	h. Unpriced bid (price bid without price) duly signed is to be submitted along with techno-commercial offer in the price format, provided. Price should be quoted separately for each item shown in the format. In the event price bid is different from the unpriced format already submitted, yard reserves the right to reject the offer at our discretion without any further discussions. Details of optional items, if any, should be indicated under separate heading in the Techno commercial bid and the respective price details should also be given in the price bid. Combining of figures against more than one item and ambiguous clauses will lead to rejection of the bid.	
	i. If, in the price structure quoted for the required material/ item, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected. If there is a discrepancy between words and figures, amount in words of respective figures shall prevail. If the bidder does not agree to the observation of the CSL, the tender is liable to be rejected and the same shall be intimated.	
	j. After submission of quotation/price offer no unsolicited correspondence will be entertained.	
	k. Udupi Cochin Shipyard Limited does not bind itself to accept the lowest or any tender but reserves to itself the right to reject any or all or a part of any tender at its discretion.	
	l. UCSL reserves the right to place order to the techno-commercially qualified lowest bidder in full or individual items to the respective lowest bidders in the tender (except in cases where basis of L1 arrival is declared specifically in enquiry). Also please refer loading applicable for split order of value less than 20 lakhs (Clause 15 b)	
	m. In the case of part quantity order, the quoted freight charges applicable for the entire quantity as per enquiry shall be apportioned and allocated.	

	<p>L1 computation shall be based on total cost of all items, including cost of spares as per tender &amp; Class/certification charges, if any required (excluding GST/IGST). For all import consignments directly imported in CSL's name/or on High Seas Sale agreement, customs duty is not applicable at import clearance. Customs clearance at Chennai port and transport till UCSL stores shall be to UCSL account.</p>	
23	<p><b><u>Integrity Pact:</u></b> As per Government of India (Central Vigilance Department), UCSL and the SUPPLIER have to sign an Integrity Pact for the high value contracts, for ensuring transparency, equity and competitiveness in public procurement. The Tenderer has to sign Pre-Contract Integrity Pact as per format enclosed and to submit along with your offer. The above is applicable when the total basic price is above Rs. 100.0 lakhs. (present limit)</p>	
24	<p><b><u>Grievance Redressal Committee:</u></b> As an alternate dispute redressal or reconciliation mechanism (other than arbitration clause), Cochin Shipyard has constituted Grievance Redressal Committee. Currently following executives of the committee may be contacted for the settlement of disputes, if any, arising out of all contracts. a) Mrs. Anjana KR, GM (Design) b) Mrs. Bindu AM (Legal) c) Mr. Shibu John, General Manager (Finance)</p>	
25	<p><b>SUB CONTRACTING AND ASSIGNMENT</b> Supplier shall not contract with any subcontractor and/or vendor without the prior written consent of UCSL. Such consent shall not relieve the Supplier from any of his responsibilities and liabilities under the Purchase Order. In addition, Supplier shall ensure that the terms and conditions of any such contract shall comply with and correspond to the terms and conditions of the Purchase Order.</p>	
26	<p><u>General:</u> a. Prior to price bid opening, UCSL is at liberty to take the credit rating of bidders at our cost on case to case basis, and to include the same during the evaluation of the tender.</p> <p>b. Deviations, if any in the techno-commercial offer from that of the tender enquiry in any form should be clearly furnished in a separate document titled as "List of Deviations", failing which it will be presumed that all the terms and conditions are acceptable.</p> <p>c. The techno-commercial part alone will be opened initially on the due date of tender. The price part will be opened only after evaluation of the Techno commercial part. Date of opening of the price part will be intimated to those firms whose Techno- commercial bids would be acceptable after the evaluation. Suppliers are allowed to depute their authorized representative to be present at the time of opening of Price Bid of their tender only. <del>In case of E-Tender, suppliers shall not depute their representative to CSL. However techno-commercially qualified supplier can view the price details in CSL E-procurement portal after opening the price bid</del></p>	
27	<p><b><u>P.O:-</u></b> a. In the event supplier's offer leads to an agreement to effect supplies, a formal purchase order shall be issued by UCSL on the basis of agreed terms and conditions of tender.</p> <p>b. Upon placement of order (by post or mail) the supplier shall submit the acknowledgement (ie: signed and stamped original/ scanned soft copy by mail) as a token of acceptance of order within 15 days. In case UCSL doesn't receive</p>	

	the above, it will be deemed as accepted.	
28	<p><b>SUPPLY:</b> - a) UCSL reserve the right to inspect the goods after receipt at UCSL store / prior to dispatch (by UCSL or UCSL authorized agency at yard cost). Short supply / Mismatch / Replacement of Defective items / those not meeting agreed / contractual specification/ Items failing during commissioning shall be sent on air freight/ DDP basis courier freight prepaid/delivered at UCSL store. The customs clearance charges of above shall be to supplier account.</p> <p>b) Replacements during guarantee period to be sent on Duty and all taxes paid basis to location as required by yard/vessel owner with all expenses to supplier account.</p> <p>c) Defective items, if any, after receipt shall be sent back on cost, carriage, handling and insurance prepaid basis including re-export (wherever desired by supplier)to be arranged by supplier. Defective items shall be returned after receipt of replacement item. Supplier shall replace all/ part of items as applicable, in case of rejection, within 4 weeks of reporting the defect, without any additional cost to UCSL. In case the defective materials are not taken back within the said period, UCSL reserves the right to dispose the same without further intimation.</p> <p>d) The supplier shall compensate UCSL for loss on account of shortage in quantity and number of pieces received than that indicated in the bill of lading provided the UCSL's claim is rejected by the insurance due to any fault of supplier. Such claims, if any, shall be supported by recognized surveyors report. The supplier shall also compensate for losses, if any sustained by the UCSL due to defective packing and/or marking of the goods not in accordance with the terms of contract. The time limits for filing claims under clauses above shall be generally 180 days from the date of complete discharge of goods.</p>	
29	UCSL reserves the right to alter, modify the scope of supply at its discretion and in consistent with the policy of the Government of India and statutory bodies under them as applicable to the contract from time to time.	
30	UCSL shall, at its own discretion and costs opt for obtaining credit information report on supplier's financial credentials through credit rating firms. The same shall also be considered as criteria for commercial evaluation. In the event supplier's credit rating is not at least satisfactory, offer will be summarily rejected.	
31	Public procurement policy as per order No. D.O. No. P-45021/2/2017-PP (BE-II) (E-1588) by Department for promotion of Industry and Internal Trade Ministry of Commerce & Industry is applicable for this tender	
32	UCSL reserves the right to commercially reject the offer if compliance is not issued to terms at Sl. No.14, 15, 16, 17 & 18 without any further clarification / notice / communication in this regard from M/s. Udupi Cochin Shipyard Ltd., even though the offer is technically acceptable.	
33	<del>UCSL has an option of receiving two more similar projects within 15th July 2021 and upon exercise of this option by owner yard will confirm the same quantity of item to supplier within 15th July 2021 or earlier. Therefore the price offer shall consist the prices for current projects as well as the discounted prices applicable for these optional projects with validity to confirm the order till 15th July 2021. However the L1 determination shall be purely based on current confirmed quantity.</del>	

Restriction of bidders sharing land border with India vide Office memorandum dt 23.7.2020 Order - Public Procurement no 1 dt 23.7.2020, Order no 2 dt 23.7.2020 and Order no 3 dt 24.7.2020

34.A	Requirement of registration	
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 competent authority as per C below. In works contracts, including turkey contracts, contractors 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 Competent authority. Relevant certificate to be submitted by bidder from a country which shares land border with India except for bidders to which Govt of India has extended lines of Credit or in which Govt of India has development projects, along with the offer as proof of registration with competent authority, failing which the offer will not be considered. A certificate is to be submitted by the bidder for compliance with the order referred above along with tender documents for consideration of offer (Wordings are as per Clause below). If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate termination and further legal action in accordance with law.	
2	Wordings of certificate to be submitted along with tender documents for Works involving possibility of sub contracting	
	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 authority and will not subcontract any work to a contractor from such countries unless such contractor is registered with the competent authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered(Evidence of valid registration by the competent authority shall be attached wherever applicable)	
B	Validity of registration	
1	Registration should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder is validly registered at the time of acceptance /order placement, registration shall not be a relevant consideration during contract execution.	
C	Competent authority and Procedure for registration	
1	The competent authority for the purpose of registration under the order shall be Registration committee constituted by the Department of Promotion of Industry and Internal Trade (DPIIT). Details of the committee and procedure for registration and restrictions shall be as per Ann I of the Order - Public Procurement no 1 dt 23.7.2020 issued by Ministry of Finance, department of Expenditure.	
D	Definition of Bidder and Bidder from a country sharing land border with India	
1	Bidder is defined as any person or firm or company including any, member of a consortium or joint venture, 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.	
2	"Bidder from a country which shares a land border with India" for the purpose of this Order means:- a) An entity incorporated, established or registered in such a country; or b) A subsidiary of an entity incorporated, established or registered in such a	

	<p>country; or</p> <p>c) An entity substantially controlled through entities incorporated, established or registered in such a country; or</p> <p>d) An entity whose beneficial owner is situated in such a country; or</p> <p>e) An Indian (or other) agent of such an entity; or</p> <p>f) A natural person who is a citizen of such a country; or</p> <p>g) A constitution or joint venture where any member of the consortium or joint venture falls under any of the above.</p>	
3	<p>Type of business entity (Private Limited Company/ Public Limited Company/ Sole Proprietorship/ One Person Company/ Partnership/ Limited Liability Partnership/ Joint Venture/ Trust/ NGO)</p> <p>In case of incorporated entity - to attach certificate of incorporation</p>	
	<p>Beneficial Owners - as defined in the Department of Expenditure Order (Public Procurement No.1) issued vide No. F.No.6/18/2019-PPD dated 23rd July, 2020. Details of all beneficial owners having entitlement of more than 01% of shares or capital or profit to be given, in the format as given in Annexure-I duly certified by practicing Chartered Account in India.</p>	
	<p><b>Preference to Make in India</b></p> <p>Purchase preference in accordance with Public procurement (Preference to Make in India Order - 2017) Order from Department of Promotion of Industry and Internal Trade P - 45021 /2/2017/-B.E -II dt .4.6.2020 and as amended from time to time shall be applicable as per below</p>	
	<p>In the procurement of all goods/services/works in respect of which there is sufficient local capacity/local competition, only Class I Local suppliers shall be eligible to bid irrespective of purchase value</p>	
	<p>In the procurement of all goods/services /works which are not covered as above and with estimated value of purchase less than Rs 200.0 Crores, only Class I local suppliers along with Class II local suppliers shall be eligible to bid.</p>	
	<p><b>Purchase preferences for Class I local suppliers</b></p>	
35	<p>In the procurement of goods/works covered under 2 above and which are divisible in nature, Class I local supplier shall be eligible for Purchase preference over Class II/Non local supplier as per following</p>	
	<p>If L1 bid is not a Class I local supplier, 50% of the order quantity shall be awarded to L1. Thereafter the lowest bidder among Class I local supplier will be invited to match the L1 price for the remaining 50% quantity subject to Class I local supplier quoted price falling within 20% margin. Contract for that quantity shall be awarded to such Class I local supplier subject to matching L1 price. In case such lowest eligible Class I local supplier fails to match L1 price or accept less than offered quantity, next higher Class I local supplier within 20% margin shall be invited to match the L1 price for the remaining qty and so on. If some quantity is left uncovered on Class I local supplier, such balance quantity shall be ordered on L1 bidder.</p>	
	<p>For procurements that are not divisible in nature and in procurement of services evaluated on price alone, Class I local supplier shall get purchase preference over Class II/Non local supplier as per below</p>	
	<p>If L1 is not a Class I local supplier, lowest bidder among Class I local supplier will be invited to match L1 price subject to Class I local supplier quoted price falling within 20% of L1 price and contract will be awarded to such Class I local supplier, subject to matching L1 price. In case such lowest eligible Class I local</p>	

	supplier fails to match L1 price, procedure same as para 3 above will be opted. In case none of Class I local suppliers within 20% margin matches L1 price, contract shall be awarded to L1 bidder. The purchase preference as above will be only for Class I local supplier and Class II local supplier will not be eligible for any Purchase preference	
	Local content requirement to categorize a supplier as Class I/Class II/Non local supplier shall be as per below. Definition of local content shall be as per order dt 4.6.2020 ie amount of value added in India which shall be the total value of the item procured (excluding net domestic indirect taxes) minus the value of import content in the item (including all customs duties) as a proportion of total value in percentage.	
	Class I -Local content equal to or greater than 50%	
	Class II-Local content greater than 20% , less than 50%	
	Non local -Local content less than 20%	
	<b>Declaration of local content</b>	
	Class I local supplier /Class II local supplier at the time of tender shall indicate % of local content and provide self certification that offered item shall meet the local content requirement for Class I/Class II as applicable including details of locations at which local value addition is made.	
	In case of procurement for a value in excess of Rs 10.0 Crores Class I/Class II local supplier is to provide a certificate from statutory auditor/cost auditor (for companies) /practicing cost accountant/Chartered accountant (suppliers other than companies) indicating % of local content	
	Verification of the Certificates issued by the bidder shall be carried out by CSL on random basis. False declarations will attract actions as stipulated in the order referred , including other actions as permissible by law.	
	Exemption is applicable from provisions of order for purchases with estimated values less than Rs 5.0 lakhs	
	Notwithstanding above, exemptions for meeting local content as per relevant Clause of order dt 4.6.2020 and as amended from time to time shall apply.	

**PRICE BID FORMAT**Tender Enquiry No: **UCSL/MAT/NPROJ/2025-26/406**

Date: 28.05.2025

Vessel/Project: GENERAL

SL. NO	DESCRIPTION	Qty in Nos	Unit Rate in (INR)	Total Price (Qty x Unit Rate)
1.	ISMC 300X90	14,500		
2.	ISMB 300X140	8,000		
3.	ISA75X75X10	2,500		
4.	ISA 100X100X10	1,000		
5.	CR 80 RAIL 40000MM	10,500		
6.	GST (as applicable)			
7.	Total landed price including P&F, Freight, Inspection Charges etc...			
8.	Other charges if any			
9.	Transit Insurance Charges		BY UCSL	
10.	HSN code			
11.	Unloading		BY UCSL	
12.	Delivery Period required at UCSL stores		Within Four Weeks	

Signature

Name &amp; Address of the firm

**Important Note:**

1. Un-priced Bid, to be submitted along with techno commercial bid with details like percentage of taxes & duties applicable and showing whether "Amount quoted/ Nil/ Included/ By UCSL" against respective column. Confirmation regarding exercising the option shall be provided during finalization of the purchase order.

BANK GUARANTEE IN LIEU OF SECURITY DEPOSIT/  
WARRANTY GUARANTEE

To

UDUPI COCHIN SHIPYARD LTD

(Formerly Tebma Shiyards Limited

MALPE HARBOUR COMPLEX, MALPE, UDUPI - 576108.

WHEREAS ..... (Name & Address of Supplier) (Hereinafter called "**the Supplier**") has undertaken, in pursuance of Contract..... No..... Dated: ..... to execute ..... (Name of Contract and brief description of works) (Hereinafter called "**the Contract**").

AND WHEREAS it has been stipulated by UDUPI COCHIN SHIPYARD LTD (The Buyer - hereinafter called "**UCSL**") in the said contract that the Supplier shall furnish CSL with a Bank Guarantee for the sum specified therein as security for compliance with the Supplier's obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier such a Bank Guarantee.

NOW THEREFORE we ..... (Name of the Bank) having its Head Office at ..... (Address of Head Office) and acting through its branch office at ..... (Address of the executing branch) (Hereinafter called "the Bank") hereby affirm that we are the Guarantor and responsible to CSL, on behalf of the Supplier up to a total of ..... (amount of Guarantee) .....in words).

We, the bank, hereby irrevocably undertake to pay you any amount not exceeding in total the Guarantee Amount upon receipt by us of your demand in writing accompanied by the following documents:

1. Your signed statement certifying that the Supplier is in breach of his obligation(s) under the Contract and the respect in which the Supplier is in breach.
2. Your signed statement certifying that the Supplier has been given a prior written notice by email from you to make good the aforesaid breach and that the Supplier still failed to fulfill the Contract within 30 days of such notice. A copy of such notice given by email to the Supplier shall be attached to the demand for payment.

Any demand for payment should contain your authorized signatures which must be authorized by your bankers or by a notary public.

We, the Bank, further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between UCSL and the Supplier shall in any way release us

from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification. We, the Bank, further agree that any change in the constitution of the said contractor or the said bank shall not discharge our liability hereunder.

**Notwithstanding** anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed .....  
(..... only).
2. This Bank Guarantee shall be valid up to (date) and
3. We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only if UC SL serve upon us a written claim or demand on or before .....(validity date) .

Any demand for payment under this guarantee must be received by us at this office during working hours on or before the validity date. Should we receive no claim from you by the validity date, our liability to you will cease and the guarantee will definitely become null and void whether returned to us or not.

Yours truly,

Signature and seal of the

Guarantor:.....

Name of Bank:.....

Address: .....

Date: .....

\* An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract and denominated in respective Dollars / Indian Rupees/Other Currency.

**DETAILED TECHNICAL SPECIFICATIONS****FOR STRUCTURAL STEEL WORKS FOR TRANSFER CRADLE SEND THROUGH MAIL****1 INTRODUCTION****1.1 Proposal for New Transfer Cradle**

This proposal outlines the requirements for the design, fabrication, and installation of a new transfer cradle for malpe yard. The new cradle will have approx dimensions of 37 meters in length and 11.2 meters in width.

**1.2 Design and Structural Arrangement**

The structural arrangement of the new transfer cradle will be similar to the existing cradle. The cradle will consist of Two/multiple sections connected by bolts and nuts. The height of the cradle will be the same as the existing one.

**1.3 Wheel Assembly**

The wheel assembly for the new transfer cradle will be identical to the existing cradle's wheel assembly.

**1.4 Scope of Work**

This proposal covers the following scope of work:

1. Supply and Fabrication: Supply and fabrication of structural steel and wheel assembly.
2. Painting and Coating: Painting and coating of the structural steel and wheel assembly.
3. Delivery and Erection: Delivery and erection of the transfer cradle at the site.
4. Shop Fabrication Drawings: Preparation of shop fabrication drawings.
5. Inspection and Testing: Inspection and testing of the transfer cradle.
6. Trail Run: Conducting a trail run as required by the officer in charge.

**1.5 Procurement and Assembly**

The cradle wheels will be procured as per the specification, and assembly will be done as per the drawing.

**1.6 Site Requirements**

The transfer cradle will be erected at the site, and all necessary precautions will be taken to ensure safe and successful installation.

**2 APPLICABLE CODES & SPECIFICATIONS**

2.1 The following specifications, standards and codes are made a part of this specification. All standards, specifications and codes of practices referred to herein shall be the latest editions including all applicable official amendments and revisions.

In case of discrepancy between this specification and other documents referred to herein, this specification shall govern. (Refer latest version of standards)

**MATERIALS**

IS: 808            Dimensions for Hot Rolled Steel sections

IS: 814	Covered Electrodes for Manual Metal Arc Welding of Carbon and Carbon Manganese Steel
IS: 1161	Steel Tubes for structural purposes
IS: 1239	Mild steel tubes, tubular and other wrought steel fittings Part 1 - Mild steel tubes Part 2 - Mild steel Tubular and other wrought steel pipe fittings
IS: 1363	Hexagon Head Bolts, Screws and Nuts of product ((Parts 1 to 3) Grade C (Size range M5 to M64)
IS: 1367	Technical Supply Conditions for Threaded Fasteners (All Parts)
IS: 1852	Rolling and Cutting Tolerances for Hot Rolled Steel products
IS: 2062	Steel for General Structural Purposes
IS: 2074	Ready Mixed Paint, Air drying, Red Oxide Zinc Chrome and Priming
IS: 3757	High Strength Structural Bolts
IS: 5369	General Requirements for Plain Washers and Lock Washers
IS: 5372	Taper Washers for Channels
IS: 5374	Taper Washer for I Beams
IS: 6610	Heavy Washers for Steel Structures
IS: 8500	Structural Steel-micro alloyed (medium and high strength qualities)
IS: 800	Code of Practice for General Construction in Steel
IS: 801	Code of practice for use of Cold formed light gauge steel structural members in general building construction
IS: 803	Code of practice for design, fabrication and erection of vertical mild steel cylindrical welded storage tanks
IS: 806	Code of practice for use of steel tubes in general building construction
IS: 816	Code of Practice for use of Metal Arc Welding for General construction in Mild Steel
IS: 822	Code of Procedure for Inspection of Welds
IS: 1182	Recommended Practice for Radiographic examination of Fusion - Welded Butt Joints in Steel Plates
IS: 1200	Method of Measurement in Building Civil Engineering Works
IS: 1477	Code of Practice for Painting of (Parts 1 & 2) Ferrous Metals in

## Buildings

IS: 2595	Code of Practice for Radiographic Testing
IS: 3658	Code of Practice for Liquid Penetrant Flaw De
IS: 4000	High strength bolts in Steel Structures - Code of Practice
IS: 5334	Code of Practice for Magnetic Particle Flaw Detection of Welds
IS: 7215	Tolerances for Fabrication of Steel Structures
IS: 9595	Recommendations for Metal Arc Welding of Carbon and Carbon Manganese Steel Painting
IS: 102	Ready Mixed paint, Brushing, Red Lead, Non-setting, Priming.
IS: 110	Ready Mixed paint, brushing, grey filler for enamels for use over primers.
IS: 117	Ready Mixed paint, Brushing, Finishing, Exterior Semi gloss for general purposes, to Indian Standard colours.
IS: 158	Ready Mixed paint, Brushing, Bituminous, Black, Lead free, acid, alkali and heat resisting.
IS: 159	Ready Mixed paint, Brushing, Acid resisting.
IS: 341	Black Japan, Types A, B and C
IS: 1477	Codes of Practice for painting of ferrous metals in buildings. Part I - Pre-treatment Part II - Painting
IS: 2074	Ready Mixed paints, Red Oxide Zinc chrome priming.
IS: 2339	Aluminium paint for general purposes, in Dual container
IS: 2932	Specification for enamel, synthetic, exterior, type 1, (a) Undercoating (b) finishing
IS: 2933	Specification for enamel, exterior, type 2, (a) Undercoating, (b) finishing
IS: 5905	Sprayed aluminium and zinc coatings on Iron and Steel.
IS: 6005	Code of practice for Phosphating of Iron and Steel.
IS: 9862	Specification for ready mixed paint, brushing, bituminous, black, lead free, acid, alkali, water & chlorine resisting.
IS: 13183	Aluminium paint, Heat resistant.
SIS-05-5900	Swedish Standard

## **ERECTION**

IS: 800	Code of Practice for General Construction in Steel
IS: 801	Code of Practice for Use of Cold Formed Light Gauge Steel Structural Members in General Building Construction
IS: 806	Code of Practice for Use of Steel Tubes in General Building

	Construction
IS: 7205	Safety Code for Erection of Structural Steel Work
IS: 7215	Tolerances for Fabrication of Steel Structures
IS: 4000	High Strength Bolts in Steel Structure - Code of Practice

### 3 MATERIALS

- 3.1 All Steel materials like plates, angles, channels, Tees, I sections and rounds etc. shall comply with the specifications laid down under respective item of Bill of quantities and relevant IS Codes. All materials supplied by the contractor shall be new, unused, and free from defects. Steel conforming to IS: 2062 E250 BR shall be used
- 3.2 Bolt material shall be of mild steel (property class 4.6) and shall conform to IS: 1367 – Part 3 and IS: 5624. Grade of Bolt steel shall be E250A.
- 3.3 Washers shall conform to IS:2016, IS:5369, IS:5372, IS: 5374, IS: 6610 and IS: 6649 as applicable. Spring washers shall be provided for those parts, which carry dynamic loads and where black bolts for connection are permitted. Welding Consumables Mild steel electrodes shall conform to IS: 814.
- 3.4 The electrodes used for welding shall be of suitable type and size depending upon specification of parent material, method of welding, position of welding and quality of welds desired. The Contractor shall furnish a certificate issued by the manufacturer to the effect that the electrodes supplied are in accordance with the above specifications.

### 4 MINIMUM THICKNESS AND SIZES OF STEEL ELEMENTS

#### Minimum Thickness

The minimum thickness of various components of a structure and hot rolled sections shall be as follows. The minimum thickness of rolled shapes shall mean flange thickness regardless of web thickness. Structural steel members exposed to marked corrosive environment shall be increased suitably in thickness or suitably protected otherwise as per good practice and sound engineering judgment in each instance.

- |                       |      |
|-----------------------|------|
| a. Columns and beams: | 8 mm |
| b. Gussets:           | 8 mm |
| c. Stiffeners:        | 8 mm |

Minimum thickness of structural members directly exposed to weather and inaccessible for painting and maintenance shall be 8 mm.

### 5 LIMITING DEFLECTION AND SLENDERNESS RATIO

Deflections of structures shall satisfy the requirements of the clause 5.6.1 of ARE: 800:2007.

The Effective limiting slenderness ratio for shall be as per Clause 3.8 of IS: 800:2007.

### 6 DRAWINGS PREPARED BY THE CONTRACTOR

6.1 The Contractor shall prepare all general, detailed, fabrication and erection drawings for the entire work. All the drawings for the entire work shall be prepared in metric units. The drawings shall preferably be of one standard size and the details shown there in shall be clear and legible.

6.2 All fabrication drawings shall be submitted to the Engineer-In-Charge for approval.

6.3 No fabrication drawings will be accepted for Engineer-In-Charge's approval unless checked and approved by the Contractor's qualified structural engineer and accompanied by an erection plan showing the location of all pieces detailed. The Contractor shall ensure that connections are detailed to obtain ease in erection of structures and in making field connections.

6.4 Fabrication shall be started by the Contractor only after Engineer-In-Charge's approval of fabrication drawings. Approval by the Engineer-In-Charge of any of the drawings shall not relieve the Contractor from the responsibility for correctness of engineering & design of connections, workmanship, fit of parts, details, material, errors or omissions of any and all work shown thereon. The Engineer-In-Charge's approval shall constitute approval of the size of members, dimensions and general arrangement but shall not constitute approval of the connections between members and other details.

6.5 The drawings prepared by the Contractor and all subsequent revisions etc. shall be at the cost of the Contractor for which no separate payment shall be made.

6.6 Contractor shall submit detailed methodology for carrying out structural fabrication, painting and erection at site for the approval of Engineer-In-Charge.

## **7 FABRICATION**

### **7.1 GENERAL**

All workmanship and finish shall be of the best quality and shall conform to the best approved method of fabrication. All materials shall be finished straight and shall be machined/ground smooth true and square where so specified. All holes and edges shall be free of burrs. Shearing and chipping shall be neatly and accurately done and all portions of work exposed to view shall be neatly finished. Unless otherwise directed/ approved, reference may be made to relevant IS codes for providing standard fabrication tolerance. Material at the shops shall be kept clean and protected from weather.

### **7.2 CONNECTIONS**

- a) Shop/field connections shall be as per approved fabrication drawings.
- b) In case of bolted connections, taper washers or flat washers or spring washers shall be used with bolts as necessary. In case of high strength friction grip bolts, hardened washers shall be used under the nuts or the bolt heads whichever are turned to tighten the bolts. The length of the bolt shall be such that at least one thread of the bolt projects beyond the nut, except in case of high strength friction grip bolts where this projection shall be at least three times the pitch of the

thread.

- c) In all cases where bearing is critical, the unthreaded portion of bolt shall bear on the members assembled. A washer of adequate thickness may be provided to exclude the threads from the bearing thickness if a longer grip bolt has to be used for this purpose.
- d) All connections and splices shall be designed for full strength of members or loads indicated on Engineer-In-Charge's design drawings. Column splices shall be designed for the full tensile strength of the minimum cross section at the splice.
- e) All bolts, nuts, washers, electrodes, screws etc. shall be supplied/brought to site 10% in excess of the requirement in each category and size. Rates shall cover the cost of this extra quantity.
- f) All members likely to collect rain water shall have drain holes provided.

### 7.3 STRAIGHTENING

All materials shall be straight and, if necessary, before being worked shall be straightened and/or flattened by pressure and shall be free from twists. Heating or forging shall not be resorted to without the prior approval of the Engineer-In-Charge in writing.

Cutting, punching, drilling, welding and fabrication tolerances shall be generally as per relevant IS codes.

### 7.4 ROLLING AND FORMING

Plates, channels, R.S.J. etc., for gantry girders, etc., shall be accurately laid off and rolled or formed to required profile/ shape as called for on the drawings. Adjacent sections shall be match-marked to facilitate accurate assembly, welding and erection in the field.

### 7.5 HIGH STRENGTH FRICTION GRIP BOLTING

Inspection after tightening of bolts shall be carried out as stipulated in the appropriate standards depending upon the method of tightening and the type of bolt used.

### 7.6 WELDING

- g) Welding procedure shall be submitted to Engineer-In-Charge for approval. Welding shall be entrusted to only qualified and experienced welders who shall be periodically tested and graded as per IS 817, IS: 7310 (Part 1) and IS: 7318 (Part 1).
- h) While fabricating plated beams and built-up members, all shop splices in each component part shall be made before such component part is welded to other parts of the members. Wherever weld reinforcement interferes with proper fit-up between components to be assembled for welding, these welds shall be ground flush prior to assembly.
- i) Approval of the welding procedure by the Engineer-In-Charge shall not relieve the Contractor of his responsibility for correct and sound welding without undue distortion in the finished structure.
- j) No welding shall be done when the surface of the members is wet nor during periods of high wind.

- k) Each layer of a multiple layer weld except root and surfaces runs may be moderately pecked with light blows from a blunt tool. Care shall be exercised to prevent scaling or flaking of weld and base metal from over pecking.
- l) No welding shall be done on base metal at a temperature below (-) 5 Deg.C. Base metal shall be preheated to the temperature as per relevant IS codes.
- m) Electrodes other than low-hydrogen electrodes shall not be permitted for thicknesses of 32 mm and above.

#### 7.8 INSPECTION OF WELDS

- n) All welds shall be inspected for flaws by any of the methods described under clause 8 "Inspection". The choice of the method adopted shall be determined by the Employer/Engineer-In-Charge.
- o) The correction of defective welds shall be carried out as directed by the Engineer-In-Charge without damaging the parent metal. When a crack in the weld is removed, magnetic particle inspection or any other equally positive means as prescribed by the Engineer-In-Charge shall be used to ensure that the whole of the crack and material up to 25 mm beyond each end of the crack has been removed. Cost of all such tests and operations incidental to correction shall be to the Contractor's account.

### 8 TOLERANCES

The dimensional and weight tolerances for rolled shapes shall be in accordance with IS:1852 for indigenous steel and equivalent applicable codes for imported steel. The tolerances for fabrication of structural steel shall be as per IS: 7215.

### 9 END MILLING

Where compression joints are specified to be designed for bearing, the bearing surfaces shall be milled true and square to ensure proper bearing and alignment.

### 10 INSPECTION

- 10.1 The Vendor/Contractor shall give due notice to the Engineer-In-Charge in advance of the works getting ready for inspection. All rejected material shall be promptly removed from the shop and replaced with new material for the Engineer-In-Charge's approval/inspection. The fact that certain material has been accepted at the Contractor's shop shall not invalidate final rejection at site by the Engineer-In-Charge if it fails to conform to the requirements of these specifications, to be in proper condition or has fabrication inaccuracies which prevents proper assembly, nor shall it invalidate any claim which the Employer may make because of defective or unsatisfactory materials and/or workmanship.
- 10.2 No materials shall be painted or despatched from fabrication yard or manufacturer to site without inspection and approval by the Engineer-In-Charge unless such inspection is waived in writing by the Engineer-In-Charge.
- 10.3 The Vendor/Contractor shall provide all the testing and inspection services and

facilities for shop work except where otherwise specified.

10.4 For fabrication work carried out in the field the same standard of supervision and quality control shall be maintained as in shop fabricated work. Inspection and testing shall be conducted in a manner satisfactory to the Engineer-In-Charge.

10.5 Inspection and tests on structural steel members shall be as set forth below.

10.6 Material Testing

If mill test reports are not available for any steel materials the same shall be got tested by the Contractor to the Engineer-In-Charge's satisfaction to demonstrate conformity with the relevant specification.

10.7 Tests on Welds

100% of welds shall be inspected for external defects. Dimensions of welds shall be checked. Welds shall be free from unfilled craters on the surfaces, undercuts, slag on the surface and visible cracks. Weld gauges shall be used to measure the size of welds. The Contractor shall carry out radiographic/ ultrasonic or other non-destructive testing as and when required by the owner through the approved agency.

Dye penetration test of welds shall be carried out using standard solutions.

Radiographic testing at random shall be carried out at least for 5% of Butt joints if directed by the Engineer-In-Charge. All radiographic tests shall be carried out in the presence of the owner through an experienced representative of a licensed firm for weld testing approved by the owner through consultant. Testing of welds shall conform to relevant Indian or ASTM standards.

10.7.1 Visual examination

All welds shall be 100% visually inspected to check the following:

- i. Presence of undercuts
- ii. Surface cracks in both welds and base metals.
- iii. Unfilled craters
- iv. Improper weld profile and size
- v. Excessive reinforcement in weld
- vi. Surface porosity

Before inspection, the surface of weld metal shall be cleaned of all slag, spatter matter; scales etc. by using wire brush or chisel.

10.7.2 Dye penetration test (DPT)

This shall be carried out for all important fillet welds and butt welds to check the following.

- a. Surface cracks
- b. Surface porosities

5% of the total length, dye-penetration test shall be carried out to the root run.

Dye Penetration Test shall be carried out in accordance with American National Standard ASTM E165.

### 10.7.3 Ultrasonic testing

Ultrasonic test shall be conducted for all groove welds and heat affected zone in dynamically loaded structures and for other important load bearing butt welds in statically loaded structures as desired by Employer to detect the following:

- i. Cracks
- ii. Lack of fusion
- iii. Slag inclusions
- iv. Gas porosity

Ultrasonic testing shall be carried out in accordance with American National Standard ANSI / AWS D1-92 Chapter 6: Part C.

Before Ultrasonic test is carried out, any surface irregularity like undercuts, sharp ridges etc. shall be rectified. Material surface to be used for scanning by probes must allow free movement of probes. For this purpose, surface shall be prepared to make it suitable for carrying out ultrasonic examination.

### 10.7.4 Magnetic Particle Test

Where welds are examined by magnetic particle testing, such testing shall be carried out in accordance with relevant IS codes. If heat treatment is performed, the completed weld shall be examined after the heat treatment. All defects shall be repaired and retested. Magnetic particle tests shall be carried out using alternating current. Direct current may be used with the permission of the Engineer-In-Charge.

### 10.7.5 Liquid Penetrant Inspection

In the case of welds examined by Liquid Penetrant Inspection, such tests shall be carried out in accordance with relevant IS Code. All defects shown shall be repaired and rechecked.

### 10.7.6 Radiographic Inspection

If directed by the Engineer-In-Charge, this test shall be limited to 2% of length of welds for welds made by manual or semiautomatic welding and 1% of length of weld if made by automatic welding machines. The location and extent of weld to be tested by this method shall be decided by Employer to detect the following defects:

- i) Gas porosity
- ii) Slag inclusions
- iii) Lack of penetration
- iv) Lack of fusion
- v) Cracks

Radiographic testing shall be conducted in accordance with American National Standard ANSI / AWS D1.1-92.

## 10.8 Dimensions, Workmanship & Cleanliness

Members shall be inspected at all stages of fabrication and assembly to verify that dimensions, tolerances, alignment, surface finish and painting are in accordance with the requirements shown in the Contractor's approved fabrication drawings and the

Engineer-In-Charge's drawings.

#### 10.9 Test Failure

In the event of failure of any member to satisfy inspection or test requirement, the Contractor shall notify the Engineer-In-Charge or his authorized representative. The Contractor must obtain permission from the Engineer-In-Charge before repair is undertaken. The quality control procedures to be followed to ensure satisfactory repair shall be subject to approval by the Engineer-In-Charge. The Engineer-In-Charge has the right to specify additional testing as and when required. The Vendor/Contractor shall maintain records of all inspection and testing which shall be made available to the Engineer-In-Charge or his authorized representative.

The contractor shall submit the proposal and methodology for testing of old/new structural steel members.

Contractor shall mark all accepted and rejected materials and stack it separately by giving proper identification marks as discussed and advised by the Engineer-In-Charge.

### 11 SHOP MATCHING

For steel work, such as columns along with the tie beams/bracings may have to be shop assembled to ensure satisfactory fabrication, obtaining of adequate bearing areas etc. if so desired by the Engineer-In-Charge. All these shop assemblies shall be carried out by Contractor at no extra cost to the Employer.

### 12 DRILLING HOLES FOR OTHER WORKS

As a part of this Contract, holes in members required for installing equipment or steel furnished by other manufacturers or other contractors shall be drilled by the Vendor/Contractor at no extra cost to the Employer. The information for such extra holes will be supplied by the Employer/Engineer-In-Charge.

### 13 MARKING OF MEMBERS

13.1 After checking and inspection, all members shall be marked for identification during erection. This mark shall correspond to distinguishing marks on approved erection drawings and shall be legibly painted and stamped on it. The erection mark shall be stamped with a metal dye with figures at least 20 mm high and to such optimum depth as to be clearly visible.

13.2 All erection marks shall be on the outer surface of all sections and near one end, but clear of bolt holes. The marking shall be so stamped that they are easily discernible when sorting out members. The stamped marking shall be encircled boldly by a distinguishable paint to facilitate easy location.

13.3 Erection marks on like pieces shall be in identical locations. Members having lengths of 7.0 m or more shall have the erection mark at both ends.

### 14 ERRORS

Any error in shop fabrication which prevents proper assembling and fitting up of parts

in the field by moderate use of drift pins or moderate amount of reaming will be classified by the Engineer-In-Charge as defective workmanship. In case Engineer-In-Charge rejects such material or defective workmanship; the same shall be replaced by the materials and workmanship conforming to the Engineer-In-Charge's requirements by Contractor free of cost at site.

## 15 PAINTING

### 15.1 SURFACE TREATMENT

15.1.1 All the surfaces of steel work to be painted shall be thoroughly cleaned of all loose mill scale, rust, grease, dirt, and other foreign matter. The type of surface treatment shall be as directed by Engineer-In-Charge. The workmanship shall generally conform to the requirements of IS 1477-Part I.

15.1.2 Oil and grease removal shall be carried out either by solvent cleaning or by using alkali type degreasing agents. To remove grease material the surface shall be cleaned with solvents containing emulsifier. After cleaning, the surface shall be washed with water. When the surface has cement pelts or salts, the cleaning shall be done with strong alkalis. After cleaning, water rinsing and subsequent passivation by dilute chromic acid rinsing shall be carried out to ensure that no traces of alkali are left on the surface. The procedure for cleaning by above mentioned methods shall be as per manufacturer's instructions.

15.1.3 De-rusting and de-scaling of steel shall be carried out either manually, mechanically, or chemically as per requirement of Engineer-In-Charge.

#### a. Manual or Hand Tool Cleaning

Loose mill scale, loose rust and loose paint shall be removed by wire brushing, scrapping, chipping, and rubbing with abrasive paper or steel wool. This method shall not be employed when the surface has firmly adhering mill scale. After hand tool cleaning, the surface shall be rubbed with sand paper so as to ensure that no loose material exists and the surfaces shall be dusted off.

#### b. Mechanical Cleaning

##### I. Power Tool Cleaning

This shall be carried out by employing power operated wire brushes. Power tool cleaning shall be resorted to only if sand/shot blasting is not possible/ permissible and high quality of surface preparation is required.

The surface prior to such cleaning shall be cleaned of dust; grease etc. and heavier layers of rust shall be removed by chipping.

The power tool cleaning shall remove loose mill scale and rust by adopting very thorough scrapping, grinding and machine brushing. After the surfaces are cleaned by compressed air, it shall have a pronounced metallic sheen.

##### II. Flame Cleaning

Hard mill scale and rust shall be removed through Oxy- acetylene flame. The work shall be carried out by trained workmen to ensure that only mill scale is removed without affecting the parent steel. The work shall be carried out carefully on welded surfaces so that the strength of weld is not affected due to heating.

c. Sand Blasting and Shot Blasting (If required) and /Shot blasting shall be resorted to only after removal of grease, oil, and other contaminants. The work shall be carried out by impinging under pressure of air, a jet of sharp sand or granulated steel (steel grits) on to the metal surface. The process shall ensure complete removal of rust and firmly adhering mill scale. Special care shall be taken on weld areas to remove flux and spatter. Blasting shall ensure an even colour of the surface and the surface shall have silver grey colour. Precautions shall be taken when sand or shot blasting of light gauge steel surfaces to ensure that buckling does not occur to continuous impingement of sand or steel shots under high velocity.

Sand/Shot blasting shall be adopted for structures which are exposed to corrosive conditions for which superior paint protection is to be adopted. The finished surfaces shall conform to the requirements of Sa 2½ or Sa 3 as per Swedish Standard SIS-05-5900 as specified in the item of work. As sand blasting causes dust nuisance necessary clearance shall be obtained by the Contractor from competent authorities prior to commencing sand blasting.

As Sandblasting causes dust nuisance necessary clearance shall be obtained by the Contractor from Competent authorities prior to commencing Sand blasting.

d. Chemical Cleaning (Pickling)

Cleaning shall be done by pickling in sulphuric, hydrochloric or phosphoric acids.

Pickling shall be carried out in accordance with detailed procedure as given in IS 6005.

Washing after pickling shall remove all traces of the acids. All work pieces shall be thoroughly inspected and in particular the inaccessible corners.

15.1.4 Contractor shall submit the Method Statement for surface treatment and painting works for old and new structural components/elements, for approval of Engineer-In-Charge.

15.1.5 At least 24 hours shall elapse between the applications of successive coats. Each coat shall vary slightly in shade, and this shall be got approved by the Engineer-In-Charge.

## 15.2 MATERIALS

### 15.2.1 Primer Paint

All steel structures shall receive two primer coats and its DFT shall be 20 microns for each coat. Primer paint shall be red oxide zinc chromate of approved make, quality and colour.

Steel surface which is to be applied with primer paint shall be cleaned of dust and grease and the heavier layers of rust shall be removed by chipping prior to actual surface preparation.

First coat of primer shall be given in shop after fabrication, before dispatch to erection site. The second coat of primer shall be applied after erection and final alignment of the erected structures.

### 15.2.2 Finish Paint

All steel structures shall receive two coats of finish paint and shall be applied after erection.

Finish paint shall be 2 coats of synthetic enamel paint of approved brand. Dry film thickness of each finish coat shall be 30 microns. The undercoat and finish coat shall be of different tint to distinguish the same from finish paint. The total dry film thickness shall be 100 microns. All paints shall be of approved brand and shade as per the Employer's requirement.

- 15.2.3 All the materials shall be of the best quality from an approved manufacturer. Contractor shall obtain prior approval of the Engineer-In-Charge for the brand of manufacture and the colour/shade prior to procurement for usage in the works.
- 15.2.4 Primer and finish paints shall be compatible with each other to avoid cracking and wrinkling. As such it is recommended that the primer and finish paint shall be from the same manufacturer.
- 15.2.5 The colour and shade shall conform to IS Standards referred to in Appendix 'D' of IS 1477-Part II. To facilitate choosing the correct shade/number from the alternatives available, Contractor shall adopt trial painting in small patches in consultation with and as directed by the Engineer-In-Charge.
- 15.2.6 All paint delivered to the fabrication shop/site shall be ready mixed, in original sealed containers, as packed by the manufacturer. Thinner shall not be permitted for usage unless specifically directed by the Engineer-In-Charge.
- 15.2.7 Paints shall be stirred thoroughly to keep the pigment in suspension.
- 15.2.8 Contractor shall at his own cost arrange for testing of paints as per relevant Indian Standards in standard laboratory whenever Employer wants the tests to be carried out for each batch of paints. Test results shall be submitted to the Employer for obtaining approval.
- 15.2.9 Joints to be site welded shall have no paint applied within 100 mm of welding zone. Similarly where Friction grip fasteners are to be used no painting shall be provided. On completion of the joint the surfaces shall receive the paint as specified.
- 15.2.10 Surfaces inaccessible after assembly shall receive two coats of primer prior to assembly. Surfaces inaccessible after erection including top surfaces of floor beams supporting gratings or chequered plate shall receive one additional coat of finish paint over and above number of coats specified before erection. Portion of steel member embedded / to be encased in concrete shall not be painted.

### 15.3 WORKMANSHIP

- 15.3.1 No painting shall be done in frosty/foggy weather or when the humidity is high enough to cause condensation on the surface to be painted. Paint shall not be applied when the temperature of the surface to be painted is at 5°C or lower. Primers shall adhere to the surface firmly and offer a key to the subsequent coats.
- 15.3.1 The application of paint film shall serve the twin purpose of protecting the steel from corrosion and giving the decorative appearance. A paint which gives the steel adequate protection over a long period together with good appearance shall therefore be adopted.
- 15.3.2 Workmanship shall generally conform to requirements specified in IS: 1477-Part II.

- 15.3.3 It is essential to ensure that immediately after preparation of the surfaces; the first coat of primer paint 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.
- 15.3.4 Structural steel surfaces shall be given the first coat of primer at shop and the second coat after it is erected in position. Further, any abraded surfaces of the first coat during transport from shop to site and during erection shall be provided with a touchup coat of the primer.
- 15.3.5 Application of finishing paints shall be carried out within the shortest possible time interval after primer since the primer coats are too thin to give adequate corrosion protection to the steel surface over a long duration.
- 15.3.6 Filler coats shall be applied to fill dents and to obtain a smooth finish wherever necessary. Only factory prepared filler suitable for steel work shall be used. Fillers prepared by whiting and linseed oil by craftsmen at site shall never be used as such fillers may be unbalanced and incompatible with primer and finishing coats. Application of filler shall be done with good 'putty knife' and necessary skill. Filler applied shall be just sufficient to fill the depression or unevenness and it shall be restricted to the minimum. It shall be applied in thin layers. In filling depression or unevenness, as many coats as are necessary may be applied allowing each layer to dry hard. The hardened coat shall be cut down by wet rubbing before the subsequent coat is applied. Where necessary, filler coats shall be applied over the undercoats also.
- 15.3.7 Painting shall be carried out either by brushing or by spraying. Contractor shall procure the appropriate quality of paint for this purpose as recommended by the manufacturer.
- 15.3.8 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 paint shall be applied by brushing/spraying 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.
- 15.3.9 At least 24 hours shall elapse between the applications of successive coats. Each coat shall vary slightly in shade and this shall be got approved by the Engineer-In-Charge.
- 15.3.10 The thickness of film shall be measured by an Elcometer to be supplied by the Contractor. The Contractor shall calibrate the Elcometer frequently for different settings. Necessary calibrating accessories should be kept ready for calibration/testing of Elcometer at any time.
- 15.3.11 Epoxy primer and epoxy paint shall be applied within the specified pot life all as per recommendations of the manufacturer.
- 15.3.12 Surfaces inaccessible after assembly shall receive two coats of primer prior to assembly.
- 15.3.13 Surfaces inaccessible after erection, including top surfaces of floor beams

supporting grating or chequered plate shall receive one additional coat of finish paint over and above the number of coats specified prior to erection.

- 15.3.14 Portion of steel members embedded/to be encased in concrete shall not be painted. Joints to be site welded shall have no shop paint for at least 50mm from the welding zone. Similarly, the steel surfaces shall not be painted in areas where connection is by use of friction grip bolts. On completion of the joint, the surfaces shall receive the painting as specified.
- 15.3.15 Maintenance painting of steel structures would become necessary if the painting already carried out shows signs of chalking, hairline cracking, deep checking, fine checking, and peeling, blistering and rusting. The breakdown of a paint film is progressive from the top finish paint to the primer coat and the object of maintenance painting is to renovate periodically to effectively check the breakdown and protect the steel surfaces from corrosion. It is essential that same quality of paint as specified earlier need be adopted to ensure compatibility. The general workmanship for maintenance painting shall conform as per Clause. 7 of IS 1477-Part II.
- 15.3.16 Contractor shall provide suitable protection as necessary to prevent paint finishes from splashing on equipment, floors, walls etc.

## **16 ERECTION OF STEEL STRUCTURES**

- 16.1 An experienced and qualified Supervisor shall be in full time charge of the job.
- 16.2 Contractor shall complete all preliminary works at site well before the arrival of structural steel, such as establishment of a well-equipped and adequately staffed site office, stores, unloading gantry, unloading and preassembly yard, labour quarters if any, electrical and water connections, electrical winches, derricks, cranes, compressors, all tools and tackles, rivet guns, welding sets, torque wrenches, spud wrenches, staging, etc. as well as experienced erection and supervisory personnel as part of this contract and any other work that may be necessary so as to start erection immediately after the arrival of the first batch of steel at site.
- 16.3 Contractor shall furnish at his own expense, the necessary nonflammable staging and hoisting materials or equipment required for the erection work and shall remove and take them away after completion of the job. Contractor shall also provide necessary passageways, fences, safety belts, helmets, lights and other fittings to the satisfaction of Employer/Engineer-In-Charge and to meet the rules of local authorities and for protection to his men and materials. A licensed electrician shall be kept on the job for the entire duration of the work to maintain Contractor's electrical equipment and connections.
- 16.4 Contractor shall protect all existing plant, structures, piping, conduits, equipment and facilities against damage during erection. Any damage caused by Contractor shall be rectified entirely at Contractor's cost, to the satisfaction of Employer/Engineer-In-Charge. If work has to be carried out adjacent to existing switch yards or electrical installations which are live, Contractor must ensure suitable safety precautions in consultation with Engineer-In-Charge.

16.5 If a portion of the work of the project area cannot be made available to Contractor for his activities due to operations being carried out by other agencies, he shall suitably modify his sequence of operations so as to continue work without interruption. Contractor shall work in coordination with other agencies working on the project site and plan his work suitably so as not to hinder the progress of construction at site.

#### 16.6 ACCEPTANCE OF STEEL, ITS HANDLING & STORAGE

16.6.1 Contractor shall carefully check the steel to be erected at the time of acceptance. Any fabrication defects observed should be brought to the notice of Employer/ Engineer-In-Charge.

16.6.2 No dragging of steel shall be permitted. All shall be stored 300mm above ground on suitable packing to avoid damage. It shall be stored in the order required for erection, with erection marks visible. All storage areas shall be prepared and maintained by Contractor. Steel shall not be stored in the vicinity of areas where excavation or grading will be done and, if so stored temporarily, this shall be removed by Contractor well before such excavation and/or grading commences to a safe distance to avoid burial under debris.

16.6.3 Scratched or abraded steel shall be given a coat of primer for protection after unloading and handling prior to erection. All milled and machined surfaces shall be properly protected from rust/corrosion by suitable coating and also from getting damaged.

#### 16.7 ASSEMBLY & CONNECTIONS

16.7.1 Field connections may be effected by riveting, bolting, welding or by use of high strength friction grip bolts as shown on the design and erection drawings.

16.7.2 All field connection works shall be carried out in accordance with the approved fabrication drawing. All bolts, nuts, washers, rivets, electrodes required for field connections shall be supplied by erector free of cost.

16.7.3 All assembling shall be carried on a level platform suiting the configuration .

16.7.4 Drifts shall be used only for drawing the work to proper position and must not be used to such an extent as to damage the holes. Size of drifts larger than the nominal diameter of hole shall not be used. Any damaged holes or burrs must be rectified to the satisfaction of Engineer-In-Charge.

16.7.5 Corrections of minor misfits and reasonable amount of reaming and cutting of excess stock from rivets shall be considered as a part of erection. Any error in the shop, which prevents proper fit on a moderate amount of reaming and slight chipping or cutting, shall be immediately reported to Engineer-In-Charge.

#### 16.8 ERECTION

16.8.1 All structural steel shall be erected as shown on the drawings. Proper size steel cable slings, etc., shall be used for hoisting. Guys shall not be anchored to existing structures, foundations, etc. unless so permitted by Engineer-In-Charge in writing. Care shall be taken to see that ropes in use are always in good condition.

- 16.8.2 Structural steel frames shall be erected plumb and true line and level. Frames shall be lifted at such points that they are not liable to buckle and deform. Frames shall be lifted only at node points. All steel columns and beams shall be checked for plumb and level individually before and after connections are made. Temporary bracings shall be introduced wherever necessary to take care of all loads to which the structure may be subjected, including erection equipment and the operation thereof. Such bracings shall be left in place as long as may be required for safety and stability.
- 16.8.3 As erection progresses, the work shall be securely bolted to take care of all dead load, wind, seismic and erection stresses.
- 16.8.4 No riveting or welding or final bolting shall be done until the structure has been properly aligned and approved by Engineer-In-Charge. No cutting, heating or enlarging of the holes shall be carried out without the prior written approval of Engineer-In-Charge.

#### 16.9 INSPECTION

Engineer-In-Charge/Employer or their authorized representatives shall have free access to all parts of the job during erection and all erection shall be subjected to their approval. In case of faulty erection, all dismantling and re-erection required will be at Contractor's cost. No paint shall be applied to field welds or bolts until these have been approved by Engineer-In-Charge.

#### 16.10 PAINTING

After steel has been erected, all bare and abraded spots, field welds, bolt heads and nuts shall be spot painted with primer. Before paint is applied, the surface shall be dry and free from dust, dirt, scale and grease. All surfaces inaccessible after erection shall receive two coats of the approved primer and paint before erection as per specification. Any damage if found in the structure/element shall be checked and if found damaged, shall be rectified or shall be repainted.

#### 16.11 CLEAN UP OF WORK SITE

During erection, the Contractor shall without any additional payment, at all times keep the working and storage areas used by him, free from accumulation of waste materials or rubbish. Before completion of erection, he shall remove or dispose of in a satisfactory manner all temporary structures, waste and debris and leave the premises in a condition satisfactory to Employer/Engineer-In-Charge.

#### 16.12 SAFETY

The safety precautions to be applied during the erection of the steel structures shall be in accordance with IS: 7205 and other appropriate IS standards.

#### 16.13 INSPECTION AT SITE

After fabrication of the structures, the Contractor shall carry out inspections and

checks in the presence of Engineer in order to demonstrate completeness of the works and correctness of the assembly. The Contractor, subject to Engineer's approval shall propose the inspections and checks to be carried out. In order to facilitate inspections as well as future maintenance, the structures shall be provided with steps, ladders, handrails, and other facilities in approved positions. The Contractor shall provide for the owner's use all equipment and instruments for inspection.

## **17 MODE OF MEASUREMENT AND PAYMENT**

### **17.1 FABRICATION**

17.1.1 For the purpose of payment, the weight of the actual completed structures shall be calculated from the approved drawings for different items of work. The Contractor shall submit to the Engineer-In-Charge relevant material list containing weight of each item.

17.1.2 No allowances will be permitted for bolts, nuts, washers, studs, screws etc., galvanizing, welding or for rolling margins. One tonne for the purpose of the payment shall mean ONE METRIC TONNE i.e. 1000kg.

17.1.3 The weight of a member made out of standard rolled section such as beams, channels, angles, etc. shall be based on the standard IS:808 without deductions for holes, notches, bevel cuts, etc. Where a component consists of a cut joist or channels, the full weight of the rolled section shall be considered only if more than half the depth of the original section is used. Otherwise, only half the section unit weight shall be considered for calculation of the weight of the components.

17.1.4 Deductions shall be made in the weight of gussets/plates for cuts and a notch as specified in IS 1200 part 8.

17.1.5 The weight of any built-up members shall be based on the weight of each component.

### **17.2 ERECTION WORKS**

17.2.1 For the purpose of payment, the weight of the actual, completed structures shall be calculated from the approved drawings for different items of work. Contractor shall submit to Employer relevant material list containing weight of each item. No allowance will be permitted for weights of rivets, bolts, washers, screws etc. in calculating the weight of the completed structure. No allowances will be permitted for galvanizing, welding or for rolling margins. One tonne for the purpose of payment shall mean ONE METRIC TONNE i.e. 1000 Kg.

17.2.2 The weight of a member made out of standard rolled sections such as beams, channels, angles, etc. shall be based on the weight of the member given in IS 808, without deducting for holes, notches, bevel cuts, etc. Where a component consists of a cut joist or channel, the full weight of the rolled section shall be considered only if more than half the depth of the section is used. Otherwise only half the section unit weight shall be taken. Deductions shall be made in the weight of gussets/plates including chequered plates for skew cuts, notches and openings as specified in IS 1200 part 8.

- 17.2.3 For gussets/plates used in trusses, bracings, columns, beams etc. the area shall be that of the minimum circumscribing rectangle, except as stated in clause 16.3 above.
- 17.2.4 The weight of any built-up member shall be separated into the weight of each component.
- 17.2.5 Erection bolts installed by erector may be left in position on completion of erection; however, no additional payment shall be made either for supply or use of such bolts. If erection bolts are removed after erection is complete, holes shall be plug welded and ground smooth. No extra payment shall be made for such plug welding.
- 17.2.6 Erection work shall not be measured separately if erection work is already included in the scope of item of work of fabrication/erection of steel.

### 17.3 PAINTING

- 17.3.1 Method of measurement for payment for painting shall be in sq. meters, correct to two places of decimals, if so specified, in the respective item of work.
- 17.3.2 Painting work shall not be measured separately, if primer painting and/or primer and finish painting are already included in the scope of the item of work of fabrication and erection of structural steel since the rate per tonne of steel is deemed to include for painting as specified.
- 17.3.3 Prior to commencement of fabrication contractor has to submit a detailed bill of material statement along with shop drawing in which item wise length, quantity, painting area shall be indicated. Fabrication has to be carried out only using shop drawing approved by Engineer-In-Charge
- 17.3.4 After completion of the work as mentioned above, joint measurements shall be taken and signed by Engineer-In-Charge and Contractor for the work completed.

## BSP : Crane Rails

Profile	Sectional Wt kg/m	Standard Length	Mill
CR - 80*	64.2	13m	Rail & Structural Mill, Bhilai
CR - 100*	89.0	13m	Rail & Structural Mill, Bhilai
CR - 120*	118.0	13m	Rail & Structural Mill, Bhilai

Denotes head width

Specification	Ladle Analysis %					
	C	Mn	P Max	S Max	Si	Hydrogen
Crane Rails	0.65-0.75	1.0-1.3	0.040	0.040	0.10-0.05	Less than 3 ppm

## Properties

UTS	850 MPa min
Elongation	8% min
Hardness	250 BHN min
Micro Structure	Peralitic
Inclusion Rating Supply Condition	3.0 max (Worst field) Sulphide, Alumina, Silicate & Globular oxide individually
CR 80 100	0.10-0.05
CR 120	Less than 3 ppm